CE EMC Test Report

Report No.: CE180227D14 R1

Test Model: EA271Q

Model No.: EA271Q, EA271Q-BK

Received Date: Feb. 27, 2018

Test Date: Feb. 28 ~ Mar. 14, 2018

Issued Date: Mar. 28, 2018

Applicant: TOP VICTORY ELECTRONICS (TAIWAN) CO., LTD.

Address: 10F., No 230, Liancheng Rd., Zhonghe Dist., New Taipei City 23553, Taiwan

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Certificate #4327.01

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Release Control Record

Issue No.	Description	Date Issued
CE180227D14	Original release.	Mar. 16, 2018
CE180227D14 R1	Added the description that EUT has two exterior colors: black and white	Mar. 28, 2018

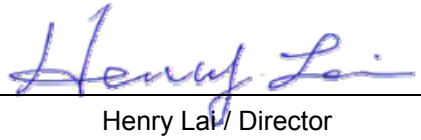
1 Certificate of Conformity

Product:	LCD Monitor
Brand:	NEC
Test Model:	EA271Q
Model No.:	EA271Q, EA271Q-BK
Sample Status:	Engineering sample
Applicant:	TOP VICTORY ELECTRONICS (TAIWAN) CO., LTD.
Test Date:	Feb. 28 ~ Mar. 14, 2018
Standards:	**EN 55032:2012 +AC:2013/ EN 55032:2015 +AC:2016, Class B**
	EN 61000-3-2:2014
	EN 61000-3-3:2013
	EN 55024:2010
	EN 61000-4-2:2009 / IEC 61000-4-2:2008 ED. 2.0
	EN 61000-4-3:2006 +A1:2008 +A2:2010 / IEC 61000-4-3:2010 ED. 3.2
	EN 61000-4-4:2012 / IEC 61000-4-4:2012 ED. 3.0
	EN 61000-4-5:2014 / IEC 61000-4-5:2014 ED. 3.0
	EN 61000-4-6:2014 / IEC 61000-4-6:2013 ED. 4.0
	EN 61000-4-8:2010 / IEC 61000-4-8:2009 ED. 2.0
	EN 61000-4-11:2004 / IEC 61000-4-11:2004 ED. 2.0

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :  , **Date:** Mar. 28, 2018

Albee Chu / Specialist

Approved by :  , **Date:** Mar. 28, 2018

Henry Lai / Director

2 Summary of Test Results

Emission			
Standard	Test Item	Result/Remarks	Verdict
EN 55032:2012 +AC:2013 / EN 55032:2015 +AC:2016	Conducted emission from the AC mains power port	Minimum passing Class B margin is -16.67 dB at 26.46094 MHz	Pass
	Asymmetric mode conducted emission at telecommunication ports	Without telecom port of the EUT	N/A
	Radiated emission 30-1000 MHz	Minimum passing Class B margin is -4.17 dB at 47.99 MHz	Pass
	Radiated emission above 1GHz	Minimum passing Class B margin is -11.41 dB at 1732.46 MHz	Pass
EN 61000-3-2:2014	Harmonic current emissions	The power consumption of EUT is less than 75W and no limits apply.	Pass
EN 61000-3-3:2013	Voltage fluctuations and flicker	$P_{st} \leqq 1.0$ $d_{max} \leqq 4\%$ $P_{lt} \leqq 0.65$ $d_c \leqq 3.3\%$ $T_{max} \leqq 500ms$	Pass

Immunity				
EN 55024 Clause	Basic standard	Test Item	Result/Remarks	Verdict
4.2.1	EN 61000-4-2:2009 / IEC 61000-4-2:2008 ED. 2.0	Electrostatic discharges (ESD)	Performance Criterion B	Pass
4.2.3.2	EN 61000-4-3:2006 +A1:2008 +A2:2010 / IEC 61000-4-3:2010 ED. 3.2	Continuous radiated disturbances (RS)	Performance Criterion A	Pass
4.2.2	EN 61000-4-4:2012 / IEC 61000-4-4:2012 ED. 3.0	Electrical fast transients (EFT)	Performance Criterion A	Pass
4.2.5	EN 61000-4-5:2014 / IEC 61000-4-5:2014 ED. 3.0	Surges	Performance Criterion A	Pass
4.2.3.3	EN 61000-4-6:2014 / IEC 61000-4-6:2013 ED. 4.0	Continuous conducted disturbances (CS)	Performance Criterion A	Pass
4.2.4	EN 61000-4-8:2010 / IEC 61000-4-8:2009 ED. 2.0	Power-frequency magnetic fields (PFMF)	Performance Criterion A	Pass
4.2.6	EN 61000-4-11:2004 / IEC 61000-4-11:2004 ED. 2.0	Voltage dips and interruptions	Voltage Dips: >95% reduction – 0.5 period, Performance Criterion A 30% reduction – 25 periods, Performance Criterion A Voltage Interruptions: >95% reduction – 250 periods, Performance Criterion C	Pass

Note:
1. The above EN/IEC basic standards are applied with latest version if customer has no special requirement.
2. There is no deviation to the applied test methods and requirements covered by the scope of this report.
3. N/A: Not Applicable

2.1 Measurement Uncertainty

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

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Expended Uncertainty (k=2) (±)	Maximum allowable uncertainty (±)
Conducted emission from AC mains power port using AMN, 150kHz ~ 30MHz	2.77 dB	3.4 dB (U_{cispr})
Radiated emission, 30MHz ~ 1GHz	4.26 dB	6.3 dB (U_{cispr})
Radiated emission, 1GHz ~ 6GHz	5.12 dB	5.2 dB (U_{cispr})

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 Features of EUT

The tests reported herein were performed according to the method specified by TOP VICTORY ELECTRONICS (TAIWAN) CO., LTD., for detailed feature description, please refer to the manufacturer's specifications or user's manual.

3.2 General Description of EUT

Product	LCD Monitor
Brand	NEC
Test Model	EA271Q
Model No.	EA271Q, EA271Q-BK
Model Difference	Marketing difference
Sample Status	Engineering sample
Operating Software	N/A
Power Supply Rating	Internal switching power supply Rating: 100-240Vac, 50/60Hz Power Cord: Non-shielded AC cable (1.8m)
Accessory Device	Refer to note as below
Data Cable Supplied	Shielded DVI cable (1.8m) with two ferrite cores Shielded Display cable (1.8m) Shielded HDMI cable (1.8m) Shielded USB type C cable (1.8m)

Note:

1. The EUT is a LCD Monitor and the highest resolution is up to 2560*1440 (60Hz).

2. The EUT has several models which are equipped the following interfaces:

Model No.	Interface	Exterior Color	Difference
EA271Q	♦ HDMI in ♦ Display in ♦ Display out ♦ DVI in ♦ Audio out ♦ USB (type A) x 1 <Side> ♦ USB (type A) x 2 <Rear> ♦ USB (type B) x 1 ♦ USB type C ♦ Control in ♦ Control out ♦ GND ♦ AC in	♦ Black ♦ white	Marketing diffrentiation
EA271Q-BK			

During the test, **model: EA271Q (Black)** was selected as the representative one and therefore only its test data was recorded this report.

3.3 Operating Modes of EUT and Determination of Worst Case Operating Mode

1. The EUT was pre-tested under operating and standby condition and the worst emission level was found under **operating condition**.

2. The EUT is designed with AC power supply of 100-240Vac, 50/60Hz.
   For radiated emission evaluation, 230Vac/50Hz & 110Vac/60Hz had been covered during the pre-test.
   The worst radiated emission data was founded at **110Vac/60Hz** and recorded in the applied test report.

3. The EUT has been pre-tested under following test modes, and test **Mode 1** was the worst case.

Description			Test Mode									
			1	2	3	4	5	6	7	8	9	10
Interface	Display	2560*1440 (60Hz)	V	V	V	V						
	HDMI						V					
	DVI							V				
	USB type C	1920*1080 (60Hz)							V			
	Display: 1600*900 (60Hz)									V		
	Display: 640*480 (60Hz)										V	
	HDMI from DVD: 1080p											V
Setup of Panel	Horizontal (up)		V	V			V	V	V	V	V	V
	Horizontal (down)				V							
	Vertical					V						
Headphone	With		V		V	V	V	V	V	V	V	V
	Without			V								

4. Test modes are presented in the report as below.

Mode		Interface / Resolution	Color bar signal	Panel	Headphone	Input Power
Conducted Emission Test						
1	A	Display / 2560*1440 (60Hz)	ITU-R BT 1729	Horizontal (up)	With Headphone	230V/50Hz & 110V/60Hz
	B		ITU-R BT 471-1			
10		HDMI to DVD/ 1080p	ITU-R BT 471-1*			
Radiated Emission Test						
1	A	Display / 2560*1440 (60Hz)	ITU-R BT 1729	Horizontal (up)	With Headphone	110V/60Hz
	B		ITU-R BT 471-1			
10		HDMI to DVD/ 1080p	ITU-R BT 471-1*			
Harmonics, Flicker & Immunity Tests						
1		Display / 2560*1440 (60Hz)	-	Horizontal (up)	With Headphone	230V/50Hz

*: Selected the worst color bar signal from radiated test.

3.4 Test Program Used and Operation Descriptions

Emission Tests (Harmonic & Flicker Test Excluded):

a. Turned on the power of all equipments.

b. PC/ Notebook PC ran a test program to enable all functions.

c. PC/ Notebook PC read and wrote messages from HDD.

d. PC read and wrote messages from ext. HDDs via EUT.

e. PC/ Notebook PC sent “ITU-R BT 1729 color bars with moving element” messages to EUT and ext monitor via EUT, then they displayed them on their screen.. ***<For Mode 1A >***

f. PC/ DVD player/ Notebook PC sent “ITU-R BT 471-1 color bars with moving element” messages to EUT and ext monitor via EUT, then they displayed them on their screen.. ***<For Mode 1B & Mode 10>***

g. PC sent messages to printer and printer printed them out.

h. PC/ DVD Player/ Notebook PC sent audio signal to earphone via EUT.

i. Steps c-h were repeated.

Harmonics, Flicker & Immunity Tests:

a. Turned on the power of all equipments.

b. PC ran a test program to enable all functions.

c. PC read and wrote messages from HDD.

d. PC read and wrote messages from USB flash drive and USB 3.0 HDDs via EUT.

e. PC sent “full white screen” messages to EUT and ext. monitor via EUT, and then they displayed them on their screen. ***<for Harmonics, Flicker tests>***

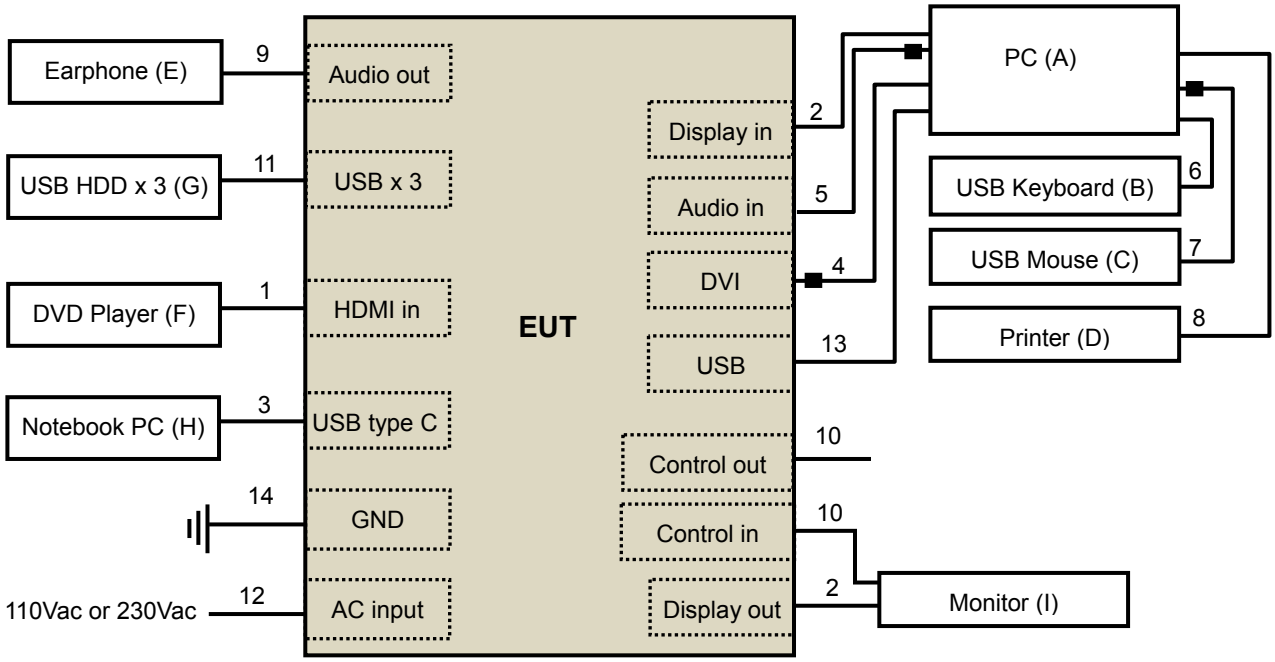
f. PC sent “H” messages to EUT and ext. monitor via EUT, and then they displayed them on their screen. ***<for Immunity tests>***

g. Steps c-f were repeated.

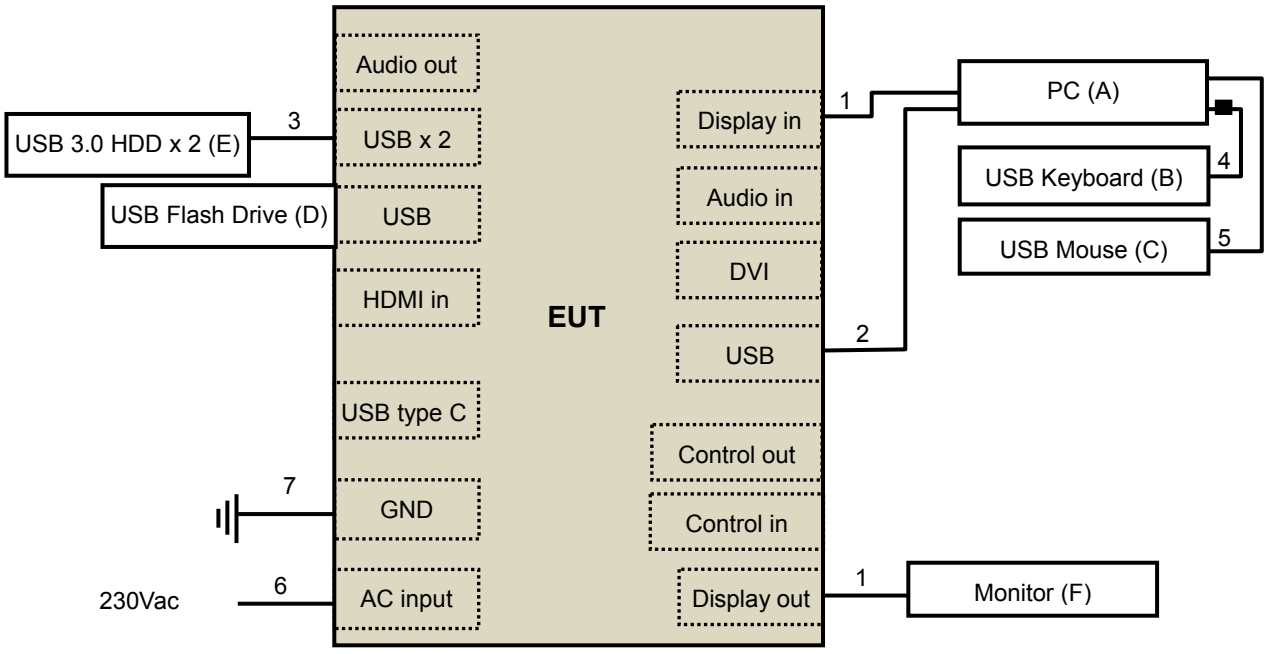
4 Configuration and Connections with EUT

4.1 Connection Diagram of EUT and Peripheral Devices

Emission tests (Harmonics & Flicker excluded):



Harmonics, Flicker, Immunity tests:



4.2 Configuration of Peripheral Devices and Cable Connections

Emission tests (Harmonics & Flicker excluded):

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	PERSONAL COMPUTER	Lenovo	90G8	R303YS8R	FCC DoC Approved	Provided by Lab
B.	USB KEYBOARD	BTC	5200U	G09302046627	E5XKB5122U	Provided by Lab
C.	USB Mouse	Microsoft	1113	9170515153524	FCC DOC Approved	Provided by Lab
D.	PRINTER	HP	CV136-64001	N/A	FCC DoC Approved	Provided by Lab
E.	EARPHONE	PHILIPS	SBC HL150	H2010154	N/A	Provided by Lab
F.	DVD PLAYER	SONY	BDP-S7200	3200138	Verification	Provided by Lab
G.	USB 3.0 Hard Disk	WD	WDBUZG0010BBK-PESN	WXF1E84H2ASN	FCC DoC Approved	Provided by Lab
	USB 3.0 Hard Disk	WD	WDBUZG0010BBK-PESN	WXN1E84F21W	FCC DoC Approved	Provided by Lab
	USB 3.0 Hard Disk	WD	WDBUZG0010BBK-PESN	WXM1E1562S3E	FCC DoC Approved	Provided by Lab
H.	Notebook PC	DELL	P54G	98HNF72	FCC DoC Approved	Provided by Lab
I.	Monitor	NEC	EA271U	N/A	N/A	Supplied by client

Note: All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	HDMI cable	1	1.8	Y	0	Supplied by client
2.	Display cable	2	1.8	Y	0	Supplied by client
3.	USB type C cable	1	1.8	Y	0	Supplied by client
4.	DVI cable	1	1.8	Y	2	Supplied by client
5.	Audio cable	1	1.8	N	0	Provided by Lab
6.	USB cable	1	1.5	Y	0	Provided by Lab
7.	USB cable	1	1.8	Y	1	Provided by Lab
8.	USB cable	1	1.5	Y	0	Provided by Lab
9.	Audio cable	1	1.2	N	0	Provided by Lab
10.	Control cable	2	1.8	N	0	Supplied by client
11.	USB cable	3	0.5	Y	0	Provided by Lab
12.	AC power cord	1	1.8	N	0	Supplied by client
13.	USB cable	1	1.8	Y	0	Provided by Lab
14.	GND cable	1	1.5	N	0	Provided by Lab

Note: The core(s) is(are) originally attached to the cable(s).

Harmonics, Flicker, Immunity tests:

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	PERSONAL COMPUTER	HP	PRO6300 MT	SGH237SVP4	FCC DoC Approved	Provided by Lab
B.	USB KEYBOARD	DELL	SK-8115	CN-0J4635-71616-63I-076X	FCC DoC Approved	Provided by Lab
C.	USB MOUSE	HP	M-UAE96	F93A90AN3V42GQ5	FCC DoC Approved	Provided by Lab
D.	USB flash drive	PNY	UCD20	N/A	N/A	Provided by Lab
E.	USB 3.0 HDD	Seagate	SRD00F2	N/A	N/A	Provided by Lab
	USB 3.0 HDD	Seagate	SRD00F2	N/A	N/A	Provided by Lab
F.	Monitor	NEC	EA271U	N/A	N/A	Supplied by client

Note: All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Display cable	2	1.8	Y	0	Supplied by client
2.	USB cable	1	1.0	Y	0	Supplied by client
3.	USB cable	2	0.3	Y	0	Provided by Lab
4.	USB cable	1	1.5	Y	1	Provided by Lab
5.	USB cable	1	1.5	Y	0	Provided by Lab
6.	AC power cord	1	1.8	N	0	Supplied by client
7.	GND cable	1	1.5	N	0	Provided by Lab

Note: The core(s) is(are) originally attached to the cable(s).

5 Conducted Emission from the AC Mains Power Port

5.1 Limits

Frequency range (MHz)	Coupling device	Detector type / bandwidth	Class A limits (dBuV)
0.15 - 0.5	AMN	Quasi-peak / 9kHz	79
0.5 - 30.0			73
0.15 - 0.5		Average / 9kHz	66
0.5 - 30.0			60

Frequency range (MHz)	Coupling device	Detector type / bandwidth	Class B limits (dBuV)
0.15 - 0.5	AMN	Quasi-peak / 9kHz	66 - 56
0.5 - 5			56
5 - 30.0			60
0.15 - 0.5		Average / 9kHz	56 - 46
0.5 - 5			46
5 - 30.0			50

5.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
ROHDE & SCHWARZ TEST RECEIVER	ESCS 30	100290	Dec. 19, 2017	Dec. 18, 2018
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH2-Z5	100104	Dec. 06, 2017	Dec. 05, 2018
LISN With Adapter (for EUT)	AD10	C09Ada-001	Dec. 06, 2017	Dec. 05, 2018
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	847265/023	Nov. 03, 2017	Nov. 02, 2018
SCHWARZBECK Artificial Mains Network (For EUT)	NNLK8129	8129229	May 9, 2017	May 8, 2018
Software	Cond_V7.3.7.4	NA	NA	NA
RF cable (JYEBAO) With 10dB PAD	5D-FB	Cable-C09.01	Feb. 21, 2018	Feb. 20, 2019
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010789	May 18, 2017	May 17, 2018
ROHDE & SCHWARZ Artificial Mains Network (For TV EUT)	ESH3-Z5	100220	Nov. 14, 2017	Nov. 13, 2018
LISN With Adapter (for TV EUT)	100220	N/A	Nov. 14, 2017	Nov. 13, 2018

Notes:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. 9.
3. The VCCI Site Registration No. C-1312.
4. Tested Date: Mar. 1 ~ 6, 2018.

