

TEST REPORT

Product Name : Tablet
Model Number : LNG-PRN-0137
Contains FCC ID : 2AAGE9260NG

Prepared for : Chengdu Vantron Technology Co., Ltd.
Address : No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, ChengDu, China

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Report Number : ENS2208310090W00204R
Date(s) of Tests : January 4, 2023 to January 11, 2023
Date of issue : January 11, 2023

1 TEST RESULT CERTIFICATION

Applicant : Chengdu Vantron Technology Co., Ltd.
 Address : No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, ChengDu, China
 Manufacturer : Chengdu Vantron Technology Co., Ltd.
 Address : No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, ChengDu, China
 EUT : Tablet
 Model Name : LNG-PRN-0137
 Trademark : Vantron

Measurement Procedure Used:

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart E	PASS
IC RSS-GEN, Issue 5(04-2018)+A1(03-2019)+A2(02-2021) IC RSS-247 Issue 2(02-2017)	PASS

The above equipment was tested by EMTEK (SHENZHEN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2, Part 15.407, IC RSS-247 Issue 2 and IC RSS-GEN, Issue 5.

The test results of this report relate only to the tested sample identified in this report.

Date of Test : January 4, 2023 to January 11, 2023

Prepared by : Luo peiye
Luo peiye/Editor

Reviewer : Joe Xia
Joe Xia/Supervisor

Approve & Authorized Signer : Lisa Wang
Lisa Wang/Manager

Modified History

Version	Report No.	Revision Date	Summary
Ver.1.0	ENS2208310090W00204R	/	Original Report

Note: This change is to request approval for Portable category specific host Tablet, Antenna Type is FPC antenna, At the same time we used the software to shutdown other BANDS (U-NII-2AandU-NII-2C), According to the requirements for antenna Change in KDB178919 D01 Permissive Change Policy v06, the antenna types are different and the gain value becomes smaller, Radiated Spurious Emission tests were performed to verify RF compliance, and the results of other test items remained unchanged based on the original report:170524-01.TR01, 170524-01.TR02, 170524-01.TR03.

TABLE OF CONTENTS

1	TEST RESULT CERTIFICATION	2
2	EUT TECHNICAL DESCRIPTION	5
3	SUMMARY OF TEST RESULT	6
4	TEST METHODOLOGY.....	7
4.1	GENERAL DESCRIPTION OF APPLIED STANDARDS	7
4.2	MEASUREMENT EQUIPMENT USED	7
4.3	DESCRIPTION OF TEST MODES	9
5	FACILITIES AND ACCREDITATIONS	12
5.1	FACILITIES.....	12
5.2	EQUIPMENT	12
5.3	LABORATORY ACCREDITATIONS AND LISTINGS	12
6	TEST SYSTEM UNCERTAINTY	13
7	SETUP OF EQUIPMENT UNDER TEST	14
7.1	RADIO FREQUENCY TEST SETUP	14
7.2	RADIO FREQUENCY TEST SETUP	14
7.3	CONDUCTED EMISSION TEST SETUP	16
7.4	BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM.....	17
7.5	SUPPORT EQUIPMENT.....	17
7.6	UNDESIRABLE RADIATED SPURIOUS EMISSION.....	18

2 EUT TECHNICAL DESCRIPTION

Characteristics	Description
Product:	Tablet
Model Number:	LNG-PRN-0137
Sample Number:	2#
Wifi Type:	Wifi 5G with 5150MHz-5250MHz Band Wifi 5G with 5725MHz-5850MHz Band
WLAN Supported:	802.11a/n/ac
Data Rate :	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: MCS0-MCS15 802.11ac: MCS0-MCS9
Modulation:	OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11ac
Frequency Range:	UNII-1: 5150MHz-5250MHz Band 5180-5240MHz for 802.11a/n(HT20)/ac(VHT20); 5190-5230MHz for 802.11n(HT40)/ac(VHT40); 5210MHz for 802.11ac(VHT80) 5250MHz for 802.11ac(VHT160) UNII-3 with 5725MHz-5850MHz Band 5745-5825MHz for 802.11a/n(HT20)/ac(VHT20); 5755-5795MHz for 802.11n(HT40)/ac(VHT40); 5775MHz for 802.11ac(VHT80);
TPC Function:	Not Applicable
Antenna Type:	FPC Antenna
Antenna Gain:	Antenna 1:3.51 dBi Antenna 2:3.51 dBi
Test Voltage:	AC 120V/60Hz
Date of Received:	January 4, 2023
Temperature Range:	0~40°C

Note: For more details, please refer to the User's manual of the EUT.

3 SUMMARY OF TEST RESULT

FCC PartClause	IC Part Clause	Test Parameter	Verdict	Remark
15.407 (b) 15.209 15.205	RSS-247, 6.2 RSS-Gen 8.9 RSS-Gen 8.10 RSS-Gen 6.13	RadiatedSpurious Emission	PASS	
NOTE1:N/A (Not Applicable) NOTE2:According to FCC OET KDB 789033, the report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.				

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for **Contains FCC ID:2AAGE9260NG** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

4 TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC 47 CFR Part 2, Subpart J

FCC 47 CFR Part 15, Subpart E

IC RSS-GEN, Issue 5(04-2018)+A1(03-2019)+A2(02-2021)

IC RSS-247 Issue 2(02-2017)

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

FCC KDB 789033 D2 General UNII Test Procedures New Rules v02r01

4.2 MEASUREMENT EQUIPMENT USED

Conducted Emission Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESCI	101384	2022/5/14	1 Year
AMN	Rohde & Schwarz	ENV216	101161	2022/5/14	1 Year
AMN	Kyoritsu	KNW-407	8-1492-9	2022/5/15	1 Year

For Spurious Emissions Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Pre-Amplifier	HP	8447F	2944A07999	2022/5/14	1 Year
EMI Test Receiver	Rohde & Schwarz	ESCI	101414	2022/5/14	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	712	2021/7/5	2 Year
Horn antenna	Schwarzbeck	BBHA9120D	9120D-1178	2022/7/4	2 Year
Pre-Amplifie	Lunar EM	LNA1G18-48	J101113101000 1	2022/5/15	1 Year
Spectrum Analyzer	Rohde & Schwarz	FSV40	100967	2022/5/14	1 Year
Horn antenna	Schwarzbeck	BBHA9170	9170-399	2021/6/12	2 Year
Cable	H+B	NmSm-05-C15052	N/A	2022/5/15	1 Year
Cable	H+B	NmSm-2-C15201	N/A	2022/5/15	1 Year
Cable	H+B	NmNm-7-C15702	N/A	2022/5/15	1 Year
Cable	H+B	SAC-40G-1	414	2022/5/15	1 Year
Cable	H+B	SUCOFLEX104	MY14871/4	2022/5/15	1 Year
Cable	H+B	BLU18A-NmSm-650 0	D8501	2022/5/15	1 Year
Band reject Filter(50dB)	WI/DE	WRCGV-2400(2400- 2485MHz)	2	2022/5/15	1 Year

For other test items:

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Signal Analyzer	Agilent	N9010A	MY53470879	2022/5/14	1 Year
Vector Signal Generater	Agilent	N5182B	MY53050878	2022/5/14	1 Year
Analog Signal Generator	Agilent	N5171B	MY53050553	2022/5/14	1 Year
Power Meter	Agilent	PS-X10-100	\	2022/5/15	1 Year

Blocking Box	THEDA	AD211	TW5451140	2022/5/14	1 Year
Switchgroup	THEDA	ETF-025(VASC6)	TW5451008	N/A	N/A
MIMO Matrix Switch	THEDA	4P5TM18	TW5451009	N/A	N/A
Temperature&Humidity Chamber	ESPEC	EL-02KA	12107166	2022/7/3	1 Year



4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (802.11a: 54 Mbps; 802.11n(HT20): MCS0; 802.11ac(VHT20): MCS0; 802.11n(HT40): MCS0; 802.11ac(VHT40): MCS0; 802.11ac(VHT80): MCS0;) were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Wifi 5G with U-NII - 1

Frequency and Channel list for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220		
40	5200	48	5240		

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230		

Frequency and Channel list for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210				

Frequency and Channel list for 802.11ac (VHT160):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
50	5250				

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	40	5200	48	5240

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	N/A	N/A	46	5230

Test Frequency and channel for 802.11ac (VHT80) :

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210	N/A	N/A	N/A	N/A

Test Frequency and channel for 802.11ac (VHT160) :

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
50	5250	N/A	N/A	N/A	N/A

Wifi 5G with U-NII -3

Frequency and Channel list for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825
153	5765	161	5805		

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795		

Frequency and Channel list for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775				

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	N/A	N/A	159	5795

Test Frequency and channel for 802.11ac (VHT80):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775				

5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at:

EMTEK (Shenzhen) Co., Ltd.

