FCC 15B Test Report

Equipment	:	**Sentrius™ IG60 Serial, Wi-Fi, & LTE Cat 1 Gateway**
Model No.	:	**Sentrius™ IG60-SERIAL-LTE**
Brand Name	:	**Laird Connectivity**
Applicant	:	**Laird Connectivity (for FCC)** **Laird Connectivity, LLC (for IC)**
Address	:	**W66N220 Commerce Court, Cedarburg, Wisconsin 53012, USA (for FCC)** **W66N220 Commerce Court, Cedarburg, Wisconsin 53012, USA (for IC)**
Standard	:	**FCC Part 15, Subpart B, Class A** **ICES-003 Issue 6, Class A** **ANSI C63.4:2014**
Received Date	:	**Aug. 19, 2019**
Tested Date	:	**Oct. 22, 2019 ~ Jan. 16, 2020**

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by: **Approved by:**

Peter Lin / Supervisor **Kent Chen / Assistant Manager**

Testing Laboratory 2732

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Release Record

Report No.	Version	Description	Issued Date
FD8N2101-01	Rev. 01	Initial issue	Apr. 24, 2020
FD8N2101-01	Rev. 02	Updated brand name	May 25, 2020

Summary of Test Results

FCC Part 15, Subpart B Emission Tests				
Ref. Std. Clause	**Test Standard**	**Test Items**	**Measured**	**Result**
15.107	FCC Part 15, Subpart B, Class A	Conducted Emissions	-29.36dB AV@ 6.121MHz.	Pass
15.109	FCC Part 15, Subpart B, Class A	Radiated Emissions	-4.07dB QP@ 125.00MHz.	Pass

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

1 General Description

1.1 Information

This report is issued as a supplementary report to original ICC report no. FD8N2101. The modification is concerned with following item:

- ✧ A WWAN module (Brand: Laird, Model: IGUP-CAT1) is added
- ✧ New model name, brand name, producrt name and applicant.
- ✧ Additional one adapter

Therefore, all test items had been re-tested and was recorded in the following sections.

1.1.1 Feature of Equipment under Test (EUT)

Power Supply Type	12Vdc from adapter 9Vdc ~ 36Vdc from DC Power Supply
Highest Frequency of the Internal Sources	5GHz

1.1.2 Accessories (New addition is marked in boldface)

Accessories		
No.	**Equipment**	**Description**
1	AC adapter	Brand: FRECOM Model: F30L2-120250SPACP Power Rating: I/P: 100-240Vac, 50/60Hz, 0.8A O/P: 12Vdc, 2.5A Power Line: 1.5m non-shielded without core
2	**AC adapter**	**Brand: FRECOM** **Model: F48L-120400SPAV** **Power Rating:** **I/P: 100-240Vac, 50/60Hz, 1.4A** **O/P: 12Vdc, 4A** **Power Line: 1.5m non-shielded with one core**
3	**DC cable**	**3m non-shielded without core**
4	**Serial loopback adapter**	**Model : DB9 female** **Brand : Kingmate**

1.2 Test Equipment and Calibration Data

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Test Date	Jan. 08, 2020				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	R&S	ESR3	101657	Jan. 08, 2019	Jan. 07, 2020
LISN	R&S	ENV216	101579	Mar. 08, 2019	Mar. 07, 2020
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127-666	Dec. 20, 2019	Dec. 19, 2020
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 22, 2019	Oct. 21, 2020
50 ohm terminal (Support Unit)	NA	50	04	May. 28, 2019	May. 27, 2020
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission below 1GHz				
Test Site	Open Area Test Site 1 / (OS01-LK)				
Test Date	Jan. 16, 2020				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Preamplifier	HP	8447D	2944A07523	May 28, 2019	May 27, 2020
Receiver	R&S	ESR3	101659	Apr. 08, 2019	Apr. 07, 2020
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 12, 2019	Jul. 11, 2020
RF Cable-R10M	EMCI	EMCCFD400	CB017	Oct. 22, 2019	Oct. 21, 2020
Measurement Software	AUDIX	e3	5.041019k2	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission above 1GHz				
Test Site	966 chamber 2 / (03CH02-WS)				
Test Date	Oct. 22, 2019				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	Agilent	N9010A	MY53400091	Nov. 07, 2018	Nov. 06, 2019
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1095	Sep. 26, 2019	Sep. 25, 2020
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 15, 2018	Nov. 14, 2019
Preamplifier	Agilent	83017A	MY39501309	Sep. 24, 2019	Sep. 23, 2020
Preamplifier	EMC	EMC184045B	980192	Aug. 01, 2019	Jul. 31, 2020
RF Cable	EMC	EMC105-SM-SM-8000	180512	Oct. 18, 2019	Oct. 17, 2020
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16018/4	Oct. 18, 2019	Oct. 17, 2020
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

FCC Part 15, Subpart B, Class A
ICES-003 Issue 6, Class A
ANSI C63.4:2014

1.4 Deviation from Test Standard and Measurement Procedure

None

1.5 Measurement Uncertainty

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).

Measurement Uncertainty		
Test Item	**Frequency**	**Uncertainty**
Conducted Emissions	150kHz ~ 30MHz	±2.92 dB
Radiated Emissions	30MHz ~ 1GHz	±4.34 dB
	Above 1GHz	±4.9 dB

Note: The results of measurements of emissions shall reference the measurement uncertainty considerations contained in CISPR 16-4-2.

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	20°C/60%	Alex Tsai
Radiated Emissions ≤1GHz	OS01-LK	20°C/65%	Alex Tsai
Radiated Emissions >1GHz	03CH02-WS	24°C/64%	Alex Tsai

- FCC Designation No.: OS01-LK: TW1074
  03CH02-WS: TW1073
- FCC site registration No.: OS01-LK: 216799
  03CH02-WS: 933633

2.2 The Worst Case Measurement Configuration

Radiation Pretest Mode	
Pretest Mode	**Operating Description**
1	LAN Speed 1G+100Mbps, Ping WiFi 2.4G, 3G Link, SD R/W, , EUT orientation: X-axis, with adapter: F30L2-120250SPACP
2	LAN Speed 1G+100Mbps, Ping WiFi 5G, LTE Link, SD R/W, EUT orientation: Y-axis, with adapter: F30L2-120250SPACP
3	LAN Speed 1G+100Mbps, BT Link, 2G Link, SD R/W, EUT orientation: Z-axis, with adapter: F30L2-120250SPACP
4	LAN Speed 1G+100Mbps, Ping WiFi 2.4G, 2G Link, SD R/W, EUT orientation: Z-axis, with adapter: F30L2-120250SPACP
5	LAN Speed 100Mbps, Ping WiFi 5G, LTE Link, SD R/W, EUT orientation: Y-axis, with adapter: F30L2-120250SPACP
6	LAN Speed 10Mbps, Ping WiFi 2.4G, LTE Link, SD R/W, EUT orientation: Y-axis, with adapter: F30L2-120250SPACP
7	LAN Speed 1G+100Mbps, Ping WiFi 5G, LTE Link, SD R/W, EUT orientation: X-axis, DC 9V
8	LAN Speed 1G+100Mbps, Ping WiFi 2.4G, LTE Link, SD R/W, EUT orientation: X-axis, DC 36V
9	LAN Speed 1G+100Mbps, Ping WiFi 5G, LTE Link, SD R/W, EUT orientation: Y-axis, with adapter: F48L-120400SPAV
For **Pretest Mode 2** is the worst case and only its data was record in this test report.	