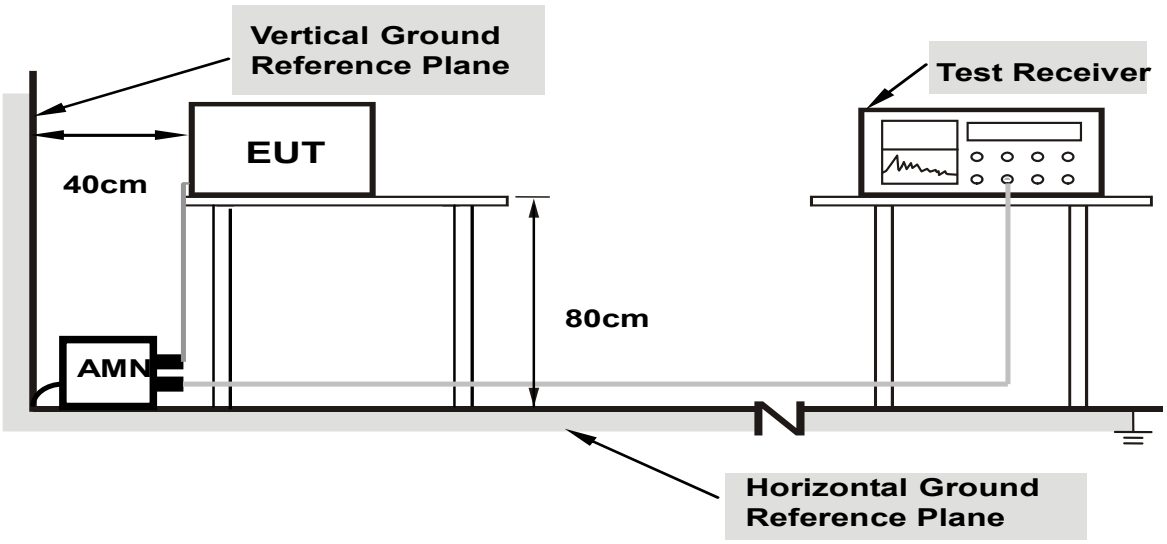
5.3 Test Arrangement

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through an Artificial Mains Network (AMN). Other support units were connected to the power mains through another AMN. The two AMNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The test results of conducted emissions at mains ports are recorded of six worst margins for quasi-peak (mandatory) [and average (if necessary)] values against the limits at frequencies of interest unless the margin is 20 dB or greater.

Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.



Note: 1. Support units were connected to second AMN.
2. The distance specified between EUT/AE and other metallic objects is ≥ 0.8 m in the measurement arrangement for table-top EUT.
3. Cable on the RGP must to be insulated.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

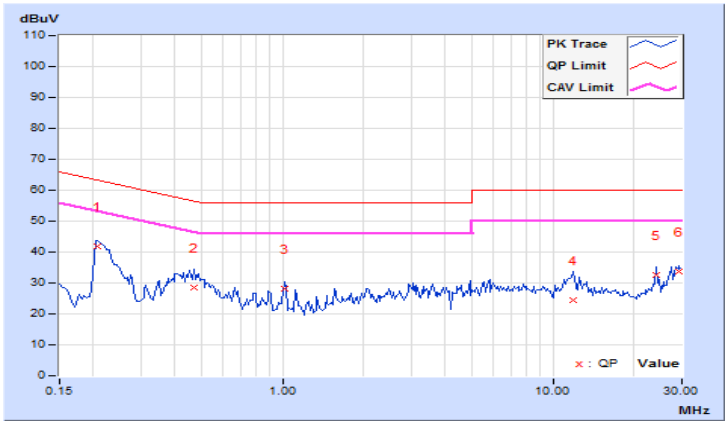
5.4 Test Results of Input Power: 110Vac, 60Hz

Frequency Range	150kHz ~ 30MHz	**Detector Function & Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	110Vac, 60Hz	**Environmental Conditions**	25℃, 75%RH, 1002mbar
Tested by	Ane Wang		
Test Mode	Mode 1A		

Phase Of Power : Line (L)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.20724	10.12	31.72	15.89	41.84	26.01	63.32	53.32	-21.48	-27.31
2	0.47031	10.16	18.40	12.53	28.56	22.69	56.51	46.51	-27.95	-23.82
3	1.02344	10.25	17.97	17.57	28.22	27.82	56.00	46.00	-27.78	-18.18
4	11.85156	10.75	13.79	8.13	24.54	18.88	60.00	50.00	-35.46	-31.12
5	24.00000	11.12	21.38	20.83	32.50	31.95	60.00	50.00	-27.50	-18.05
6	29.22266	11.13	22.56	21.95	33.69	33.08	60.00	50.00	-26.31	-16.92

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

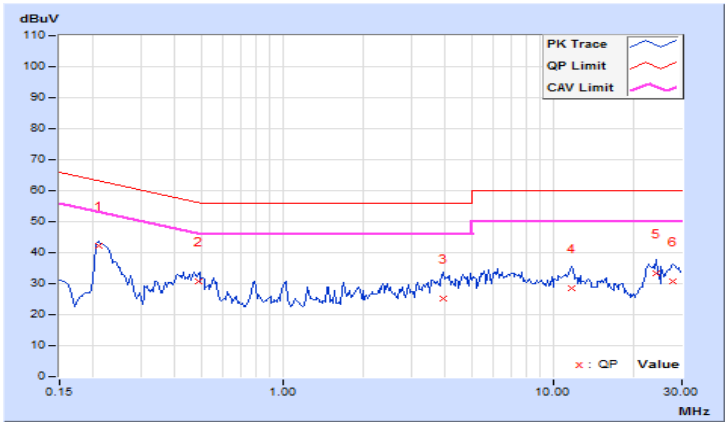


Frequency Range	150kHz ~ 30MHz	**Detector Function & Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	110Vac, 60Hz	**Environmental Conditions**	25℃, 75%RH, 1002mbar
Tested by	Ane Wang		
Test Mode	Mode 1A		

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.20859	10.14	32.09	16.52	42.23	26.66	63.26	53.26	-21.03	-26.60
2	0.49247	10.18	20.65	18.96	30.83	29.14	56.13	46.13	-25.30	-16.99
3	3.94531	10.49	14.61	9.27	25.10	19.76	56.00	46.00	-30.90	-26.24
4	11.80859	10.69	17.89	9.86	28.58	20.55	60.00	50.00	-31.42	-29.45
5	23.99872	10.75	22.67	21.53	33.42	32.28	60.00	50.00	-26.58	-17.72
6	27.92578	10.60	20.02	19.06	30.62	29.66	60.00	50.00	-29.38	-20.34

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

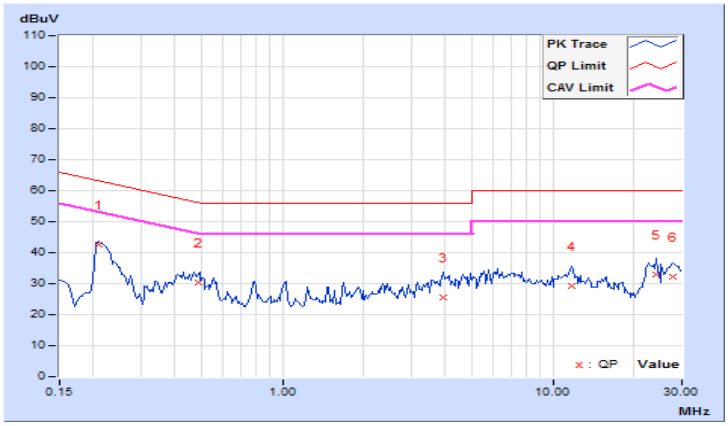


Frequency Range	150kHz ~ 30MHz	**Detector Function & Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	110Vac, 60Hz	**Environmental Conditions**	25℃, 75%RH, 1002mbar
Tested by	Ane Wang		
Test Mode	Mode 1B		

Phase Of Power : Line (L)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.20859	10.12	32.57	15.52	42.69	25.64	63.26	53.26	-20.57	-27.62
2	0.49247	10.17	20.29	17.96	30.46	28.13	56.13	46.13	-25.67	-18.00
3	3.94531	10.47	15.11	5.27	25.58	15.74	56.00	46.00	-30.42	-30.26
4	11.80859	10.75	18.67	6.86	29.42	17.61	60.00	50.00	-30.58	-32.39
5	23.99872	11.12	21.67	18.53	32.79	29.65	60.00	50.00	-27.21	-20.35
6	27.92578	11.13	20.97	17.06	32.10	28.19	60.00	50.00	-27.90	-21.81

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

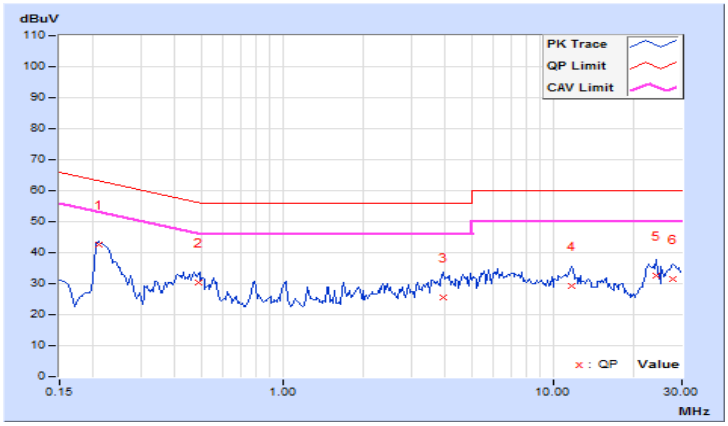


Frequency Range	150kHz ~ 30MHz	**Detector Function & Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	110Vac, 60Hz	**Environmental Conditions**	25℃, 75%RH, 1002mbar
Tested by	Ane Wang		
Test Mode	Mode 1B		

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.20859	10.14	32.57	16.52	42.71	26.66	63.26	53.26	-20.55	-26.60
2	0.49247	10.18	20.29	18.96	30.47	29.14	56.13	46.13	-25.66	-16.99
3	3.94531	10.49	15.11	7.27	25.60	17.76	56.00	46.00	-30.40	-28.24
4	11.80859	10.69	18.67	7.86	29.36	18.55	60.00	50.00	-30.64	-31.45
5	23.99872	10.75	21.67	19.53	32.42	30.28	60.00	50.00	-27.58	-19.72
6	27.92578	10.60	20.97	19.06	31.57	29.66	60.00	50.00	-28.43	-20.34

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

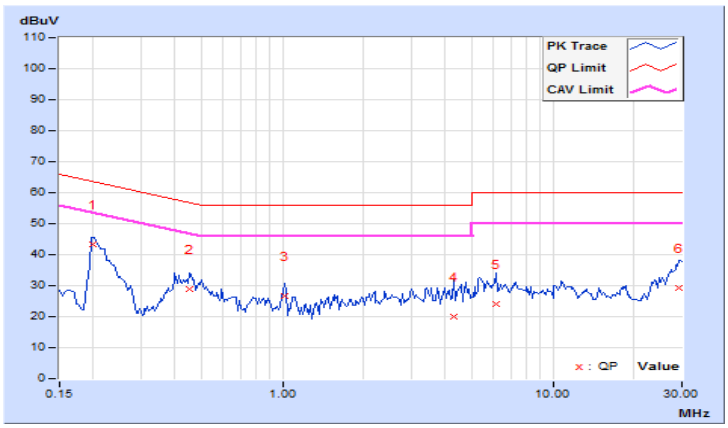


Frequency Range	150kHz ~ 30MHz	**Detector Function & Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	110Vac, 60Hz	**Environmental Conditions**	25℃, 75%RH, 1002mbar
Tested by	Ane Wang		
Test Mode	Mode 10		

Phase Of Power : Line (L)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.19815	10.12	33.16	23.02	43.28	33.14	63.69	53.69	-20.41	-20.55
2	0.45469	10.16	18.83	15.49	28.99	25.65	56.79	46.79	-27.80	-21.14
3	1.02344	10.25	16.57	16.56	26.82	26.81	56.00	46.00	-29.18	-19.19
4	4.31250	10.48	9.58	2.00	20.06	12.48	56.00	46.00	-35.94	-33.52
5	6.13281	10.54	13.44	8.15	23.98	18.69	60.00	50.00	-36.02	-31.31
6	29.32813	11.13	18.01	5.17	29.14	16.30	60.00	50.00	-30.86	-33.70

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

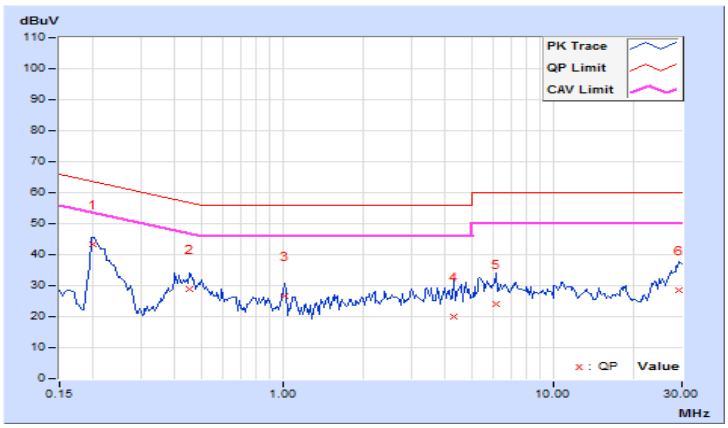


Frequency Range	150kHz ~ 30MHz	**Detector Function & Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	110Vac, 60Hz	**Environmental Conditions**	25℃, 75%RH, 1002mbar
Tested by	Ane Wang		
Test Mode	Mode 10		

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.19815	10.14	33.16	24.47	43.30	34.61	63.69	53.69	-20.39	-19.08
2	0.45469	10.17	18.83	16.11	29.00	26.28	56.79	46.79	-27.79	-20.51
3	1.02344	10.27	16.57	15.57	26.84	25.84	56.00	46.00	-29.16	-20.16
4	4.31250	10.50	9.58	8.02	20.08	18.52	56.00	46.00	-35.92	-27.48
5	6.13281	10.55	13.44	6.15	23.99	16.70	60.00	50.00	-36.01	-33.30
6	29.32813	10.55	18.01	4.73	28.56	15.28	60.00	50.00	-31.44	-34.72

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



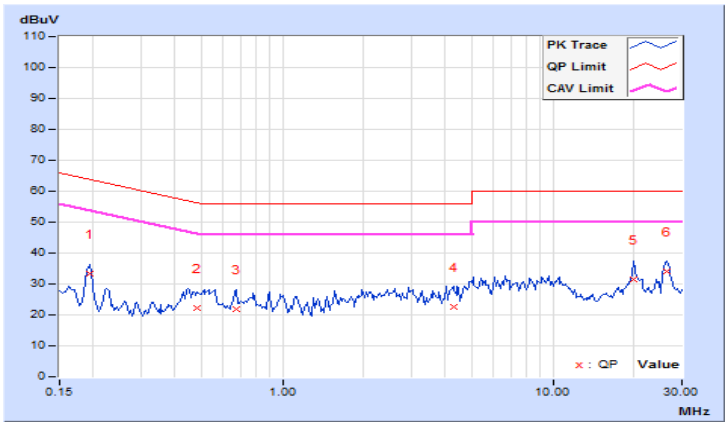
5.5 Test Results of Input Power: 230Vac, 50Hz

Frequency Range	150kHz ~ 30MHz	**Detector Function & Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	230Vac, 50Hz	**Environmental Conditions**	25℃, 75%RH, 1012mbar
Tested by	Ane Wang		
Test Mode	Mode 1A		

Phase Of Power : Line (L)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.19297	10.12	23.14	18.17	33.26	28.29	63.91	53.91	-30.65	-25.62
2	0.48203	10.16	12.08	7.62	22.24	17.78	56.30	46.30	-34.06	-28.52
3	0.67734	10.20	11.81	5.07	22.01	15.27	56.00	46.00	-33.99	-30.73
4	4.27734	10.48	11.96	4.86	22.44	15.34	56.00	46.00	-33.56	-30.66
5	19.87891	11.12	20.35	12.37	31.47	23.49	60.00	50.00	-28.53	-26.51
6	**26.46094**	**11.12**	**22.98**	**22.21**	**34.10**	**33.33**	**60.00**	**50.00**	**-25.90**	**-16.67**

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

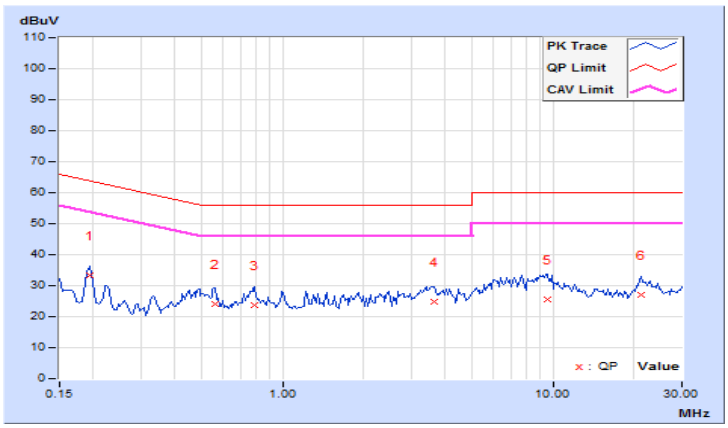


Frequency Range	150kHz ~ 30MHz	**Detector Function & Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	230Vac, 50Hz	**Environmental Conditions**	25℃, 75%RH, 1012mbar
Tested by	Ane Wang		
Test Mode	Mode 1A		

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.19297	10.14	23.29	18.39	33.43	28.53	63.91	53.91	-30.48	-25.38
2	0.56406	10.19	13.75	8.28	23.94	18.47	56.00	46.00	-32.06	-27.53
3	0.78672	10.23	13.61	8.37	23.84	18.60	56.00	46.00	-32.16	-27.40
4	3.62500	10.46	14.46	10.23	24.92	20.69	56.00	46.00	-31.08	-25.31
5	9.55078	10.64	14.79	9.79	25.43	20.43	60.00	50.00	-34.57	-29.57
6	21.31641	10.86	16.02	9.27	26.88	20.13	60.00	50.00	-33.12	-29.87

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

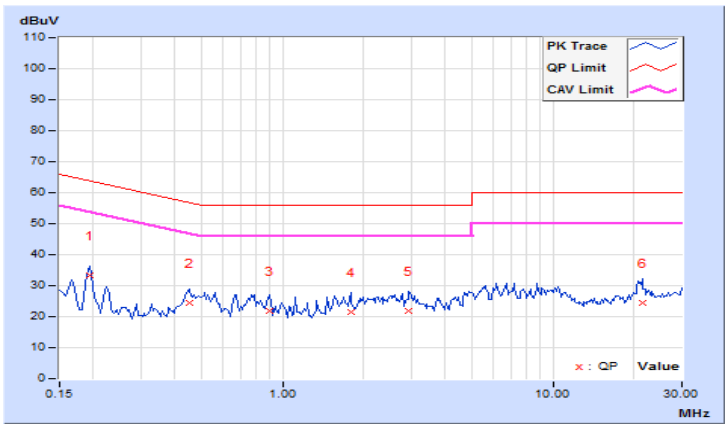


Frequency Range	150kHz ~ 30MHz	**Detector Function & Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	230Vac, 50Hz	**Environmental Conditions**	25℃, 75%RH, 1012mbar
Tested by	Ane Wang		
Test Mode	Mode 1B		

Phase Of Power : Line (L)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.19297	10.12	23.19	18.13	33.31	28.25	63.91	53.91	-30.60	-25.66
2	0.45078	10.16	14.37	9.69	24.53	19.85	56.86	46.86	-32.33	-27.01
3	0.90000	10.23	11.59	6.07	21.82	16.30	56.00	46.00	-34.18	-29.70
4	1.78516	10.30	11.03	3.51	21.33	13.81	56.00	46.00	-34.67	-32.19
5	2.93750	10.39	11.35	6.35	21.74	16.74	56.00	46.00	-34.26	-29.26
6	21.34766	11.13	13.38	3.36	24.51	14.49	60.00	50.00	-35.49	-35.51

