FCC Verification Test Report

Report No.:	FV161221E06
Test Model:	Wedge100S
Received Date:	Dec. 21, 2016
Test Date:	Jan. 07 to 16, 2017
Issued Date:	Feb. 08, 2017
Applicant:	Accton Technology Corporation
Address:	No.1, Creation Rd. III, Science-based Industrial Park, Hsinchu, Taiwan, R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
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The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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Release Control Record

Issue No.	Description	Date Issued
FV161221E06	Original release.	Feb. 08, 2017

1 Certificate of Conformity

Product:	Ethernet Switch
Brand:	Facebook
Test Model:	Wedge100S
Sample Status:	R&D SAMPLE
Applicant:	Accton Technology Corporation
Test Date:	Jan. 07 to 16, 2017
Standards:	47 CFR FCC Part 15: 2015, Subpart B, Class A ICES-003:2016 Issue 6, Class A ANSI C63.4:2014

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

Prepared by : _____ , **Date:** Feb. 08, 2017

Midoli Peng / Specialist

Approved by : _____ , **Date:** Feb. 08, 2017

Ken Lu / Manager

2 Summary of Test Results

47 CFR FCC Part 15: 2015, Subpart B, / ICES-003:2016 Issue 6, Class A ANSI C63.4:2014				
FCC Clause	ICES-003 Clause	Test Item	Result/Remarks	Verdict
15.107	6.1	AC Power Line Conducted Emissions	Minimum passing Class A margin is -15.91 dB at 0.20080 MHz	Pass
15.109	6.2.1	Radiated Emissions up to 1 GHz	Minimum passing Class A margin is -3.22 dB at 150.01 MHz	Pass
	6.2.2	Radiated Emissions above 1 GHz	Minimum passing Class A margin is -7.74 dB at 17966.79 MHz	Pass

Note: There is no deviation to the applied test methods and requirements covered by the scope of this report.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.83 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	3.62 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.34 dB
	6GHz ~ 18GHz	3.51 dB
	18GHz ~ 40GHz	3.30 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 Features of EUT

The tests reported herein were performed according to the method specified by Accton Technology Corporation, for detailed feature description, please refer to the manufacturer's specifications or user's manual.

3.2 General Description of EUT

Product	Ethernet Switch
Brand	Facebook
Test Model	Wedge100S
Sample Status	R&D SAMPLE
Operating Software	NA
Power Supply Information	Refer to Note 2
Accessory Device	NA
Data Cable Supplied	NA
I/O Port	QSFP28 x32 RJ45 MGMT x1 RJ45 console x1 Type-A USB2 x1 Facebook 14-pin debug connector x1 RJ485 x3 GPIO x1

Note:

1. The test frequency range was performed up to 40GHz for radiated emission test.
2. The EUT must be supplied with power supplies as below table.

Internal AC Power supply		
Brand	Model	Specification
Bel power	SPAFCBK-14G	Device Type: Slide-in Input AC: 100-240V, 9-4A, 50-60Hz Output DC: 12V/3.3V, 62A/3A
Internal DC Power supply		
Brand	Model	Specification
Accton	Wedge100-PWR-Module	Device Type: Slide-in 12V, 29A

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

The EUT is designed with AC power of rating 100-240Vac, 50-60Hz & DC 12V.

Test modes are presented in the report as below.

Test Condition				
Conducted emission test				
Test Mode	PSU (Brand)	PSU	Port 1 to 32 For DAC	MGMT
Mode 1	Bel power	Two power (Left PSU tested)	100Gbps	1Gbps
Mode 2	Bel power	Two power (Right PSU tested)	100Gbps	1Gbps
Mode 3	Accton	One power	100Gbps	1Gbps
Radiated emission test				
Test Mode	PSU (Brand)	PSU	Port 1 to 32 For DAC	MGMT
Mode 1	Bel power	Two power	100Gbps	1Gbps
Mode 2	Accton	One power	100Gbps	1Gbps

3.4 Test Program Used and Operation Descriptions

For AC Mode Test:

1. Turn on the power of all equipment.
2. Support units A (Laptop) runs “Ping.exe” program to communicate with EUTvia UTP cable.
3. The EUT under transmission/receiving condition of loop back mode.
4. Support unit B (i-pod) is connected to EUT to simulate real connection.
5. Support unit A (Laptop) runs “ Tfgen.exe” program to create LAN utilization via one UTP cable.
6. The EUT is powered by AC power.

For DC Mode Test:

1. Turn on the power of all equipment.
2. Support units A (Laptop) runs “Ping.exe” program to communicate with EUTvia UTP cable.
3. The EUT under transmission/receiving condition of loop back mode.
4. Support unit B (i-pod) is connected to EUT to simulate real connection.
5. Support unit A (Laptop) runs “ Tfgen.exe” program to create LAN utilization via one UTP cable.
6. The EUT is powered by support unit B (DC Power Supply).

3.5 Primary Clock Frequencies of Internal Source

The highest frequency generated or used within the EUT or on which the EUT operates or tunes is 14.0625 GHz, provided by Accton Technology Corporation, for detailed internal source, please refer to the manufacturer's specifications.

3.6 Miscellaneous

Labelling Requirements for Part 15 Devices:

➢ Verification

The specific labelling requirements for a device subject to the Verification procedure are contained in Section 15.19(a). These labelling requirements are:

If the device is subject only to Verification, include a label bearing a unique identifier (Section 2.954) and one of three compliance statements specified in Section 15.19(a). If the labeling area for the device is so small, and/or it is not practical to place the compliance statement on the device, then the statement can be placed in the user manual or product packaging (Section 15.19(a)(5)). However, the device must still be labelled with the unique identifier (Verification). Generally, devices smaller than the palm of the hand are considered too small for the compliance statement.

➢ Certification

If the device is subject to Certification: (1) Section 2.925 contains information on identification of the equipment; (2) include a label bearing an FCC Identifier (FCC ID) (Section 2.926) and (3) include the appropriate compliance statement in Section 15.19(a). If the device is considered too small and therefore it is impractical (smaller than the palm of the hand) to display the compliance statement, then the statement may be placed in the user manual or product packaging. However, the device must still be labelled with the FCC ID. If the device is unquestionably too small for the FCC ID to be readable (smaller than 4-6 points), the FCC ID may be placed in the user manual. However, it must be determined that the device itself is too small – the label area allocated to the FCC ID may not be reduced because of over crowded identification of other product and regulatory information.

An electronic display of the FCC ID (see 9. Electronic Labelling below) may be used for Certification of Section 15.212 modular transmitters and software defined radios (Section 2.944).

➢ Declaration of Conformity (DoC):

The labelling requirements for a device subject to the DoC procedure are specified in Section 15.19(b). The label should include the FCC logo along with the Trade Name and Model Number, which satisfies the unique identifier requirement of Section 2.1074 if it represents the identical equipment tested for DoC compliance. For personal computers assembled from authorized components, the following additional text must also be included: “Assembled from tested components,” “Complete system not tested.” When the device is so small and/or when it is not practical to place the required additional text on the device, the text may be placed in the user manual or pamphlet supplied to the user. However, the FCC logo, Trade Name, and Model Number must still be displayed on the device (Section 15.19(b)(3)).



Part 15 Declaration of Conformity (DoC) Label Examples

Equipment certified as software defined radio may use a means that readily displays the FCC ID on an electronic display screen, instead of labelling the device (Section 2.925 (e)).

Further information may refer to FCC KDB:784748 D01 Labelling Part 15 &18 Guidelines

Labelling Requirements for ICES-003 Devices:

➢ Industry Canada ICES-003 Compliance Label:

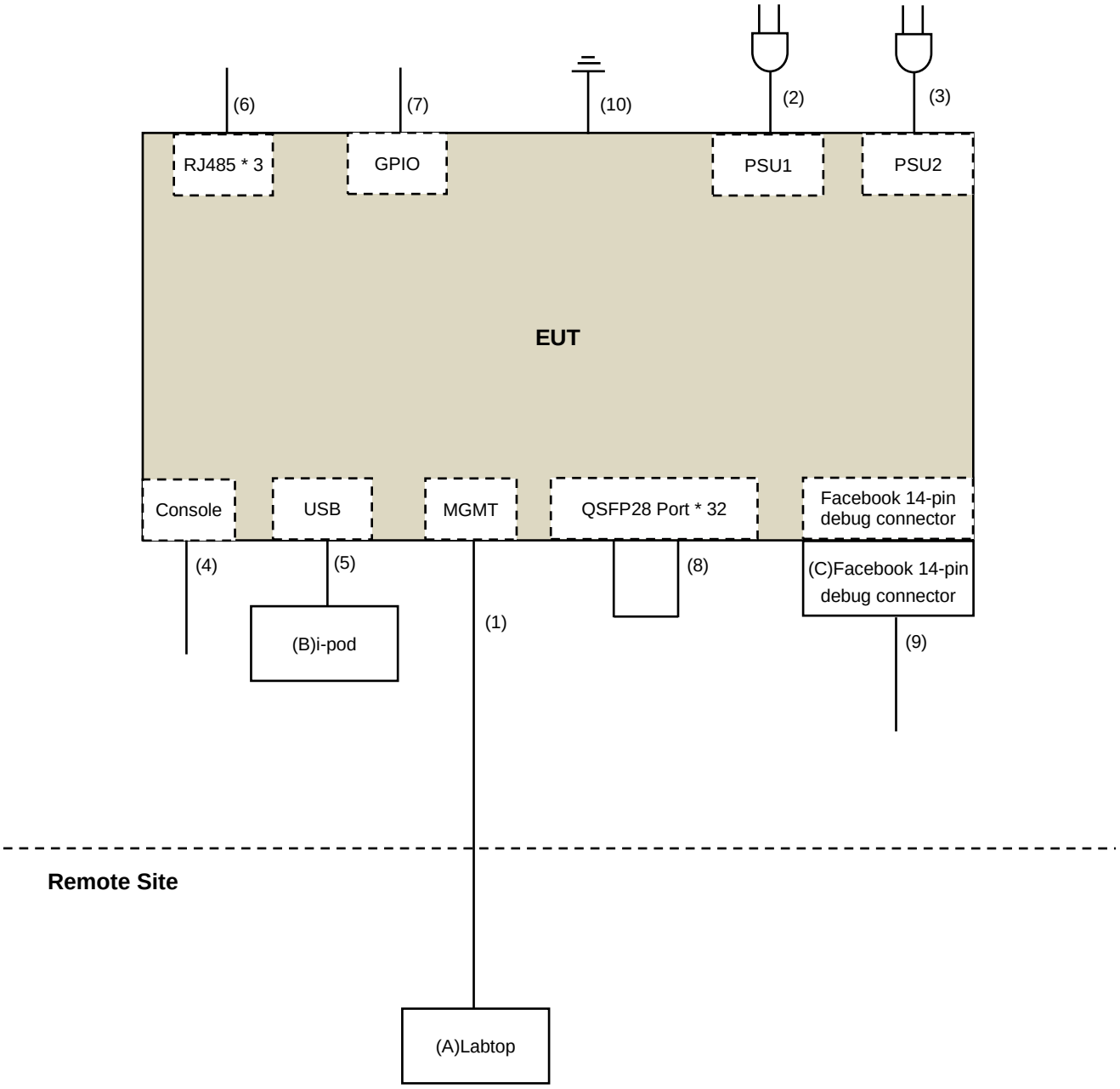
CAN ICES-3 (*)/NMB-3(*)

* Insert either “A” or “B” but not both to identify the applicable Class of ITE.

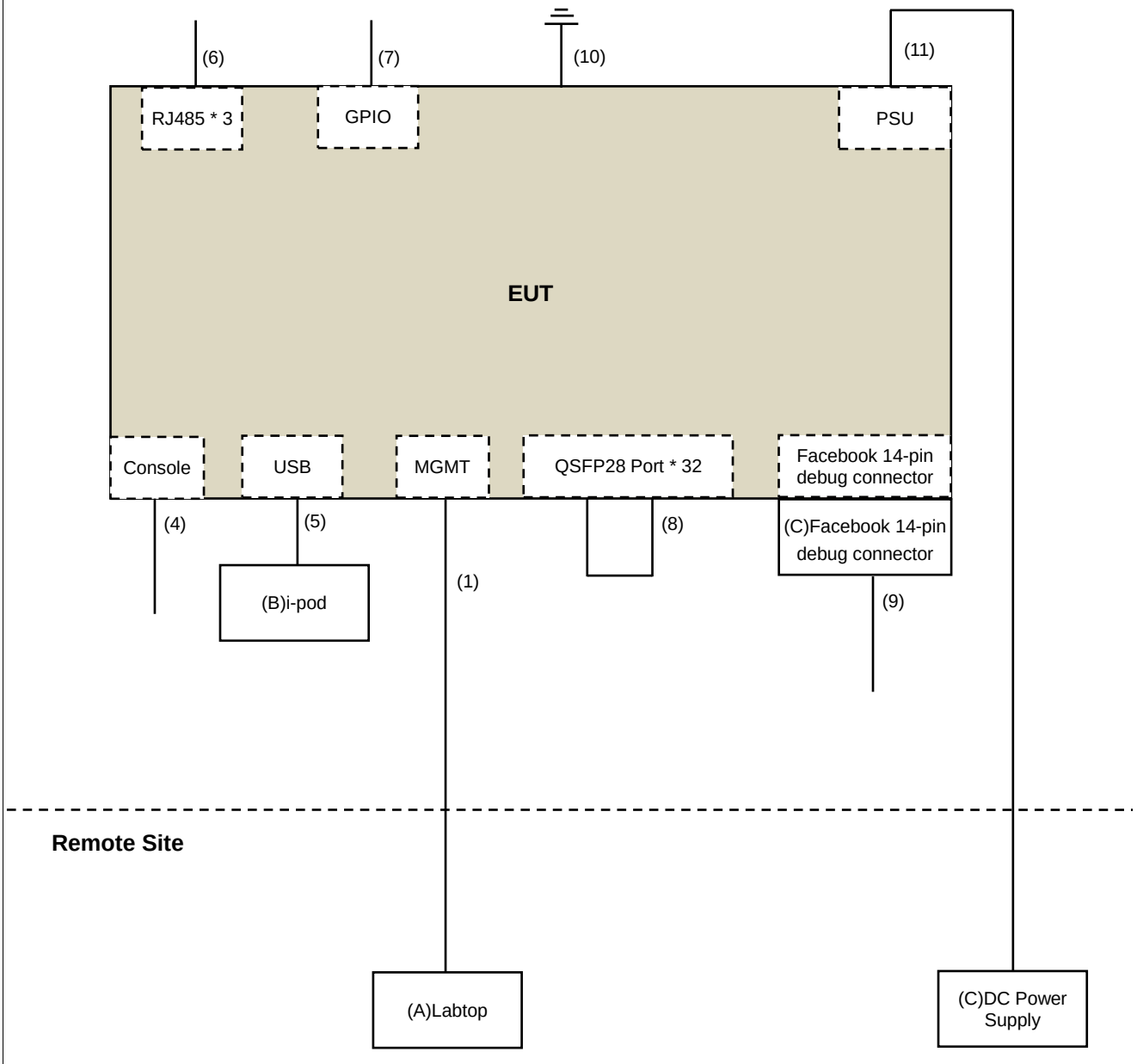
4 Configuration and Connections with EUT