Building 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab.

Accredited by CNAS

The Certificate Registration Number is L2291.

The Laboratory has been assessed and proved to be in compliance with CNAS-CL01 (identical to ISO/IEC 17025:2017)

Accredited by FCC

Designation Number: CN1204

Test Firm Registration Number: 882943

Accredited by A2LA

The Certificate Number is 4321.01.

Accredited by Industry Canada

The Conformity Assessment Body Identifier is CN0008

Name of Firm

: EMTEK (SHENZHEN) CO., LTD.

Site Location

: Building 69, Majialong Industry Zone,
Nanshan District, Shenzhen, Guangdong, China

6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

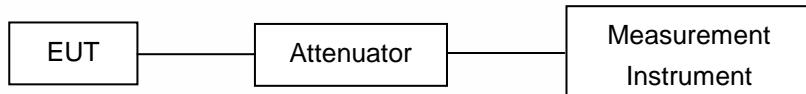
Test Parameter	Measurement Uncertainty
Radio Frequency	$\pm 1 \times 10^{-5}$
Maximum Peak Output Power Test	$\pm 1.0 \text{dB}$
Conducted Emissions Test	$\pm 2.0 \text{dB}$
Radiated Emission Test	$\pm 2.0 \text{dB}$
Power Density	$\pm 2.0 \text{dB}$
Occupied Bandwidth Test	$\pm 1.0 \text{dB}$
Band Edge Test	$\pm 3 \text{dB}$
All emission, radiated	$\pm 3 \text{dB}$
Antenna Port Emission	$\pm 3 \text{dB}$
Temperature	$\pm 0.5^\circ\text{C}$
Humidity	$\pm 3\%$

Measurement Uncertainty for a level of Confidence of 95%

7 SETUP OF EQUIPMENT UNDER TEST

7.1 RADIO FREQUENCY TEST SETUP

The WLAN component's antenna port(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



7.2 RADIO FREQUENCY TEST SETUP

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

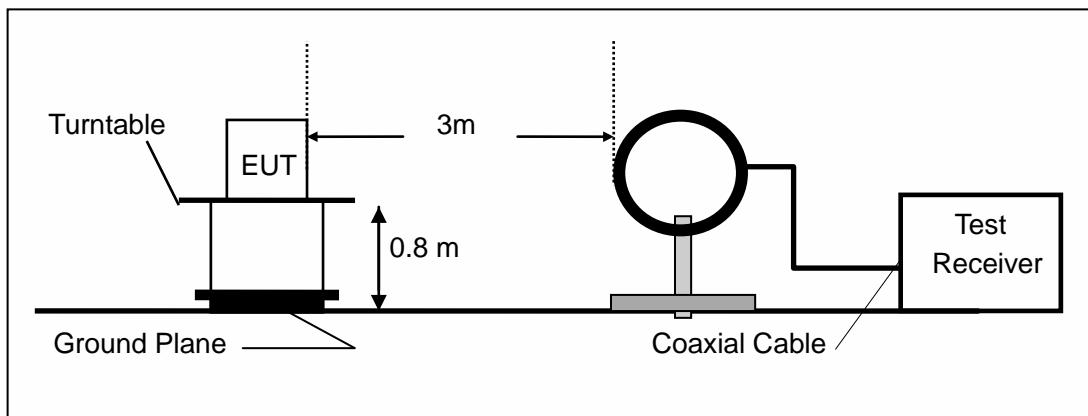
Above 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

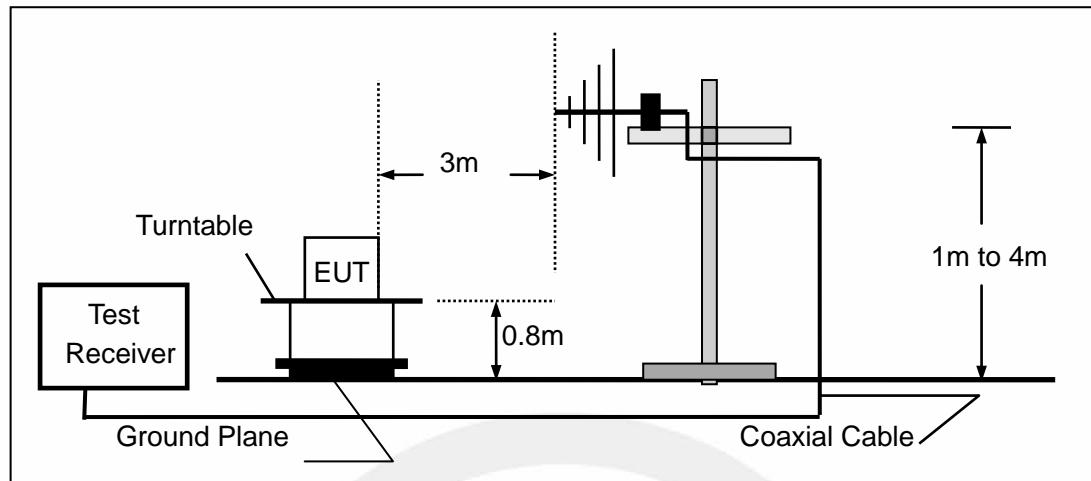
Above 1GHz:

(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.)
 The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

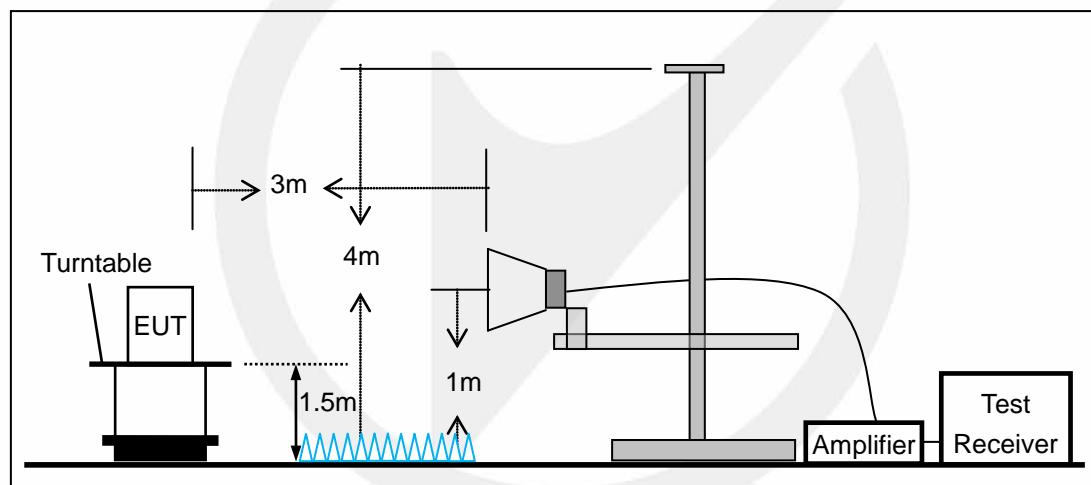
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

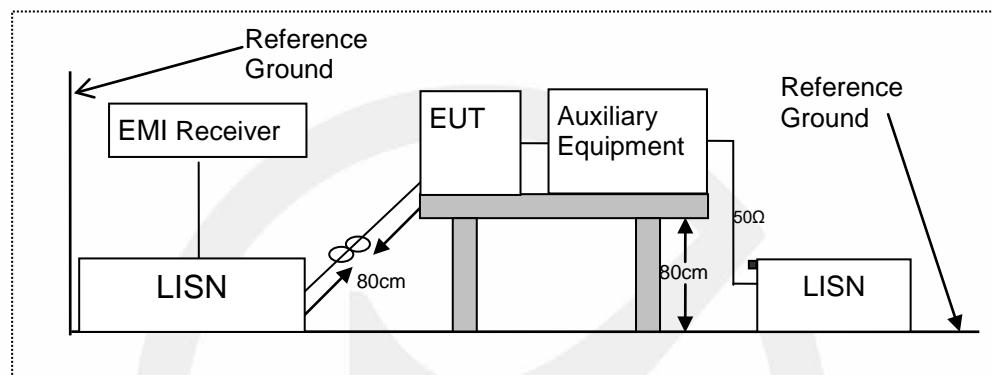


7.3 CONDUCTED EMISSION TEST SETUP

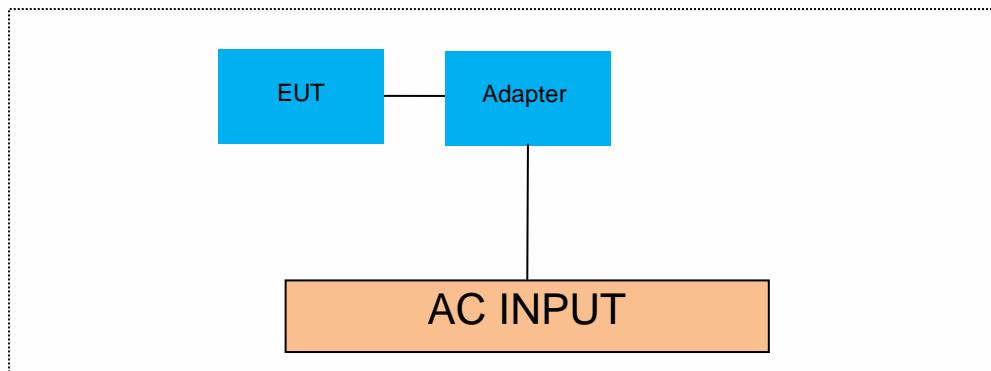
The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