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

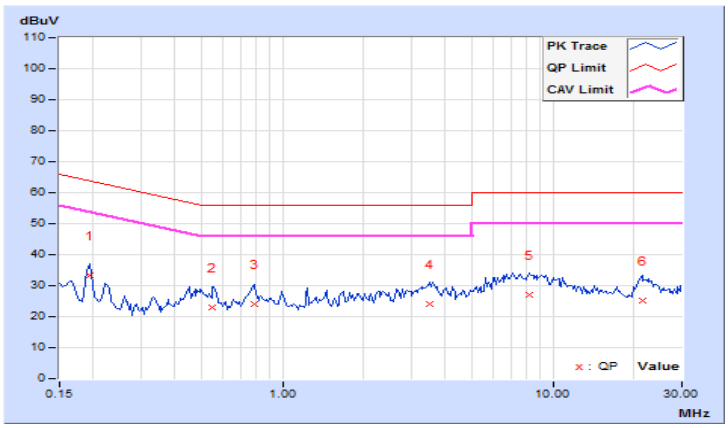


Frequency Range	150kHz ~ 30MHz	**Detector Function & Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	230Vac, 50Hz	**Environmental Conditions**	25℃, 75%RH, 1012mbar
Tested by	Ane Wang		
Test Mode	Mode 1B		

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.19297	10.14	23.27	18.43	33.41	28.57	63.91	53.91	-30.50	-25.34
2	0.55234	10.19	12.83	7.54	23.02	17.73	56.00	46.00	-32.98	-28.27
3	0.78672	10.23	13.84	8.69	24.07	18.92	56.00	46.00	-31.93	-27.08
4	3.50000	10.45	13.65	9.44	24.10	19.89	56.00	46.00	-31.90	-26.11
5	8.20313	10.60	16.61	8.88	27.21	19.48	60.00	50.00	-32.79	-30.52
6	21.43750	10.86	14.51	8.27	25.37	19.13	60.00	50.00	-34.63	-30.87

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

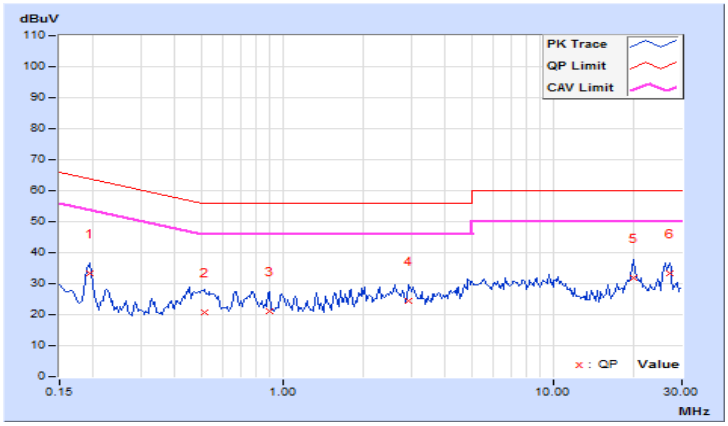


Frequency Range	150kHz ~ 30MHz	**Detector Function & Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	230Vac, 50Hz	**Environmental Conditions**	25℃, 75%RH, 1012mbar
Tested by	Ane Wang		
Test Mode	Mode 10		

Phase Of Power : Line (L)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.19297	10.12	23.21	18.19	33.33	28.31	63.91	53.91	-30.58	-25.60
2	0.51719	10.17	10.39	5.22	20.56	15.39	56.00	46.00	-35.44	-30.61
3	0.90000	10.23	11.00	4.94	21.23	15.17	56.00	46.00	-34.77	-30.83
4	2.93750	10.39	14.21	8.74	24.60	19.13	56.00	46.00	-31.40	-26.87
5	19.85156	11.12	20.60	10.56	31.72	21.68	60.00	50.00	-28.28	-28.32
6	26.92969	11.12	22.20	21.36	33.32	32.48	60.00	50.00	-26.68	-17.52

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

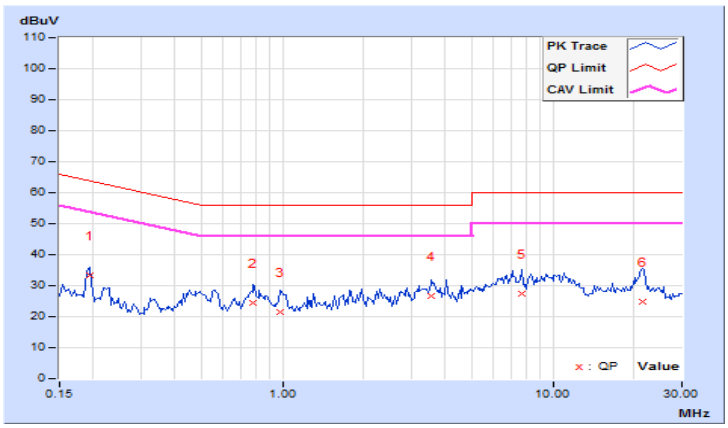


Frequency Range	150kHz ~ 30MHz	**Detector Function & Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	230Vac, 50Hz	**Environmental Conditions**	25℃, 75%RH, 1012mbar
Tested by	Ane Wang		
Test Mode	Mode 10		

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.19297	10.14	23.27	18.35	33.41	28.49	63.91	53.91	-30.50	-25.42
2	0.78281	10.23	14.33	9.09	24.56	19.32	56.00	46.00	-31.44	-26.68
3	0.98203	10.27	11.35	8.10	21.62	18.37	56.00	46.00	-34.38	-27.63
4	3.54688	10.45	16.11	11.14	26.56	21.59	56.00	46.00	-29.44	-24.41
5	7.62891	10.59	16.91	10.57	27.50	21.16	60.00	50.00	-32.50	-28.84
6	21.42188	10.86	13.86	7.85	24.72	18.71	60.00	50.00	-35.28	-31.29

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



6 Radiated Emission at Frequencies up to 1GHz

6.1 Limits

For Class A Equipment

EN 55032 Table clause	Frequency range (MHz)	Distance (m)	Limits (dBuV/m)
A2.1	30 - 230	10	40
	230 - 1000		47
A2.2	30 - 230	3	50
	230 - 1000		57

For Class B Equipment

EN 55032 Table clause	Frequency range (MHz)	Distance (m)	Limits (dBuV/m)
A4.1	30 - 230	10	30
	230 - 1000		37
A4.2	30 - 230	3	40
	230 - 1000		47

6.2 Test Instruments

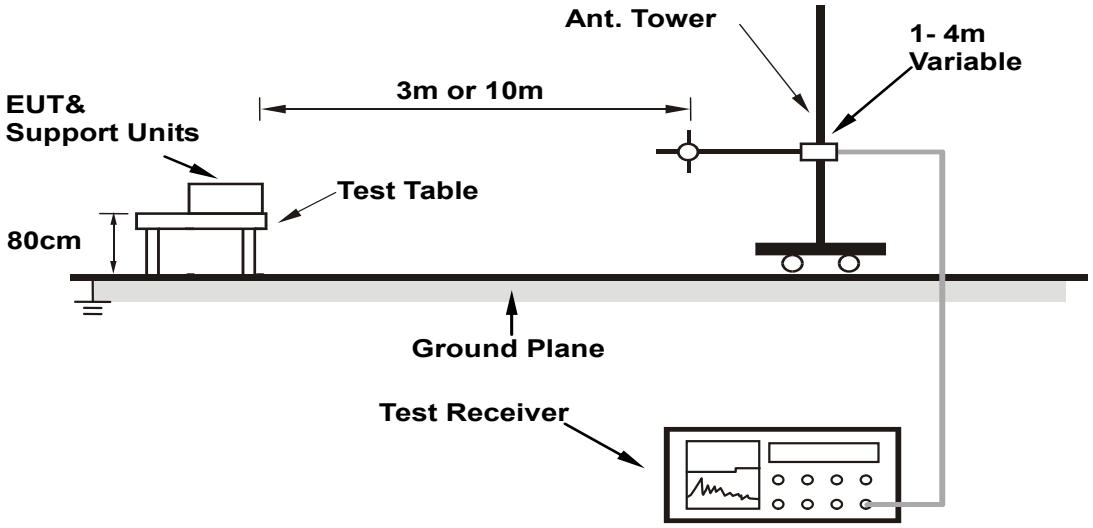
Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Sonoma Preamplifier	310N	352922	Feb. 20, 2018	Feb. 19, 2019
Sonoma Preamplifier	310N	352921	Feb. 20, 2018	Feb. 19, 2019
Agilent Test Receiver	N9038A	MY50010158	Jul. 1, 2017	Jun. 30, 2018
Agilent Test Receiver	N9038A	MY51210114	Jul. 5, 2017	Jul. 4, 2018
Schwarzbeck Antenna	VULB9168	9168-316	Dec. 11, 2017	Dec. 10, 2018
Schwarzbeck Antenna	VULB9168	9168-317	Dec. 11, 2017	Dec. 10, 2018
Max Full. Turn Table & Tower	MF7802	MF7802121	NA	NA
Max Full. Tower	MF7802	MF780208105	NA	NA
Software	Radiated_V8.7.08	NA	NA	NA
JYEBAO RF cable With 5dB PAD	LMR-600	CABLE-CH8-01.V	Jun. 26, 2017	Jun. 25, 2018
JYEBAO RF cable With 5dB PAD	LMR-600	CABLE-CH8-02.H	Jun. 26, 2017	Jun. 25, 2018
WOKEN RF cable With 5dB PAD	8D	CABLE-CH8-03.3M	Jun. 26, 2017	Jun. 25, 2018

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Chamber No. 8.
3. The Industry Canada Reference No. IC 7450E-8.
4. The VCCI Site Registration No. R-12946.
5. Tested Date: Mar. 2, 2018.

6.3 Test Arrangement

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited test facility. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is up to 1 GHz.

Note:
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for quasi-peak detection (QP) at frequency up to 1GHz.
2. The measurement distance is the shortest horizontal distance between an imaginary circular periphery just encompassing this arrangement and the calibration point of the antenna.



Note: Cable on the RGP must to be insulated.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

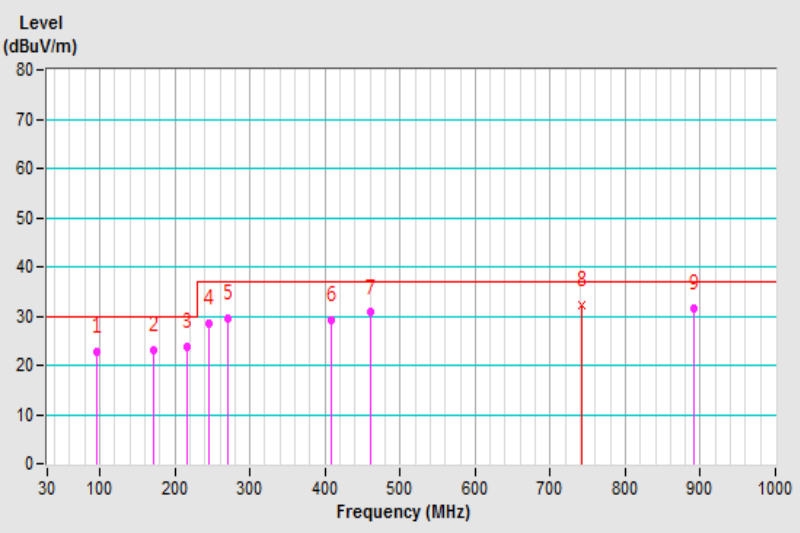
6.4 Test Results

Frequency Range	30MHz ~ 1GHz	Detector Function & Bandwidth	Quasi-Peak (QP), 120kHz
Test Mode	Mode 1A	Environmental Conditions	20℃, 76%RH, 1002mbar
Tested by	Adam Chen		

Antenna Polarity & Test Distance : Horizontal at 10 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	96.01	22.74 QP	30.00	-7.26	4.00 H	103	40.89	-18.15
2	170.72	23.10 QP	30.00	-6.90	4.00 H	245	36.04	-12.94
3	216.01	23.67 QP	30.00	-6.33	3.97 H	185	38.65	-14.98
4	246.24	28.55 QP	37.00	-8.45	3.83 H	54	41.69	-13.14
5	269.69	29.60 QP	37.00	-7.40	2.92 H	171	42.04	-12.44
6	407.96	29.22 QP	37.00	-7.78	1.92 H	350	37.59	-8.37
7	460.07	30.71 QP	37.00	-6.29	2.08 H	223	38.26	-7.55
8	742.53	32.33 QP	37.00	-4.67	1.00 H	254	34.24	-1.91
9	891.00	31.68 QP	37.00	-5.32	3.00 H	3	32.84	-1.16

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

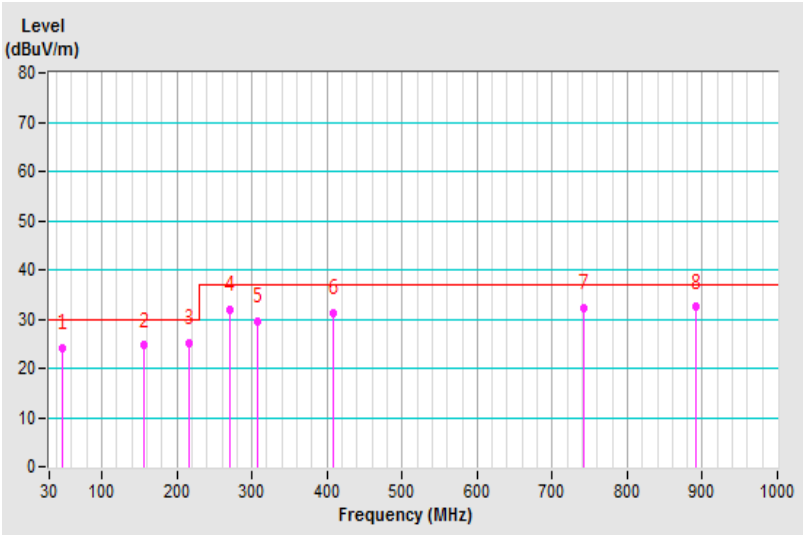


Frequency Range	30MHz ~ 1GHz	Detector Function & Bandwidth	Quasi-Peak (QP), 120kHz
Test Mode	Mode 1A	Environmental Conditions	20℃, 76%RH, 1002mbar
Tested by	Adam Chen		

Antenna Polarity & Test Distance : Vertical at 10 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	47.98	24.12 QP	30.00	-5.88	1.49 V	195	38.22	-14.10
2	155.27	24.64 QP	30.00	-5.36	1.00 V	353	37.59	-12.95
3	216.01	25.06 QP	30.00	-4.94	1.00 V	78	40.91	-15.85
4	270.73	31.81 QP	37.00	-5.19	1.00 V	317	44.88	-13.07
5	306.55	29.48 QP	37.00	-7.52	1.00 V	299	41.57	-12.09
6	408.62	31.30 QP	37.00	-5.70	3.91 V	111	40.95	-9.65
7	742.47	32.14 QP	37.00	-4.86	1.94 V	238	33.28	-1.14
8	891.02	32.39 QP	37.00	-4.61	2.69 V	128	32.49	-0.10

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
   – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

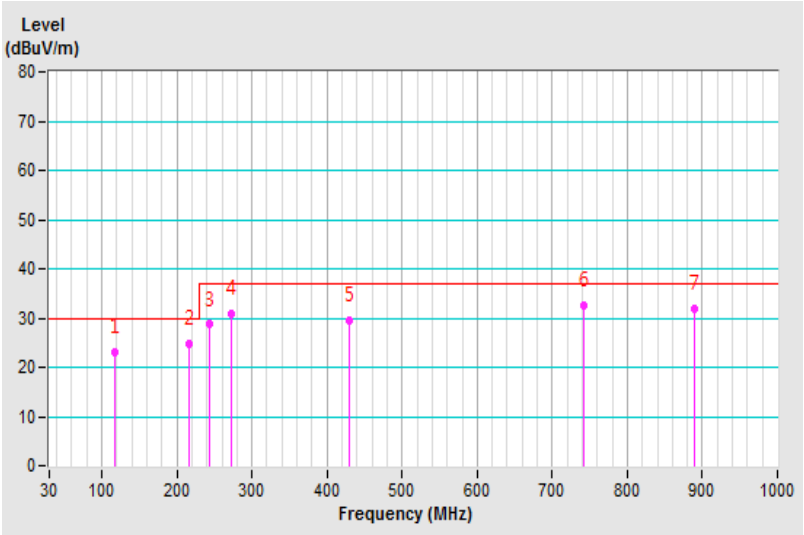


Frequency Range	30MHz ~ 1GHz	**Detector Function & Bandwidth**	Quasi-Peak (QP), 120kHz
Test Mode	Mode 1B	**Environmental Conditions**	20℃, 76%RH, 1002mbar
Tested by	Adam Chen		

Antenna Polarity & Test Distance : Horizontal at 10 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	116.65	23.05 QP	30.00	-6.95	4.00 H	0	38.55	-15.50
2	216.02	24.71 QP	30.00	-5.29	4.00 H	182	39.69	-14.98
3	244.32	28.69 QP	37.00	-8.31	3.03 H	54	41.89	-13.20
4	271.97	31.01 QP	37.00	-5.99	3.85 H	338	43.27	-12.26
5	429.71	29.61 QP	37.00	-7.39	2.06 H	323	37.59	-7.98
6	741.76	32.70 QP	37.00	-4.30	1.09 H	224	34.61	-1.91
7	890.09	31.79 QP	37.00	-5.21	1.00 H	313	33.01	-1.22

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

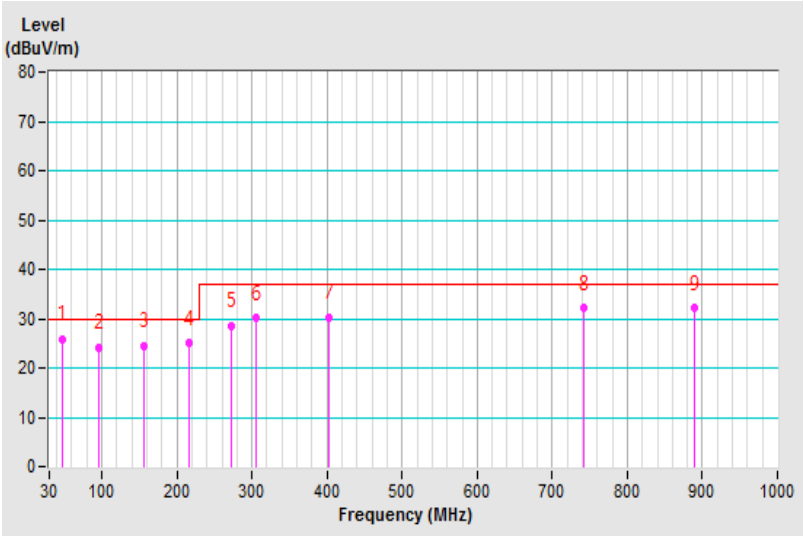


Frequency Range	30MHz ~ 1GHz	**Detector Function & Bandwidth**	Quasi-Peak (QP), 120kHz
Test Mode	Mode 1B	**Environmental Conditions**	20℃, 76%RH, 1002mbar
Tested by	Adam Chen		

Antenna Polarity & Test Distance : Vertical at 10 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	**47.99**	**25.83 QP**	**30.00**	**-4.17**	**1.41 V**	**185**	**39.93**	**-14.10**
2	96.01	24.13 QP	30.00	-5.87	1.55 V	2	43.19	-19.06
3	155.37	24.34 QP	30.00	-5.66	1.00 V	332	37.28	-12.94
4	215.99	24.92 QP	30.00	-5.08	1.00 V	124	40.77	-15.85
5	271.87	28.50 QP	37.00	-8.50	2.19 V	291	41.53	-13.03
6	304.58	30.06 QP	37.00	-6.94	3.55 V	313	42.22	-12.16
7	401.66	30.10 QP	37.00	-6.90	3.91 V	115	39.84	-9.74
8	741.76	32.06 QP	37.00	-4.94	2.41 V	233	33.21	-1.15
9	890.12	32.09 QP	37.00	-4.91	3.04 V	110	32.26	-0.17

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

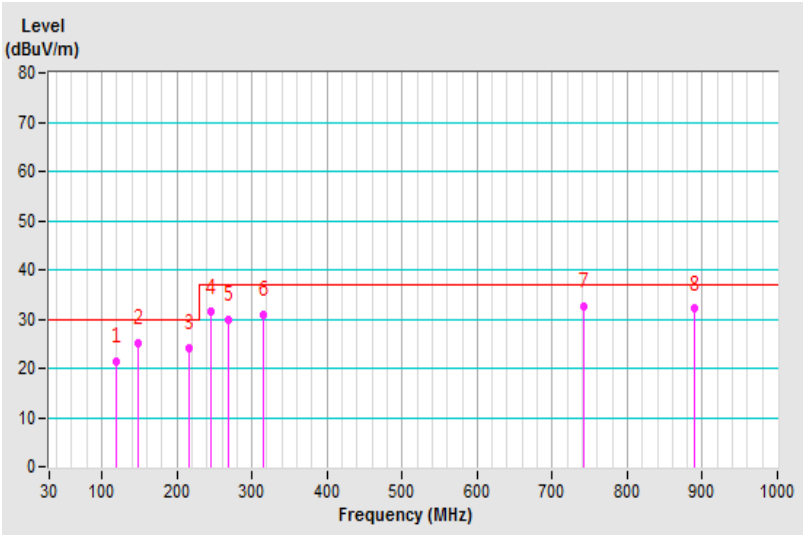


Frequency Range	30MHz ~ 1GHz	Detector Function & Bandwidth	Quasi-Peak (QP), 120kHz
Test Mode	Mode 10	Environmental Conditions	20℃, 76%RH, 1002mbar
Tested by	Adam Chen		

