TEST REPORT

Application No.:	DNT2411220365R4306-06468
Applicant:	Sino Innovation (Beijing) Technology Development Co., Ltd.
Address of Applicant:	Room 2508, Building A, No.72 West Third Ring North Road, Haidian District, Beijing
EUT Description:	HMPROTECTION-Remote control
Model No.:	Y001
FCC ID:	2BM9M-Y001
Power Supply	DC 12V
Trade Mark:	HM PROTECTION
Standards:	47 CFR FCC Part 2, Subpart J 47 CFR Part 15, Subpart C ANSI C63.10: 2013
Date of Receipt:	2024/11/23
Date of Test:	2024/11/24 to 2024/12/04
Date of Issue:	2024/12/05
Test Result:	**PASS**

Prepared By: Wayne.Lin (Testing Engineer)

Reviewed By: Pencils.Chen (Project Engineer)

Approved By: Kevin Chen (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.

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Dec.05, 2024	Valid	Original Report

1 Test Summary

Test Item	Standard Section	Test Result	Result
Antenna Requirement	15.203	Clause 3.1	PASS
20dB Occupied Bandwidth	15.231(c)	Clause 3.2	PASS
Duration time	15.231(a)	Clause 3.3	PASS
Duty Cycle	-	-	PASS
Field Strength	15.231	Clause 3.4	PASS
Radiated Spurious Emissions	15.231, 15.209	Clause 3.5	PASS
AC Power Line Conducted Emissions	15.207	Clause 3.6	N/A

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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:	Sino Innovation (Beijing) Technology Development Co., Ltd.
Address of Manufacturer:	Room 2508, Building A, No.72 West Third Ring North Road, Haidian District, Beijing
EUT Description:	HMPROTECTION-Remote control
Test Model No.:	Y001
Additional Model(s):	/
Power Supply	DC 12V
Chip Type:	F119
Serial number:	PR2411220365R4306
Trade Mark:	HM PROTECTION
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	433.9MHz
Type of Modulation:	ASK
Sample Type:	Prototype production
Antenna Type:	☐ External, ☒ Integrated
Antenna Ports	☒ Ant 1, ☐ Ant 2, ☐ Ant 3
Antenna Gain*:	☒ Provided by applicant
	2dBi
RF Cable*:	☒ Provided by applicant
	0.5dB(0.6~1GHz); 0.8dB(1.4~2GHz); 1.0dB(2.1~2.7GHz); 1.5dB(3~4GHz); 1.8dB(4.4~6GHz);

Remark:

*All models are just name differences, motherboard, PCB circuit board, chip, electronic components, appearance is all the same.

*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 Power Setting of Test Software

Software Name	N/A
Frequency(MHz)	433.9
Setting	Default

2.4 Test Environment and Mode

Operating Environment:	
Temperature:	20~25.0 ℃
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.

2.5 Channel List

Operation Frequency of each channel (SRD)							
Channel	**Frequency**	**Channel**	**Frequency**	**Channel**	**Frequency**	**Channel**	**Frequency**
1	433.9MHz						

2.6 Description of Support Units

The EUT has been tested independent unit.

2.7 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.

• 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.

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

No.	Item	Measurement Uncertainty
1	Total RF power, conducted	±0.41dB
2	RF power density, conducted	±1.96dB

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)

2.9 Equipment List

For Connect EUT Antenna Terminal Test					
Description	Manufacturer	Model	Serial Number	Cal date	Due date
Signal Generator	Keysight	N5181A-6G	MY48180415	2024-10-23	2025-10-22
Signal Generator	Keysight	N5182B	MY57300617	2024-10-23	2025-10-22
Power supply	Keysight	E3640A	ZB2022656	2024-10-23	2025-10-22
Spectrum Analyzer	Aglient	N9010A	MY52221458	2024-10-23	2025-10-22
BT/WIFI Test Software	Tonscend	JS1120 V3.1.83	NA	NA	NA
RF Control Unit	Tonscend	JS0806-2	22F8060581	NA	NA
temperature and humidity box	SCOTEK	SCD-C40-80PRO	6866682020008	2024-10-23	2025-10-22

Test Equipment for Conducted Emission					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Receiver	R&S	ESCI3	101152	2024-10-23	2025-10-22
LISN	R&S	ENV216	102874	2024-10-23	2025-10-22
ISN	R&S	ENY81-CA6	1309.8590.03	2024-10-23	2025-10-22

Test Equipment for Radiated Emission(below 1000MHz)					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Receiver	R&S	ESR7	102497	2024-10-23	2025-10-22
Test Software	ETS-LINDGREN	TiLE-FULL	NA	NA	NA
RF Cable	ETS-LINDGREN	RFC-NMS-100-NMS-350-IN	NA	2024-10-23	2025-10-22
Log periodic antenna	ETS-LINDGREN	VULB 9168	01475	2022-11-28	2025-11-27
Pre-amplifier	Schwarzbeck	BBV9743B	00423	2024-10-23	2025-10-22
Single ring magnetic field ring antenna	ETS-LINDGREN	6502	6502	2024-10-23	2025-10-22

