TEST REPORT

Application No.:	DNT2408120122R0864-01141
Applicant:	SHANTOU PINLEPIN TECHNOLOGY CO.,LTD
Address of Applicant:	NO.89,MEIZE ROAD WEST,PUMEI,GUANGYI STREET,CHENGHAI DISTRICT,SHANTOU CITY,GUANGDONG PROVINCE,CHINA
EUT Description:	Building Blocks Series
Model No.:	11048
FCC ID:	2BH9B-11048
Power Supply	DC 3V
Trade Mark:	/
Standards:	47 CFR FCC Part 2, Subpart J 47 CFR Part 15, Subpart C ANSI C63.10: 2013
Date of Receipt:	2024/8/13
Date of Test:	2024/8/15 to 2024/8/22
Date of Issue:	2024/8/26
Test Result:	**PASS**

Prepared By: Wayne.Lin (Testing Engineer)

Reviewed By: Pencils.Chen (Project Engineer)

Approved By: Steve 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
V2.0	/	Aug.26, 2024	Valid	Original Report

1 Test Summary

Test Item	Standard Section	Test Result
Antenna Requirement	15.203	PASS
20dB Occupied Bandwidth	15.215	PASS
Duty Cycle	N/A	PASS
Field Strength	15.249(a)	PASS
Radiated Spurious Emissions And Band Edge	15.205, 15.209, 15.249(a)(c)(d)(e), 15.35(b)	PASS
AC Power Line Conducted Emissions	15.207	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:	SHANTOU PINLEPIN TECHNOLOGY CO.,LTD
Address of Manufacturer:	NO.89,MEIZE ROAD WEST,PUMEI,GUANGYI STREET,CHENGHAI DISTRICT,SHANTOU CITY,GUANGDONG PROVINCE,CHINA
EUT Description:	Building Blocks Series
Test Model No.:	11048
Additional Model(s):	11049,11050 ,11051,11052,11053,11054,11055,11056,11057,Q16001, Q16002,Q16003,Q16004,Q16005,Q16006,Q16007,Q16008,Q16009, Q16010,X8801,X8802,X8803,X8804,X8805,X8806,X8807,X8808,X8809, X8810,PL001,PL002,PL003,PL004,PL005,PL006,PL007,PL008,PL009, PL010,PL011,PL012,PL013,PL014,PL015,PL016,PL017,PL018,PL019, PL020,PL021,PL022,PL023,PL024,PL025,PL026,PL027,PL028,PL029, PL030,PL031,PL032,PL033,PL034,PL035,PL036,PL037,PL038,PL039, PL040,PL041,PL042,PL043,PL044,PL045,PL046,PL047,PL048,PL049, PL050,PL051,PL052,PL053,PL054,PL055,PL056,PL057,PL058,PL059, PL060,PL061,PL062,PL063,PL064,PL065,PL066,PL067,PL068,PL069, PL070
Power Supply	DC 3V
Chip Type:	210-IC
Serial number:	PR2408120122R0864
Trade Mark:	/
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	2411MHz-2476MHz
Type of Modulation:	GFSK
Sample Type:	Prototype production
Antenna Type:	☐ External, ☒ Integrated
Antenna Ports	☒ Ant 1, ☐ Ant 2, ☐ Ant 3
Antenna Gain*:	☒ Provided by applicant
	-0.58dBi
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 samples are only different color combinations, and all model circuits, materials and mechanical structures are 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)	2411	2443	2476
Setting	Default	Default	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							
Channel	**Frequency**	**Channel**	**Frequency**	**Channel**	**Frequency**	**Channel**	**Frequency**
1	2411	**11**	2454				
2	2414	**12**	2462				
3	2418	**13**	2469				
4	2422	**14**	2471				
5	2425	**15**	2473				
6	2427	**16**	2474				
7	2428	**17**	2476				
8	2435	**18**					
9	2443	**19**					
10	2451	**20**					

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	2023-10-25	2024-10-24
Signal Generator	Keysight	N5182B	MY57300617	2023-10-25	2024-10-24
Power supply	Keysight	E3640A	ZB2022656	2023-10-25	2024-10-24
Spectrum Analyzer	Aglient	N9010A	MY52221458	2023-10-25	2024-10-24
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	2023-10-25	2024-10-24

Test Equipment for Conducted Emission					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Receiver	R&S	ESCI3	101152	2023-10-24	2024-10-23
LISN	R&S	ENV216	102874	2023-10-24	2024-10-23
ISN	R&S	ENY81-CA6	1309.8590.03	2023-10-24	2024-10-23

Test Equipment for Radiated Emission(below 1000MHz)					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Receiver	R&S	ESR7	102497	2023-10-24	2024-10-23
Test Software	ETS-LINDGREN	TiLE-FULL	NA	NA	NA
RF Cable	ETS-LINDGREN	RFC-NMS-100-NMS-350-IN	NA	2023-10-24	2024-10-23
Log periodic antenna	ETS-LINDGREN	VULB 9168	01475	2023-10-24	2024-10-23
Pre-amplifier	Schwarzbeck	BBV9743B	00423	2023-10-24	2024-10-23
Single ring magnetic field ring antenna	ETS-LINDGREN	6502	6502	2023-10-24	2024-10-23

Test Equipment for Radiated Emission(Above 1000MHz)					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Frequency analyser	Keysight	N9010A	MY52221458	2023-10-24	2024-10-23
RF Cable	ETS-LINDGREN	RFC-NMS-100-NMS-350-IN	NA	2023-10-24	2024-10-23
Horn Antenna	ETS-LINDGREN	3117	00252567	2023-10-24	2024-10-23
Double ridged waveguide antenna	ETS-LINDGREN	3116C	00251780	2023-10-24	2024-10-23
Test Software	ETS-LINDGREN	TiLE-FULL	NA	NA	NA
Pre-amplifier	ETS-LINDGREN	3117-PA	252567	2023-10-24	2024-10-23
Pre-amplifier	ETS-LINDGREN	3116C-PA	251780	2023-10-24	2024-10-23

2.10 Assistant equipment used for test

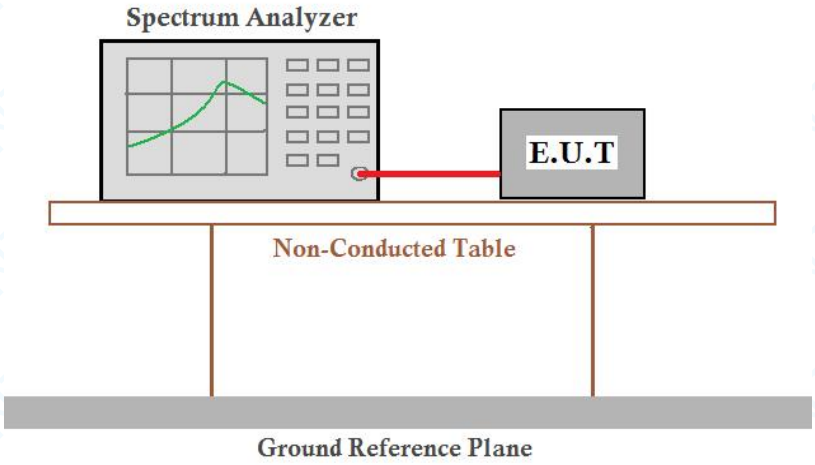
Code	Equipment	Manufacturer	Model No.	Equipment No.
1	1	Adapter	Chenyang	ICSO1

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 -0.58dBi.	