7.5 SUPPORT EQUIPMENT

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

7.6 UNDESIRABLE RADIATED SPURIOUS EMISSION

7.6.1 Applicable Standard

According to FCC Part 15.407 (b), 15.209, 15.205

According to 789033 D02 SectionII(G)

According to RSS-GEN 8.9, 8.10 and 6.13

7.6.2 Conformance Limit

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

Restricted Frequency(MHz)	Field Strength (μ V/m)	Field Strength (dB μ V/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (μ V/m)	300
0.490-1.705	24000/F(KHz)	20 log (μ V/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

The provisions of §15.205 apply to intentional radiators operating under this section, 15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	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	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)
13.36-13.41			

Remark: 1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of 15.205, and the emissions located in restricted bands also comply with 15.209 limit.

7.6.3 Test Configuration

Test according to clause 6.2 radio frequency test setup

7.6.4 Test Procedure

■ Unwanted Emissions Measurements below 1000 MHz

Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

The EUT was placed on a turn table which is 0.8m above ground plane.

And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

Repeat above procedures until all frequency measured was complete.

We use software control the EUT, Let EUT hopping on and transmit with highest power, All the modes have been tested and the worst result was reported.

Use the following spectrum analyzer settings:

SetRBW=120kHz for $f < 1$ GHz(30MHz to 1GHz), 200Hz for $f < 150$ KHz(9KHz to 150KHz), 9KHz for <30MHz(150KHz to 30KHz).

Set the VBW > RBW.

Detector = Peak.

Trace mode = max hold.

Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Repeat above procedures until all frequency measured was complete.

■ Unwanted Maximumpeak Emissions Measurements above 1000 MHz

Maximum emission levels are measured by setting the analyzer as follows:

RBW = 1 MHz.

VBW \geq 3 MHz.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately $1/x$, where x is the duty cycle. For example, at 50 percent duty cycle, the measurement time will increase by a factor of two relative to measurement time for continuous transmission.

■ Unwanted Average Emissions Measurements above 1000 MHz

Method VB (Averaging using reduced video bandwidth): Alternative method.

RBW = 1 MHz.

Video bandwidth. • If the EUT is configured to transmit with duty cycle \geq 98 percent, set $VBW \leq RBW/100$ (i.e., 10 kHz) but not less than 10 Hz.

• If the EUT duty cycle is < 98 percent, set $VBW \geq 1/T$, where T is defined in section II.B.1.a).

Video bandwidth mode or display mode • The instrument shall be set to ensure that video filtering is applied in the power domain. Typically, this requires setting the detector mode to RMS and setting the Average-VBW Type to Power (RMS).

• As an alternative, the analyzer may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some analyzers require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where x is the duty cycle. For example, use at least 200 traces if the duty cycle is 25 percent. (If a specific emission is demonstrated to be continuous—i.e., 100 percent duty cycle—rather than turning on and off with the transmit cycle, at least 50 traces shall be averaged.)

■ Band edge measurements.

Unwanted band-edge emissions may be measured using either of the special band-edge measurement techniques (the marker-delta or integration methods) described below. Note that the marker-delta method is primarily a radiated measurement technique that requires the 99% occupied bandwidth edge to be within 2 MHz of the authorized band edge, whereas the integration method can be used in either a radiated or conducted measurement without any special requirement with regards to the displacement of the unwanted emission(s) relative to the authorized bandwidth.

Marker-Delta Method.

The marker-delta method, as described in ANSI C63.10, can be used to perform measurements of the radiated unwanted emissions level of emissions provided that the 99% occupied bandwidth of the fundamental is within 2 MHz of the authorized band-edge.

7.6.5 Test Results

Temperature:	22° C
Relative Humidity:	43%
ATM Pressure:	1011 mbar

■ Spurious Emission below 30MHz(9KHz to 30MHz)

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
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Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor = $40\log(\text{Specific distance}/ \text{test distance})(\text{dB})$;

Limit line=Specific limits(dBuV) + distance extrapolation factor

■ For Undesirable radiated Spurious Emission in U-NII - 1

- Undesirable radiated Spurious Emission Above 1GHz(1GHz to 40GHz)

All the antenna(Antenna 1&2) and modes(802.11a/n/ac) has been tested and the worst(Antenna 1,802.11ac(VHT20)) result recorded was report as below:

Test mode:	802.11ac(VHT20)	Frequency:	Channel 36: 5180MHz		
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Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11508.12	V	60.10	-35.13	-27	-8.13
14557.5	V	62.83	-32.40	-27	-5.40
17500.62	V	67.26	-27.97	-27	-0.97
10044	H	58.64	-36.59	-27	-9.59
14716.87	H	62.82	-32.41	-27	-5.41
17511.25	H	67.29	-27.94	-27	-0.94

Test mode:	802.11ac(VHT20)	Frequency:	Channel 40: 5200MHz		
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Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11365.75	V	59.86	-32.48	-27	-5.48
14602.12	V	62.75	-27.48	-27	-0.48
17504.87	V	67.75	-35.86	-27	-8.86
10764.37	H	59.37	-31.85	-27	-4.85
15158.87	H	63.38	-28.46	-27	-1.46
17485.75	H	66.77	-32.48	-27	-5.48

Test mode:	802.11ac(VHT20)	Frequency:	Channel 48: 5240MHz		
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Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
9608.375	V	59.37	-35.86	-27	-8.86
14738.12	V	62.71	-32.52	-27	-5.52
17498.5	V	62	-33.23	-27	-6.23
10747.37	H	59.03	-36.20	-27	-9.20
14733.87	H	63.41	-31.82	-27	-4.82
17498.5	H	67.57	-27.66	-27	-0.66

Note:

- (1) All Readings are Peak Value (VBW=3MHz) and Average Value(VBW=10Hz).
- (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
- (3) $EIRP[\text{dBm}] = E[\text{dB}\mu\text{V/m}] + 20 \log(d[\text{meters}]) - 104.77$
d is the measurement distance in 3 meters

Test mode: 802.11ac(VHT20)

Frequency:

Channel 36: 5180MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
11508.12	V	60.10	46.60	74	54	-13.90	-7.40
14557.5	V	62.83	47.68	74	54	-11.17	-6.32
17500.62	V	67.26	47.08	74	54	-6.74	-6.92
10044	H	58.64	44.03	74	54	-15.36	-9.97
14716.87	H	62.82	46.29	74	54	-11.18	-7.71
17511.25	H	67.29	47.12	74	54	-6.71	-6.88

Test mode: 802.11ac(VHT20)

Frequency:

Channel 40: 5200MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
11365.75	V	59.86	45.28	74	54	-14.14	-8.72
14602.12	V	62.75	48.23	74	54	-11.25	-5.77
17504.87	V	67.75	46.93	74	54	-6.25	-7.07
10764.37	H	59.37	45.37	74	54	-14.63	-8.63
15158.87	H	63.38	47.18	74	54	-10.62	-6.82
17485.75	H	66.77	47.10	74	54	-7.23	-6.90

Test mode: 802.11ac(VHT20)

Frequency:

Channel 48: 5240MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
9608.375	V	59.37	46.94	74	54	-14.63	-7.06
14738.12	V	62.71	49.93	74	54	-11.29	-4.07
17498.5	V	62	51.09	74	54	-12	-2.91
10747.37	H	59.03	45.65	74	54	-14.97	-8.35
14733.87	H	63.41	46.26	74	54	-10.59	-7.74
17498.5	H	67.57	47.36	74	54	-6.43	-6.64

Note:

- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
- (2) Emission Level= Reading Level+Correct Factor.
- (3) Correct Factor= Ant_F + Cab_L - Preamp
- (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

● Undesirable radiated Undesirable radiated Spurious Emission in Band Edge

All the antenna(Antenna 1&2) and modes(802.11a/n/ac) has been tested and the worst(Antenna 1,802.11ac(VHT20)) result recorded was report as below:

Test mode:		802.11ac(VHT20)	Frequency:	Channel 36: 5180MHz	
Freq. (MHz)	Ant.Pol.	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5049.00	H	53.39	-41.84	-27	Pass
5042.75	V	54.22	-41.01	-27	Pass

Test mode:		802.11ac(VHT20)	Frequency:	Channel 48: 5240MHz	
Freq. (MHz)	Ant.Pol.	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5366.18	H	52.35	-42.88	-27	Pass
5372.67	V	52.92	-42.31	-27	Pass

Note: (1) All Readings are Peak Value (VBW=3MHz) and Average Value(VBW=10Hz).

