

TEST REPORT

Product : 4G Intelligent Gateway
Trade mark : N/A
Model/Type reference : X2
Serial Number : N/A
Report Number : EED32P80040002
FCC ID : 2AG6GX2
Date of Issue : Mar. 09, 2023
Test Standards : 47 CFR Part 15 Subpart E
Test result : PASS

Prepared for:

Hongdian Corporation
Tower A, Hongdian Building, 100 Huabao Road, Pinghu,
Longgang District, Shenzhen, China

Prepared by:

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Date:

Mar. 09, 2023



Check No.: 2407100123

2 Content

1 COVER PAGE	1
2 CONTENT	2
3 VERSION	3
4 TEST SUMMARY	4
5 GENERAL INFORMATION	5
5.1 CLIENT INFORMATION.....	5
5.2 GENERAL DESCRIPTION OF EUT.....	5
5.3 TEST CONFIGURATION.....	7
5.4 TEST ENVIRONMENT.....	7
5.5 DESCRIPTION OF SUPPORT UNITS.....	8
5.6 TEST LOCATION.....	8
5.7 DEVIATION FROM STANDARDS.....	8
5.8 ABNORMALITIES FROM STANDARD CONDITIONS.....	8
5.9 OTHER INFORMATION REQUESTED BY THE CUSTOMER.....	8
5.10 MEASUREMENT UNCERTAINTY (95% CONFIDENCE LEVELS, K=2).....	8
6 EQUIPMENT LIST	9
7 RADIO TECHNICAL REQUIREMENTS SPECIFICATION	12
7.1 ANTENNA REQUIREMENT.....	12
7.2 AC POWER LINE CONDUCTED EMISSIONS.....	13
7.3 MAXIMUM CONDUCTED OUTPUT POWER.....	19
7.4 6dB EMISSION BANDWIDTH.....	20
7.5 26dB EMISSION BANDWIDTH AND 99% OCCUPIED BANDWIDTH.....	21
7.6 MAXIMUM POWER SPECTRAL DENSITY.....	22
7.7 FREQUENCY STABILITY.....	23
7.8 RADIATED EMISSION.....	24
7.9 RADIATED EMISSION WHICH FALL IN THE RESTRICTED BANDS.....	43
8 APPENDIX 5G WIFI	82
PHOTOGRAPHS OF TEST SETUP	83
PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS	88

3 Version

Version No.	Date	Description
00	Mar. 09, 2023	Original

4 Test Summary

Test Item	Test Requirement	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart E Section 15.407 (b)(6)	PASS
Duty Cycle	47 CFR Part 15 Subpart E Section 15.407	PASS
Maximum Conducted Output Power	47 CFR Part 15 Subpart E Section 15.407 (a)	PASS
26dB emission bandwidth	47 CFR Part 15 Subpart E Section 15.407 (a)	PASS
99% Occupied bandwidth	\	PASS
6dB emission bandwidth	47 CFR Part 15 Subpart E Section 15.407 (e)	PASS
Maximum Power Spectral Density	47 CFR Part 15 Subpart E Section 15.407 (a)	PASS
Frequency stability	47 CFR Part 15 Subpart E Section 15.407 (g)	PASS
Radiated Emissions	47 CFR Part 15 Subpart E Section 15.407 (b)	PASS
Radiated Emissions which fall in the restricted bands	47 CFR Part 15 Subpart E Section 15.407 (b)	PASS

Remark:

This product has two antenna schemes, please see the product photo, and we have tested both. Company Name and Address shown on Report, the sample(s) and sample Information were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

5 General Information

5.1 Client Information

Applicant:	Hongdian Corporation
Address of Applicant:	Tower A, Hongdian Building, 100 Huabao Road, Pinghu, Longgang District, Shenzhen, China
Manufacturer:	Hongdian Corporation
Address of Manufacturer:	Tower A, Hongdian Building, 100 Huabao Road, Pinghu, Longgang District, Shenzhen, China
Factory :	Hongdian Corporation
Address of Factory :	Tower A, Hongdian Building, 100 Huabao Road, Pinghu, Longgang District, Shenzhen, China

5.2 General Description of EUT

Product Name:	4G Intelligent Gateway	
Model No.:	X2	
Trade mark:	N/A	
Product Type:	<input type="checkbox"/> Mobile <input type="checkbox"/> Portable <input checked="" type="checkbox"/> Fix Location	
Type of Modulation:	IEEE 802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE 802.11n(HT20/HT40): OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE 802.11ac(VHT20/VHT40/VHT80): OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)	
Operating Frequency	U-NII-1: 5180-5250MHz U-NII-3: 5745-5825MHz	
Antenna Type:	External Antenna	
Antenna Gain:	Antenna schemes 1:	U-NII-1: Ant1: 2.58dBi, Ant2: 2.58dBi U-NII-3: Ant1: 3.23dBi, Ant2: 3.23dBi
	Antenna schemes 2:	U-NII-1: Ant1: 2.55dBi, Ant2: 2.55dBi U-NII-3: Ant1: -0.42dBi, Ant2: -0.42dBi
Power Supply:	DC12V,3A	
Test voltage:	DC12V	
Sample Received Date:	Jan. 10, 2023	
Sample tested Date:	Jan. 10, 2023 to Feb. 03, 2023	