Test Equipment for Radiated Emission(Above 1000MHz)					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Frequency analyser	Keysight	N9010A	MY52221458	2024-10-23	2025-10-22
RF Cable	ETS-LINDGREN	RFC-NMS-100-NMS-350-IN	NA	2024-10-23	2025-10-22
Horn Antenna	ETS-LINDGREN	3117	00252567	2022-11-28	2025-11-27
Double ridged waveguide antenna	ETS-LINDGREN	3116C	00251780	2022-11-28	2025-11-27
Test Software	ETS-LINDGREN	TiLE-FULL	NA	NA	NA
Pre-amplifier	ETS-LINDGREN	3117-PA	252567	2024-10-23	2025-10-22
Pre-amplifier	ETS-LINDGREN	3116C-PA	251780	2024-10-23	2025-10-22

2.10 Assistant equipment used for test

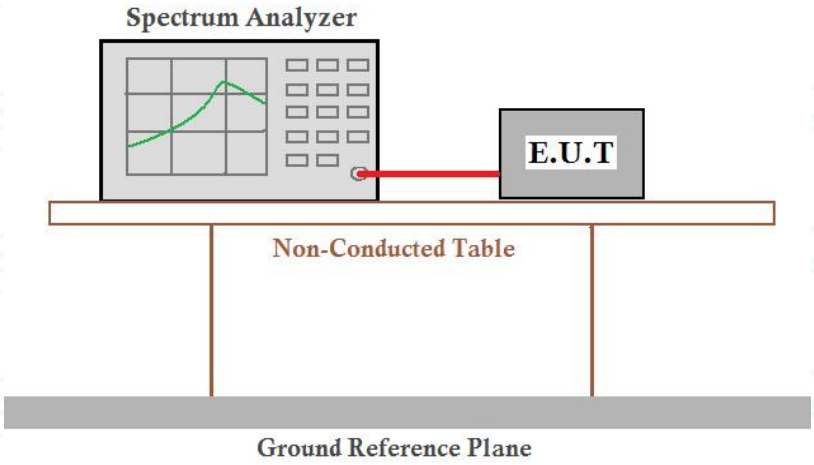
Code	Equipment	Manufacturer	Model No.	Equipment No.
1	1	Adapter	Chenyang	ICSO1

3 Test results and Measurement Data

3.1 Antenna requirements

Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)
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 shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.	
The antenna is welded on the main PCB and no consideration of replacement. The best case gain of the antenna is 2dBi.	

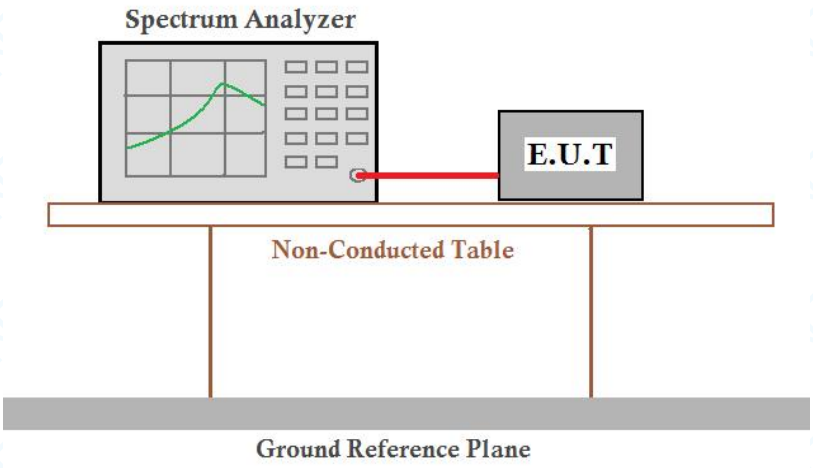
3.2 20dB Occupied Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.231
Test Method:	ANSI C63.10:2013 Section 7.8.7
Test Setup:	
Instruments Used:	Refer to section 2.9 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the worst case
Limit:	no wider than 0.25% of the center frequency
Test Results:	Pass

Test Data:

Test Frequency (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Result
433.9	0.027	1.0848	Pass