3.2 20dB Occupied Bandwidth

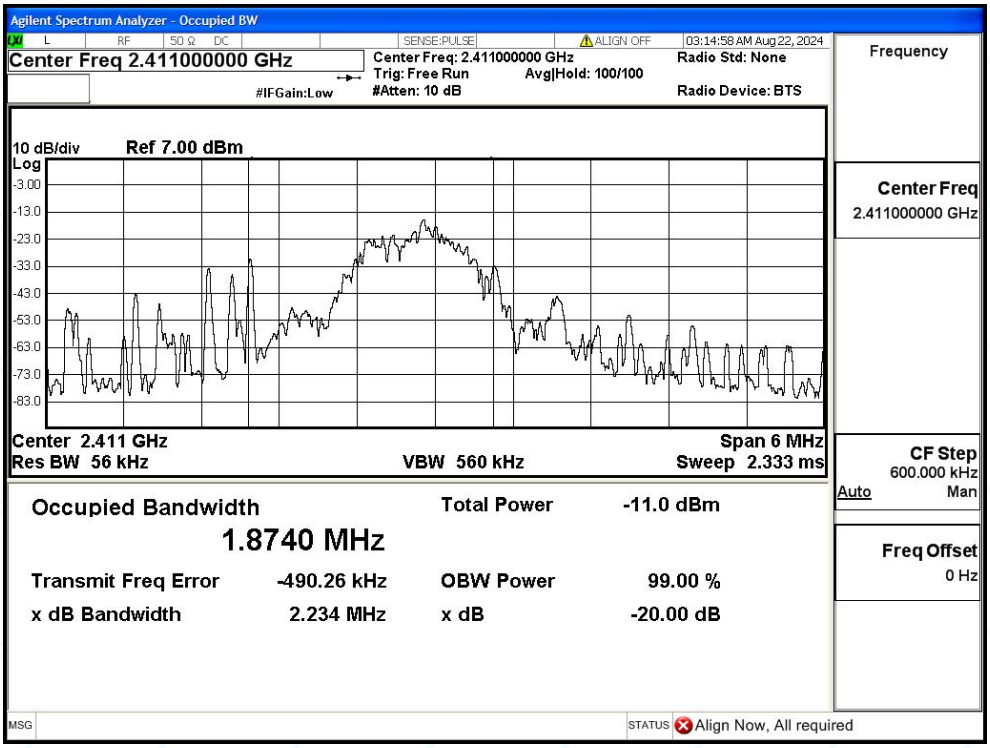
Test Requirement:	47 CFR Part 15C Section 15.215
Test Method:	ANSI C63.10:2013 Section 7.8.7
Test Setup:	
Instruments Used:	Refer to section 2.9 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the worst case
Limit:	no wider than 0.25% of the center frequency
Test Results:	Pass

Test Data:

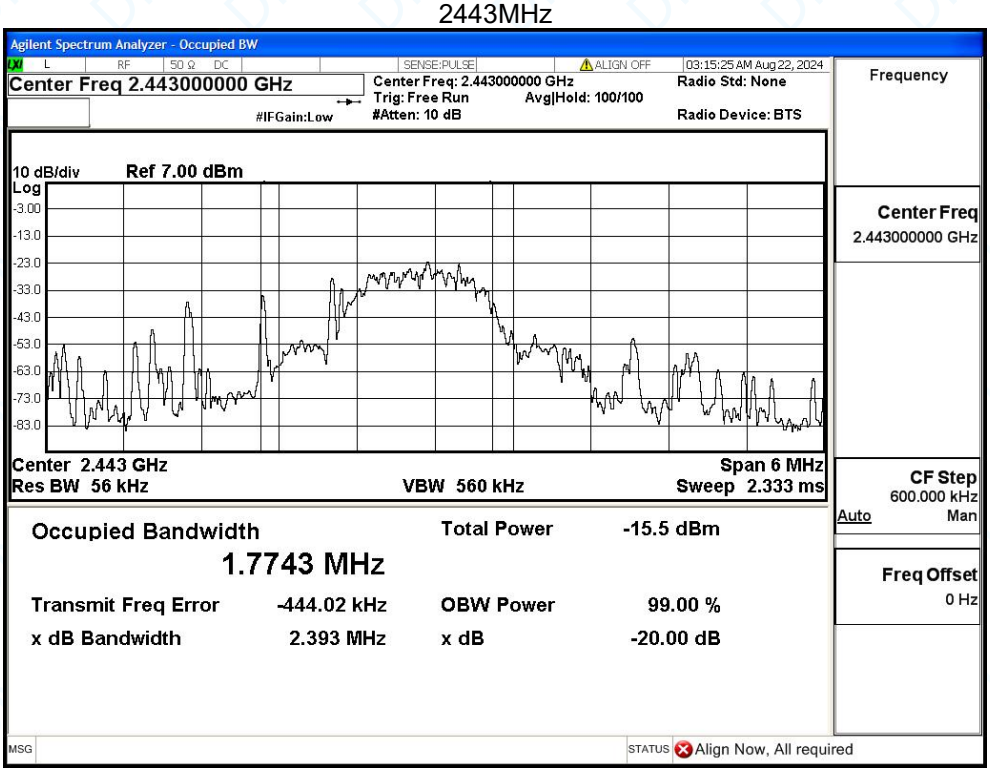
Test Frequency (MHz)	20dB Bandwidth (MHz)	Result
2411	2.234	Pass
2443	2.393	Pass
2476	2.721	Pass