4.1 Connection Diagram of EUT and Peripheral Devices

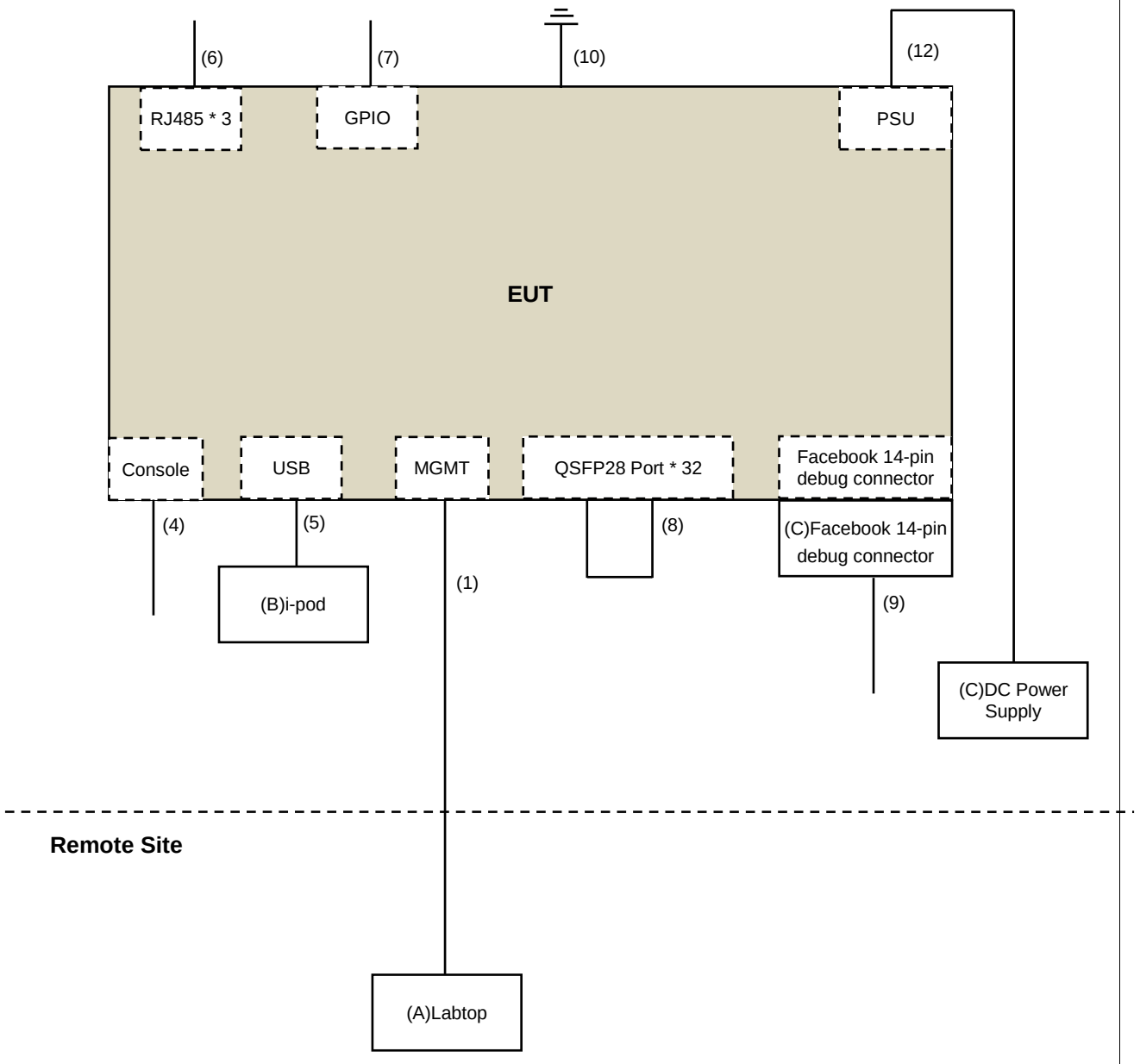
For AC Mode Test:



For DC Mode (Radiated emission)Test:



For DC Mode (Conducted emission)Test:



4.2 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Labtop	DELL	PP32LA	HSLB32S	FCC DoC	Provided by Lab
B	i-pod	Apple	MD778TA/A	CC4JMCMXF4T1	NA	Provided by Lab
C	Facebook 14-pin debug connector	NA	NA	NA	NA	Supplied by client
D	DC Power Supply	Agilent	N8758A	US14C4443M	NA	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	RJ-45 Cable	1	10	No	0	Provided by Lab
2	AC cable	1	2.5	Yes	0	Supplied by client
3	AC cable	1	2.5	Yes	0	Supplied by client
4	RJ-45 to RS232	1	1.5	Yes	0	Supplied by client
5	USB Cable	1	0.1	Yes	0	Provided by Lab
6	RJ-45 Cable	3	0.2	No	0	Provided by Lab
7	RJ-45 Cable	1	0.3	No	0	Provided by Lab
8	DAC Cable	16	1	Yes	0	Supplied by client
9	Micro USB to USB Cable	1	1	Yes	0	Supplied by client
10	GND Cable	1	1.8	No	0	Provided by Lab
11	DC cable	2	10	No	0	Provided by Lab
12	DC cable	2	1.8	No	0	Provided by Lab

Note: The core is originally attached to the cable.

5 Conducted Emissions at Mains Ports

5.1 Limits

Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Notes: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

5.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100287	Apr. 16, 2016	Apr. 15, 2017
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-523	Oct. 11, 2016	Oct. 10, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	848773/004	Oct. 26, 2016	Oct. 25, 2017
RF Cable	5D-FB	COACAB-001	May 24, 2016	May 23, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-001	Sep. 13, 2016	Sep. 12, 2017
50 ohms Terminator	50	3	Oct. 26, 2016	Oct. 25, 2017
50 ohms Terminator	N/A	EMC-04	Nov. 02, 2016	Nov. 01, 2017
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. D.
3. The VCCI Con D Registration No. is
4. Tested Date: Jan. 11 to 12, 2017

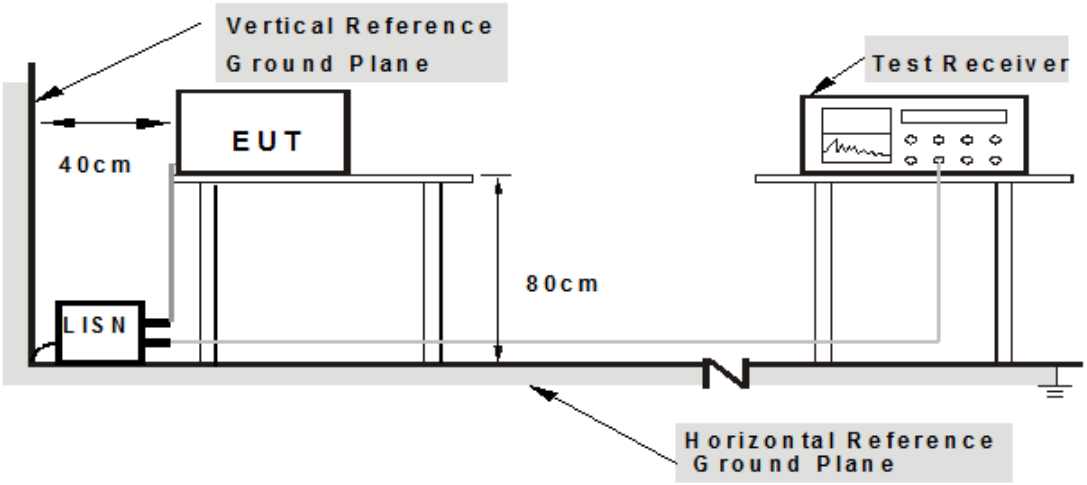
5.3 Test Arrangement

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

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

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

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



Note: 1.Support units were connected to second LISN.

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

5.4 Supplementary Information

There is not any deviation from the test standards for the test method.

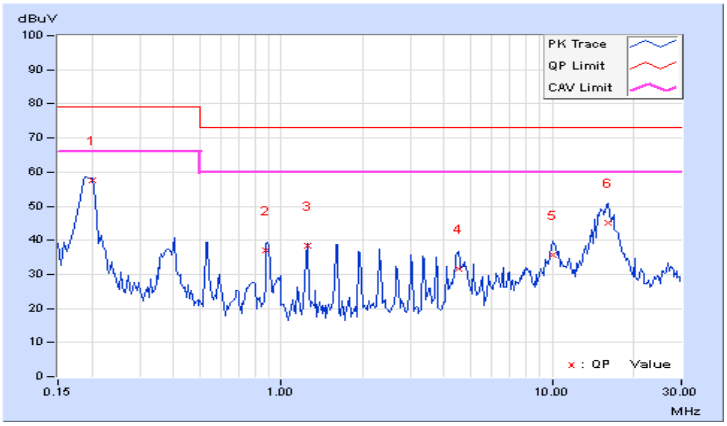
5.5 Test Results (Mode 1)

Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	21℃, 65%RH
Tested by	Barry Lee		
Test Mode	Mode 1		

Phase Of Power : Line (L)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.20078	10.29	47.17	39.61	57.46	49.90	79.00	66.00	-21.54	-16.10
2	0.88047	10.47	26.67	18.65	37.14	29.12	73.00	60.00	-35.86	-30.88
3	1.24609	10.48	27.74	23.22	38.22	33.70	73.00	60.00	-34.78	-26.30
4	4.50391	10.51	21.28	14.37	31.79	24.88	73.00	60.00	-41.21	-35.12
5	10.07422	10.64	25.10	18.73	35.74	29.37	73.00	60.00	-37.26	-30.63
6	16.11719	10.86	34.39	24.10	45.25	34.96	73.00	60.00	-27.75	-25.04

Remarks:

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

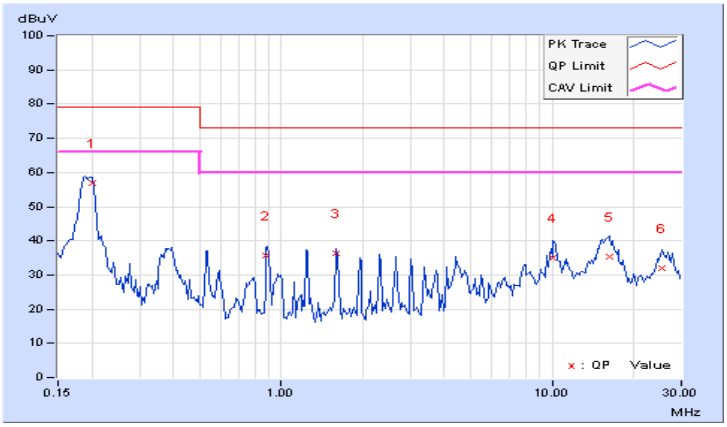


Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	21℃, 65%RH
Tested by	Barry Lee		
Test Mode	Mode 1		

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.20078	10.36	46.50	38.24	56.86	48.60	79.00	66.00	-22.14	-17.40
2	0.88047	10.53	25.18	16.26	35.71	26.79	73.00	60.00	-37.29	-33.21
3	1.60156	10.55	25.75	20.08	36.30	30.63	73.00	60.00	-36.70	-29.37
4	10.00781	10.67	24.43	18.17	35.10	28.84	73.00	60.00	-37.90	-31.16
5	16.26172	10.88	24.41	14.72	35.29	25.60	73.00	60.00	-37.71	-34.40
6	25.51172	11.09	20.93	14.36	32.02	25.45	73.00	60.00	-40.98	-34.55

Remarks:

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



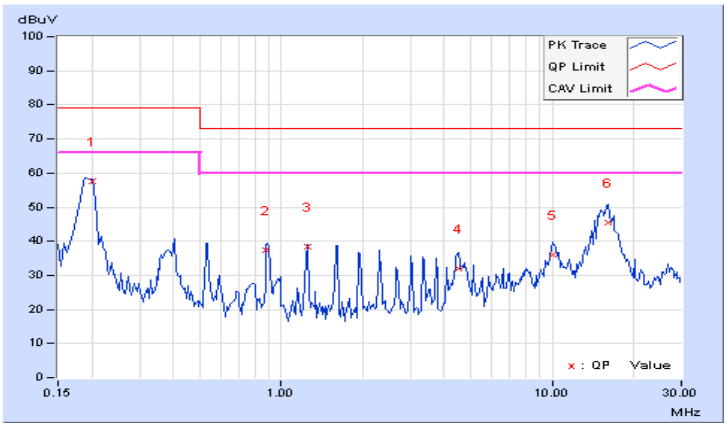
5.6 Test Results (Mode 2)

Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	21℃, 65%RH
Tested by	Barry Lee		
Test Mode	Mode 2		

Phase Of Power : Line (L)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	**0.20080**	**10.29**	**47.25**	**39.80**	**57.54**	**50.09**	**79.00**	**66.00**	**-21.46**	**-15.91**
2	0.88049	10.47	26.80	18.96	37.27	29.43	73.00	60.00	-35.73	-30.57
3	1.24615	10.48	27.89	23.98	38.37	34.46	73.00	60.00	-34.63	-25.54
4	4.50395	10.51	21.33	14.55	31.84	25.06	73.00	60.00	-41.16	-34.94
5	10.07425	10.64	25.33	18.88	35.97	29.52	73.00	60.00	-37.03	-30.48
6	16.11725	10.86	34.66	24.88	45.52	35.74	73.00	60.00	-27.48	-24.26

Remarks:

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

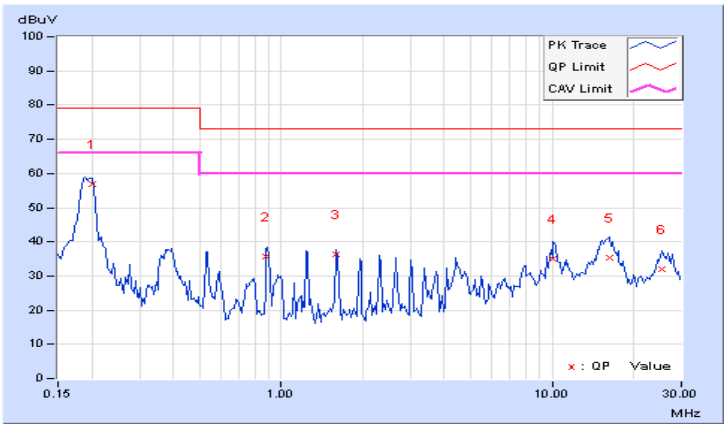


Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	21℃, 65%RH
Tested by	Barry Lee		
Test Mode	Mode 2		

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.20080	10.36	46.51	38.23	56.87	48.59	79.00	66.00	-22.13	-17.41
2	0.88050	10.53	25.20	16.28	35.73	26.81	73.00	60.00	-37.27	-33.19
3	1.60160	10.55	25.79	20.12	36.34	30.67	73.00	60.00	-36.66	-29.33
4	10.00785	10.67	24.45	18.25	35.12	28.92	73.00	60.00	-37.88	-31.08
5	16.26175	10.88	24.49	14.75	35.37	25.63	73.00	60.00	-37.63	-34.37
6	25.51176	11.09	20.95	14.40	32.04	25.49	73.00	60.00	-40.96	-34.51

Remarks:

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



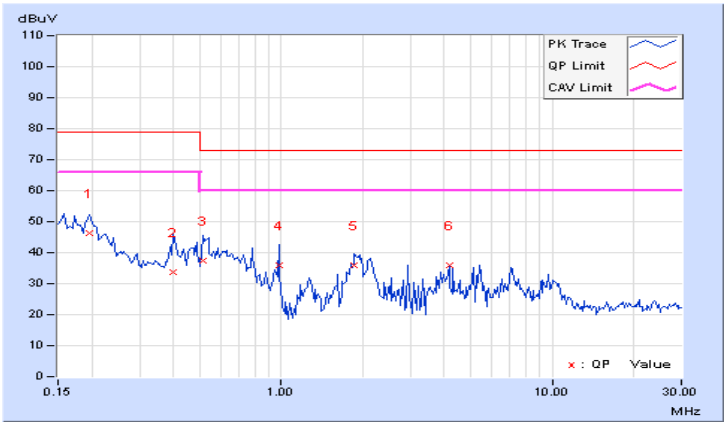
5.7 Test Results (Mode 3)

Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	DC 12V	**Environmental Conditions**	25℃, 60%RH
Tested by	Barry Lee		
Test Mode	Mode 3		

Phase Of Power : Line (L1)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.19687	10.29	35.87	31.77	46.16	42.06	79.00	66.00	-32.84	-23.94
2	0.40000	10.34	23.53	18.55	33.87	28.89	79.00	66.00	-45.13	-37.11
3	0.51719	10.37	26.98	15.13	37.35	25.50	73.00	60.00	-35.65	-34.50
4	0.97813	10.49	25.30	18.26	35.79	28.75	73.00	60.00	-37.21	-31.25
5	1.86328	10.42	25.62	19.25	36.04	29.67	73.00	60.00	-36.96	-30.33
6	4.16016	10.50	25.52	23.02	36.02	33.52	73.00	60.00	-36.98	-26.48

Remarks:

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

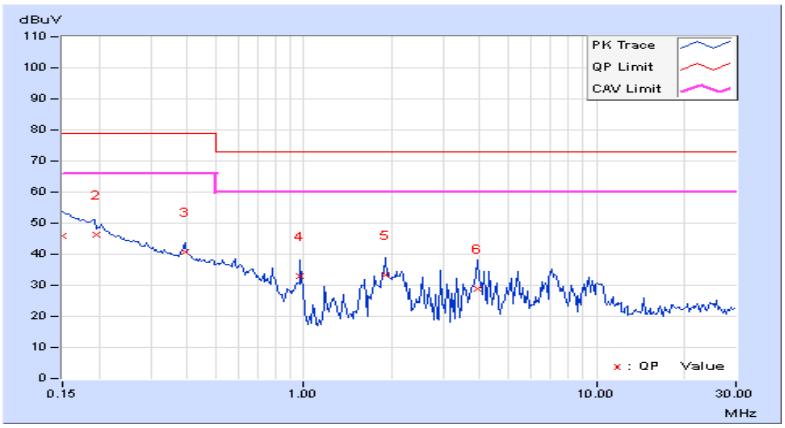


Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	DC 12V	**Environmental Conditions**	25℃, 75%RH
Tested by	Barry Lee		
Test Mode	Mode 3		

Phase Of Power : Line (L2)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.15000	10.36	35.75	17.22	46.11	27.58	79.00	66.00	-32.89	-38.42
2	0.19700	10.36	35.78	32.00	46.14	42.36	79.00	66.00	-32.86	-23.64
3	0.39219	10.44	30.36	25.39	40.80	35.83	79.00	66.00	-38.20	-30.17
4	0.97422	10.55	22.35	13.86	32.90	24.41	73.00	60.00	-40.10	-35.59
5	1.90625	10.55	22.84	16.42	33.39	26.97	73.00	60.00	-39.61	-33.03
6	3.91406	10.57	18.48	10.54	29.05	21.11	73.00	60.00	-43.95	-38.89

Remarks:

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

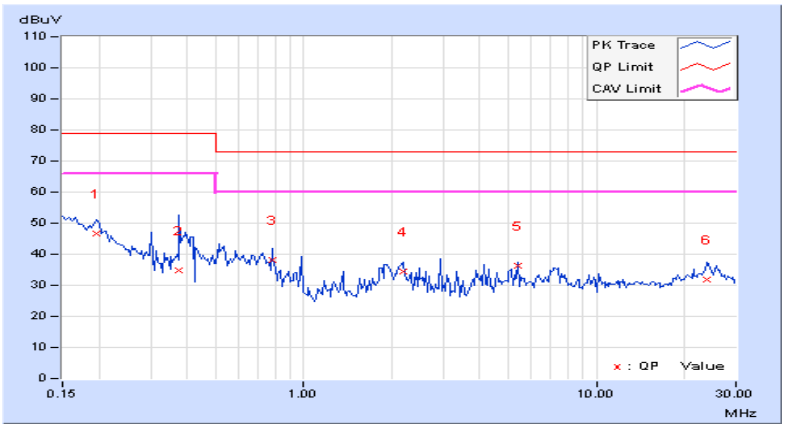


Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	DC 12V	**Environmental Conditions**	25℃, 75%RH
Tested by	Barry Lee		
Test Mode	Mode 3		

Phase Of Power : Line (L3)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.19687	19.94	26.62	22.65	46.56	42.59	79.00	66.00	-32.44	-23.41
2	0.37656	19.90	14.94	1.78	34.84	21.68	79.00	66.00	-44.16	-44.32
3	0.78281	19.98	18.35	13.06	38.33	33.04	73.00	60.00	-34.67	-26.96
4	2.17969	20.05	14.48	9.33	34.53	29.38	73.00	60.00	-38.47	-30.62
5	5.36328	20.09	16.06	15.67	36.15	35.76	73.00	60.00	-36.85	-24.24
6	23.93359	20.40	11.46	5.15	31.86	25.55	73.00	60.00	-41.14	-34.45

Remarks:

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



6 Radiated Emissions up to 1 GHz

6.1 Limits

Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

Radiated Emissions Limits at 10 meters (dBμV/m)				
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	39	29.5	40	30
88-216	43.5	33.1		
216-230	46.4	35.6		
230-960			47	37
960-1000	49.5	43.5		

Radiated Emissions Limits at 3 meters (dBμV/m)				
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	49.5	40	50.5	40.5
88-216	54	43.5		
216-230	56.9	46		
230-960			57.5	47.5
960-1000	60	54		

Notes: 1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. QP detector shall be applied if not specified.

6.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010125	Apr. 16, 2016	Apr. 15, 2017
	N9038A	MY50010132	June 28, 2016	June 27, 2017
Pre-Amplifier Sonoma	310N	352925	Aug. 29, 2016	Aug. 28, 2017
	310N	352926	Aug. 29, 2016	Aug. 28, 2017
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-359	Dec. 28, 2016	Dec. 27, 2017
	VULB 9168	9168-358	Dec. 16, 2016	Dec. 15, 2017
Fixed attenuator Mini-Circuits	UNAT-5+	CHF-001	Sep. 09, 2016	Sep. 08, 2017
	UNAT-5+	CHF-002	Sep. 09, 2016	Sep. 08, 2017
RF Cable	8D-FB	CHFCAB-001-1 CHFCAB-001-3 CHFCAB-001-4	Sep. 22, 2016	Sep. 21, 2017
		CHFCAB-002-1 CHFCAB-002-3 CHFCAB-002-4	Sep. 22, 2016	Sep. 21, 2017
Software BVADT	ADT_Radiated_V 8.7.08	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

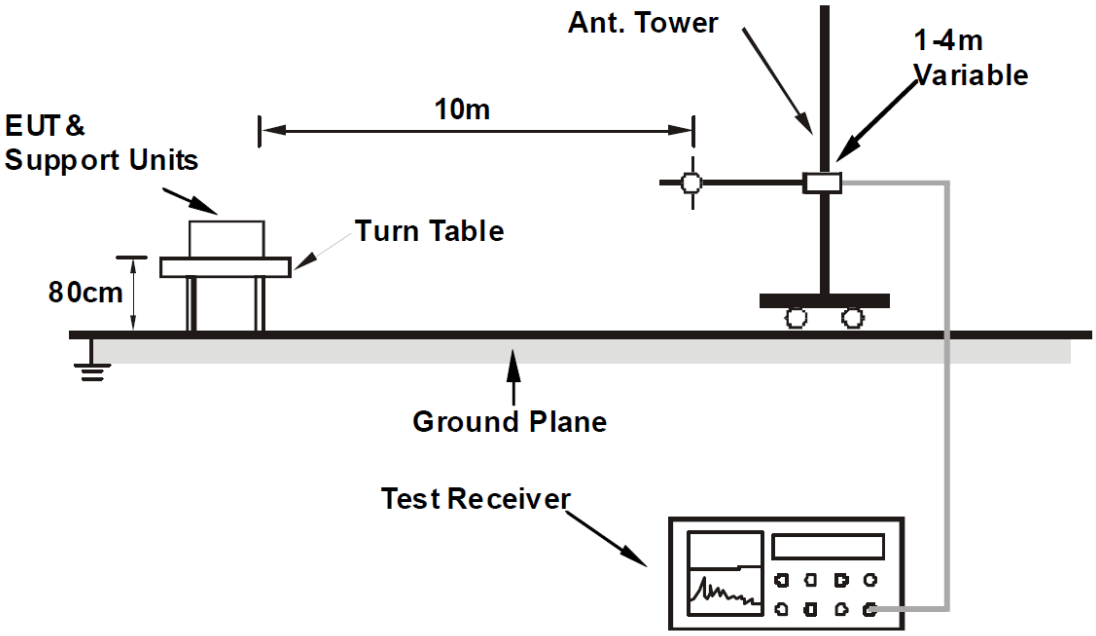
Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 10m Chamber No. F.
3. The FCC Site Registration No. is 928149.
4. The VCCI Site Registration No. is R-3252.
5. The CANADA Site Registration No. is IC 7450H-1.
6. Tested Date: Jan. 07 to 16, 2017

6.3 Test Arrangement

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

Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for quasi-peak detection (QP) at frequency up to 1GHz.



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

6.4 Supplementary Information

There is not any deviation from the test standards for the test method.