Operation Frequency each of channel

802.11a/802.11n/802.11ac (20MHz) Frequency/Channel Operations:

U-NII-1		U-NII-3	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
36	5180	149	5745
40	5200	153	5765
44	5220	157	5785
48	5240	161	5805
-	-	165	5825

802.11n/802.11ac (40MHz) Frequency/Channel Operations:

U-NII-1		U-NII-3	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
38	5190	151	5755
46	5230	159	5795

802.11ac (80MHz) Frequency/Channel Operations:

U-NII-1		U-NII-3	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
42	5210	155	5775

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

5.3 Test Configuration

EUT Test Software Settings:	
Software:	qdart
EUT Power Grade:	Default
Use test software to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT.	
Test Mode:	
We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:	
Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.	
Mode	Data rate
802.11a	6 Mbps
802.11n(HT20)	MCS0
802.11n(HT40)	MCS0
802.11ac(VHT20)	MCS0
802.11ac(VHT40)	MCS0
802.11ac(VHT80)	MCS0

5.4 Test Environment

Operating Environment:		
Radiated Spurious Emissions:		
Temperature:	22~25.0 °C	
Humidity:	50~55 % RH	
Atmospheric Pressure:	1010mbar	
Conducted Emissions:		
Temperature:	22~25.0 °C	
Humidity:	50~55 % RH	
Atmospheric Pressure:	1010mbar	
RF Conducted:		
Humidity:	50~55 % RH	
Atmospheric Pressure:	1010mbar	
Temperature:	NT (Normal Temperature)	22~25.0 °C
	LT (Low Temperature)	-30 °C
	HT (High Temperature)	75.0 °C
Working Voltage of the EUT:	NV (Normal Voltage)	DC 12 V
	LV (Low Voltage)	DC 9 V
	HV (High Voltage)	DC 48 V

5.5 Description of Support Units

The EUT has been tested with associated equipment below.

1) support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
AC/DC adapter	Shenzhen Boshenggao Technology CO LTD	BSG-1203000	CCC	Client
Notebook	Lenovo	ThinkBook 14	FCC	CTI

5.6 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.

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

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9 x 10 ⁻⁸
2	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-18GHz)
3	Radiated Spurious emission test	3.3dB (9kHz-30MHz)
		4.5dB (30MHz-1GHz)
		4.8dB (1GHz-18GHz)
		3.4dB (18GHz-40GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

6 Equipment List

RF test system					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Communication tset set	R&S	CMW500	107929	07-06-2022	07-05-2023
Signal Generator	R&S	SMBV100A	1407.6004K02- 262149-CV	09-09-2022	09-08-2023
Spectrum Analyzer	R&S	FSV40	101200	08-01-2022	07-31-2023
RF control unit(power unit)	MWRF-test	MW100-RFCB	MW220620CTI-42	07-06-2022	07-05-2023
high-low temperature test chamber	Dong Guang Qin Zhuo	LK-80GA	QZ20150611879	12-19-2022	12-18-2023
Temperature/ Humidity Indicator	biaozhi	HM10	1804186	06-16-2022	06-15-2023
BT&WI-FI Automatic test software	MWRF-test	MTS 8310	2.0.0.0	---	---

Conducted disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100435	05-06-2022	05-05-2023
Temperature/ Humidity Indicator	Defu	TH128	/	---	---
LISN	R&S	ENV216	100098	09-27-2022	09-26-2023
Barometer	changchun	DYM3	1188	---	---
Capacitive voltage probe	Schwarzbeck	CVP 9222C	00124	07-13-2022	07-12-2023
ISN	TESEQ	ISN T800	30297	12-29-2022	12-28-2023

3M Semi-anechoic Chamber (2)- Radiated disturbance Test					
Equipment	Manufacturer	Model	Serial No.	Cal. Date	Due Date
3M Chamber & Accessory Equipment	TDK	SAC-3	---	05-22-2022	05-21-2025
Receiver	R&S	ESCI7	100938-003	09-28-2022	09-27-2023
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	9163-618	05-22-2022	05-21-2025
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04-15-2021	04-14-2024
Microwave Preamplifier	Tonscend	EMC051845SE	980380	12-23-2022	12-22-2023
Multi device Controller	matur	NCD/070/10711112	---	---	---
Horn Antenna	ETS-LINGREN	BBHA 9120D	9120D-1869	04/15/2021	04/14/2024
Microwave Preamplifier	Agilent	8449B	3008A02425	06/20/2022	06/19/2023