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3) EIRP[dBm] = E[dB μ V/m] + 20 log(d[meters]) - 104.77

d is the measurement distance in 3 meters

Test mode:		802.11ac(VHT20)	Frequency:	Channel 36: 5180MHz	
Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
5049.00	H	53.39	74	47.10	54
5042.75	V	54.22	74	47.40	54

Test mode:		802.11ac(VHT20)	Frequency:	Channel 48: 5240MHz	
Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
5366.18	H	52.35	74	47.43	54
5372.67	V	52.92	74	48.32	54

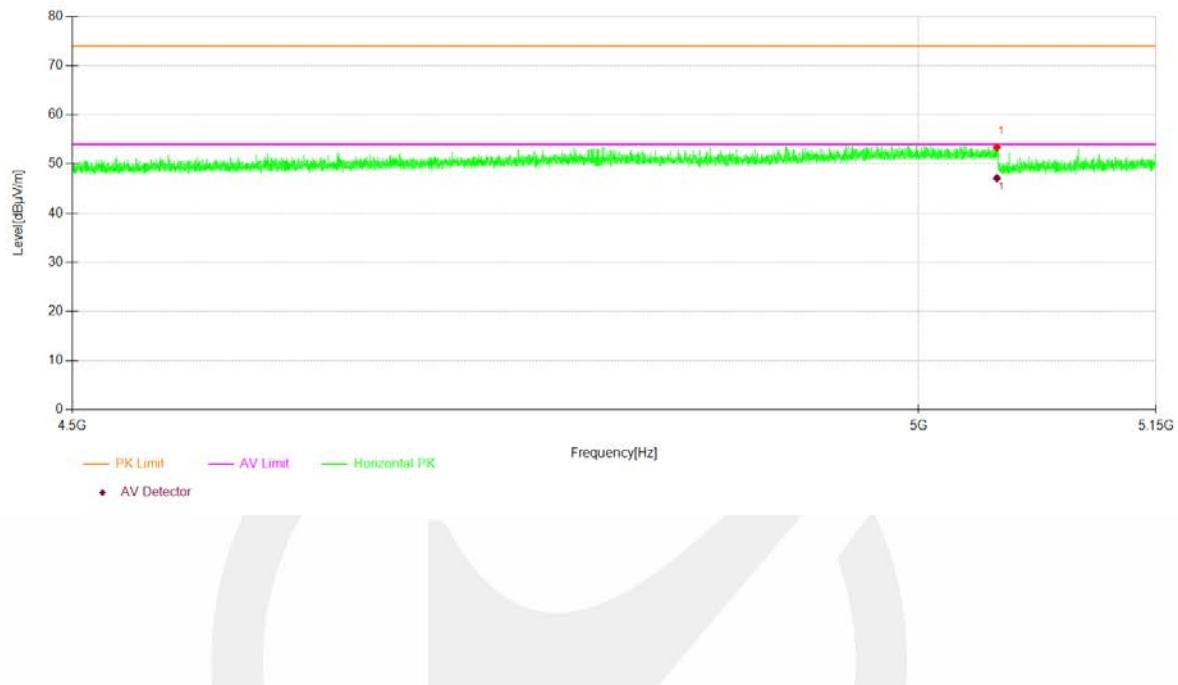
Note: (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).

(2) Emission Level= Reading Level+Correct Factor.

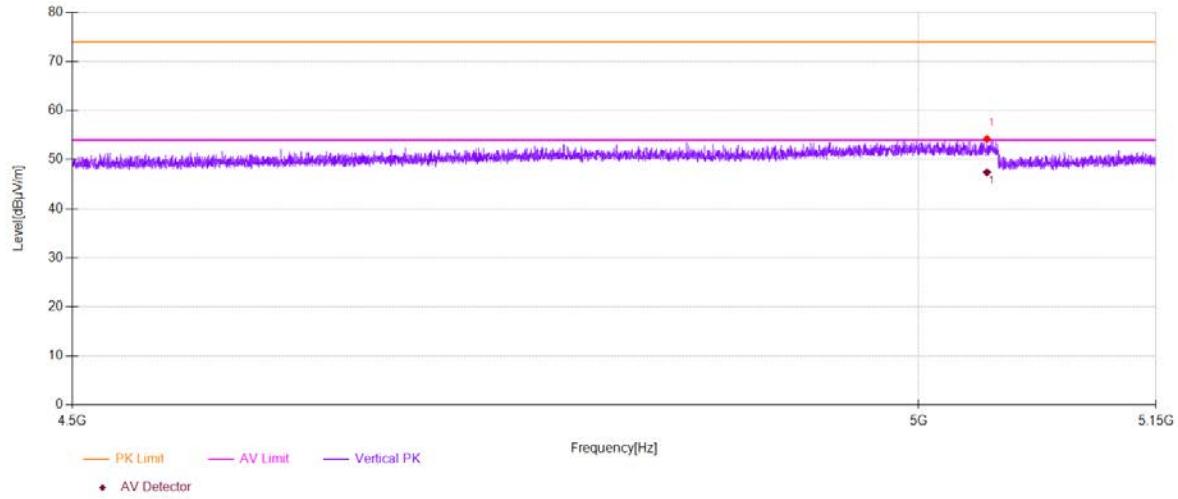
(3) Correct Factor= Ant_F + Cab_L - Preamp

(4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

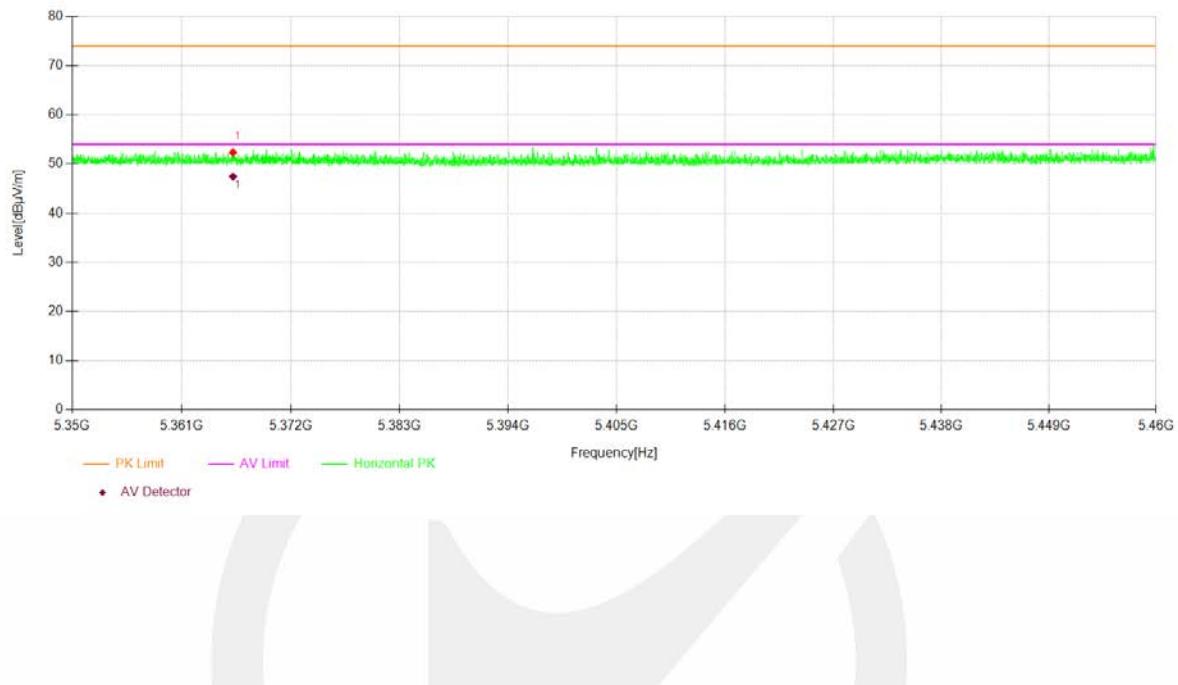
U-NII - 1
Test Model Undesirable radiated Undesirable radiated Spurious Emission in Band Edge
 802.11ac(VHT20) Channel 36: 5180MHz Ant.Pol H



