FCC Test Report

Application No.:	DNT2410170162R2749-04501
Applicant:	Systec&Solutions
Address of Applicant:	Wilhelm-Schickard-Straße 9, Karlsruhe, Karlsruhe, Germany
EUT Description:	Wireless charger module
Model No.:	HG-EPP15W-V3.0
FCC ID:	2BMCR-HG-EPP15W-V3
Power Supply:	DC 24V
Trade Mark:	/
Standards:	47 CFR Part 15, Subpart C ANSI C63.10: 2013
Date of Receipt:	2024/10/25
Date of Test:	2024/10/26 to 2024/11/4
Date of Issue:	2024/12/12
Test Result:	**PASS ***

Prepared By: Wayne.Lin (Testing Engineer)

Reviewed By: Pencils.Chen (Project Engineer)

Approved By: (Manager)

Note: If there is any objection to the results in this report, please submit a written inquiry to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp, and is issued by the company in accordance with the requirements of the "Conditions of Issuance of Test Reports" printed in the attached page. Unless otherwise stated, the results presented in this report only apply to the samples tested this time. Partial reproduction of this report is not allowed unless approved by the company in writing.

Dongguan DN Testing Co., Ltd.

Add: No. 1, West Fourth Street, Xingfa South Road, Wusha Community, Chang 'an Town, Dongguan City, Guangdong P.R.China

Web: www.dn-testing.com Tel:+86-769-88087383 E-mail: service@dn-testing.com

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Dec.12, 2024	Valid	Original Report

1 Test Summary

Test Item	Test Requirement	Test Method	Test Result	Result
Antenna Requirement	15.203/247(b)	--	Clause 3.1	PASS
Radiated Spurious emissions	15.247(d); 15.205/15.209	ANSI C63.10 (2013)	Clause 3.2	PASS
AC Power Line Conducted Emission	15.207	ANSI C63.10 (2013)	Clause 3.3	N/A

Note:
1. “N/A” denotes test is not applicable in this test report.

Contents

2 General Information

2.1 Test Location

Company:	Dongguan DN Testing Co., Ltd
Address:	No. 1, West Fourth Street, South Xinfa Road, Wusha Liwu, Chang ' an Town, Dongguan City, Guangdong P.R.China
Test engineer:	Wayne Lin

2.2 General Description of EUT

Manufacturer:	Shenzhen Huagon Technology Co.,Ltd
Address of Manufacturer:	6 floor, Building A,Weihuada Industrial Park, No. 5, Lirong Road, Xinshi community, Dalang street, Longhua District, Shenzhen 518109
Test EUT Description:	Wireless charger module
Model No.:	HG-EPP15W-V3.0
Additional Model(s):	/
Chip Type:	SC5004
Serial number:	PR2410170162R2749
Power Supply:	DC 24V
Output Max Wireless Charge Power；	15W
Trade Mark:	/
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	110.5KHz-205KHz
Test Frequency:	127KHz
Modulation Technique:	FSK
Sample Type:	☐ Portable Device, ☒ Module,☒ Mobile Device
Antenna Type:	Copper inducted coil

Remark:

*Since the above data and/or information is provided by the applicant relevant results or conclusions of this report are only made for these data and/or information , DNT is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.

2.3 Test Environment and Mode

Operating Environment:	
Temperature:	20~25.0 ˚C
Humidity:	45~56 % RH
Atmospheric Pressure:	101.0~101.30 KPa
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.

Test Item	Test Mode
Radiated Emission	Wireless Charging with Full Load

Note: The Full Load is worst case, will be recorded in the report.

2.4 Description of Support Units

The EUT has been tested independent unit.

2.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

Lab A:

• FCC, USA

Designation Number: CN1348

• A2LA (Certificate No. 7050.01)

DONGGUAN DN TESTING CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 7050.01.

• Innovation, Science and Economic Development Canada

DONGGUAN DN TESTING CO., LTD. EMC Laboratory has been recognized by ISED as an accredited testing laboratory. CAB identifier is CN0149.

IC#: 30755.

