SPORTON LAB.

Project No : FD982050-01

VERIFICATION OF COMPLIANCE

Equipment : **USB 3.0 Mini Dock HDMI & VGA Dual Display / Gigabit Ethernet / USB HUB**

Model No. : **JUD380, JUD323B, JUD323S, JCD380**

Applicant : **KAIJET TECHNOLOGY INTERNATIONAL CORPORATION**
8F., No.109, Zhongcheng Rd., Tucheng Dist.,
New Taipei City 236, Taiwan, R.O.C.

SPORTON LAB

I HEREBY DECLARE THAT :

The equipment is in accordance with the procedures are given in **ANSI C63.4-2014** and the energy emitted by this equipment was **Passed by CISPR PUB. 22, FCC Part 15 Subpart B, Canada Standard ICES-003 Issue 6**. Radiated and conducted emissions are compliance in **Class B** limits.
The test was carried out on **Sep. 03, 2019** at **SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory**.

William Li

Testing Laboratory
1190

FCC EMI TEST REPORT

Filing Type	:	**Supplier's Declaration of Conformity**
Equipment	:	**USB 3.0 Mini Dock HDMI & VGA Dual Display / Gigabit Ethernet / USB HUB**
Brand Name	:	**J5create**
Model Name	:	**JUD380, JUD323B, JUD323S, JCD380**
Applicant	:	**KAIJET TECHNOLOGY INTERNATIONAL CORPORATION 8F., No.109, Zhongcheng Rd., Tucheng Dist., New Taipei City 236, Taiwan, R.O.C.**
Manufacturer	:	**Magic Control Technology Corporation 10F., No.123, Zhongcheng Rd., Tucheng Dist., New Taipei City 236, Taiwan R.O.C.**
Standard	:	**47 CFR FCC Rules and Regulations Part 15 Subpart B, Class B Digital Device ICES-003 Issue 6, Class B**

The product was received on Aug. 27, 2019, and testing was started from Aug. 29, 2019 and completed on Sep. 03, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2014 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: William Li

SDoC by:

Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FD982050-01	01	Initial issue of report	Oct. 07, 2019

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
4	15.107	Conducted Emissions of Powerline	PASS	Under limit 8.82 dB at 0.69 MHz
5.1	15.109	Radiated Emissions below 1GHz	PASS	Under limit 3.61 dB at 33.630 MHz
5.2	15.109	Radiated Emissions above 1GHz	PASS	Under limit 7.74 dB at 2.936 GHz
Note : From Sporton Project No.:FD982050				

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
None

Reviewed by: Mark Ma

Report Producer: Michelle Tsai

1. General Description of Equipment under Test

1.1. Basic Description of Equipment under Test

Equipment : USB 3.0 Mini Dock HDMI & VGA Dual Display / Gigabit Ethernet / USB HUB
Model No. : JUD380, JUD323B, JUD323S, JCD380
Power Supply Type : From Host System
The maximum operating frequency : 500 MHz

1.2. Feature of Equipment under Test

For more detailed features description, please refer to the specifications or user's manual.

1.3. Modification of EUT

No modifications to the EUT were made.

1.4. Table for Multiple Listing

Model Name	Interface	Description
JUD380	USB Type-A Interface	The difference of models is in sales marketing.
JUD323B		
JUD323S		
JCD380	USB Type-C Interface	-

Note: The information from manufacturer.

2. Test Configuration of Equipment under Test

2.1. Details of EUT Test Modes

From the above models, Model: JUD380, JCD380 was selected as representative model for the test and its data was recorded in this report. The equipment under test were performed the following test modes:

Test Items	Description of test modes
Conducted Emission	Mode 1. JCD380 HDMI+D-SUB:2048*1152 60Hz,LAN:1Gbps Mode 2. JUD380 HDMI+D-SUB:2048*1152 60Hz,LAN:1Gbps Mode 3. JCD380 HDMI+D-SUB:1920*1080 60Hz,LAN:1Gbps cause “mode 1” generated the worst test result; it was reported as final data.
Radiated Emissions <below 1GHz>	Mode 1. JCD380 HDMI+D-SUB:2048*1152 60Hz,LAN:1Gbps Mode 2. JUD380 HDMI+D-SUB:2048*1152 60Hz,LAN:1Gbps Mode 3. JCD380 HDMI+D-SUB:1920*1080 60Hz,LAN:1Gbps cause “mode 1” generated the worst test result; it was reported as final data.
Radiated Emissions <above 1GHz>	Mode 1. JCD380 HDMI+D-SUB:2048*1152 60Hz,LAN:1Gbps Mode 2. JUD380 HDMI+D-SUB:2048*1152 60Hz,LAN:1Gbps Mode 3. JCD380 HDMI+D-SUB:1920*1080 60Hz,LAN:1Gbps cause “mode 1” generated the worst test result; it was reported as final data.

2.2. Description of Test System

Conducted emission and radiated emission below 1GHz

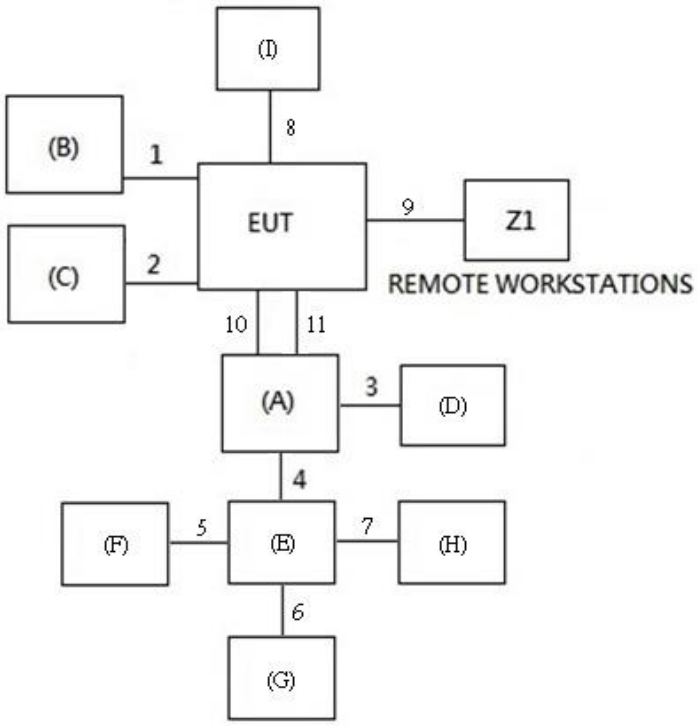
No.	Peripheral	Manufacturer	Model Number	FCC ID	Remarks
For Local					
A	Notebook	Dell	P54G	DoC	-
B	LCD Monitor	Dell	U2173HMt	DoC	-
C	LCD Monitor	ASUS	PB27U	DoC	-
D	Notebook Adapter	Dell	LA45NM131	N/A	-
E	USB HUB	Generic	UH-314BP	N/A	-
F	iPod Nano	Apple	A1137	DoC	-
G	Printer	Fuji Xerox	Phaser 3121	DoC	-
H	Mouse	ASUS	MOBTUO	DoC	-
I	HDD*2	WD	WDBACW0010HBK-SESN	DoC	-
For Remote					
Z	Notebook	DELL	E5520	DoC	-

Radiated emission above 1GHz

No.	Peripheral	Manufacturer	Model Number	FCC ID	Remarks
For Local					
A	Notebook	Dell	P54G	DoC	-
B	LCD Monitor	Dell	U2173HMt	DoC	-
C	LCD Monitor	ASUS	PB287	DoC	-
D	Notebook Adapter	Dell	LA45NM131	N/A	-
E	USB HUB	DigiFusion	U3H04C	N/A	-
F	iPod Nano	Apple	A1137	DoC	-
G	Printer	EPSON	C61	N/A	-
H	Mouse	Microsoft	1113	DoC	-
I	HDD*2	WD	WDBF JK0020HBK-SESN	DoC	-
For Remote					
Z	Notebook	DELL	E5520	DoC	-

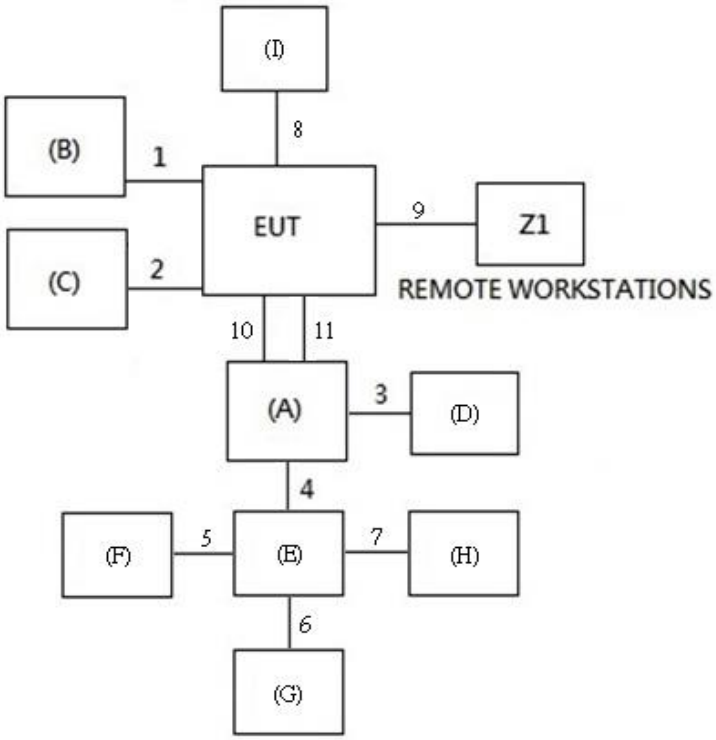
2.3. Connection Diagram of Test System

Test Setup Diagram - Conducted emission and radiated emission below 1GHz



No.	Types of Cables	Shielding on Cable	Length (m)	Remarks
1	D-SUB Cable	D-Shielded	1.8	-
2	HDMI Cable	D-Shielded	1.8	-
3	DC Cable	B-Shielded	2.0	-
4	USB Cable	D-Shielded	1.0	-
5	USB Cable	D-Shielded	1.0	-
6	USB Cable	D-Shielded	1.8	-
7	USB Cable	AL-F-Shielded	1.8	-
8	USB Cables *2	D-Shielded	1.0	-
9	RJ45 Cable	Non-Shielded	20.0	Remote
10	TYPE C Cable	D-Shielded	0.2	EUT
11	Micro USB Cable	Non-Shielded	1.0	-