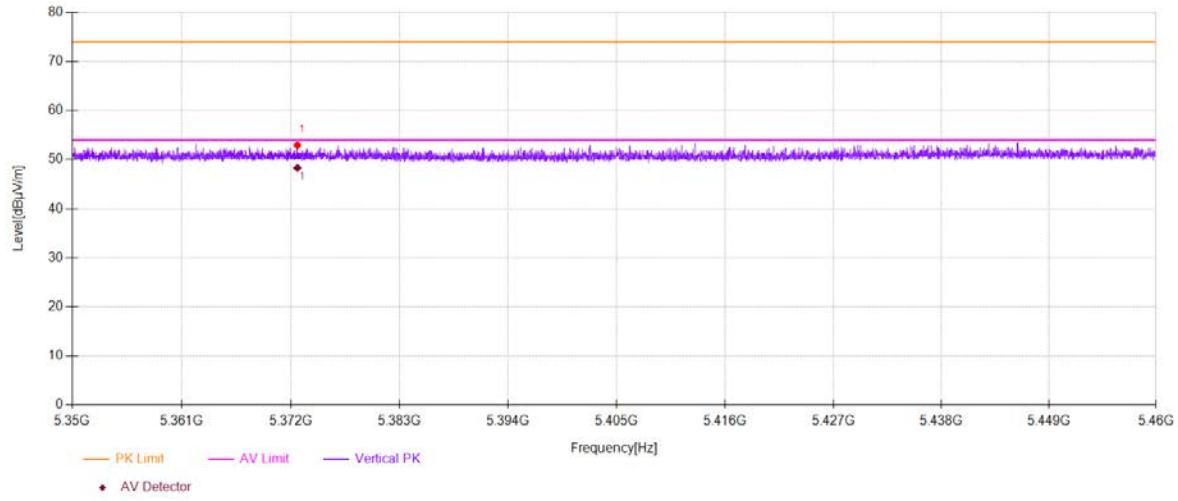
U-NII - 1
Test Model Undesirable radiated Undesirable radiated Spurious Emission in Band Edge
 802.11ac(VHT20) Channel 36: 5180MHz Ant.Pol V



Test Model U-NII - 1
 Undesirable radiated Undesirable radiated Spurious Emission in Band Edge
 802.11ac(VHT20) Channel 48: 5240MHz Ant.Pol H



Test Model U-NII - 1
 Undesirable radiated Undesirable radiated Spurious Emission in Band Edge
 802.11ac(VHT20) Channel 48: 5240MHz Ant.Pol V



■ For Undesirable radiated Spurious Emission in U-NII -3

● Undesirable radiated Spurious Emission Above 1GHz(1GHz to 40GHz)

All the antenna(Antenna 1&2) and modes(802.11a/n/ac) has been tested and the worst(Antenna 1,802.11ac(VHT20)) result recorded was report as below:

Test mode: 802.11ac(VHT20) Frequency: Channel 149: 5745MHz

Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
10670.87	V	59.39	-35.84	-27	-8.84
14638.25	V	62.46	-32.77	-27	-5.77
17479.37	V	67.18	-28.05	-27	-1.05
10056.75	H	58.47	-36.76	-27	-9.76
14657.37	H	62.95	-32.28	-27	-5.28
17492.12	H	66.91	-28.32	-27	-1.32

Test mode: 802.11ac(VHT20) Frequency: Channel 157: 5785MHz

Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11569.75	V	59.73	-35.50	-27	-8.50
14619.12	V	62.43	-32.80	-27	-5.80
17507	V	66.70	-28.53	-27	-1.53
11359.37	H	60.08	-35.15	-27	-8.15
14689.25	H	62.44	-32.79	-27	-5.79
17485.75	H	67.61	-27.62	-27	-0.62

Test mode: 802.11ac(VHT20) Frequency: Channel 165: 5825MHz

Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
10702.75	V	60.02	-35.21	-27	-8.21
14540.5	V	62.31	-32.92	-27	-5.92
17494.25	V	66.75	-28.48	-27	-1.48
11382.75	H	60.12	-35.11	-27	-8.11
14634	H	63.18	-32.05	-27	-5.05
17500.62	H	66.34	-28.89	-27	-1.89

Note: (1) All Readings are Peak Value (VBW=3MHz) and Average Value(VBW=10Hz).

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3) $EIRP[\text{dBm}] = E[\text{dB}\mu\text{V/m}] + 20 \log(d[\text{meters}]) - 104.77$

d is the measurement distance in 3 meters

Test mode: 802.11ac(VHT20)

Frequency:

Channel 149: 5745MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
10670.87	V	59.39	46.06	74.00	54.00	-14.61	-7.94
14638.25	V	62.46	47.52	74.00	54.00	-11.54	-6.48
17479.37	V	67.18	48.14	74.00	54.00	-6.82	-5.86
10056.75	H	58.47	44.55	74.00	54.00	-15.53	-9.45
14657.37	H	62.95	46.83	74.00	54.00	-11.05	-7.17
17492.12	H	66.91	46.72	74.00	54.00	-7.09	-7.28

Test mode: 802.11ac(VHT20)

Frequency:

Channel 157: 5785MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
11569.75	V	59.73	45.69	74.00	54.00	-14.27	-8.31
14619.12	V	62.43	47.54	74.00	54.00	-11.57	-6.46
17507	V	66.70	47.34	74.00	54.00	-7.30	-6.66
11359.37	H	60.08	45.38	74.00	54.00	-13.92	-8.62
14689.25	H	62.44	46.60	74.00	54.00	-11.56	-7.40
17485.75	H	67.61	46.40	74.00	54.00	-6.39	-7.60

Test mode: 802.11ac(VHT20)

Frequency:

Channel 165: 5825MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
10702.75	V	60.02	46.61	74.00	54.00	-13.98	-7.39
14540.5	V	62.31	47.12	74.00	54.00	-11.69	-6.88
17494.25	V	66.75	46.89	74.00	54.00	-7.25	-7.11
11382.75	H	60.12	45.24	74.00	54.00	-13.88	-8.76
14634	H	63.18	47.26	74.00	54.00	-10.82	-6.74
17500.62	H	66.34	47.42	74.00	54.00	-7.66	-6.58

Note:

- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
- (2) Emission Level= Reading Level+Correct Factor.
- (3) Correct Factor= Ant_F + Cab_L - Preamp
- (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

● Undesirable radiated Undesirable radiated Spurious Emission in Band Edge

All the antenna(Antenna 1&2) and modes(802.11a/n/ac) has been tested and the worst(Antenna 1,802.11ac(VHT20)) result recorded was report as below:

Test mode:		802.11ac(VHT20)	Frequency:	Channel 149: 5745MHz	
Freq. (MHz)	Ant.Pol.	Field Strength (RBW=100KHz) (dB μ V/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5709.93	H	53.22	-42.01	12.78	Pass
5701.36	V	53.23	-42.00	10.38	Pass

Test mode:		802.11ac(VHT20)	Frequency:	Channel 165: 5825MHz	
Freq. (MHz)	Ant.Pol.	Field Strength (RBW=100KHz) (dB μ V/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5851.25	H	54.14	-41.09	24.15	Pass
5872.38	V	53.74	-41.49	10.73	Pass

Note: (1) All Readings are Peak Value (VBW=3MHz) and Average Value(VBW=10Hz).