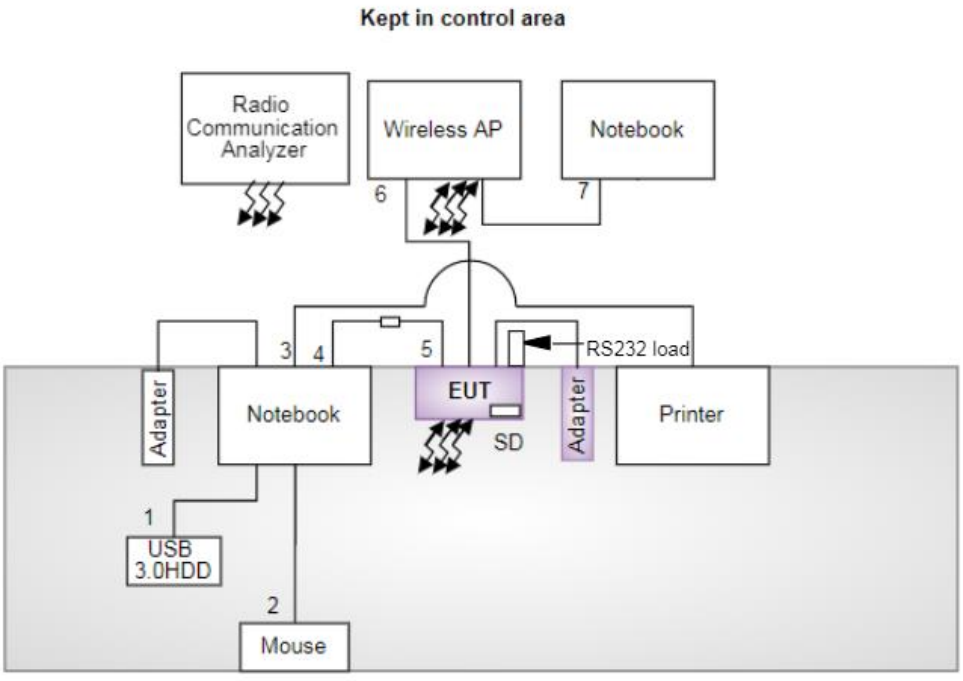
The Determined Worst Case Configurations	
Conducted Emissions	
Test Mode	**Operating Description**
1	LAN Speed 1G+100Mbps, Ping WiFi 5G, LTE Link, SD R/W, EUT orientation: Y-axis, with adapter: F30L2-120250SPACP
2	LAN Speed 1G+100Mbps, Ping WiFi 5G, LTE Link, SD R/W, EUT orientation: Y-axis, with adapter: F48L-120400SPAV
Radiated Emissions	
Test Mode ≤ 1GHz	**Operating Description**
1	LAN Speed 1G+100Mbps, Ping WiFi 5G, LTE Link, SD R/W, EUT orientation: Y-axis, with adapter: F30L2-120250SPACP
Test Mode > 1GHz	**Operating Description**
1	LAN Speed 1G+100Mbps, Ping WiFi 5G, LTE Link, SD R/W, EUT orientation: Y-axis, with adapter: F30L2-120250SPACP

2.3 Local Support Equipment List

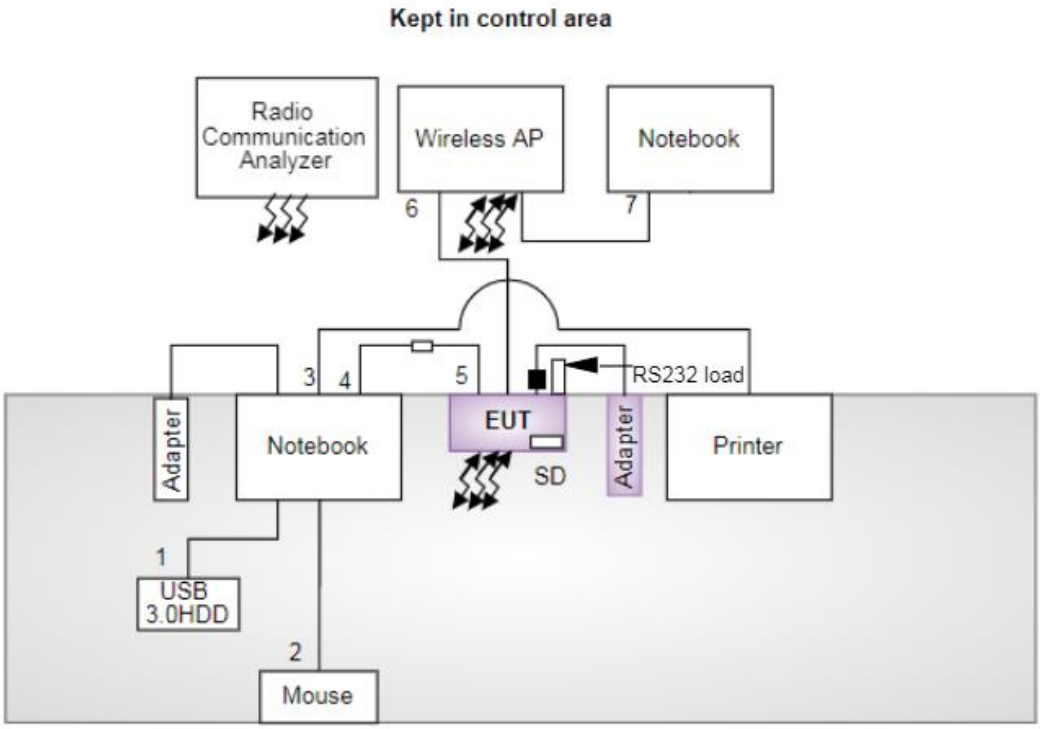
Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**S/N**	**Remarks**
1	Notebook	DELL	Latitude E6440	8VXMD12	---
2	Notebook	DELL	Latitude E6440	FNXMD12	---
3	Wireless AP	D-LINK	DIR-850L	RZ1Q4G6000261	---
4	Printer	EPSON	XP-30	QSDK002410	---
6	Mouse	DELL	MS111-L	2C3-00N9	---
7	SD Card	SanDisk	Micro SDHC 8GB	---	---
8	Radio Communication Analyzer	ANRITSU	MT8820C	6201240341	---

2.4 Test Setup Chart

Test Setup Diagram(Adapter: F30L2-120250SPACP)



No.	Signal cable / Length (m)
1	USB, 0.5m shielded.
2-3	USB, 1.8m shielded.
4-5	USB to RS232, 2m shielded.
6	RJ45, 10m(x2) non-shielded.
7	RJ45, 3m non-shielded.

Test Setup Diagram (Adapter: F48L-120400SPAU)


No.	Signal cable / Length (m)
1	USB, 0.5m shielded.
2-3	USB, 1.8m shielded.
4-5	USB to RS232, 2m shielded.
6	RJ45, 10m(x2) non-shielded.
7	RJ45, 3m non-shielded.

2.5 Test Software and Operating Condition

a. Enabled all function of test system.
b. Plugged the SD card into EUT to turn on the WiFi function.
c. The support notebook executed “WinEMC.exe” to send “H” patterns to its monitor and the monitor displayed them.
d. The support notebook executed “WinEMC.exe” to send “H” patterns to the printer.
e. The support notebooks communicated with support AP via EUT by using ping command to receive and transmit data by LAN & WLAN
f. The support notebook executed “teraterm.exe” to read and write data from SD card via console cable.