Test Setup Diagram - Radiated emission above 1GHz



No.	Types of Cables	Shielding on Cable	Length (m)	Remarks
1	D-SUB Cable	D-Shielded	1.5	-
2	HDMI Cable	D-Shielded	1.8	-
3	DC Cable	B-Shielded	2.0	-
4	USB Cable	D-Shielded	0.3	-
5	USB Cable	D-Shielded	1.0	-
6	USB Cable	D-Shielded	1.8	-
7	USB Cable	AL-F-Shielded	1.8	-
8	USB Cables*2	D-Shielded	1.2	-
9	RJ45 Cable	Non-Shielded	20.0	Remote
10	Type C Cable	D-Shielded	0.2	EUT
11	Micro USB Cable	D-Shielded	1.5	-

2.4. Test Manner

During the test, the program under Win 10(local) & Win 7(remote) was executed:

- Turn on the power of all equipment.
- The Notebook executed "BurnInTest.exe" to sends "H" pattern to the monitor, and the monitor displays "H" patterns on the screen via EUT.
- The Notebook opened "Word" to send "H" messages to the printer, and then the printer prints them on the paper.
- The Notebook executed "WINTHRAX" to send signal messages to the HDD and reads and writes the message via EUT.
- The Notebook executed "WINTHRAX" to send signal messages to the iPod Nano and reads and writes the message via USB HUB.
- The Notebook executed "Media player.exe" to play audio by Monitor speaker via EUT.
- The Notebook executed "ping.exe" to link with the remote Notebook to maintain the connection via EUT.

3. General Information of Test

3.1. Test Facilities

Test Site：SPORTON INTERNATIONAL INC.		
☒	HUA YA	ADD: No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: 886-3-327-3456 FAX: 886-3-318-0055 FCC Designation Number: TW1093
☒	DONG HU	ADD: No. 3, Ln. 238, Kangle St., Neihu Dist., Taipei City, Taiwan (R.O.C.) TEL: 886-2-2631-5551 FAX: 886-2-2631-9740 FCC Designation Number: TW1094
☐	LIN KOU	ADD: No. 30-2, Dingfu Vil., Linkou Dist., New Taipei City, Taiwan (R.O.C.) TEL: 886-2-2601-1640 FAX: 886-2-2601-1695 FCC Designation Number: TW1095

Test Items	Test Site No.	Test Engineer	Test Environment		Test Date	Remark
			temp °C	hum %		
Conducted Emissions of Powerline	CO01-NH	Willy Lee	24.5~24.9	52.5~52.8	29/Aug/2019	-
Radiated Emissions below 1GHz	OS03-NH	Louis Lin	28.1~28.2	52.1~52.4	01/Sep/2019	-
Radiated Emissions above 1GHz	03CH04-HY	Alan Chen	28.5~28.6	60~61	03/Sep/2019	-

3.2. Test Standards

Test items	Test Standards and Test Procedures
Radiated and Conducted Emissions	ANSI C63.4:2014 with FCC Method 47 CFR Part 15, Subpart B, Class B Digital Device, CISPR PUB. 22 and Canada Standard ICES-003 Issue 6, Class B

3.3. Test Voltage/Frequencies

Power Supply Type	Voltage/Frequencies
AC Power Supply	120V / 60Hz

3.4. Test Distance and Frequency Range Investigated

Test Items	Frequency Range	Remark
Powerline Conducted Emissions	150 kHz to 30 MHz	-
Radiated Emissions (below 1GHz)	30 MHz to 1,000 MHz	Measurement distance is 10 m.
Radiated Emissions (above 1GHz)	1,000 MHz to 5,000 MHz	Measurement distance is 3 m.

3.5. Operating Condition

- Full system.

3.6. Labelling requirements

3.6.1. FCC Labelling requirements

The devices shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

3.6.2. ICES Labelling requirements

The manufacturer, importer or supplier shall meet the labelling requirements set out in this section and in Notice 2014-DRS1003 for electronic labelling for every unit:

(i) prior to marketing in Canada, for ITE manufactured in Canada and
(ii) prior to importation into Canada, for imported ITE.

Each unit of an ITE model shall bear a label (see below) that represents the manufacturer's or the importer's SDoC with Innovation, Science and Economic Development Canada's ICES-003. This label shall be permanently affixed to the ITE or displayed electronically and its text must be clearly legible. If the dimensions of the device are too small or if it is not practical to place the label on the ITE and electronic labelling has not been implemented, the label shall be, upon agreement with Innovation, Science and Economic Development Canada, placed in a prominent location in the user manual supplied with the ITE. The user manual may be in an electronic format and must be readily available.

Innovation, Science and Economic Development Canada ICES-003 Compliance Label:
CAN ICES-3 (*)/NMB-3(*)
* Insert either "A" or "B" but not both to identify the applicable Class of ITE.

3.7. User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

4. Conducted Emissions Measurement

Conducted Emissions were measured according to the methods defined in ANSI C63.4-2014 Section 7.
The EUT is which satisfies the Class B disturbance limits.

4.1. Limit

Limits for conducted disturbance at the mains ports of class B			
Frequency range MHz	**Coupling device**	**Detector type / bandwidth**	**Class B limits** dB(μV)
0,15 – 0,5	AMN	Quasi-peak / 9 kHz	66 - 56
0,5 – 5			56
5 – 30			60
0,15 – 0,5	AMN	Average / 9 kHz	56 - 46
0,5 – 5			46
5 – 30			50
Note 1: The lower limit shall apply at the transition frequencies. Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.			

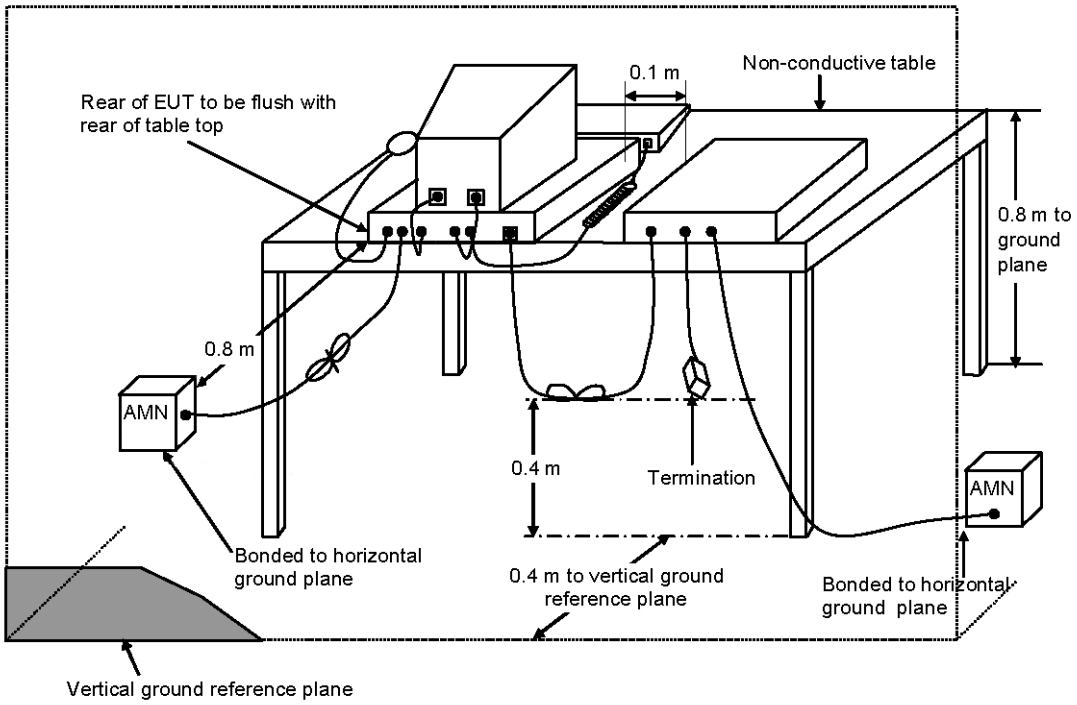
4.2. Test Procedures

a). The EUT was warmed up for 15 minutes before testing started.
b). The EUT was placed on a desk 0.8 meter height from the metal ground plane and 0.4 meter from the conducting wall of the shielding room and it was kept at least 0.8 meter from any other grounded conducting surface.
c). Connect EUT to the power mains through a line impedance stabilization network (LISN).
d). All the support units are connect to the other LISN.
e). The LISN provides 50 ohm, coupling impedance for the measuring instrument.
f). The FCC states that a 50 ohm, 50 microhenry LISN should be used.
g). Both sides of AC line were checked for maximum conducted interference.
h). The frequency range from 150 kHz to 30 MHz was searched.
i). Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
j). All emissions not reported here are more than 10 dB below the prescribed limit.

