

Technical Compliance Statement FCC and ISED Test Report

For the following information

Ref. File No.: C1M1912027

Product : LCD Monitor
Model Number : (1)M179E9 (2)E172M
Brand Name : NEC
Applicant : TPV Electronics (Fujian) Co., Ltd.
Rules and Standards : 47 CFR FCC Part 15 Subpart B and
ICES-003 Issue 6:2016 (Class B Limit)

We hereby certify that the above product has been tested by us and complied with above FCC and ICES official limits. The test was performed according to the procedures ANSI C63.4-2014. The equipment might be marketed in US or Canada in accordance with the rules of 47 CFR FCC Part 2 and ISED regulations.

The test data and results are issued on the test report **EM-F190486**.

Signature



Alex Deng/Deputy Manager
Date: 2019. 12. 06

Test Laboratory:
AUDIX Technology Corporation, EMC Department
NVLAP Lab. Code: 200077-0
FCC OET Designation: TW1004 & TW1090
Web Site: www.audixtech.com

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

TEST REPORT

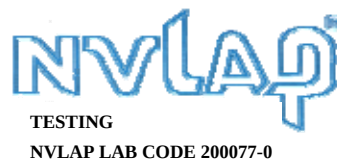
Product: LCD Monitor
Model No.: (1)M179E9 (2)E172M
Brand: NEC

Applicant for:

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

Prepared by:

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



File No. : C1M1912027
(ACS Ref. No.: A1Z1911031)
Report No. : EM-F190486
Date of Report : 2019. 12. 06

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

Test Report

Applicant : TPV Electronics (Fujian) Co., Ltd.

EUT Description

(1) Product : LCD Monitor
(2) Model Number : (1)M179E9 (2)E172M
(3) Brand : NEC
(4) Power Rating : AC 100-240V, 50/60Hz
(5) Test Voltage : AC 120V, 60Hz

Rules of Compliance and Applicable Standards:

47 CFR FCC Part 15 Subpart B
ANSI C63.4:2014
ICES-003 Issue 6:2016

The device described above was tested by Audix Technology Corporation to determine the maximum emission levels emanating from the device. All of the tests were requested by the applicant and the results thereof based upon the information that the applicant provided to us. We, Audix Technology Corporation assumes full responsibility for the accuracy and completeness of these measurements. This report is made under FCC Part 2.938 and ICES-003 chapter 7, and shows that the EUT is technically compliance with the class B limit for both **FCC rule and ICES standard** described as above.

No modifications were required during testing to bring this product into compliance.

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

Date of Report: 2019. 12. 06

Reviewed by:

 (Patty Yu/Administrator)

Approved by:

 (Alex Deng/Deputy Manager)

Name of the Representative of the Responsible Party:

Signature:

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1. Revision of Test Report

Issued Date	Revision Summary	Report Number
2019. 12. 06	Original Report.	EM-F190486

2. Summary of Test Result

2.1. Test Result

Test Item	Referred Rules/Standard	Limit	Result
Power-line conducted emission	47 CFR FCC Part 15 Subpart B and ICES-003: 2016	Class B	Pass
			Margin 6.14dB at 0.675MHz
Radiated emission (30 – 1000MHz)	47 CFR FCC Part 15 Subpart B and ICES-003: 2016	Class B	Pass
			Margin 4.76dB at 34.18MHz (Vertical, 1m/157°)
Radiated emission (Above 1GHz)	47 CFR FCC Part 15 Subpart B and ICES-003: 2016	Class B	Pass
			Margin 14.27dB at 1782.48MHz
Note :			
1. The uncertainties value is not used in determining the result.			
2. N/A is an abbreviation for Not Applicable.			
3. Special measures: None			
4. Decision and justification not to measure: None			
5. The FCC Part 15 Subpart B emission measurement results are deemed satisfactory evidence of compliance with ICES-003 regulations.			

2.2. Description of Test Firm

Name of Test Firm	Audix Technology Corporation / EMC Department No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan Tel: +886-2-26092133 Fax: +886-2-26099303 Website : www.audixtech.com Contact e-mail: attemc_report@audixtech.com
Accreditations	The laboratory is accredited by following organizations under ISO/IEC 17025:2017 (1) NVLAP(USA) NVLAP Lab Code 200077-0 (2) TAF(Taiwan) No. 1724
Test Facilities	FCC OET Designation Number under APEC MRA by BSMI is : TW1004 & TW1090 (1) No.8 Shielding Room (2) No.1 10m Semi-Anechoic Chamber

3. General Information

3.1. Description of Application

Applicant	TPV Electronics (Fujian) Co., Ltd. Rongqiao Economic and Technological Development Zone, Fuqing City, Fujian Province, P.R. China
Product	LCD Monitor
Brand	NEC
Model Number	(1)M179E9 (2)E172M The difference of above models is in sales marketing.

3.2. Description of the EUT

Test Model	M179E9
Serial Number	N/A
Power Rating	AC 100-240V, 50/60Hz
Firmware Version	N/A
Sample Status	Production
Date of Receipt	2019. 11. 25
Date of Test	2019. 12. 04 ~ 05
I/O Ports List	Back View • One AC In Port • One Audio In Port • One DP Port • One HDMI Port • One D-Sub Port • One Earphone Port
Accessories Supplied	• DP Cable • HDMI Cable • D-Sub Cable • Audio Cable • AC Power Cord (3C)

3.3. Highest Frequency within EUT

The Highest frequency is 135MHz of EUT.

3.4. Determination of Worse Case Operating Modes

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

Test Item	Data Cable & Power Cord	Input Port	Display, Resolution/Frequency
Power-line conducted emission	1.8m	HDMI	1280*1024/75Hz
		DP	1280*1024/75Hz
		D-Sub	1280*1024/75Hz
		HDMI	1024*768/75Hz
			640*480/60Hz
	Color Bar, 1080P		
	1.5m	HDMI	1280*1024/75Hz
Radiated emission	1.8m	HDMI	1280*1024/75Hz
		DP	1280*1024/75Hz
		D-Sub	1280*1024/75Hz
		HDMI	1024*768/75Hz
			640*480/60Hz
			Color Bar, 1080P
	1.5m	HDMI	1280*1024/75Hz

3.5. Final Test Configuration

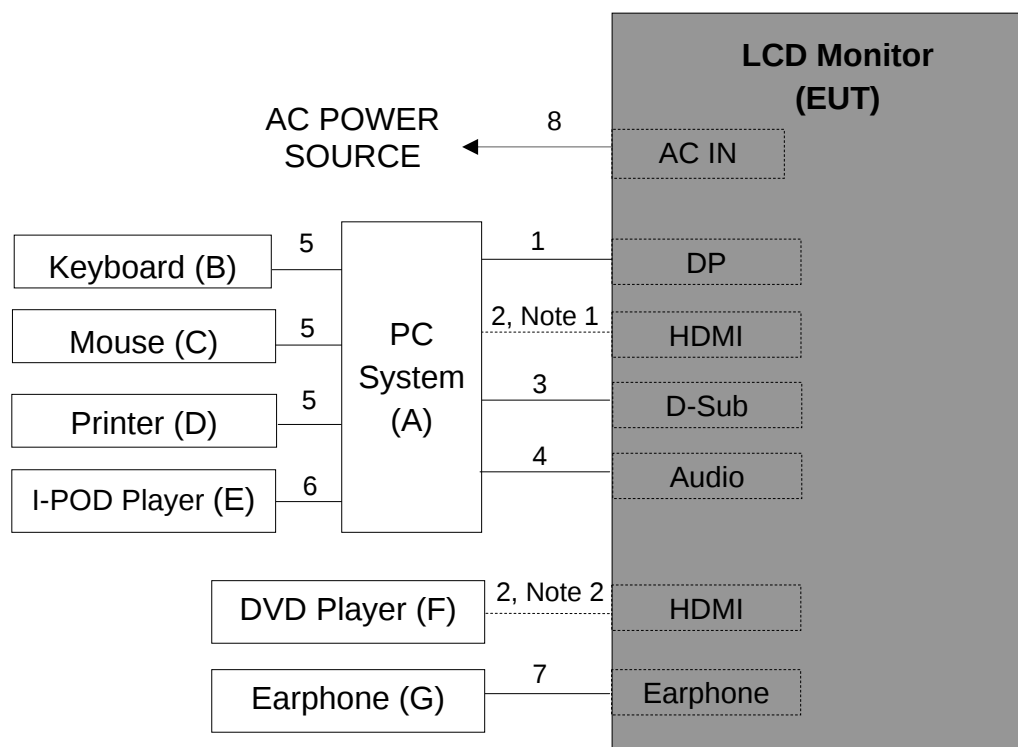
The worst showed as following configuration was recorded in this report.

Test Item	Data Cable & Power Cord	Input Port	Display, Resolution/Frequency
Power-line conducted emission	1.8m	HDMI	1280*1024/75Hz
	1.8m	HDMI	Color Bar, 1080P
Radiated emission (30-1000MHz) & (Above 1GHz)	1.8m	HDMI	1280*1024/75Hz
	1.8m	HDMI	Color Bar, 1080P

4. Measurement Arrangement

4.1. Equipment and cables arrangement

- Connection Diagram of EUT and Peripheral Devices



Note 1: HDMI cable to PC system for “H” Pattern, 1280*1024/75Hz Mode Used

Note 2: HDMI cable to DVD player for HDMI “Color Bar” Image, 1080p Mode Used

Remark: Connect the HDMI Cable Separately.