3 Emission Tests Results

3.1 Conducted Emissions

3.1.1 Limit of Conducted Emissions

Applicable Standard: FCC Part 15, Subpart B §15.107, ICES-003 §6.1				
Frequency Range (MHz)	Class A (dBµV)		Class B (dBµV)	
	Limits			
	Quasi-peak	Average	Quasi-peak	Average
0,15 to 0,5	79	66	66 to 56	56 to 46
0,5 to 5	73	60	56	46
5 to 30	73	60	60	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.				

3.1.2 Test Procedures

a. The EUT was placed on a table with a height of 0.8 meters from the metal ground plane and 0.4 meters from the conducting wall of the shielding room and it was kept at least 0.8 meters from any other grounded conducting surface.

b. The test equipment EUT installed received DC power through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane.

c. All the support units were connected to the other LISN.

d. The LISN provides 50 ohm coupling impedance for the measuring instrument.

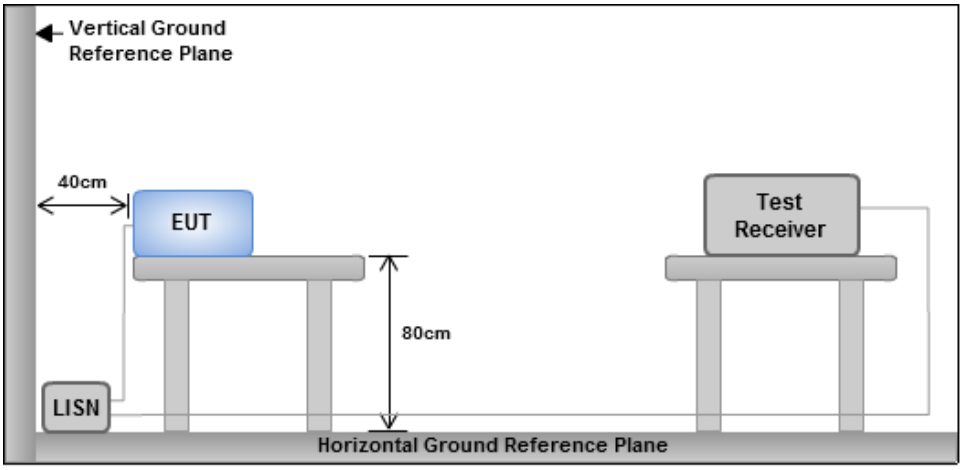
e. The ANSI 63.4 states that a 50 ohm, 50 microhenry LISN should be used.

f. Both sides of AC line were checked for maximum conducted interference.

g. The measurement frequency range extends from 150 kHz to 30 MHz.

h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

3.1.3 Test Setup

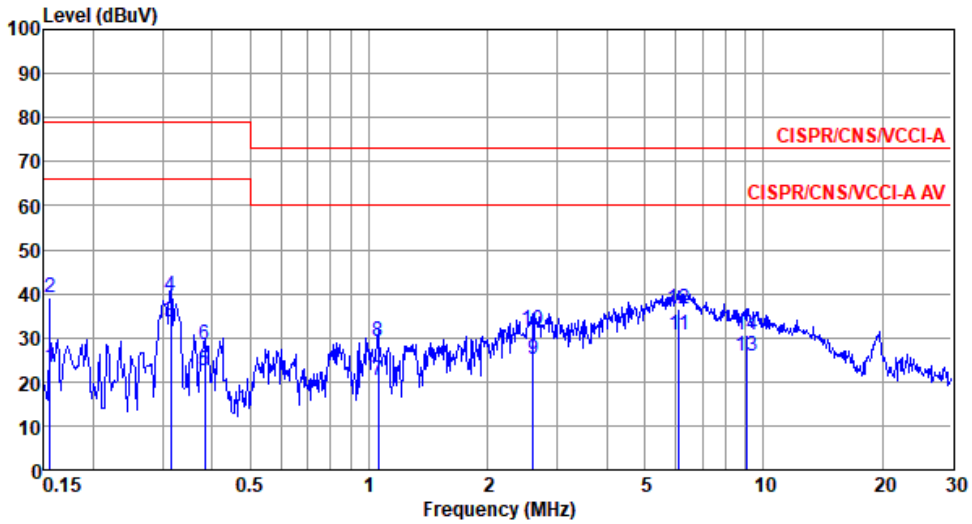


Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions

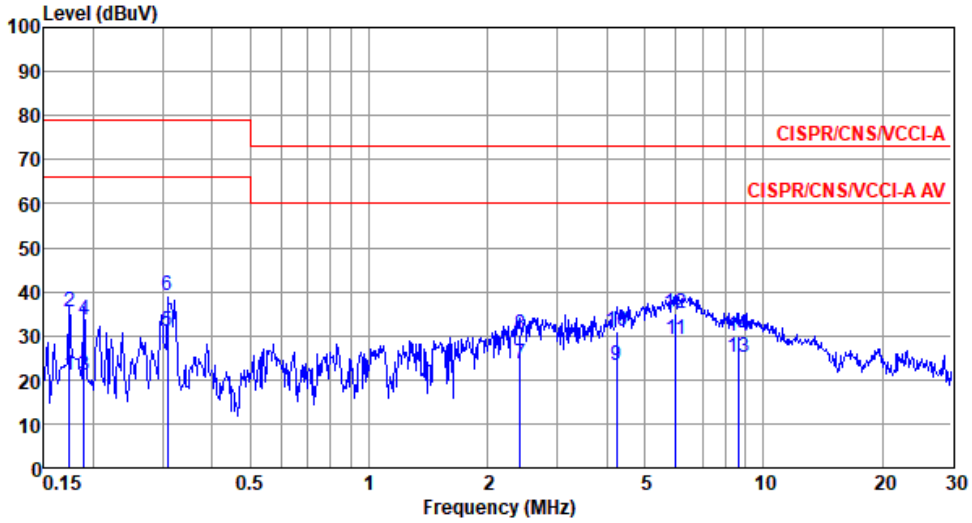
Power Phase	Line	Test Mode	1



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.156	23.12	66.00	-42.88	13.38	9.53	0.05	Average
2	0.156	39.10	79.00	-39.90	29.36	9.53	0.05	QP
3	0.315	33.41	66.00	-32.59	23.55	9.56	0.07	Average
4	0.315	39.56	79.00	-39.44	29.70	9.56	0.07	QP
5	0.383	22.57	66.00	-43.43	12.67	9.57	0.08	Average
6	0.383	28.37	79.00	-50.63	18.47	9.57	0.08	QP
7	1.054	20.20	60.00	-39.80	10.16	9.60	0.12	Average
8	1.054	28.97	73.00	-44.03	18.93	9.60	0.12	QP
9	2.608	24.99	60.00	-35.01	14.82	9.60	0.22	Average
10	2.608	31.58	73.00	-41.42	21.41	9.60	0.22	QP
11*	6.121	30.64	60.00	-29.36	20.29	9.63	0.34	Average
12	6.121	36.40	73.00	-36.60	26.05	9.63	0.34	QP
13	9.059	25.91	60.00	-34.09	15.48	9.65	0.38	Average
14	9.059	30.72	73.00	-42.28	20.29	9.65	0.38	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