4.3. Measurement Results Calculation

The measurand Level is calculated using:
Corrected Reading (dBμV) = LISN Factor + Cable Loss + Read Level
For example at 0.3 MHz if the LISN Factor is 10.48 dB, the cable loss is 0.10 dB, the measured voltage is 36.39 dBμV, the signal strength would be calculated:
Corrected Reading (dBμV) = 10.48 dB + 0.10 dB + 36.39 dBμV = 46.97 dBμV

4.4. Typical Test Setup Layout

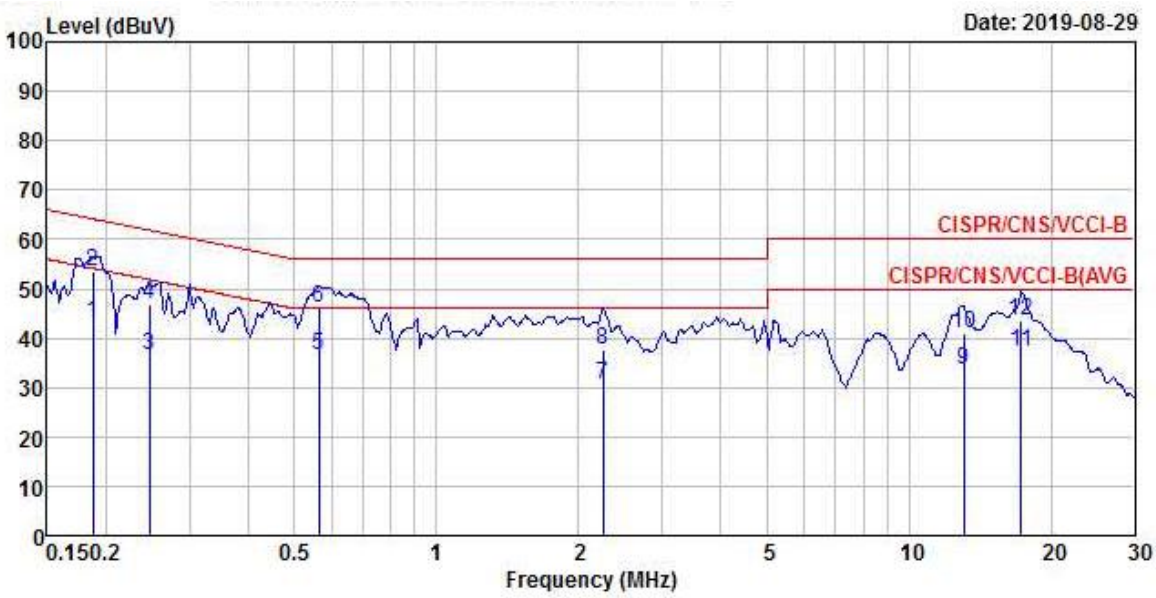


a). AMN is 80 cm from the EUT and at least 80 cm from other units and other metal planes.
b). EUT is connected to one artificial mains network (AMN).
c). All other units of a system are powered from a second AMN. A multiple outlet strip can be used for multiple mains cords.
d). Rear of EUT to be flushed with rear of table top.
e). Peripherals shall be placed at a distance of 10 cm from each other and from the controller, except for the monitor which, if this is an acceptable installation practice, shall be placed directly on the top of the controller.
f). If cables, which hang closer than 40 cm to the horizontal metal ground plane, cannot be shortened to appropriate length, the excess shall be folded back and forth forming a bundle 30 cm to 40 cm long.
g). Mains cords and signal cables shall be positioned for their entire lengths, as far as possible, at 40 cm from the vertical reference plane.
h). Cables of hand operated devices, such as keyboards, mice, etc. shall be placed as for normal usage.

4.5. Test Result

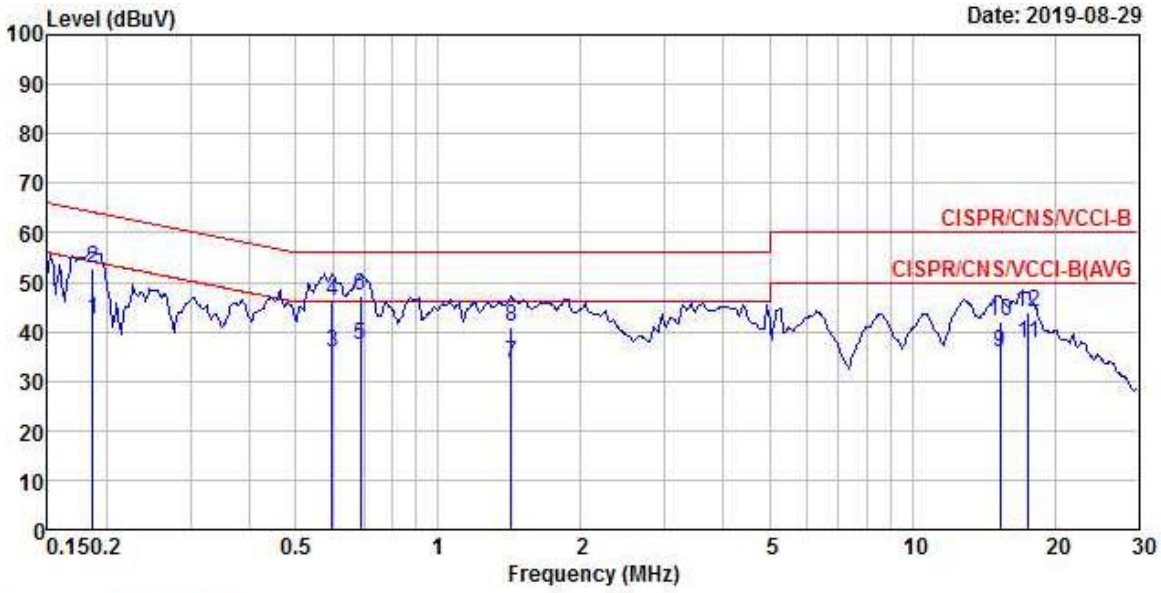
Test Mode	Mode 1		
Test Frequency	0.15 MHz ~ 30 MHz	Test Voltage	AC 120V / 60Hz
■ The test was passed at the minimum margin that marked by the frame in the following data			

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.19	43.13	-11.03	54.16	32.83	10.20	0.10	Average
2	0.19	53.39	-10.77	64.16	43.09	10.20	0.10	QP
3	0.25	36.56	-15.30	51.86	26.26	10.20	0.10	Average
4	0.25	47.01	-14.85	61.86	36.71	10.20	0.10	QP
5 @	0.56	36.66	-9.34	46.00	26.36	10.20	0.10	Average
6	0.56	45.95	-10.05	56.00	35.65	10.20	0.10	QP
7	2.25	30.56	-15.44	46.00	20.13	10.23	0.20	Average
8	2.25	37.64	-18.36	56.00	27.21	10.23	0.20	QP
9	13.06	33.49	-16.51	50.00	22.79	10.43	0.27	Average
10	13.06	40.91	-19.09	60.00	30.21	10.43	0.27	QP
11	17.29	37.44	-12.56	50.00	26.58	10.51	0.35	Average
12	17.29	43.48	-16.52	60.00	32.62	10.51	0.35	QP

Neutral



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.19	42.51	-11.69	54.20	32.25	10.16	0.10	Average
2	0.19	52.77	-11.43	64.20	42.51	10.16	0.10	QP
3	0.60	35.69	-10.31	46.00	25.44	10.15	0.10	Average
4	0.60	46.28	-9.72	56.00	36.03	10.15	0.10	QP
5	0.69	37.09	-8.91	46.00	26.83	10.16	0.10	Average
6 @	0.69	47.18	-8.82	56.00	36.92	10.16	0.10	QP
7	1.43	33.42	-12.58	46.00	23.10	10.17	0.15	Average
8	1.43	41.08	-14.92	56.00	30.76	10.17	0.15	QP
9	15.31	35.68	-14.32	50.00	24.87	10.50	0.31	Average
10	15.31	41.98	-18.02	60.00	31.17	10.50	0.31	QP
11	17.57	37.68	-12.32	50.00	26.78	10.55	0.35	Average
12	17.57	43.80	-16.20	60.00	32.90	10.55	0.35	QP

5. Radiated Emissions Measurement

Radiated Emissions were measured according to the methods defined in ANSI C63.4-2014 Section 8.
The EUT is which satisfies the Class B disturbance limits.

5.1. Radiated Emission below 1GHz

5.1.1. Limit

radiated emissions at frequencies up to 1 GHz for Class B equipment			
Frequency range MHz	**Measurement**		**Class B limits**
	Distance (m)	**Detector type / bandwidth**	**dB(μV/m)**
30 – 230	10	Quasi Peak / 120 kHz	30
230 – 1000			37

