FCC EMI TEST REPORT

REPORT NO.	**:**	**FD592302-09**
MODEL NO.	**:**	**AP-8432I**
RECEIVED DATE	**:**	**Feb. 01, 2016**
FINAL TESTED DATE	**:**	**Feb. 15, 2016**
ISSUED DATE	**:**	**Mar. 15, 2016**
TEST STANDARD	**:**	**47 CFR FCC Rules and Regulations Part 15 Subpart B, Class B Digital Device** **Canada Standard ICES-003, Issue 6, Class B**
Filing Type	**:**	**Declaration of Conformity**
APPLICANT	**:**	**Zebra Technologies, Corp.**
ADDRESS	**:**	**1 Zebra Plaza Holtsville, NY 11742 USA**
Manufacturer	**:**	**Wistron NeWeb Corporation**
ADDRESS	**:**	**20 Park Avenue II, Hsinchu Science Park, Hsinchu 308 Taiwan**
ISSUED BY	**:**	**SPORTON International Inc.**
LAB ADDRESS	**:**	**No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.**

- The test result refers exclusively to the test presented test model / sample.
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- This test report is only applicable to U.S.A. / Canada.

TAF
Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	ISSUED DATE	Description
FD592302-09	Rev. 01	Mar. 15, 2016	Initial issue of report

VERIFICATION OF COMPLIANCE

EQUIPMENT NAME	:	802.11AC MU-MIMO, dual Radio, INT ANT
BRAND NAME	:	ZEBRA
MODEL NO.	:	AP-8432I
APPLICANT	:	Zebra Technologies, Corp.
ADDRESS	:	1 Zebra Plaza Holtsville, NY 11742 USA
FINAL TESTED DATE	:	Feb. 15, 2016
TEST STANDARD	:	47 CFR FCC Rules and Regulations Part 15 Subpart B, Class B Digital Device Canada Standard ICES-003, Issue 6, Class B

I **HEREBY** DECLARE THAT:

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 – 2014**.

The above equipment has been tested by **SPORTON International Inc.** LAB., 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 EMI characteristics under the conditions specified in this report.

Beck Wu

Beck Wu
SPORTON INTERNATIONAL INC.

1. Summary of Test Results

After estimating all the combination of every test mode, the result shown as below is the worst case.

The EUT has been tested according to the following specifications.

EMISSION			
Test Standard	**Test Type**	**Result**	**Remarks**
47 CFR FCC Rules and Regulations Part 15 Subpart B, Class B Digital Device and Canada Standard ICES-003, Issue 6, Class B	AC Power Port Conducted emission test 150 kHz – 30 MHz	PASS	Meet minimum passing margin is -10.50dB at 0.1582MHz.
	Radiated emission test 30 MHz – 1,000 MHz @ 3 m 1,000 MHz – 18,000 MHz @ 3 m 18,000 MHz – 30,000 MHz @ 1 m	PASS	Meet minimum passing margin is -3.13dB at 55.22MHz.

2. General Description of Equipment under Test

Product Detail	
Equipment Name	802.11AC MU-MIMO, dual Radio, INT ANT
Model No.	AP-8432I
Brand Name	ZEBRA
Power Supply	From Power Adapter or PoE
Accessories	N/A

2.1. Feature of Equipment under Test

1. The EUT supports 2.4GHz/5GHz wireless function.

2. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.2. Table for Filed Antenna

Set	Brand	Model Name (Part Number)	Antenna Type	Connector	Indoor/ Outdoor	Rmark	EUT/ R(Radio)
1	ZEBRA	CEDAR-INT-ANT	Monopole	U.FL	Indoor	WLAN/BT	R1~R3

Note 1:

Set	Antenna Gain (dBi)			
	Radio 1 / 5G			
	Chain 1	Chain 2	Chain 3	Chain 4
1	6.8	6.7	6.6	5.9

Set	Antenna Gain (dBi)					
	Radio 2 / 2.4G			Radio 2 / 5G		
	Chain 1	Chain 2	Chain 3	Chain 1	Chain 2	Chain 3
1	4.1	4.4	4.4	5.9	5.4	5.9

Set	Antenna Gain (dBi)
	Radio 3 / BT
1	7.7

Note 2:
The EUT has three radios, Radio 1 supports WLAN 5GHz, Radio 2 supports WLAN 2.4GHz + 5GHz and Radio 3 supports Bluetooth functions.

2.3. Modification of EUT

Please refer to the Photographs of EUT.

3. Test Configuration of Equipment under Test

3.1. Test Mode

Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Conducted Emission test					
The EUT was performed at Y axis and Z axis position for Radiated emission below 1GHz test, and the worst case was found at Y axis. So the measurement will follow this same test configuration.					
Mode	Y axis	Z axis	Set 1	Adapter	PoE
1	●	-	● Radio1/5G Radio2/2.4G Radio3/BT	●	-
2	●	-	● Radio1/5G Radio2/5G Radio3/BT	●	-
3 Note1	●	-	● Radio1/5G Radio2/2.4G Radio3/BT	-	●
Note1: Mode 1 has been evaluated to be the worst case between Mode 1~2, thus measurement for Mode 3 will follow this same test mode. All test results were recorded in the report.					

Radiated Emissions					
Mode	Y axis	Z axis	Set 1	Adapter	PoE
1	●	-	● Radio1/5G Radio2/2.4G Radio3/BT	●	-
2	-	●	● Radio1/5G Radio2/2.4G Radio3/BT	●	-
3 Note1	●	-	● Radio1/5G Radio2/5G Radio3/BT	●	-
4 Note2	●	-	● Radio1/5G Radio2/5G Radio3/BT	-	●

Note1: Mode 1 has been evaluated to be the worst case between Mode 1~2, thus measurement for Mode 3 will follow this same test mode.
Note2: Mode 3 has been evaluated to be the worst case among Mode 1~3, thus measurement for Mode 4 will follow this same test mode.
For Radiated Emission test below 1GHz:
All test results were recorded in the report.
For Radiated Emission test above1GHz:
Mode 3 generated the worst test result for Radiated emission below 1GHz test,
thus the measurement for Radiated emission above 1GHz test will follow this same test configuration.

Note1: The PoE and Adapter information as below:

Support Unit	Brand	Model
PoE	Symbol	PD-9001GR/AT/AC
Adapter	PHIHONG	PSAC45W-480

Note2: All the specification of test configurations and test modes were based on customer's request
Note3:The USB port can not be used by end user. It is generally used for updating FW by professional installer.

3.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

For Conducted Emissions Test:

For Adapter mode:

Support Unit	Brand	Model	FCC ID
NB*4	DELL	E6430	DoC
Bluetooth tester	Anritsu	MT8852B	DoC
Flash disk	Silicon	I-Series	DoC
PoE PD Simulator (PD load)	WNC	PDS-16	DoC
Adapter	PHIHONG	PSAC45W-480	N/A

For PoE mode:

Support Unit	Brand	Model	FCC ID
NB*4	DELL	E6430	DoC
Bluetooth tester	Anritsu	MT8852B	DoC
Flash disk	Silicon	I-Series	DoC
PoE PD Simulator (PD load)	WNC	PDS-16	DoC
PoE	Symbol	PD-9001GR/AT/AC	DoC

For Radiated Emissions Test:

For Adapter mode:

Support Unit	Brand	Model	FCC ID
NB*4	DELL	E4300	DoC
Bluetooth tester	Anritsu	MT8852B	DoC
Flash disk	Transcend	JF700	DoC
PoE PD Simulator (PD load)	WNC	PDS-16	DoC
Adapter	PHIHONG	PSAC45W-480	N/A

For PoE mode:

Support Unit	Brand	Model	FCC ID
NB*4	DELL	E4300	DoC
Bluetooth tester	Anritsu	MT8852B	DoC
Flash disk	Transcend	JF700	DoC
PoE PD Simulator (PD load)	WNC	PDS-16	DoC
PoE	Symbol	PD-9001GR/AT/AC	DoC

3.3. EUT Operation Condition

For Conducted Emissions Test:

During the test, the following programs under Win 7 were executed:

The remote notebook executed “Telnet“ to make the function of Bluetooth enabled and wifi Radio 2.4 & 5G to switch.

The remote notebook executed "ping.exe" to link with the EUT to maintain the connection by LAN and WLAN.

EUT enables Bluetooth function to connect with the bluetooth tester.

For Radiated Emissions Test:

During the test, the following programs under Win XP were executed:

The remote notebook executed “Telnet“ to make the function of Bluetooth enabled and wifi Radio 2.4 & 5G to switch.

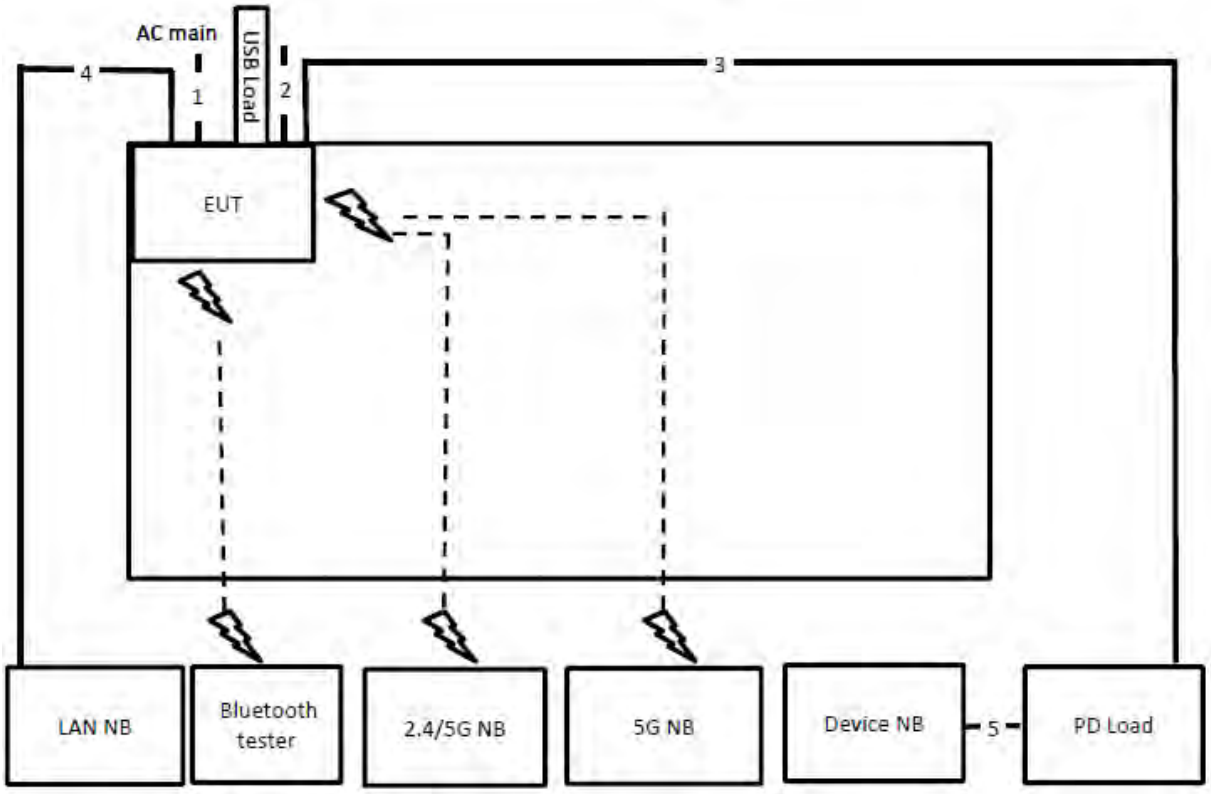
The remote notebook executed "ping.exe" to link with the EUT to maintain the connection by LAN and WLAN.