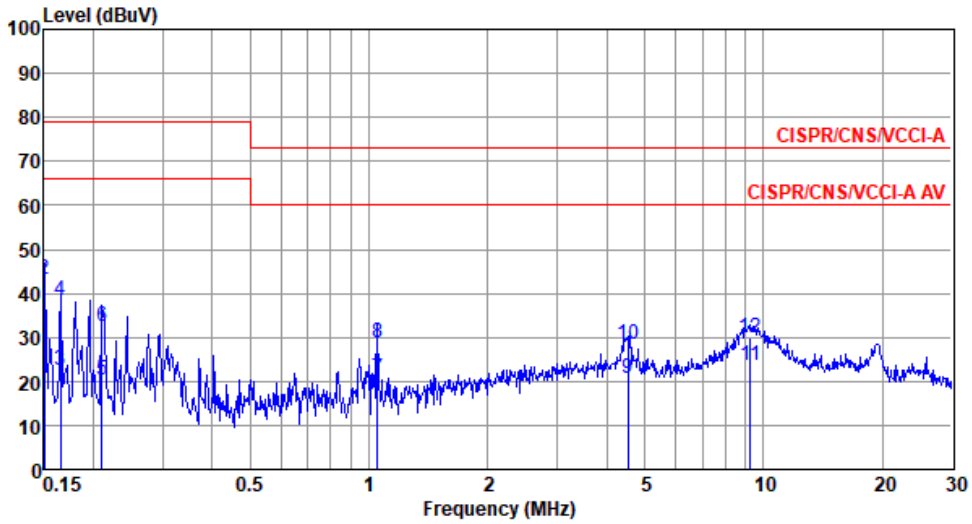
Power Phase	Neutral	Test Mode	1



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.174	20.89	66.00	-45.11	11.11	9.58	0.06	Average
2	0.174	35.57	79.00	-43.43	25.79	9.58	0.06	QP
3	0.189	21.04	66.00	-44.96	11.26	9.58	0.06	Average
4	0.189	33.73	79.00	-45.27	23.95	9.58	0.06	QP
5	0.308	31.10	66.00	-34.90	21.27	9.60	0.07	Average
6	0.308	39.22	79.00	-39.78	29.39	9.60	0.07	QP
7	2.422	23.52	60.00	-36.48	13.40	9.65	0.21	Average
8	2.422	30.38	73.00	-42.62	20.26	9.65	0.21	QP
9	4.247	23.14	60.00	-36.86	12.92	9.66	0.30	Average
10	4.247	30.85	73.00	-42.15	20.63	9.66	0.30	QP
11*	5.993	29.11	60.00	-30.89	18.81	9.68	0.33	Average
12	5.993	34.92	73.00	-38.08	24.62	9.68	0.33	QP
13	8.683	25.18	60.00	-34.82	14.79	9.70	0.37	Average
14	8.683	29.91	73.00	-43.09	19.52	9.70	0.37	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

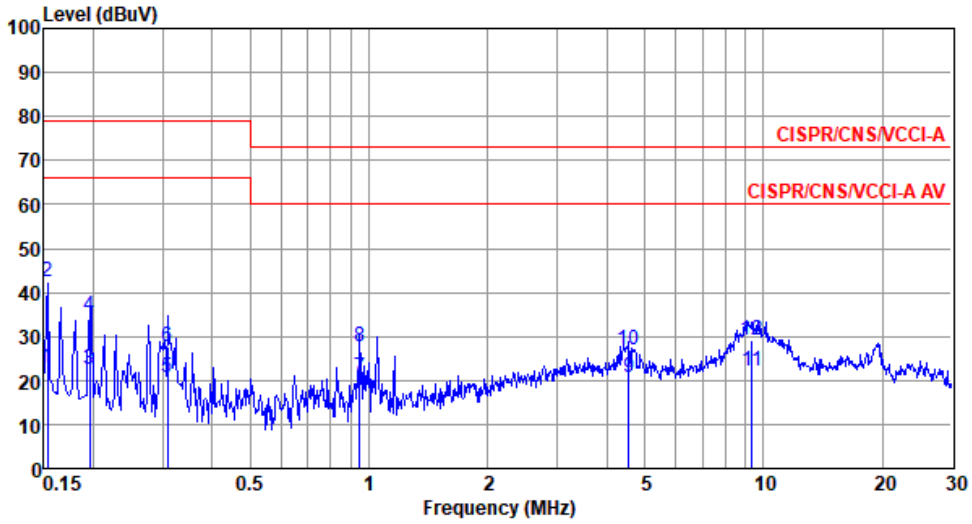
Power Phase	Line	Test Mode	2



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.150	23.17	66.00	-42.83	13.43	9.53	0.05	Average
2*	0.150	43.35	79.00	-35.65	33.61	9.53	0.05	QP
3	0.165	22.67	66.00	-43.33	12.92	9.53	0.05	Average
4	0.165	38.38	79.00	-40.62	28.63	9.53	0.05	QP
5	0.211	20.17	66.00	-45.83	10.38	9.54	0.06	Average
6	0.211	32.58	79.00	-46.42	22.79	9.54	0.06	QP
7	1.049	20.56	60.00	-39.44	10.52	9.60	0.12	Average
8	1.049	28.92	73.00	-44.08	18.88	9.60	0.12	QP
9	4.525	20.69	60.00	-39.31	10.40	9.62	0.30	Average
10	4.525	28.40	73.00	-44.60	18.11	9.62	0.30	QP
11	9.253	23.48	60.00	-36.52	13.05	9.65	0.38	Average
12	9.253	29.79	73.00	-43.21	19.36	9.65	0.38	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

Power Phase	Neutral	Test Mode	2



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.153	22.96	66.00	-43.04	13.22	9.57	0.05	Average
2*	0.153	42.57	79.00	-36.43	32.83	9.57	0.05	QP
3	0.195	22.36	66.00	-43.64	12.57	9.58	0.06	Average
4	0.195	34.63	79.00	-44.37	24.84	9.58	0.06	QP
5	0.308	20.67	66.00	-45.33	10.84	9.60	0.07	Average
6	0.308	27.64	79.00	-51.36	17.81	9.60	0.07	QP
7	0.948	20.75	60.00	-39.25	10.79	9.64	0.12	Average
8	0.948	27.84	73.00	-45.16	17.88	9.64	0.12	QP
9	4.549	20.65	60.00	-39.35	10.41	9.67	0.30	Average
10	4.549	26.97	73.00	-46.03	16.73	9.67	0.30	QP
11	9.352	22.09	60.00	-37.91	11.67	9.71	0.38	Average
12	9.352	29.19	73.00	-43.81	18.77	9.71	0.38	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

3.2 Radiated Emissions

3.2.1 Limit of Radiated Emissions

Applicable Standard: FCC Part 15, Subpart B §15.109, ICES-003 §6.2		
Frequency Range (MHz)	**Class A (10 m)**	**Class B (10 m)**
	Quasi-peak limits (dBμV/m)	
30 to 230	40	30
230 to 1000	47	37
Note 1: The lower limit shall apply at the transition frequency. Note 2: Additional provisions may be required for cases where interference occurs.		

Note:
1) According to FCC Part 15, Subpart B §15.109(g): As an alternative to the radiated emission limits shown in paragraphs (a) and (b) of this section, digital devices may be shown to comply with the standards contained in Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, “Information Technology Equipment – Radio Disturbance Characteristics – Limits and Methods of Measurement.”
2) The CISPR 22 §6 standard limits are applied to the test data hereinafter.