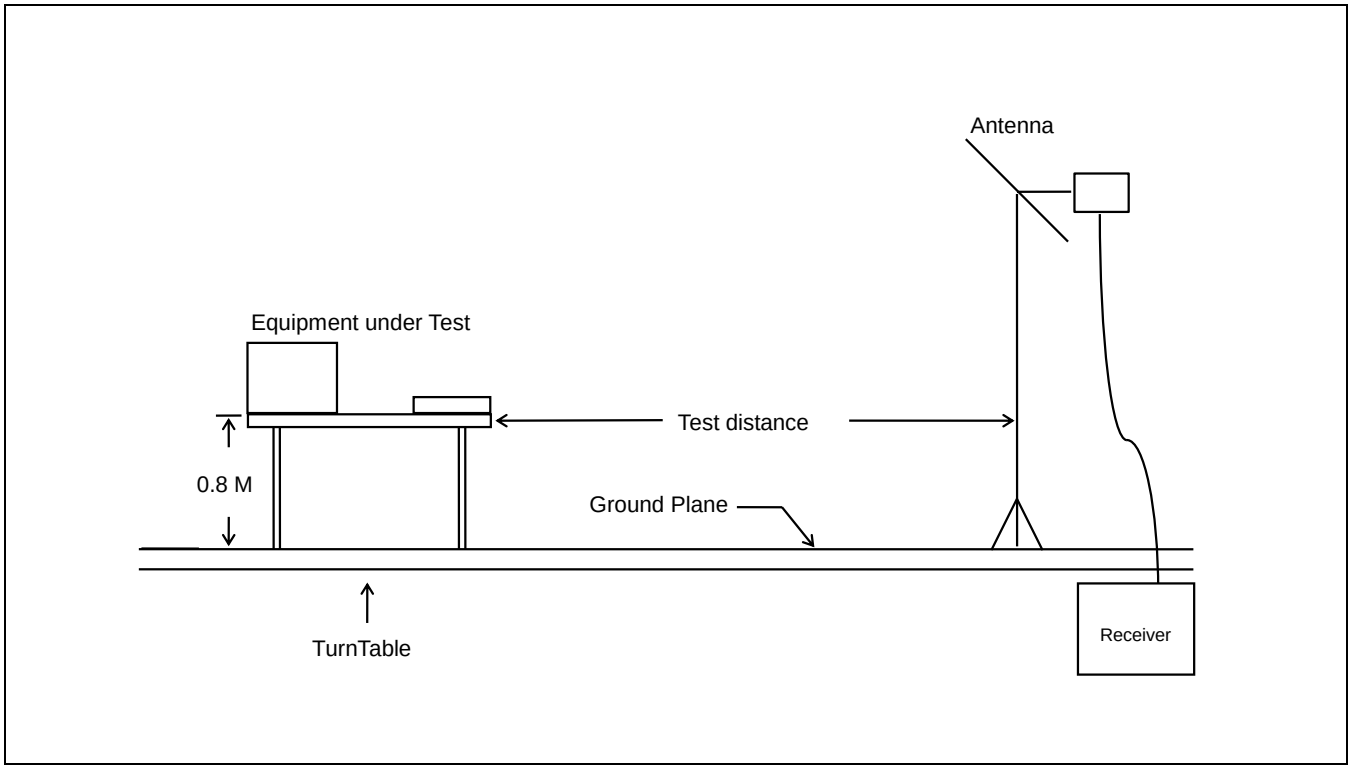
5.1.2. Test Procedures

a). The EUT was placed on a rotatable table top 0.8 meter above ground.
b). The EUT was set 10 meters from the interference-receiving antenna which was mounted on the top of a variable height antenna tower.
c). The table was rotated 360 degrees to determine the position of the highest radiation.
d). The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
e). For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
f). Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
g). If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
h). The FCC Part 15.109(g) permit parties seeking to authorize a digital device to choose to demonstrate that the device complies with either the Part 15 standards or the international standards found in Publication 22 of the International Special Committee on Radio Interference (CISPR).

5.1.3. Measurement Results Calculation

The measurand Level is calculated using:
Corrected Reading (dBμV/m) = Antenna Factor + Cable Loss + Read Level – Preamp Factor
For example at 125 MHz if the Antenna Factor is 17.24 dB/m, the cable loss is 1.20 dB, the measured voltage is 35.80 dBμV and the Preamp Factor is 27.18 dB, the signal strength would be calculated:
Corrected Reading (dBμV/m) = 17.24 dB/m + 1.20 dB + 35.80 dBμV - 27.18 dB = 27.06 dBμV/m
Note: If a hybrid antenna is used, the antenna factor shell be the sum of the Antenna Factor + Attenuator Factor.

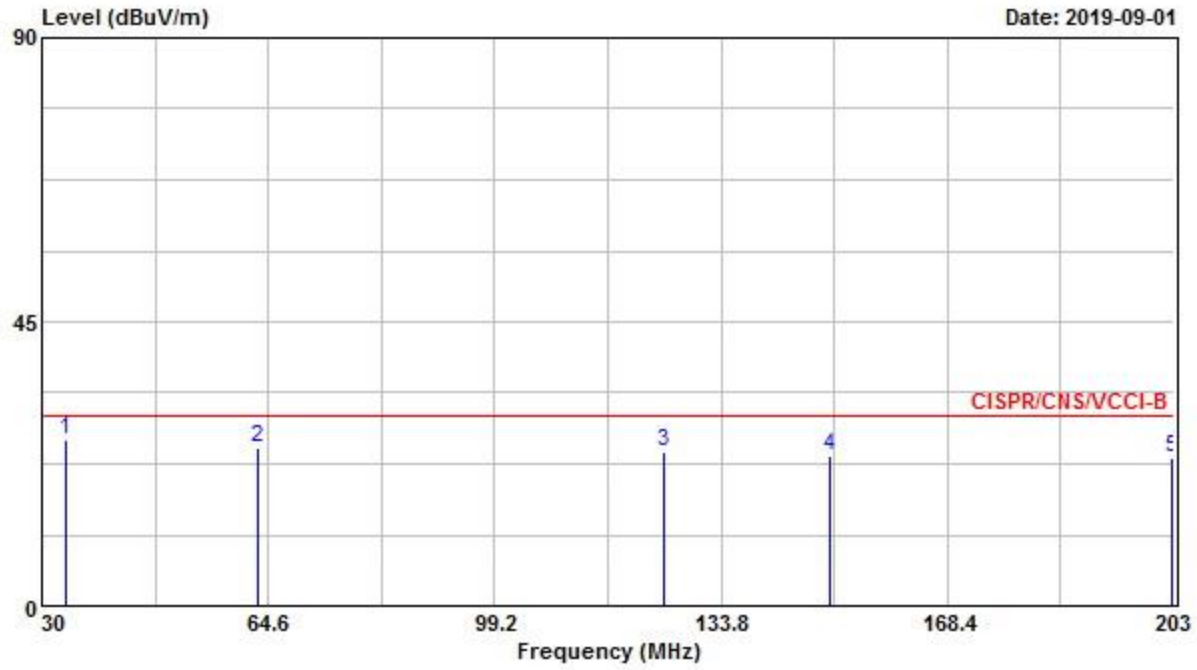
5.1.4. Typical Test Setup Layout



5.1.5. Test Result

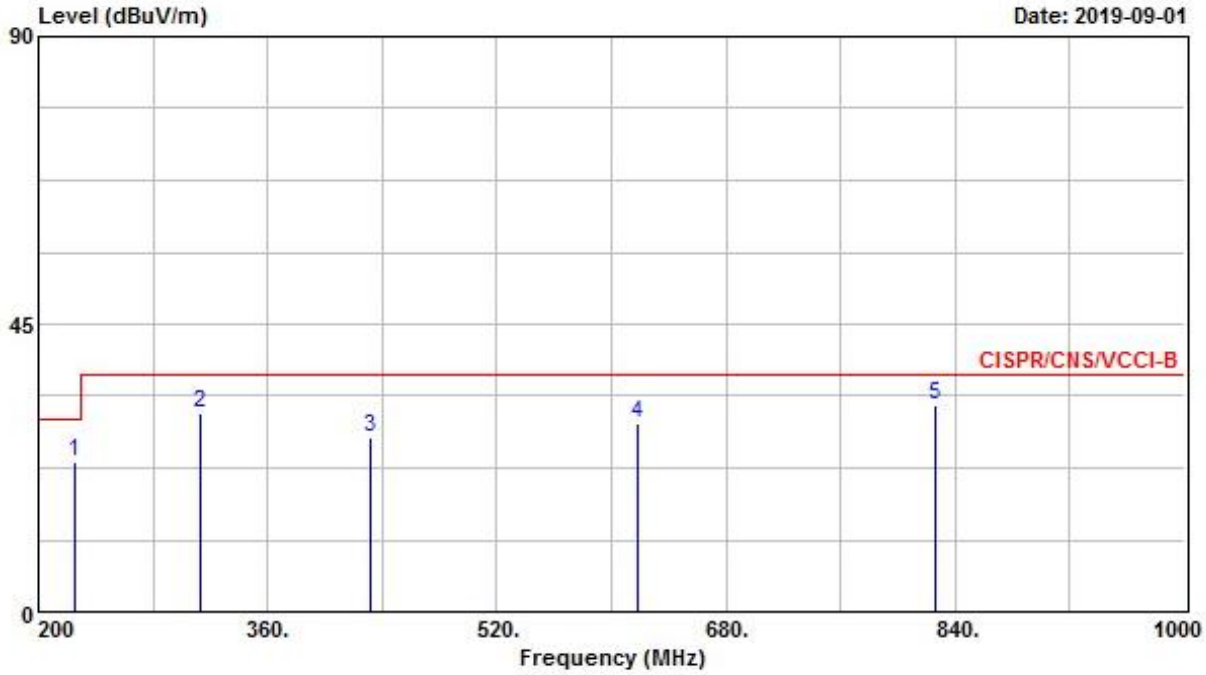
Test mode	Mode 1		
Test frequency	30 MHz ~ 1000 MHz	Test Voltage	AC 120V / 60Hz
■ The test was passed at the minimum margin that marked by the frame in the following data			

Vertical



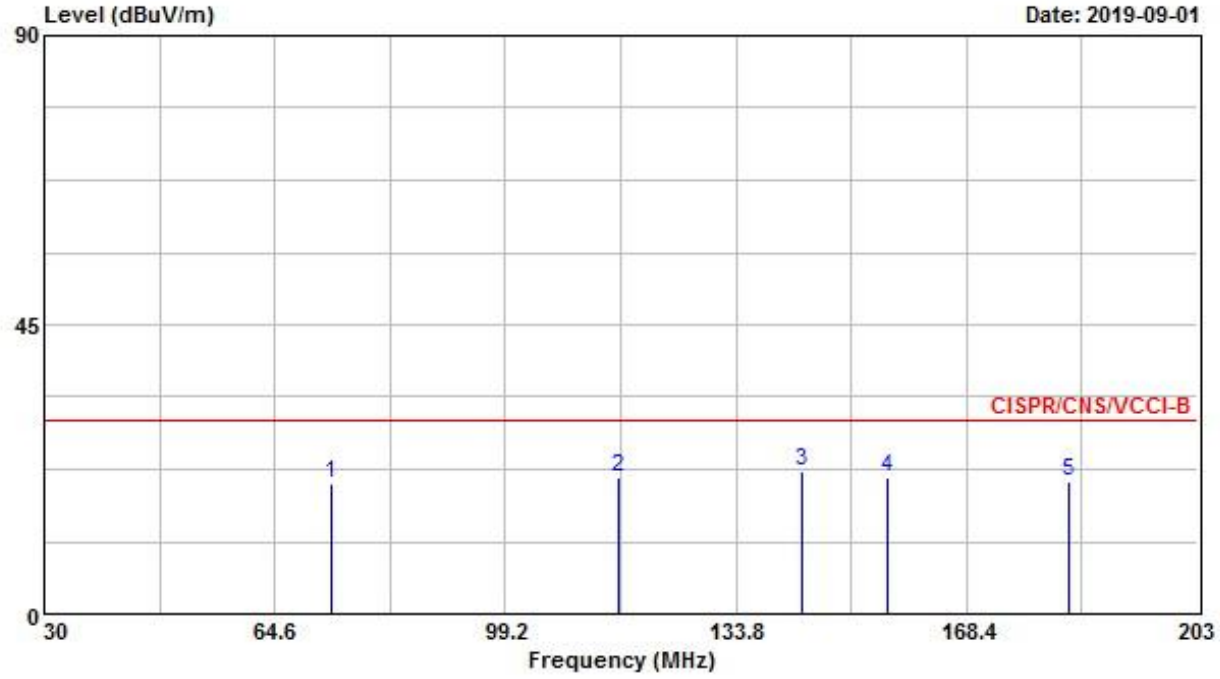
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	33.630	26.39	-3.61	30.00	32.88	20.94	1.00	28.43	QP	100	185
2	63.040	25.08	-4.92	30.00	40.45	11.64	1.37	28.38	Peak	---	---
3	124.980	24.51	-5.49	30.00	33.06	17.73	1.93	28.21	Peak	---	---
4	150.410	23.80	-6.20	30.00	33.96	15.81	2.15	28.12	Peak	---	---
5	202.830	23.57	-6.43	30.00	34.12	14.71	2.67	27.93	Peak	---	---