4.2. Method of Exercising EUT

The methods for exercising the EUT during the measurement specified in ANSI C63.4:2014 clause 11.2, 11.3 and figure 16 were used.

Operating System	Windows 10 of PC system
Test Program	“EMC Test”, “Windows Media Player”
Video Signal (Display Image)	(1) Standard Color bars image (DVD mode) or (2) Scrolling H Pattern (PC mode)
Audio Signal	Play 1kHz Audio Signal
Other	Other peripheral devices were driven and operated in turn

4.3. List of Supported Units under Test

Item	Product	Brand	Model No.	Serial No.	Approval
A	PC System	DELL	D19M005	17H5HV2	By DoC
B	USB Keyboard	DELL	KB216t	CN-OW33XP-LO30 0-8BQ-1286-A03	By DoC
C	USB Mouse	DELL	MS116-BK	CN-0N11X0-73826- 73V-018D	By DoC
D	Laser Printer	SAMSUNG	ML-1630	4561B1CP600023X	FCC ID A3LML1630
E	I-POD Player	APPLE	A1204	4H722TDXVTE	By DoC
F	DVD Player	SONY	BDP-S370	3213939	N/A
G	Earphone	Cheng Jia	CJ-323	N/A	N/A

4.4. List of Used Cables under Test

Item	Type	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remark
1	DP Cable	1	1.5/1.8	Yes	0	Accessory of EUT
2	HDMI Cable	1	1.5/1.8	Yes	0	Accessory of EUT
3	D-Sub Cable	1	1.5/1.8	Yes	2	Accessory of EUT
4	Audio Cable	1	1.5/1.8	Yes	0	Accessory of EUT
5	USB Cable	3	1.8	Yes	0	Provided by LAB
6	USB Cable	1	1.0	Yes	0	Provided by LAB
7	Earphone Cable	1	1.1	No	0	Provided by LAB
8	AC Power Cord (3C)	1	1.5/1.8	No	0	Accessory of EUT
9	AC Power Cord	3	1.8	No	0	Provided by LAB for above sup- ported units

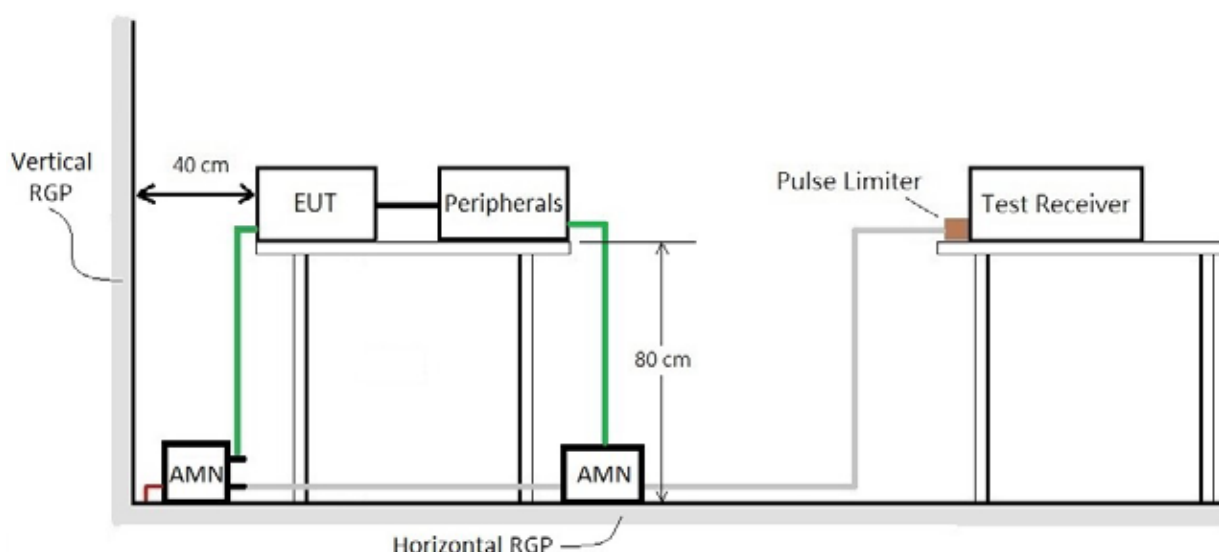
5. Measurement of Conducted Emissions

5.1. List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Test Receiver	R&S	ESR3	101774	2019. 01. 23	1 Year
2	A.M.N.	R&S	ENV4200	100169	2019. 11. 13	1 Year
3	L.I.S.N.	Kyoritsu	KNW-407	8-855-9	2018. 12. 19	1 Year
4	Pulse Limiter	R&S	ESH3-Z2	100354	2019. 01. 12	1 Year
5	Signal Cable	Yeida	RG/58AU	CE-08	2019. 09. 20	1 Year
6	Test Software	Audix	e3	V6.120619c	N.C.R.	N.C.R.
7	Digital Ther-mo-Hygro Meter	iMax	HTC-1	No.8 S/R	2019. 04. 20	1 Year

5.2. Test Setup

The EUT and test equipment were configured in accordance with the requirement of ANSI C63.4:2014 clause 5.2.



5.3. Power-line Conducted Emission Limits

- For FCC §15.107 and ICES-003 §6.1

Frequency Range (MHz)	Class A Limits		Class B Limits	
	Quasi Peak dB(μV)	Average dB(μV)	Quasi Peak dB(μV)	Average dB(μV)
0.15 – 0.50	79	66	66 – 56*	56 – 46*
0.50 – 5.0	73	60	56	46
5.0 – 30			60	50

Note: * Decreases with the logarithm of the frequency.

5.4. Measurement Procedure

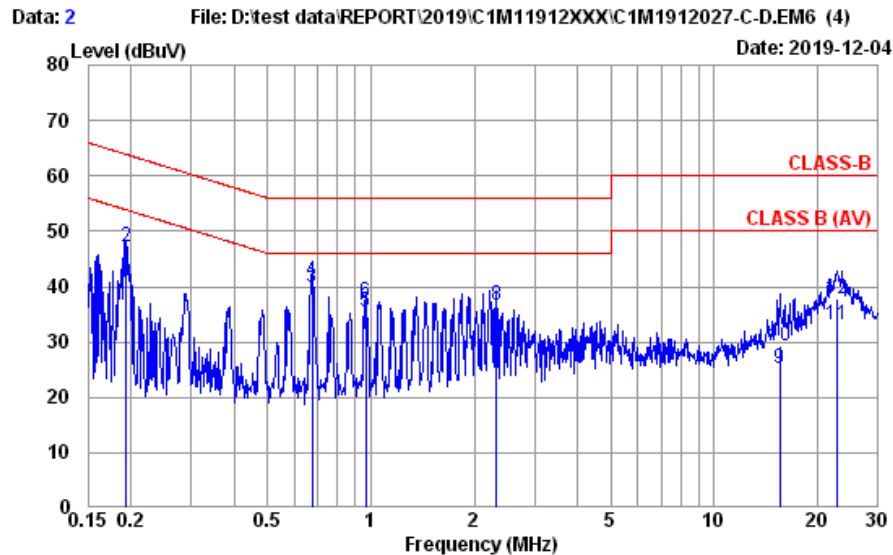
The power-line conducted emission measurement was performed in accordance with the procedure of ANSI C63.4:2014 clause 7.3.

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

5.5. Measurement Result

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

Test Phase	Neutral	Test Result	Pass
Test Mode	HDMI, 1280*1024/75Hz	Test Model	M179E9

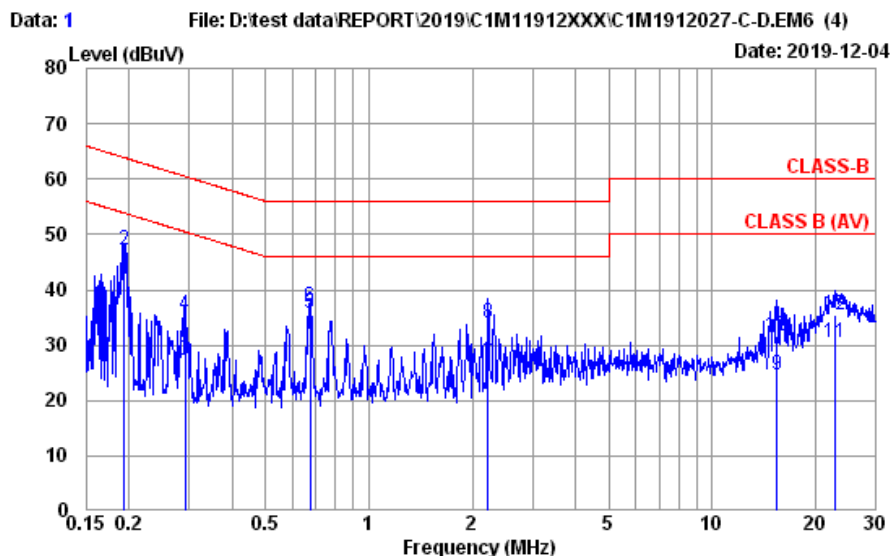


Site no. : No.8 Shielded Room Data no. : 2
Condition : ENV4200 100169 LISN Phase : NEUTRAL
Limit : CLASS-B
Env. / Ins. : 23°C / 47% ESR3 (1774) Engineer : Chucky Chiu
EUT : M179E9
Power Rating : 120Vac/60Hz
Test Mode : 1280*1024/75Hz HDMI
Line:1.8m