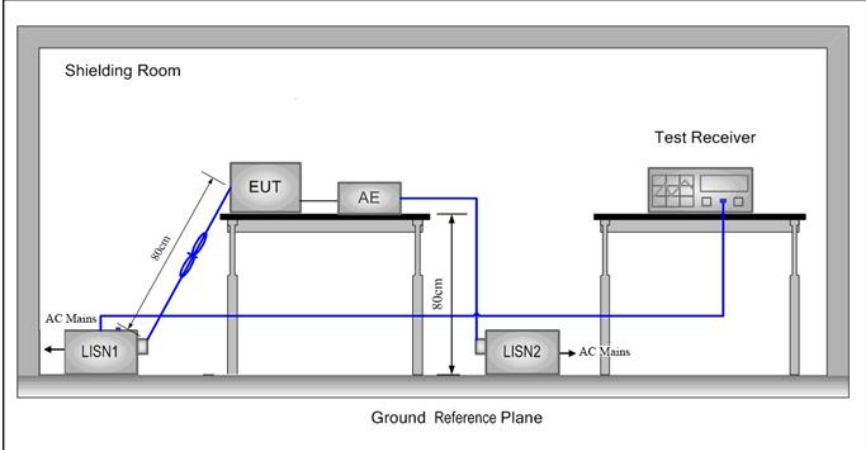
3M full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
RSE Automatic test software	JS Tonscend	JS36-RSE	10166	---	---
Receiver	Keysight	N9038A	MY57290136	03-01-2022	02-28-2023
Spectrum Analyzer	Keysight	N9020B	MY57111112	03-01-2022	02-28-2023
Spectrum Analyzer	Keysight	N9030B	MY57140871	03-01-2022	02-28-2023
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1148	04-28-2021	04-27-2024
Horn Antenna	Schwarzbeck	BBHA 9170	9170-832	04-15-2021	04-14-2024
Horn Antenna	ETS-LINDGREN	3117	57407	07-04-2021	07-03-2024
Preamplifier	EMCI	EMC184055SE	980597	04-20-2022	04-19-2023
Preamplifier	EMCI	EMC001330	980563	04-13-2022	04-12-2023
Preamplifier	JS Tonscend	TAP-011858	AP21B806112	07-29-2022	07-28-2023
Communication test set	R&S	CMW500	102898	12-23-2022	12-22-2023
Temperature/Humidity Indicator	biaozhi	GM1360	EE1186631	02-21-2022	02-20-2023
Fully Anechoic Chamber	TDK	FAC-3	---	01-09-2021	01-08-2024
Cable line	Times	SFT205-NMSM-2.50M	394812-0001	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0002	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0003	---	---
Cable line	Times	SFT205-NMSM-2.50M	393495-0001	---	---
Cable line	Times	EMC104-NMNM-1000	SN160710	---	---
Cable line	Times	SFT205-NMSM-3.00M	394813-0001	---	---
Cable line	Times	SFT205-NMNM-1.50M	381964-0001	---	---
Cable line	Times	SFT205-NMSM-7.00M	394815-0001	---	---
Cable line	Times	HF160-KMKM-3.00M	393493-0001	---	---

7 Radio Technical Requirements Specification

7.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
EUT Antenna:	Please see Internal photos
The antenna is External antenna. The best case gain of the antenna please refer to the section 5.2.	

7.2 AC Power Line Conducted Emissions

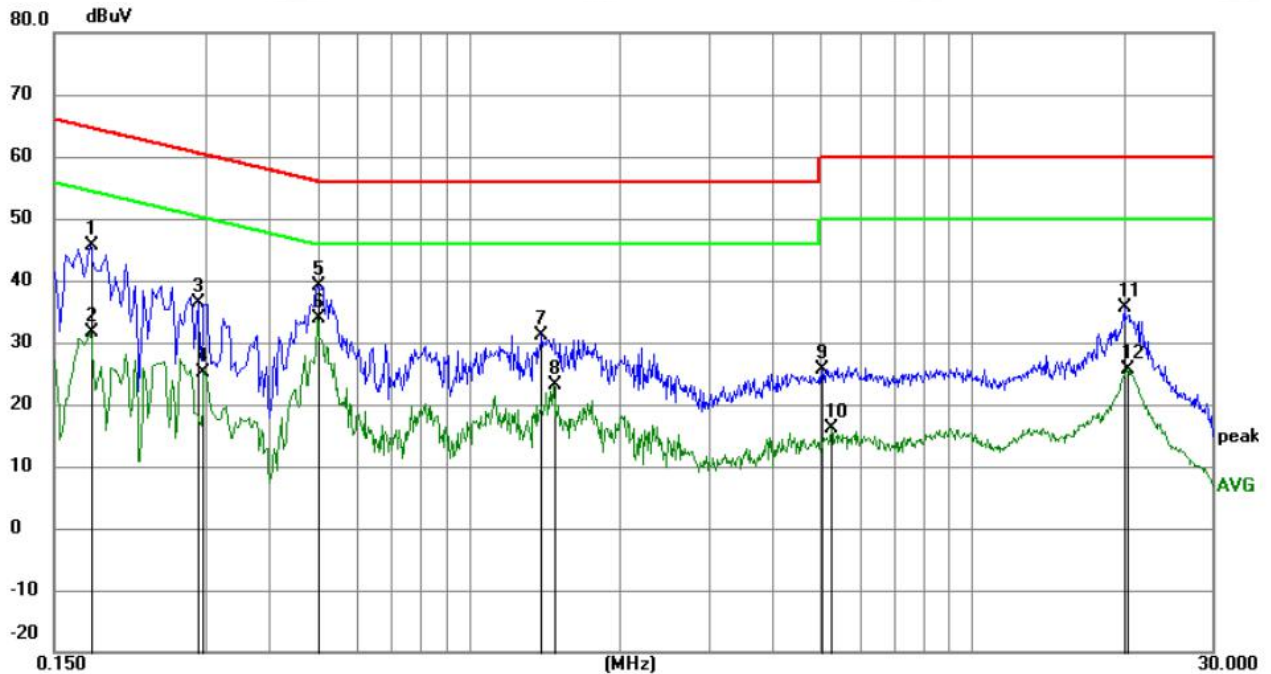
Test Requirement:	47 CFR Part 15C Section 15.207	
Test Method:	ANSI C63.10: 2013	
Test Frequency Range:	150kHz to 30MHz	
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto	
Limit:	Frequency range (MHz)	Limit (dBuV)
		Quasi-peak
		Average
	0.15-0.5	66 to 56*
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		
Test Setup:		
Test Procedure:	<ol style="list-style-type: none"> 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. 5) 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 Mode:	All modes were tested,only the worst case lowest channel of 6Mbps for 802.11 a was recorded in the report
Test Results:	Pass