Vertical



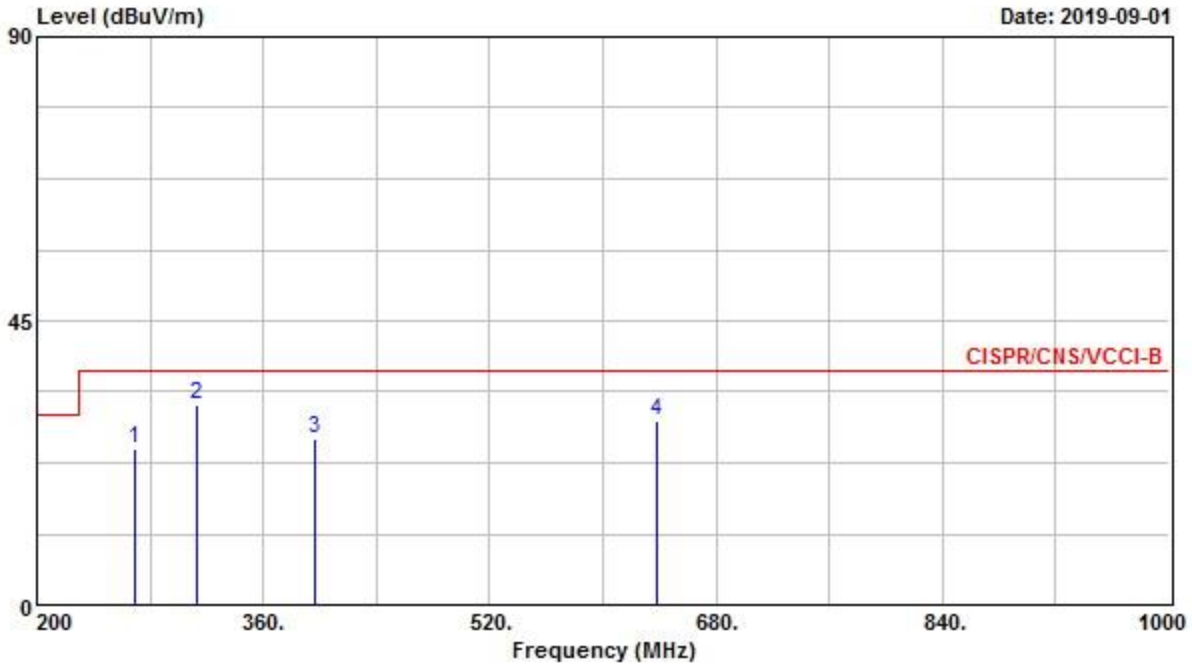
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	224.800	23.57	-6.43	30.00	33.30	15.34	2.83	27.90	Peak	---	---
2	313.600	31.03	-5.97	37.00	36.69	18.91	3.33	27.90	Peak	---	---
3	432.000	27.28	-9.72	37.00	30.17	21.76	4.03	28.68	Peak	---	---
4	618.400	29.35	-7.65	37.00	29.47	24.04	5.03	29.19	Peak	---	---
5	826.400	32.33	-4.67	37.00	29.72	25.61	5.92	28.92	Peak	---	---

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	73.080	20.37	-9.63	30.00	35.51	11.70	1.52	28.36	Peak	---	---
2	116.150	21.15	-8.85	30.00	29.90	17.64	1.86	28.25	Peak	---	---
3	143.660	22.11	-7.89	30.00	31.87	16.28	2.10	28.14	Peak	---	---
4	156.460	21.31	-8.69	30.00	31.65	15.56	2.20	28.10	Peak	---	---
5	183.800	20.53	-9.47	30.00	31.53	14.50	2.49	27.99	Peak	---	---

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	269.600	24.56	-12.44	37.00	30.76	18.53	3.11	27.84	Peak	---	---
2	313.600	31.54	-5.46	37.00	37.20	18.91	3.33	27.90	Peak	---	---
3	396.800	26.18	-10.82	37.00	29.84	21.02	3.81	28.49	Peak	---	---
4	637.600	29.11	-7.89	37.00	29.04	24.15	5.11	29.19	Peak	---	---

5.2. Radiated Emission above 1GHz

5.2.1. Limit

radiated emissions at frequencies above 1 GHz for Class B equipment			
Frequency range GHz	**Measurement**		**Class B limits**
	Distance (m)	**Detector type / RBW / VBW**	**dB(μV/m)**
1 – 5	3	Average / 1MHz / 1Hz	54
1 – 5		Peak / 1MHz / 3MHz	74

Required highest frequency for radiated measurement	
Highest internal frequency (F_x)	**Highest measured frequency**
$F_x \leq 108$ MHz	1 GHz
108 MHz < $F_x \leq 500$ MHz	2 GHz
500 MHz < $F_x \leq 1$ GHz	5 GHz
$F_x > 1$ GHz	5 x F_x up to a maximum of 40 GHz

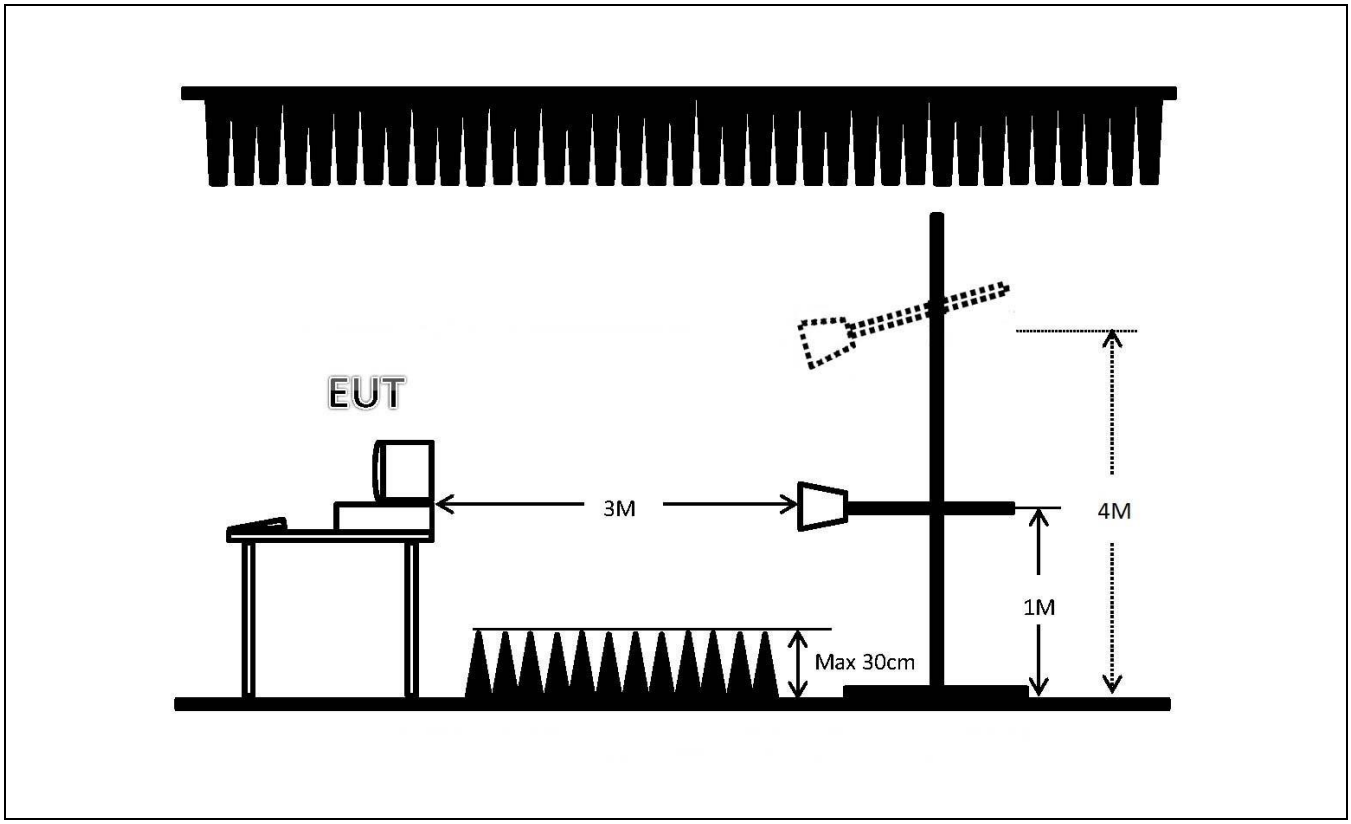
5.2.2. Test Procedures

a). Same test set up as below 1GHz radiated testing.
b). The EUT was set 3m (1 – 5GHz) from the interference-receiving antenna which was mounted on the top of a variable height antenna tower.
c). There should be absorber placed between the EUT and Antenna and its located size should let the test site meet CISPR16-1-4 requirement.
d). The table was rotated 360 degrees to determine the position of the highest radiation.
e). The measured using a test-receiver system with both a peak and CISPR average detector.
f). If the EUT is having a Wireless or Bluetooth modular, install the filter at the input connector of test-receiver system.
g). Set the DRG Horn Antenna at 1M height, then run the turn table to get the maximum noise reading from Horizontal and Vertical polarity separately.t the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
h). When EUT locating on the turn-table, and its height is over 172cm (Antenna's 3dB beam width of 6GHz is 27∘), the DRG Horn Antenna must be raised up and descended down, then turning around the turn-table to get the maximum noise reading of the Horizontal and Vertical polarity separately. Note the maximum raise up height is same as the top of EUT.
i). If emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