Antenna Polarity & Test Distance : Horizontal at 10 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	119.64	21.41 QP	30.00	-8.59	3.81 H	46	36.56	-15.15
2	148.36	25.06 QP	30.00	-4.94	4.00 H	118	37.84	-12.78
3	216.02	24.06 QP	30.00	-5.94	3.34 H	88	39.04	-14.98
4	246.04	31.39 QP	37.00	-5.61	2.71 H	109	44.53	-13.14
5	268.96	30.00 QP	37.00	-7.00	2.98 H	332	42.48	-12.48
6	315.39	30.81 QP	37.00	-6.19	2.16 H	290	41.52	-10.71
7	741.76	32.63 QP	37.00	-4.37	1.14 H	228	34.54	-1.91
8	890.11	32.09 QP	37.00	-4.91	1.00 H	303	33.31	-1.22

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
   – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

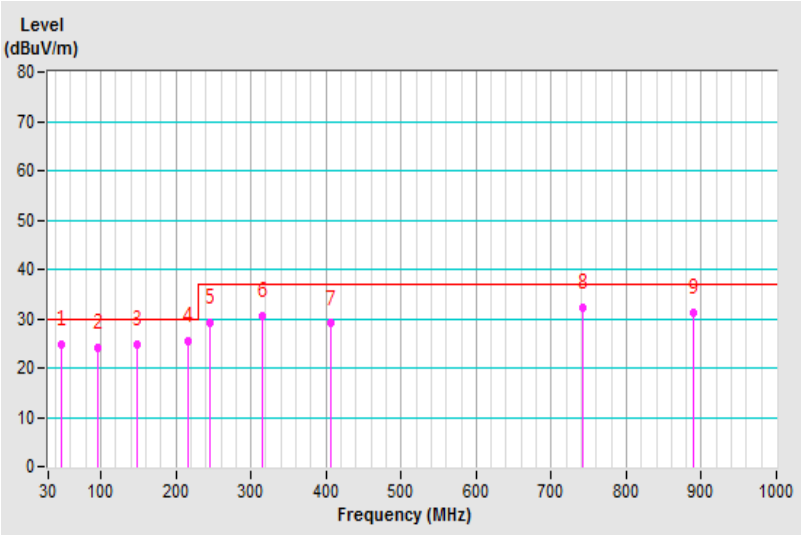


Frequency Range	30MHz ~ 1GHz	**Detector Function & Bandwidth**	Quasi-Peak (QP), 120kHz
Test Mode	Mode 10	**Environmental Conditions**	20℃, 76%RH, 1002mbar
Tested by	Adam Chen		

Antenna Polarity & Test Distance : Vertical at 10 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	47.99	24.83 QP	30.00	-5.17	1.41 V	221	38.93	-14.10
2	96.01	24.11 QP	30.00	-5.89	1.38 V	30	43.17	-19.06
3	148.25	24.73 QP	30.00	-5.27	1.00 V	88	38.04	-13.31
4	216.04	25.56 QP	30.00	-4.44	1.00 V	90	41.40	-15.84
5	244.68	29.17 QP	37.00	-7.83	1.92 V	212	43.51	-14.34
6	315.47	30.46 QP	37.00	-6.54	3.43 V	134	42.22	-11.76
7	406.29	29.01 QP	37.00	-7.99	3.98 V	111	38.68	-9.67
8	741.76	32.22 QP	37.00	-4.78	2.15 V	268	33.37	-1.15
9	890.12	31.28 QP	37.00	-5.72	1.86 V	144	31.45	-0.17

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value



7 Radiated Emission at Frequencies above 1GHz

7.1 Limits

For Class A Equipment

EN 55032 Table clause	Frequency range (MHz)	Distance (m)	Detector type	Limits (dBuV/m)
A3.1	1000 - 3000	3	Average	56
	3000 - 6000			60
A3.2	1000 - 3000		Peak	76
	3000 - 6000			80

For Class B Equipment

EN 55032 Table clause	Frequency range (MHz)	Distance (m)	Detector type	Limits (dBuV/m)
A5.1	1000 - 3000	3	Average	50
	3000 - 6000			54
A5.2	1000 - 3000		Peak	70
	3000 - 6000			74

Required highest frequency for radiated measurement

EN 55032 Table clause	Highest internal frequency (F_x)	Highest measured frequency
1	$F_x \leqq$ 108 MHz	1 GHz
	108 MHz $< F_x \leqq$ 500 MHz	2 GHz
	500 MHz $< F_x \leqq$ 1 GHz	5 GHz
	$F_x >$ 1 GHz	5 x F_x up to a maximum of 6 GHz

NOTE 1 For FM and TV broadcast receivers, F_x is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.

NOTE 2 F_x is highest fundamental frequency generated or used within the EUT or highest frequency at which it operates.

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

7.2 Test Instruments

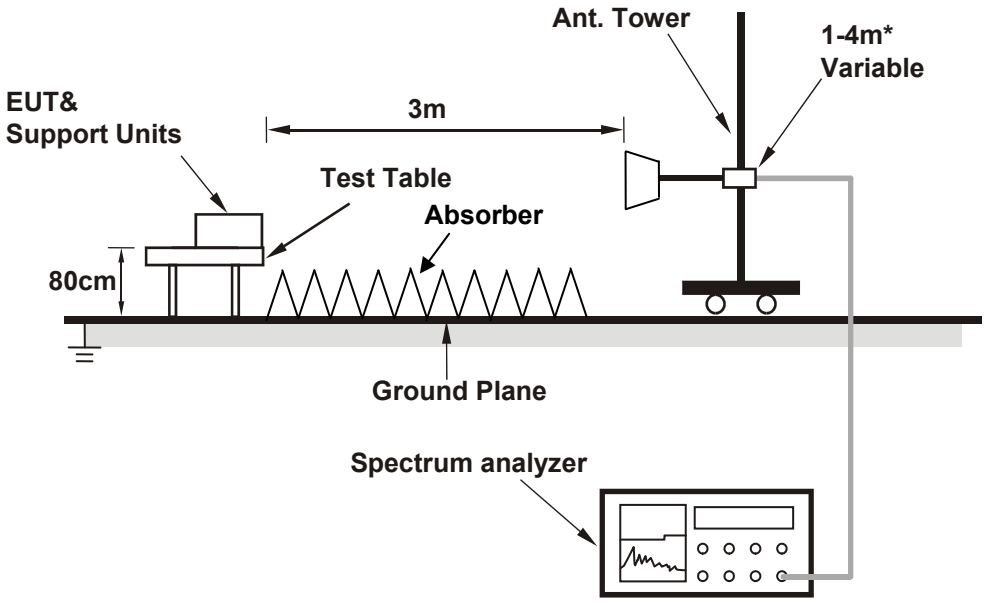
Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Agilent Spectrum	E4446A	MY51100009	Jun. 1, 2017	May 31, 2018
Agilent Test Receiver	N9038A	MY50010135	Jun. 29, 2017	Jun. 28, 2018
Agilent Preamplifier	8449B	3008A02367	Feb. 22, 2018	Feb. 21, 2019
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Feb. 21, 2018	Feb. 20, 2019
EMCI Preamplifier	EMC184045B	980235	Feb. 22, 2018	Feb. 21, 2019
Schwarzbeck Horn Antenna	BBHA-9170	212	Dec. 1, 2017	Nov. 30, 2018
EMCO Horn Antenna	3115	9312-4192	Dec. 1, 2017	Nov. 30, 2018
Max Full. Turn Table & Tower	MF7802	MF780208103	NA	NA
Software	Radiated_V8.7.08	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF106-18	Cable-CH7-01	Aug. 14, 2017	Aug. 13, 2018
SUHNER RF cable With 3/4dB PAD	SF102	Cable-CH7-3.6m	Aug. 14, 2017	Aug. 13, 2018
MICRO-TRONICS Notch filter	BRC50703-01	010	May 31, 2017	May 30, 2018
MICRO-TRONICS Band Pass Filter	BRM17690	005	May 31, 2017	May 30, 2018

Notes:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The 3dB beamwidth of the horn antenna is minimum 30 degree (or w = 1.6m at 3m distance) for 1~6 GHz.
3. The test was performed in Chamber No. 7.
4. The Industry Canada Reference No. IC 7450E-7.
5. The VCCI Site Registration No. G-39
6. Tested Date: Feb. 28, 2018.

7.3 Test Arrangement

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the directional antenna, which was pointed towards the source of the emission within the EUT. This could be done by either pointing the antenna at an angle towards the source of the emission, or by rotating the EUT, in both height and polarization, to maximize the measured emission.
c. The height of antenna can be varied from one meter to four meters, the height of adjustment depends on the EUT height and the antenna 3dB beamwidth both, to detect the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The spectrum analyzer system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

Note:
1. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection (PK) at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.
2. The measurement distance is the shortest horizontal distance between an imaginary circular periphery just encompassing this arrangement and the calibration point of the antenna.



Note: Cable on the RGP must to be insulated.

* :depends on the EUT height and the antenna 3dB beamwidth both.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

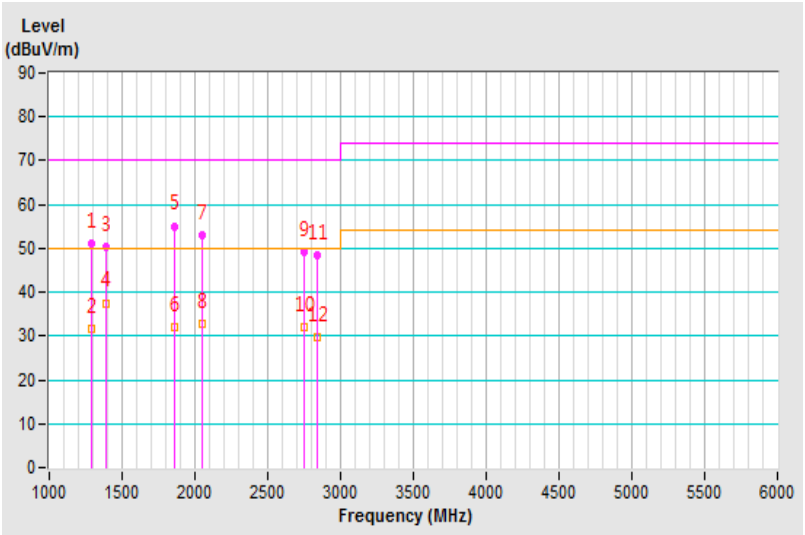
7.4 Test Results

Frequency Range	1GHz ~ 6GHz	Detector Function & Bandwidth	Peak (PK) / Average (AV), 1MHz
Test Mode	Mode 1A	Environmental Conditions	20℃, 70%RH, 1006mbar
Tested by	Paul Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1293.05	51.05 PK	70.00	-18.95	2.37 H	242	53.18	-2.13
2	1293.05	31.72 AV	50.00	-18.28	2.37 H	242	33.85	-2.13
3	1389.87	50.33 PK	70.00	-19.67	1.00 H	196	53.06	-2.73
4	1389.87	37.55 AV	50.00	-12.45	1.00 H	196	40.28	-2.73
5	1863.28	55.07 PK	70.00	-14.93	1.65 H	220	56.63	-1.56
6	1863.28	32.10 AV	50.00	-17.90	1.65 H	220	33.66	-1.56
7	2047.72	52.89 PK	70.00	-17.11	1.55 H	210	54.18	-1.29
8	2047.72	32.87 AV	50.00	-17.13	1.55 H	210	34.16	-1.29
9	2747.35	49.19 PK	70.00	-20.81	1.10 H	144	49.87	-0.68
10	2747.35	32.01 AV	50.00	-17.99	1.10 H	144	32.69	-0.68
11	2840.47	48.39 PK	70.00	-21.61	1.50 H	326	48.85	-0.46
12	2840.47	29.87 AV	50.00	-20.13	1.50 H	326	30.33	-0.46

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

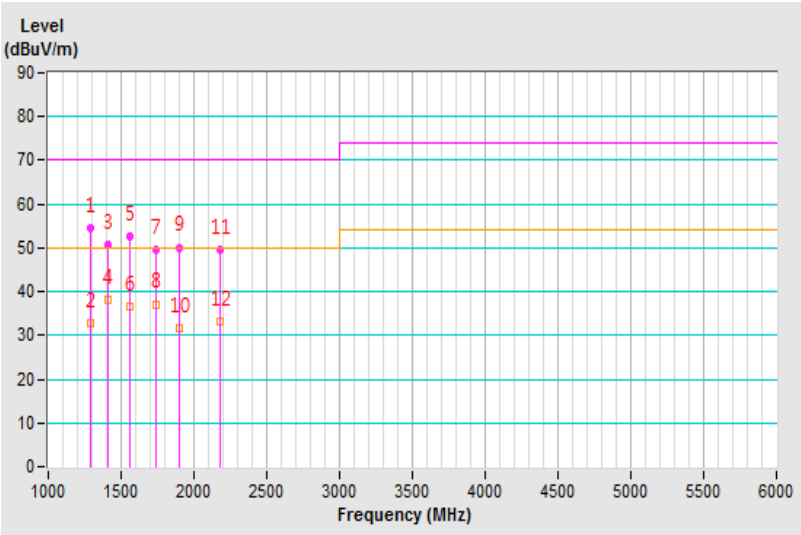


Frequency Range	1GHz ~ 6GHz	Detector Function & Bandwidth	Peak (PK) / Average (AV), 1MHz
Test Mode	Mode 1A	Environmental Conditions	20℃, 70%RH, 1006mbar
Tested by	Paul Chen		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1293.26	54.36 PK	70.00	-15.64	2.04 V	214	56.49	-2.13
2	1293.26	32.66 AV	50.00	-17.34	2.04 V	214	34.79	-2.13
3	1408.58	50.71 PK	70.00	-19.29	1.89 V	360	53.58	-2.87
4	1408.58	38.17 AV	50.00	-11.83	1.89 V	360	41.04	-2.87
5	1558.06	52.67 PK	70.00	-17.33	1.10 V	214	56.71	-4.04
6	1558.06	36.49 AV	50.00	-13.51	1.10 V	214	40.53	-4.04
7	1735.06	49.45 PK	70.00	-20.55	2.00 V	360	52.21	-2.76
8	1735.06	37.16 AV	50.00	-12.84	2.00 V	360	39.92	-2.76
9	1895.53	50.12 PK	70.00	-19.88	2.21 V	222	51.56	-1.44
10	1895.53	31.51 AV	50.00	-18.49	2.21 V	222	32.95	-1.44
11	2175.19	49.61 PK	70.00	-20.39	2.45 V	358	51.55	-1.94
12	2175.19	33.02 AV	50.00	-16.98	2.45 V	358	34.96	-1.94

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

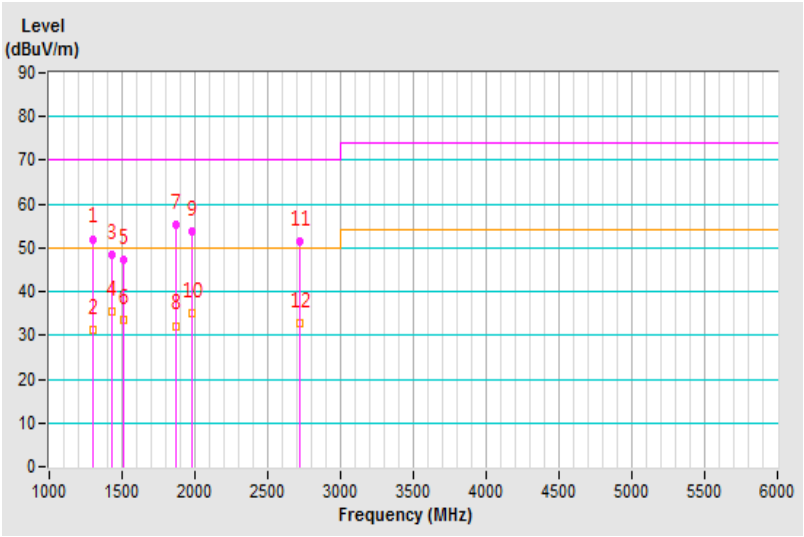


Frequency Range	1GHz ~ 6GHz	**Detector Function & Bandwidth**	Peak (PK) / Average (AV), 1MHz
Test Mode	Mode 1B	**Environmental Conditions**	20℃, 70%RH, 1006mbar
Tested by	Paul Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	1296.74	52.03 PK	70.00	-17.97	2.22 H	193	54.18	-2.15
2	1296.74	31.41 AV	50.00	-18.59	2.22 H	193	33.56	-2.15
3	1428.97	48.37 PK	70.00	-21.63	1.53 H	201	51.48	-3.11
4	1428.97	35.40 AV	50.00	-14.60	1.53 H	201	38.51	-3.11
5	1514.00	47.18 PK	70.00	-22.82	1.13 H	184	51.09	-3.91
6	1514.00	33.44 AV	50.00	-16.56	1.13 H	184	37.35	-3.91
7	1868.34	55.24 PK	70.00	-14.76	1.00 H	223	56.78	-1.54
8	1868.34	32.21 AV	50.00	-17.79	1.00 H	223	33.75	-1.54
9	1978.87	53.69 PK	70.00	-16.31	1.26 H	189	55.00	-1.31
10	1978.87	34.98 AV	50.00	-15.02	1.26 H	189	36.29	-1.31
11	2715.86	51.35 PK	70.00	-18.65	1.34 H	160	51.95	-0.60
12	2715.86	32.90 AV	50.00	-17.10	1.34 H	160	33.50	-0.60

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

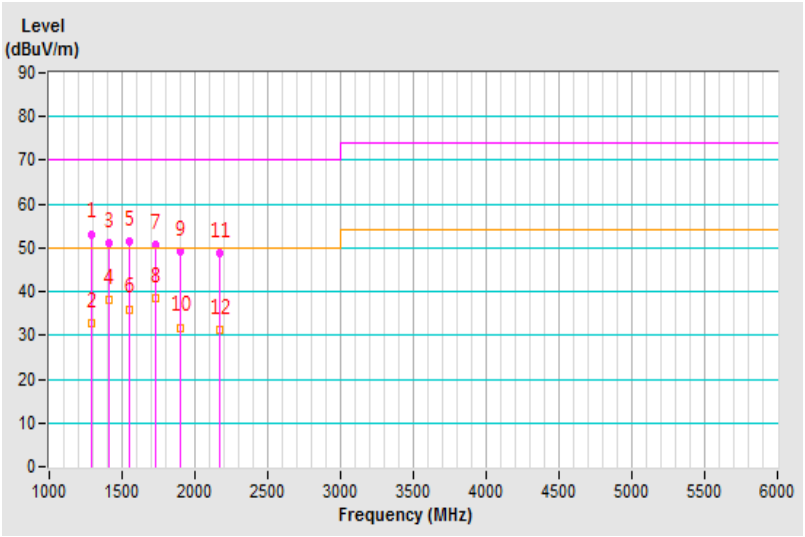


Frequency Range	1GHz ~ 6GHz	Detector Function & Bandwidth	Peak (PK) / Average (AV), 1MHz
Test Mode	Mode 1B	Environmental Conditions	20℃, 70%RH, 1006mbar
Tested by	Paul Chen		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1292.82	53.17 PK	70.00	-16.83	1.63 V	218	55.30	-2.13
2	1292.82	32.92 AV	50.00	-17.08	1.63 V	218	35.05	-2.13
3	1410.67	51.14 PK	70.00	-18.86	2.19 V	23	54.04	-2.90
4	1410.67	38.25 AV	50.00	-11.75	2.19 V	23	41.15	-2.90
5	1554.13	51.60 PK	70.00	-18.40	1.18 V	216	55.64	-4.04
6	1554.13	36.02 AV	50.00	-13.98	1.18 V	216	40.06	-4.04
7	1732.46	50.61 PK	70.00	-19.39	1.73 V	198	53.39	-2.78
8	**1732.46**	**38.59 AV**	**50.00**	**-11.41**	**1.73 V**	**198**	**41.37**	**-2.78**
9	1900.57	49.24 PK	70.00	-20.76	2.41 V	225	50.67	-1.43
10	1900.57	31.83 AV	50.00	-18.17	2.41 V	225	33.26	-1.43
11	2173.79	48.64 PK	70.00	-21.36	1.00 V	0	50.59	-1.95
12	2173.79	31.23 AV	50.00	-18.77	1.00 V	0	33.18	-1.95