Test Graphs

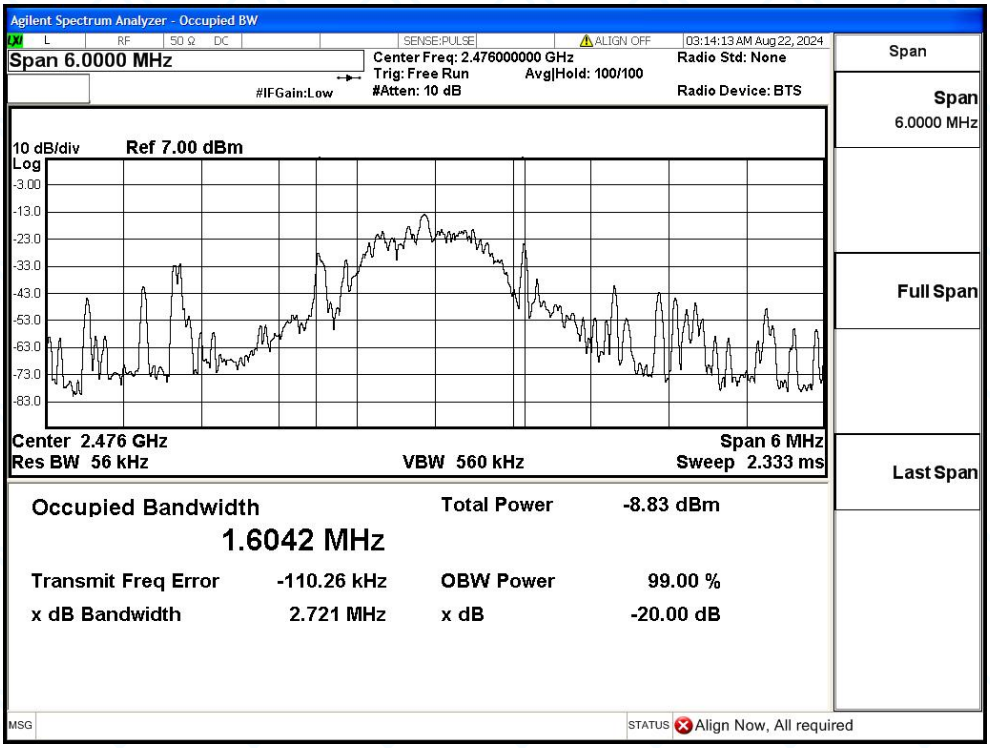
2411MHz



2443MHz

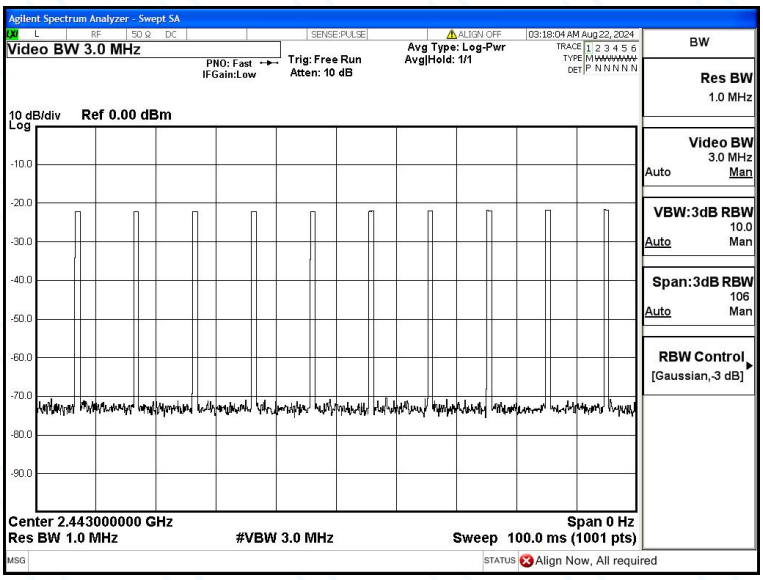


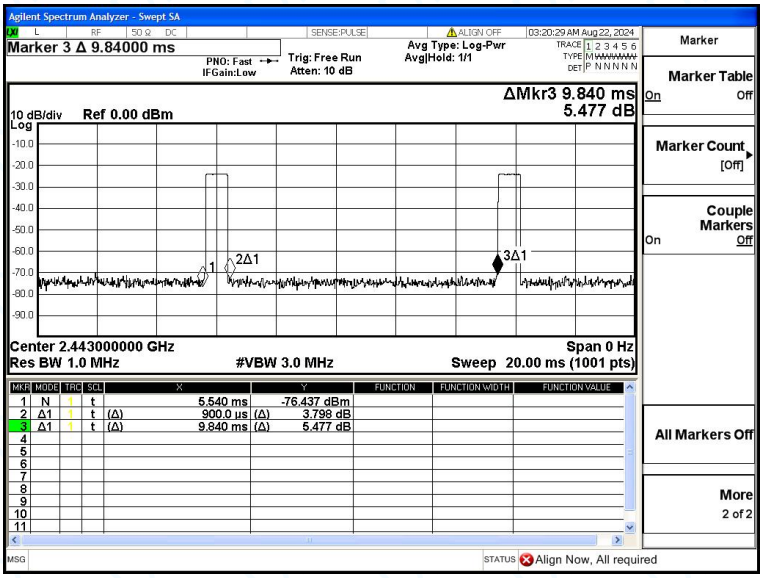
2476MHz


Agilent Spectrum Analyzer - Occupied BW
Span 6.0000 MHz
Center Freq: 2.476000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 10 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
03:14:13 AM Aug 22, 2024
ALIGN OFF
10 dB/div
Ref 7.00 dBm
Log
-3.00
-13.0
-23.0
-33.0
-43.0
-53.0
-63.0
-73.0
-83.0
Center 2.476 GHz
Res BW 56 kHz
VBW 560 kHz
Span 6 MHz
Sweep 2.333 ms
Occupied Bandwidth
1.6042 MHz
Total Power -8.83 dBm
Transmit Freq Error -110.26 kHz
OBW Power 99.00 %
x dB Bandwidth 2.721 MHz
x dB -20.00 dB
Span
Span 6.0000 MHz
Full Span
Last Span
MSG
STATUS Align Now, All required

3.3 Duty Cycle

Limit :N/A



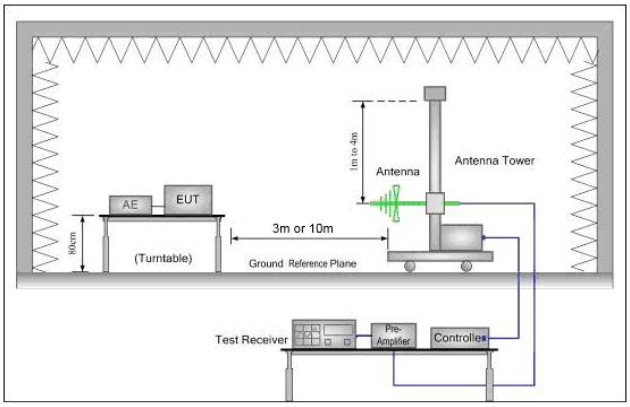


The average correction factor is computed by analyzing the on time less than or equal to 100ms over one complete pulse train. Analysis of the remote transmitter on time in one complete pulse train, therefore the average value of fundamental frequency is: Average = Peak value + 20log (Duty cycle), where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

20log (Duty cycle) =20log(0.9*10/100)=20log(0.09)= -20.92dB

Please refer to below plots for more details.

3.4 Field Strength of Fundamental

Test Requirement:	47 CFR Part 15C Section 15.249(a)
Test Method:	ANSI C63.10 :2020 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	Field strength of fundamental@3m (microvolts/meter)
902-928MHz	50
2400-2483.5MHz	50
5725-5875MHz	50
24.0-24.25	250

The EUT fundamental frequency is in 2400-2483.5MHz,So the Average Limit& Peak Limit is show in below table:

Fundamental frequency	Field strength of fundamental@3m (dBμV/m)	
	Average Limit	Peak Limit
2400-2483.5MHz	94	114

Note:

1. Average Limit (dBμV/m)=20×log[1000×Field Strength (mV/m)].
2. Peak Limit (dBμV/m)= Average Limit (dBμV/m)+20dB

Test Configuration:

RBW: ⩾OBW
VBW: 3XRBW
Start frequency: 2400MHz
Stop frequency: 2483.5MHz
Sweep Time: Auto
Detector: PEAK/AVG

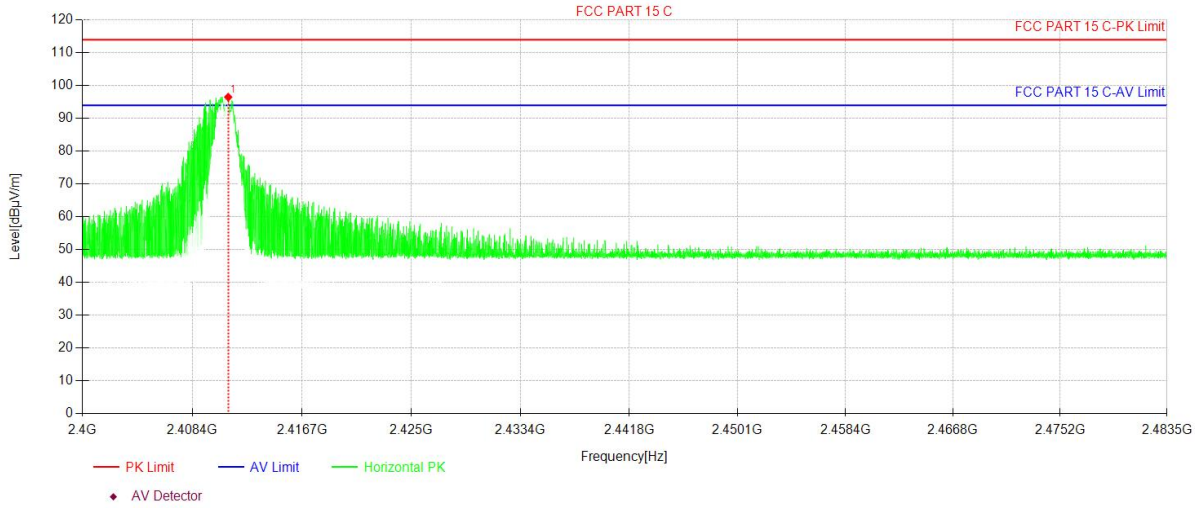
	Trace Mode: Max Hold
Test Procedure:	a. the EUT was placed on the top of a rotating table 1 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation b. The EUT was set 3 meters away from the interference-receiving 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
2411	20.92	96.50	75.58	94	18.42	AVG	H
2411	20.92	85.08	64.16	94	29.84	AVG	V
2443	20.92	97.11	76.19	94	17.81	AVG	H
2443	20.92	85.12	64.2	94	29.8	AVG	V
2476	20.92	97.13	76.21	94	17.79	AVG	H
2476	20.92	82.06	61.14	94	32.86	AVG	V