EUT enables Bluetooth function to connect with the bluetooth tester.

3.4. Connection Diagram of Test System

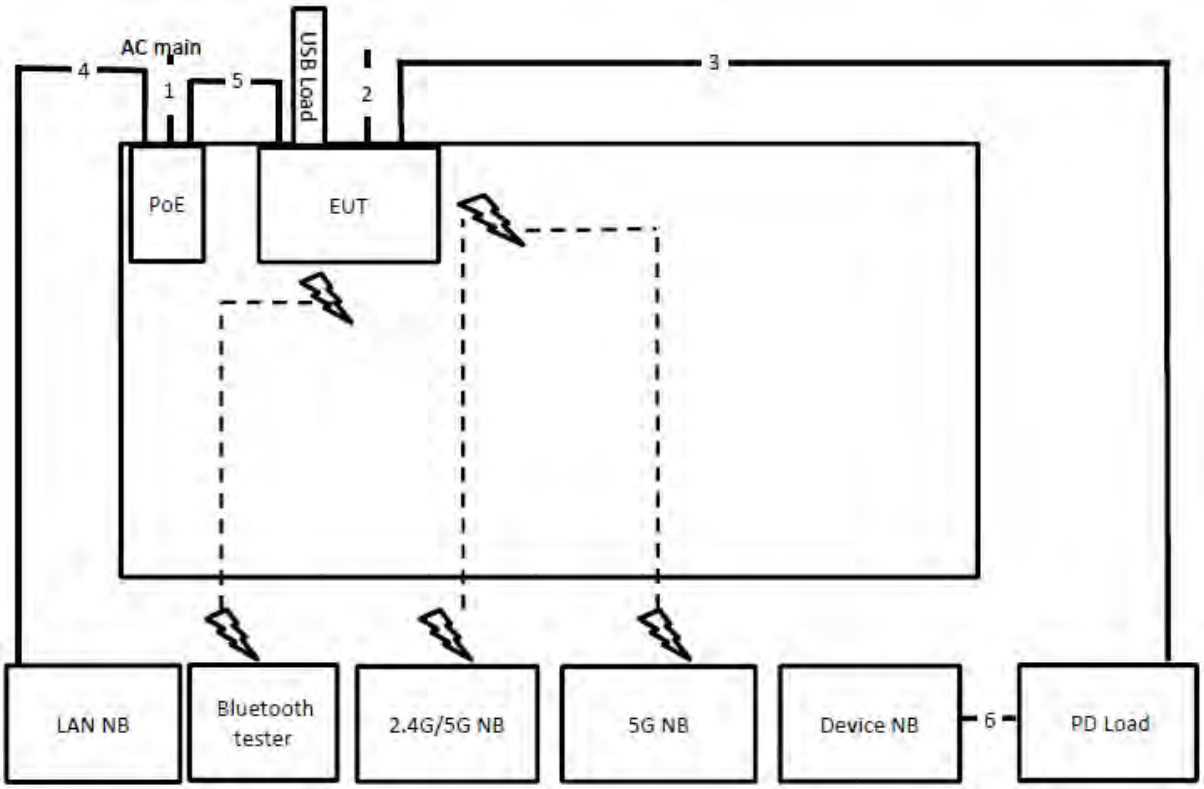
3.4.1. AC Power Line Conduction Emissions Test Configuration

For Adapter Mode:



Item	Connection	Shielded	Length
1	Power cable	No	4.3m
2	Console cable	No	1.5m
3	RJ-45 cable	No	10m
4	RJ-45 cable	No	10m
5	RJ-45 cable	No	1.5m

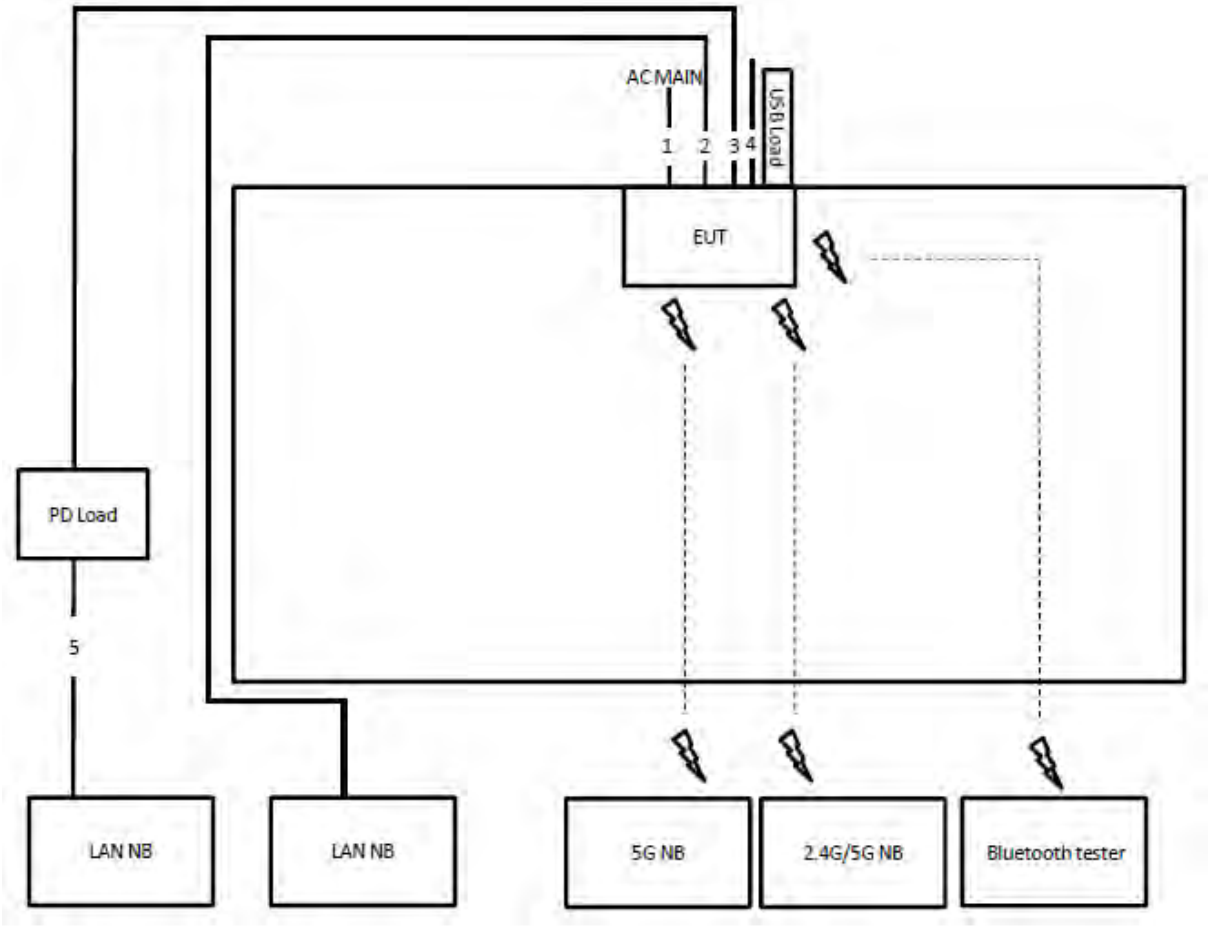
For PoE Mode:



Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	Console cable	No	1.5m
3	RJ-45 cable	No	10m
4	RJ-45 cable	No	10m
5	RJ-45 cable	No	1.5m
6	RJ-45 cable	No	1.5m

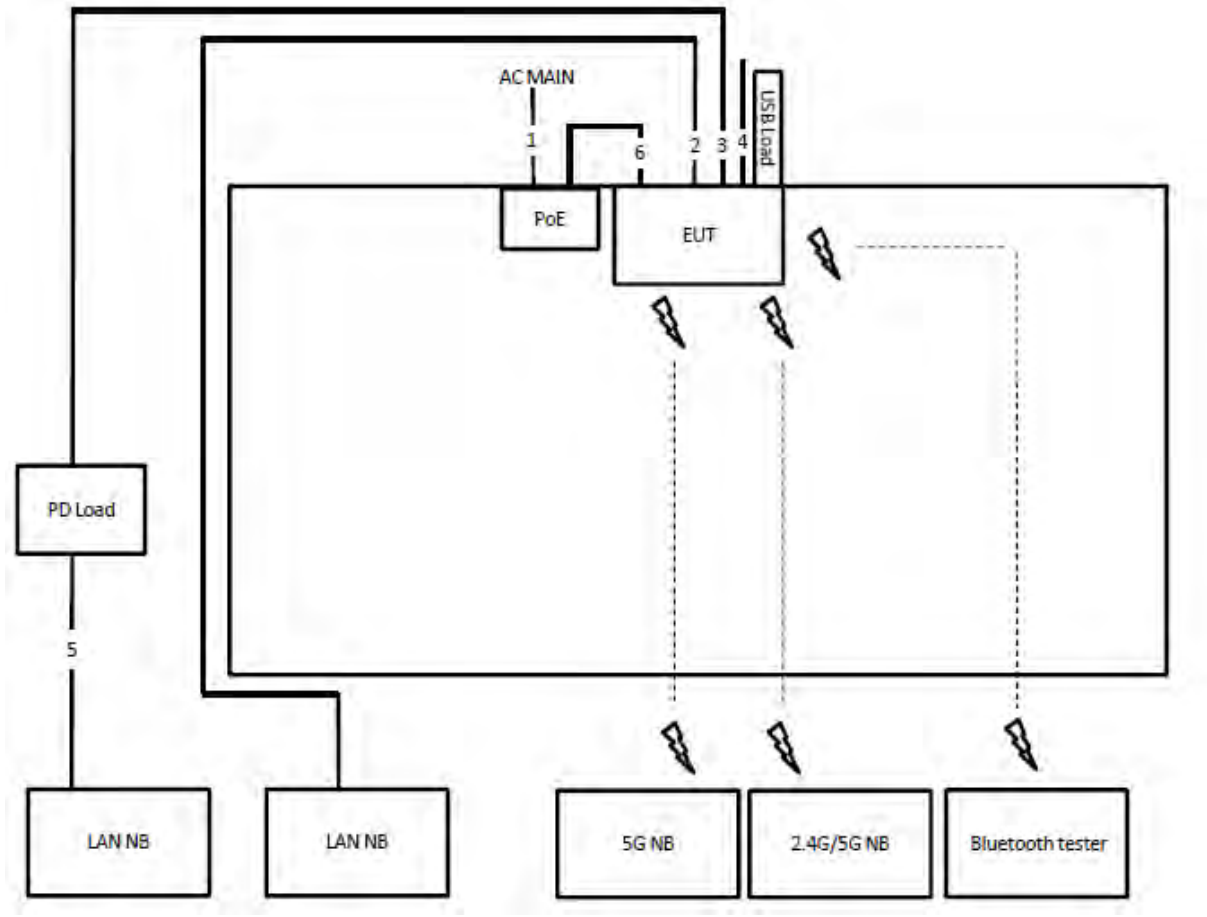
3.4.2. Radiation Emissions Test Configuration