Measurement Data

Antenna schemes 1:

Live line:

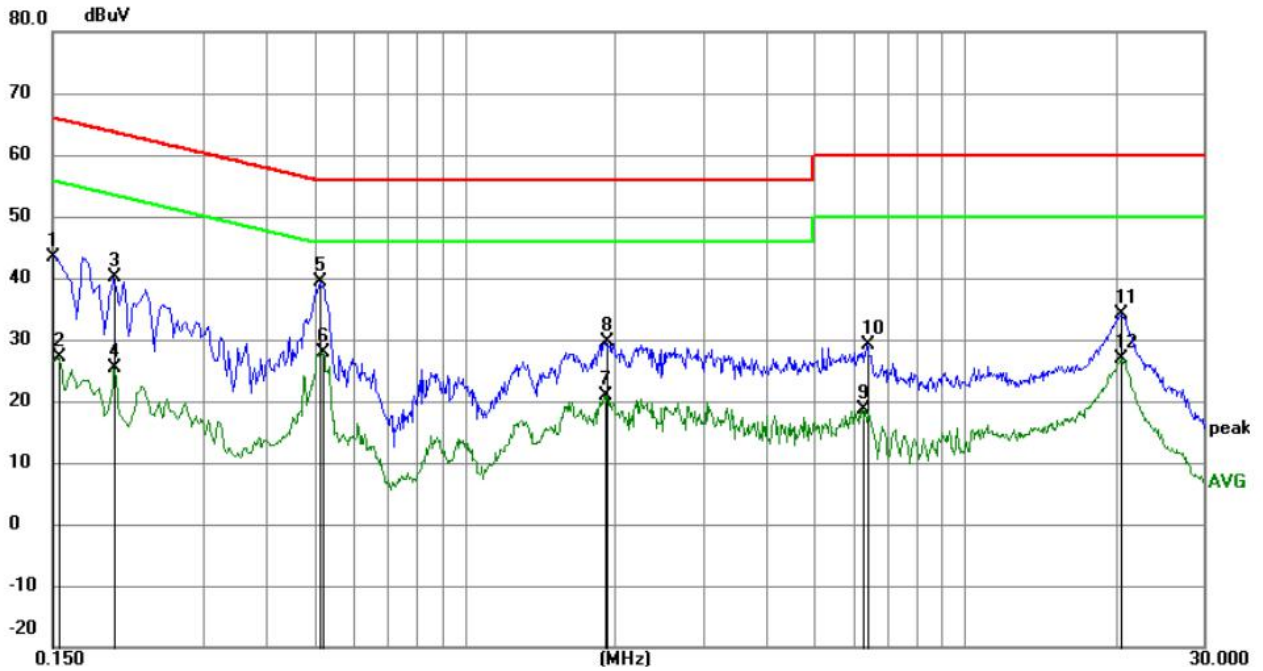


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1768	35.79	9.87	45.66	64.63	-18.97	QP	
2		0.1768	21.65	9.87	31.52	54.63	-23.11	AVG	
3		0.2893	26.45	10.05	36.50	60.54	-24.04	QP	
4		0.2971	15.02	10.06	25.08	50.32	-25.24	AVG	
5		0.4994	29.14	9.95	39.09	56.01	-16.92	QP	
6	*	0.4994	23.93	9.95	33.88	46.01	-12.13	AVG	
7		1.3958	21.22	9.81	31.03	56.00	-24.97	QP	
8		1.4718	13.39	9.81	23.20	46.00	-22.80	AVG	
9		5.0312	15.83	9.78	25.61	60.00	-34.39	QP	
10		5.2490	6.42	9.78	16.20	50.00	-33.80	AVG	
11		20.0559	25.56	9.97	35.53	60.00	-24.47	QP	
12		20.2696	15.66	9.97	25.63	50.00	-24.37	AVG	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1500	33.58	9.87	43.45	66.00	-22.55	QP	
2		0.1544	17.23	9.87	27.10	55.76	-28.66	AVG	
3		0.1995	30.25	9.87	40.12	63.63	-23.51	QP	
4		0.1995	15.58	9.87	25.45	53.63	-28.18	AVG	
5	*	0.5144	29.32	9.97	39.29	56.00	-16.71	QP	
6		0.5190	17.98	9.97	27.95	46.00	-18.05	AVG	
7		1.9004	11.20	9.79	20.99	46.00	-25.01	AVG	
8		1.9229	19.74	9.79	29.53	56.00	-26.47	QP	
9		6.2295	8.90	9.79	18.69	50.00	-31.31	AVG	
10		6.3735	19.35	9.79	29.14	60.00	-30.86	QP	
11		20.5889	24.13	9.97	34.10	60.00	-25.90	QP	
12		20.5889	16.88	9.97	26.85	50.00	-23.15	AVG	