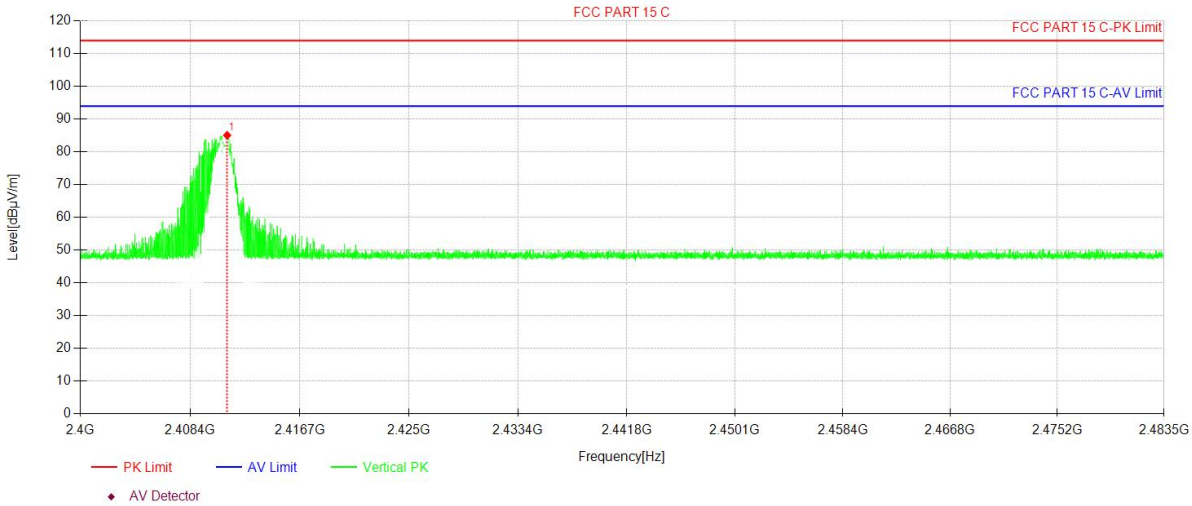
2411MHz

Horizontal:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2411.07	97.17	-0.67	96.50	114.00	17.50	150	152	PK

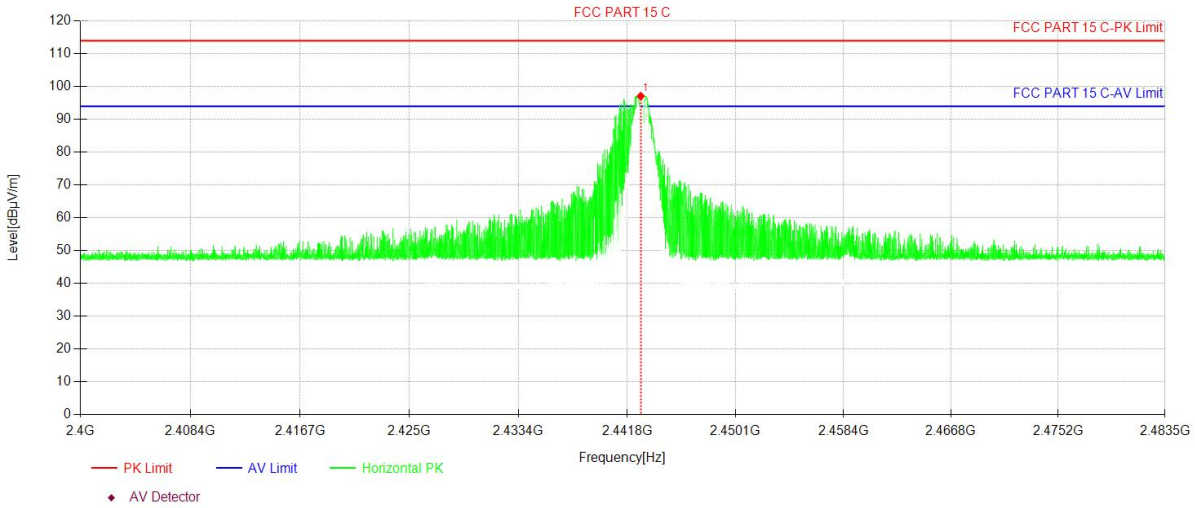
Vertical:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2411.15	85.75	-0.67	85.08	114.00	28.92	150	236	PK

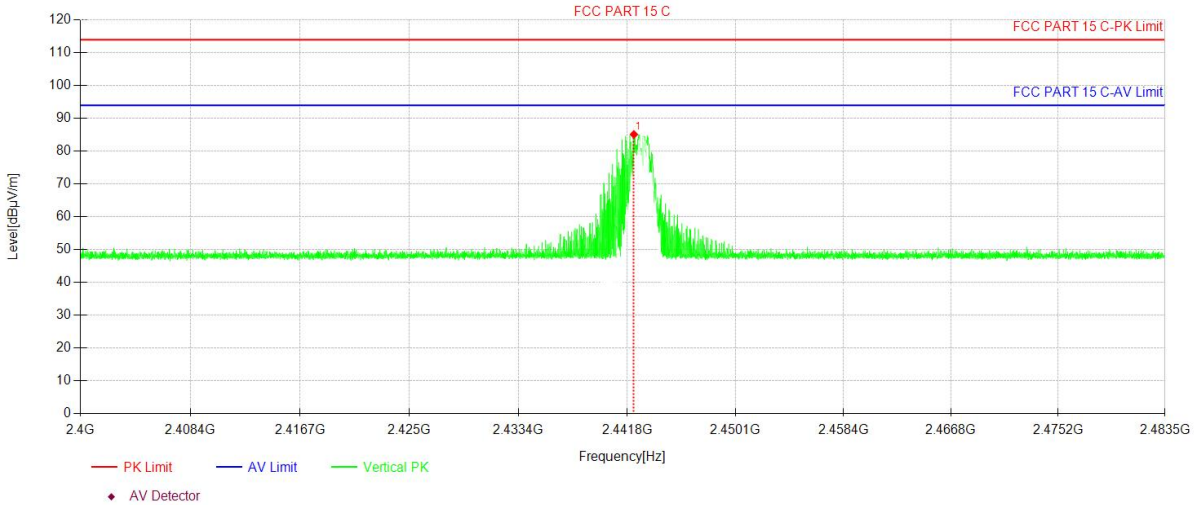
2443MHz

Horizontal:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2442.78	97.58	-0.47	97.11	114.00	16.89	150	160	PK

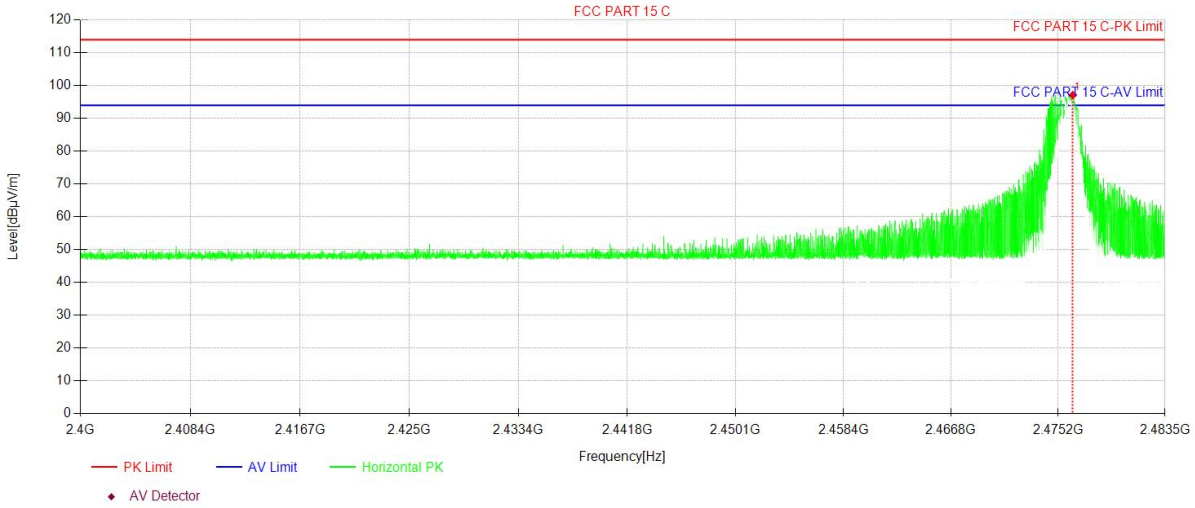
Vertical:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2442.26	85.59	-0.47	85.12	114.00	28.88	150	251	PK