Frequency of Emission (MHz)	**Field Strength (uV/m)**		**Field Strength (dBuV/m)**	
	Class A	**Class B**	**Class A**	**Class B**
Above 1000	1000	500	60	54

According to FCC Part 15, Subpart B §15.109, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the above values.

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

Note: According to FCC Part 15, Subpart B §15.33: For an unintentional radiator is shown in the table above.

3.2.2 Test Procedures

Measuring below 1 GHz:

a. The EUT was placed on a rotatable table top with a height of 0.8 meters which is placed on the ground plane.

b. The EUT received DC power source from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.

c. The EUT was set 10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.

d. The table was rotated 360 degrees to determine the position of the highest radiation.

e. 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.

f. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 to 4 meters) and turn table (from 0 to 360 degrees) to find the maximum reading.

g. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

h. If the emission level of the EUT in peak mode was 2 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 2 dB margin will be repeated one by one using the quasi-peak method and reported.

Measuring above 1 GHz:

a. Same test set up as below 1GHz radiated testing.

b. The EUT was set 3 meters 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. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

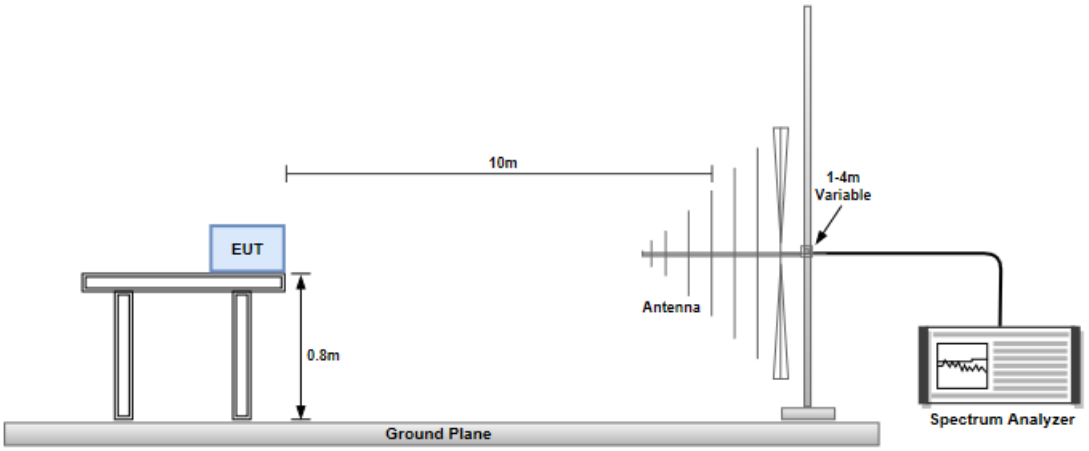
f. Set the Horn Antenna at 1m height, then run the turn table to get the maximum noise reading from Horizontal and Vertical polarity separately.

g. When EUT locating on the turn-table, the 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.

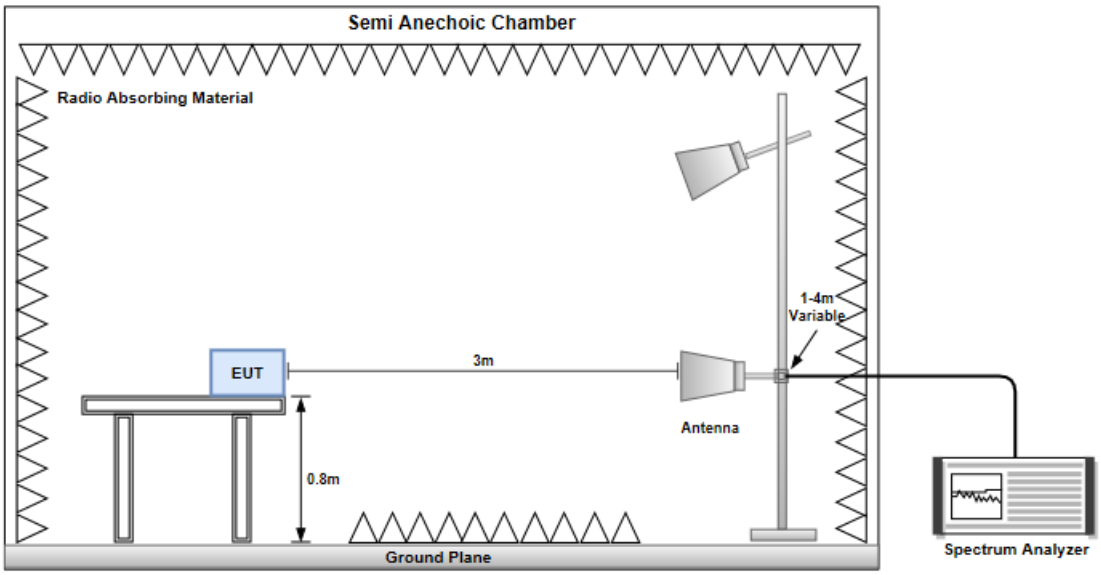
h. If emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.2.3 Test Setup