For Adapter Mode:



Item	Connection	Shielded	Length
1	Power cable	No	4.3m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	10m
4	Console cable	No	1.5m
5	RJ-45 cable	No	1m

For PoE Mode:



Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	10m
4	Console cable	No	1.5m
5	RJ-45 cable	No	1m
6	RJ-45 cable	No	1.5m

4. General Information of Test

4.1. Test Facility

Test Site Location	:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.
TEL	:	886-3-656-9065
FAX	:	886-3-656-9085
Test Site No.	:	Conduction: CO01-CB Radiation: 03CH01-CB

4.2. Test Voltage

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

4.3. Standard for Methods of Measurement

ANSI C63.4-2014

4.4. Frequency Range Investigated

Test Items	Frequency Range
Conducted emission test	150 kHz to 30 MHz
Radiated emission test	30 MHz to 30,000 MHz

4.5. Test Distance

Test Items	Test Distance
Radiated emission test below 1 GHz (30 MHz to 1,000 MHz)	3 m
Radiated emission test above 1 GHz (1,000 MHz to 18,000 MHz)	3 m
Radiated emission test above 1 GHz (18,000 MHz to 30,000 MHz)	1 m

5. Test of Conducted Emission

5.1. Limit

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

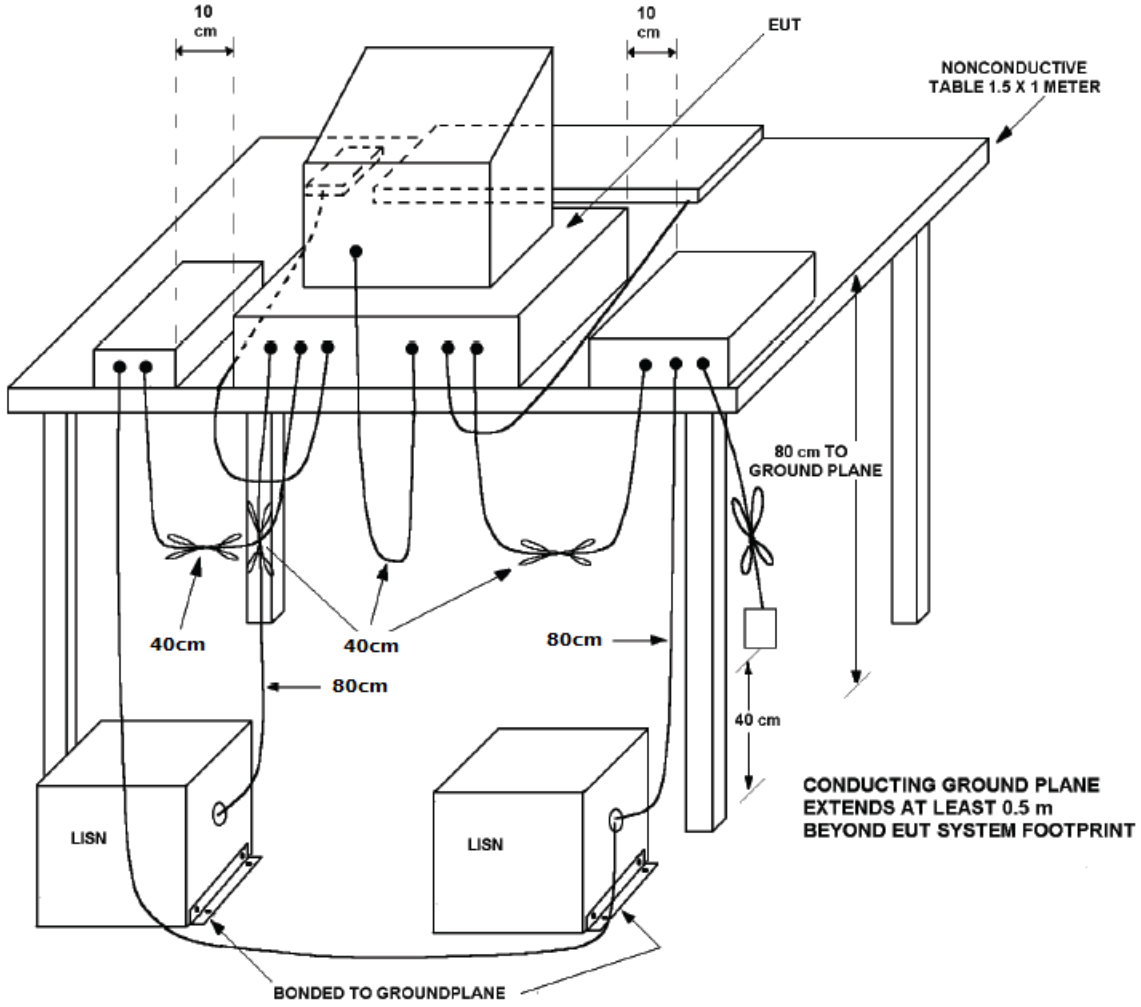
5.2. Description of Major Test Instruments

Test Receiver	R&S ESCS 30
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

5.3. Test Procedures

a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connect to the other LISN.
d. The LISN provides 50 Ω coupling impedance for the measuring instrument.
e. The FCC states that a 50 Ω, 50 uH LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

5.4. Typical Test Setup Layout of Conducted Emission

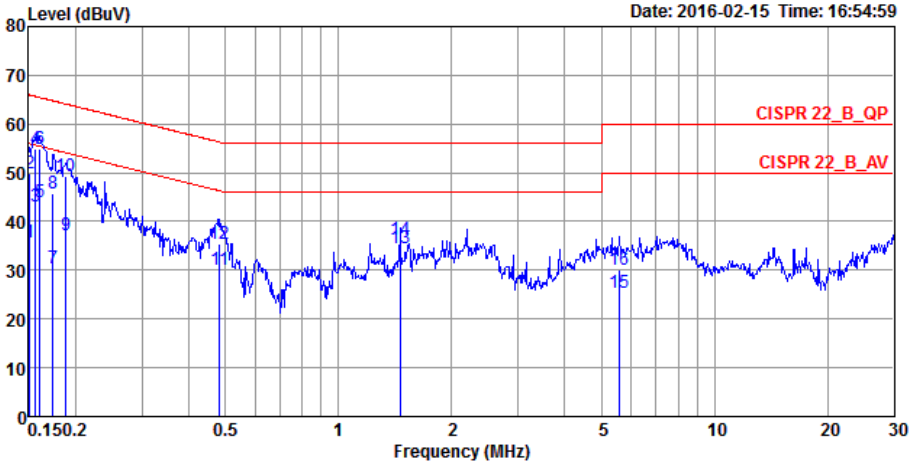


5.5. Test Result of AC Power Ports

Temperature	20℃	Humidity	50%
Test Engineer	Deven Huang	Frequency Range	0.15 MHz to 30 MHz
Test Mode	Mode 1		

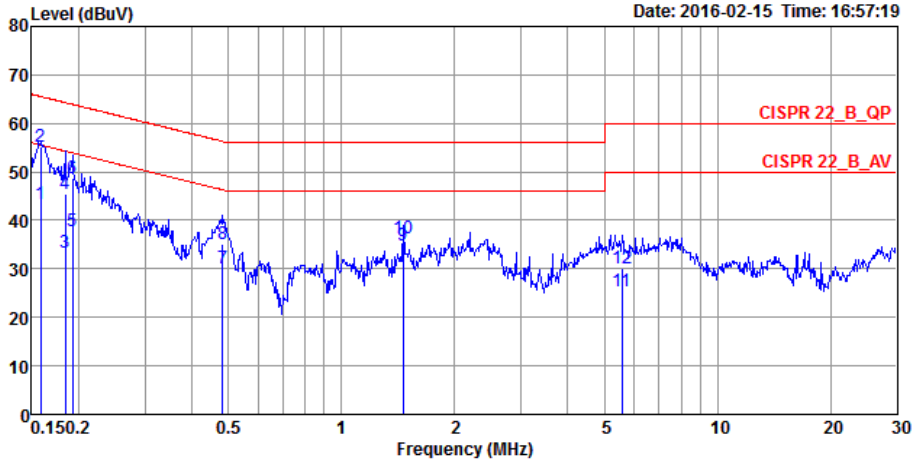
- Corrected Reading (dBuV) = LISN Factor + Cable Loss + Read Level = Level
- Margin = - Limit + (Read Level + LISN Factor + Cable Loss)
- All emissions not reported here are more than 10 dB below the prescribed limit.
- The test was passed at the minimum margin that marked by a frame in the following table

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1508	35.69	-20.27	55.96	25.74	9.93	0.02	LINE	Average
2	0.1508	49.83	-16.13	65.96	39.88	9.93	0.02	LINE	QP
3	0.1565	42.98	-12.67	55.65	33.03	9.93	0.02	LINE	Average
4	0.1565	54.99	-10.66	65.65	45.04	9.93	0.02	LINE	QP
5	0.1607	43.92	-11.51	55.43	33.97	9.93	0.02	LINE	Average
6	0.1607	54.87	-10.56	65.43	44.92	9.93	0.02	LINE	QP
7	0.1740	30.46	-24.31	54.77	20.51	9.93	0.02	LINE	Average
8	0.1740	45.88	-18.89	64.77	35.93	9.93	0.02	LINE	QP
9	0.1884	37.32	-16.79	54.11	27.37	9.93	0.02	LINE	Average
10	0.1884	49.31	-14.80	64.11	39.36	9.93	0.02	LINE	QP
11	0.4837	29.97	-16.30	46.27	19.99	9.94	0.04	LINE	Average
12	0.4837	35.32	-20.95	56.27	25.34	9.94	0.04	LINE	QP
13	1.4562	34.55	-11.45	46.00	24.51	9.98	0.06	LINE	Average
14	1.4562	36.38	-19.62	56.00	26.34	9.98	0.06	LINE	QP
15	5.5936	25.49	-24.51	50.00	15.30	10.08	0.11	LINE	Average
16	5.5936	30.18	-29.82	60.00	19.99	10.08	0.11	LINE	QP