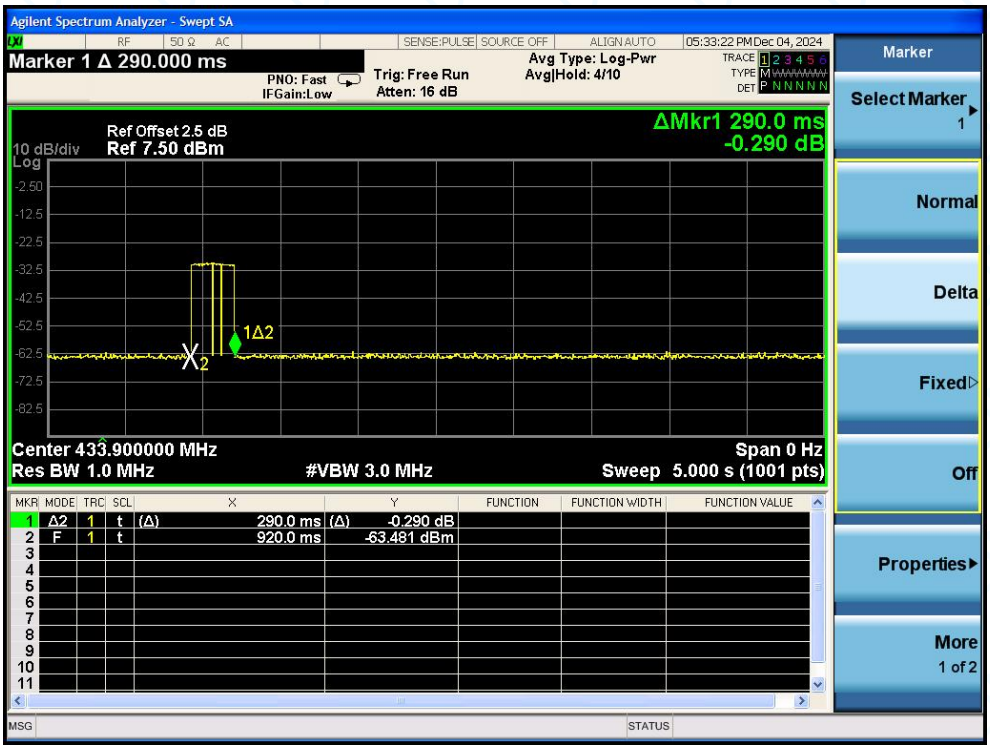
3.3 Duration time

Test Requirement:	47 CFR Part 15C Section 15.231
Test Setup:	
Instruments Used:	Refer to section 2.9 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the worst case
Limit:	(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released. (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation. (3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.
Test produce	1. Connect EUT antenna terminal to the spectrum analyzer with RF cable. 2. Spectrum analyzer setting parameters： RBW:1MHz,VBW:3MHz,Span:0Hz. 3. Set the EUT transmit in normal use. 4. Adjust sweep time on the spectrum analyzer to capture at least one period of the pulse train of the EUT. 5. Allow trace to stabilize, use the marker-delta function to measure the on time and off time of the signal. 6. Record the results in the test report.
Test Results:	Pass

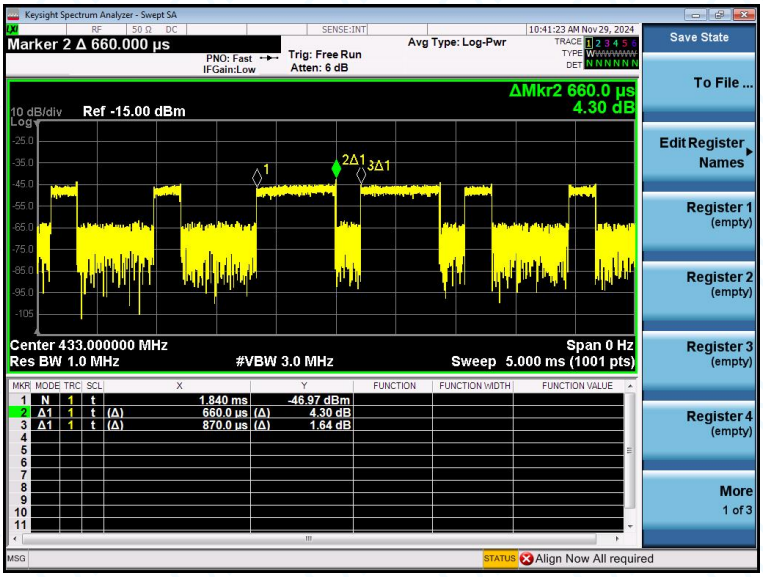
Test Data

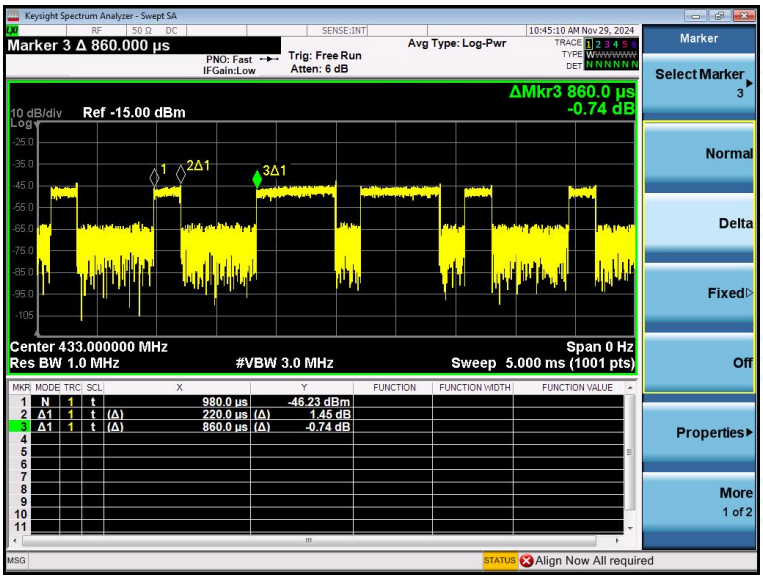
Test Frequency (MHz)	On Time (s)	Limit (s)	Result
433.90	0.913	5	Pass