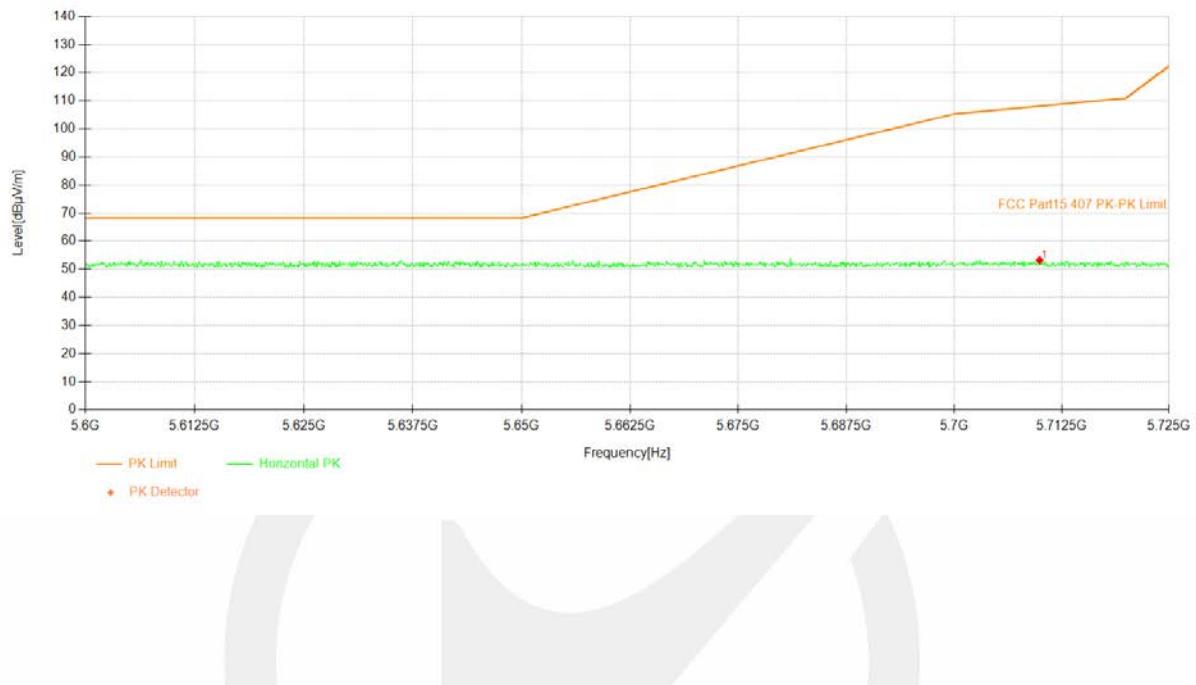
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3)EIRP[dBm] = E[dB μ V/m] + 20 log(d[meters]) - 104.77

d is the measurement distance in 3 meters

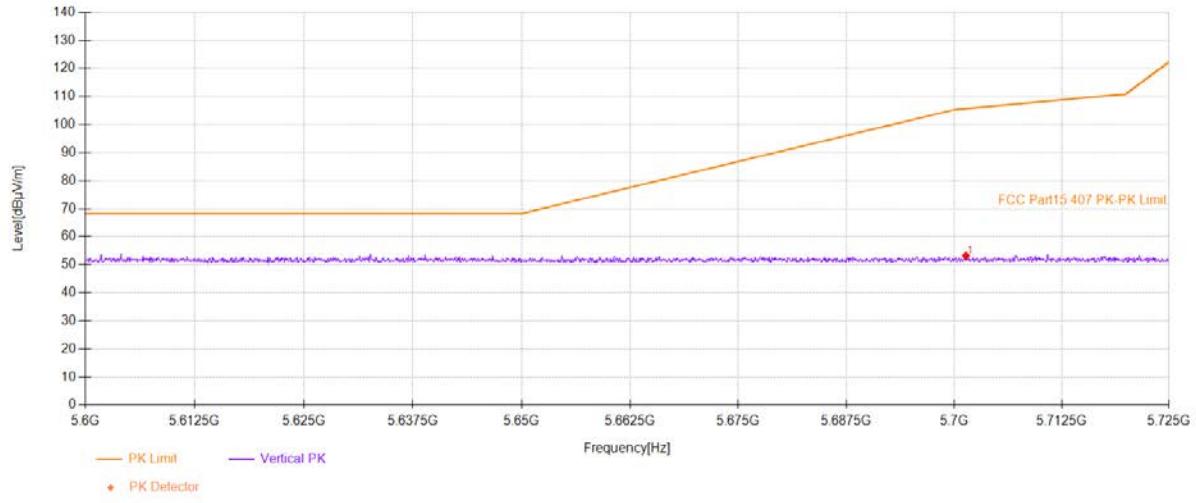
U-NII-3

Test Model Undesirable radiated Undesirable radiated Spurious Emission in Band Edge
 802.11ac(VHT20) Channel 149: 5745MHz Ant.Pol H

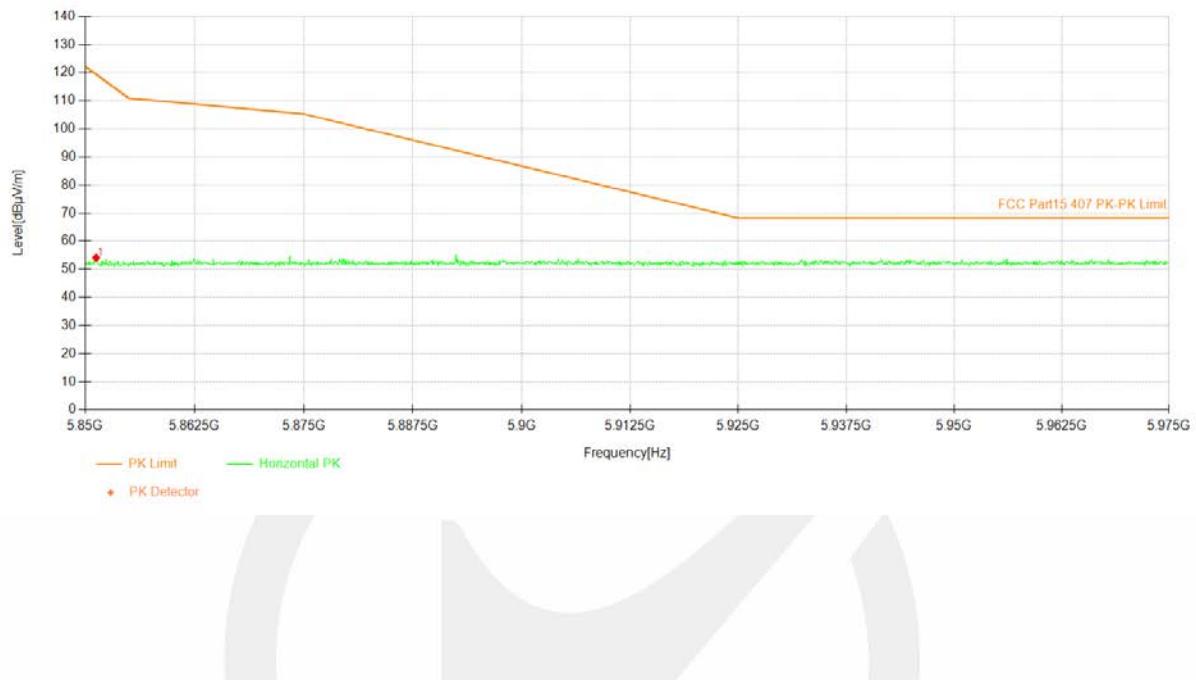


U-NII-3

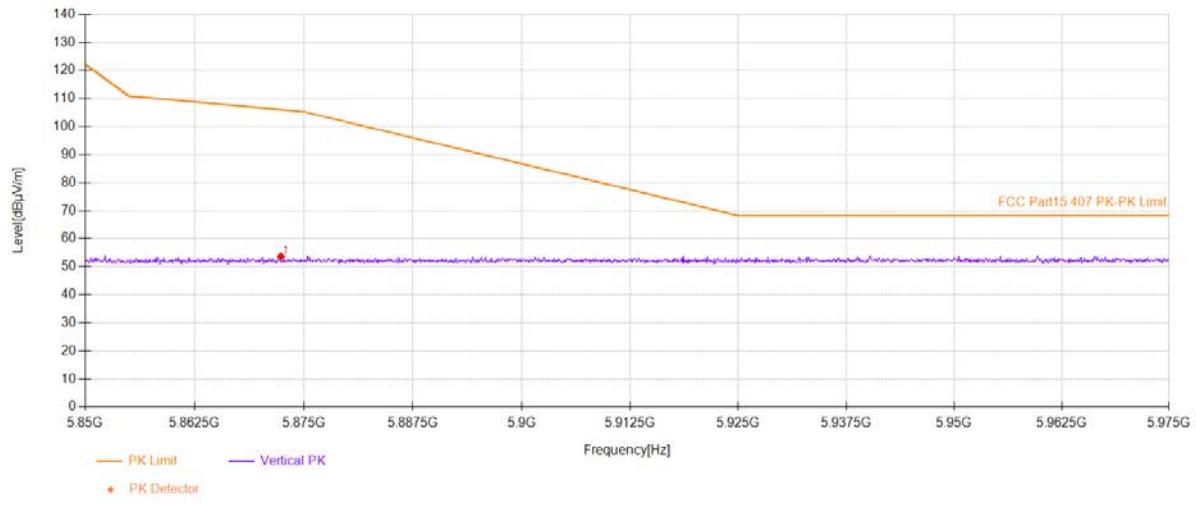
Test Model Undesirable radiated Undesirable radiated Spurious Emission in Band Edge
 802.11ac(VHT20) Channel 149: 5745MHz Ant.Pol V