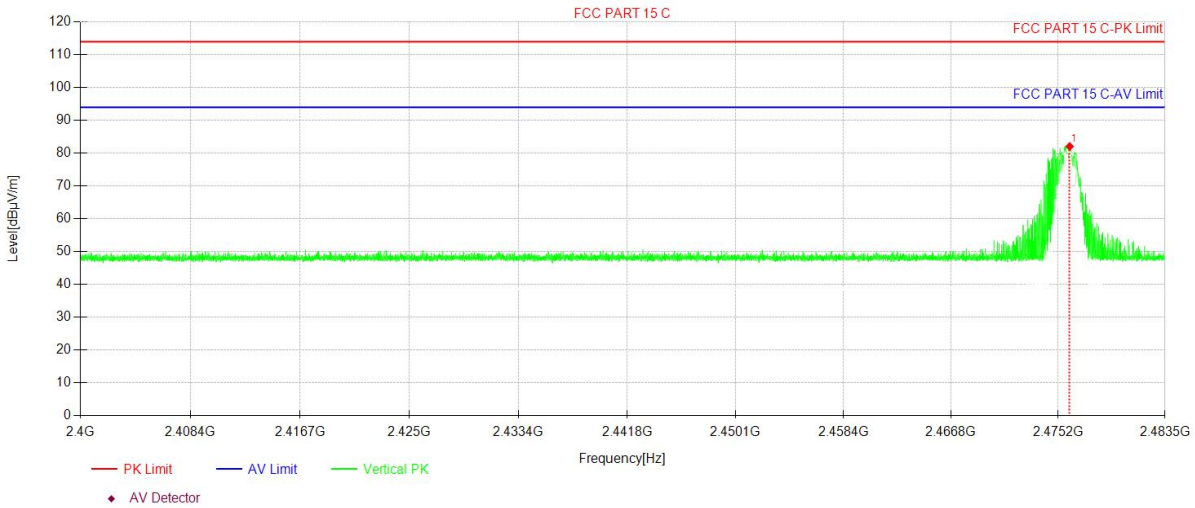
2476MHz

Horizontal:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2476.29	97.46	-0.33	97.13	114.00	16.87	150	161	PK

Vertical:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2476.04	82.39	-0.33	82.06	114.00	31.94	150	208	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.)

2. Average Level=Peak Level + 20log(Duty cycle)

3.5 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.249(a) 47 CFR Part 15C Section 15.209 47 CFR Part 15C Section 15.205				
Test Method:	ANSI C63.10 :2020 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	Field strength of harmonics@3m (microvolts/meter)
902-928MHz	500
2400-2483.5MHz	500
5725-5875MHz	500
24.0-24.25	2500

The EUT fundamental frequency is 2400-2483.5MHz,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
2400-2483.5	54	74

Note:

1.Average Limit (dBμV/m)=20×log[1000×Field Strength (mV/m)].

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

15.205 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:

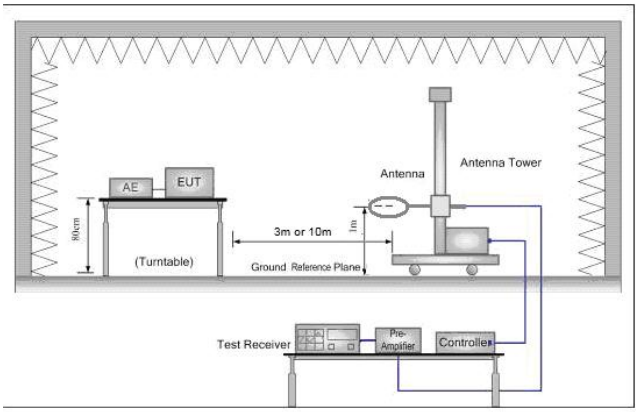


Figure 1. Below 30MHz

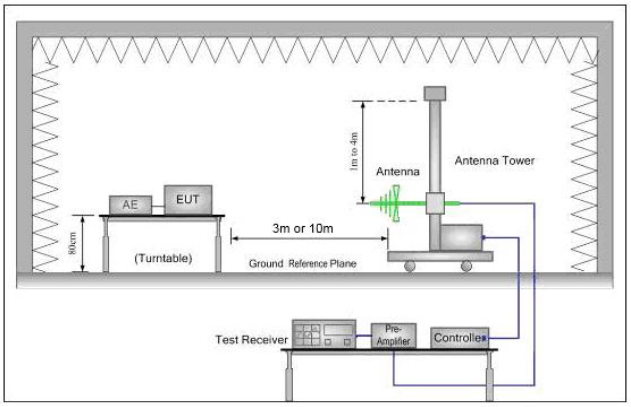


Figure 2. 30MHz to 1GHz

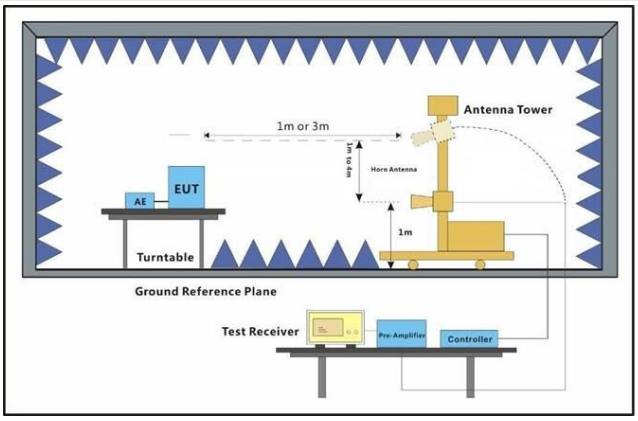


Figure 3. Above 1 GHz

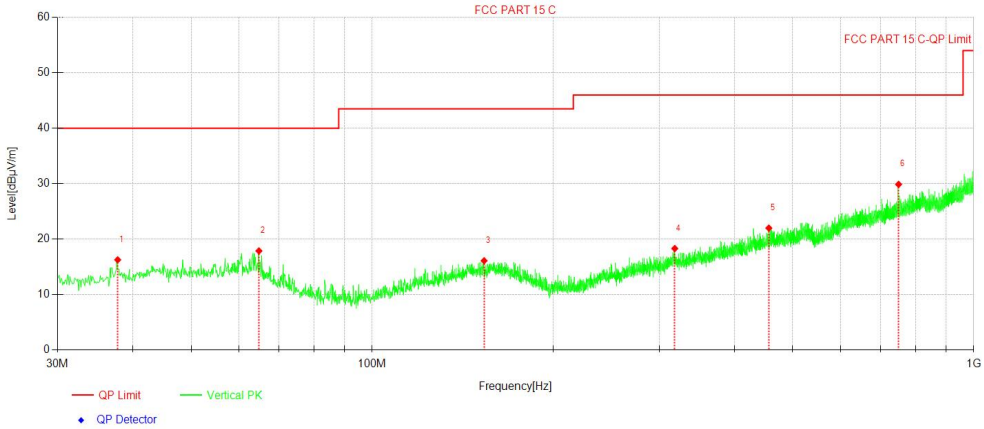
Test Procedure:	h. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. i. For above 1GHz, the EUT was placed on the top of a rotating 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.Transmitting mode.