2.6 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	20dB Emission Bandwidth	±0.0196%
2	Carrier Frequency Separation	±1.9%
3	Number of Hopping Channel	±1.9%
4	Time of Occupancy	±0.028%
5	Max Peak Conducted Output Power	±0.743 dB
6	Band-edge Spurious Emission	±1.328 dB
7	Conducted RF Spurious Emission	9KHz-1GHz:±0.746dB 1GHz-26GHz:±1.328dB

No.	Item	Measurement Uncertainty
1	Conduction Emission	± 3.0dB (150kHz to 30MHz)
2	Radiated Emission	± 4.8dB (Below 1GHz)
		± 4.8dB (1GHz to 6GHz)
		± 4.5dB (6GHz to 18GHz)
		± 5.02dB (Above 18GHz)

2.7 Equipment List

Test Equipment for Conducted Emission					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Receiver	R&S	ESCI3	101152	2024-10-24	2025-10-23
LISN	R&S	ENV216	102874	2024-10-24	2025-10-23
ISN	R&S	ENY81-CA6	1309.8590.03	2024-10-24	2025-10-23

Test Equipment for Radiated Emission(30MHz-1000MHz)					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Receiver	R&S	ESR7	102497	2024-10-24	2025-10-23
Test Software	ETS-LINDGREN	TiLE-FULL	NA	NA	NA
RF Cable	ETS-LINDGREN	RFC-NMS-100-NMS-350-IN	NA	2024-10-24	2025-10-23
Log periodic antenna	ETS-LINDGREN	VULB 9168	01475	2024-10-24	2025-10-23
Pre-amplifier	Schwarzbeck	BBV9743B	00423	2024-10-24	2025-10-23
Single ring magnetic field ring antenna	ETS-LINDGREN	6502	6502	2024-10-24	2025-10-23

2.8 Assistant equipment used for test

Code	Equipment	Manufacturer	Model No.	Equipment No.
1	iPhone	Apple	iPhone 14	NA

3 Test results and Measurement Data

3.1 Antenna Requirement

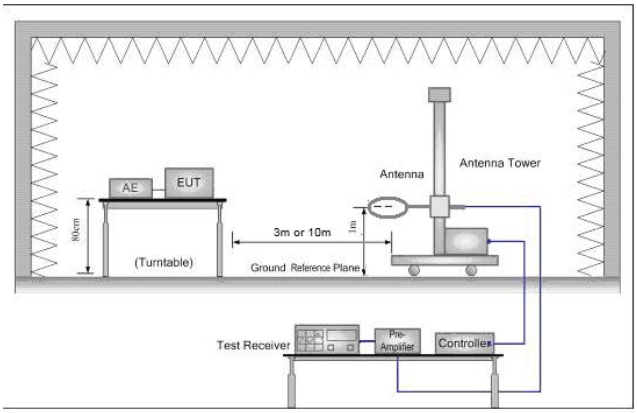
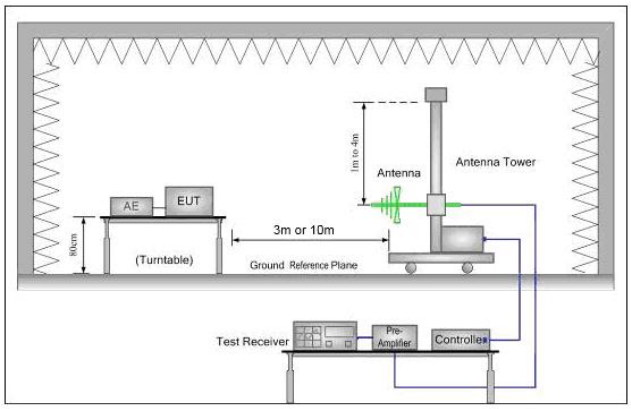
Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.+	
The antennas used for this product is Coil antenna.	

3.2 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10: 2013 Section 11.12				
Test Site:	Measurement Distance: 3m or 10m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.090MHz-0.150MHz	Quasi-peak	300Hz	300Hz	Quasi-peak
	0.150MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz (DC⩾0.98) ⩾1/T (DC<0.98)	Average
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Remark: 15.35(b),Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.				