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

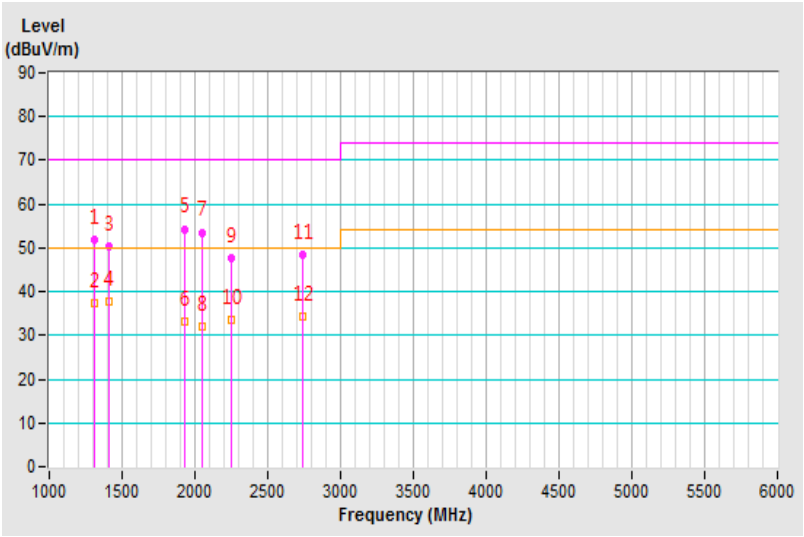


Frequency Range	1GHz ~ 6GHz	Detector Function & Bandwidth	Peak (PK) / Average (AV), 1MHz
Test Mode	Mode 10	Environmental Conditions	20℃, 70%RH, 1006mbar
Tested by	Paul Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1311.88	51.75 PK	70.00	-18.25	1.87 H	316	54.04	-2.29
2	1311.88	37.37 AV	50.00	-12.63	1.87 H	316	39.66	-2.29
3	1408.46	50.34 PK	70.00	-19.66	1.07 H	198	53.21	-2.87
4	1408.46	37.57 AV	50.00	-12.43	1.07 H	198	40.44	-2.87
5	1931.50	54.31 PK	70.00	-15.69	2.11 H	216	55.71	-1.40
6	1931.50	32.99 AV	50.00	-17.01	2.11 H	216	34.39	-1.40
7	2046.18	53.57 PK	70.00	-16.43	1.38 H	187	54.86	-1.29
8	2046.18	31.89 AV	50.00	-18.11	1.38 H	187	33.18	-1.29
9	2248.25	47.64 PK	70.00	-22.36	1.16 H	226	49.88	-2.24
10	2248.25	33.38 AV	50.00	-16.62	1.16 H	226	35.62	-2.24
11	2737.08	48.42 PK	70.00	-21.58	1.21 H	172	49.08	-0.66
12	2737.08	34.43 AV	50.00	-15.57	1.21 H	172	35.09	-0.66

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

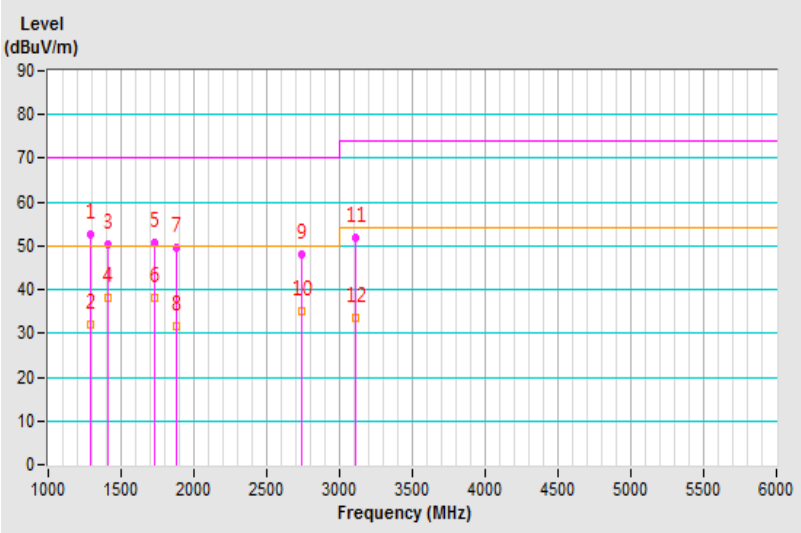


Frequency Range	1GHz ~ 6GHz	Detector Function & Bandwidth	Peak (PK) / Average (AV), 1MHz
Test Mode	Mode 10	Environmental Conditions	20℃, 70%RH, 1006mbar
Tested by	Paul Chen		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1293.17	52.69 PK	70.00	-17.31	1.85 V	220	54.82	-2.13
2	1293.17	32.09 AV	50.00	-17.91	1.85 V	220	34.22	-2.13
3	1406.81	50.27 PK	70.00	-19.73	2.10 V	19	53.12	-2.85
4	1406.81	38.16 AV	50.00	-11.84	2.10 V	19	41.01	-2.85
5	1728.89	50.67 PK	70.00	-19.33	1.97 V	198	53.49	-2.82
6	1728.89	38.16 AV	50.00	-11.84	1.97 V	198	40.98	-2.82
7	1880.56	49.70 PK	70.00	-20.30	2.22 V	227	51.19	-1.49
8	1880.56	31.73 AV	50.00	-18.27	2.22 V	227	33.22	-1.49
9	2744.53	47.99 PK	70.00	-22.01	1.00 V	227	48.66	-0.67
10	2744.53	35.06 AV	50.00	-14.94	1.00 V	227	35.73	-0.67
11	3106.97	51.87 PK	74.00	-22.13	1.86 V	317	50.23	1.64
12	3106.97	33.53 AV	54.00	-20.47	1.86 V	317	31.89	1.64

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value



8 Harmonics Current Measurement

8.1 Limits

Limits for Class A equipment	
Harmonic Order n	Max. permissible harmonics current A
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15≦n≦39	0.15 x 15/n
Even harmonics	
2	1.08
4	0.43
6	0.30
8≦n≦40	0.23 x 8/n

Limits for Class D equipment		
Harmonic Order n	Max. permissible harmonics current per watt mA/W	Max. permissible harmonics 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	0.15 x 15/n

Notes: 1. Class A and Class D are classified according to section 5 of EN 61000-3-2.
2. 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.

8.2 Classification of Equipment

Class A	Class B	Class C	Class D
Balanced three-phase equipment; Household appliances excluding equipment as Class D; Tools excluding portable tools; Dimmers for incandescent lamps; Audio equipment; Equipment not specified in one of the three other classes.	Portable tools; Arc welding equipment which is not professional equipment.	Lighting equipment.	Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors; Television receivers; Refrigerators and freezers having one or more variable-speed drives to control compressor motor(s).

8.3 Test Instruments

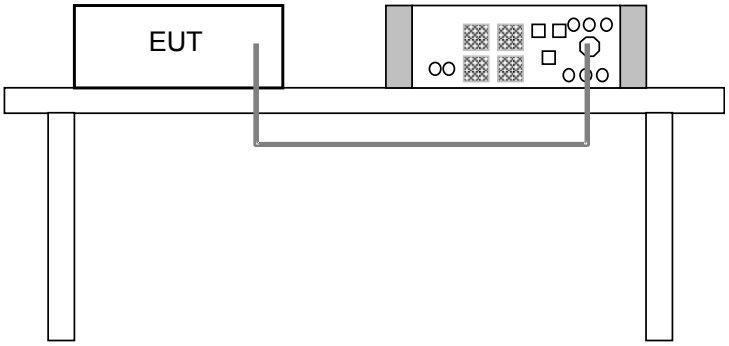
Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Teseq Harmonics - Flicker Test System	Profline 2105	32A00983 & 1639A01863	Sep. 28, 2017	Sep. 27, 2018
Software	WIN2100	NA	NA	NA

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in EMS Room No. 1.
3. According to IEC 61000-4-7: 2002, the time window shall be synchronized with each group of 10 or 12 cycles (200 ms)for power frequency of 50 or 60Hz.
4. Tested Date: Mar. 14, 2018.

8.4 Test Arrangement

a. 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.

b. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

8.5 Test Results

Fundamental Voltage/Ampere	229.97rms/ 0.225Arms	Power Frequency	50.000Hz
Power Consumption	41.0W	Power Factor	0.794
Environmental Conditions	26deg. C, 64%RH	Tested by	Michael Cheng
Test Mode	Mode 1		

Note: 1. Limits are not specified for equipment with a rated power of 75W or less (other than lighting equipment).
2. According to EN 61000-3-2 the manufacturer shall specify the power of the apparatus. This value shall be used for establishing limits. The specified power shall be within +/-10% of the measured power.

9 Voltage Fluctuations and Flicker Measurement

9.1 Limits

Test item	Limit	Note
P_{st}	1.0	$P_{st:}$ short-term flicker severity.
P_{lt}	0.65	$P_{lt:}$ long-term flicker severity.
T_{max} (ms)	500	$T_{max:}$ maximum time duration during the observation period that the voltage deviation d(t) exceeds the limit for d_c .
d_{max} (%)	4	$d_{max:}$ maximum absolute voltage change during an observation period.
d_c (%)	3.3	$d_{c:}$ maximum steady state voltage change during an observation period.

9.2 Test Instruments

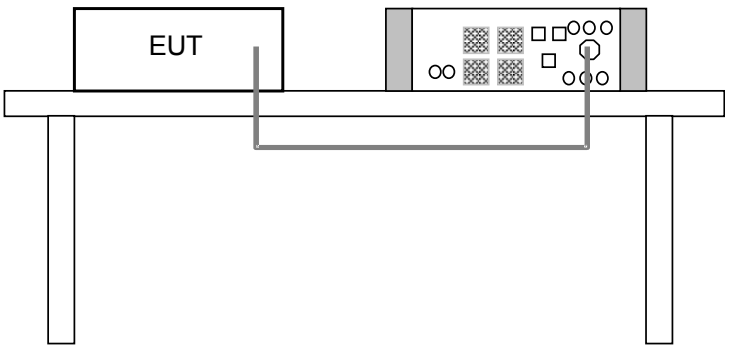
Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Teseq Harmonics - Flicker Test System	Profline 2105	32A00983 & 1639A01863	Sep. 28, 2017	Sep. 27, 2018
Software	WIN2100	NA	NA	NA

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in EMS Room No. 1.
3. Tested Date: Mar. 14, 2018.

9.3 Test Arrangement

a. 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.

b. During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

9.4 Test Results

Fundamental Voltage/Ampere	229.97rms/ 0.225Arms	Power Frequency	50.000Hz
Observation (T_p)	10 min.	Power Factor	0.794
Enviromental Conditions	26deg. C, 64%RH	Tested by	Michael Cheng
Test Mode	Mode 1		

Test Parameter	Measurement Value	Limit	Remarks
P_{st}	0.064	1.00	Pass
P_{lt}	0.028	0.65	Pass
T_{max} (ms)	0	500	Pass
d_{max} (%)	0	4	Pass
d_c (%)	0	3.3	Pass

Note: (1) P_{st} means short-term flicker indicator.
(2) P_{lt} means long-term flicker indicator.
(3) T_{max} means accumulated time value of d(t) with a deviation exceeding 3.3 %.
(4) d_{max} means maximum relative voltage change.
(5) d_c means maximum relative steady-state voltage change.

10 General Immunity Requirements

EN 55024:2010, Immunity requirements				
Clause	Reference standard	Table	Test specification	Performance Criterion
4.2.1	EN/IEC 61000-4-2 ESD	1.3	Enclosure port: ±8kV Air discharge, ±4kV Contact discharge	B
4.2.3.2	EN/IEC 61000-4-3 RS	1.2	Enclosure port: 80-1000 MHz, 3V/m, 80% AM (1kHz)	A
4.2.2	EN/IEC 61000-4-4 EFT	2.3	Signal ports and telecommunication ports: xDSL equipment: ±0.5kV, 5/50 (T_r/T_h) ns, 100kHz others: ±0.5kV, 5/50 (T_r/T_h) ns, 5kHz	B
		3.3	Input DC power port: ±0.5kV, 5/50 (T_r/T_h) ns, 5kHz	
		4.5	Input AC Power ports: ±1kV, 5/50 (T_r/T_h) ns, 5kHz	
4.2.5	EN/IEC 61000-4-5 Surge	2.2	Signal and telecommunication ports (direct to outdoor cables): 10/700 (5/320) (T_r/T_h) µs w/o primary protectors: ±1kV, or with primary protectors fitted: ±4kV	C
		3.2	Input DC power port (direct to outdoor cables): 1.2/50 (8/20) (T_r/T_h) µs Line to earth: ±0.5kV	B
		4.4	Input AC Power ports: 1.2/50 (8/20) (T_r/T_h) µs, Line to line: ±1kV Line to earth: ±2kV	
4.2.3.3	EN/IEC 61000-4-6 CS	2.1	Signal and telecommunication ports(cable length > 3m): 0.15-80 MHz, 3V, 80% AM (1kHz)	A
		3.1	Input DC power port: 0.15-80 MHz, 3V, 80% AM (1kHz)	
		4.1	Input AC Power ports: 0.15-80 MHz, 3V, 80% AM (1kHz)	
4.2.4	EN/IEC 61000-4-8 PFMF	1.1	Enclosure port: 50 or 60 Hz, 1A/m	A
4.2.6	EN/IEC 61000-4-11 Dips & Interruptions	4.2	Input AC Power ports: Voltage Dips: >95% reduction – 0.5 period 30% reduction – 25 periods	B C
		4.3	Input AC Power ports: Voltage Interruptions: >95% reduction – 250 periods	C

10.1 Performance Criteria

General Performance Criteria

Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criterion B

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

Particular performance criteria

The particular performance criteria which are specified in the normative annexes of EN 55024 take precedence over the corresponding parts of the general performance criteria. Where particular performance criteria for specific functions are not given, then the general performance criteria shall apply.

11 Electrostatic Discharge Immunity Test (ESD)

11.1 Test Specification

Basic Standard:	EN/IEC 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Discharge Voltage:	Air Discharge: ±2, ±4, ±8kV (Direct) Contact Discharge: ±2, ±4kV (Direct/Indirect)
Number of Discharge:	Air – Direct: 10 discharges per location (each polarity) Contact – Direct & Indirect: 25 discharges per location (each polarity) and min. 200 times in total
Discharge Mode:	Single Discharge
Discharge Period:	1-second minimum

11.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
EM Test ESD Simulator	Dito	V0707102251	Apr. 11, 2017	Apr. 10, 2018

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in ESD Room No. 3.
3. Tested Date: Mar. 12, 2018.

11.3 Test Arrangement

The discharges shall be applied in two ways:

a. Contact discharges to the conductive surfaces and coupling planes:

The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges. If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.

b. Air discharges at slots and apertures and insulating surfaces:

On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur. Such points are tested using the air discharge method. This investigation should be restricted to those area normally handled by the user. A minimum of 10 single air discharges shall be applied to the selected test point for each such area.

The basic test procedure was in accordance with EN/IEC 61000-4-2:

a. Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.

b. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.

c. The time interval between two successive single discharges was at least 1 second.

d. The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.

e. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.

f. Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.

g. At least ten single discharges (in the most sensitive polarity) were applied to the **H**orizontal **C**oupling **P**lane at points on each side of the EUT. The ESD generator was positioned at a distance of 0.1 meters from the EUT with the discharge electrode touching the **HCP.**

h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the **V**ertical **C**oupling **P**lane in sufficiently different positions that the four faces of the EUT were completely illuminated. The **VCP** (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.

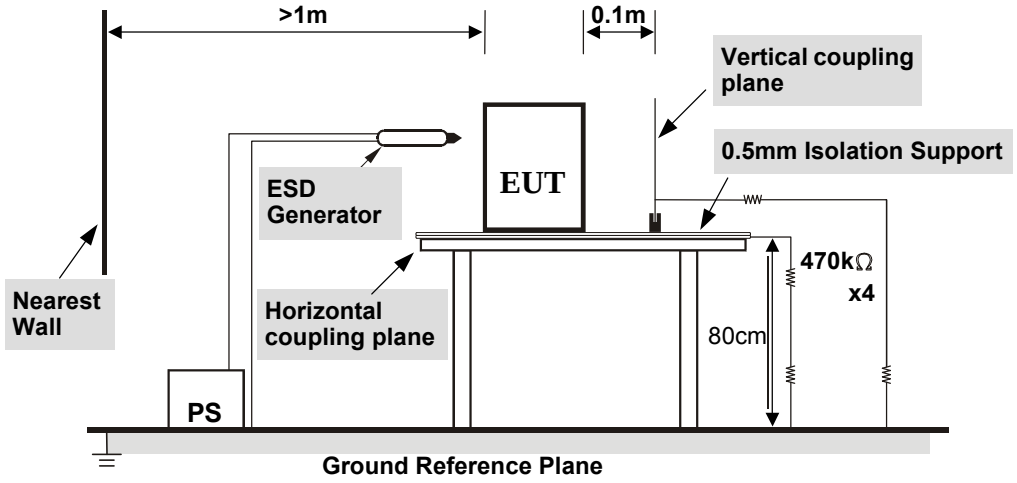


TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the **G**round **R**eference **P**lane. The **GRP** consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A **H**orizontal **C**oupling **P**lane (1.6m x 0.8m) was placed on the table and attached to the **GRP** by means of a cable with 940kΩ total impedance. The equipment under test, was installed in a representative system as described in section 7 of EN/IEC 61000-4-2, and its cables were placed on the **HCP** and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

11.4 Test Results

Test mode	Mode 1	Input Power	230 Vac, 50 Hz
Enviromental conditions	24 °C, 44% RH 1010 mbar	Tested by	Joey Liu

Test Results of Direct Application					
Discharge Level (kV)	Polarity (+/-)	Test Point	Contact Discharge	Air Discharge	Performance Criterion
2	+/-	6~8, 10, 11, 14, 18	Note 1	NA	A
4	+/-	6~8, 10, 11, 14, 18	Note 2	NA	B
2, 4	+/-	1~5, 9, 12, 13, 15~17, 19, 20	NA	Note 1	A
8	+/-	2~5, 12, 13, 17, 19	NA	Note 1	A
8	+/-	1, 9	NA	Note 2	B
8	+/-	15, 16, 20	NA	Note 3	B

Description of test points of direct application: Please refer to following page for representative mark only.