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

Test data

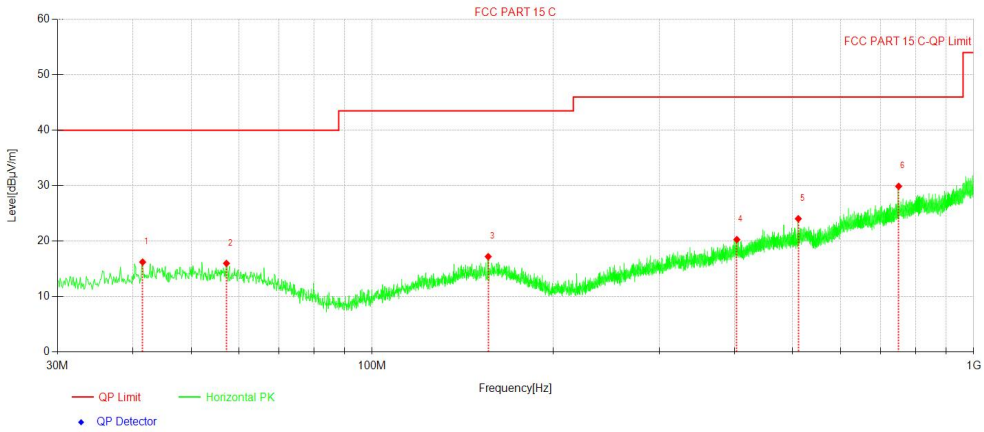
For 30-1000MHz TX

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	37.76	25.33	-9.08	16.25	40.00	23.75	100	235	Peak
2	64.82	27.16	-9.30	17.86	40.00	22.14	100	62	Peak
3	153.49	23.89	-7.80	16.09	43.50	27.41	200	146	Peak
4	318.40	24.65	-6.36	18.29	46.00	27.71	100	225	Peak
5	456.45	24.65	-2.67	21.98	46.00	24.02	100	104	Peak
6	750.00	26.46	3.41	29.87	46.00	16.13	100	331	Peak

Horizontal:

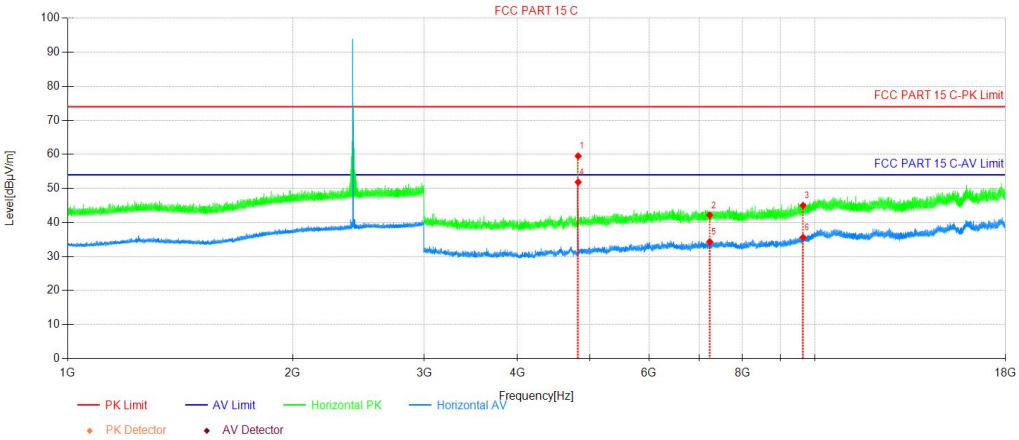


NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	41.54	24.79	-8.58	16.21	40.00	23.79	200	360	PK
2	57.25	24.46	-8.49	15.97	40.00	24.03	200	48	PK
3	155.91	24.98	-7.79	17.19	43.50	26.31	100	5	PK
4	403.77	24.54	-4.27	20.27	46.00	25.73	100	171	AV
5	510.87	25.57	-1.54	24.03	46.00	21.97	100	65	AV
6	750.00	26.47	3.41	29.88	46.00	16.12	100	160	AV

For above 1GHz TX

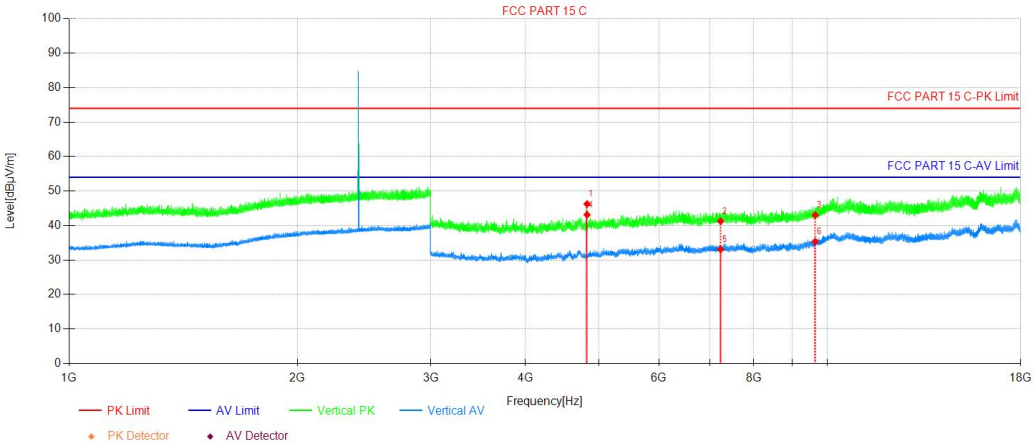
2411MHz

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	4821.84	64.15	-4.63	59.52	74.00	14.48	150	360	PK
2	7233.21	43.87	-1.70	42.17	74.00	31.83	150	313	PK
3	9644.58	43.91	1.06	44.97	74.00	29.03	150	23	PK
4	4822.59	56.48	-4.63	51.85	54.00	2.15	150	66	AV
5	7233.21	36.02	-1.70	34.32	54.00	19.68	150	313	AV
6	9644.58	34.57	1.06	35.63	54.00	18.37	150	248	AV

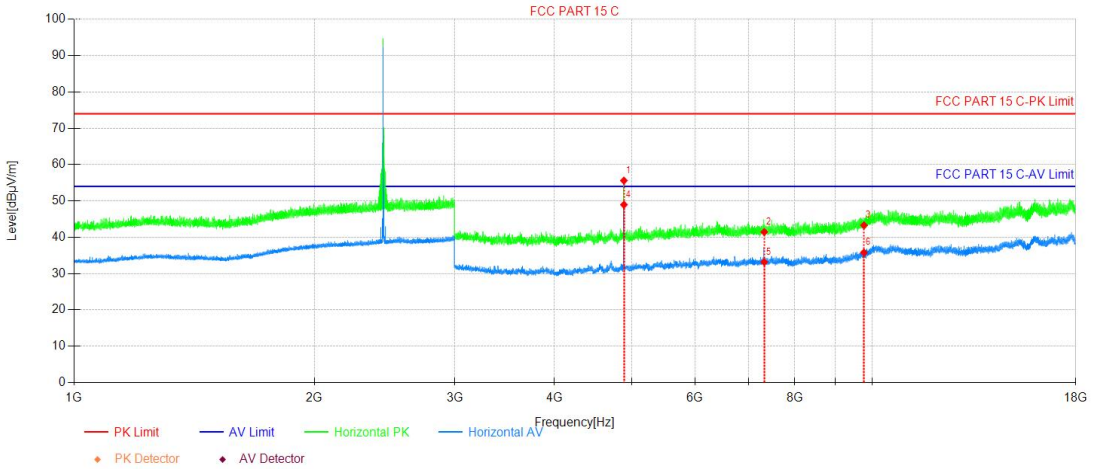
Vertical:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	4821.84	50.88	-4.63	46.25	74.00	27.75	150	223	PK
2	7233.21	42.96	-1.70	41.26	74.00	32.74	150	298	PK
3	9644.58	41.99	1.06	43.05	74.00	30.95	150	256	PK
4	4822.59	47.75	-4.63	43.12	54.00	10.88	150	223	AV
5	7233.21	34.79	-1.70	33.09	54.00	20.91	150	276	AV
6	9644.58	34.31	1.06	35.37	54.00	18.63	150	158	AV