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.193	10.63	0.04	9.86	20.62	41.15	53.89	12.74	Average
2	0.193	10.63	0.04	9.86	26.75	47.28	63.89	16.61	QP
3	0.675	10.48	0.05	9.86	19.47	39.86	46.00	6.14	Average
4	0.675	10.48	0.05	9.86	20.66	41.05	56.00	14.95	QP
5	0.966	10.47	0.05	9.86	14.95	35.33	46.00	10.67	Average
6	0.966	10.47	0.05	9.86	16.81	37.19	56.00	18.81	QP
7	2.318	10.54	0.07	9.86	9.98	30.45	46.00	15.55	Average
8	2.318	10.54	0.07	9.86	16.23	36.70	56.00	19.30	QP
9	15.552	12.77	0.16	9.92	2.42	25.27	50.00	24.73	Average
10	15.552	12.77	0.16	9.92	6.56	29.41	60.00	30.59	QP
11	22.775	14.43	0.21	9.97	8.36	32.97	50.00	17.03	Average
12	22.775	14.43	0.21	9.97	13.30	37.91	60.00	22.09	QP

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

Test Phase	Line	Test Result	Pass
Test Mode	HDMI, 1280*1024/75Hz	Test Model	M179E9

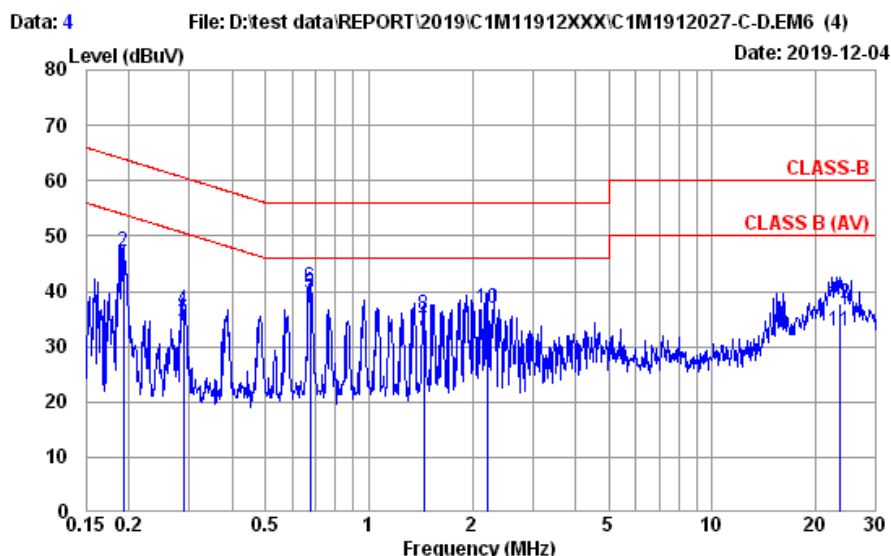


Site no. : No.8 Shielded Room Data no. : 1
Condition : ENV4200 100169 LISN Phase : LINE
Limit : CLASS-B
Env. / Ins. : 23°C / 47% ESR3 (1774) Engineer : Chucky Chiu
EUT : M179E9
Power Rating : 120Vac/60Hz
Test Mode : 1280*1024/75Hz HDMI
Line:1.8m

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.193	10.55	0.04	9.86	18.54	38.99	53.89	14.90	Average
2	0.193	10.55	0.04	9.86	26.62	47.07	63.89	16.82	QP
3	0.291	10.49	0.04	9.86	6.89	27.28	50.50	23.22	Average
4	0.291	10.49	0.04	9.86	15.01	35.40	60.50	25.10	QP
5	0.675	10.43	0.05	9.86	15.28	35.62	46.00	10.38	Average
6	0.675	10.43	0.05	9.86	16.56	36.90	56.00	19.10	QP
7	2.222	10.47	0.07	9.86	6.38	26.78	46.00	19.22	Average
8	2.222	10.47	0.07	9.86	13.73	34.13	56.00	21.87	QP
9	15.470	12.39	0.16	9.92	2.17	24.64	50.00	25.36	Average
10	15.470	12.39	0.16	9.92	9.20	31.67	60.00	28.33	QP
11	22.775	13.97	0.21	9.97	6.38	30.53	50.00	19.47	Average
12	22.775	13.97	0.21	9.97	11.20	35.35	60.00	24.65	QP

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

Test Phase	Neutral	Test Result	Pass
Test Mode	HDMI, 1080P	Test Model	M179E9

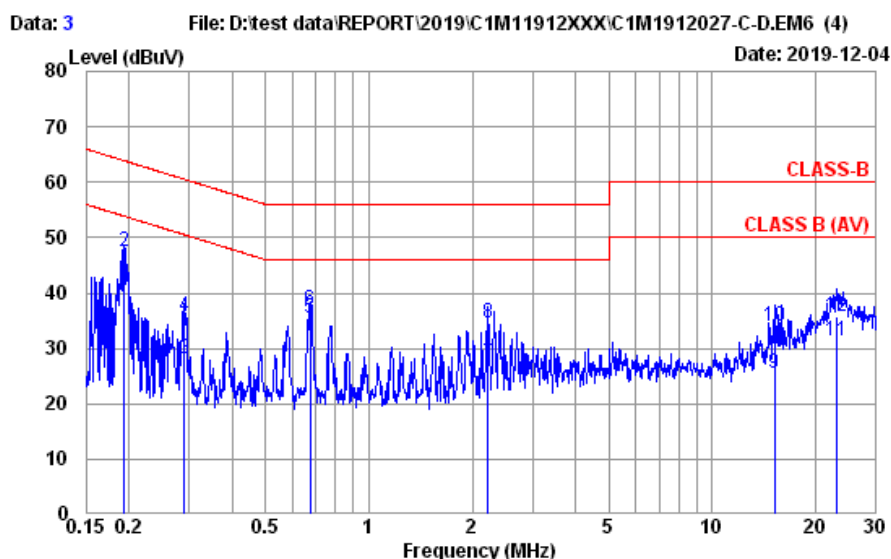


Site no. : No.8 Shielded Room Data no. : 4
Condition : ENV4200 100169 LISN Phase : NEUTRAL
Limit : CLASS-B
Env. / Ins. : 23°C / 47% ESR3 (1774) Engineer : Chucky Chiu
EUT : M179E9
Power Rating : 120Vac/60Hz
Test Mode : HDMI 1080P
Line:1.8m

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.192	10.63	0.04	9.86	20.62	41.15	53.93	12.78	Average
2	0.192	10.63	0.04	9.86	26.61	47.14	63.93	16.79	QP
3	0.288	10.55	0.04	9.86	13.79	34.24	50.59	16.35	Average
4	0.288	10.55	0.04	9.86	16.15	36.60	60.59	23.99	QP
5	0.674	10.48	0.05	9.86	19.04	39.43	46.00	6.57	Average
6	0.674	10.48	0.05	9.86	20.39	40.78	56.00	15.22	QP
7	1.449	10.49	0.06	9.86	12.42	32.83	46.00	13.17	Average
8	1.449	10.49	0.06	9.86	15.42	35.83	56.00	20.17	QP
9	2.213	10.53	0.07	9.86	9.21	29.67	46.00	16.33	Average
10	2.213	10.53	0.07	9.86	16.34	36.80	56.00	19.20	QP
11	23.511	14.64	0.21	9.97	8.12	32.94	50.00	17.06	Average
12	23.511	14.64	0.21	9.97	13.03	37.85	60.00	22.15	QP

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

Test Phase	Line	Test Result	Pass
Test Mode	HDMI, 1080P	Test Model	M179E9



Site no. : No.8 Shielded Room Data no. : 3
 Condition : ENV4200 100169 LISN Phase : LINE
 Limit : CLASS-B
 Env. / Ins. : 23°C / 47% ESR3 (1774) Engineer : Chucky Chiu
 EUT : M179E9
 Power Rating : 120Vac/60Hz
 Test Mode : HDMI 1080P
 Line: 1.8m

	AMN	Cable	Pulse		Emission				
Freq.	Factor	Loss	Att.	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB)	(dB)	(dB)	(dBμV)	(dBμV)	(dBμV)	(dB)		
1	0.193	10.55	0.04	9.86	18.77	39.22	53.89	14.67	Average
2	0.193	10.55	0.04	9.86	26.98	47.43	63.89	16.46	QP
3	0.289	10.49	0.04	9.86	7.74	28.13	50.54	22.41	Average
4	0.289	10.49	0.04	9.86	15.25	35.64	60.54	24.90	QP
5	0.675	10.43	0.05	9.86	15.14	35.48	46.00	10.52	Average
6	0.675	10.43	0.05	9.86	16.54	36.88	56.00	19.12	QP
7	2.224	10.47	0.07	9.86	6.80	27.20	46.00	18.80	Average
8	2.224	10.47	0.07	9.86	14.04	34.44	56.00	21.56	QP
9	15.226	12.34	0.16	9.92	2.97	25.39	50.00	24.61	Average
10	15.226	12.34	0.16	9.92	11.55	33.97	60.00	26.03	QP
11	23.140	14.07	0.21	9.97	7.10	31.35	50.00	18.65	Average
12	23.140	14.07	0.21	9.97	11.52	35.77	60.00	24.23	QP

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

6. Measurement of Radiated Emissions

6.1. List of Test Instruments

- For measurement of 30 to 1000MHz frequency range

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Spectrum Analyzer	Agilent	N9010A-503	MY52220119	2018. 12. 14	1 Year
2	Spectrum Analyzer	Agilent	N9010A-503	MY51250850	2019. 03. 08	1 Year
3	Test Receiver	R&S	ESCI7	100922	2019. 05. 27	1 Year
4	Amplifier	EMCI	EMC9135	980530	2019. 09. 17	1 Year
5	Amplifier	EMCI	EMC9135	980531	2019. 09. 17	1 Year
6	TRILOG Broad band antenna	Schwarzbeck	VULB 9168	711	2019. 07. 16	1 Year
7	TRILOG Broad band antenna	Schwarzbeck	VULB 9168	712	2019. 07. 16	1 Year
8	Signal Cable	HUBER + SUHNER	S07212BD	10m ACC3CL (10mA)	2019. 02. 01	1 Year
9	Signal Cable	HUBER + SUHNER	S07212BD	10m ACC3CL (10mB)	2019. 02. 01	1 Year
10	Digital Ther-mo-Hygro Meter	iMax	HTC-1	No.1 10m A/C	2019. 04. 20	1 Year
11	Test Software	Audix	e3	V6.120619c	N.C.R.	N.C.R.