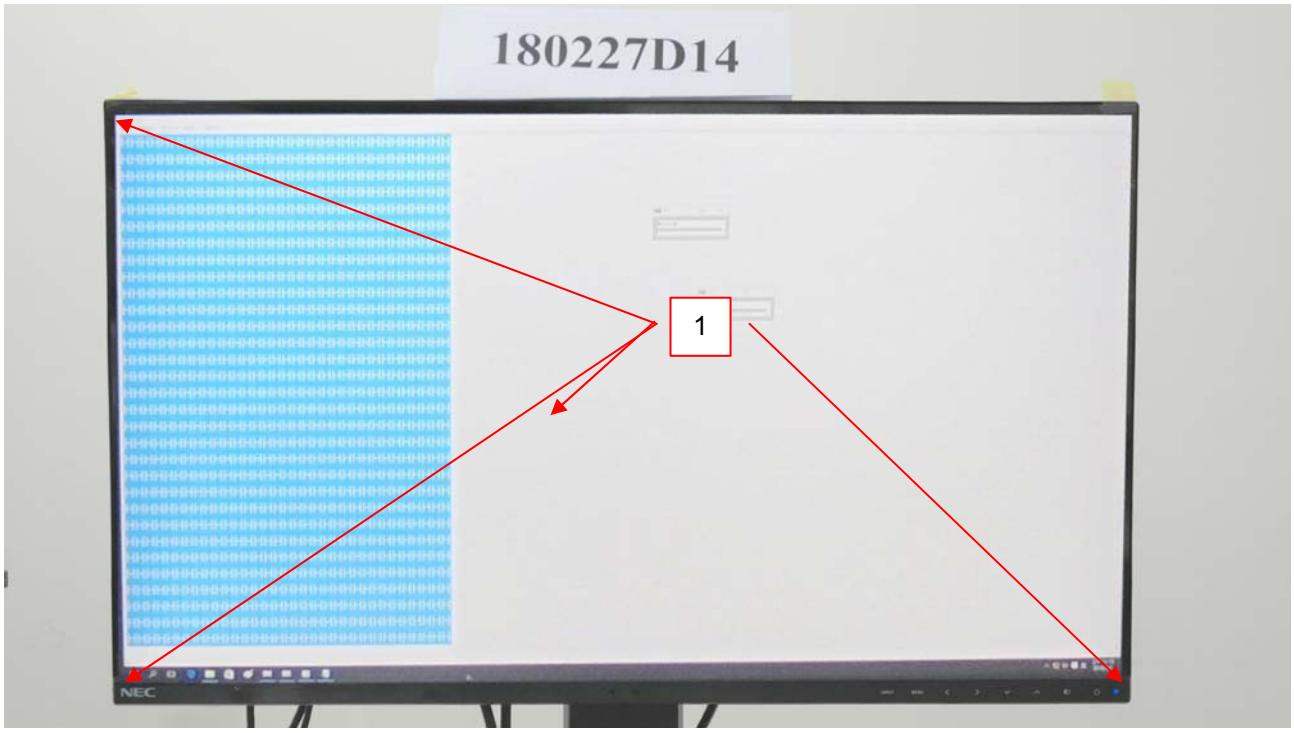
Test Results of Indirect Application					
Discharge Level (kV)	Polarity (+/-)	Test Point	Horizontal Coupling Plane	Vertical Coupling Plane	Performance Criterion
2, 4	+/-	Four Sides	Note 1	Note 1	A

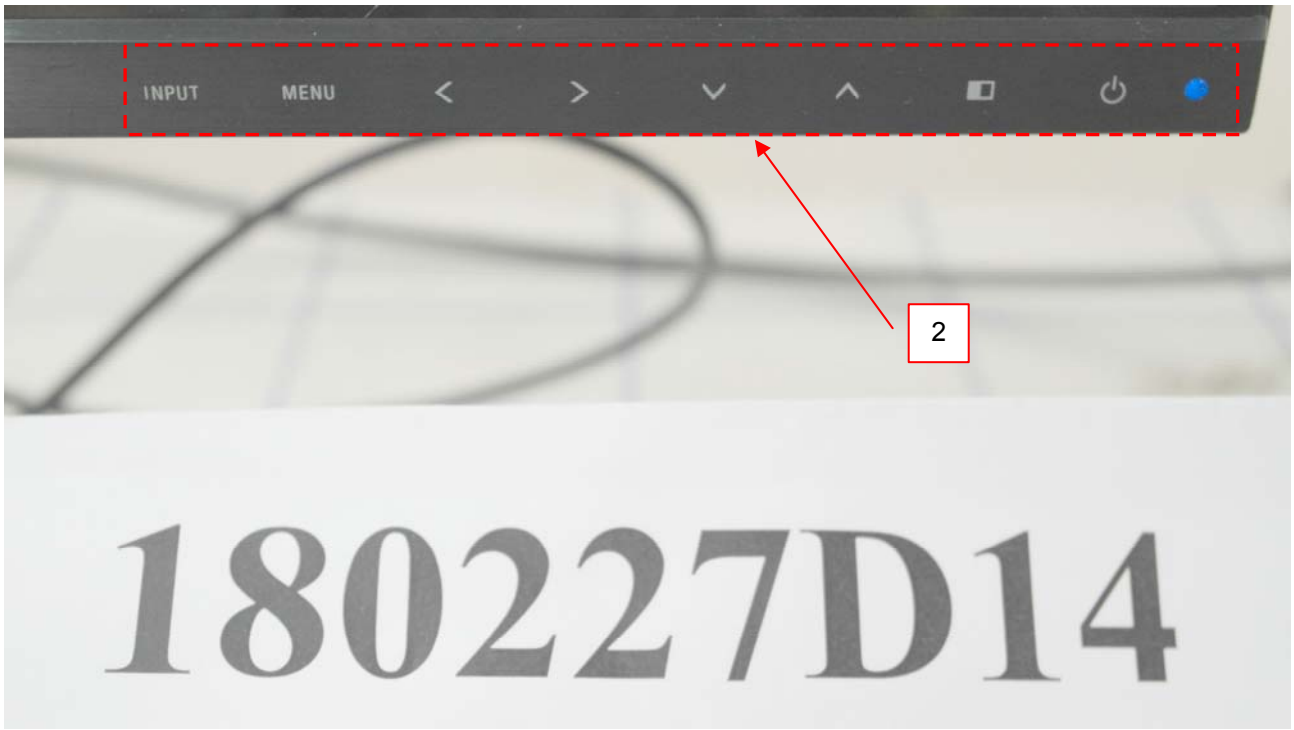
Description of test points of indirect application:

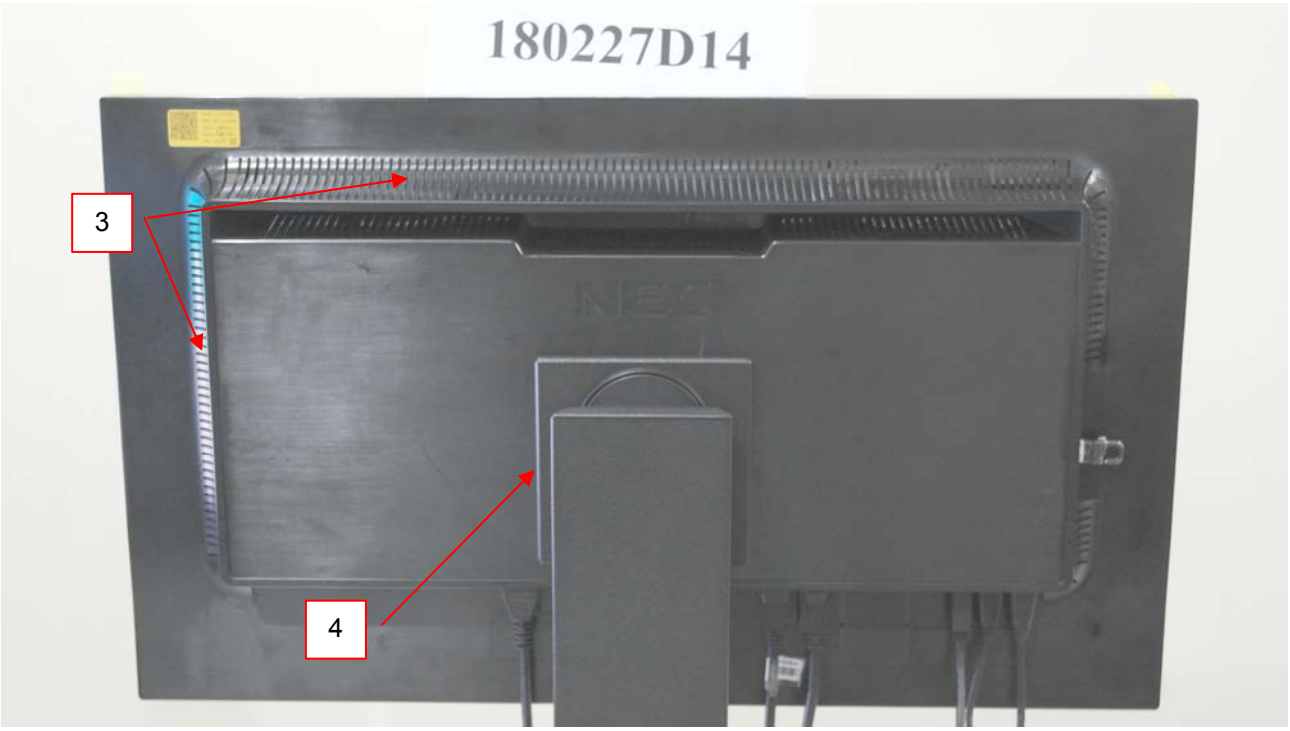
1. Front side 2. Rear side 3. Right side 4. Left side

Note: 1. The EUT function was correct during the test.
2. There was flickered disturbance on the dispaly screen during the test, but could self-recover after the test.
3. The USB R/W function of EUT was delay for 1~2 seconds during the test, but could self-recover after the test.

Description of Test Points



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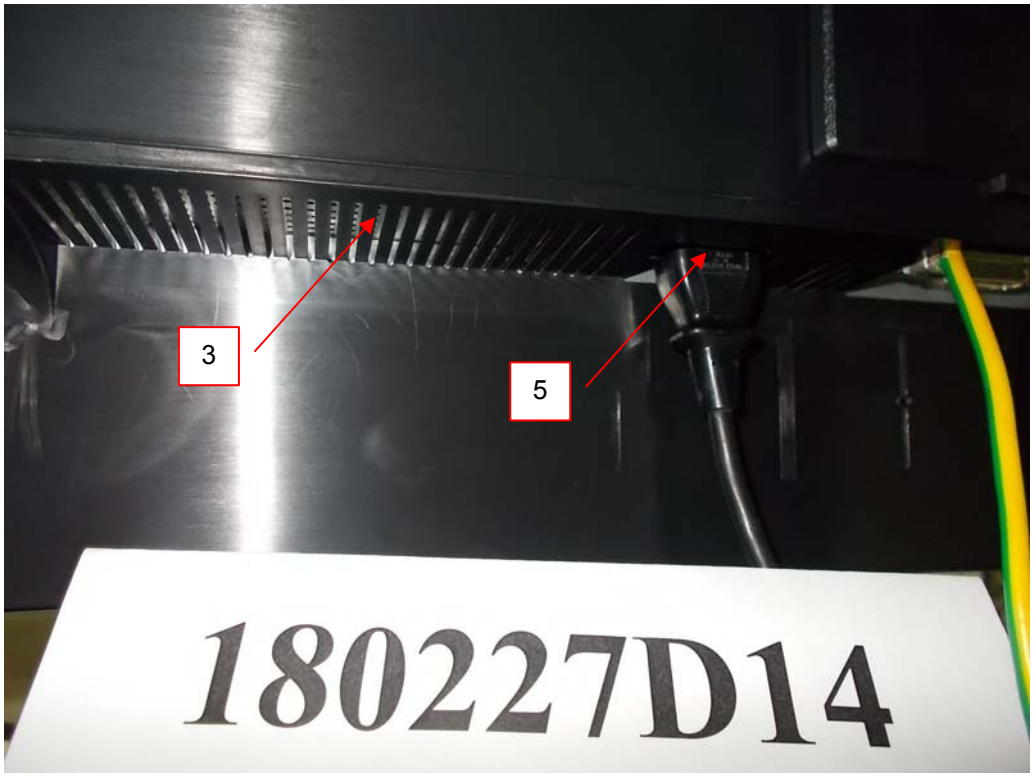
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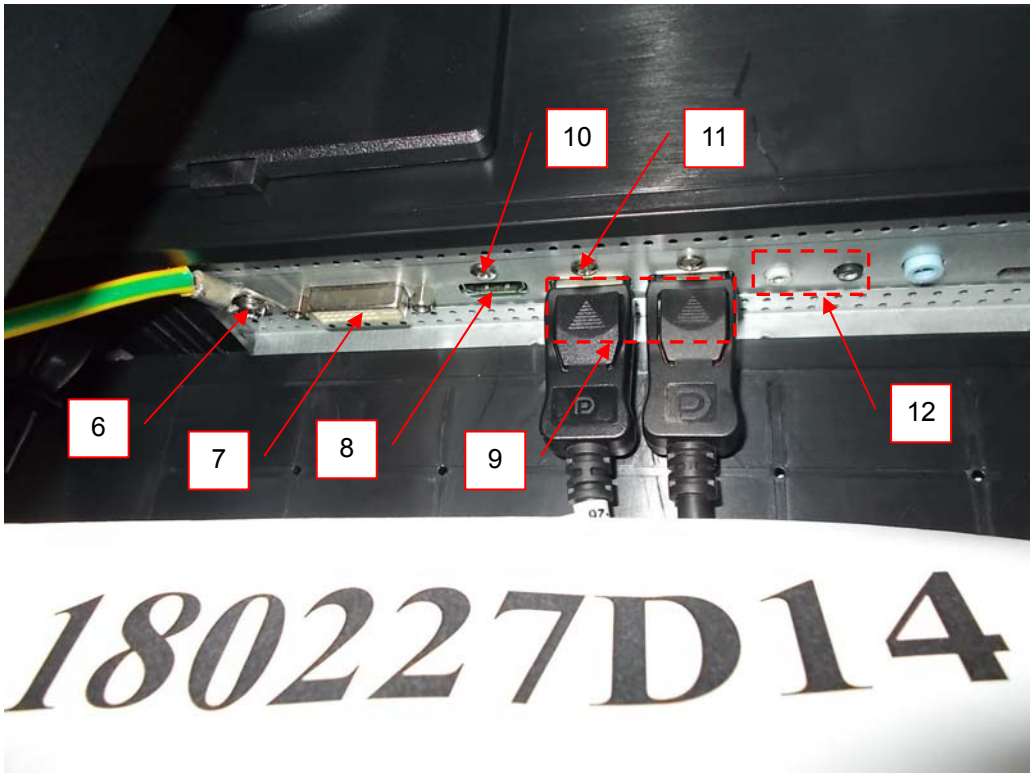
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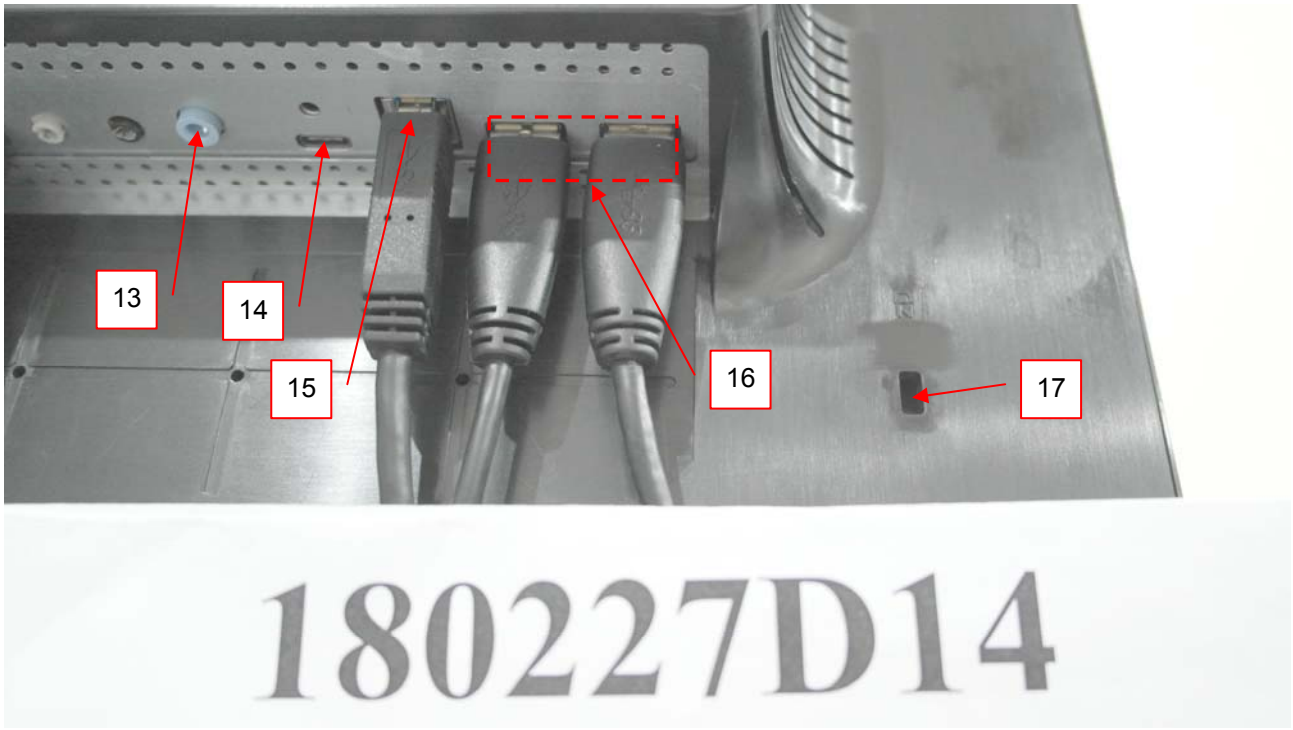
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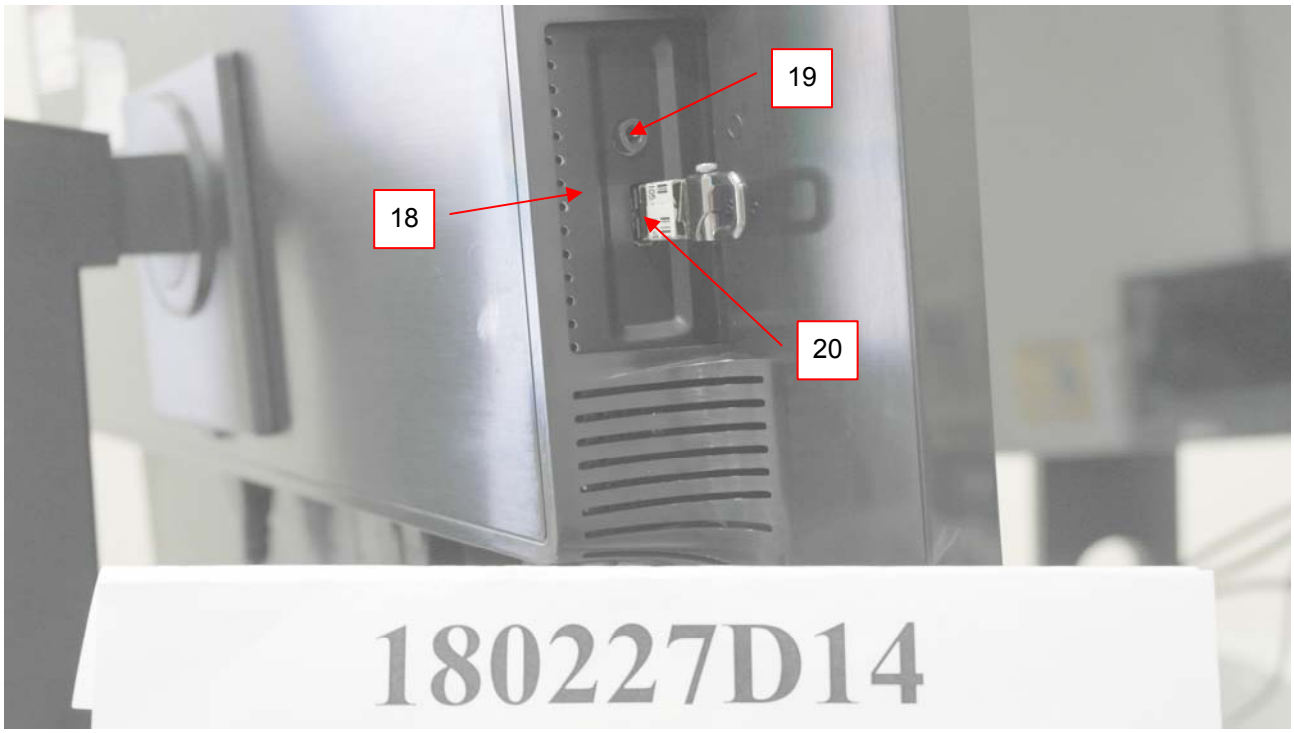
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12 Radiated, Radio-frequency, Electromagnetic Field Immunity Test (RS)

12.1 Test Specification

Basic Standard:	EN/IEC 61000-4-3
Frequency Range:	80 MHz - 1000 MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of preceding frequency value
Polarity of Antenna:	Horizontal and Vertical
Antenna Height:	1.5m
Dwell Time:	3 seconds

12.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
BOONTON Power Meter	4232A	94901	Jul. 18, 2017	Jul. 17, 2018
BOONTON Power Sensor	51011-EMC	32807	Jul. 18, 2017	Jul. 17, 2018
BOONTON Power Sensor	51011-EMC	32832	Jul. 18, 2017	Jul. 17, 2018
TESEQ RF Generator	ITS 6006	37543	May 8, 2017	May 7, 2018
ETS Electric Field Sensor	HI-6105	00217912	Nov. 27, 2017	Nov. 26, 2018
TESTQ Amplifier	AS1860-50	S-5944/1	NA	NA
TESTQ Amplifier	CBA 3G-050	T44345	NA	NA
TESTQ Amplifier	CBA 1G-275	T44344	NA	NA
AR Log-Periodic Antenna	AT5080	312115	NA	NA
Schwarzbeck LOG ANTENNA	Stlp 9149	9149-260	NA	NA
CHANCE MOST Compact Full Anechoic Chamber (7x3x3 m)	N/A	N/A	Jul. 28, 2017	Jul. 27, 2018
Software	RS_V7.6	NA	NA	NA

Notes: 1. The calibration interval of the above test instruments is 12/24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in RS Room No.1.
3. The transmit antenna was located at a distance of 3 meters from the EUT.
4. Tested Date: Mar. 12, 2018.