Restricted frequency band

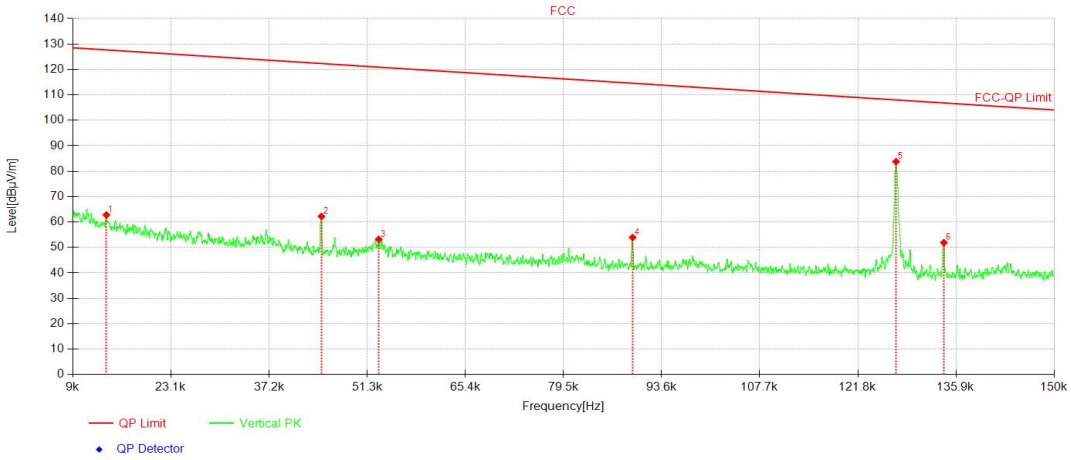
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

Test Setup:	
 Figure 1. Below 30MHz	 Figure 2. 30MHz to 1GHz
Test Procedure:	a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. d. The antenna 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. e. 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(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. h. Test the EUT in the lowest channel, the middle channel ,the Highest channel. i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case. j. Repeat above procedures until all frequencies measured was complete.
Test Configuration:	Measurements 9K-150KHz • RBW = 300Hz • VBW = 300Hz • Detector = Peak • Trace mode = max hold Measurements 150K-30MHz • RBW = 10KHz • VBW = 30KHz • Detector = Peak

	• Trace mode = max hold Measurements 30 - 1000MHz • RBW = 120 kHz • VBW = 300 kHz • Detector = Peak • Trace mode = max hold Peak Measurements Above 1000 MHz • RBW = 1 MHz • VBW ⩾ 3 MHz • Detector = Peak • Sweep time = auto • Trace mode = max hold Average Measurements Above 1000MHz • RBW = 1 MHz • VBW = 10 Hz, when duty cycle is no less than 98 percent. • VBW ⩾ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Charge+Transmitting mode.
Final Test Mode:	Pretest the EUT at Transmitting mode. Through Pre-scan, find the worst case of All modulation type.
Instruments Used:	Refer to section 2.9 for details
Test Results:	Pass