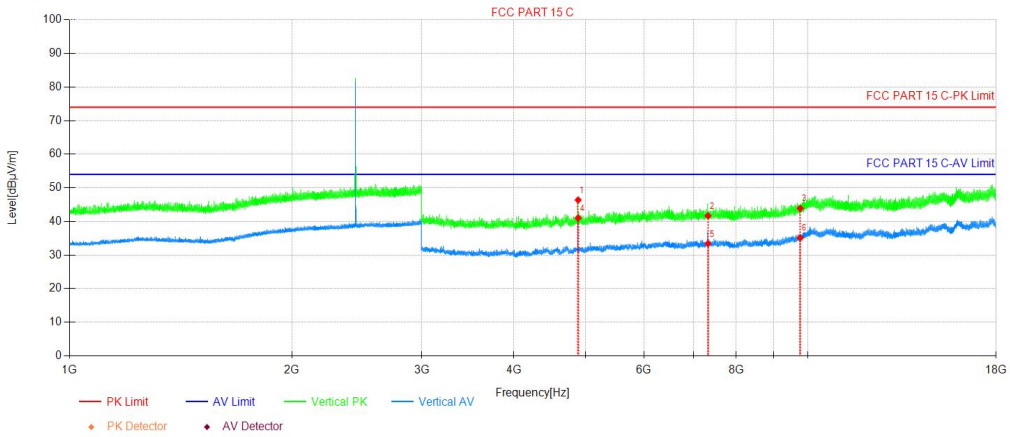
2443MHz

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	4886.34	60.32	-4.72	55.60	74.00	18.40	150	133	PK
2	7326.21	42.92	-1.48	41.44	74.00	32.56	150	3	PK
3	9768.33	41.61	1.67	43.28	74.00	30.72	150	111	PK
4	4887.09	53.68	-4.72	48.96	54.00	5.04	150	3	AV
5	7326.21	34.65	-1.48	33.17	54.00	20.83	150	122	AV
6	9768.33	34.11	1.67	35.78	54.00	18.22	150	13	AV

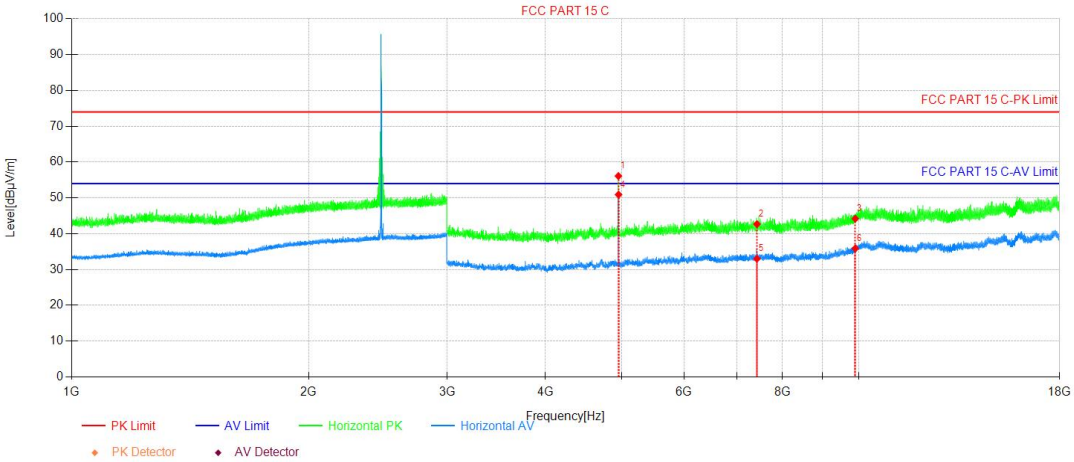
Vertical:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	4885.59	51.11	-4.72	46.39	74.00	27.61	150	243	PK
2	7326.21	43.15	-1.48	41.67	74.00	32.33	150	44	PK
3	9768.33	42.24	1.67	43.91	74.00	30.09	150	66	PK
4	4886.34	45.76	-4.72	41.04	54.00	12.96	150	233	AV
5	7326.21	34.89	-1.48	33.41	54.00	20.59	150	142	AV
6	9768.33	33.48	1.67	35.15	54.00	18.85	150	233	AV

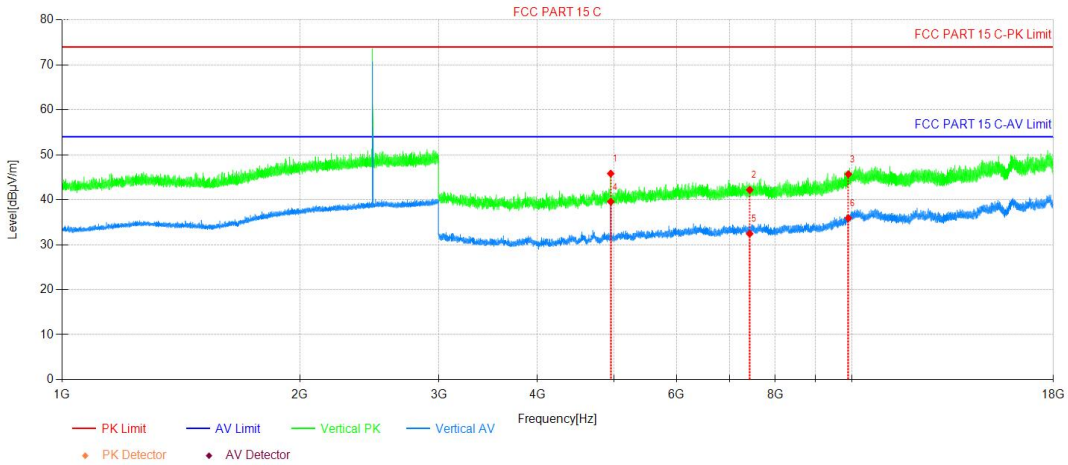
2476MHz

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	4950.84	60.95	-4.85	56.10	74.00	17.90	150	359	PK
2	7425.22	44.00	-1.32	42.68	74.00	31.32	150	157	PK
3	9900.34	41.99	2.20	44.19	74.00	29.81	150	223	PK
4	4953.09	55.76	-4.85	50.91	54.00	3.09	150	359	AV
5	7425.22	34.33	-1.32	33.01	54.00	20.99	150	90	AV
6	9900.34	33.69	2.20	35.89	54.00	18.11	150	360	AV

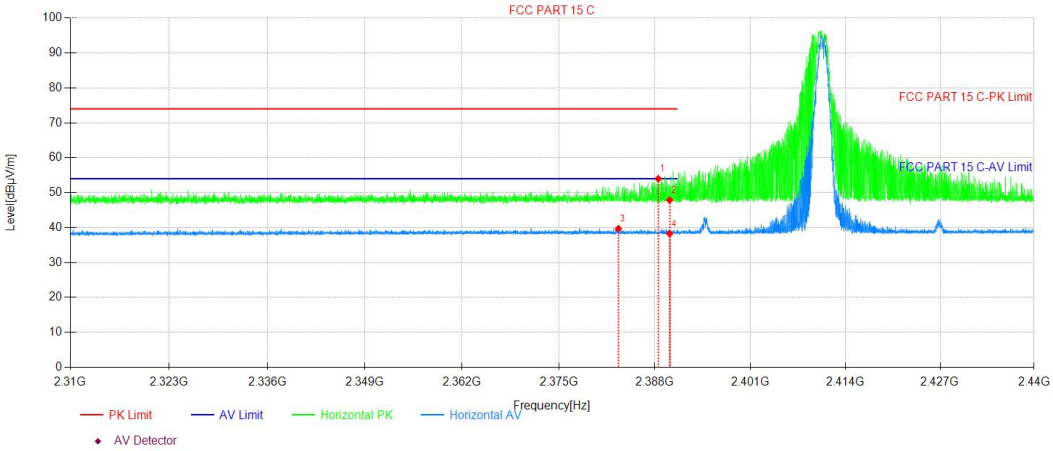
Vertical:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	4951.59	50.67	-4.85	45.82	74.00	28.18	150	272	PK
2	7425.22	43.52	-1.32	42.20	74.00	31.80	150	251	PK
3	9900.34	43.49	2.20	45.69	74.00	28.31	150	113	PK
4	4953.09	44.41	-4.85	39.56	54.00	14.44	150	272	AV
5	7425.22	33.75	-1.32	32.43	54.00	21.57	150	124	AV
6	9900.34	33.72	2.20	35.92	54.00	18.08	150	3	AV