12.3 Test Arrangement

The test procedure was in accordance with EN/IEC 61000-4-3.

a. The testing was performed in a modified semi-anechoic chamber.

b. The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80% amplitude modulated with a 1kHz sine wave.

c. The field strength level was 3 V/m.

d. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

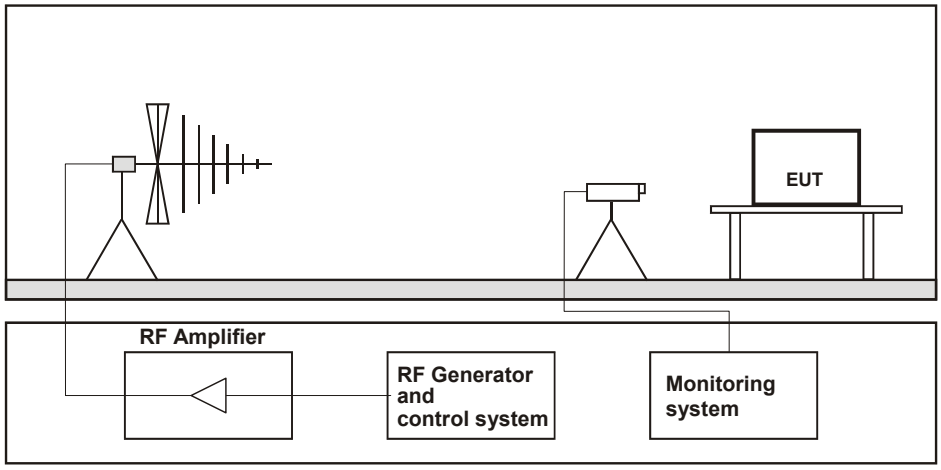


Table-top Equipment

The EUT installed in a representative system as described in section 7 of EN/IEC 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

12.4 Test Results

Test mode	Mode 1	Input Power	230 Vac, 50 Hz
Enviromental conditions	24 ˚C, 64% RH	Tested by	Bernie Lu

Frequency (MHz)	Polarity	Azimuth(°)	Applied Field Strength		Observation	Performance Criterion
			(V/m)	Modulation		
80 -1000	V&H	0	3	80% AM (1kHz)	Note	A
80 -1000	V&H	90	3	80% AM (1kHz)	Note	A
80 -1000	V&H	180	3	80% AM (1kHz)	Note	A
80 -1000	V&H	270	3	80% AM (1kHz)	Note	A

Note: The EUT function was correct during the test.

13 Electrical Fast Transient/Burst Immunity Test (EFT)

13.1 Test Specification

Basic Standard:	EN/IEC 61000-4-4
Test Voltage:	Signal / telecommunication port: N/A Input DC power port: N/A Input AC power port: ±1kV
Impulse Repetition Frequency:	xDSL telecommunication port: 100kHz others: 5kHz
Impulse Wave Shape:	5/50 ns
Burst Duration:	0.75 ms for 100kHz Repetition Frequency 15 ms for 5kHz Repetition Frequency
Burst Period:	300 ms
Test Duration:	1 min.

13.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Haefely, EFT Generator	PEFT 4010	154954	Apr. 17, 2017	Apr. 16, 2018
Haefely,Capacitive Clamp	IP4A	155173	Apr. 17, 2017	Apr. 16, 2018

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in EFT Room.
3. Tested Date: Mar. 14, 2018.

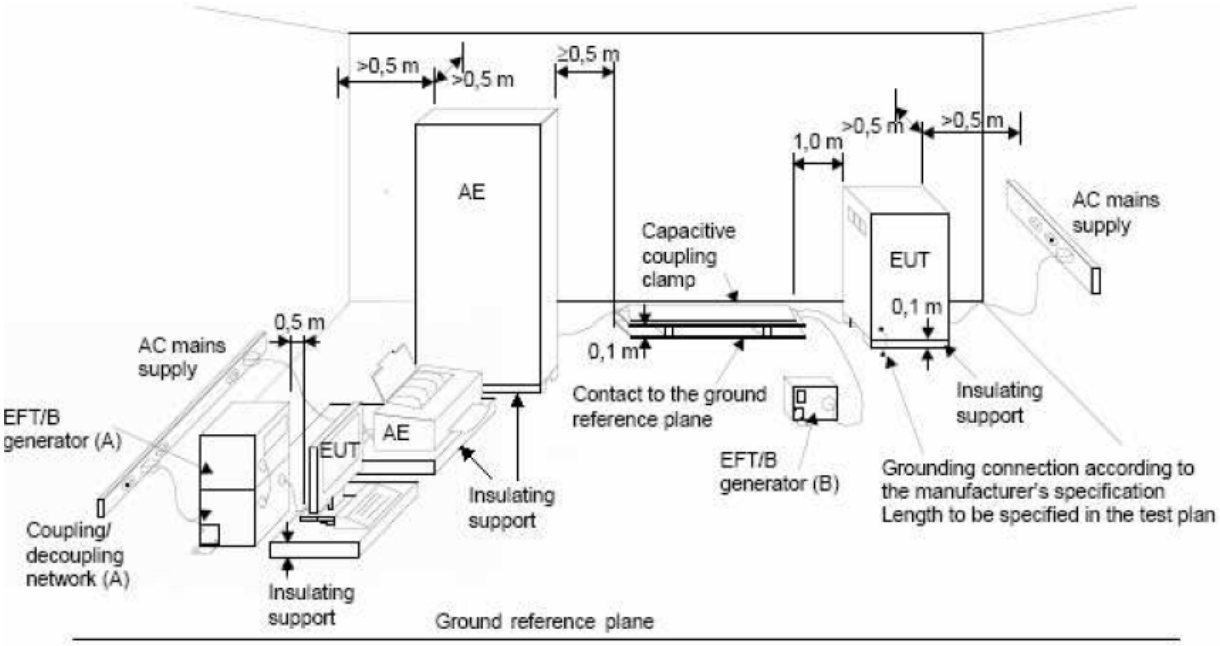
13.3 Test Arrangement

a. Both positive and negative polarity discharges were applied.

b. The distance between any coupling devices and the EUT should be 0.5 m for table-top equipment testing, and 1.0 m for floor standing equipment.

c. The duration time of each test sequential was 1 minute.

d. The transient/burst waveform was in accordance with EN/IEC 61000-4-4, 5/50 ns.



NOTE:
(A) location for supply line coupling
(B) location for signal lines coupling

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

13.4 Test Results

Test mode	Mode 1	Input Power	230 Vac, 50 Hz
Enviromental conditions	25 °C, 61% RH	Tested by	Michael Cheng

Input AC power port

Voltage (kV)	Test Point	Polarity (+/-)	Observation	Performance Criterion
1	L1	+/-	Note	A
1	L2	+/-	Note	A
1	PE	+/-	Note	A
1	L1-L2-PE	+/-	Note	A

Note: The EUT function was correct during the test.

14 Surge Immunity Test

14.1 Test Specification

Basic Standard:	EN/IEC 61000-4-5
Wave-Shape:	Signal / telecommunication port (direct to outdoor cables*): 10/700 µs Open Circuit Voltage 5/320 µs Short Circuit Current
	Input DC power port (direct to outdoor cables*): 1.2/50 µs Open Circuit Voltage 8/20 µs Short Circuit Current
	Input AC power port: 1.2/50 µs Open Circuit Voltage 8/20 µs Short Circuit Current
Test Voltage:	Signal and telecommunication ports**: w/o primary protectors: N/A with primary protectors fitted: N/A
	Input DC power port: Line to earth or ground: N/A
	Input AC power ports: Line to line: ±0.5kV, ±1kV Line to earth or ground: ±0.5kV, ±1kV, ±2kV
AC Phase Angle (degree):	0°, 90°, 180°, 270°
Pulse Repetition Rate:	1 time / 20 sec.
Number of Tests:	5 positive and 5 negative at selected points

* This test is only applicable only to ports, which according to the manufacturer's specification, may connect directly to outdoor cables.

** For ports where primary protection is intended, surges are applied at voltages up to 4 kV with the primary protectors fitted. Otherwise the 1 kV test level is applied without primary protection in place.

14.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
KeyTek, Surge Simulator	EMC Pro	9902207	May 11, 2017	May 10, 2018
Coupling Decoupling Network	CDN-UTP8	028	Aug. 18, 2017	Aug. 17, 2018
Software	CEWare32	NA	NA	NA

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in EMS Room No. 1.
3. Tested Date: Mar. 14, 2018.

14.3 Test Arrangement

a. Input AC/DC Power ports:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

For double-insulated products without PE or external earth connections, the test shall be done in a similar way as for grounded products but without adding any additional external grounded connections. If there are no other possible connections to earth, line-to-ground tests may be omitted.

b. Signal and telecommunication ports,

- Unshielded unsymmetrical interconnection lines:

The surge is applied to the lines via the capacitive coupling. The coupling / decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length.

- Unshielded symmetrical interconnections communication lines:

The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length.

- High speed communications lines

Prior to the test, the correct operation of the port shall be verified; the external connection shall then be removed and the surge applied directly to the port's terminals with no coupling /decoupling network. After the surge, the correct operation of the port shall again be verified.

- Shielded lines:

- Direct application,

The EUT is isolated from ground and the surge is applied to its metallic enclosure; the termination (or auxiliary equipment) at the port(s) under test is grounded. This test applies to equipment with single or multiple shielded cables.

Rules for application of the surge to shielded lines:

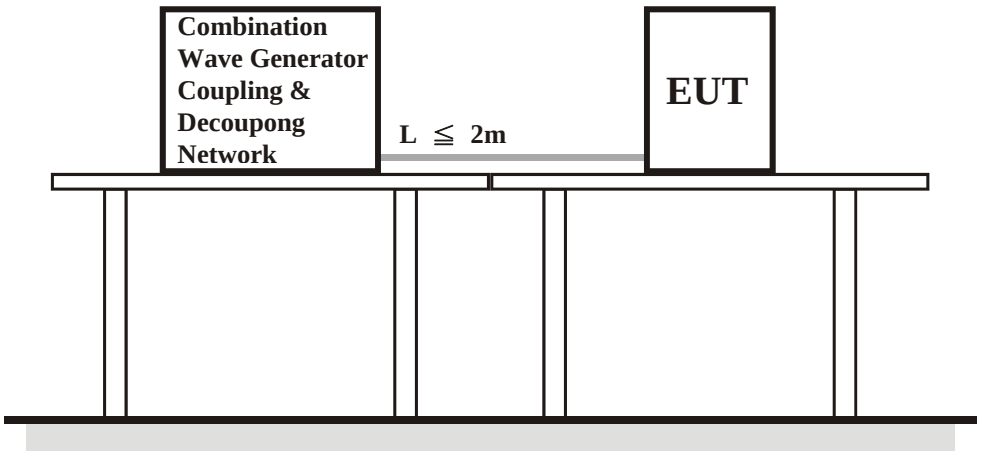
a) Shields grounded at both ends
- The surge injection on the shield.

b) Shields grounded at one end
- If in the installation the shield is connected only at the auxiliary equipment, test shall be done in that configuration but with the generator still connected to the EUT side. If cable lengths allow, the cables shall be on insulated supports 0,1 m above the ground plane or cable tray.

For products which do not have metallic enclosures, the surge is applied directly to the shielded cable.

- Alternative coupling method for testing single cables in a multi-shield configuration,

Surges are applied in close proximity to the interconnection cable under test by a wire. The length of the cable between the port(s) under test and the device attached to the other end of the cable shall be the lesser of: the maximum length permitted by the EUT's specification, or 20 m. Where the length exceeds 1 m, excess lengths of cables shall be bundled at the approximate centre of the cables with the bundles 30 cm to 40 cm in length.



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

14.4 Test Results

Test mode	Mode 1	Input Power	230 Vac, 50 Hz
Enviromental conditions	25 °C, 62% RH	Tested by	Michael Cheng

Input AC power port

Voltage (kV)	Test Point	Polarity (+/-)	Observation	Performance Criterion
0.5, 1	L1-L2	+/-	Note	A
0.5, 1, 2	L1-PE	+/-	Note	A
0.5, 1, 2	L2-PE	+/-	Note	A

Note: The EUT function was correct during the test.

15 Immunity to Conducted Disturbances Induced by RF Fields (CS)

15.1 Test Specification

Basic Standard:	EN/IEC 61000-4-6
Frequency Range:	0.15 MHz - 80 MHz
Voltage Level:	3 V
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of preceding frequency value
Dwell Time	3 seconds

15.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
ROHDE & SCHWARZ Signal Generator	SML03	101801	Jan. 8, 2018	Jan. 7, 2019
Digital Sweep Function Generator	8120	984801	NA	NA
AR Power Amplifier	75A250AM1	306331	NA	NA
FCC Coupling Decoupling Network	FCC-801-M2-16A	01047	Jun. 21, 2017	Jun. 20, 2018
FISCHER CUSTOM COMMUNICATIONS EM Injection Clamp	F-203I-23mm	455	NA	NA
FISCHER CUSTOM COMMUNICATIONS Current Injection Clamp	F-120-9A	361	Jul. 26, 2017	Jul. 25, 2018
B&K Ear Simulator	4185	2553594	NA	NA
EM TEST Coupling Decoupling Network	CDN M1/32A	306508	Jun. 21, 2017	Jun. 20, 2018
TESEQ Coupling Decoupling Network	CDN T800	34428	Jun. 21, 2017	Jun. 20, 2018
FCC Coupling Decoupling Network	FCC-801-T4	02031	Jun. 21, 2017	Jun. 20, 2018
EM TEST Coupling Decoupling Network	CDN T2	306509	Jun. 21, 2017	Jun. 20, 2018
R&S Power Sensor	NRV-Z5	837878/039	Oct. 30, 2017	Oct. 29, 2018
R&S Power Meter	NRVD	837794/040	Oct. 30, 2017	Oct. 29, 2018
TESEQ Coupling Decoupling Network	CDN M232	37702	Jun. 21, 2017	Jun. 20, 2018
TESEQ Coupling Decoupling Network	CDN M332	41258	Jun. 21, 2017	Jun. 20, 2018
TESEQ Coupling Decoupling Network	CDN M332	41256	Jun. 21, 2017	Jun. 20, 2018
TESEQ Coupling Decoupling Network	CDN T400A	28569	Jun. 21, 2017	Jun. 20, 2018
TESEQ Coupling Decoupling Network	CDN T8-10	40376	Jun. 21, 2017	Jun. 20, 2018
Software	CS_V7.4.2	NA	NA	NA

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in CS Room No. 1.
3. Tested Date: Mar. 14, 2018.

15.3 Test Arrangement

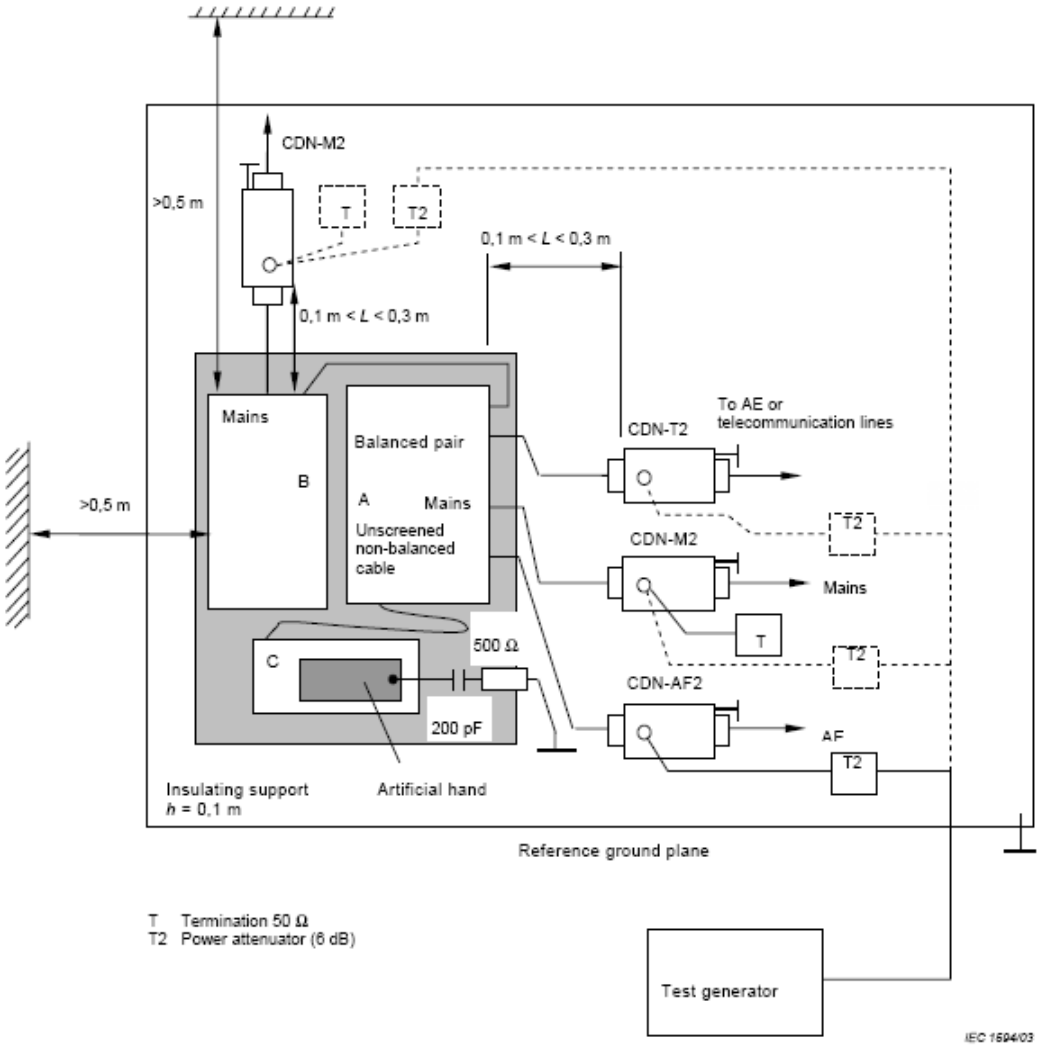
a. The EUT shall be tested within its intended operating and climatic conditions.

b. An artificial hand was placed on the hand-held accessory and connected to the ground reference plane.

c. One of the CDNs not used for injection was terminated with 50 ohm, providing only one return path. All other CDNs were coupled as decoupling networks.

d. 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.

e. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.



Note: 1.The EUT clearance from any metallic obstacles shall be at least 0,5 m.
2. Interconnecting cables (≦1 m) belonging to the EUT shall remain on the insulating support.
3. The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

15.4 Test Results

Test mode	Mode 1	Input Power	230 Vac, 50 Hz
Enviromental conditions	22 °C, 66% RH	Tested by	Bernie Lu

Frequency (MHz)	Level (Vrms)	Tested Line	Injection Method	Return Path	Observation	Performance Criterion
0.15 – 80	3	AC Power	CDN-M3	CDN-M1	Note	A

Note: The EUT function was correct during the test.

16 Power Frequency Magnetic Field Immunity Test

16.1 Test Specification

Basic Standard:	EN/IEC 61000-4-8
Frequency Range:	50Hz
Field Strength:	1 A/m
Observation Time:	1 minute
Inductance Coil:	Rectangular type, 1 m x 1 m

16.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
HAEFELY Magnetic Field Tester	MAG 100	083794-06	NA	NA
COMBINOVA Magnetic Field Meter	MFM10	224	Apr. 17, 2017	Apr, 16, 2018

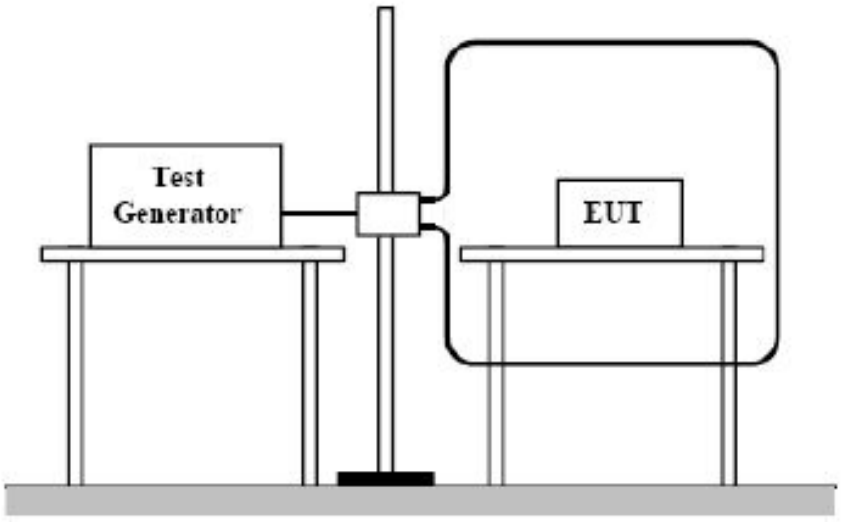
Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in EMS Room No. 1
3. Tested Date: Mar. 14, 2018.

16.3 Test Arrangement

a. The equipment is configured and connected to satisfy its functional requirements.

b. The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.

c. The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.



TABLETOP EQUIPMENT

The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

16.4 Test Results

Test mode	Mode 1	Input Power	230 Vac, 50 Hz
Enviromental conditions	25 °C, 62% RH	Tested by	Michael Cheng

Application	Frequency (Hz)	Field Strength (A/m)	Observation	Performance Criterion
X - Axis	50	1	Note	A
Y - Axis	50	1	Note	A
Z - Axis	50	1	Note	A

Note: The EUT function was correct during the test.