Radiated Emissions below 1 GHz

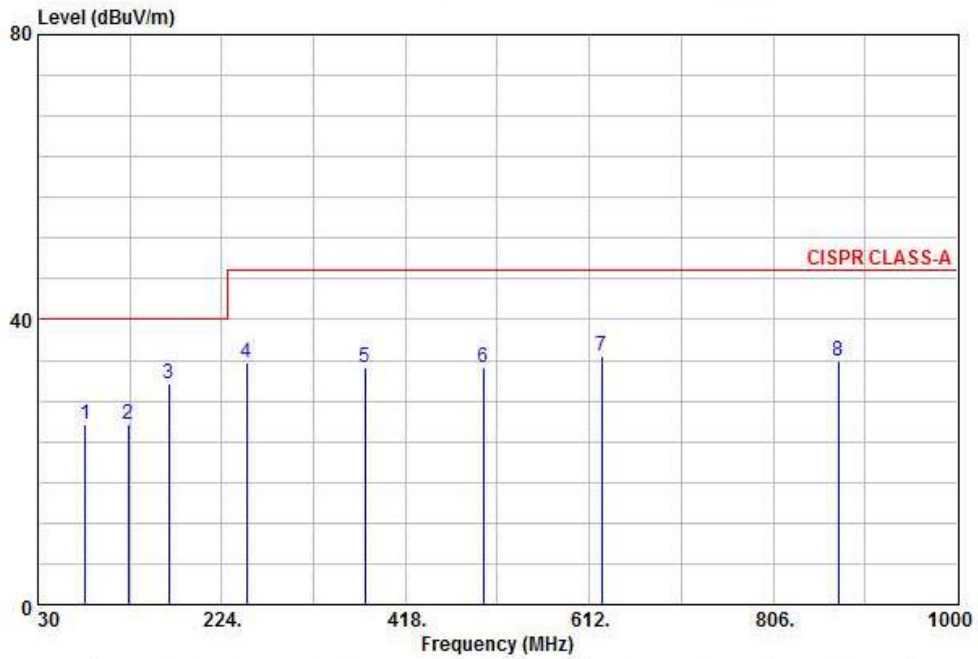


Radiated Emissions above 1 GHz



3.2.4 Radiated Emissions (Below 1GHz)

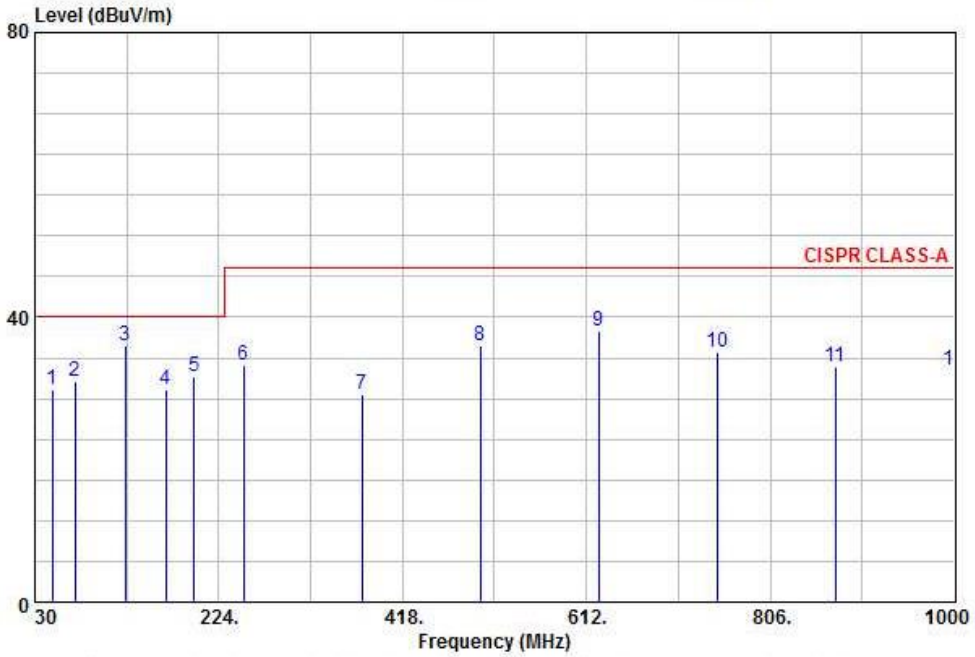
Polarization	Horizontal	Test Mode	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	80.00	25.21	40.00	-14.79	36.86	-11.65	Peak		
2	125.00	25.33	40.00	-14.67	34.00	-8.67	Peak		
3	168.12	30.93	40.00	-9.07	37.00	-6.07	Peak		
4	250.00	34.00	47.00	-13.00	40.99	-6.99	Peak		
5	375.00	33.17	47.00	-13.83	36.86	-3.69	Peak		
6	500.00	33.36	47.00	-13.64	35.00	-1.64	Peak		
7	625.00	34.84	47.00	-12.16	34.00	0.84	Peak		
8	875.00	34.08	47.00	-12.93	29.00	5.08	Peak		

Note 1: Emission level (dBuV/m) = SA reading (dBuV) + Factor (dB)
2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m)

Polarization	Vertical	Test Mode	1

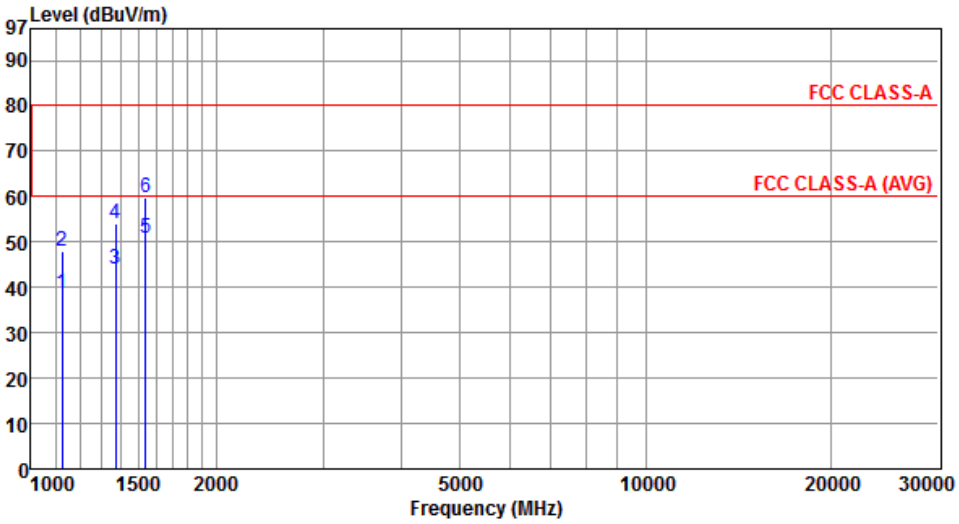


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	48.00	29.74	40.00	-10.26	36.76	-7.02	Peak		
2	72.07	31.01	40.00	-8.99	41.00	-9.99	QP	100	285
3	125.00	35.93	40.00	-4.07	44.60	-8.67	QP	100	168
4	168.11	29.93	40.00	-10.07	36.00	-6.07	Peak		
5	197.95	31.72	40.00	-8.28	39.00	-7.28	Peak		
6	250.00	33.19	47.00	-13.82	40.17	-6.99	Peak		
7	375.00	29.16	47.00	-17.84	32.85	-3.69	Peak		
8	500.00	36.00	47.00	-11.00	37.64	-1.64	Peak		
9	625.00	38.00	47.00	-9.00	37.16	0.84	Peak		
10	750.00	35.00	47.00	-12.00	31.79	3.22	Peak		
11	875.00	33.00	47.00	-14.00	27.93	5.08	Peak		
12	1000.00	32.61	47.00	-14.39	25.30	7.31	Peak		

Note 1: Emission level (dBuV/m) = SA reading (dBuV) + Factor (dB)
2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m)

3.2.5 Radiated Emissions (Above 1GHz)

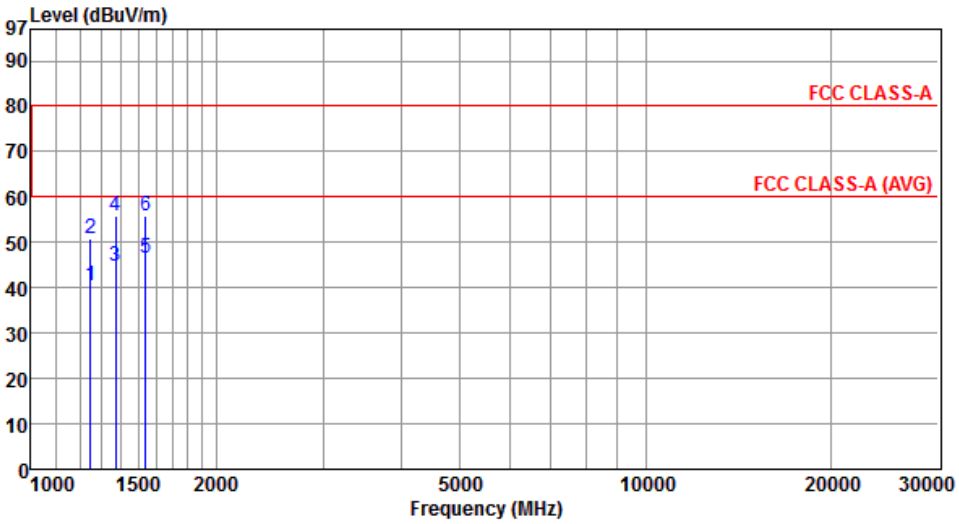
Polarization	Horizontal	Test Mode	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1125.02	38.60	60.00	-21.40	47.54	-8.94	Average	100	211
2	1125.02	48.01	80.00	-31.99	56.95	-8.94	Peak	100	211
3	1375.03	44.20	60.00	-15.80	50.52	-6.32	Average	100	160
4	1375.03	53.91	80.00	-26.09	60.23	-6.32	Peak	100	160
5	1538.08	50.77	60.00	-9.23	57.11	-6.34	Average	100	62
6	1538.08	59.64	80.00	-20.36	65.98	-6.34	Peak	100	62