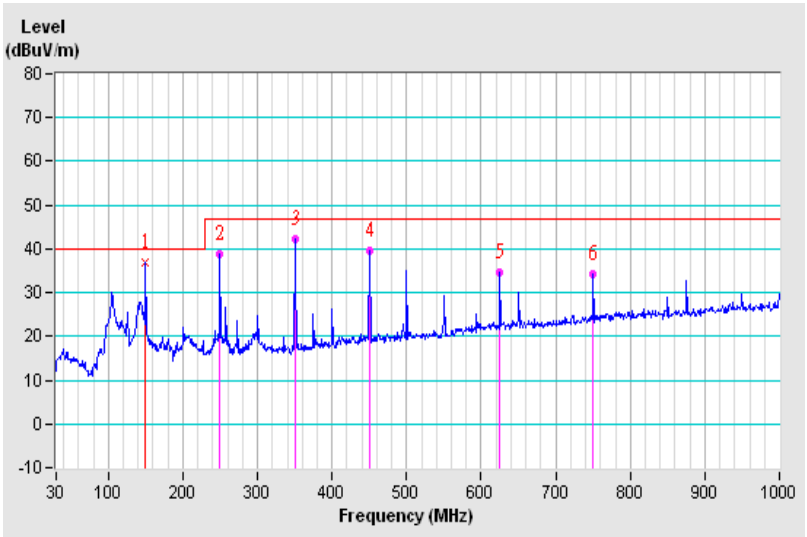
6.5 Test Results (Mode 1)

Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	120Vac, 60Hz	Environmental Conditions	24℃, 68%RH
Tested by	Wythe Lin		
Test Mode	Mode 1		

Antenna Polarity & Test Distance : Horizontal at 10 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	150.01	36.74 QP	40.00	-3.26	4.00 H	106	49.20	-12.46
2	250.00	38.72 QP	47.00	-8.28	4.00 H	164	52.05	-13.33
3	350.00	42.13 QP	47.00	-4.87	3.00 H	188	52.34	-10.21
4	450.01	39.41 QP	47.00	-7.59	2.00 H	294	46.68	-7.27
5	625.00	34.75 QP	47.00	-12.25	1.00 H	255	38.40	-3.65
6	750.01	34.19 QP	47.00	-12.81	1.00 H	39	35.81	-1.62

Remarks:

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

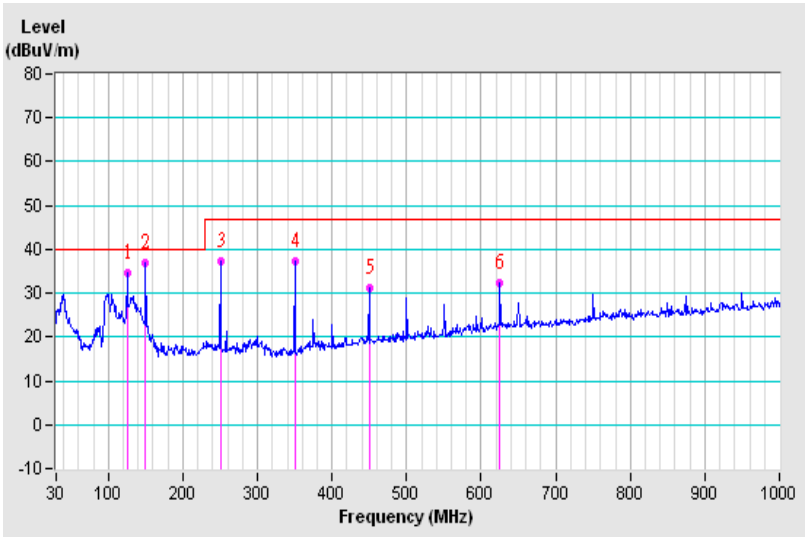


Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	120Vac, 60Hz	Environmental Conditions	24℃, 68%RH
Tested by	Wythe Lin		
Test Mode	Mode 1		

Antenna Polarity & Test Distance : Vertical at 10 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	125.01	34.58 QP	40.00	-5.42	2.00 V	53	48.60	-14.02
2	**150.01**	**36.78 QP**	**40.00**	**-3.22**	**1.00 V**	**76**	**49.14**	**-12.36**
3	250.02	37.33 QP	47.00	-9.67	1.00 V	275	50.68	-13.35
4	350.00	37.15 QP	47.00	-9.85	3.00 V	184	47.45	-10.30
5	449.99	31.09 QP	47.00	-15.91	2.00 V	269	38.27	-7.18
6	625.02	32.18 QP	47.00	-14.82	1.00 V	296	35.48	-3.30

Remarks:

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



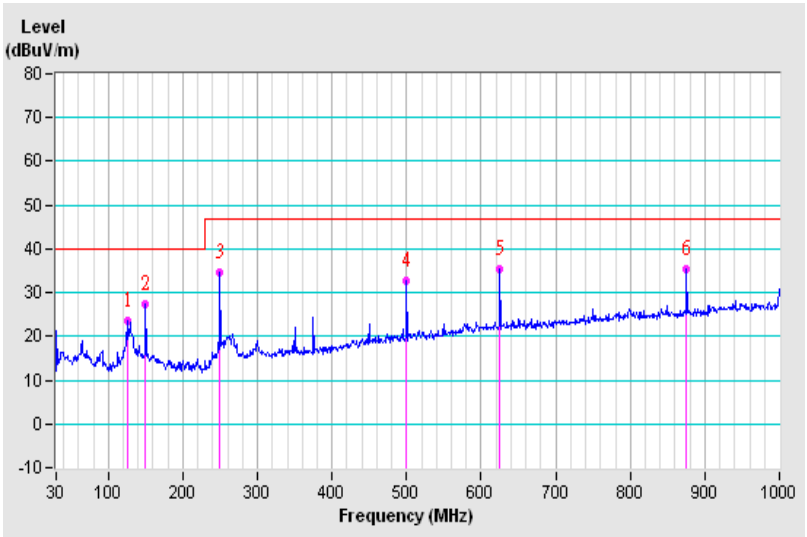
6.6 Test Results (Mode 2)

Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	DC 12V	Environmental Conditions	26℃, 73%RH
Tested by	Jason Huang		
Test Mode	Mode 2		

Antenna Polarity & Test Distance : Horizontal at 10 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	124.99	23.39 QP	40.00	-16.61	4.00 H	176	37.41	-14.02
2	149.99	27.21 QP	40.00	-12.79	4.00 H	171	39.68	-12.47
3	250.00	34.68 QP	47.00	-12.32	3.00 H	19	48.01	-13.33
4	500.01	32.70 QP	47.00	-14.30	2.00 H	62	39.13	-6.43
5	625.02	35.35 QP	47.00	-11.65	2.00 H	140	38.99	-3.64
6	875.02	35.21 QP	47.00	-11.79	1.00 H	258	34.84	0.37

Remarks:

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

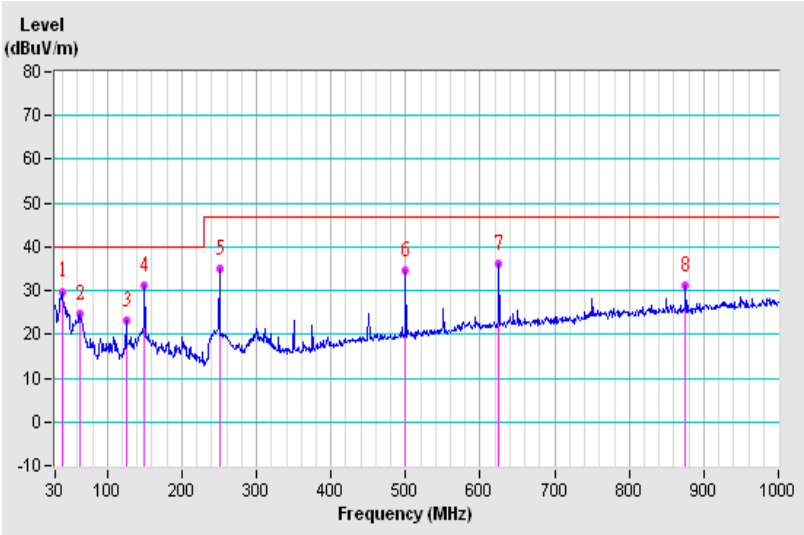


Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	DC 12V	Environmental Conditions	26℃, 73%RH
Tested by	Jason Huang		
Test Mode	Mode 2		

Antenna Polarity & Test Distance : Vertical at 10 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	39.26	29.85 QP	40.00	-10.15	3.00 V	181	43.39	-13.54
2	62.49	24.74 QP	40.00	-15.26	3.00 V	61	38.64	-13.90
3	125.01	23.20 QP	40.00	-16.80	1.00 V	293	37.22	-14.02
4	150.01	31.05 QP	40.00	-8.95	2.00 V	119	43.41	-12.36
5	250.02	35.03 QP	47.00	-11.97	1.00 V	164	48.38	-13.35
6	500.01	34.53 QP	47.00	-12.47	1.00 V	208	40.77	-6.24
7	625.02	36.06 QP	47.00	-10.94	1.00 V	258	39.36	-3.30
8	875.02	31.24 QP	47.00	-15.76	4.00 V	103	30.39	0.85

Remarks:

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



7 Radiated Emissions above 1 GHz

7.1 Limits

Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

Radiated Emissions Limits at 10 meters (dBμV/m)				
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
1000-3000	Avg: 49.5 Peak: 69.5	Avg: 43.5 Peak: 63.5	Not defined	Not defined
Above 3000			Not defined	Not defined

Radiated Emissions Limits at 3 meters (dBμV/m)				
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
1000-3000	Avg: 60 Peak: 80	Avg: 54 Peak: 74	Avg: 56 Peak: 76	Avg: 50 Peak: 70
Above 3000			Avg: 60 Peak: 80	Avg: 54 Peak: 74

Notes:
1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Frequency Range (For unintentional radiators)

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 40GHz, whichever is lower

7.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010125	Apr. 16, 2016	Apr. 15, 2017
Pre-Amplifier Agilent	8449B	3008A01975	Feb. 27, 2016	Feb. 26, 2017
Horn Antenna SCHWARZBECK	BBHA 9120D	D123	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX104	RF-104-209	Dec. 09, 2016	Dec. 08, 2017
RF Cable	EMC104-SM-SM -6000	150325	Jan. 16, 2017	Jan. 15, 2018
RF Cable	104 RF cable	131221	Dec. 09, 2016	Dec. 08, 2017
Spectrum Analyzer Agilent	E4446A	MY48250254	Nov. 23, 2016	Nov. 22, 2017
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 10, 2016	Dec. 09, 2017
Horn Antenna SCHWARZBECK	BBHA 9170	9170-424	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX 102	36442/2 36434/2	Dec. 09, 2016	Dec. 08, 2017
Software BVADT	ADT_Radiated_ V8.7.08	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Fix tool for Boresight antenna tower	BAF-01	5	NA	NA

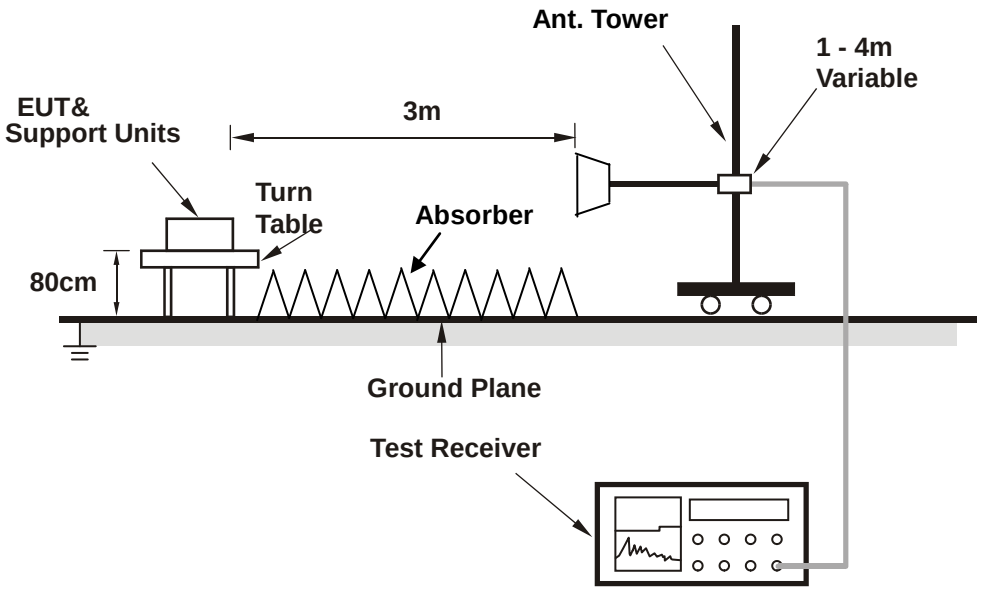
Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 10m Chamber No. F.
3. Tested Date: Jan. 16, 2017

7.3 Test Arrangement

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

Note: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection (PK) at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.



The test arrangement is in accordance with ANSI 63.4:2014. For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.4 Supplementary Information

There is not any deviation from the test standards for the test method.