Neutral

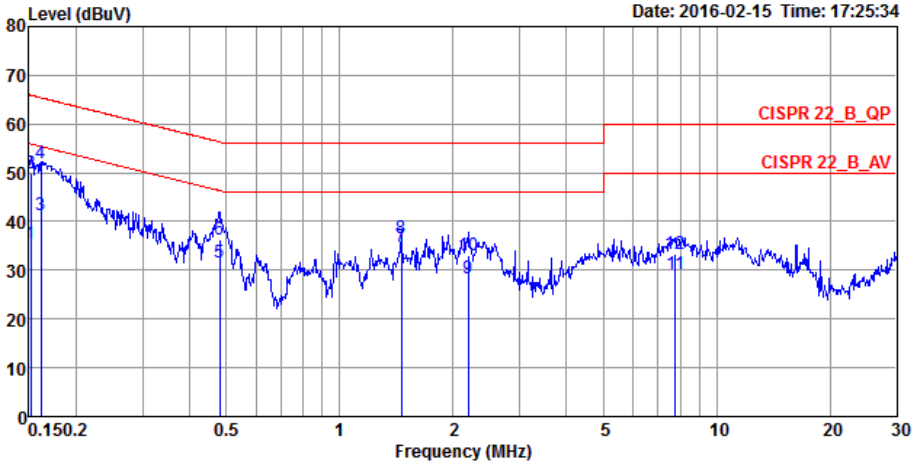


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1582	43.40	-12.16	55.56	33.60	9.78	0.02	NEUTRAL	Average
2	0.1582	55.06	-10.50	65.56	45.26	9.78	0.02	NEUTRAL	QP
3	0.1844	33.27	-21.01	54.28	23.46	9.79	0.02	NEUTRAL	Average
4	0.1844	45.55	-18.73	64.28	35.74	9.79	0.02	NEUTRAL	QP
5	0.1924	37.90	-16.03	53.93	28.09	9.79	0.02	NEUTRAL	Average
6	0.1924	48.76	-15.17	63.93	38.95	9.79	0.02	NEUTRAL	QP
7	0.4837	30.13	-16.14	46.27	20.30	9.79	0.04	NEUTRAL	Average
8	0.4837	35.23	-21.04	56.27	25.40	9.79	0.04	NEUTRAL	QP
9	1.4562	34.75	-11.25	46.00	24.86	9.83	0.06	NEUTRAL	Average
10	1.4562	36.44	-19.56	56.00	26.55	9.83	0.06	NEUTRAL	QP
11	5.5641	25.25	-24.75	50.00	15.22	9.92	0.11	NEUTRAL	Average
12	5.5641	30.19	-29.81	60.00	20.16	9.92	0.11	NEUTRAL	QP

Temperature	20℃	**Humidity**	50%
Test Engineer	Deven Huang	**Frequency Range**	0.15 MHz to 30 MHz
Test Mode	Mode 2		

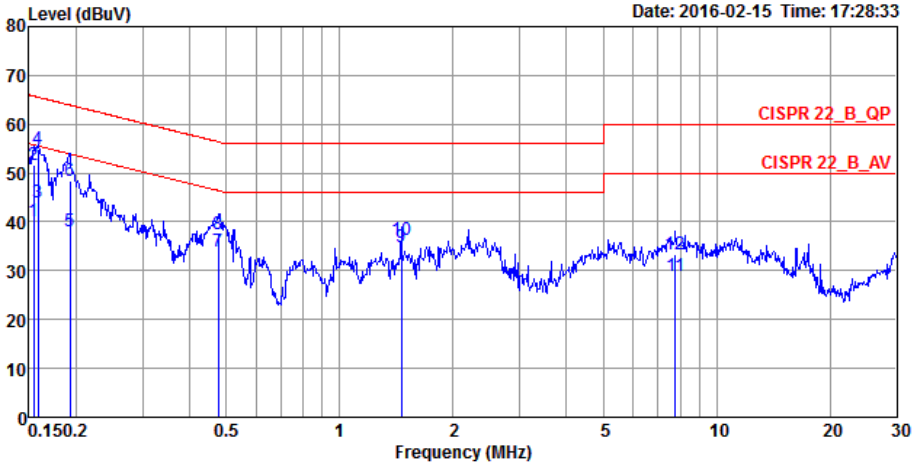
- Corrected Reading (dBuV) = LISN Factor + Cable Loss + Read Level = Level
- Margin = - Limit + (Read Level + LISN Factor + Cable Loss)
- All emissions not reported here are more than 10 dB below the prescribed limit.
- The test was passed at the minimum margin that marked by a frame in the following table

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1516	35.44	-20.47	55.91	25.49	9.93	0.02	LINE	Average
2	0.1516	49.87	-16.04	65.91	39.92	9.93	0.02	LINE	QP
3	0.1616	41.41	-13.97	55.38	31.46	9.93	0.02	LINE	Average
4	0.1616	51.93	-13.45	65.38	41.98	9.93	0.02	LINE	QP
5	0.4812	31.57	-14.75	46.32	21.59	9.94	0.04	LINE	Average
6	0.4812	36.43	-19.89	56.32	26.45	9.94	0.04	LINE	QP
7	1.4562	34.83	-11.17	46.00	24.79	9.98	0.06	LINE	Average
8	1.4562	36.63	-19.37	56.00	26.59	9.98	0.06	LINE	QP
9	2.1898	28.36	-17.64	46.00	18.31	9.99	0.06	LINE	Average
10	2.1898	33.12	-22.88	56.00	23.07	9.99	0.06	LINE	QP
11	7.7689	29.22	-20.78	50.00	18.93	10.13	0.16	LINE	Average
12	7.7689	33.25	-26.75	60.00	22.96	10.13	0.16	LINE	QP

Neutral

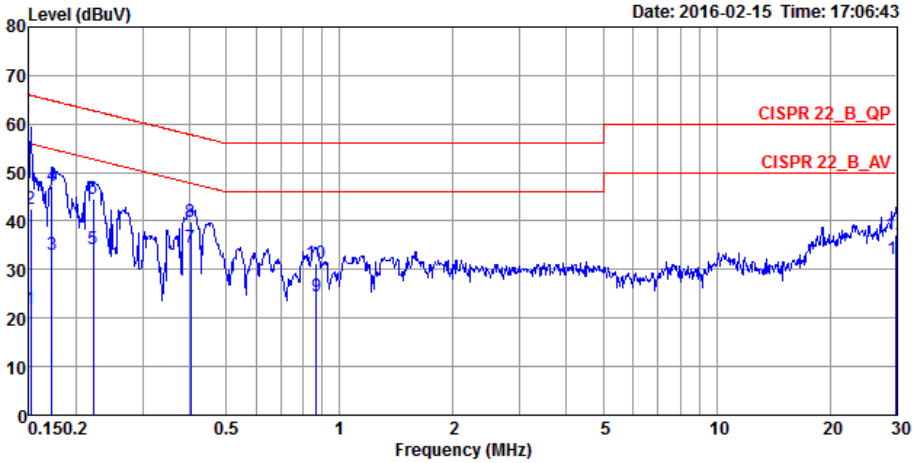


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1540	40.07	-15.71	55.78	30.27	9.78	0.02	NEUTRAL	Average
2	0.1540	51.64	-14.14	65.78	41.84	9.78	0.02	NEUTRAL	QP
3	0.1582	44.10	-11.46	55.56	34.30	9.78	0.02	NEUTRAL	Average
4	0.1582	54.86	-10.70	65.56	45.06	9.78	0.02	NEUTRAL	QP
5	0.1924	38.04	-15.89	53.93	28.23	9.79	0.02	NEUTRAL	Average
6	0.1924	48.44	-15.49	63.93	38.63	9.79	0.02	NEUTRAL	QP
7	0.4761	34.02	-12.39	46.41	24.19	9.79	0.04	NEUTRAL	Average
8	0.4761	37.54	-18.87	56.41	27.71	9.79	0.04	NEUTRAL	QP
9	1.4562	34.75	-11.25	46.00	24.86	9.83	0.06	NEUTRAL	Average
10	1.4562	36.44	-19.56	56.00	26.55	9.83	0.06	NEUTRAL	QP
11	7.7689	28.92	-21.08	50.00	18.79	9.97	0.16	NEUTRAL	Average
12	7.7689	33.45	-26.55	60.00	23.32	9.97	0.16	NEUTRAL	QP

Temperature	20℃	**Humidity**	50%
Test Engineer	Deven Huang	**Frequency Range**	0.15 MHz to 30 MHz
Test Mode	Mode 3		

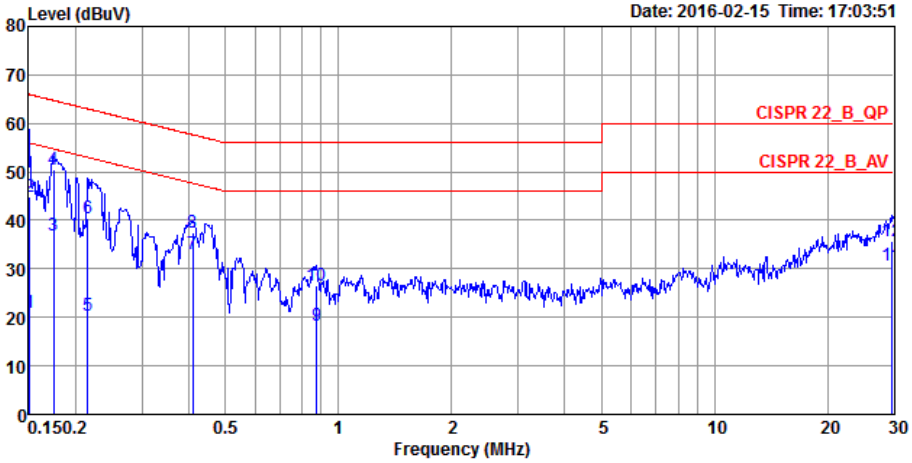
- Corrected Reading (dBuV) = LISN Factor + Cable Loss + Read Level = Level
- Margin = - Limit + (Read Level + LISN Factor + Cable Loss)
- All emissions not reported here are more than 10 dB below the prescribed limit.
- The test was passed at the minimum margin that marked by a frame in the following table