Note 1: Emission level (dBuV/m) = SA reading (dBuV) + Factor (dB)
2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m)

Polarization	Vertical	Test Mode	1

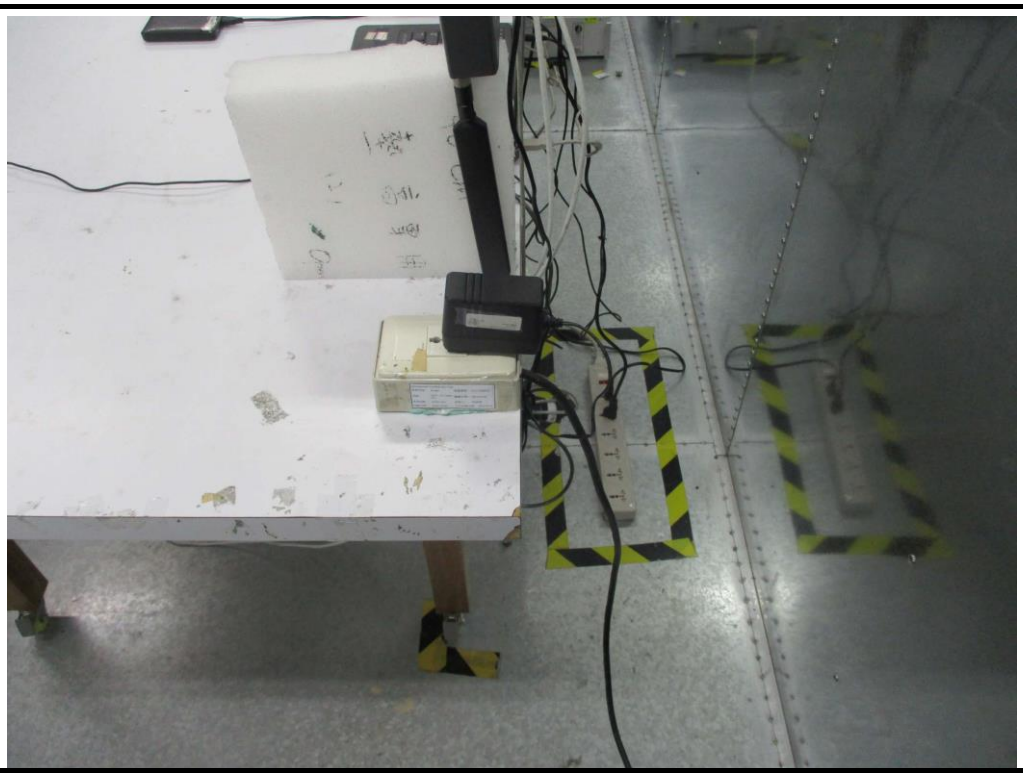


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1249.90	40.55	60.00	-19.45	47.90	-7.35	Average	100	120
2	1249.90	50.92	80.00	-29.08	58.27	-7.35	Peak	100	120
3	1375.00	44.64	60.00	-15.36	50.96	-6.32	Average	100	163
4	1375.00	55.69	80.00	-24.31	62.01	-6.32	Peak	100	163
5	1538.05	46.65	60.00	-13.35	52.99	-6.34	Average	100	175
6	1538.05	55.89	80.00	-24.11	62.23	-6.34	Peak	100	175

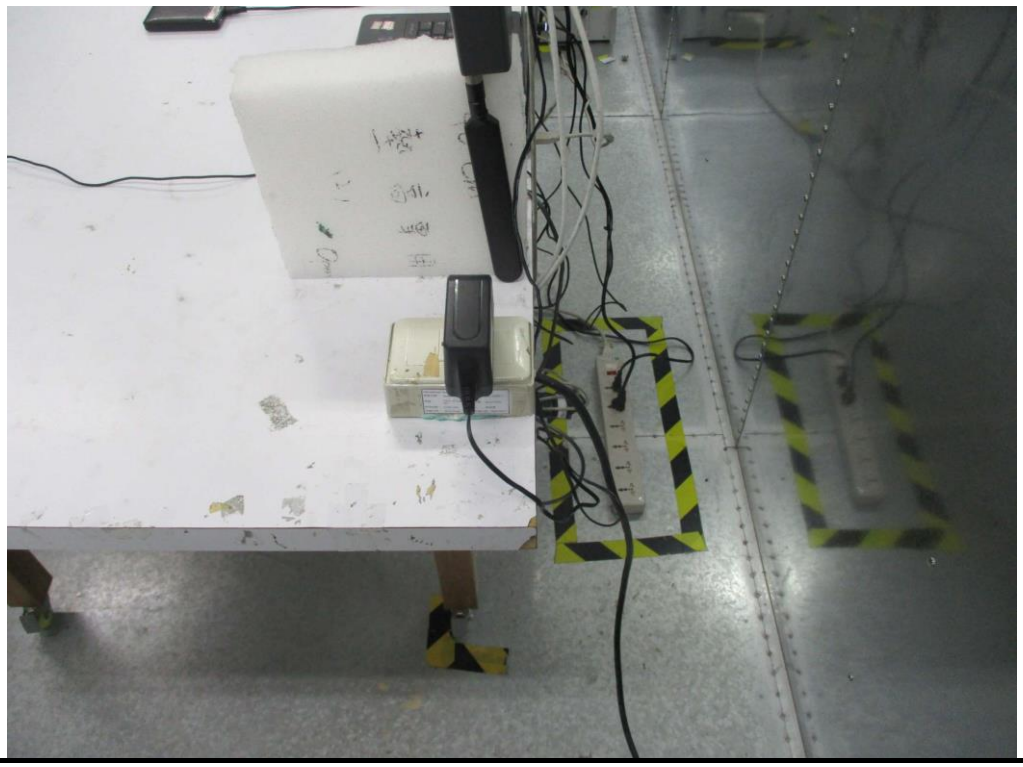
Note 1: Emission level (dBuV/m) = SA reading (dBuV) + Factor (dB)
2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m)