5.2.3. Measurement Results Calculation

The measurand Level is calculated using:
Corrected Reading (dBμV/m) = Raw(Read Level)+AF(Antenna Factor)+CL(Cable Loss)-PA(Preamp Factor)
For example at 1980 MHz if the Antenna Factor is 26.19 dB/m, the cable loss is 4.08 dB, the measured voltage is 51.30 dBμV and the Preamp Factor is 33.34 dB, the signal strength would be calculated:
Corrected Reading (dBμV/m) = 51.30 dBμV + 26.19 dB/m + 4.08 dB + - 33.34 dB = 48.23 dBμV/m

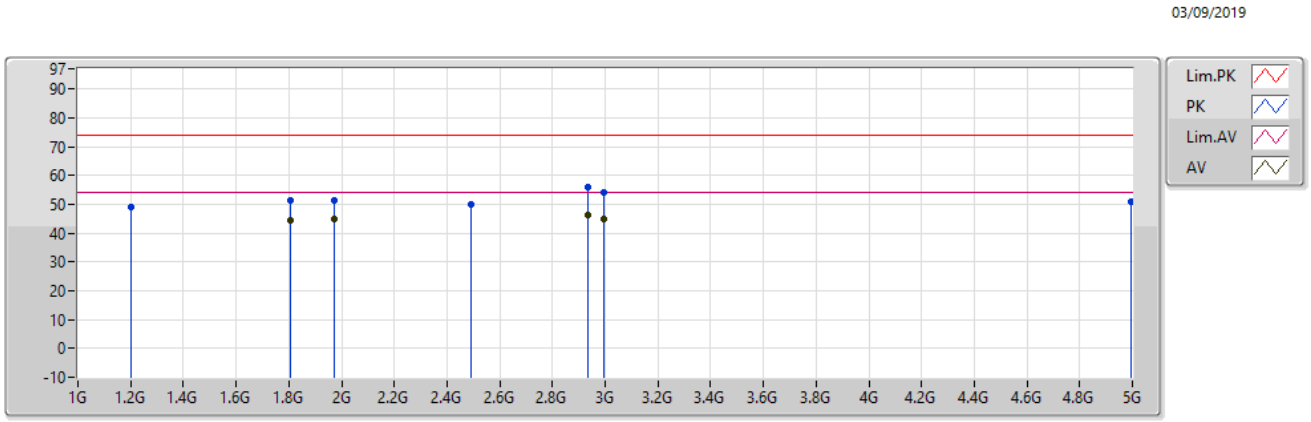
5.2.4. Typical Test Setup Layout



5.2.5. Test Result

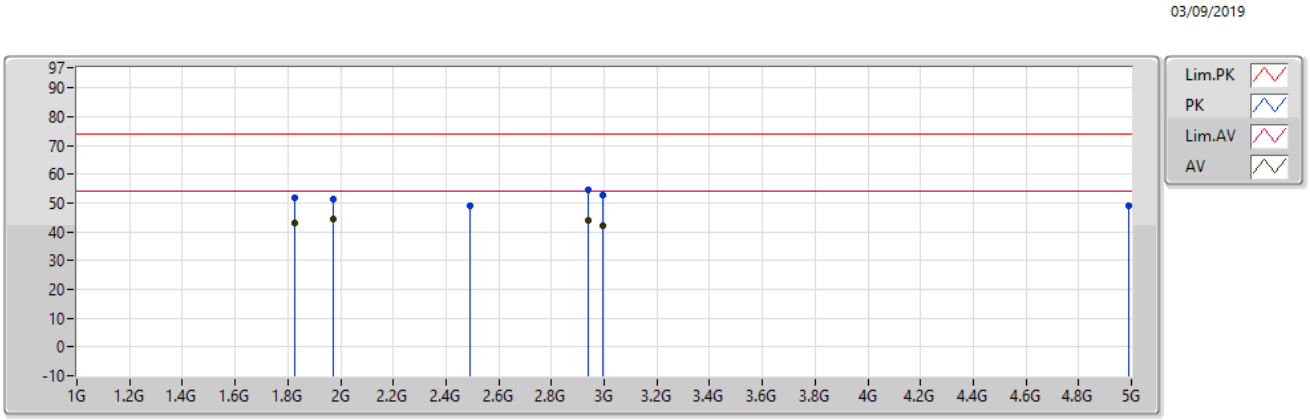
Test mode	Mode 1		
Test frequency	Above 1GHz	Test Voltage	AC 120V / 60Hz
■ The test was passed at the minimum margin that marked by the frame in the following data			

Vertical



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	1.2G	48.93	74.00	-25.07	-5.75	3	Vertical	-	-	-	54.68	25.50	2.63	33.88
PK	1.804G	51.30	74.00	-22.70	-4.85	3	Vertical	220	1	-	56.15	25.41	3.21	33.47
AV	1.804G	44.53	54.00	-9.47	-4.85	3	Vertical	220	1	-	49.38	25.41	3.21	33.47
PK	1.972G	51.48	74.00	-22.52	-3.87	3	Vertical	215	1	-	55.35	26.20	3.38	33.45
AV	1.972G	44.87	54.00	-9.13	-3.87	3	Vertical	215	1	-	48.74	26.20	3.38	33.45
PK	2.492G	50.04	74.00	-23.96	-2.40	3	Vertical	-	-	-	52.44	27.42	3.83	33.65
PK	2.936G	56.00	74.00	-18.00	-1.16	3	Vertical	124	1	-	57.16	28.47	4.29	33.92
AV	2.936G	46.26	54.00	-7.74	-1.16	3	Vertical	124	1	"Worst"	47.42	28.47	4.29	33.92
PK	2.996G	53.92	74.00	-20.08	-1.01	3	Vertical	330	1	-	54.93	28.59	4.35	33.95
AV	2.996G	45.09	54.00	-8.91	-1.01	3	Vertical	330	1	-	46.10	28.59	4.35	33.95
PK	4.996G	50.66	74.00	-23.34	3.10	3	Vertical	-	-	-	47.56	31.58	5.42	33.90

Horizontal



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	1.828G	51.79	74.00	-22.21	-4.76	3	Horizontal	205	1	-	56.55	25.48	3.23	33.47
AV	1.828G	43.08	54.00	-10.92	-4.76	3	Horizontal	205	1	-	47.84	25.48	3.23	33.47
PK	1.972G	51.17	74.00	-22.83	-3.87	3	Horizontal	200	1	-	55.04	26.20	3.38	33.45
AV	1.972G	44.43	54.00	-9.57	-3.87	3	Horizontal	200	1	"Worst"	48.30	26.20	3.38	33.45
PK	2.492G	48.86	74.00	-25.14	-2.40	3	Horizontal	-	-	-	51.26	27.42	3.83	33.65
PK	2.94G	54.63	74.00	-19.37	-1.14	3	Horizontal	210	1	-	55.77	28.48	4.30	33.92
AV	2.94G	43.96	54.00	-10.04	-1.14	3	Horizontal	210	1	-	45.10	28.48	4.30	33.92
PK	2.996G	52.80	74.00	-21.20	-1.01	3	Horizontal	295	1	-	53.81	28.59	4.35	33.95
AV	2.996G	42.09	54.00	-11.91	-1.01	3	Horizontal	295	1	-	43.10	28.59	4.35	33.95
PK	4.988G	48.89	74.00	-25.11	3.06	3	Horizontal	-	-	-	45.83	31.55	5.41	33.90

6. Uncertainty of Test Site

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2).

6.1. Emission Test Measurement Uncertainty

Test Items	Test Site No.	U_{LAB}
Conducted Emissions	CO01-NH	2.7 dB
Radiated Emissions below 1GHz	OS03-NH	5.9 dB
Radiated Emissions above 1GHz	03CH04-HY	6.47 dB

7. List of Measuring Equipment Used

Conducted Emission - Test Date: 29/Aug/2019

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Receiver	R&S	ESR3	102318	9K Hz – 3.6 GHz	30/Jul/2019	Conduction (CO01-NH)
LISN	SCHAFFNER	NNB41	06/10024	9kHz - 30MHz	02/Jan/2019	Conduction (CO01-NH)
LISN	ROLF HEINE	NNB-2/16Z	99079	9kHz - 30MHz	21/Jan/2019	Conduction (CO01-NH)
Power Filter	CORCOM	MR12030	N/A	30A*2	NCR	Conduction (CO01-NH)
RF Cable-CON	Suhner Switzerland	RG223/U	CB004	9kHz - 30MHz	27/Dec/2018	Conduction (CO01-NH)
software	Audix	E3	6.12160806	-	NCR	Conduction (CO01-NH)

Note: Calibration Interval of instruments listed above is one year. NCR: No Calibration Request.

Radiated Emission below 1GHz - Test Date: 01/Sep/2019

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Open Area Test Site	SPORTON	OATS-10	OS03-NH	30 MHz - 1 GHz 10m, 3m	23/Oct/2018	Radiation (OS03-NH)
Amplifier	HP	8447D	2944A08292	0.1 MHz - 1.3 GHz	04/Jul/2019	Radiation (OS03-NH)
Spectrum Analyzer	R&S	FSP7	838858/038	9 kHz – 7GHz	12/Nov/2018	Radiation (OS03-NH)
Receiver	R&S	ESCS30	838251/002	9 kHz –2.75 GHz	05/Jul/2019	Radiation (OS03-NH)
Bilog Antenna With 5dB Attenuator	CHASE	CBL6112D	25234	30 MHz - 2 GHz	27/Apr/2019	Radiation (OS03-NH)
Turn Table	EMCO	2080	9805-2065	0 - 360 degree	NCR	Radiation (OS03-NH)
Antenna Mast	EMCO	2075	9804-2151	1 m - 4 m	NCR	Radiation (OS03-NH)
RF Cable-R10m	HSCN	RG213U	2X11N	30 MHz - 1 GHz	22/Jul/2019	Radiation (OS03-NH)
Software	Audix	E3	Ver.4	-	NCR	Radiation (OS03-NH)

Note: Calibration Interval of instruments listed above is one year. NCR: No Calibration Request.