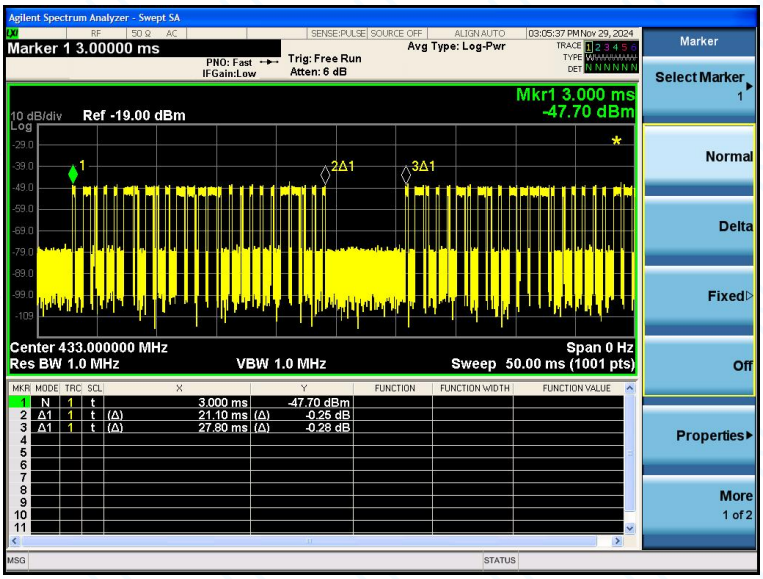
Test Graphs



3.4 DUTY


Keysight Spectrum Analyzer - Swept SA
Marker 2 Δ 660.000 µs
Avg Type: Log-Pwr
Trig: Free Run
Atten: 6 dB
ΔMkr2 660.0 µs
4.30 dB
10 dB/div Ref -15.00 dBm
Center 433.000000 MHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
Sweep 5.000 ms (1001 pts)
Save State
To File ...
Edit Register Names
Register 1 (empty)
Register 2 (empty)
Register 3 (empty)
Register 4 (empty)
More 1 of 3
Align Now All required


Keysight Spectrum Analyzer - Swept SA
Marker 3 Δ 860.000 µs
Avg Type: Log-Pwr
Trig: Free Run
Atten: 6 dB
ΔMkr3 860.0 µs
-0.74 dB
10 dB/div Ref -15.00 dBm
Center 433.000000 MHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
Sweep 5.000 ms (1001 pts)
Marker
Select Marker 3
Normal
Delta
Fixed
Off
Properties
More 1 of 2
Align Now All required

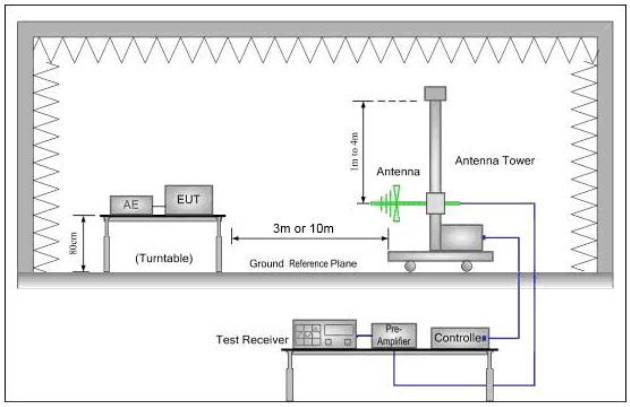

Agilent Spectrum Analyzer - Swept SA
Marker 1 3.00000 ms
Avg Type: Log-Pwr
Trig: Free Run
Atten: 6 dB
Mkr1 3.000 ms
-47.70 dBm
10 dB/div Ref -19.00 dBm
Center 433.000000 MHz
Span 0 Hz
Res BW 1.0 MHz
VBW 1.0 MHz
Sweep 50.00 ms (1001 pts)
Marker
Select Marker 1
Normal
Delta
Fixed
Off
Properties
More 1 of 2

The average correction factor is computed by analyzing the on time less than or equal to 100ms over one complete pulse train. Analysis of the remote transmitter on time in one complete pulse train, therefore the average value of fundamental frequency is: Average = Peak value + 20log (Duty cycle), where the duty factor is calculated from following formula:

20log (Duty cycle) =20log((0.66*9+ 0.22*16)/27.8)=20log(0.261)= -11.67dB

Please refer to below plots for more details.

3.5 Field Strength

Test Requirement:	47 CFR Part 15C Section 15.231
Test Method:	ANSI C63.10: 2013 Section 11.12
Test Setup:	
Test Instruments:	Refer to section 2.9 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the worst case

Limit:

Fundamental frequency (MHz)	Field strength of fundamental@3m (microvolts/meter)
40.66-40.70	2,250
70-130	1,250
130-174	[1]1,250 to 3,750
174-260	3,750
260-470	[1]3,750 to 12,500
Above 470	12,500

[1]Linear interpolations

The EUT fundamental frequency is 433.90MHz,So the Average Limit& Peak Limit is show in below table:

Fundamental frequency (MHz)	Field strength of fundamental@3m (dBμV/m)	
	Average Limit	Peak Limit
433.90	80.83	100.83