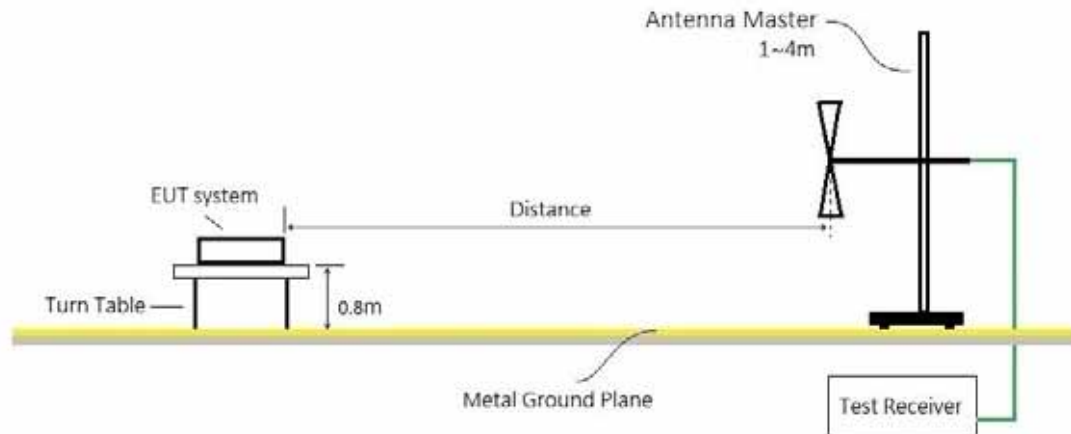
- For measurement of above 1GHz frequency range

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Spectrum Analyzer	Agilent	N9010A-526	MY51250943	2019. 02. 13	1 Year
2	Microwave Preamplifier	Agilent	8449B	3008A02681	2019. 03. 26	1 Year
3	Double-Ridged Waveguide Horn	ETS-Lindgren	3117	00114403	2019. 03. 25	1 Year
4	Signal Cable	HUBER + SUHNER	SUCOFLEX 104	10m ACCL 1-18G	2019. 04. 23	1 Year
5	Digital Ther-mo-Hygro Meter	iMax	HTC-1	No.1 10m A/C	2019. 04. 20	1 Year
6	Test Software	Audix	e3	V6.120619c	N.C.R.	N.C.R.

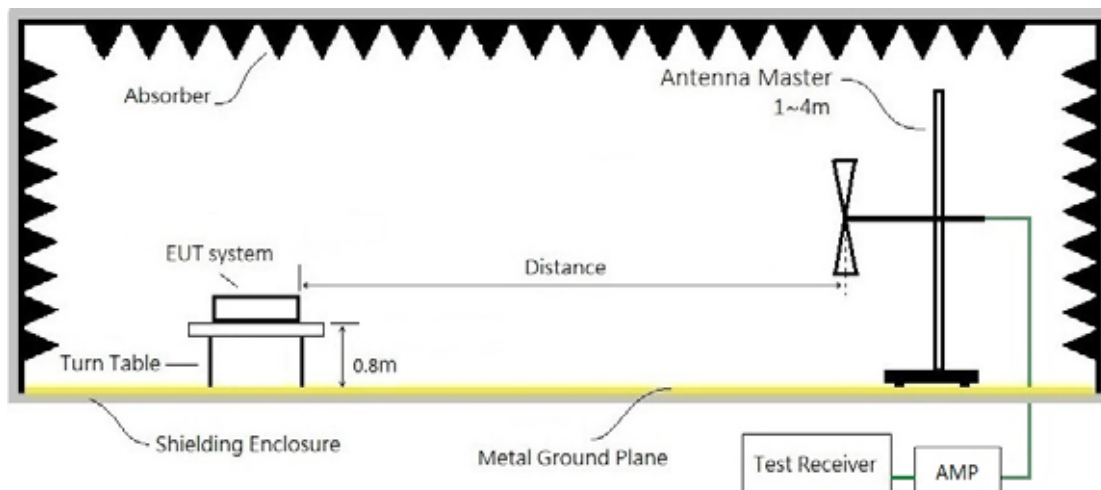
6.2. Test Setup

The EUT and test equipment were configured in accordance with the requirement of ANSI C63.4:2014 clause 5.4. and 5.5.

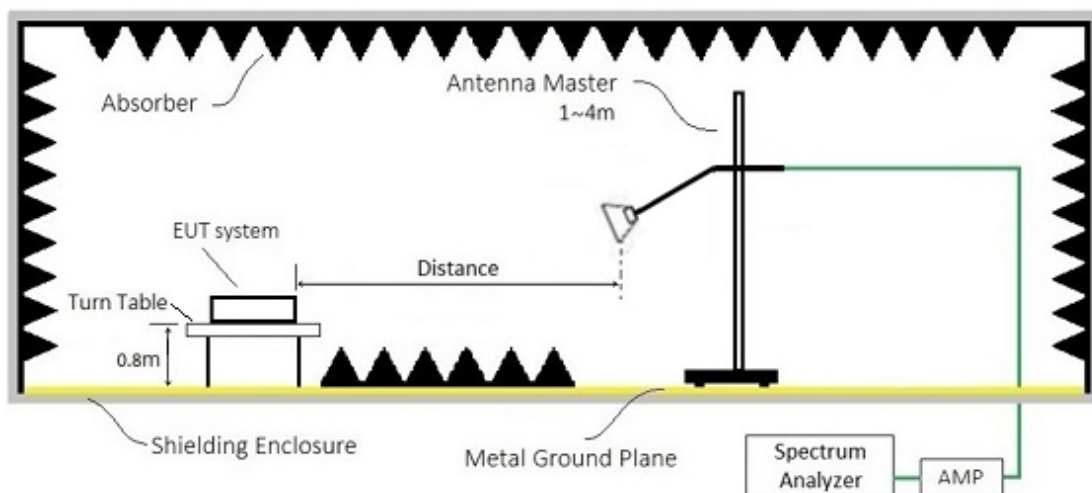
- For frequency range 30 to 1000MHz (at Open Area Test Site)



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



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



6.3. Radiation Emission Limits

- For Below 1GHz, FCC §15.109(a)(g)/CISPR 22 and ICES-003 §6.2

Frequency Range (MHz)	Distance (meter)	Class A Limits	Class B Limits
		Quasi-Peak [dB(μV/m)]	Quasi-Peak [dB(μV/m)]
30 – 230	10	40	30
230 – 1000		47	37
30 – 230	3	50	40
230 – 1000		57	47

- For Above 1GHz, FCC §15.109(a)(g)/CISPR 22 and ICES-003 §6.2

Frequency Range (MHz)	Distance (meter)	Class A Limits		Class B Limits	
		Peak [dB(μV/m)]	Average [dB(μV/m)]	Peak [dB(μV/m)]	Average [dB(μV/m)]
Above 1000	3	79.54	59.54	73.98	53.98

- The tighter limit applies at the edge between two frequency bands.
- Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the E.U.T.
- The limits from 30 to 1000MHz are referred to CISPR 22 standard, which are in accordance with the requirement of FCC Part 15.38 (b)(3), Part 15.109 (a)(g) and ICES-003 section 5(a)(i).
- The limits above 1GHz are referred to FCC Part 15.109(a)

- Required highest frequency for radiated measurement

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

6.4. Measurement Procedure

The radiated emission measurement was performed in accordance with the procedure of the ANSI C63.4:2014 clause 8.3.