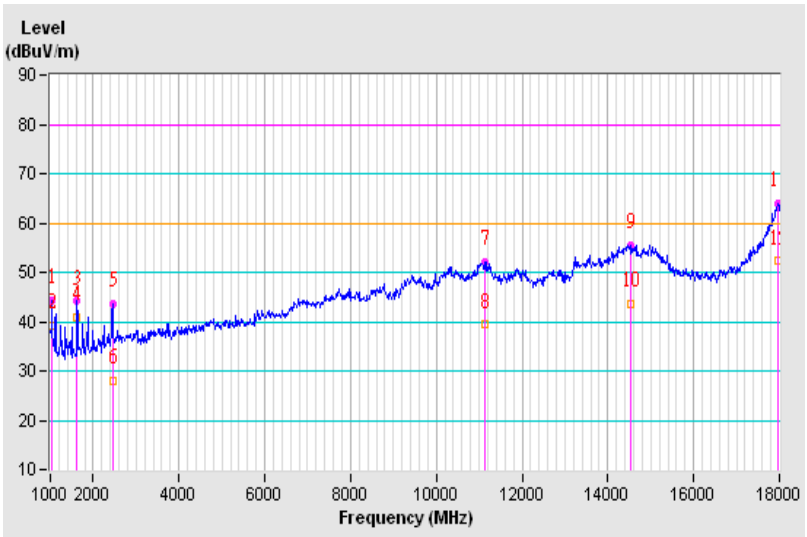
7.5 Test Results (Mode 1)

Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	Environmental Conditions	23℃, 71%RH
Tested by	Jason Huang		
Test Mode	Mode 1		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1050.00	44.23 PK	80.00	-35.77	1.00 H	37	54.88	-10.65
2	1050.00	39.29 AV	60.00	-20.71	1.00 H	37	49.94	-10.65
3	1625.00	44.11 PK	80.00	-35.89	1.00 H	207	52.62	-8.51
4	1625.00	40.87 AV	60.00	-19.13	1.00 H	207	49.38	-8.51
5	2456.96	43.64 PK	80.00	-36.36	1.00 H	254	49.38	-5.74
6	2456.96	28.01 AV	60.00	-31.99	1.00 H	254	33.75	-5.74
7	11126.11	52.11 PK	80.00	-27.89	1.00 H	311	43.01	9.10
8	11126.11	39.35 AV	60.00	-20.65	1.00 H	311	30.25	9.10
9	14527.77	55.39 PK	80.00	-24.61	1.00 H	187	42.67	12.72
10	14527.77	43.63 AV	60.00	-16.37	1.00 H	187	30.91	12.72
11	17966.79	63.83 PK	80.00	-16.17	1.00 H	318	42.16	21.67
12	**17966.79**	**52.26 AV**	**60.00**	**-7.74**	**1.00 H**	**318**	**30.59**	**21.67**

Remarks:

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

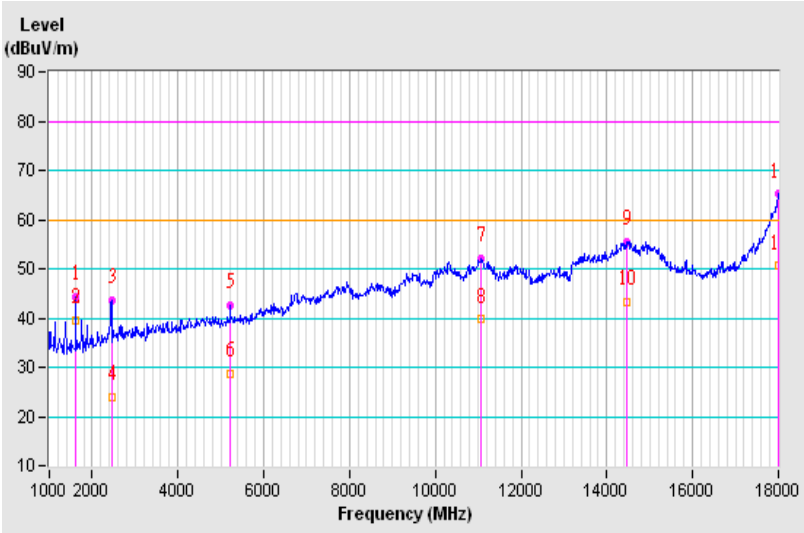


Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	Environmental Conditions	23℃, 71%RH
Tested by	Jason Huang		
Test Mode	Mode 1		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1625.00	44.36 PK	80.00	-35.64	1.00 V	158	52.87	-8.51
2	1625.00	39.56 AV	60.00	-20.44	1.00 V	158	48.07	-8.51
3	2456.96	43.56 PK	80.00	-36.44	1.00 V	52	49.30	-5.74
4	2456.96	24.03 AV	60.00	-35.97	1.00 V	52	29.77	-5.74
5	5231.84	42.69 PK	80.00	-37.31	1.00 V	64	43.23	-0.54
6	5231.84	28.65 AV	60.00	-31.35	1.00 V	64	29.19	-0.54
7	11065.93	52.08 PK	80.00	-27.92	1.00 V	352	42.86	9.22
8	11065.93	39.72 AV	60.00	-20.28	1.00 V	352	30.50	9.22
9	14477.96	55.52 PK	80.00	-24.48	1.00 V	116	42.77	12.75
10	14477.96	43.36 AV	60.00	-16.64	1.00 V	116	30.61	12.75
11	17999.00	65.09 PK	80.00	-14.91	1.00 V	100	42.87	22.22
12	17999.00	50.59 AV	60.00	-9.41	1.00 V	100	28.37	22.22

Remarks:

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

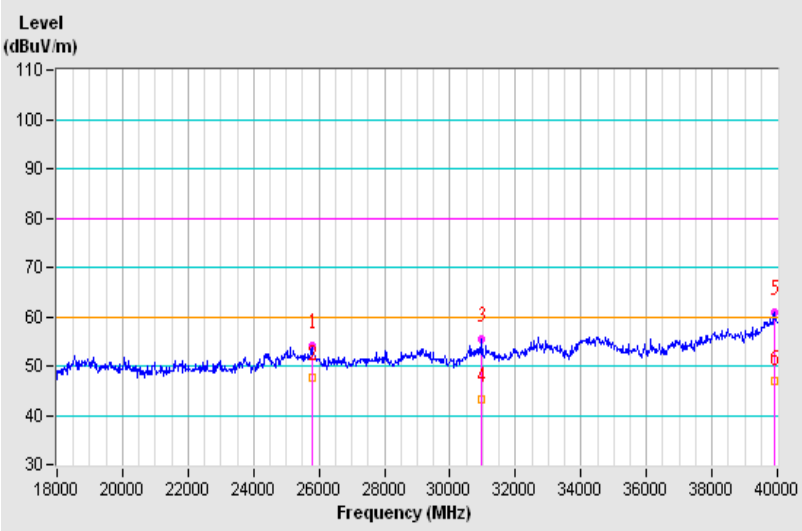


Frequency Range	18GHz ~ 40GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	Environmental Conditions	26℃, 72%RH
Tested by	Jason Huang		
Test Mode	Mode 1		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	25781.24	54.20 PK	80.00	-25.80	1.00 H	34	59.87	-5.67
2	25781.24	47.57 AV	60.00	-12.43	1.00 H	34	53.24	-5.67
3	30964.72	55.36 PK	80.00	-24.64	1.00 H	240	59.18	-3.82
4	30964.72	43.28 AV	60.00	-16.72	1.00 H	240	47.10	-3.82
5	39922.11	60.90 PK	80.00	-19.10	1.00 H	141	56.50	4.40
6	39922.11	46.86 AV	60.00	-13.14	1.00 H	141	42.46	4.40

Remarks:

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

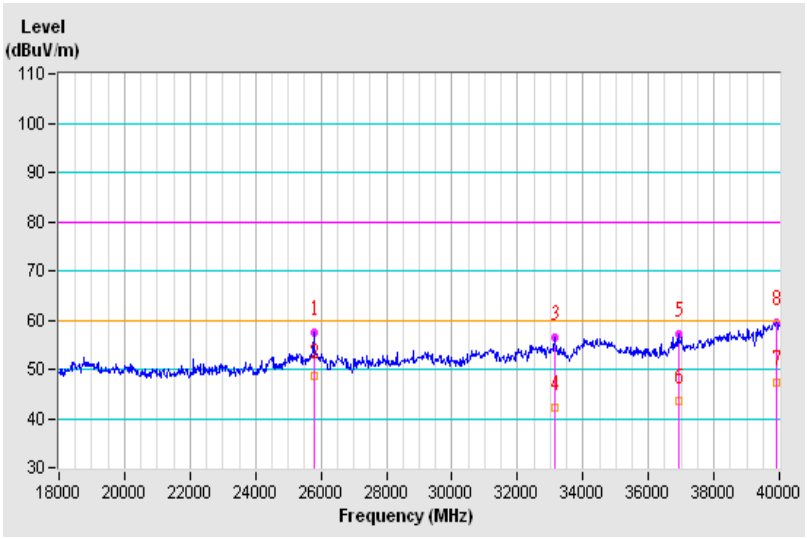


Frequency Range	18GHz ~ 40GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	Environmental Conditions	26℃, 72%RH
Tested by	Jason Huang		
Test Mode	Mode 1		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	25780.98	57.49 PK	80.00	-22.51	1.00 V	7	63.16	-5.67
2	25780.98	48.69 AV	60.00	-11.31	1.00 V	7	54.36	-5.67
3	33140.28	56.36 PK	80.00	-23.64	1.00 V	20	57.39	-1.03
4	33140.28	42.15 AV	60.00	-17.85	1.00 V	20	43.18	-1.03
5	36905.98	57.06 PK	80.00	-22.94	1.00 V	245	58.33	-1.27
6	36905.98	43.67 AV	60.00	-16.33	1.00 V	245	44.94	-1.27
7	39900.62	47.27 AV	60.00	-12.73	1.00 V	340	42.84	4.43
8	39900.62	59.43 PK	80.00	-20.57	1.00 V	340	55.00	4.43

Remarks:

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



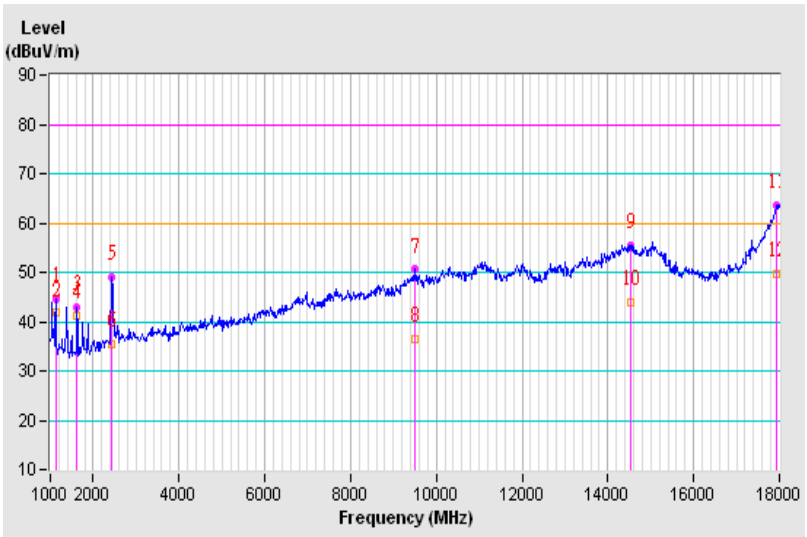
7.6 Test Results (Mode 2)

Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	DC 12V	Environmental Conditions	23℃, 71%RH
Tested by	Jason Huang		
Test Mode	Mode 2		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1125.00	44.72 PK	80.00	-35.28	1.00 H	337	55.05	-10.33
2	1125.00	41.70 AV	60.00	-18.30	1.00 H	337	52.03	-10.33
3	1625.00	43.02 PK	80.00	-36.98	1.00 H	154	51.53	-8.51
4	1625.00	41.30 AV	60.00	-18.70	1.00 H	154	49.81	-8.51
5	2427.91	49.06 PK	80.00	-30.94	1.00 H	242	54.90	-5.84
6	2427.91	35.58 AV	60.00	-24.42	1.00 H	242	41.42	-5.84
7	9513.49	50.58 PK	80.00	-29.42	1.00 H	202	44.51	6.07
8	9513.49	36.61 AV	60.00	-23.39	1.00 H	202	30.54	6.07
9	14515.32	55.45 PK	80.00	-24.55	1.00 H	37	42.70	12.75
10	14515.32	43.85 AV	60.00	-16.15	1.00 H	37	31.10	12.75
11	17931.51	63.69 PK	80.00	-16.31	1.00 H	20	42.61	21.08
12	17931.51	49.80 AV	60.00	-10.20	1.00 H	20	28.72	21.08

Remarks:

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

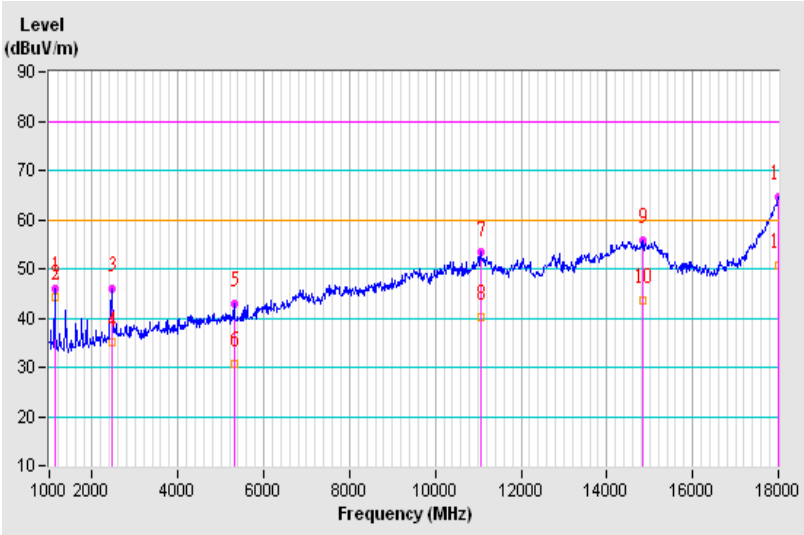


Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	DC 12V	Environmental Conditions	23℃, 71%RH
Tested by	Jason Huang		
Test Mode	Mode 2		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1125.00	45.97 PK	80.00	-34.03	1.00 V	345	56.30	-10.33
2	1125.00	44.36 AV	60.00	-15.64	1.00 V	345	54.69	-10.33
3	2471.49	46.03 PK	80.00	-33.97	1.00 V	360	51.73	-5.70
4	2471.49	34.94 AV	60.00	-25.06	1.00 V	360	40.64	-5.70
5	5306.56	42.86 PK	80.00	-37.14	1.00 V	338	43.34	-0.48
6	5306.56	30.76 AV	60.00	-29.24	1.00 V	338	31.24	-0.48
7	11061.78	53.29 PK	80.00	-26.71	1.00 V	43	44.06	9.23
8	11061.78	40.12 AV	60.00	-19.88	1.00 V	43	30.89	9.23
9	14832.87	55.92 PK	80.00	-24.08	1.00 V	351	43.61	12.31
10	14832.87	43.50 AV	60.00	-16.50	1.00 V	351	31.19	12.31
11	17991.70	64.55 PK	80.00	-15.45	1.00 V	50	42.45	22.10
12	17991.70	50.83 AV	60.00	-9.17	1.00 V	50	28.73	22.10