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1516	21.77	-34.14	55.91	11.82	9.93	0.02	LINE	Average
2	0.1516	42.55	-23.36	65.91	32.60	9.93	0.02	LINE	QP
3	0.1722	33.08	-21.78	54.86	23.13	9.93	0.02	LINE	Average
4	0.1722	47.34	-17.52	64.86	37.39	9.93	0.02	LINE	QP
5	0.2220	34.11	-18.63	52.74	24.15	9.93	0.03	LINE	Average
6	0.2220	44.53	-18.21	62.74	34.57	9.93	0.03	LINE	QP
7	0.4019	34.47	-13.34	47.81	24.50	9.93	0.04	LINE	Average
8	0.4019	39.75	-18.06	57.81	29.78	9.93	0.04	LINE	QP
9	0.8664	24.53	-21.47	46.00	14.53	9.96	0.04	LINE	Average
10	0.8664	31.21	-24.79	56.00	21.21	9.96	0.04	LINE	QP
11	30.0000	32.28	-17.72	50.00	21.32	10.68	0.28	LINE	Average
12	30.0000	37.13	-22.87	60.00	26.17	10.68	0.28	LINE	QP

Neutral



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1508	20.88	-35.08	55.96	11.08	9.78	0.02	NEUTRAL	Average
2	0.1508	45.01	-20.95	65.96	35.21	9.78	0.02	NEUTRAL	QP
3	0.1749	36.99	-17.73	54.72	27.18	9.79	0.02	NEUTRAL	Average
4	0.1749	50.50	-14.22	64.72	40.69	9.79	0.02	NEUTRAL	QP
5	0.2151	20.36	-32.65	53.01	10.55	9.79	0.02	NEUTRAL	Average
6	0.2151	40.58	-22.43	63.01	30.77	9.79	0.02	NEUTRAL	QP
7	0.4105	33.03	-14.61	47.64	23.20	9.79	0.04	NEUTRAL	Average
8	0.4105	37.45	-20.19	57.64	27.62	9.79	0.04	NEUTRAL	QP
9	0.8757	18.32	-27.68	46.00	8.46	9.81	0.05	NEUTRAL	Average
10	0.8757	26.71	-29.29	56.00	16.85	9.81	0.05	NEUTRAL	QP
11	29.5269	30.80	-19.20	50.00	20.18	10.34	0.28	NEUTRAL	Average
12	29.5269	35.62	-24.38	60.00	25.00	10.34	0.28	NEUTRAL	QP

6. Test of Radiated Emission

6.1. Limit

Radiated Emission below 1 GHz test at 3 m:

Frequency (MHz)	QP (dBuV/m)
30~88	40
88~216	43.5
216~960	46
Above 960	54

Radiated Emission 1~18 GHz test at 3 m:

Frequency (MHz)	PK (dBuV/m)	AV (dBuV/m)
1,000 to 18,000	74	54

Radiated Emission 18~30 GHz test at 1 m:

Frequency (MHz)	PK (dBuV/m)	AV (dBuV/m)
18,000 to 30,000	83.54	63.54

6.2. Description of Major Test Instruments

6.2.1. 30 MHz ~ 1,000 MHz

Receiver Parameter	Setting
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

6.2.2. Above 1 GHz

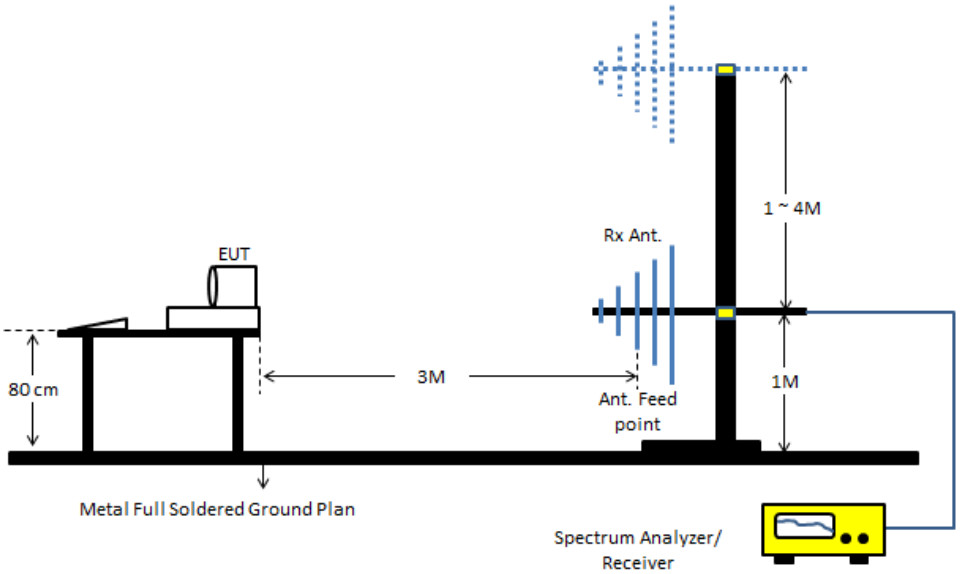
Spectrum Parameter	Setting
Start Frequency	1000 MHz
Stop Frequency	5th harmonic of highest frequency
RBW / VBW	1 MHz / 3MHz for Peak ; 1 MHz / 1Hz for Average

6.3. Test Procedures

a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 3m (below 1GHz) / 3m (1GHz-18GHz) / 1m (18GHz-30GHz) 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 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. For testing above 1GHz, the 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.

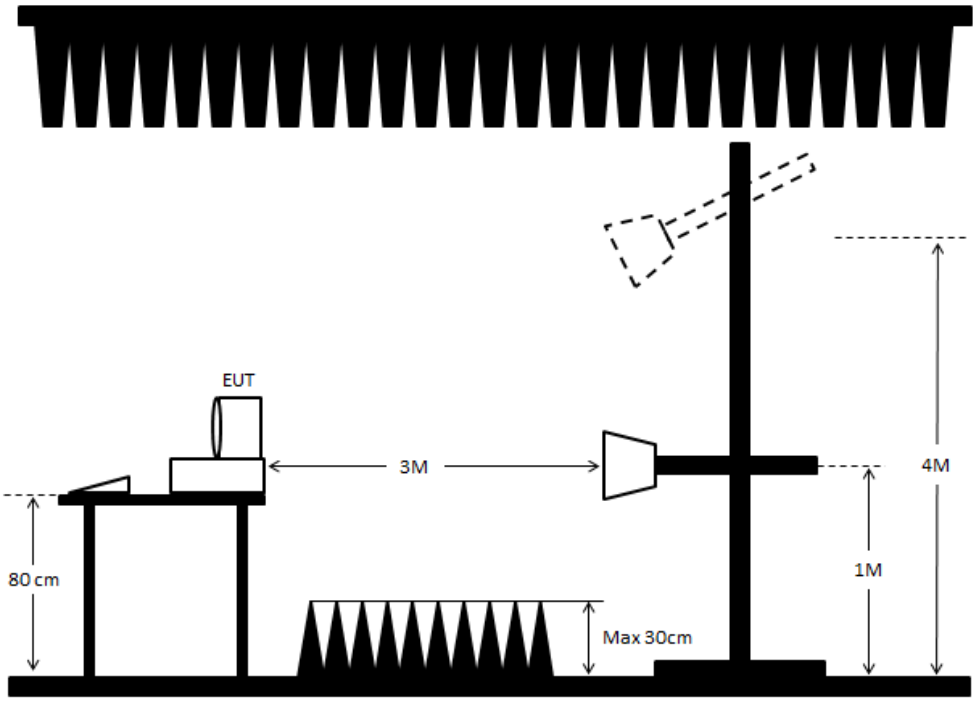
6.4. Typical Test Setup Layout of Radiated Emission

<Below 1 GHz>:

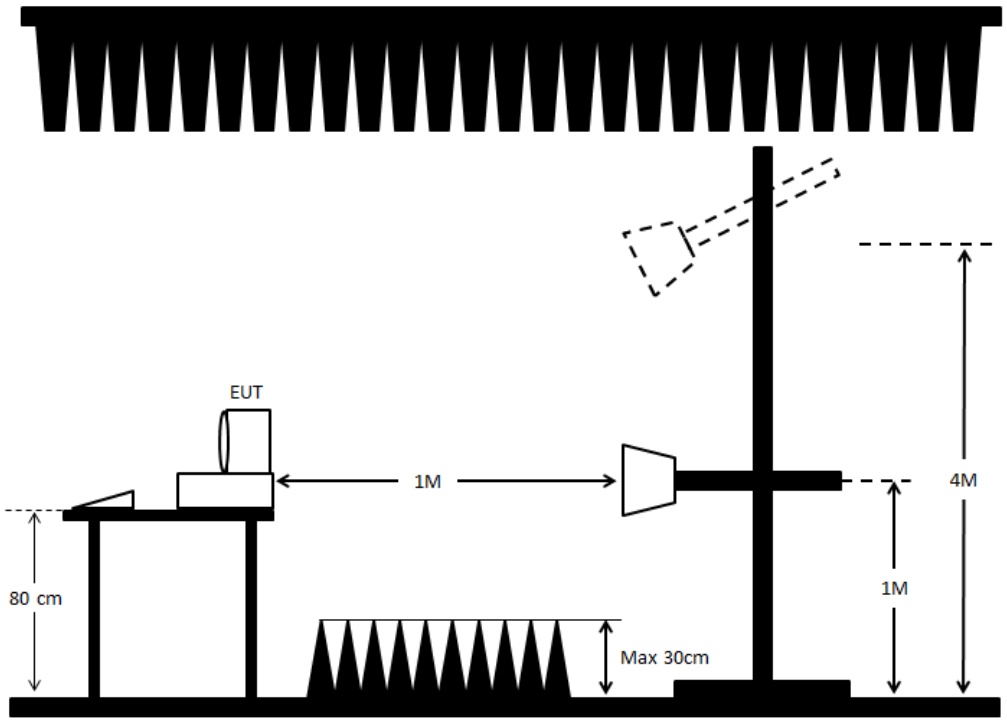


<Above 1 GHz>:

1,000~18,000 MHz



18,000~30,000 MHz

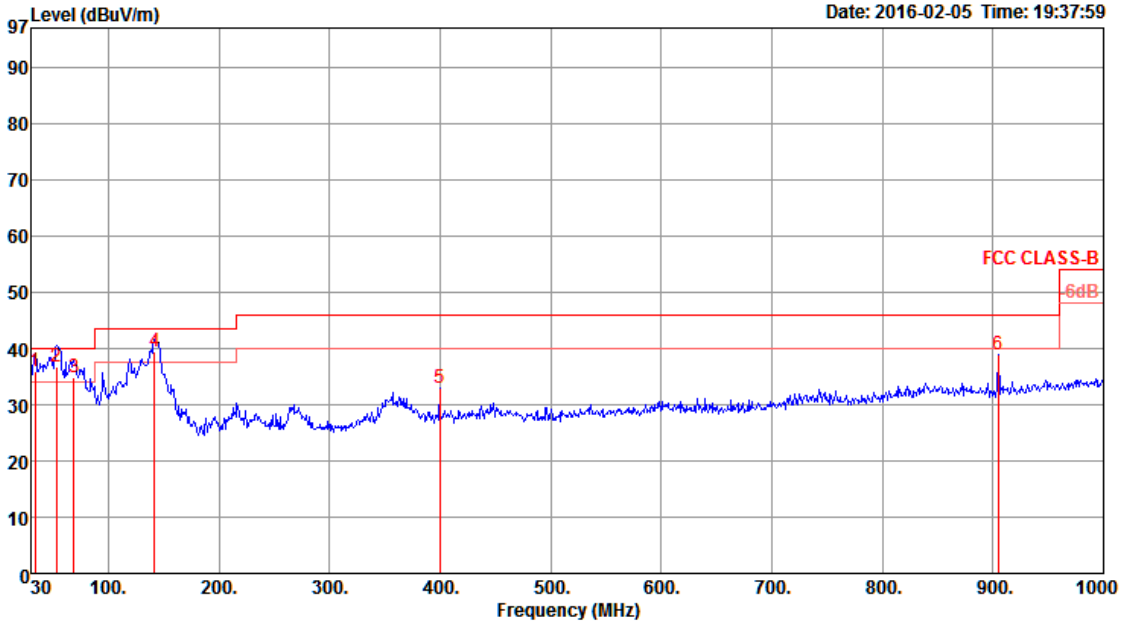


6.5. Test Result of Radiated Emission below 1 GHz

Temperature	24℃	**Humidity**	55%
Test Engineer	Lucke Hsieh	**Frequency Range**	30 MHz to 1,000 MHz
Test Mode	Mode 1		

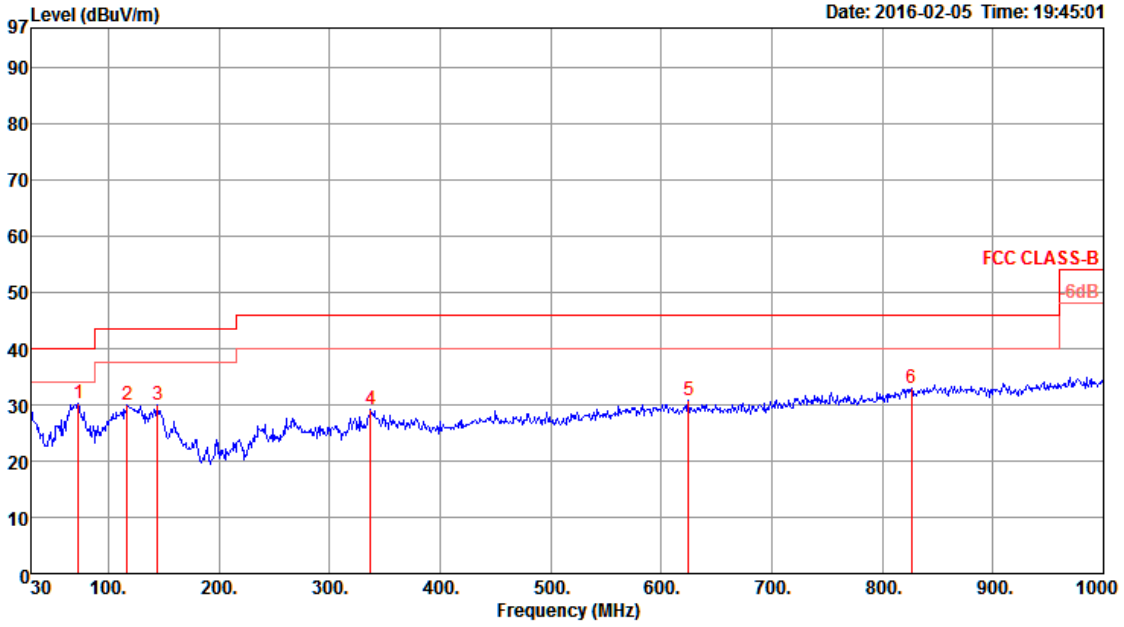
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
- Margin = - Limit + (Read Level + Antenna Factor + Cable Loss - Preamp Factor)
- The test was passed at the minimum margin that marked by the frame in the following test record

Vertical 30 MHz to 1,000 MHz



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	33.88	36.06	40.00	-3.94	42.22	0.22	23.11	29.49	212	100	QP	VERTICAL
2	53.28	36.82	40.00	-3.18	52.11	0.41	13.74	29.44	178	100	QP	VERTICAL
3	68.80	34.94	40.00	-5.06	51.62	0.48	12.21	29.37	155	104	QP	VERTICAL
4	141.55	39.43	43.50	-4.07	50.11	0.89	17.48	29.05	122	182	QP	VERTICAL
5	399.57	32.86	46.00	-13.14	37.76	1.79	22.36	29.05	132	125	Peak	VERTICAL
6	904.94	38.80	46.00	-7.20	36.22	2.96	27.54	27.92	119	100	Peak	VERTICAL

Horizontal 30 MHz to 1,000 MHz

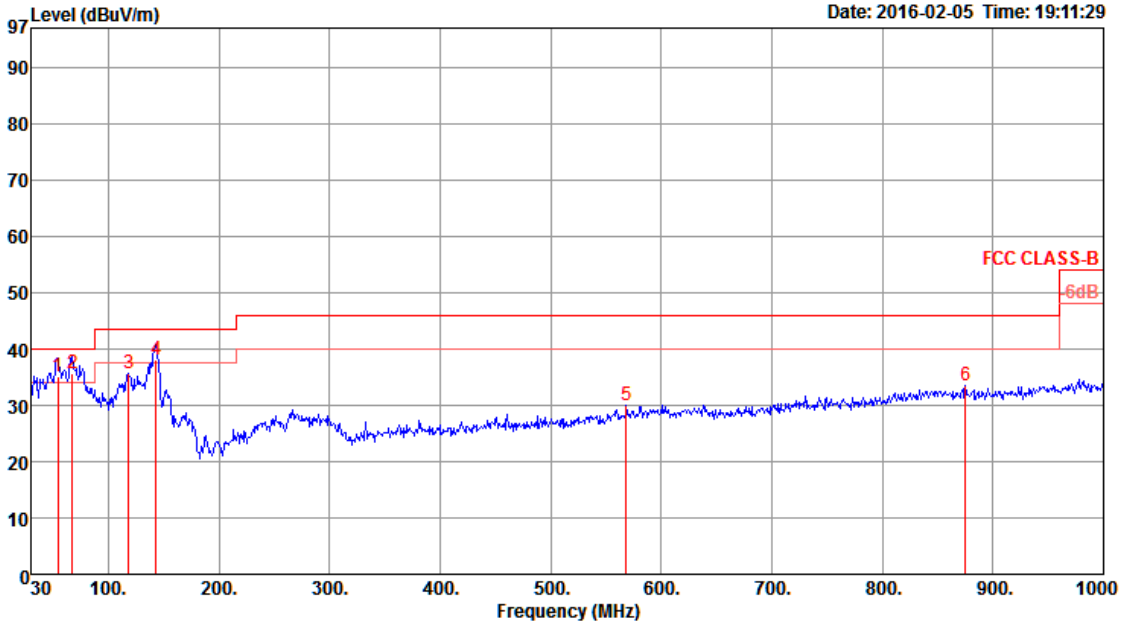


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	72.68	30.19	40.00	-9.81	46.59	0.52	12.44	29.36	137	100	Peak	HORIZONTAL
2	117.30	30.07	43.50	-13.43	40.23	0.79	18.22	29.17	188	125	Peak	HORIZONTAL
3	144.46	29.94	43.50	-13.56	40.83	0.90	17.24	29.03	237	100	Peak	HORIZONTAL
4	337.49	29.15	46.00	-16.85	35.50	1.62	20.65	28.62	258	100	Peak	HORIZONTAL
5	624.61	30.81	46.00	-15.19	32.36	2.35	25.21	29.11	151	150	Peak	HORIZONTAL
6	826.37	32.95	46.00	-13.05	31.54	2.85	26.98	28.42	234	100	Peak	HORIZONTAL

Temperature	24℃	**Humidity**	55%
Test Engineer	Lucke Hsieh	**Frequency Range**	30 MHz to 1,000 MHz
Test Mode	Mode 2		

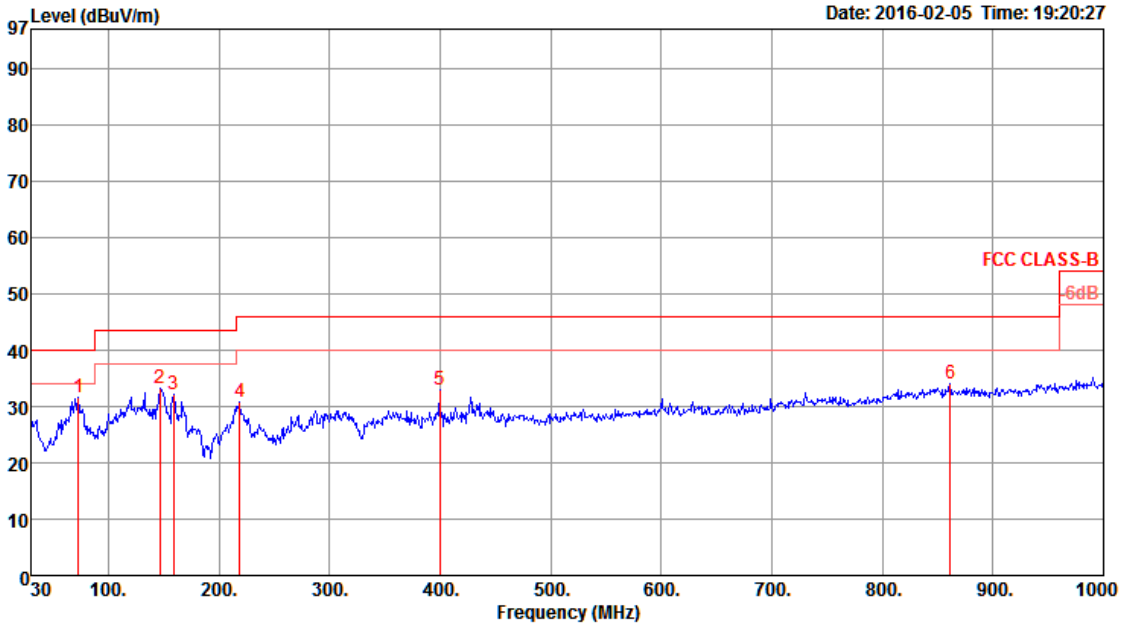
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
- Margin = - Limit + (Read Level + Antenna Factor + Cable Loss - Preamp Factor)
- The test was passed at the minimum margin that marked by the frame in the following test record