17 Voltage Dips and Interruptions

17.1 Test Specification

Basic Standard:	EN/IEC 61000-4-11
Test levels:	Voltage Dips: >95% reduction – 0.5 period 30% reduction – 25 periods Voltage Interruptions: >95% reduction – 250 periods
Interval between Event:	Minimum ten seconds
Sync Angle (degrees):	0° / 180°
Test Cycle:	3 times

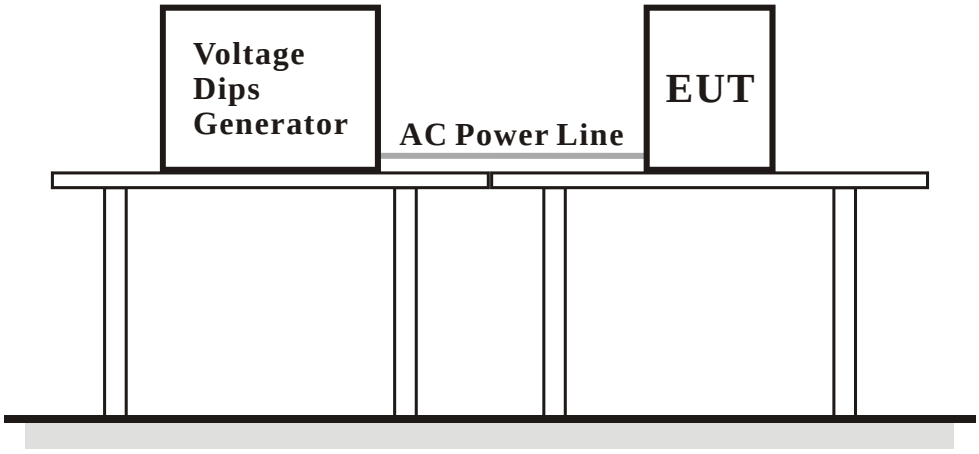
17.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Teseq Immunity Test System	Profline 2105	1632A00983 & 1639A01863	Sep. 28, 2017	Sep. 27, 2018
Software	WIN2120	NA	NA	NA

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in EMS Room No. 1.
3. Tested Date: Mar. 14, 2018.

17.3 Test Arrangement

The EUT shall be tested for each selected combination of test levels and duration with a sequence of 3 dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at 0 dregee crossover point of the voltage waveform.



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

17.4 Test Results

Test mode	Mode 1	Input Power	230 Vac, 50 Hz/ 240 Vac, 50 Hz/ 100 Vac, 50 Hz
Enviromental conditions	25 °C, 62% RH	Tested by	Michael Cheng

Input Power for testing: 230 Vac, 50 Hz (Nominal input Voltage)					
Voltage Reduction (%)	Duration (period)	Interval (sec)	Times	Observation	Performance Criterion
>95	0.5	10	3	Note 1	A
30	25	10	3	Note 1	A
>95	250	10	3	Note 2	C

Input Power for testing: 240 Vac, 50 Hz (Maximum rated input voltage)					
Voltage Reduction (%)	Duration (period)	Interval (sec)	Times	Observation	Performance Criterion
>95	0.5	10	3	Note 1	A
30	25	10	3	Note 1	A
>95	250	10	3	Note 2	C

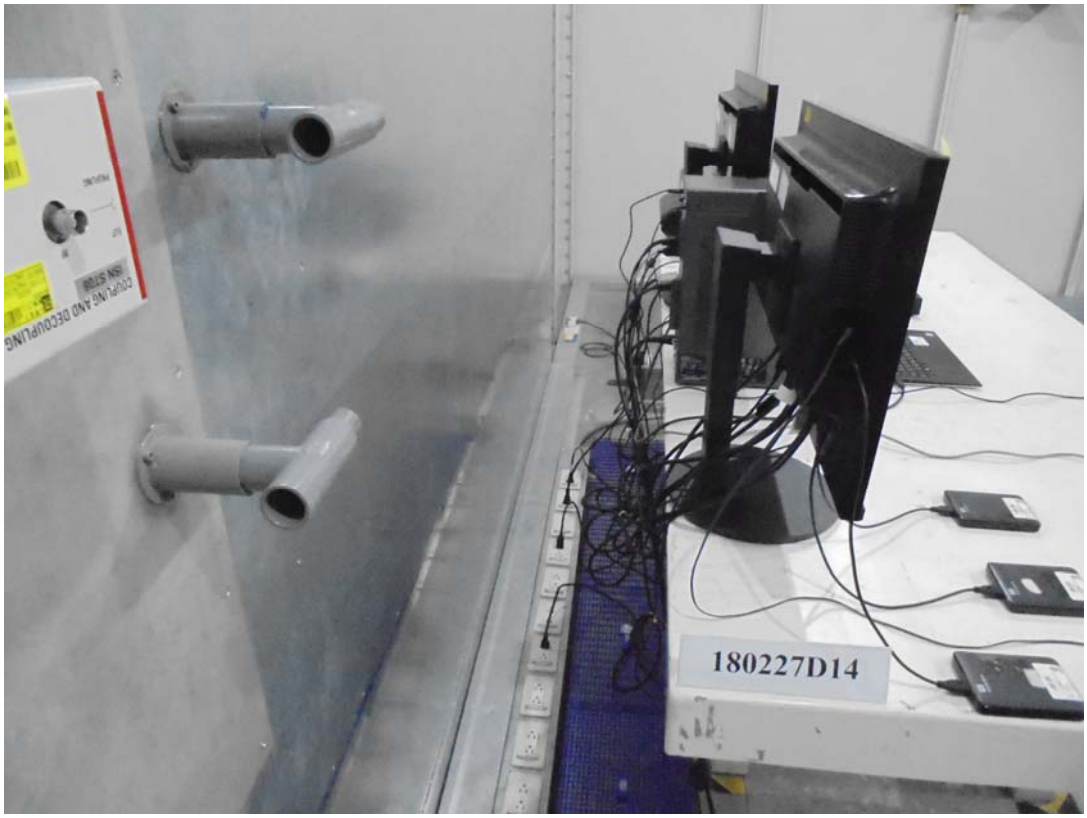
Input Power for testing: 100 Vac, 50 Hz (Minimum rated input voltage)					
Voltage Reduction (%)	Duration (period)	Interval (sec)	Times	Observation	Performance Criterion
>95	0.5	10	3	Note 1	A
30	25	10	3	Note 1	A
>95	250	10	3	Note 2	C

Note: 1. The EUT function was correct during the test.
2. The EUT shut down during the test and must be recovered manually.

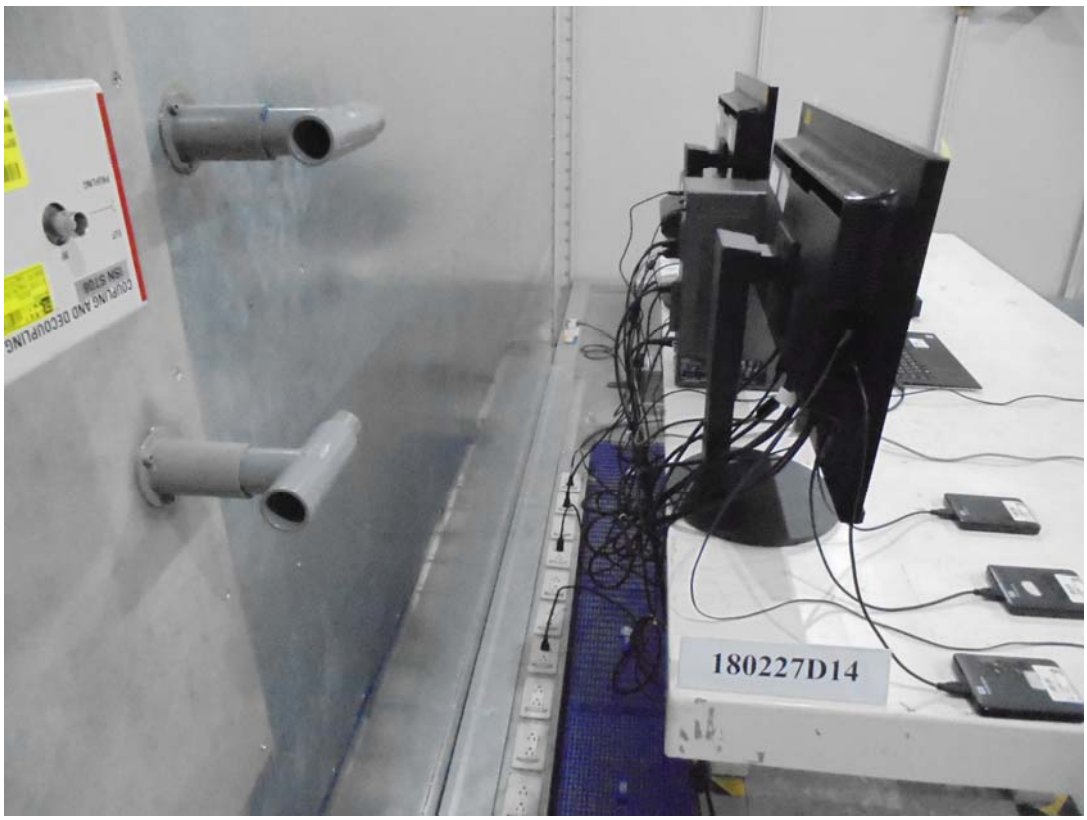
18 Pictures of Test Arrangements

18.1 Conducted Emission from the AC Mains Power Port

For Mode 1A



For Mode 1B & Mode 10



18.2 Radiated Emission at Frequencies up to 1GHz

For Mode 1A

For Mode 1B & Mode 10

18.3 Radiated Emission at Frequencies above 1GHz

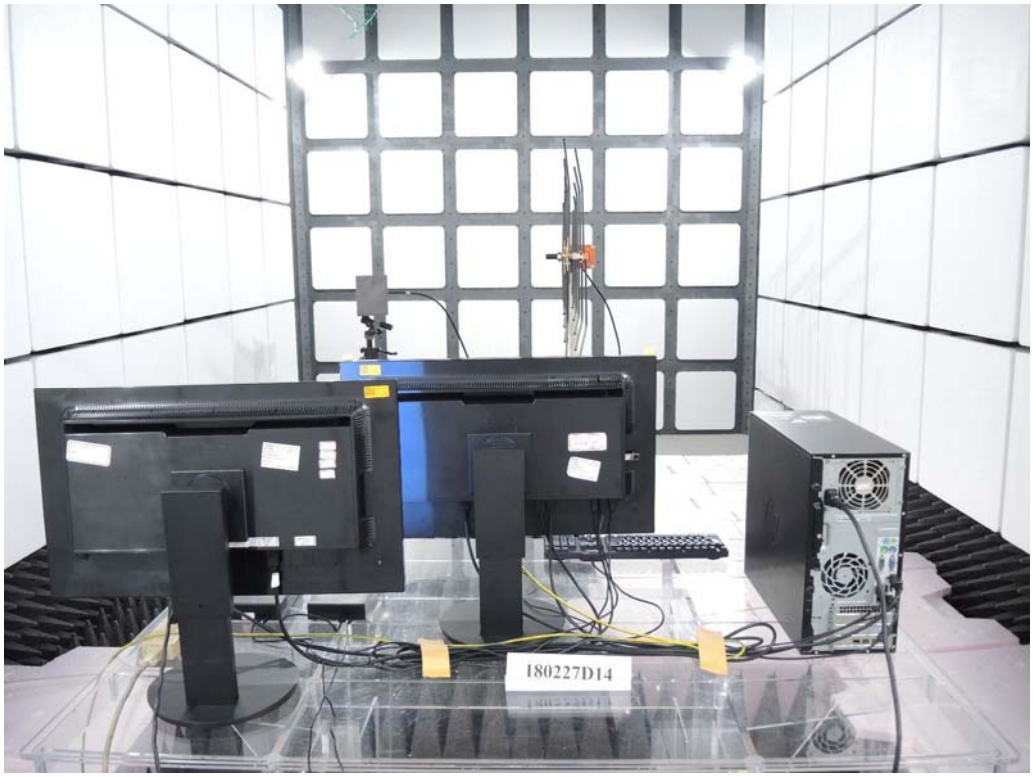
For Mode 1A

For Mode 1B & Mode 10

18.4 Harmonics Current, Voltage Fluctuations and Flicker Measurement

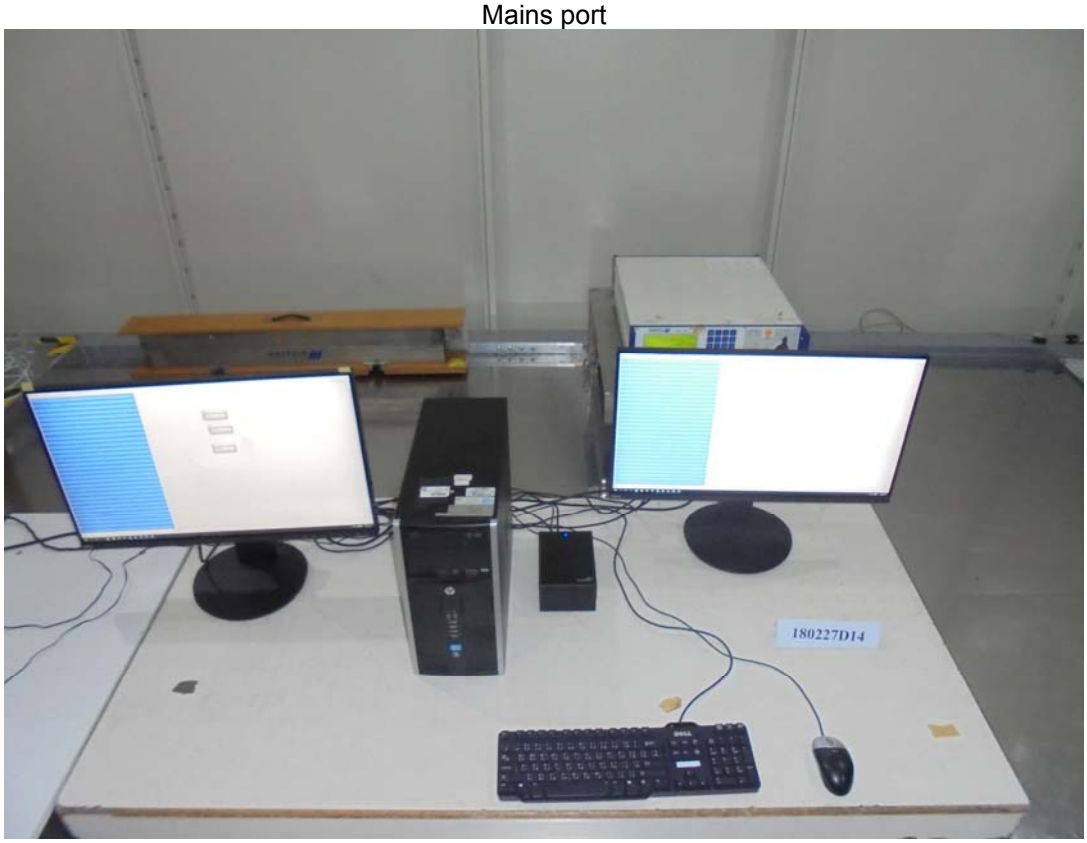
18.5 Electrostatic Discharge Immunity Test (ESD)

18.6 Radio-frequency, Electromagnetic Field Immunity Test (RS)



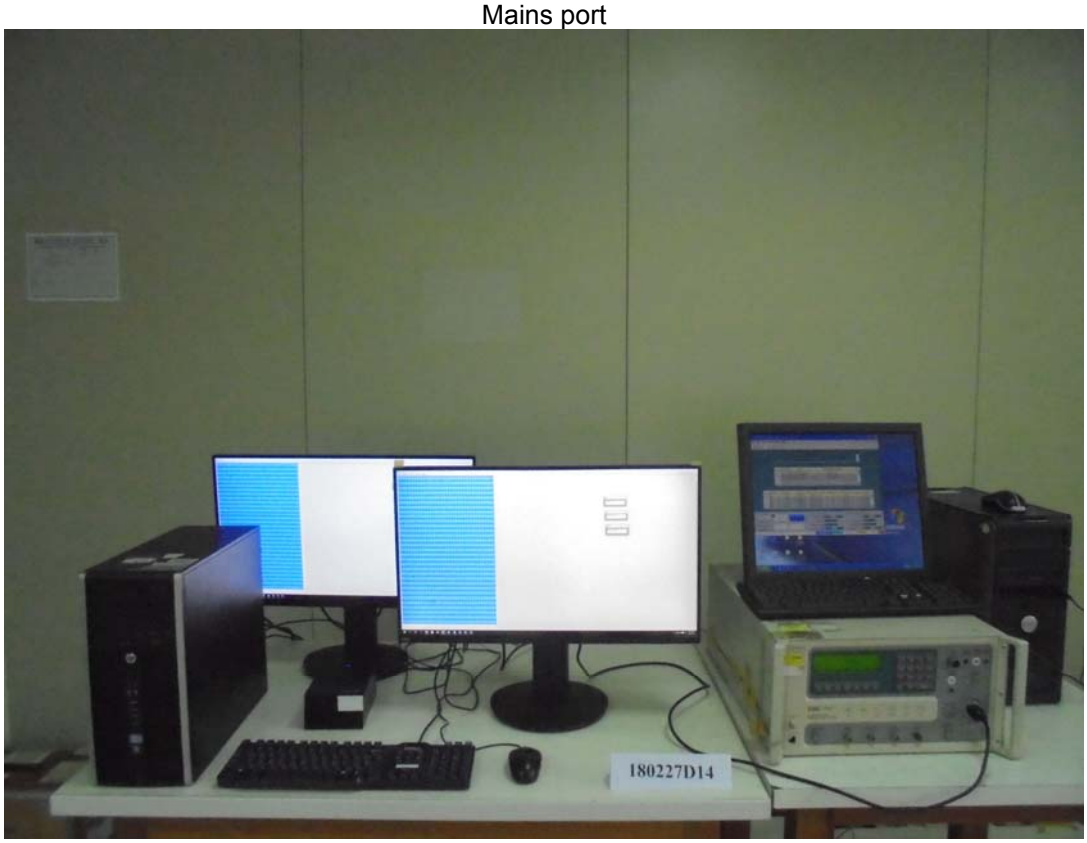
18.7 Electrical Fast Transient/Burst Immunity Test (EFT)

Mains port



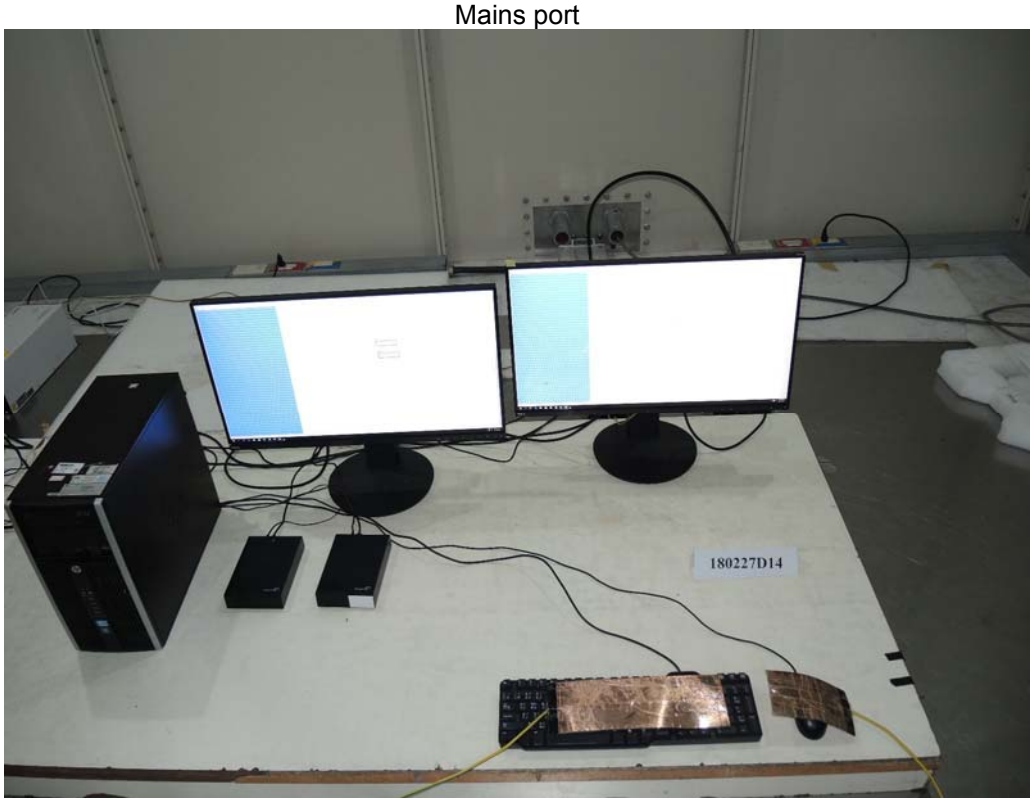
18.8 Surge Immunity Test

Mains port



18.9 Conducted Disturbances Induced by RF Fields (CS)

Mains port



18.10 Power Frequency Magnetic Field Immunity Test (PFMF)

18.11 Voltage Dips and Interruptions

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauVeritas.com
Web Site: www.bureauVeritas-adt.com

The address and road map of all our labs can be found in our web site also.

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