Test Model	Undesirable radiated Undesirable radiated Spurious Emission in Band Edge	Channel 165: 5825MHz	Ant.Pol	U-NII-3
802.11ac(VHT20)				H

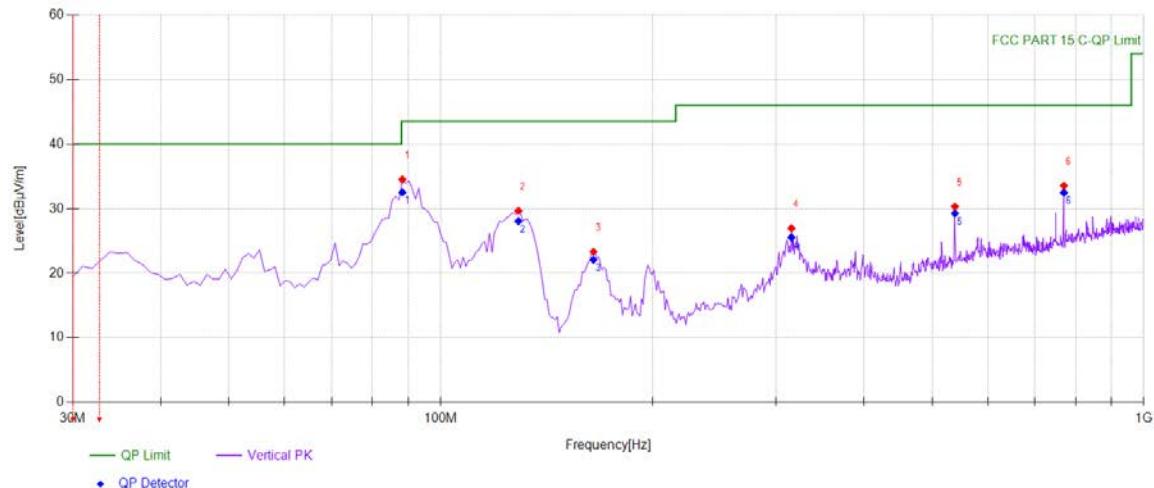


Test Model	Undesirable radiated Undesirable radiated Spurious Emission in Band Edge	Channel 165: 5825MHz	Ant.Pol	U-NII-3
802.11ac(VHT20)				V



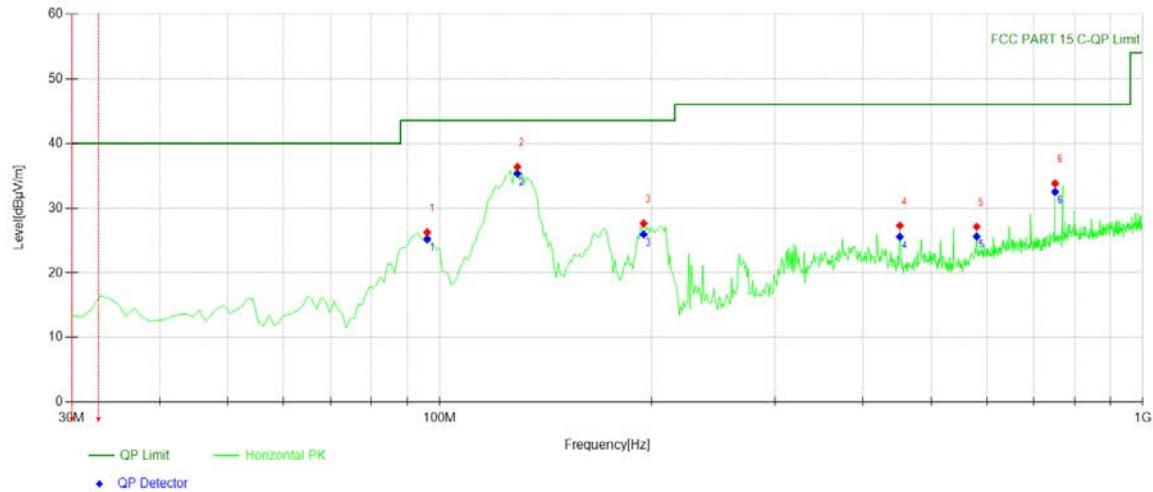
- Undesirable radiated Spurious Emission below 1GHz (30MHz to 1GHz)
All the antenna(Antenna 1&2) and modes(802.11a/n/ac) has been tested and the worst(Antenna 1,802.11ac(VHT20)) result recorded was report as below:

Mode:	11AC20 5180
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Suspected Data List										
NO .	Freq. [MHz]	Readin g [dBμV]	Facto r [dB/m]	Level [dBμV/ m]	Detect or	Limit [dBμV/ m]	Margi n [dB]	Polarit y	Angle[°]	Height[c m]
1	88.2583	54.06	-19.56	34.50	PK	43.50	9.00	Vertic al	22	100
2	129.039	48.56	-18.90	29.66	PK	43.50	13.84	Vertic al	200	100
3	164.965	42.62	-19.29	23.33	PK	43.50	20.17	Vertic al	236	100
4	315.4655	41.11	-14.14	26.97	PK	46.00	19.03	Vertic al	302	100
5	538.7888	39.58	-9.26	30.32	PK	46.00	15.68	Vertic al	101	100
6	769.8799	38.55	-5.01	33.54	PK	46.00	12.46	Vertic al	27	100

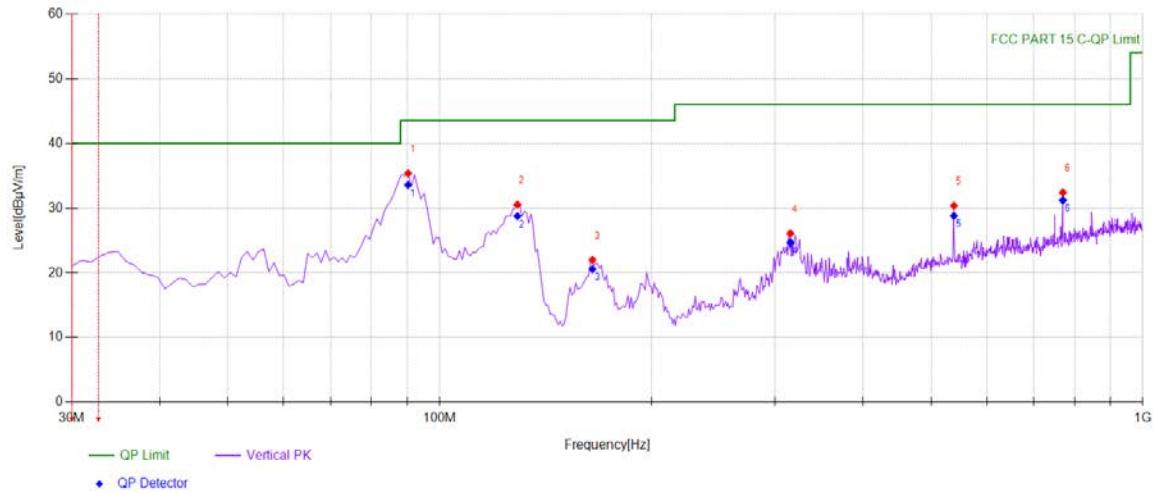
Mode:	11AC20 5180
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Suspected Data List

NO .	Freq. [MHz]	Readin g [dB μ V]	Facto r [dB/ m]	Level [dB μ V/ m]	Detect or	Limit [dB μ V/ m]	Margi n [dB]	Polarity	Angle[°]	Height[c m]
1	96.026	43.98	-17.7 ₃	26.25	PK	43.50	17.25	Horizontal	112	100
2	129.039	55.28	-18.9 ₀	36.38	PK	43.50	7.12	Horizontal	286	100
3	195.065 ₁	45.06	-17.4 ₃	27.63	PK	43.50	15.87	Horizontal	126	100
4	451.401 ₄	38.39	-11.1 ₂	27.27	PK	46.00	18.73	Horizontal	126	100
5	580.540 ₅	34.26	-7.14	27.12	PK	46.00	18.88	Horizontal	31	100
6	750.460 ₅	39.15	-5.33	33.82	PK	46.00	12.18	Horizontal	244	100