4 Photographs of the Test Configuration

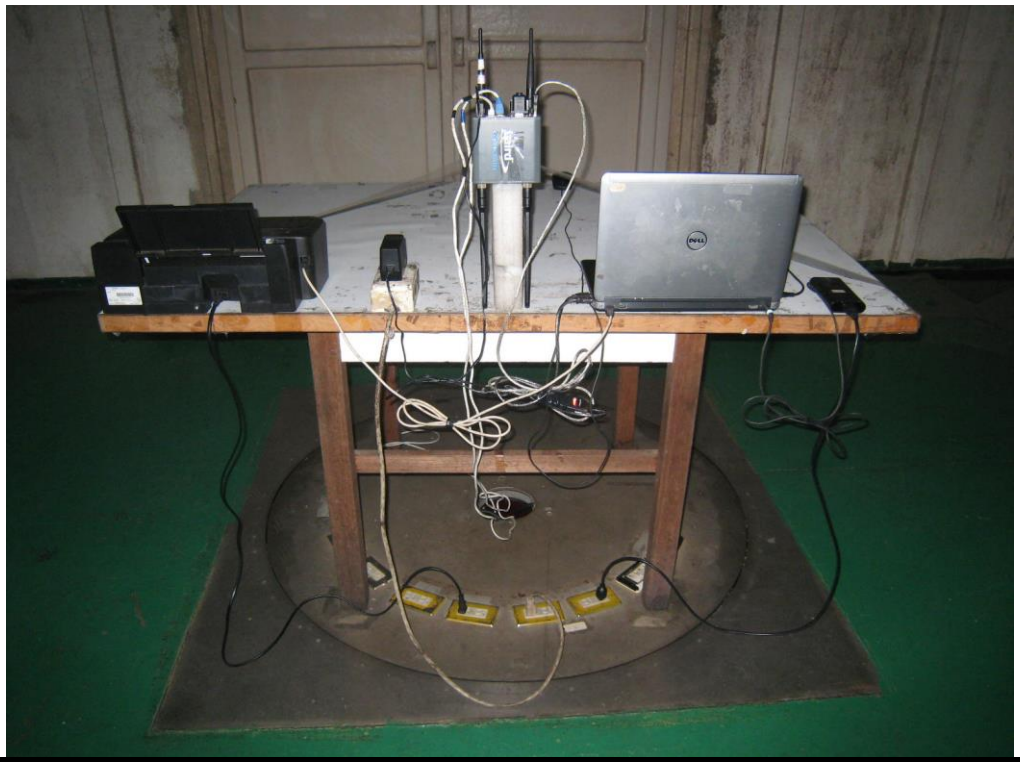
Conducted Emission Test (Adapter: F30L2-120250SPACP)



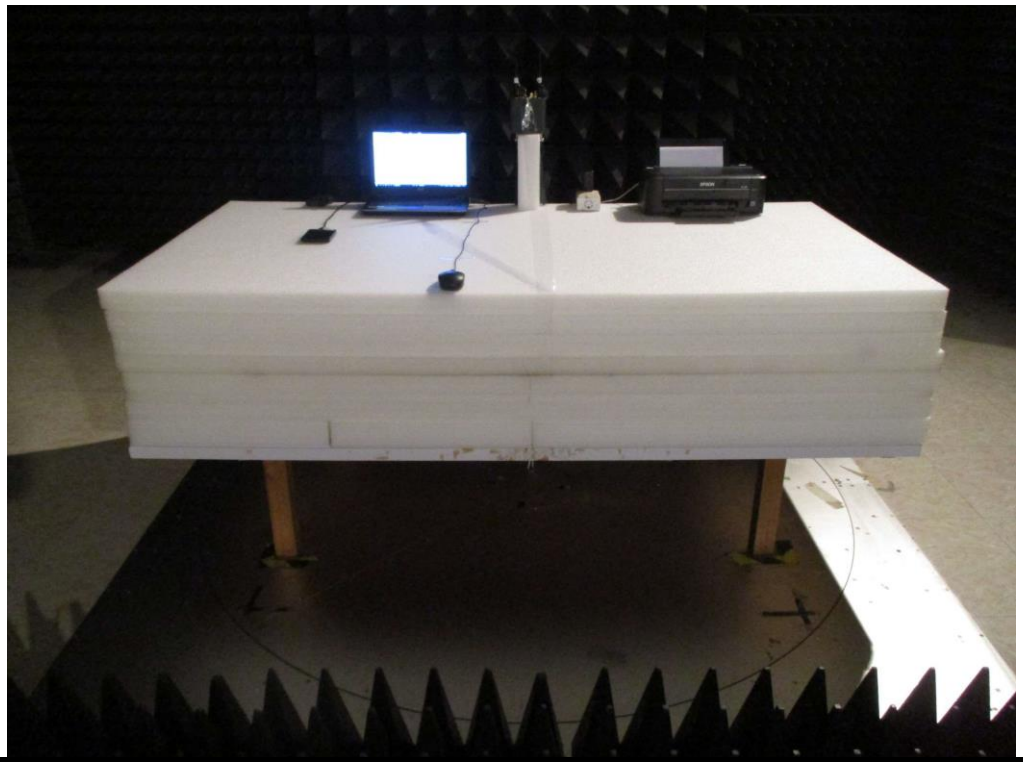
Conducted Emission Test (Adapter: F48L-120400SPAU)

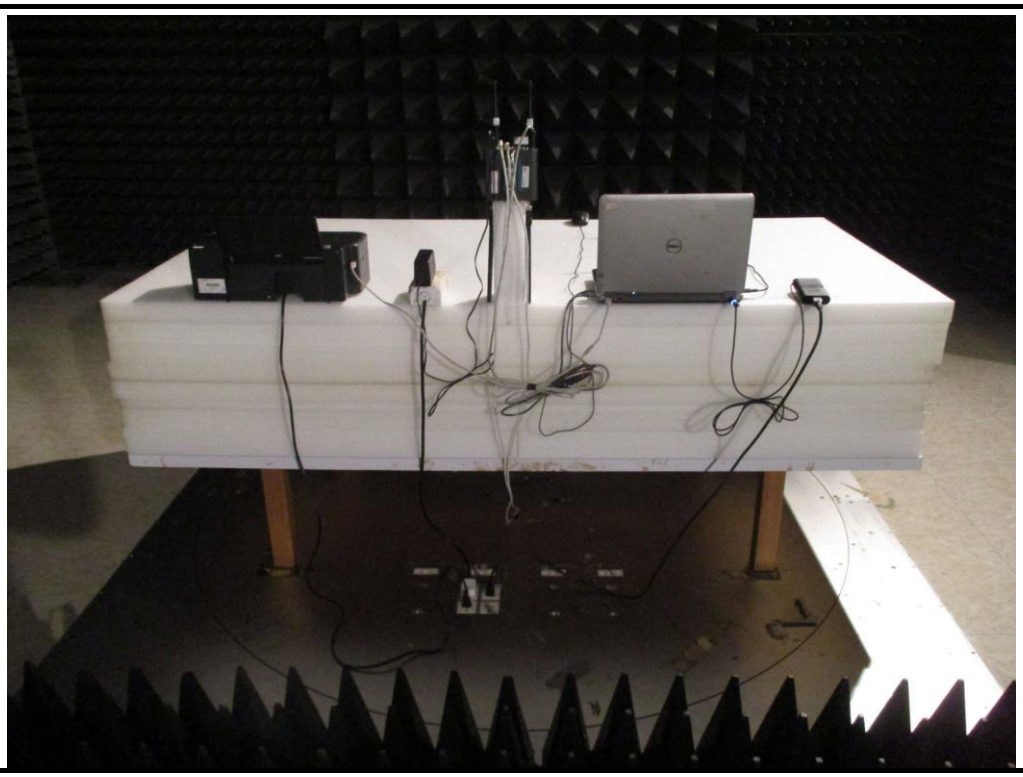


Radiated Emission Below 1GHz Test



Radiated Emission Above 1GHz Test





5 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website http://www.icertifi.com.tw.

Linkou	**Kwei Shan**	**Kwei Shan Site II**
Tel: 886-2-2601-1640	Tel: 886-3-271-8666	Tel: 886-3-271-8640
No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.	No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information

Tel: 886-3-271-8666
Fax: 886-3-318-0155
Email: ICC_Service@icertifi.com.tw

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