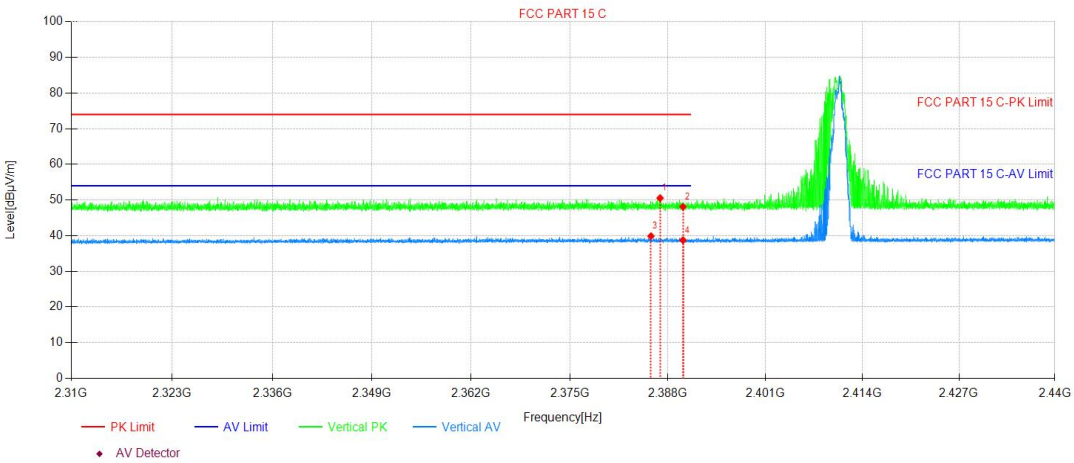
2411MHz

Horizontal:



Data List											
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Verdict
1	2388.46	54.78	-0.80	53.98	74.00	20.02	150	181	PK	Horizont	PASS
2	2390.01	48.70	-0.80	47.90	74.00	26.10	150	78	PK	Horizont	PASS
3	2383.06	40.52	-0.83	39.69	54.00	14.31	150	324	AV	Horizont	PASS
4	2390.01	39.09	-0.80	38.29	54.00	15.71	150	360	AV	Horizont	PASS

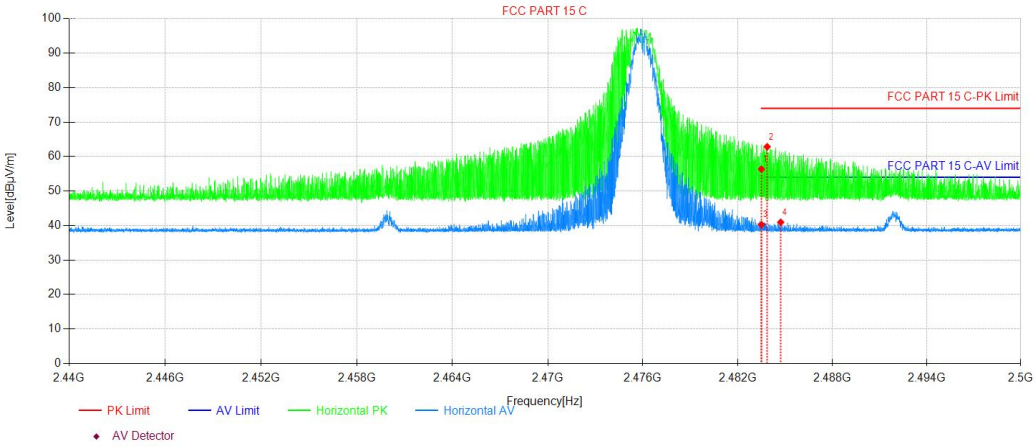
Vertical:



Data List											
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Verdict
1	2386.96	51.36	-0.81	50.55	74.00	23.45	150	109	PK	Vertical	PASS
2	2390.01	48.91	-0.80	48.11	74.00	25.89	150	350	PK	Vertical	PASS
3	2385.75	40.69	-0.81	39.88	54.00	14.12	150	203	AV	Vertical	PASS
4	2390.01	39.54	-0.80	38.74	54.00	15.26	150	68	AV	Vertical	PASS

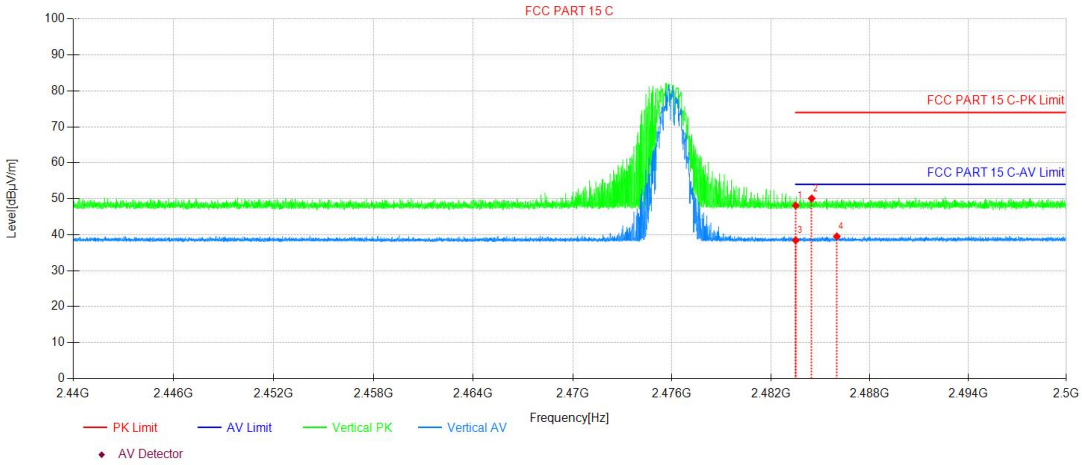
2476MHz

Horizontal:



Data List											
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Verdict
1	2483.50	56.64	-0.29	56.35	74.00	17.65	150	0	PK	Horizont	PASS
2	2483.87	63.12	-0.28	62.84	74.00	11.16	150	161	PK	Horizont	PASS
3	2483.50	40.56	-0.29	40.27	54.00	13.73	150	147	AV	Horizont	PASS
4	2484.72	41.22	-0.27	40.95	54.00	13.05	150	161	AV	Horizont	PASS

Vertical:



Data List											
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Verdict
1	2483.50	48.41	-0.29	48.12	74.00	25.88	150	37	PK	Vertical	PASS
2	2484.47	50.35	-0.28	50.07	74.00	23.93	150	272	PK	Vertical	PASS
3	2483.50	38.73	-0.29	38.44	54.00	15.56	150	20	AV	Vertical	PASS
4	2486.00	39.80	-0.27	39.53	54.00	14.47	150	3	AV	Vertical	PASS

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:

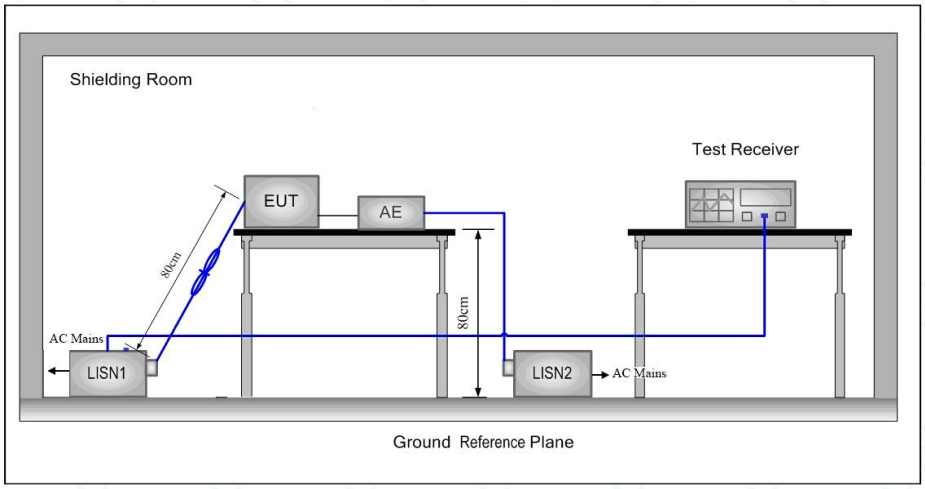
   Measurement Level= Reading Level + Correct Factor(including LISN Factor ,Cable Factor etc.)

2. Average Level=Peak Level + 20log(Duty cycle)

3. 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.

3.6 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2020		
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---