- The EUT and peripherals were placed on the rotatable non-conduction table, which is 0.8meters above the ground reference plane at the semi-anechoic chamber or OATS as described in section 4.1 and 6.2.
- The measurement distance is set as specified in section 6.3. The specified distance is between the horizontal projection onto the ground plane of the closest periphery of the EUT and the projection onto the ground plane of the center of the axis of the elements of the receiving antenna.
- The resolution bandwidth of the test receiver was at 120kHz (testing from 30 to 1000MHz) or 1MHz (testing above 1000MHz).
- Operate the EUT system as described in section 4.2.
- For the exploratory measurement, determine the highest emission amplitude relative to the limit on each of antenna polarization with the peak detector by each of the EUT operations over the specified frequency range and record it.
- For final measurement, select the EUT operation mode that produced the highest amplitude in the exploratory measurement to determine the highest emissions with each specified detector and record it.
- In order to determine the maximum emission level, must rotate the table in 360 degree and move the receiving antenna between 1~4m height above the ground reference plane.
- In order to find the maximum emission, all of the interconnecting cables were manipulated, except for the bundled cable.
- Both polarizations of receiving antenna were determined.
- The measurement result was calculated by following formulas:

(30 – 1000MHz)

Emission Level = Reading (Receiver) + Cable Loss + Antenna Factor – Preamp Gain

(Above 1GHz)

Emission Level = Reading (Spectrum) + Cable Loss + Antenna Factor –
Preamp Gain

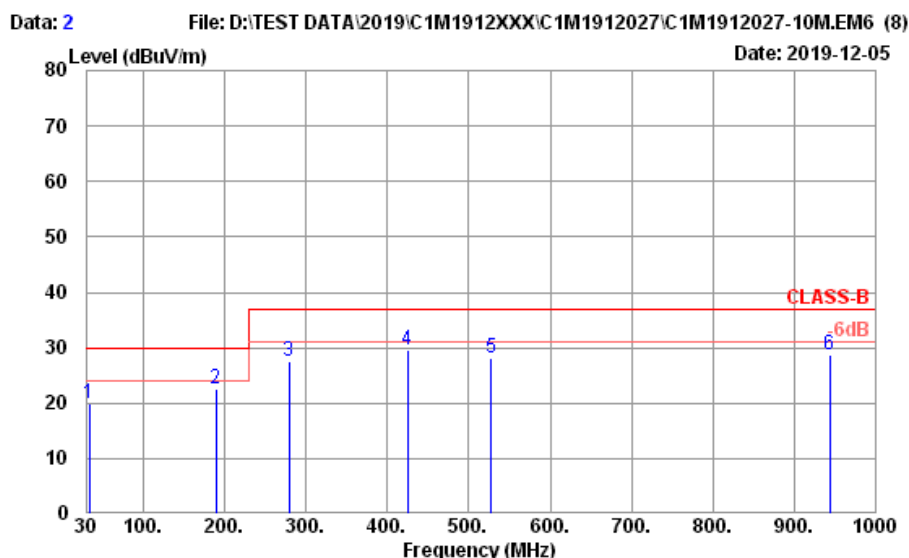
- The 3dB bandwidth of the horn antenna is minimum 52 degree (or $w=2.93m$ at 3m distance) for 1~6 GHz.

6.5. Measurement Result

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

- For frequency range 30 – 1000MHz

Ant. Polarity	Horizontal	Test Result	Pass
Test Mode	HDMI, 1280*1024/75Hz	Test Model	M179E9



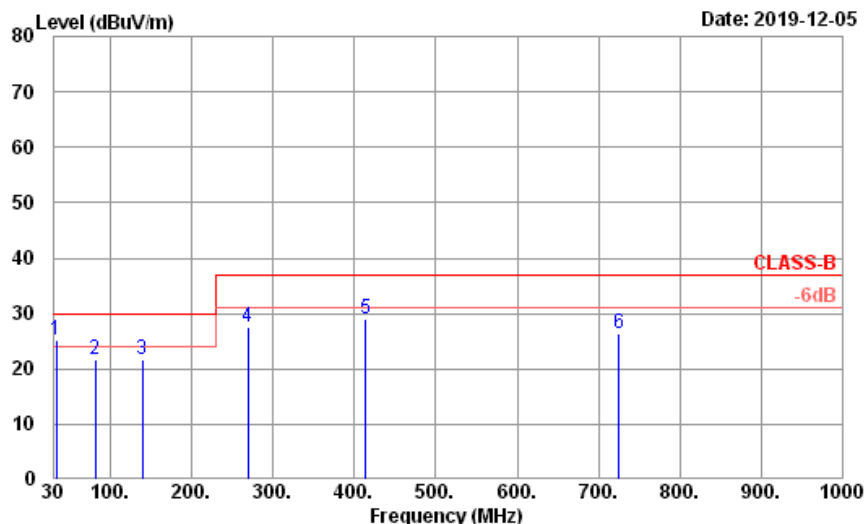
Site no. : No.1 10m Semi Anechoic Chamber Data no. : 2
 Dis. / Ant. : 10m VULB 9168 712 Ant. pol. : HORIZONTAL
 Limit : CLASS-B
 Env. / Ins. : 22°C / 51% ESCI 7(0922) Engineer : Ken Yang
 EUT : M179E9
 Power Rating : 120Vac/60Hz
 Test Mode : 1280*1024/75Hz HDMI
 Line:1.8m

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	34.20	18.97	1.58	37.34	36.84	20.05	30.00	9.95	QP
2	189.38	16.69	3.13	36.88	39.54	22.48	30.00	7.52	QP
3	279.33	18.56	3.70	36.94	42.21	27.53	37.00	9.47	QP
4	424.34	22.02	4.55	37.12	40.04	29.49	37.00	7.51	QP
5	527.61	23.94	5.07	37.18	36.33	28.16	37.00	8.84	QP
6	942.77	29.33	6.80	37.07	29.64	28.70	37.00	8.30	QP

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

Ant. Polarity	Vertical	Test Result	Pass
Test Mode	HDMI, 1280*1024/75Hz	Test Model	M179E9

Data: 1 File: D:\TEST DATA\2019\1M1912XXX\1M1912027\1M1912027-10M.EM6 (8)



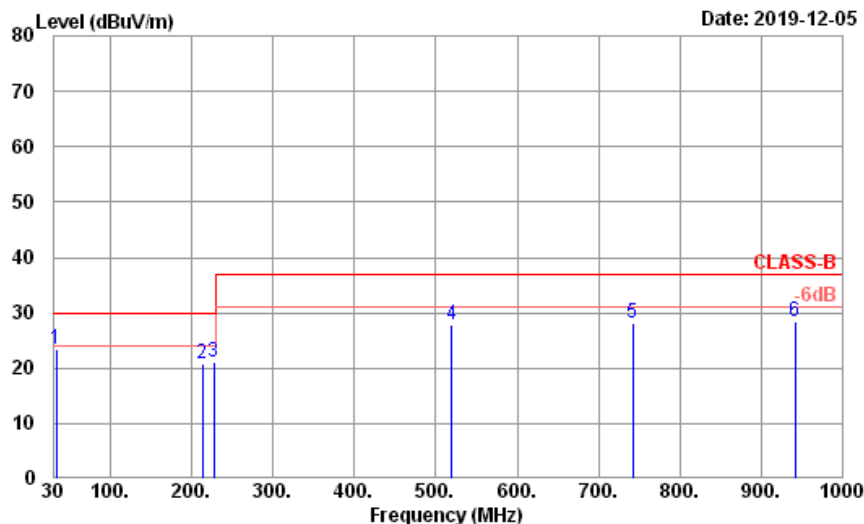
Site no. : No.1 10m Semi Anechoic Chamber Data no. : 1
Dis. / Ant. : 10m VULB 9168 711 Ant. pol. : VERTICAL
Limit : CLASS-B
Env. / Ins. : 22°C / 51% ESCI 7(0922) Engineer : Ken Yang
EUT : M179E9
Power Rating : 120Vac/60Hz
Test Mode : 1280*1024/75Hz HDMI
Line:1.8m

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	34.18	19.00	0.67	37.40	42.97	25.24	30.00	4.76	QP
2	82.14	14.76	1.11	37.09	42.78	21.56	30.00	8.44	QP
3	139.46	18.61	1.51	36.86	38.31	21.57	30.00	8.43	QP
4	269.59	18.32	2.21	36.78	49.84	27.59	37.00	9.41	QP
5	414.27	21.71	2.83	37.04	41.57	29.07	37.00	7.93	QP
6	725.29	27.09	3.89	37.28	32.67	26.37	37.00	10.63	QP

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

Ant. Polarity	Horizontal	Test Result	Pass
Test Mode	HDMI, 1080P	Test Model	M179E9

Data: 4 File: D:\TEST DATA\2019\C1M1912XXX\C1M1912027\C1M1912027-10M.EM6 (8)



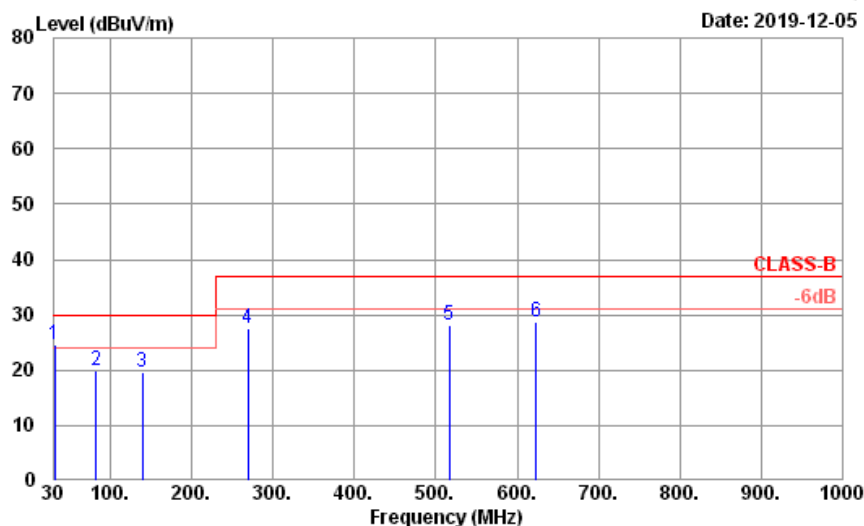
Site no. : No.1 10m Semi Anechoic Chamber Data no. : 4
 Dis. / Ant. : 10m VULB 9188 712 Ant. pol. : HORIZONTAL
 Limit : CLASS-B
 Env. / Ins. : 22°C / 51% ESCI 7(0922) Engineer : Ken Yang
 EUT : M179E9
 Power Rating : 120Vac/60Hz
 Test Mode : HDMI 1080p
 Line:1.8m