Vertical 30 MHz to 1,000 MHz



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	54.25	35.23	40.00	-4.77	50.73	0.41	13.53	29.44	136	100	QP	VERTICAL
2	67.83	35.78	40.00	-4.22	52.46	0.48	12.22	29.38	102	125	QP	VERTICAL
3	118.27	35.71	43.50	-7.79	45.83	0.79	18.25	29.16	156	100	Peak	VERTICAL
4	143.49	38.19	43.50	-5.31	49.01	0.90	17.32	29.04	77	100	QP	VERTICAL
5	568.35	30.04	46.00	-15.96	32.32	2.21	24.75	29.24	247	100	Peak	VERTICAL
6	874.87	33.47	46.00	-12.53	31.31	2.93	27.35	28.12	308	125	Peak	VERTICAL

Horizontal 30 MHz to 1,000 MHz

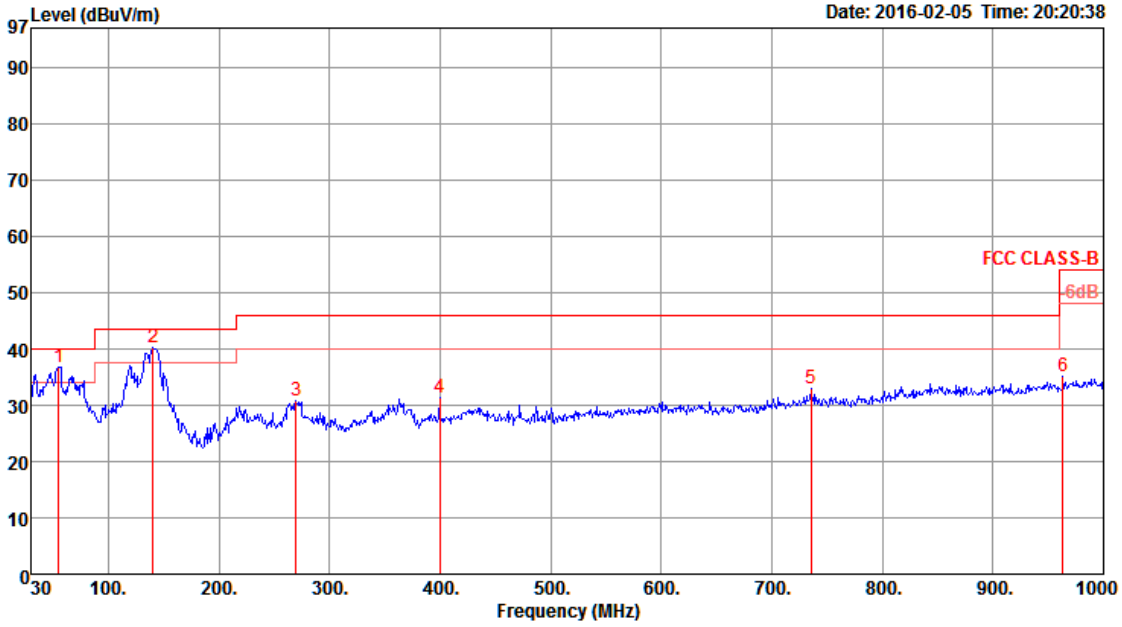


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	72.68	31.61	40.00	-8.39	48.01	0.52	12.44	29.36	251	100	Peak	HORIZONTAL
2	146.40	33.30	43.50	-10.20	44.34	0.91	17.08	29.03	137	120	Peak	HORIZONTAL
3	159.01	32.07	43.50	-11.43	43.68	0.95	16.42	28.98	189	150	Peak	HORIZONTAL
4	219.15	30.75	46.00	-15.25	42.05	1.21	16.21	28.72	178	100	Peak	HORIZONTAL
5	399.57	32.85	46.00	-13.15	37.75	1.79	22.36	29.05	231	100	Peak	HORIZONTAL
6	861.29	34.06	46.00	-11.94	32.12	2.90	27.26	28.22	331	200	Peak	HORIZONTAL

Temperature	24℃	**Humidity**	55%
Test Engineer	Lucke Hsieh	**Frequency Range**	30 MHz to 1,000 MHz
Test Mode	Mode 3		

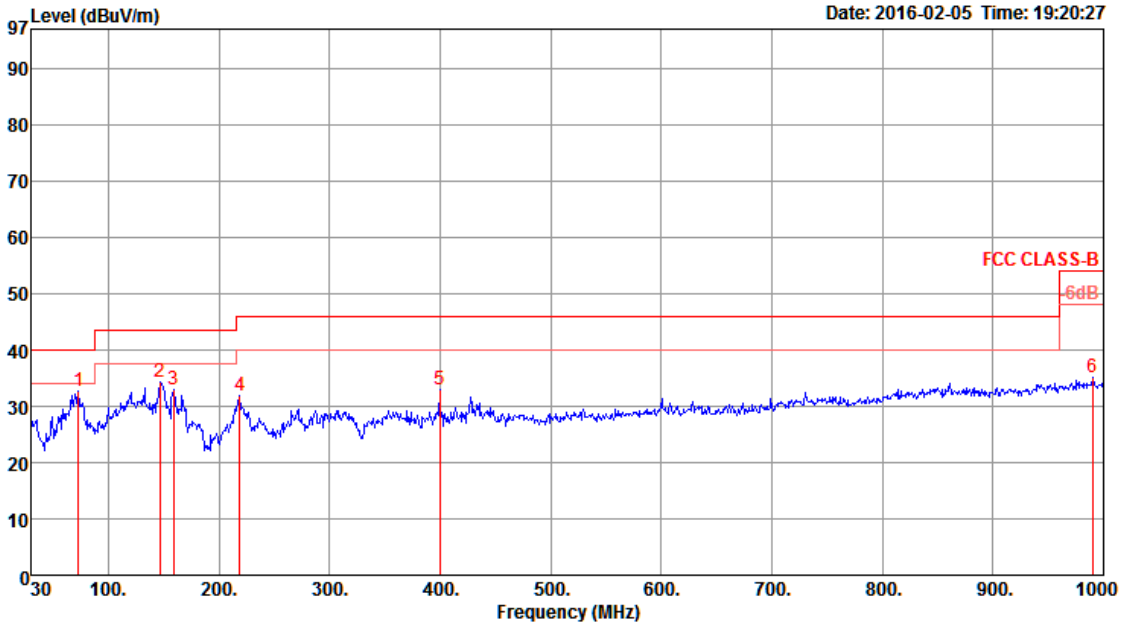
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
- Margin = - Limit + (Read Level + Antenna Factor + Cable Loss - Preamp Factor)
- The test was passed at the minimum margin that marked by the frame in the following test record

Vertical 30 MHz to 1,000 MHz



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	55.22	36.87	40.00	-3.13	52.56	0.42	13.32	29.43	0	400	Peak	VERTICAL
2	140.58	40.28	43.50	-3.22	50.88	0.89	17.56	29.05	0	400	Peak	VERTICAL
3	269.59	30.91	46.00	-15.09	38.55	1.40	19.42	28.46	0	400	Peak	VERTICAL
4	399.57	31.29	46.00	-14.71	36.19	1.79	22.36	29.05	0	400	Peak	VERTICAL
5	735.19	32.85	46.00	-13.15	32.92	2.64	26.09	28.80	0	400	Peak	VERTICAL
6	963.14	35.01	54.00	-18.99	31.67	3.00	27.85	27.51	0	400	Peak	VERTICAL

Horizontal 30 MHz to 1,000 MHz

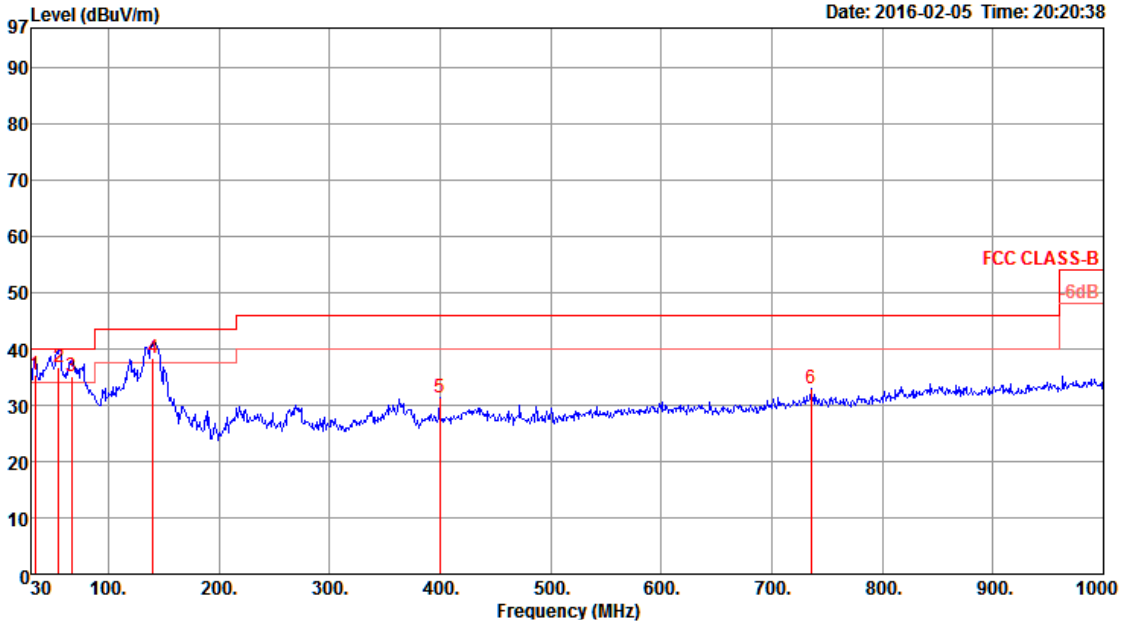


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	72.68	32.61	40.00	-7.39	49.01	0.52	12.44	29.36	0	100	Peak	HORIZONTAL
2	146.40	34.30	43.50	-9.20	45.34	0.91	17.08	29.03	0	100	Peak	HORIZONTAL
3	159.01	33.07	43.50	-10.43	44.68	0.95	16.42	28.98	0	100	Peak	HORIZONTAL
4	219.15	31.75	46.00	-14.25	43.05	1.21	16.21	28.72	0	100	Peak	HORIZONTAL
5	399.57	32.85	46.00	-13.15	37.75	1.79	22.36	29.05	0	100	Peak	HORIZONTAL
6	990.30	35.19	54.00	-18.81	31.53	3.01	27.96	27.31	0	100	Peak	HORIZONTAL

Temperature	24℃	**Humidity**	55%
Test Engineer	Lucke Hsieh	**Frequency Range**	30 MHz to 1,000 MHz
Test Mode	Mode 4		