Note:

According to ANSI C63.10:2013 section 7.6.2:

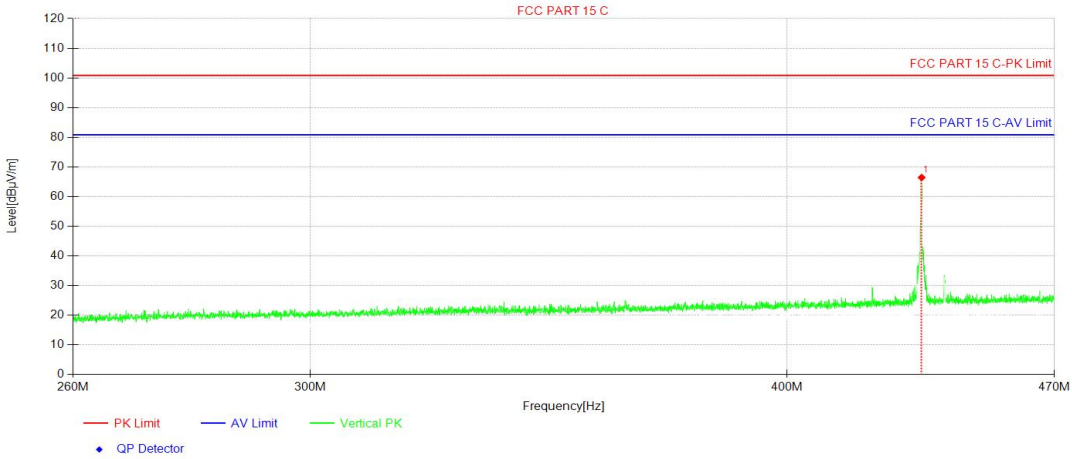
The effective limit at the frequency of interest is found by linearly interpolating using the familiarslope-intercept formula, y = mx+b, rewritten as in Equation：

	Limit[μV/m]=Limlower+ΔF[(Limupper-Limlower)/(fupper-flower)] where Lim_{lower} is the limit at the lower frequency of the intended band of operation Lim_{upper} is the limit at the upper frequency of the intended band of operation f_{lower} is the lower frequency of the intended band of operation f_{upper} is the upper frequency of the intended band of operation ΔF equals $f_c - f_{lower}$ f_c is the center frequency of the emission signal For fundamental frequency 433.90MHz: Average Limit(μV/m)=3750+(433.90-260)[(12500-3750)/(470-260)]=10996.413. 2.AverageLimit(dBμV/m)=20×LOG[FieldStrength(μV/m)]=20×LOG(10996.413) =80.83. According to §15.35(b): Peak Limit (dBμV/m)= Average Limit (dBμV/m)+20dB=80.83+20=100.83.
Test Configuration:	RBW: ⩾OBW VBW: 3XRBW Start frequency: 260MHz Stop frequency: 470MHz Sweep Time: Auto Detector: PEAK/AVG Trace Mode: Max Hold
Test Procedure:	a. the EUT was placed on the top of a rotating table 1 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 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 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. 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(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. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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. g. 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. r. Repeat above procedures until all frequencies measured was complete.
Test Results:	Pass

Test Data

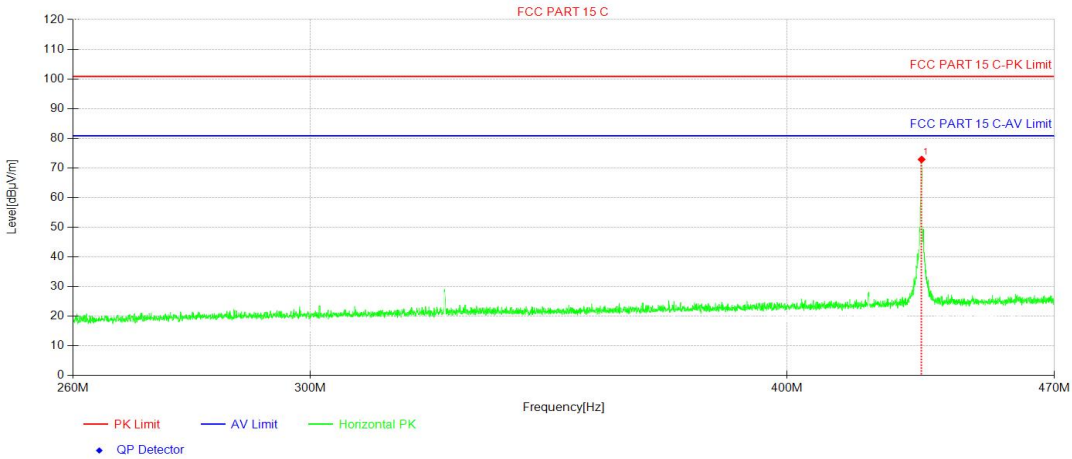
Frequency (MHz)	20log (Duty cycle) (dB)	Peak Level (dBμV/m)	Average Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector Type	Polarity
433.9	-11.67	66.43	54.76	80.83	26.07	AVG	H
433.9	-11.67	72.86	61.19	80.83	19.64	AVG	V

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	433.91	69.65	-3.22	66.43	100.83	34.40	100	160	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	433.91	76.08	-3.22	72.86	100.83	27.97	100	164	PK

Note

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

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

3.6 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.231 47 CFR Part 15C Section 15.209				
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
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Limit:	15.209 **Radiated emission limits**				
	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: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. The limits on the field strength of the spurious emissions in the below table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in §15.209, whichever limit permits a higher field strength.				