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	34.52	19.05	1.58	37.34	40.03	23.32	30.00	6.68	QP
2	213.63	16.25	3.29	36.87	38.25	20.92	30.00	9.08	QP
3	227.46	16.80	3.38	36.89	37.89	21.18	30.00	8.82	QP
4	519.32	23.74	5.03	37.18	36.37	27.96	37.00	9.04	QP
5	741.98	27.52	6.00	37.33	32.08	28.27	37.00	8.73	QP
6	940.83	29.33	6.79	37.11	29.53	28.54	37.00	8.46	QP

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

Ant. Polarity	Vertical	Test Result	Pass
Test Mode	HDMI, 1080P	Test Model	M179E9

Data: 3 File: D:\TEST DATA\2019\1M1912XXX\1M1912027\1M1912027-10M.EM6 (8)



Site no. : No.1 10m Semi Anechoic Chamber Data no. : 3
Dis. / Ant. : 10m VULB 9168 711 Ant. pol. : VERTICAL
Limit : CLASS-B
Env. / Ins. : 22°C / 51% ESCI 7(0922) Engineer : Ken Yang
EUT : M179E9
Power Rating : 120Vac/60Hz
Test Mode : HDMI 1080p
Line:1.8m

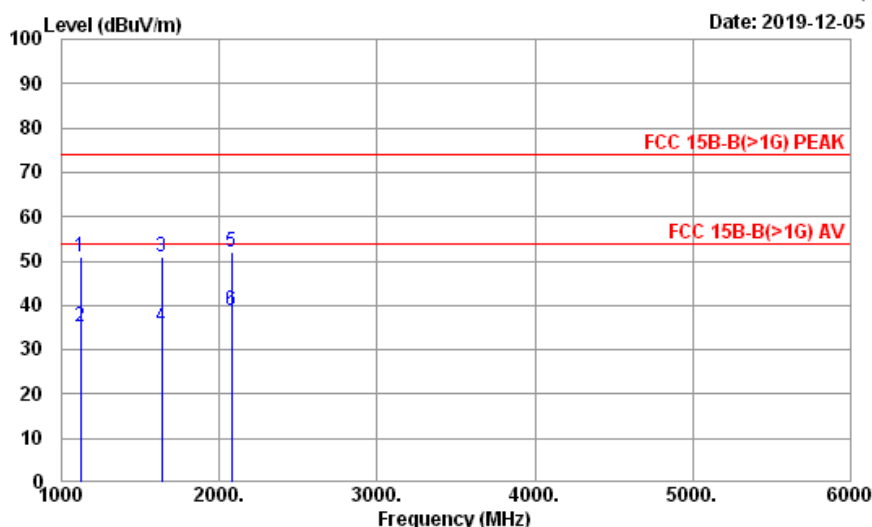
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	32.38	18.62	0.65	37.41	42.70	24.56	30.00	5.44	QP
2	82.38	14.72	1.11	37.09	41.31	20.05	30.00	9.95	QP
3	139.61	18.65	1.51	36.86	36.22	19.52	30.00	10.48	QP
4	269.59	18.32	2.21	36.78	43.93	27.68	37.00	9.32	QP
5	516.58	23.57	3.20	37.20	38.57	28.14	37.00	8.86	QP
6	623.64	25.60	3.57	37.26	36.92	28.83	37.00	8.17	QP

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

- For frequency range above 1 GHz

Ant. Polarity	Horizontal	Test Result	Pass
Test Mode	HDMI, 1280*1024/75Hz	Test Model	M179E9

Data: 6 File: D:\TEST DATA\2019\1M1912XXX\1M1912027\1M1912027-10M.EM6 (8)



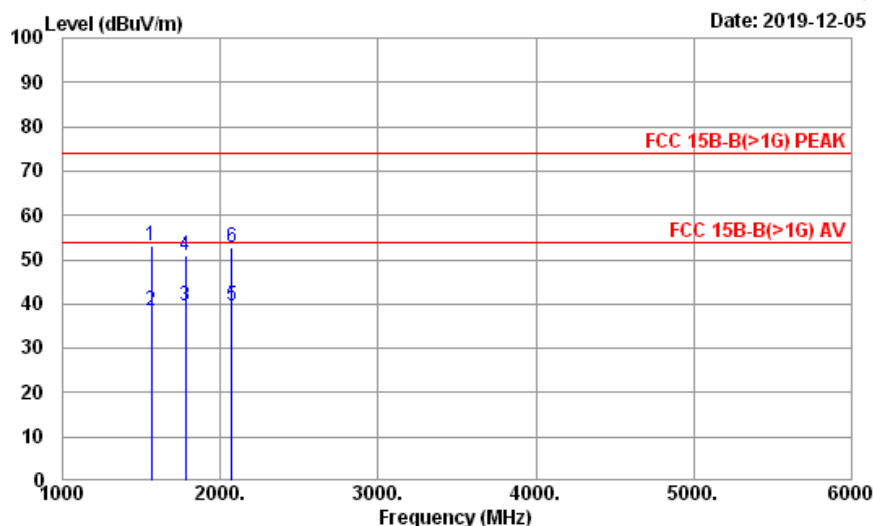
Site no. : No.1 10m Semi Anechoic Chamber Data no. : 6
 Dis. / Ant. : 3m 3117 14403 Ant. pol. : HORIZONTAL
 Limit : FCC 15B-B(>1G) PEAK
 Env. / Ins. : 22°C / 51% N9010A(0943) Engineer : Ken Yang
 EUT : M179E9
 Power Rating : 120Vac/60Hz
 Test Mode : 1280*1024/75Hz HDMI
 Line:1.8m

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	1124.32	27.60	2.06	35.14	56.58	51.10	73.98	22.88	Peak
2	1124.82	27.60	2.06	35.14	40.54	35.06	53.98	18.92	Average
3	1635.84	28.40	2.42	34.39	54.67	51.10	73.98	22.88	Peak
4	1635.92	28.40	2.42	34.39	38.90	35.33	53.98	18.65	Average
5	2078.47	31.77	2.71	34.20	51.82	52.10	73.98	21.88	Peak
6	2078.96	31.77	2.71	34.20	38.71	38.99	53.98	14.99	Average

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

Ant. Polarity	Vertical	Test Result	Pass
Test Mode	HDMI, 1280*1024/75Hz	Test Model	M179E9

Data: 5 File: D:\TEST DATA\2019\1M1912XXX\1M1912027\1M1912027-10M.EM6 (8)



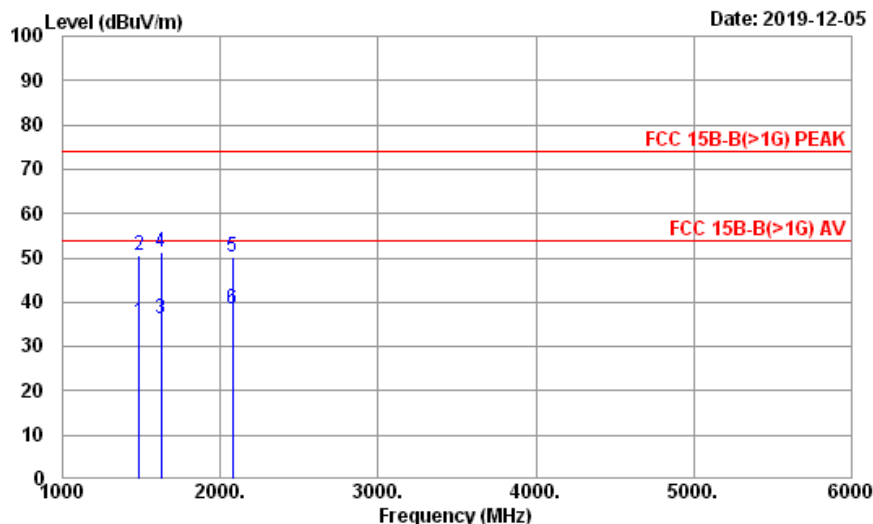
Site no. : No.1 10m Semi Anechoic Chamber Data no. : 5
 Dis. / Ant. : 3m 3117 14403 Ant. pol. : VERTICAL
 Limit : FCC 15B-B(>1G) PEAK
 Env. / Ins. : 22°C / 51% N9010A(0943) Engineer : Ken Yang
 EUT : M179E9
 Power Rating : 120Vac/60Hz
 Test Mode : 1280*1024/75Hz HDMI
 Line:1.8m