Radiated Emission above 1GHz - Test Date: 03/Sep/2019

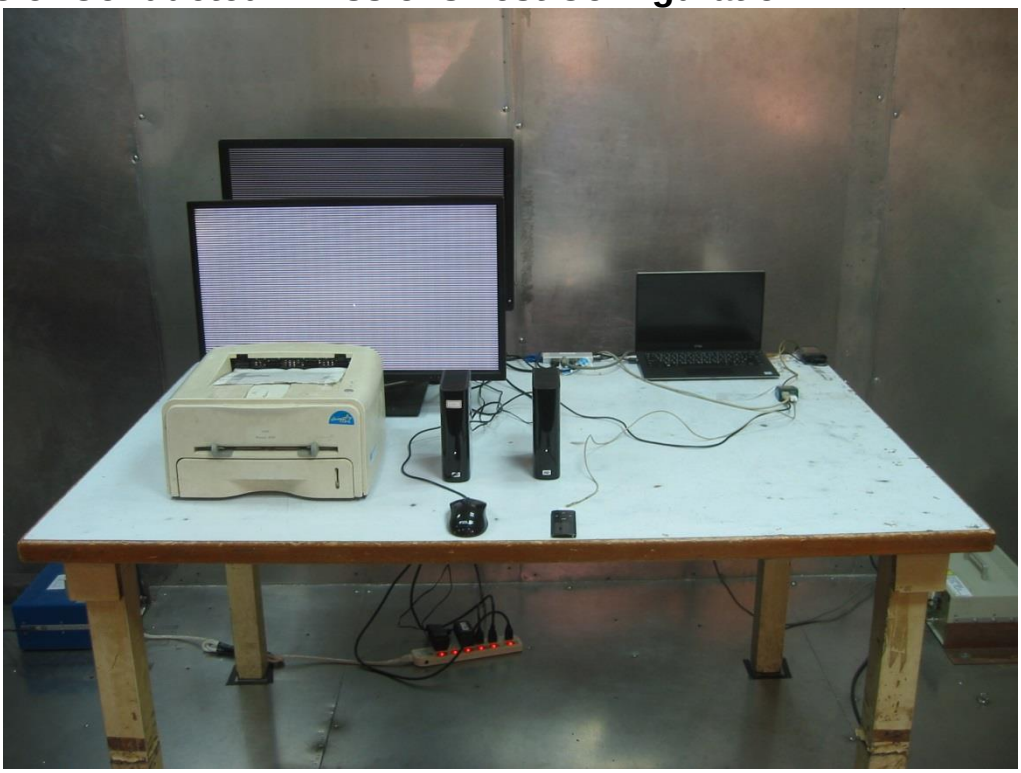
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Test Receiver	R&S	ESU-26	100422	20Hz ~ 26.5GHz	25/Oct/2018	24/Oct/2019	Radiation (03CH04-HY)
Turn Table	Chaintek	3000	MF7802056	0 ~ 360 degree	NCR	NCR	Radiation (03CH04-HY)
Antenna Mast	MF	MF-7802	MF780208163	1 m ~ 4 m	NCR	NCR	Radiation (03CH04-HY)
3m Semi Anechoic Chamber (Site V.S.W.R)	RIKEN	3m SAC	03CH04-HY	1 GHz ~ 18 GHz 3m	09/Mar/2019	08/Mar/2020	Radiation (03CH04-HY)
Microwave Preamplifier	Agilent	8449B	3008A02364	1GHz ~ 26.5GHz	13/Dec/2018	12/Dec/2019	Radiation (03CH04-HY)
Horn Antenna	SCHWARZBECK	BBHA9120	BBHA 9120 D-1130	1 GHz ~ 18 GHz	26/Oct/2018	25/Oct/2019	Radiation (03CH04-HY)
RF Cable-HIGH	HUBER+SUHNER	SUOFLEX 104	SN805197/4+MY39495	1 GHz ~ 26 GHz	13/Mar/2019	12/Mar/2020	Radiation (03CH04-HY)
Software	Sporton	SENSE-EMI	V5.10.5	-	NCR	NCR	Radiation (03CH04-HY)

NCR: No Calibration Request.