Fundamental frequency (MHz)	Field strength of spurious emission@3m (microvolts/meter)
40.66-40.70	225
70-130	125
130-174	[1]125 to 375
174-260	375
260-470	[1]375 to 1,250
Above 470	1,250
[1]Linear interpolations	

The EUT fundamental frequency is 433.90MHz,So the Average Limit& Peak Limit is show in below table:

Fundamental frequency (MHz)	Field strength of spurious emission@3m (dBμV/m)	
	Average Limit	Peak Limit
433.90	60.83	80.83

Note:

According to ANSI C63.10:2013 section 7.6.2:

The effective limit at the frequency of interest is found by linearly interpolating using the familiarslope-intercept formula, y = mx+b, rewritten as in Equation：

Limit[μV/m]=Limlower+ΔF[(Limupper-Limlower)/(fupper-flower)]

where

Lim_{lower} is the limit at the lower frequency of the intended band of operation

Lim_{upper} is the limit at the upper frequency of the intended band of operation

f_{lower} is the lower frequency of the intended band of operation

f_{upper} is the upper frequency of the intended band of operation

ΔF equals $f_c - f_{lower}$

f_c is the center frequency of the emission signal

For fundamental frequency 433.90MHz:

Average Limit(μV/m)=375+(433.90-260)[(1250-375)/(470-260)]=1099.64.

2.AverageLimit(dBμV/m)=20×LOG[FieldStrength(μV/m)]=20×LOG(1099.64)
=60.83.

According to §15.35(b):

Peak Limit (dBμV/m)= Average Limit (dBμV/m)+20dB=60.83+20=80.83.

Test Setup:

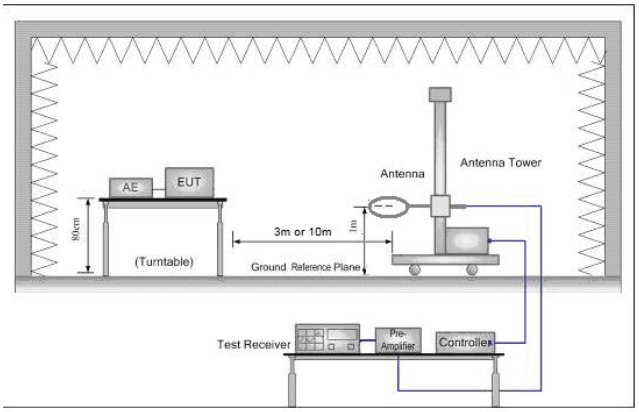


Figure 1. Below 30MHz

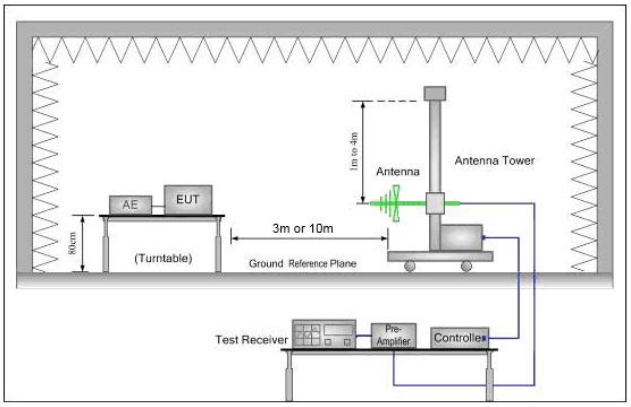


Figure 2. 30MHz to 1GHz

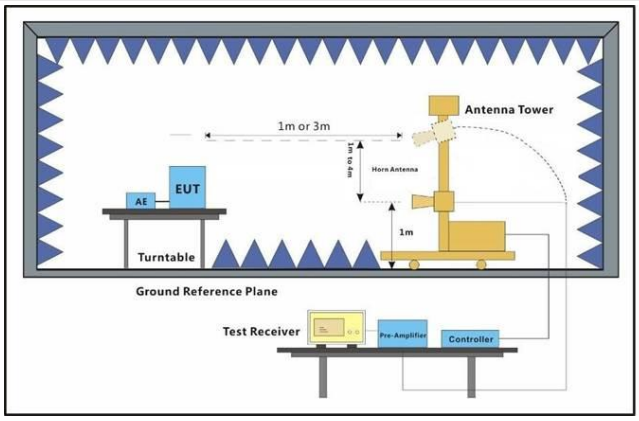


Figure 3. Above 1 GHz

Test Procedure:	h. 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. i. 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 j. 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. k. 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. l. 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. m. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. n. 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. o. Test the EUT in the lowest channel, the middle channel ,the Highest channel. p. 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. q. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Charge + Transmitting mode.