Remarks:

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

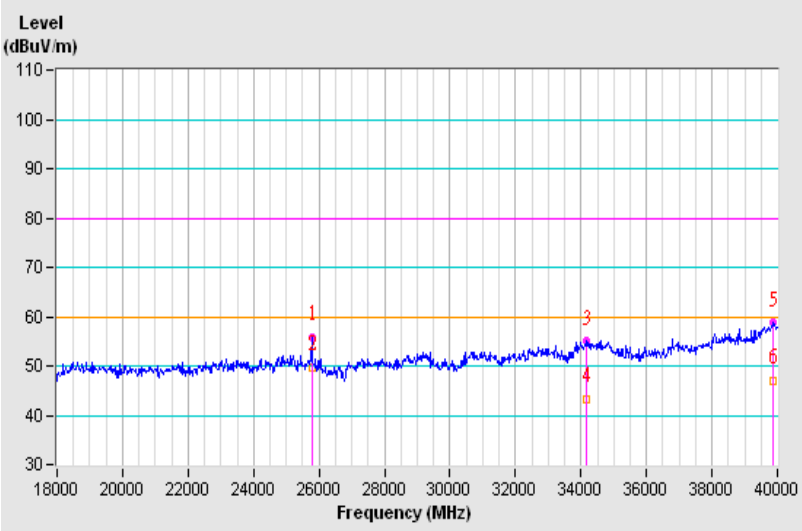


Frequency Range	18GHz ~ 40GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	DC 12V	Environmental Conditions	26℃, 72%RH
Tested by	Jason Huang		
Test Mode	Mode 2		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	25780.98	55.71 PK	80.00	-24.29	1.00 H	148	61.38	-5.67
2	25780.98	49.82 AV	60.00	-10.18	1.00 H	148	55.49	-5.67
3	34185.08	54.95 PK	80.00	-25.05	1.00 H	46	54.75	0.20
4	34185.08	43.22 AV	60.00	-16.78	1.00 H	46	43.02	0.20
5	39884.51	58.70 PK	80.00	-21.30	1.00 H	91	54.34	4.36
6	39884.51	47.05 AV	60.00	-12.95	1.00 H	91	42.69	4.36

Remarks:

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

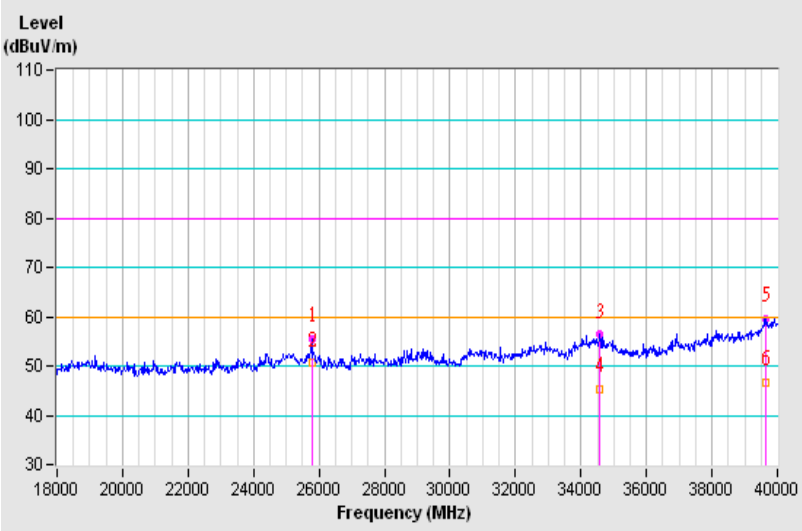


Frequency Range	18GHz ~ 40GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	DC 12V	Environmental Conditions	26℃, 72%RH
Tested by	Jason Huang		
Test Mode	Mode 2		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	25781.21	55.52 PK	80.00	-24.48	1.00 V	35	61.19	-5.67
2	25781.21	50.57 AV	60.00	-9.43	1.00 V	35	56.24	-5.67
3	34579.90	56.30 PK	80.00	-23.70	1.00 V	22	56.31	-0.01
4	34579.90	45.30 AV	60.00	-14.70	1.00 V	22	45.31	-0.01
5	39658.89	59.49 PK	80.00	-20.51	1.00 V	175	55.45	4.04
6	39658.89	46.68 AV	60.00	-13.32	1.00 V	175	42.64	4.04

Remarks:

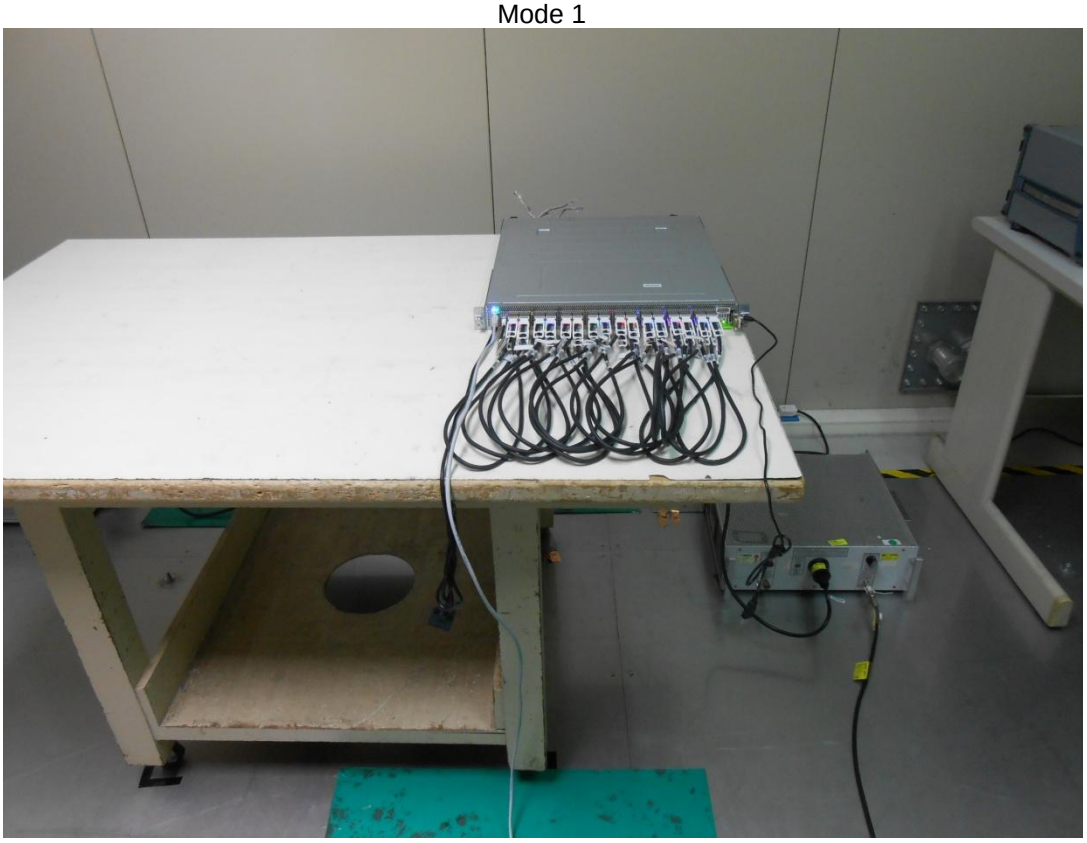
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