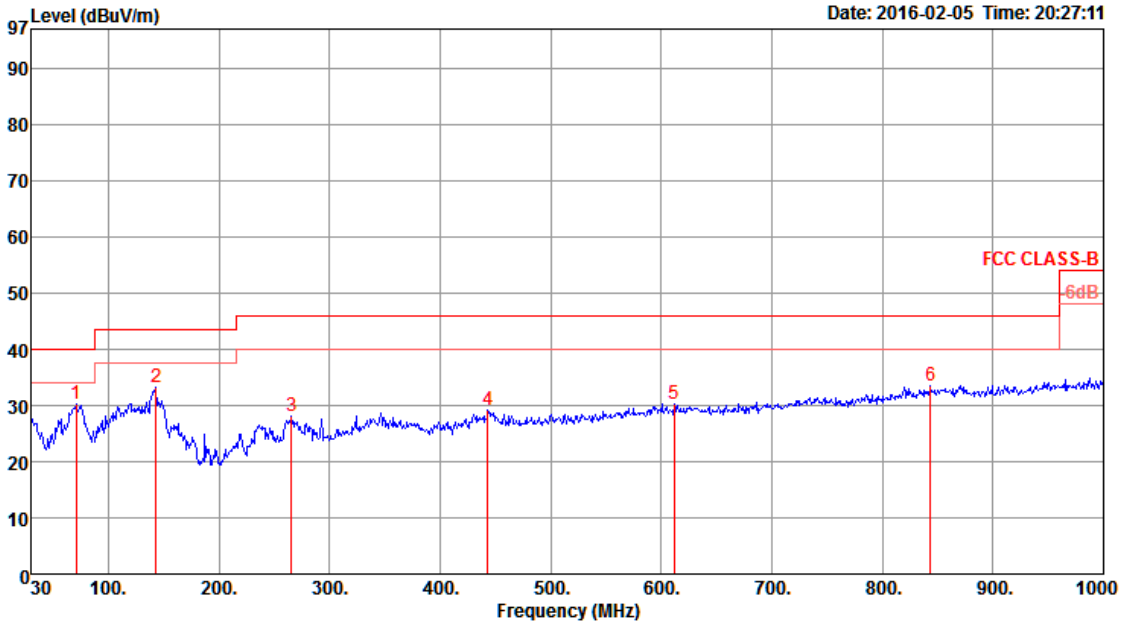
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
- Margin = - Limit + (Read Level + Antenna Factor + Cable Loss - Preamp Factor)
- The test was passed at the minimum margin that marked by the frame in the following test record

Vertical 30 MHz to 1,000 MHz



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	33.88	35.27	40.00	-4.73	41.43	0.22	23.11	29.49	178	100	QP	VERTICAL
2	55.22	36.63	40.00	-3.37	52.32	0.42	13.32	29.43	157	100	QP	VERTICAL
3	66.86	35.00	40.00	-5.00	51.68	0.47	12.23	29.38	167	125	QP	VERTICAL
4	140.58	38.42	43.50	-5.08	49.02	0.89	17.56	29.05	258	192	QP	VERTICAL
5	399.57	31.29	46.00	-14.71	36.19	1.79	22.36	29.05	211	100	Peak	VERTICAL
6	735.19	32.85	46.00	-13.15	32.92	2.64	26.09	28.80	151	100	Peak	VERTICAL

Horizontal 30 MHz to 1,000 MHz



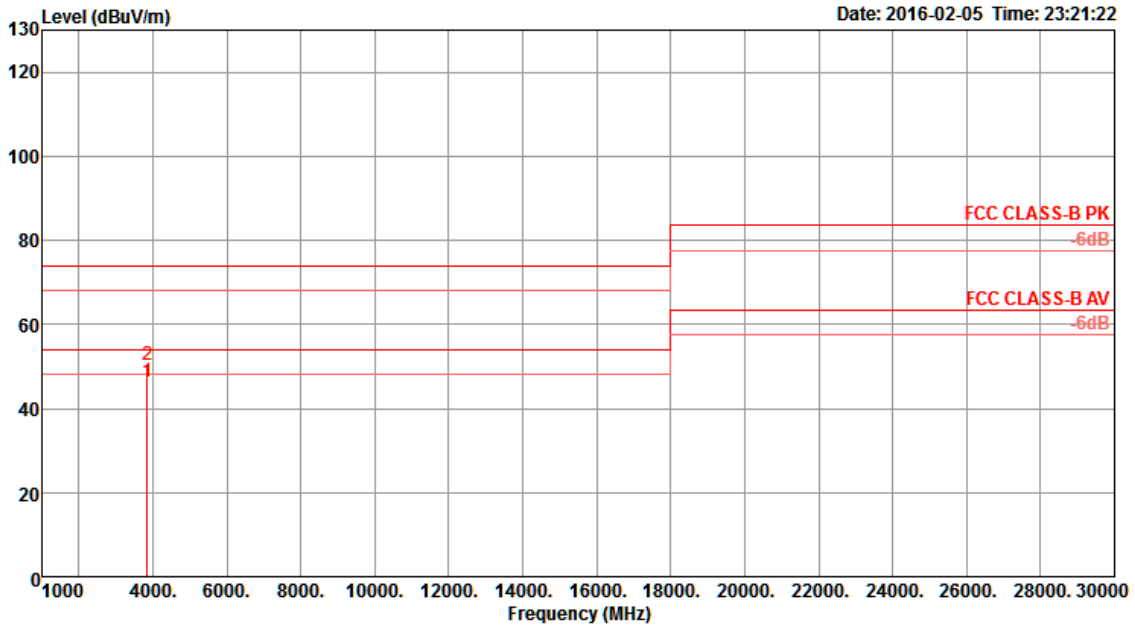
	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	70.74	30.29	40.00	-9.71	46.89	0.49	12.27	29.36	158	100	Peak	HORIZONTAL
2	143.49	33.13	43.50	-10.37	43.95	0.90	17.32	29.04	132	100	Peak	HORIZONTAL
3	265.71	28.04	46.00	-17.96	35.65	1.38	19.49	28.48	115	100	Peak	HORIZONTAL
4	443.22	29.18	46.00	-16.82	33.47	1.90	23.02	29.21	254	200	Peak	HORIZONTAL
5	612.00	30.32	46.00	-15.68	32.05	2.32	25.10	29.15	152	150	Peak	HORIZONTAL
6	843.83	33.63	46.00	-12.37	31.93	2.88	27.14	28.32	92	100	Peak	HORIZONTAL

6.6. Test Result of Radiated Emission above 1 GHz

Temperature	24℃	**Humidity**	55%
Test Engineer	Lucke Hsieh	**Frequency Range**	1,000 MHz to 30,000 MHz
Test Mode	Mode 3		

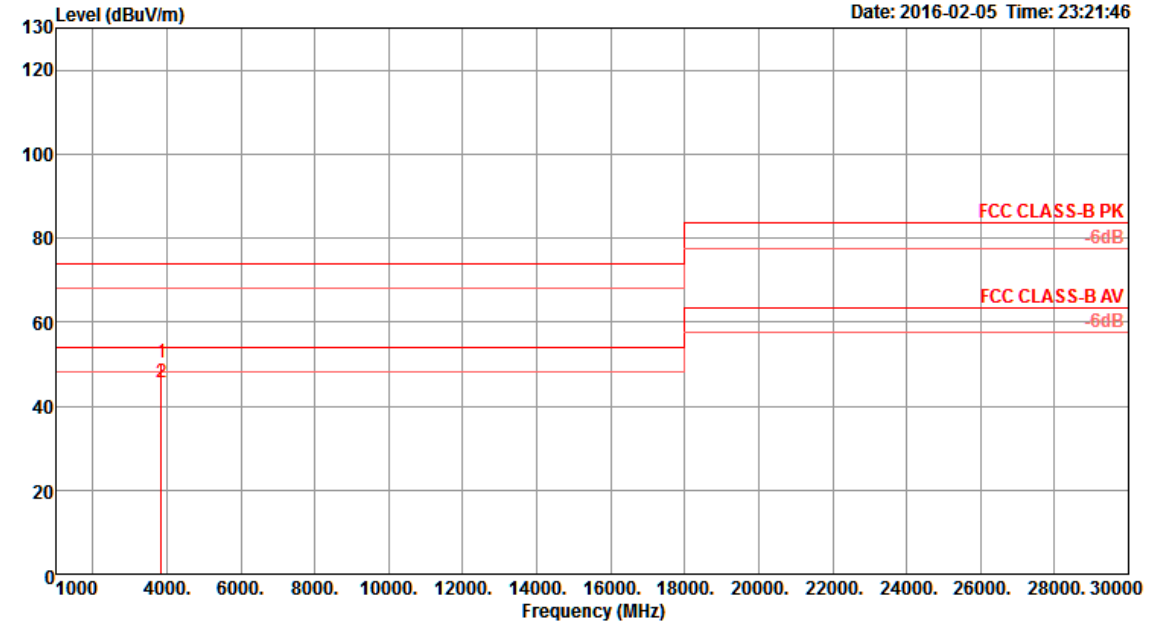
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
- Margin = - Limit + (Read Level + Antenna Factor + Cable Loss - Preamp Factor)
- The test was passed at the minimum margin that marked by the frame in the following test record

Vertical 1,000 MHz to 30,000 MHz



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	3851.94	46.24	54.00	-7.76	44.26	5.00	31.44	34.46	82	109	Average	VERTICAL
2	3852.07	50.27	74.00	-23.73	48.29	5.00	31.44	34.46	82	109	Peak	VERTICAL

Horizontal 1,000 MHz to 30,000 MHz



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	3851.84	50.25	74.00	-23.75	48.27	5.00	31.44	34.46	240	109	Peak	HORIZONTAL
2	3851.91	45.69	54.00	-8.31	43.71	5.00	31.44	34.46	240	109	Average	HORIZONTAL

7. List of Measuring Equipment Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100355	9kHz ~ 2.75GHz	Apr. 22, 2015	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 08, 2015	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 23, 2015	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 25, 2015	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	37880	20MHz ~ 2GHz	Sep. 03, 2015	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Feb. 24, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Feb.10, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
EMI Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8.4GHz	Jan. 27, 2016	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz ~ 1 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-17	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Test Software	Audix	E3	6.2009-l0-7	N/A	N/A	Radiation (03CH01-CB)

※ Calibration Interval of instruments listed above is one year.

※ N.C.R. means Non-Calibration required.

8. Uncertainty of Test Site

Test Items	Uncertainty	Remark
Conducted Emissions	3.2 dB	Confidence levels of 95%
Radiated Emissions below 1GHz	3.6 dB	Confidence levels of 95%
Radiated Emissions 1GHz ~ 18GHz	3.7 dB	Confidence levels of 95%
Radiated Emissions 18GHz ~ 40GHz	3.5 dB	Confidence levels of 95%