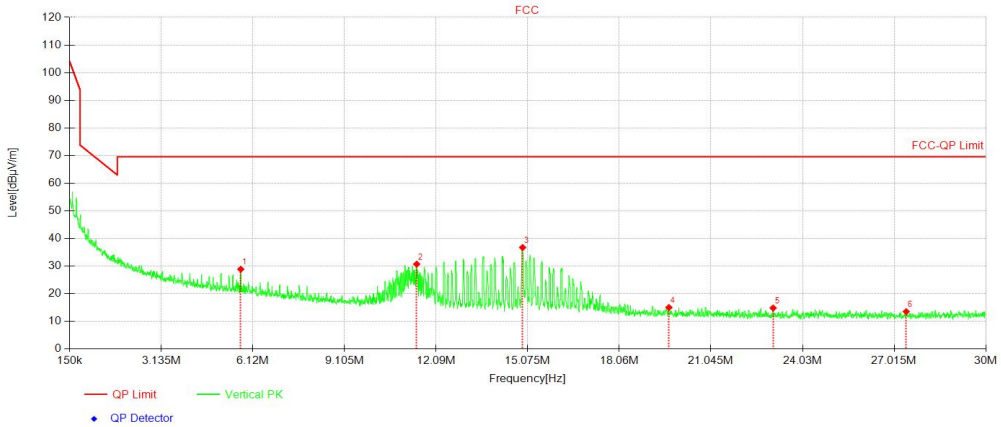
Test data

For 9K-150KHz



NO.	Freq. [MHz]	Reading Level [dBµV]	Correct Factor [dB/m]	Result Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	0.013	45.70	17.10	62.80	128.17	65.37	100	93	PK
2	0.044	50.45	11.77	62.22	125.94	63.72	100	82	PK
3	0.052	41.72	11.49	53.21	125.35	72.14	100	95	PK
4	0.089	42.90	11.02	53.92	122.71	68.79	100	91	PK
5	0.127	72.92	10.84	83.76	119.98	36.22	100	68	PK
6	0.134	41.05	10.84	51.89	119.48	67.59	100	80	PK

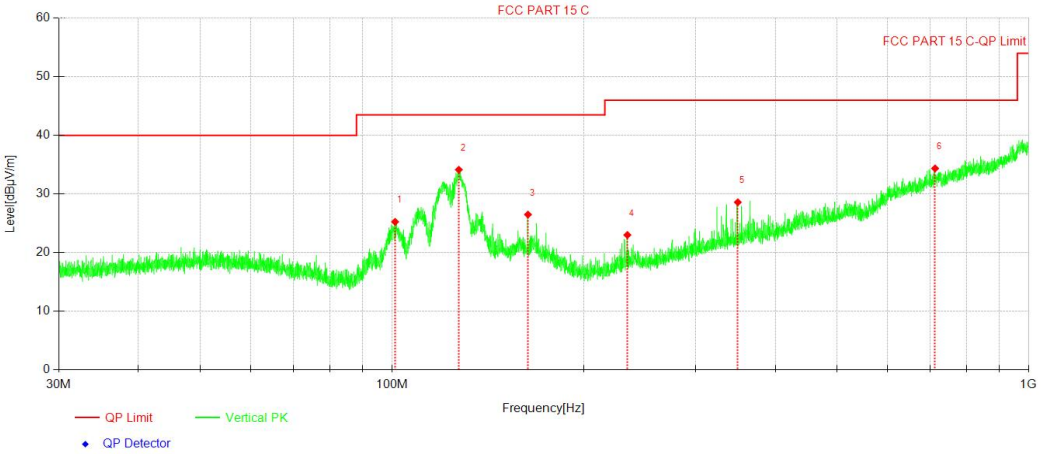
For 150KHz-30MHz



NO.	Freq. [MHz]	Reading Level [dBµV]	Correct Factor [dB/m]	Result Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	5.727	18.29	10.60	28.89	69.54	40.65	100	38	PK
2	11.459	20.35	10.38	30.73	69.54	38.81	100	75	PK
3	14.910	26.66	10.08	36.74	69.54	32.80	100	270	PK
4	19.675	5.55	9.47	15.02	69.54	54.52	100	101	PK
5	23.073	5.94	8.92	14.86	69.54	54.68	100	214	PK
6	27.408	5.51	8.04	13.55	69.54	55.99	100	87	PK