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	1564.32	28.19	2.37	34.43	57.03	53.16	73.98	20.82	Peak
2	1564.52	28.18	2.37	34.43	42.37	38.49	53.98	15.49	Average
3	1782.48	30.49	2.52	34.31	41.01	39.71	53.98	14.27	Average
4	1782.62	30.50	2.52	34.31	52.31	51.02	73.98	22.96	Peak
5	2075.50	31.75	2.70	34.20	39.29	39.54	53.98	14.44	Average
6	2075.62	31.75	2.70	34.20	52.63	52.88	73.98	21.10	Peak

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

Ant. Polarity	Horizontal	Test Result	Pass
Test Mode	HDMI, 1080P	Test Model	M179E9

Data: 8 File: D:\TEST DATA\2019\1M1912XXX\1M1912027\1M1912027-10M.EM6 (8)



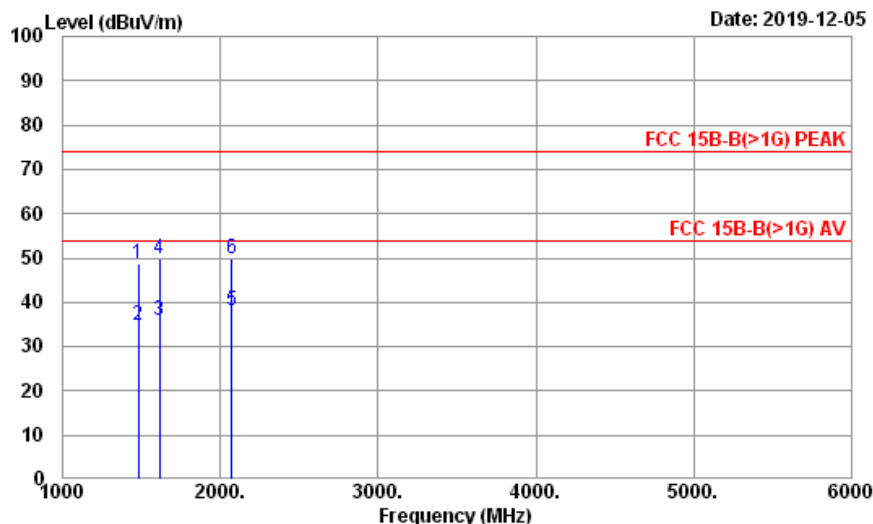
Site no. : No.1 10m Semi Anechoic Chamber Data no. : 8
 Dis. / Ant. : 3m 3117 14403 Ant. pol. : HORIZONTAL
 Limit : FCC 15B-B(>1G) PEAK
 Env. / Ins. : 22°C / 51% N9010A(0943) Engineer : Ken Yang
 EUT : M179E9
 Power Rating : 120Vac/60Hz
 Test Mode : HDMI 1080p
 Line:1.8m

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	1486.34	27.85	2.33	34.48	39.66	35.36	53.98	18.62	Average
2	1486.85	27.84	2.33	34.48	54.79	50.48	73.98	23.50	Peak
3	1627.48	28.28	2.41	34.39	40.02	36.32	53.98	17.66	Average
4	1627.97	28.29	2.41	34.39	54.83	51.14	73.98	22.84	Peak
5	2079.15	31.77	2.71	34.20	50.05	50.33	73.98	23.65	Peak
6	2079.29	31.78	2.71	34.20	38.28	38.57	53.98	15.41	Average

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

Ant. Polarity	Vertical	Test Result	Pass
Test Mode	HDMI, 1080P	Test Model	M179E9

Data: 7 File: D:\TEST DATA\2019\1M1912XXX\1M1912027\1M1912027-10M.EM6 (8)



Site no. : No.1 10m Semi Anechoic Chamber Data no. : 7
 Dis. / Ant. : 3m 3117 14403 Ant. pol. : VERTICAL
 Limit : FCC 15B-B(>1G) PEAK
 Env. / Ins. : 22°C / 51% N9010A(0943) Engineer : Ken Yang
 EUT : M179E9
 Power Rating : 120Vac/60Hz
 Test Mode : HDMI 1080p
 Line:1.8m

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	1485.63	27.86	2.33	34.49	53.18	48.88	73.98	25.10	Peak
2	1485.74	27.86	2.33	34.49	39.00	34.70	53.98	19.28	Average
3	1615.25	28.11	2.40	34.40	39.94	36.05	53.98	17.93	Average
4	1615.33	28.11	2.40	34.40	53.83	49.94	73.98	24.04	Peak
5	2074.05	31.74	2.70	34.20	37.70	37.94	53.98	16.04	Average
6	2074.17	31.75	2.70	34.20	49.66	49.91	73.98	24.07	Peak

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

7. Measurement Uncertainty List

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

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

Test Items/Facilities	Frequency/Equipment/Unit	Uncertainty
Conducted emissions at AC mains power port	9kHz-150kHz	±3.7dB
	150kHz-30MHz	±3.5dB
Conducted emissions at wired network port	150kHz-30MHz	±3.5dB
Conducted emissions at broadcast receiver tuner port	150kHz-30MHz	±3.5dB
Conducted emissions Power Clamp (No. 7 Shielded Room)	30MHz-300MHz	±4.4dB
Conducted emissions Power Clamp (No. 8 Shielded Room)	30MHz-300MHz	±4.4dB
Radiated, magnetic field (Triple-Loop Antenna)	9kHz-30MHz	±0.5dB
Radiated, magnetic field (Loop Antenna)	9kHz-150kHz	±3.1dB
	150kHz-30MHz	±3.0dB
Radiated emissions (No.1 10m Semi Anechoic Chamber)	30MHz-200MHz, 3m, Horizontal	±4.3dB
	200MHz-1000MHz, 3m, Horizontal	±4.1dB
	30MHz-200MHz, 3m, Vertical	±4.3dB
	200MHz-1000MHz, 3m, Vertical	±4.2dB
	30MHz-200MHz, 10m, Horizontal	±4.3dB
	200MHz-1000MHz, 10m, Horizontal	±3.9dB
	30MHz-200MHz, 10m, Vertical	±4.3dB
	200MHz-1000MHz, 10m, Vertical	±3.9dB
	1GHz-6GHz, 3m	±4.1dB
	6GHz-18GHz, 3m	±4.4dB
Radiated emissions (No.2 10m Semi Anechoic Chamber)	30MHz-200MHz, 3m, Horizontal	±4.3dB
	200MHz-1000MHz, 3m, Horizontal	±4.2dB
	30MHz-200MHz, 3m, Vertical	±4.1dB
	200MHz-1000MHz, 3m, Vertical	±4.4dB
	30MHz-200MHz, 10m, Horizontal	±4.3dB
	200MHz-1000MHz, 10m, Horizontal	±4.0dB
	30MHz-200MHz, 10m, Vertical	±4.1dB
	200MHz-1000MHz, 10m, Vertical	±4.1dB
	1GHz-6GHz, 3m	±4.2dB
	6GHz-18GHz, 3m	±4.4dB

Test Items/Facilities	Frequency/Equipment/Unit	Uncertainty
Radiated emissions (No.1 3m Semi Anechoic Chamber)	30MHz-200MHz, 3m, Horizontal	±4.1dB
	200MHz-1000MHz, 3m, Horizontal	±3.9dB
	30MHz-200MHz, 3m, Vertical	±4.2dB
	200MHz-1000MHz, 3m, Vertical	±4.1dB
	1GHz-6GHz, 3m	±4.2dB
	6GHz-18GHz, 3m	±4.6dB
Radiated emissions (No.2 3m Semi Anechoic Chamber)	30MHz-200MHz, 3m, Horizontal	±3.7dB
	200MHz-1000MHz, 3m, Horizontal	±4.0dB
	30MHz-200MHz, 3m, Vertical	±4.2dB
	200MHz-1000MHz, 3m, Vertical	±4.5dB
	1GHz-6GHz, 3m	±4.3dB
	6GHz-18GHz, 3m	±4.7dB
Radiated emissions (No.3 3m Semi Anechoic Chamber)	30MHz-200MHz, 3m, Horizontal	±3.9dB
	200MHz-1000MHz, 3m, Horizontal	±3.9dB
	30MHz-200MHz, 3m, Vertical	±4.4dB
	200MHz-1000MHz, 3m, Vertical	±4.1dB
Radiated emissions (No.4 3m Semi Anechoic Chamber)	30MHz-200MHz, 3m, Horizontal	±4.3dB
	200MHz-1000MHz, 3m, Horizontal	±4.0dB
	30MHz-200MHz, 3m, Vertical	±4.3dB
	200MHz-1000MHz, 3m, Vertical	±4.4dB
	1GHz-6GHz, 3m	±4.5dB
	6GHz-18GHz, 3m	±4.6dB
Radiated emissions (No.5 3m Semi Anechoic Chamber)	30MHz-200MHz, 3m, Horizontal	±4.0dB
	200MHz-1000MHz, 3m, Horizontal	±3.9dB
	30MHz-200MHz, 3m, Vertical	±4.2dB
	200MHz-1000MHz, 3m, Vertical	±4.3dB
	1GHz-6GHz, 3m	±4.3dB
	6GHz-18GHz, 3m	±4.7dB