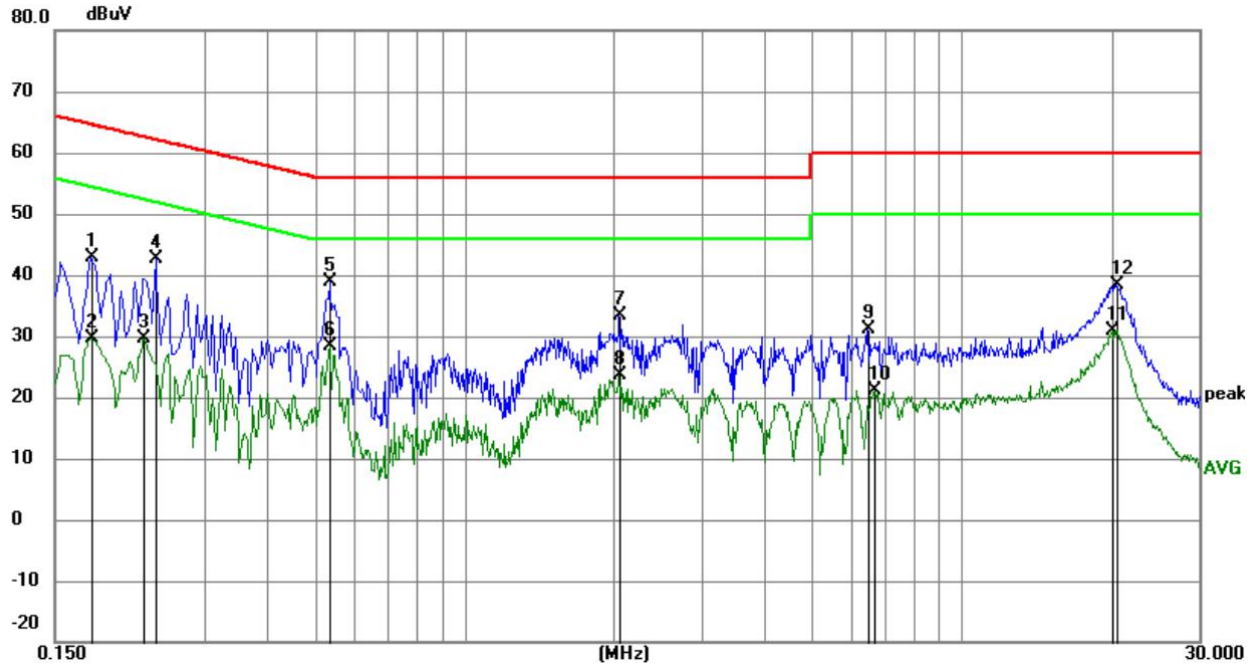
Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Measurement Data

Antenna schemes 2:

Live line:

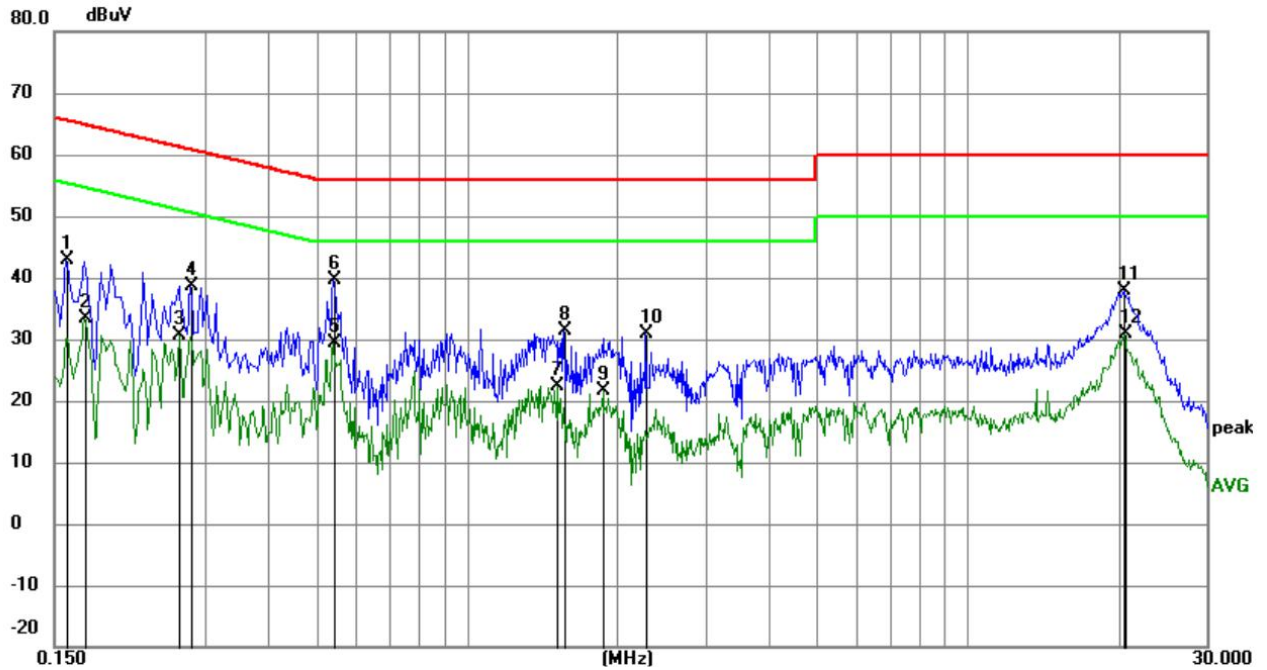


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1770	32.97	9.87	42.84	64.63	-21.79	QP	
2		0.1770	19.86	9.87	29.73	54.63	-24.90	AVG	
3		0.2265	19.83	9.92	29.75	52.58	-22.83	AVG	
4		0.2400	32.60	9.95	42.55	62.10	-19.55	QP	
5	*	0.5370	28.92	9.99	38.91	56.00	-17.09	QP	
6		0.5370	18.42	9.99	28.41	46.00	-17.59	AVG	
7		2.0445	23.57	9.79	33.36	56.00	-22.64	QP	
8		2.0445	13.94	9.79	23.73	46.00	-22.27	AVG	
9		6.4680	21.45	9.79	31.24	60.00	-28.76	QP	
10		6.6660	11.38	9.79	21.17	50.00	-28.83	AVG	
11		20.1299	20.87	9.97	30.84	50.00	-19.16	AVG	
12		20.4360	28.34	9.97	38.31	60.00	-21.69	QP	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1590	33.00	9.87	42.87	65.52	-22.65	QP	
2		0.1725	23.51	9.87	33.38	54.84	-21.46	AVG	
3		0.2670	20.65	10.00	30.65	51.21	-20.56	AVG	
4		0.2805	28.71	10.03	38.74	60.80	-22.06	QP	
5		0.5414	19.48	10.00	29.48	46.00	-16.52	AVG	
6	*	0.5415	29.58	10.00	39.58	56.00	-16.42	QP	
7		1.5179	12.66	9.81	22.47	46.00	-23.53	AVG	
8		1.5673	21.66	9.81	31.47	56.00	-24.53	QP	
9		1.8689	11.79	9.80	21.59	46.00	-24.41	AVG	
10		2.2783	21.07	9.79	30.86	56.00	-25.14	QP	
11		20.5935	27.91	9.97	37.88	60.00	-22.12	QP	
12		20.5980	20.89	9.97	30.86	50.00	-19.14	AVG	

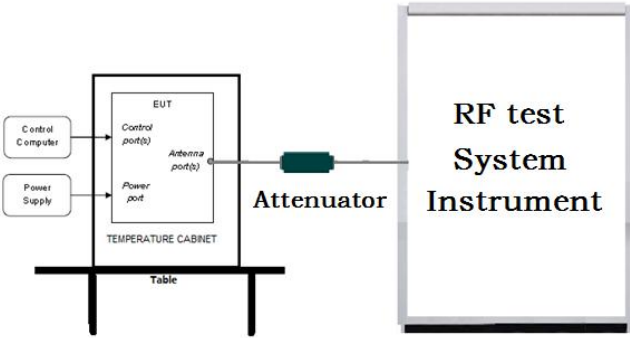
Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