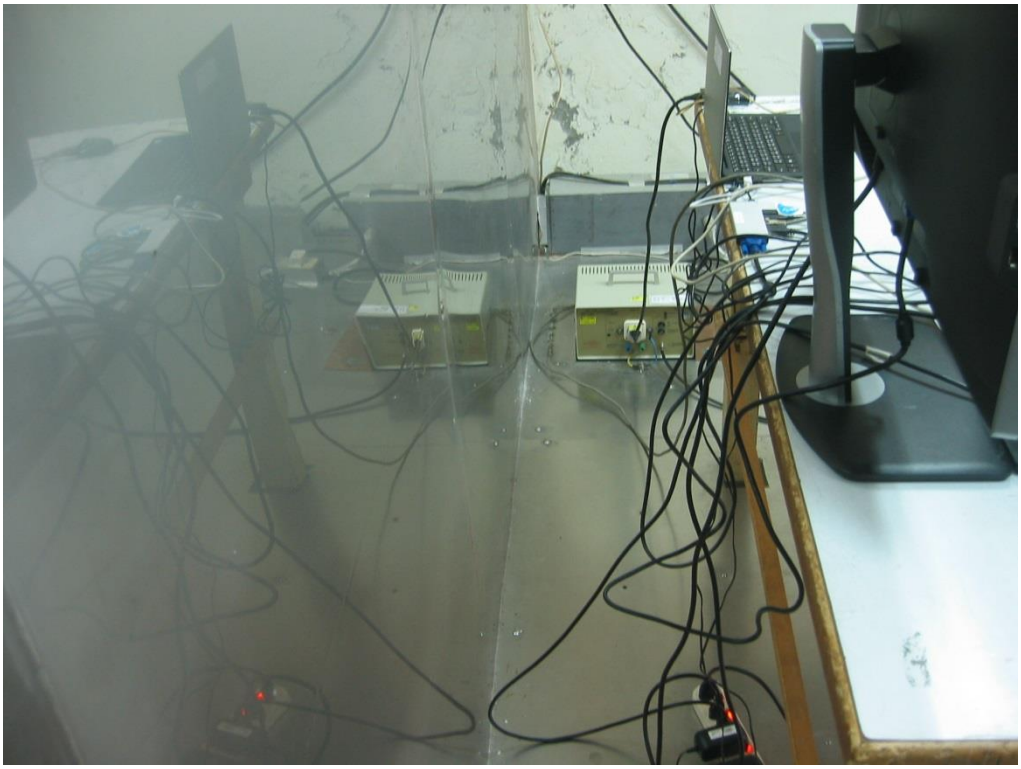
Appendix A. Test Photos

1. Photographs of Conducted Emissions Test Configuration

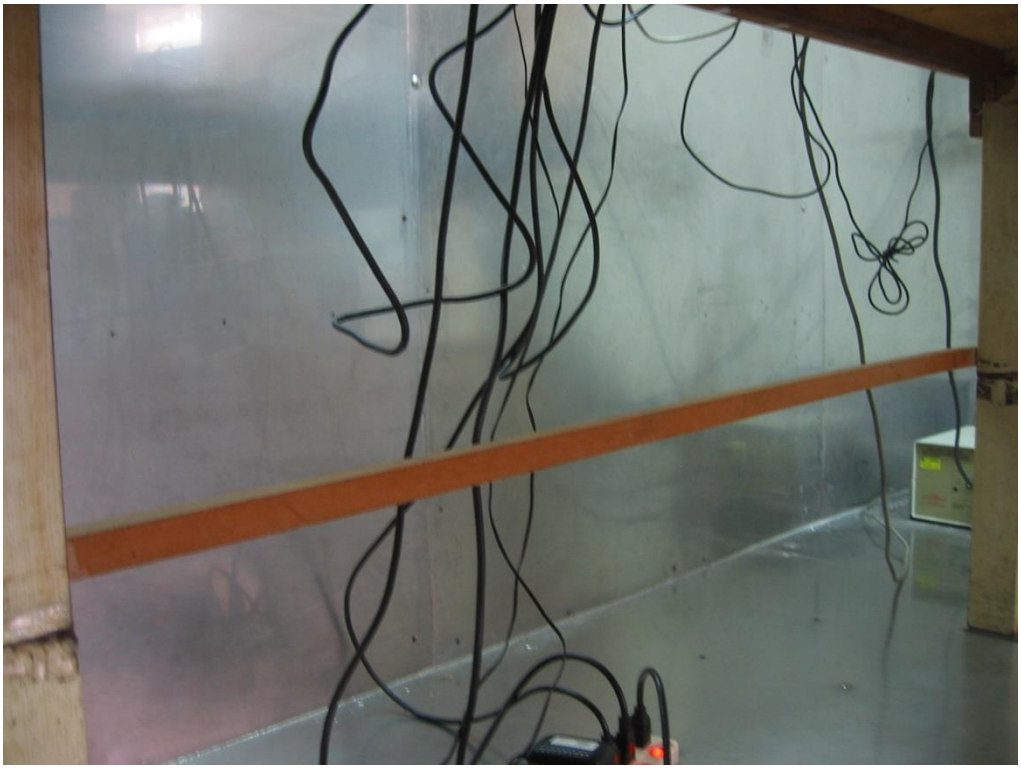
Front View



Side View



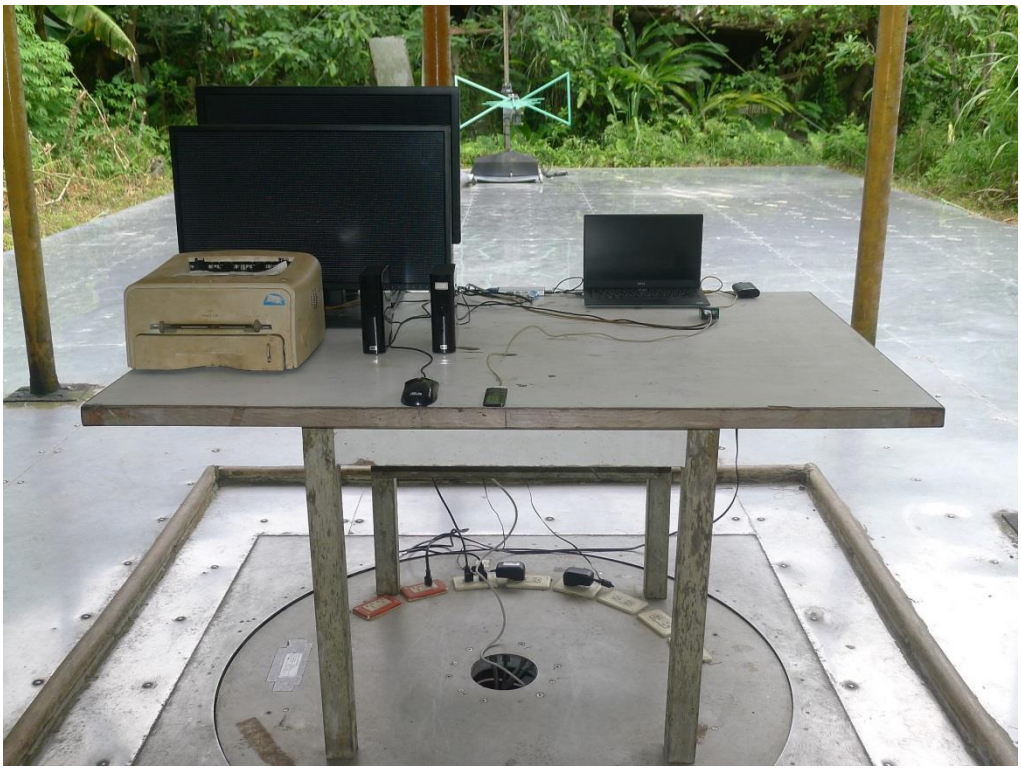
Under Table View



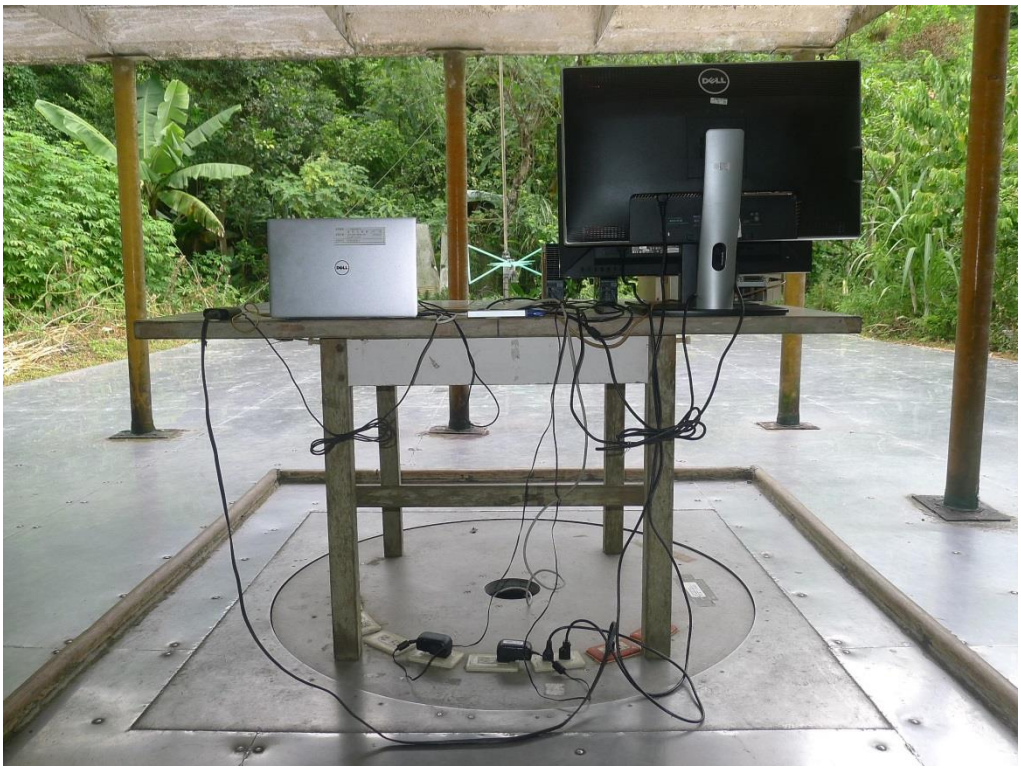
2. Photographs of Radiated Emissions Test Configuration

For radiated emissions below 1GHz

Front View

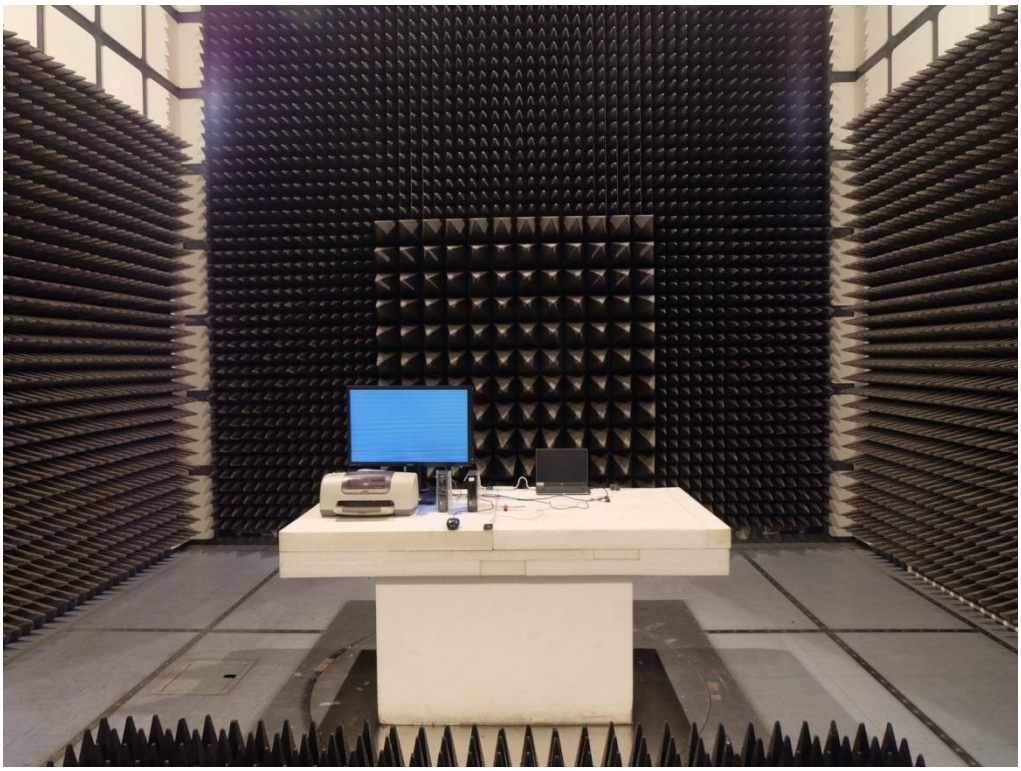


Rear View

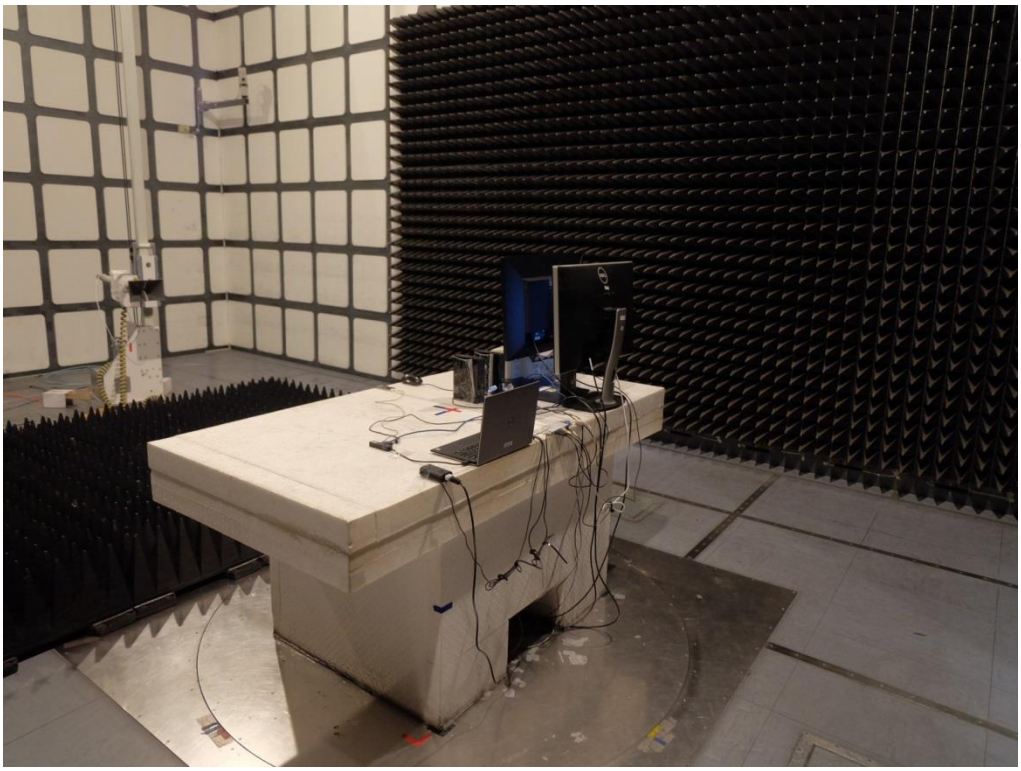


For radiated emissions above 1GHz

Front View



Rear View



THE END