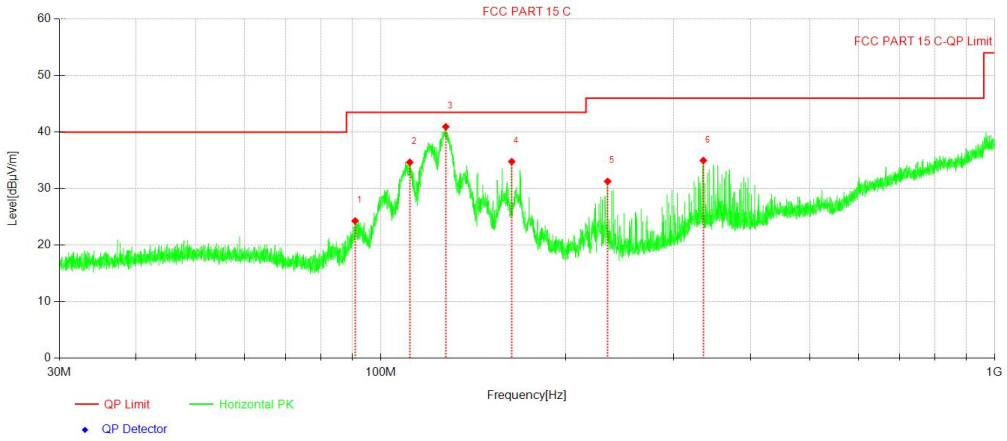
For 30-1000MHz

Vertical:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	101.182	37.70	-12.46	25.24	43.50	18.26	200	358	PK
2	127.396	43.80	-9.66	34.14	43.50	9.36	100	1	PK
3	163.582	34.38	-7.89	26.49	43.50	17.01	200	48	PK
4	234.332	32.82	-9.82	23.00	46.00	23.00	200	99	PK
5	349.372	34.42	-5.83	28.59	46.00	17.41	200	1	PK
6	712.922	31.92	2.44	34.36	46.00	11.64	200	211	PK

Horizontal :



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	90.919	38.08	-13.80	24.28	43.50	19.22	200	70	PK
2	111.581	45.69	-11.04	34.65	43.50	8.85	200	251	PK
3	127.709	50.58	-9.64	40.94	43.50	2.56	200	78	PK
4	163.525	42.67	-7.89	34.78	43.50	8.72	200	92	PK
5	234.332	41.09	-9.82	31.27	46.00	14.73	100	152	PK
6	335.446	40.89	-5.92	34.97	46.00	11.03	100	0	PK

Note:

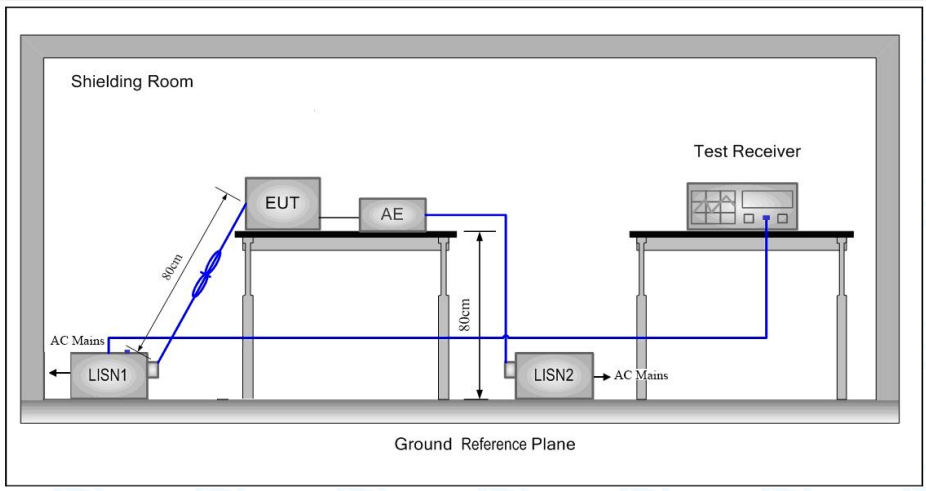
1. The Measurement (Result Level) is calculated by Reading Level adding the Correct Factor(maybe including Ant.Factor and the Cable Factor etc.), The basic equation is as follows:

Result Level= Reading Level + Correct Factor(including Ant.Factor, Cable Factor etc.)

2. The amplitude of 9KHz to 30MHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

3. The amplitude of 18GHz to 25GHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be report.

3.3 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	* Decreases with the logarithm of the frequency.		
Test Procedure:	1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 2013 on conducted measurement.		
Test Setup:			
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel. Charge + Transmitting mode.		

Final Test Mode:	Through Pre-scan, find the the worst case.
Instruments Used:	Refer to section 2.9 for details
Test Results:	NA

---END REPORT---