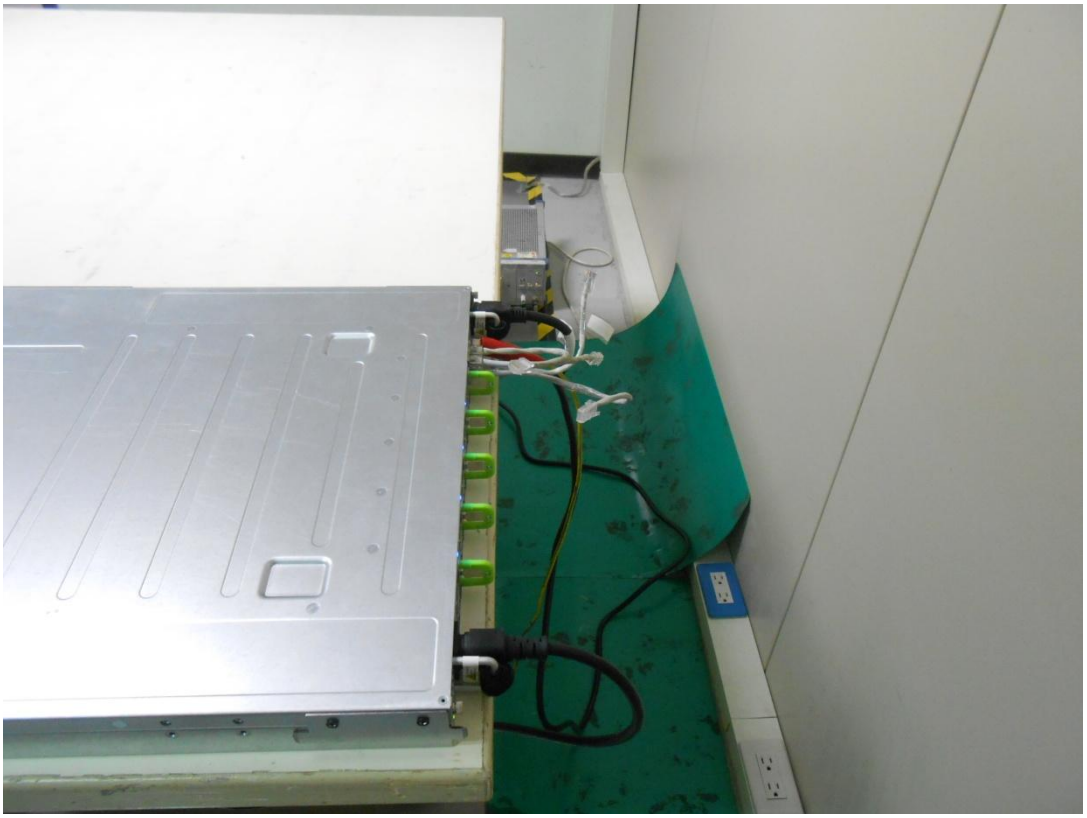


8 Pictures of Test Arrangements

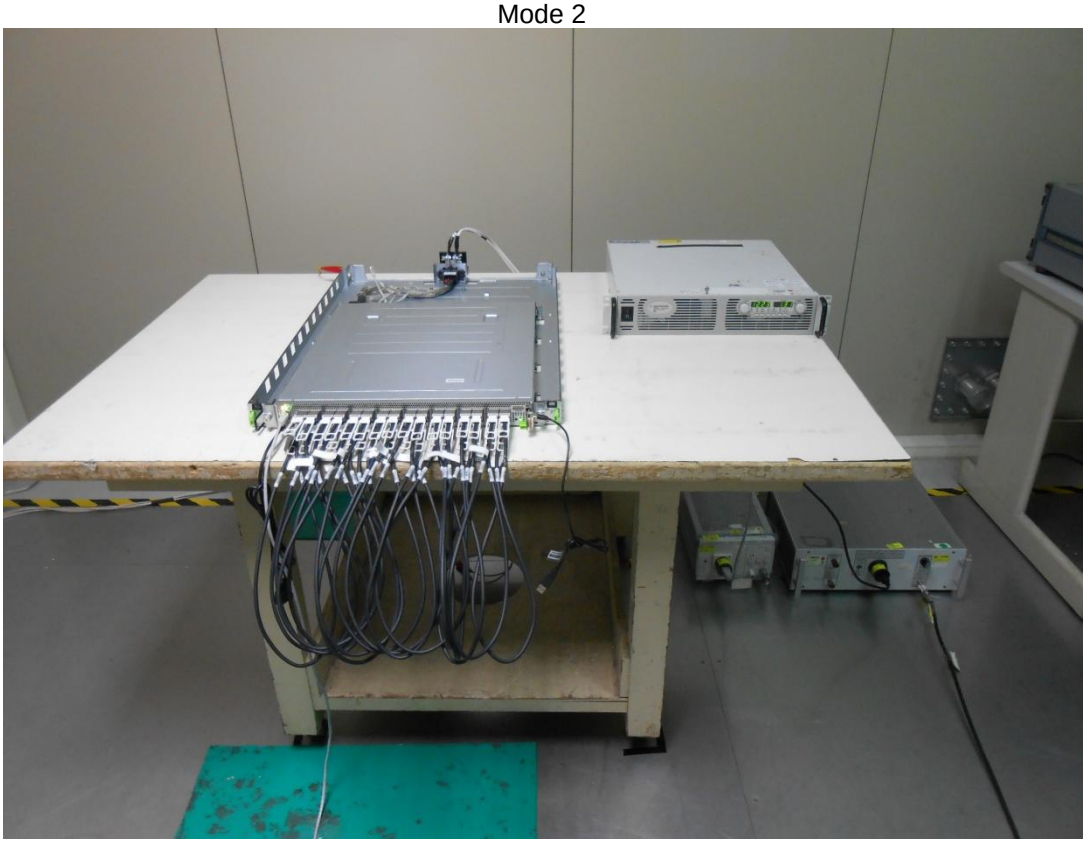
8.1 Conducted Emissions at Mains Ports

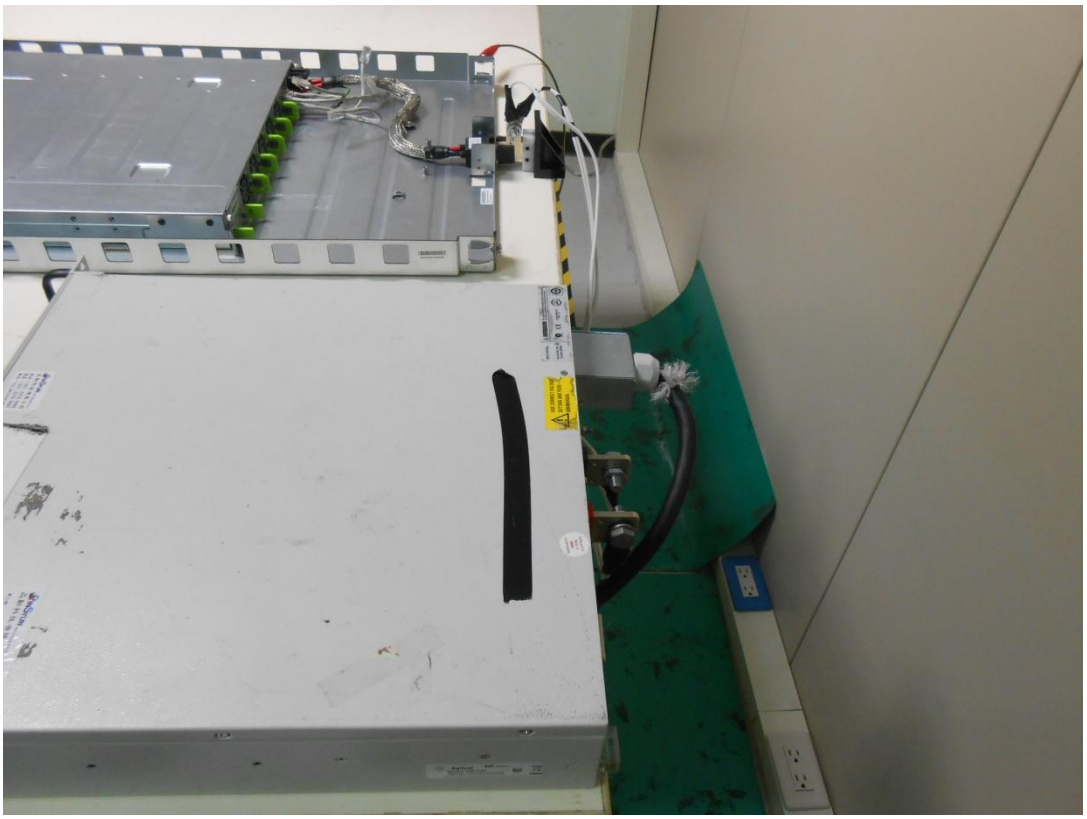
Mode 1





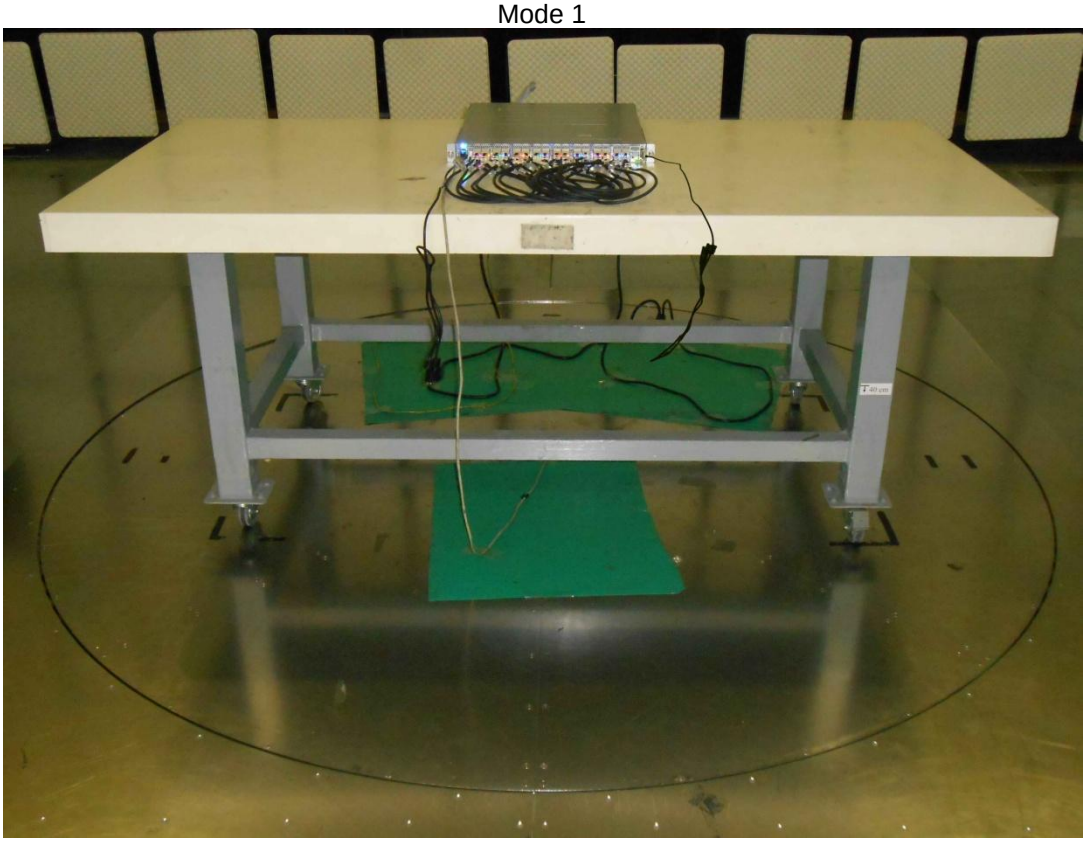
Mode 2

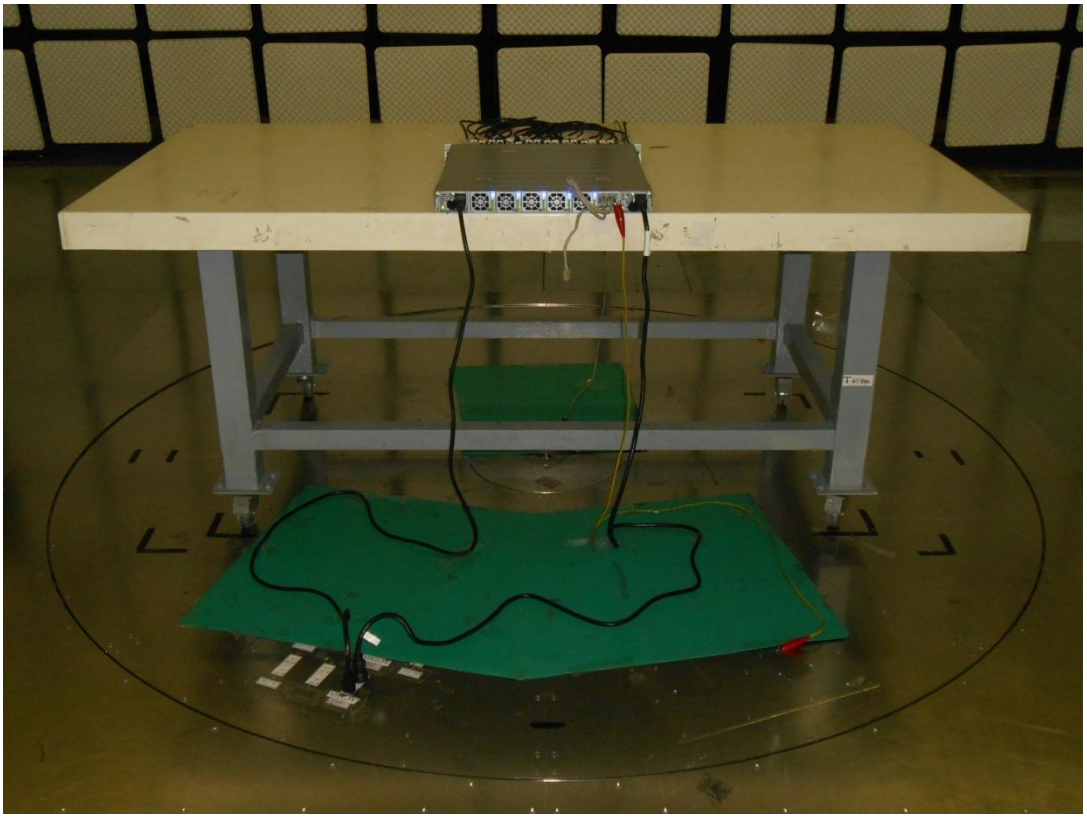




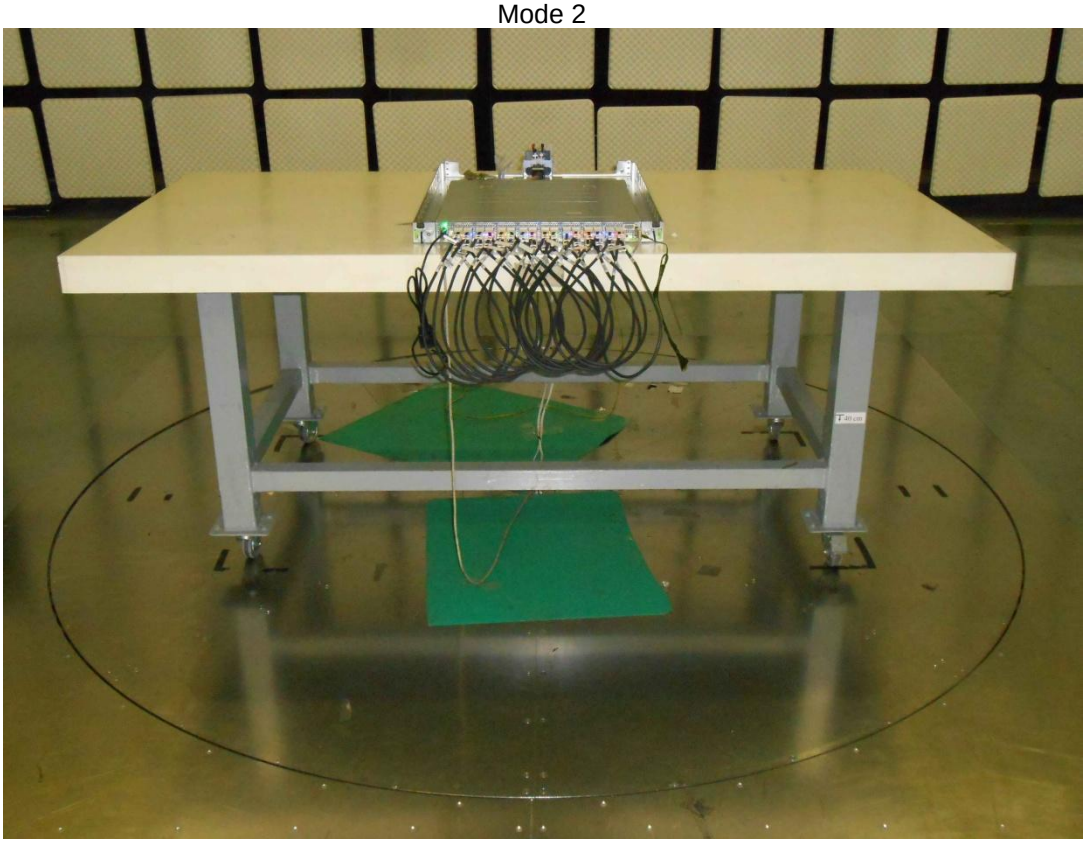
8.2 Radiated Emissions up to 1 GHz

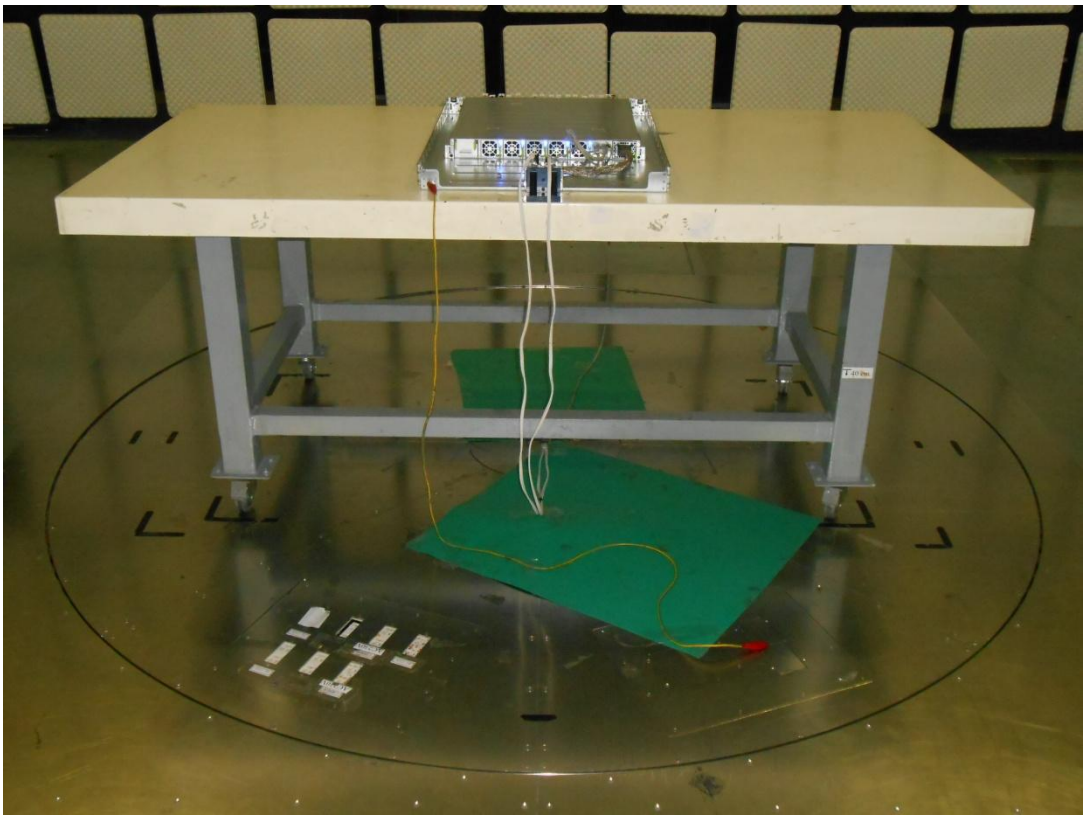
Mode 1





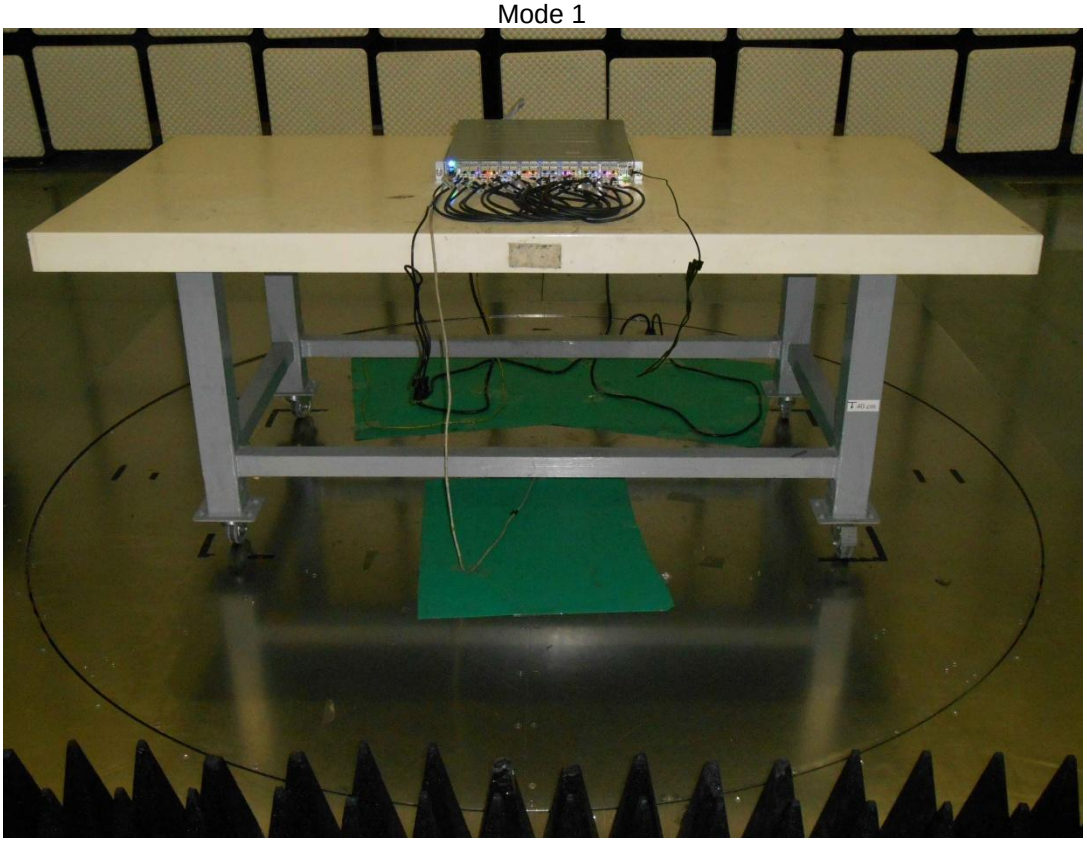
Mode 2

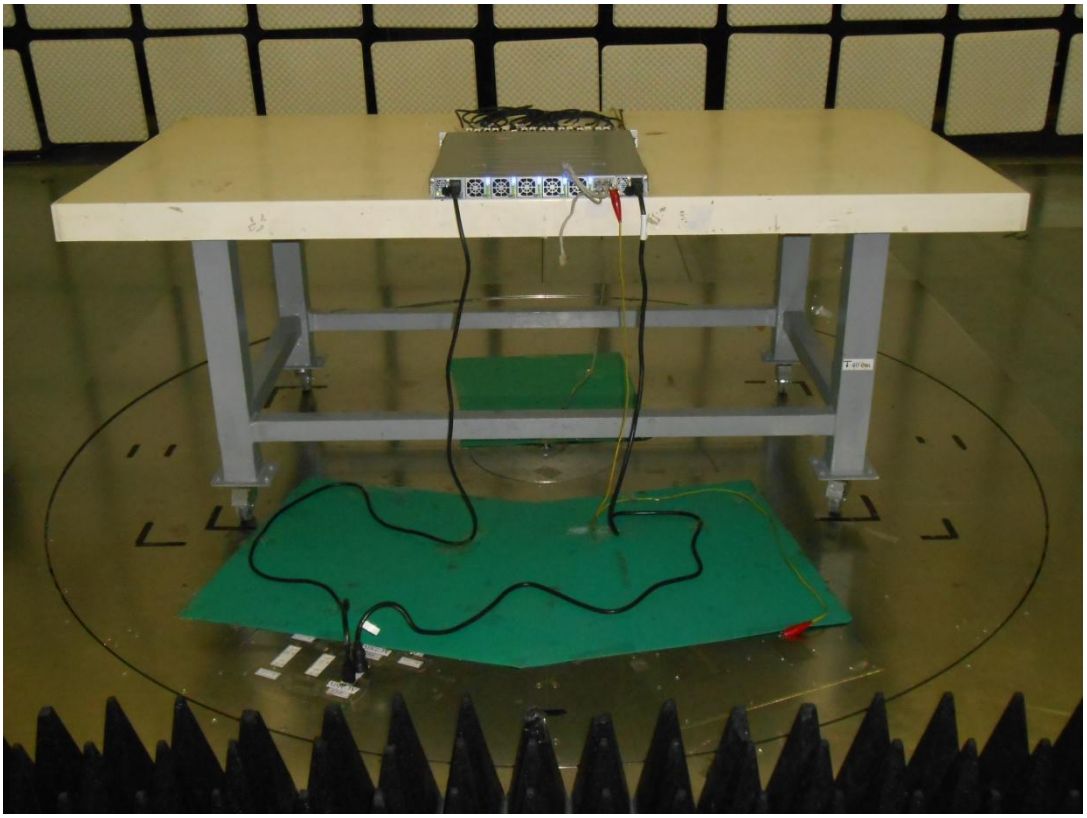




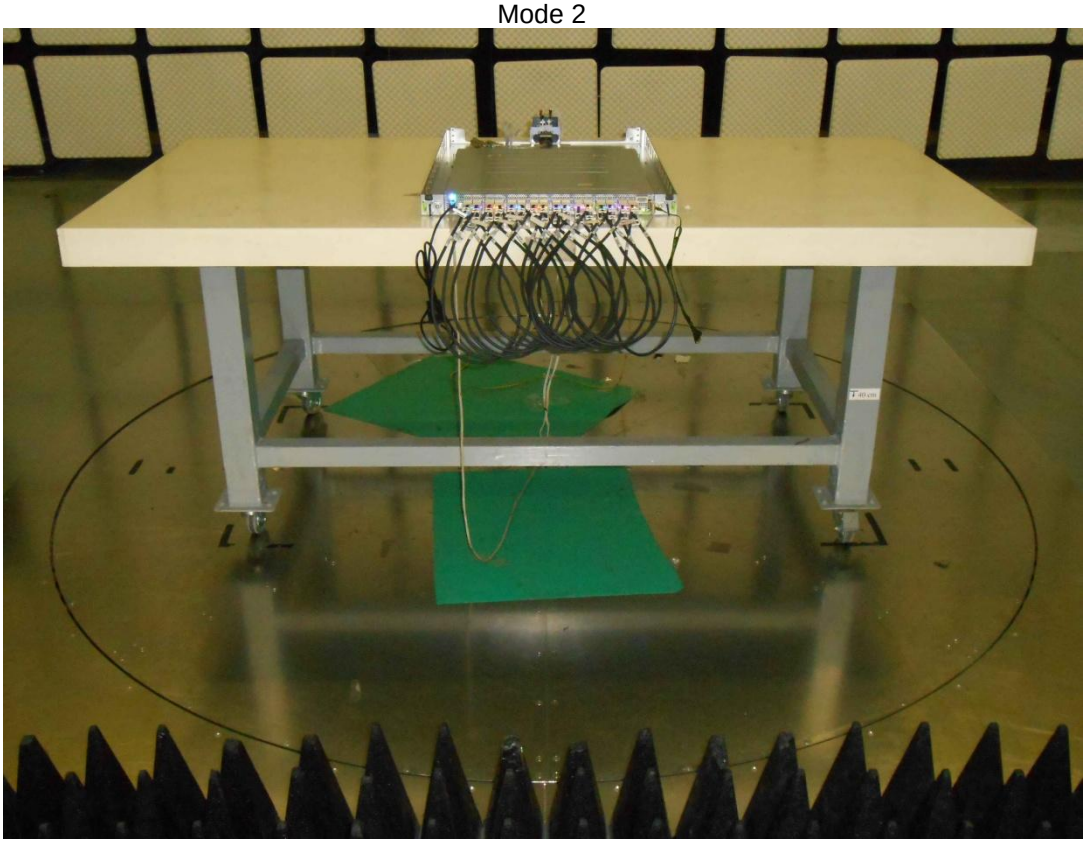