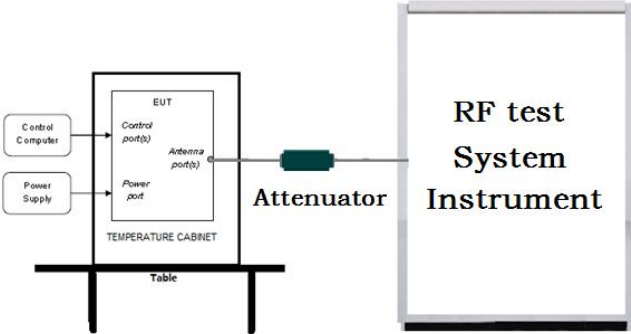
7.3 Maximum Conducted Output Power

Test Requirement:	47 CFR Part 15C Section 15.407 (a)													
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section E													
Test Setup:														
Test Procedure:	<ol style="list-style-type: none"> 1. The testing follows the Measurement Procedure of KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section E, 3, a 2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement. 3. Set to the maximum power setting and enable the EUT transmit continuously. 4. Measure the conducted output power and record the results in the test report. 													
Limit:	<table border="1"> <thead> <tr> <th>Frequency band (MHz)</th> <th>Limit</th> </tr> </thead> <tbody> <tr> <td rowspan="2">5150-5250</td> <td>≤1W(30dBm) for master device</td> </tr> <tr> <td>≤250mW(24dBm) for client device</td> </tr> <tr> <td>5250-5350</td> <td>≤250mW(24dBm) for client device or 11dBm+10logB*</td> </tr> <tr> <td>5470-5725</td> <td>≤250mW(24dBm) for client device or 11dBm+10logB*</td> </tr> <tr> <td>5725-5850</td> <td>≤1W(30dBm)</td> </tr> <tr> <td>Remark:</td> <td>* Where B is the 26dB emission bandwidth in MHz. The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.</td> </tr> </tbody> </table>	Frequency band (MHz)	Limit	5150-5250	≤1W(30dBm) for master device	≤250mW(24dBm) for client device	5250-5350	≤250mW(24dBm) for client device or 11dBm+10logB*	5470-5725	≤250mW(24dBm) for client device or 11dBm+10logB*	5725-5850	≤1W(30dBm)	Remark:	* Where B is the 26dB emission bandwidth in MHz. The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.
Frequency band (MHz)	Limit													
5150-5250	≤1W(30dBm) for master device													
	≤250mW(24dBm) for client device													
5250-5350	≤250mW(24dBm) for client device or 11dBm+10logB*													
5470-5725	≤250mW(24dBm) for client device or 11dBm+10logB*													
5725-5850	≤1W(30dBm)													
Remark:	* Where B is the 26dB emission bandwidth in MHz. The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.													
Test Mode:	Transmitting mode with modulation													
Test Results:	Refer to Appendix 5G WIFI													

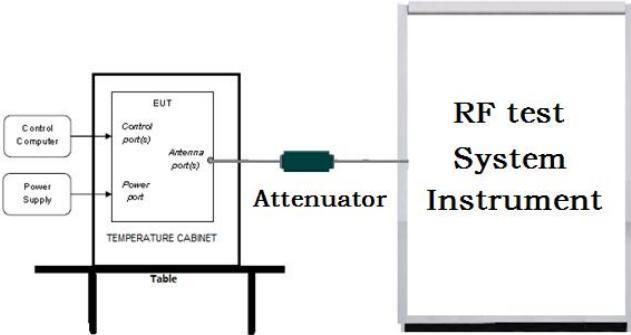
7.4 6dB Emission Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.407 (e)
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C
Test Setup:	 <p>Remark: Offset=Cable loss+ attenuation factor.</p>
Test Procedure:	<ol style="list-style-type: none"> 1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz. 4. Measure and record the results in the test report.
Limit:	≥ 500 kHz
Test Mode:	Transmitting mode with modulation
Test Results:	Refer to Appendix 5G WIFI

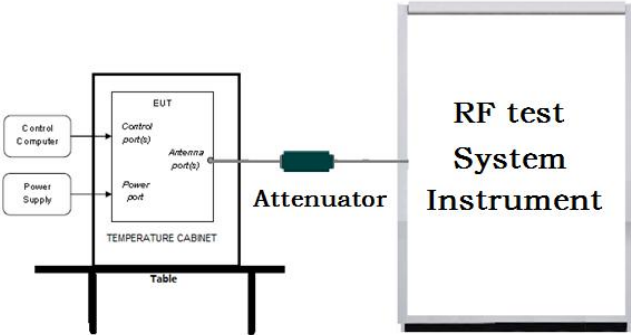
7.5 26dB Emission Bandwidth and 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.407 (a)
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section D
Test Setup:	 <p>Remark: Offset=Cable loss+ attenuation factor.</p>
Test Procedure:	<ol style="list-style-type: none"> 1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section D 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. 4. Measure and record the results in the test report.
Limit:	No restriction limits
Test Mode:	Transmitting mode with modulation
Test Results:	Refer to Appendix 5G WIFI

7.6 Maximum Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.407 (a)													
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section F													
Test Setup:	 <p>Remark: Offset=Cable loss+ attenuation factor.</p>													
Test Procedure:	<ol style="list-style-type: none"> Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth. 1. Set RBW = 510 kHz/1 MHz, VBW ≥ 3*RBW, Sweep time = Auto, Detector = RMS. Allow the sweeps to continue until the trace stabilizes. Use the peak marker function to determine the maximum amplitude level. 													
Limit:	<table border="1"> <thead> <tr> <th>Frequency band (MHz)</th> <th>Limit</th> </tr> </thead> <tbody> <tr> <td rowspan="2">5150-5250</td> <td>≤17dBm in 1MHz for master device</td> </tr> <tr> <td>≤11dBm in 1MHz for client device</td> </tr> <tr> <td>5250-5350</td> <td>≤11dBm in 1MHz for client device</td> </tr> <tr> <td>5470-5725</td> <td>≤11dBm in 1MHz for client device</td> </tr> <tr> <td>5725-5850</td> <td>≤30dBm in 500kHz</td> </tr> <tr> <td>Remark:</td> <td>The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.</td> </tr> </tbody> </table>	Frequency band (MHz)	Limit	5150-5250	≤17dBm in 1MHz for master device	≤11dBm in 1MHz for client device	5250-5350	≤11dBm in 1MHz for client device	5470-5725	≤11dBm in 1MHz for client device	5725-5850	≤30dBm in 500kHz	Remark:	The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.
Frequency band (MHz)	Limit													
5150-5250	≤17dBm in 1MHz for master device													
	≤11dBm in 1MHz for client device													
5250-5350	≤11dBm in 1MHz for client device													
5470-5725	≤11dBm in 1MHz for client device													
5725-5850	≤30dBm in 500kHz													
Remark:	The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.													
Test Mode:	Transmitting mode with modulation													
Test Results:	Refer to Appendix 5G WIFI													