Final Test Mode:	Pretest the EUT at Charge + Transmitting mode. Through Pre-scan, find the worst case.
Instruments Used:	Refer to section 2.9 for details
Test Results:	Pass

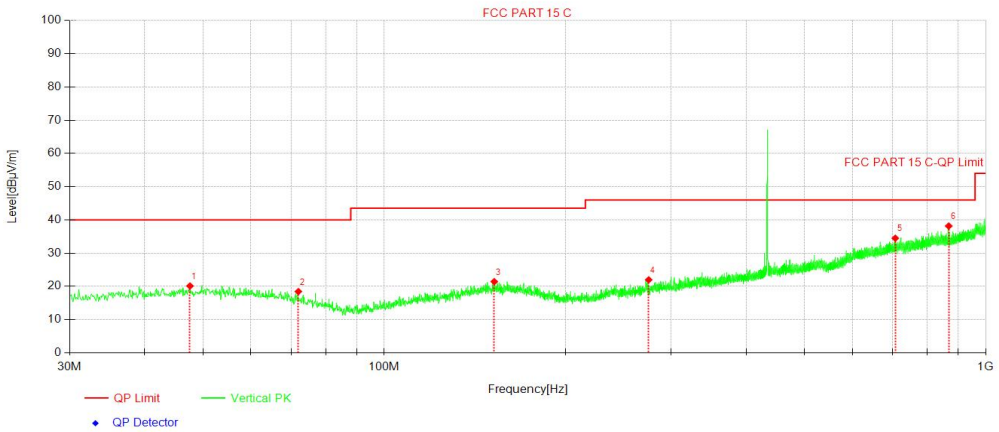
Frequency (MHz)	Peak Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector Type	Polarity
1301.7	42.66	80.83	38.17	PEAK	V
1735.6	47.47	80.83	33.36	PEAK	V
2169.5	47.92	80.83	32.91	PEAK	V
1301.7	42.70	80.83	38.13	PEAK	H
1735.6	43.08	80.83	37.75	PEAK	H
2169.5	43.35	80.83	37.48	PEAK	H

Frequency (MHz)	20log (Duty cycle) (dB)	Peak Level (dBμV/m)	Average Level (dBμV/m)	AV Limit (dBμV/m)	Margin (dB)	Detector Type	Polarity
1301.7	-11.67	42.66	30.99	60.83	23.01	AVG	V
1735.6	-11.67	47.47	35.8	60.83	18.2	AVG	V
2169.5	-11.67	47.92	36.25	60.83	17.75	AVG	V
1301.7	-11.67	42.70	31.03	60.83	22.97	AVG	H
1735.6	-11.67	43.08	31.41	60.83	22.59	AVG	H
2169.5	-11.67	43.35	31.68	60.83	22.32	AVG	H

Test data

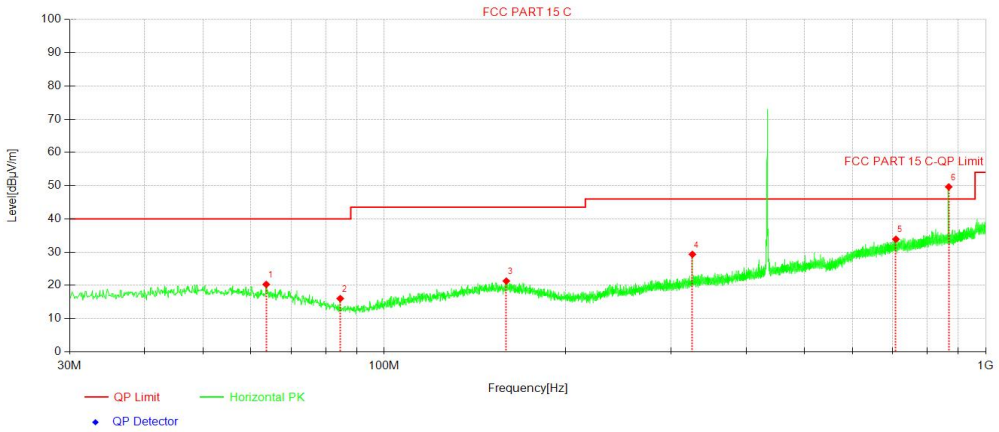
For 30-1000MHz TX

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	47.55	28.19	-8.08	20.11	40.00	19.89	100	0	PK
2	72.00	28.91	-10.47	18.44	40.00	21.56	100	126	PK
3	152.42	29.25	-7.82	21.43	43.50	22.07	100	11	PK
4	275.24	29.74	-7.76	21.98	46.00	24.02	100	45	PK
5	707.32	32.05	2.45	34.50	46.00	11.50	100	7	PK
6	867.87	33.58	4.57	38.15	80.83	42.68	100	116	PK