8.3 Radiated Emissions above 1 GHz

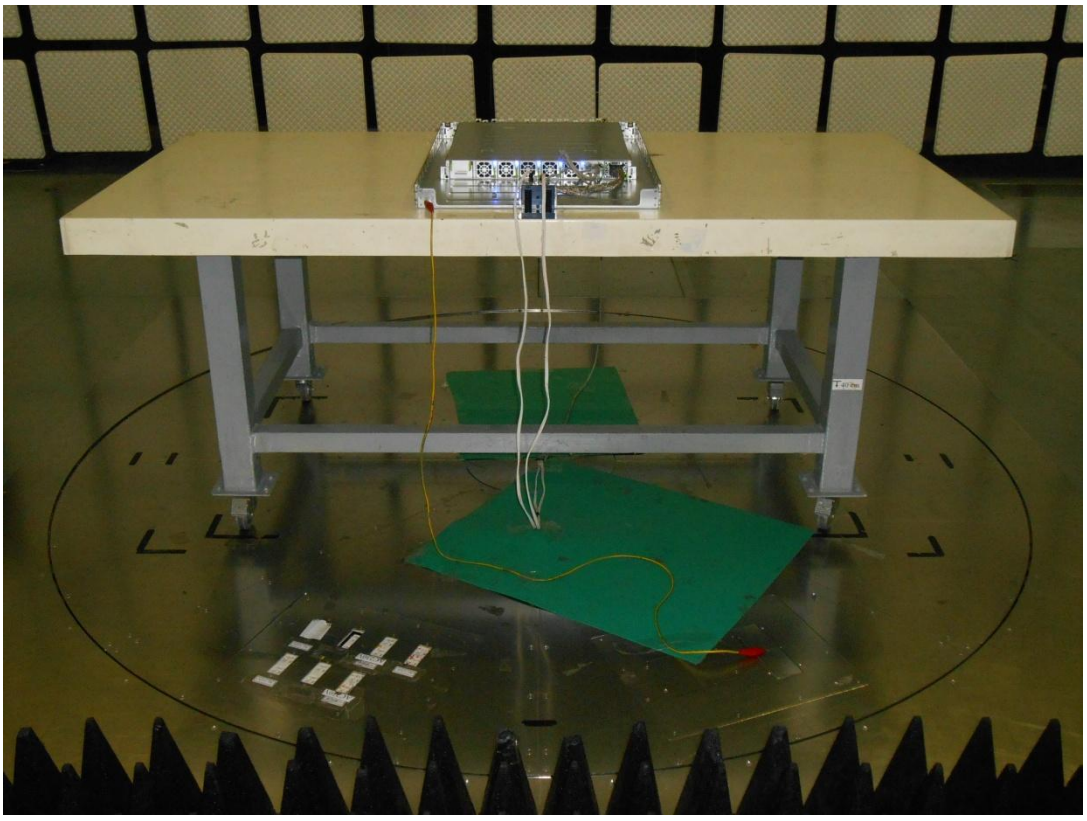
Mode 1





Mode 2





Appendix – Information on the Testing Laboratories

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

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

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

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

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

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

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

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