Test Items/Facilities	Frequency/Equipment/Unit	Uncertainty
Radiated emissions (No.3 Open Area Test Site)	30MHz-200MHz, 3m, Horizontal	±4.4dB
	200MHz-1000MHz, 3m, Horizontal	±4.2dB
	30MHz-200MHz, 3m, Vertical	±4.2dB
	200MHz-1000MHz, 3m, Vertical	±4.4dB
	30MHz-200MHz, 10m, Horizontal	±4.4dB
	200MHz-1000MHz, 10m, Horizontal	±4.0dB
	30MHz-200MHz, 10m, Vertical	±4.2dB
	200MHz-1000MHz, 10m, Vertical	±4.2dB
Radiated emissions (No.5 Open Area Test Site)	30MHz-200MHz, 3m, Horizontal	±4.3dB
	200MHz-1000MHz, 3m, Horizontal	±4.4dB
	30MHz-200MHz, 3m, Vertical	±4.4dB
	200MHz-1000MHz, 3m, Vertical	±4.9dB
	30MHz-200MHz, 10m, Horizontal	±4.3dB
	200MHz-1000MHz, 10m, Horizontal	±4.2dB
	30MHz-200MHz, 10m, Vertical	±4.4dB
	200MHz-1000MHz, 10m, Vertical	±4.7dB
Radiated emissions (No.6 Open Area Test Site)	30MHz-200MHz, 3m, Horizontal	±3.6dB
	200MHz-1000MHz, 3m, Horizontal	±4.4dB
	30MHz-200MHz, 3m, Vertical	±4.0dB
	200MHz-1000MHz, 3m, Vertical	±4.2dB
	30MHz-200MHz, 10m, Horizontal	±3.6dB
	200MHz-1000MHz, 10m, Horizontal	±4.2dB
	30MHz-200MHz, 10m, Vertical	±4.0dB
	200MHz-1000MHz, 10m, Vertical	±4.0dB
Radiated emissions (No.7 Open Area Test Site)	30MHz-200MHz, 3m, Horizontal	±3.6dB
	200MHz-1000MHz, 3m, Horizontal	±4.5dB
	30MHz-200MHz, 3m, Vertical	±4.3dB
	200MHz-1000MHz, 3m, Vertical	±4.7dB
	30MHz-200MHz, 10m, Horizontal	±3.6dB
	200MHz-1000MHz, 10m, Horizontal	±4.3dB
	30MHz-200MHz, 10m, Vertical	±4.3dB
	200MHz-1000MHz, 10m, Vertical	±4.5dB
Radiated emissions (No.8 Open Area Test Site)	30MHz-200MHz, 3m, Horizontal	±3.8dB
	200MHz-1000MHz, 3m, Horizontal	±4.2dB
	30MHz-200MHz, 3m, Vertical	±4.5dB
	200MHz-1000MHz, 3m, Vertical	±4.3dB
	30MHz-200MHz, 10m, Horizontal	±3.7dB
	200MHz-1000MHz, 10m, Horizontal	±4.0dB
	30MHz-200MHz, 10m, Vertical	±4.5dB
	200MHz-1000MHz, 10m, Vertical	±4.1dB

8. Photographs

8.1. Powerline Conducted Emission Measurement

【"H" Pattern】



Front View of Conducted Measurement



Back View of Conducted Measurement

【“Color Bar” Image】

Front View of Conducted Measurement



Back View of Conducted Measurement

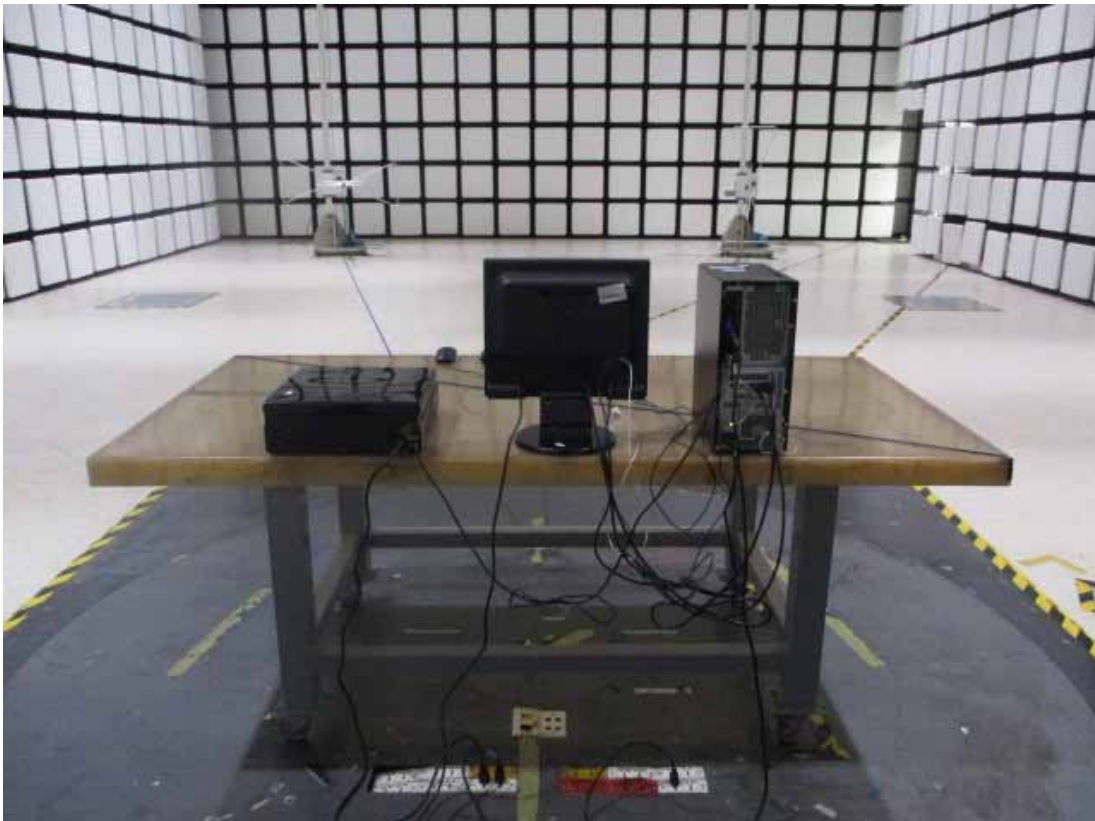
8.2. Radiated Emissions Measurement

- For Frequency Range 30 – 1000MHz

【"H" Pattern】



Front View of Radiated Measurement



Back View of Radiated Measurement

【“Color Bar” Image】

Front View of Radiated Measurement



Back View of Radiated Measurement

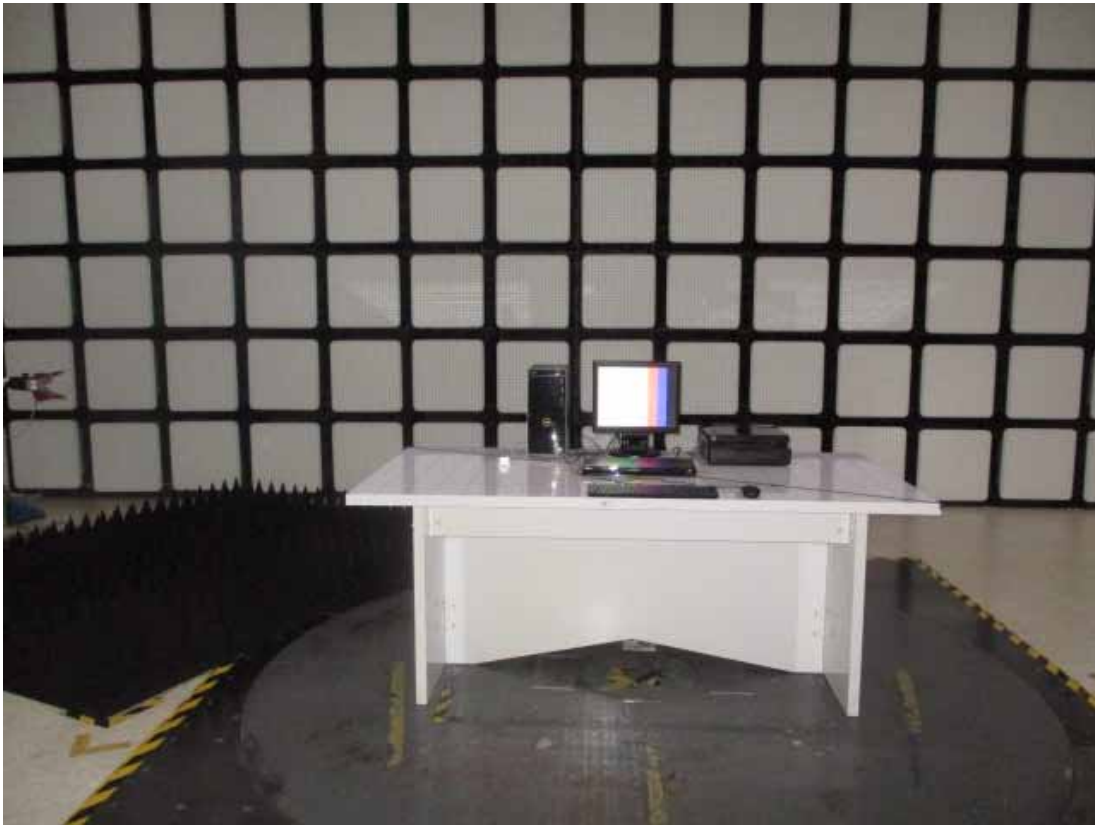
- For Frequency Range Above 1GHz
【"H" Pattern】



Front View of Radiated Measurement



Back View of Radiated Measurement

【“Color Bar” Image】

Front View of Radiated Measurement



Back View of Radiated Measurement