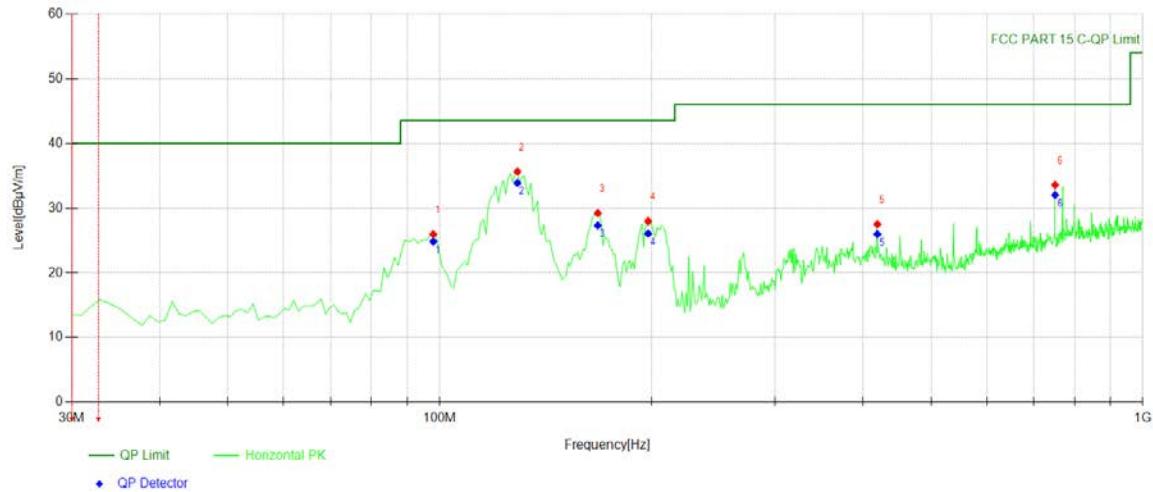
Mode:	11AC20 5200
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Suspected Data List

NO .	Freq. [MHz]	Readin g [dBμV]	Facto r [dB/m]	Level [dBμV/ m]	Detect or	Limit [dBμV/ m]	Margi n [dB]	Polarit y	Angle[°]	Height[c m]
1	90.2002	54.47	-19.1 2	35.35	PK	43.50	8.15	Vertic al	123	100
2	129.039	49.43	-18.9 0	30.53	PK	43.50	12.97	Vertic al	165	100
3	164.965	41.27	-19.2 9	21.98	PK	43.50	21.52	Vertic al	197	100
4	315.465 5	40.24	-14.1 4	26.10	PK	46.00	19.90	Vertic al	287	100
5	538.788 8	39.62	-9.26	30.36	PK	46.00	15.64	Vertic al	108	100
6	769.879 9	37.43	-5.01	32.42	PK	46.00	13.58	Vertic al	28	100

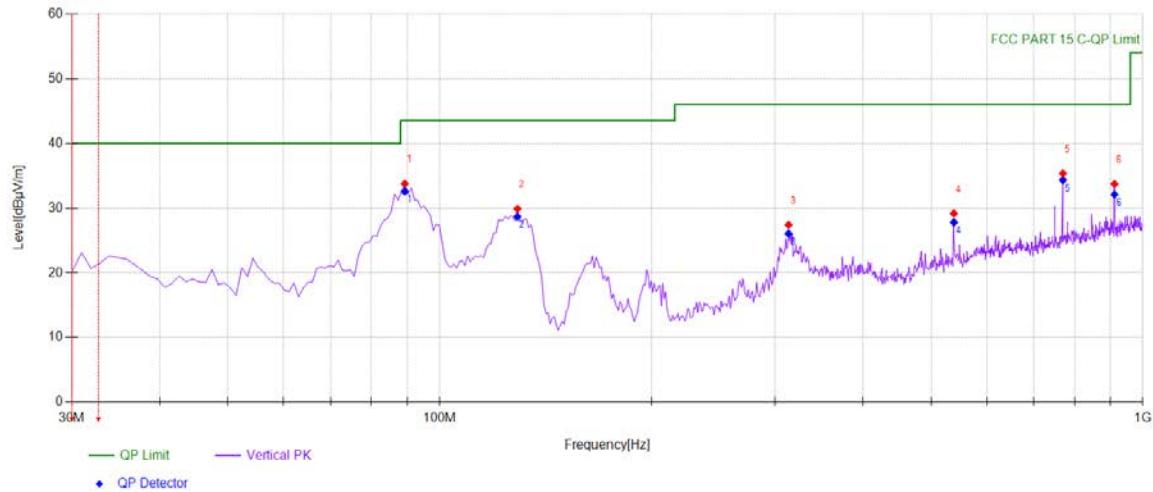
Mode:	11AC20 5200
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Suspected Data List

NO .	Freq. [MHz]	Readin g [dBμV]	Facto r [dB/ m]	Level [dBμV/ m]	Detect or	Limit [dBμV/ m]	Margi n [dB]	Polarity	Angle[°]	Height[c m]
1	97.968	43.24	-17.28	25.96	PK	43.50	17.54	Horizontal	94	100
2	129.039	54.54	-18.90	35.64	PK	43.50	7.86	Horizontal	276	100
3	167.8779	48.33	-19.10	29.23	PK	43.50	14.27	Horizontal	31	100
4	197.978	45.23	-17.25	27.98	PK	43.50	15.52	Horizontal	99	100
5	419.3594	39.26	-11.74	27.52	PK	46.00	18.48	Horizontal	149	100
6	750.4605	38.91	-5.33	33.58	PK	46.00	12.42	Horizontal	263	100

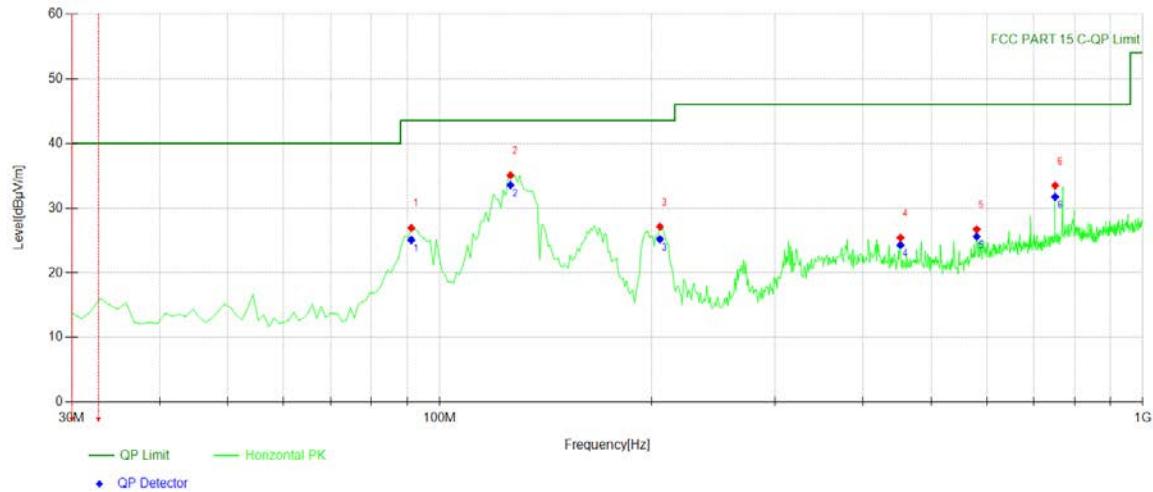
Mode:	11AC20 5240
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Suspected Data List

NO .	Freq. [MHz]	Readin g [dBμV]	Facto r [dB/m]	Level [dBμV/ m]	Detect or	Limit [dBμV/ m]	Margi n [dB]	Polarit y	Angle[°]	Height[c m]
1	89.2292	53.13	-19.3 4	33.79	PK	43.50	9.71	Vertic al	72	100
2	129.039	48.79	-18.9 0	29.89	PK	43.50	13.61	Vertic al	210	100
3	313.523 5	41.56	-14.1 4	27.42	PK	46.00	18.58	Vertic al	302	100
4	538.788 8	38.44	-9.26	29.18	PK	46.00	16.82	Vertic al	320	100
5	769.879 9	40.35	-5.01	35.34	PK	46.00	10.66	Vertic al	36	100
6	911.641 6	36.58	-2.84	33.74	PK	46.00	12.26	Vertic al	247	100

Mode:	11AC20 5240
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Suspected Data List

NO .	Freq. [MHz]	Readin g [dB μ V]	Facto r [dB/ m]	Level [dB μ V/ m]	Detect or	Limit [dB μ V/ m]	Margi n [dB]	Polarity	Angle[°]	Height[c m]
1	91.1712	45.82	-18.88	26.94	PK	43.50	16.56	Horizontal	123	100
2	126.1261	53.64	-18.58	35.06	PK	43.50	8.44	Horizontal	335	100
3	205.7457	44.27	-17.13	27.14	PK	43.50	16.36	Horizontal	91	100
4	452.3724	36.53	-11.11	25.42	PK	46.00	20.58	Horizontal	146	100
5	580.5405	33.86	-7.14	26.72	PK	46.00	19.28	Horizontal	360	100
6	750.4605	38.82	-5.33	33.49	PK	46.00	12.51	Horizontal	259	100

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