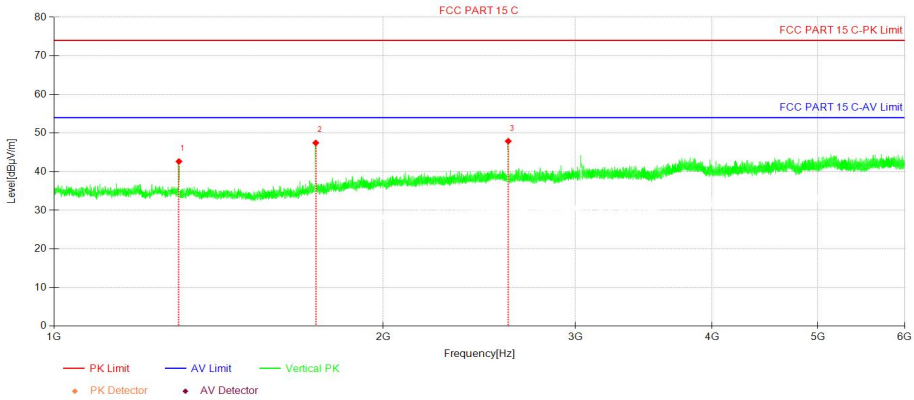
Horizontal:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	63.66	29.46	-9.17	20.29	40.00	19.71	100	50	PK
2	84.51	29.56	-13.52	16.04	40.00	23.96	100	52	PK
3	159.6	29.11	-7.80	21.31	43.50	22.19	100	352	PK
4	325.39	35.46	-6.12	29.34	46.00	16.66	100	176	PK
5	708.97	31.43	2.45	33.88	46.00	12.12	100	152	PK
6	867.87	45.07	4.57	49.64	80.83	31.19	100	184	PK

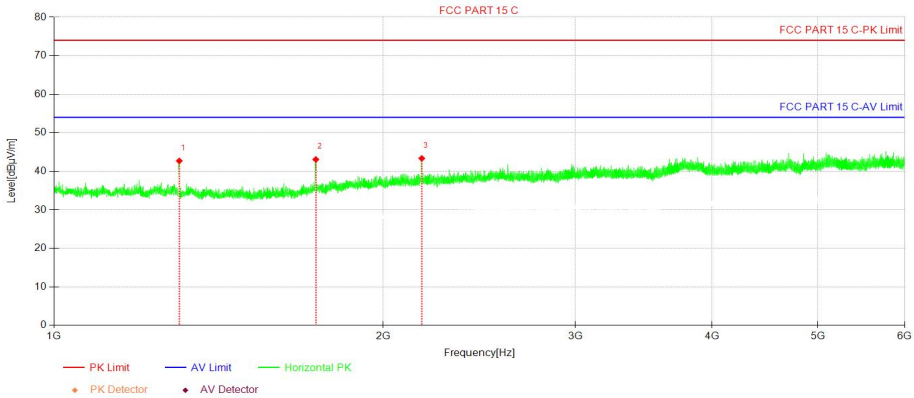
For above 1GHz TX

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	1300.76	58.24	-15.58	42.66	74.00	31.34	150	325	PK
2	1735.53	61.68	-14.21	47.47	74.00	26.53	150	57	PK
3	2603.33	57.17	-9.25	47.92	74.00	26.08	150	36	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	1301.76	58.29	-15.59	42.70	74.00	31.30	150	347	PK
2	1735.53	57.29	-14.21	43.08	74.00	30.92	150	294	PK
3	2169.55	54.67	-11.32	43.35	74.00	30.65	150	357	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:

   Measurement Level= Reading Level + Correct Factor(including LISN 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.

3.7 AC Power Line Conducted Emissions

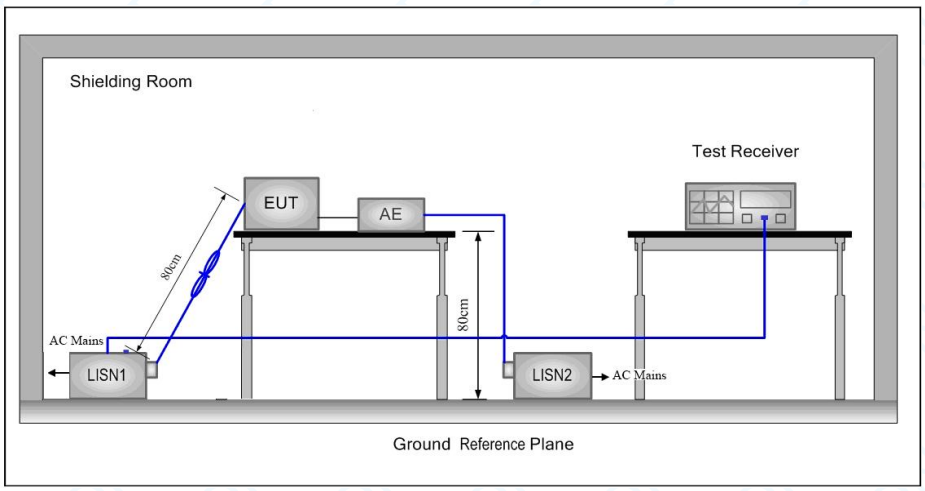
Test Requirement:	47 CFR Part 15C Section 15.207
Test Method:	ANSI C63.10: 2013
Test Frequency Range:	150kHz to 30MHz
Limit:	

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 6.5Mbps of rate of 802.11n(HT20) at lowest channel is the worst case. Charge + Transmitting mode. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 2.9 for details
Test Results:	N/A

---END REPORT---