7.7 Frequency Stability

Test Requirement:	47 CFR Part 15C Section 15.407 (g)
Test Method:	ANSI C63.10: 2013
Test Setup:	 <p>Remark: Offset=Cable loss+ attenuation factor.</p>
Test Procedure:	<ol style="list-style-type: none"> 1.The EUT was placed inside the environmental test chamber and powered by nominal AC/DC voltage. 2. Turn the EUT on and couple its output to a spectrum analyzer. 3. Turn the EUT off and set the chamber to the highest temperature specified. d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. 4. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature. 5. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
Limit:	The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 45 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.
Test Mode:	Transmitting mode with modulation
Test Results:	Refer to Appendix 5G WIFI

7.8 Radiated Emission

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.407 (b)				
Test Method:	ANSI C63.10 2013				
Test Site:	Measurement Distance: 3m (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	100 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Peak		1MHz	10kHz	Average	
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
<p>*(1) 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.</p> <p>(2) 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.</p> <p>(3) 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.</p> <p>(4) For transmitters operating in the 5.725-5.85 GHz band:</p> <p>(i) 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.</p> <p>Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing</p>					

an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

Note:

(j) $EIRP = ((E*d)^2) / 30$

where:

- E is the field strength in V/m;
 - d is the measurement distance in meters;
 - EIRP is the equivalent isotropically radiated power in watts.
- (ii) Working in dB units, the above equation is equivalent to:
- $$EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$$

(iii) Or, if d is 3 meters:

$$EIRP[dBm] = E[dB\mu V/m] - 95.2$$

Test Setup:

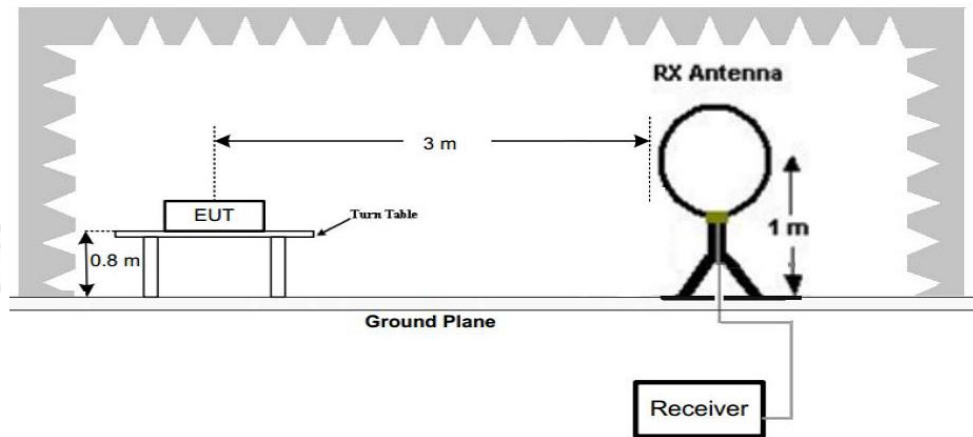


Figure 1. Below 30MHz

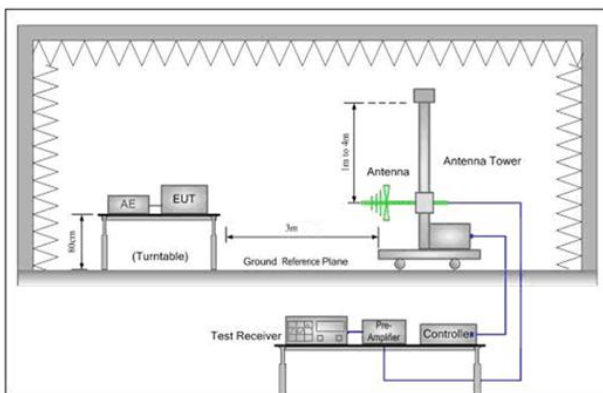


Figure 2. 30MHz to 1GHz

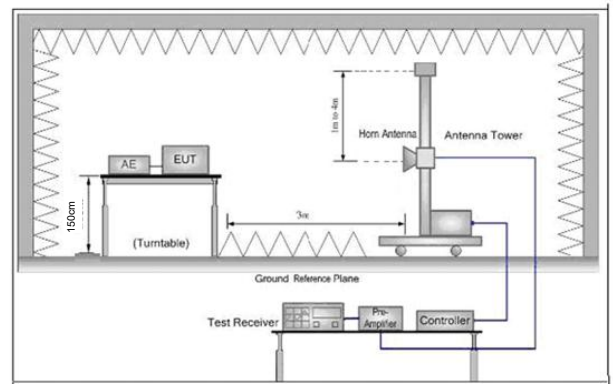


Figure 3. Above 1 GHz

Test Procedure:

- a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

Note: For the radiated emission test above 1GHz:

	<p>Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.</p> <ol style="list-style-type: none"> 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. Test the EUT in the lowest channel, the middle channel and the highest channel h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete.
Test Mode:	Transmitting mode with modulation
Test Results:	Pass

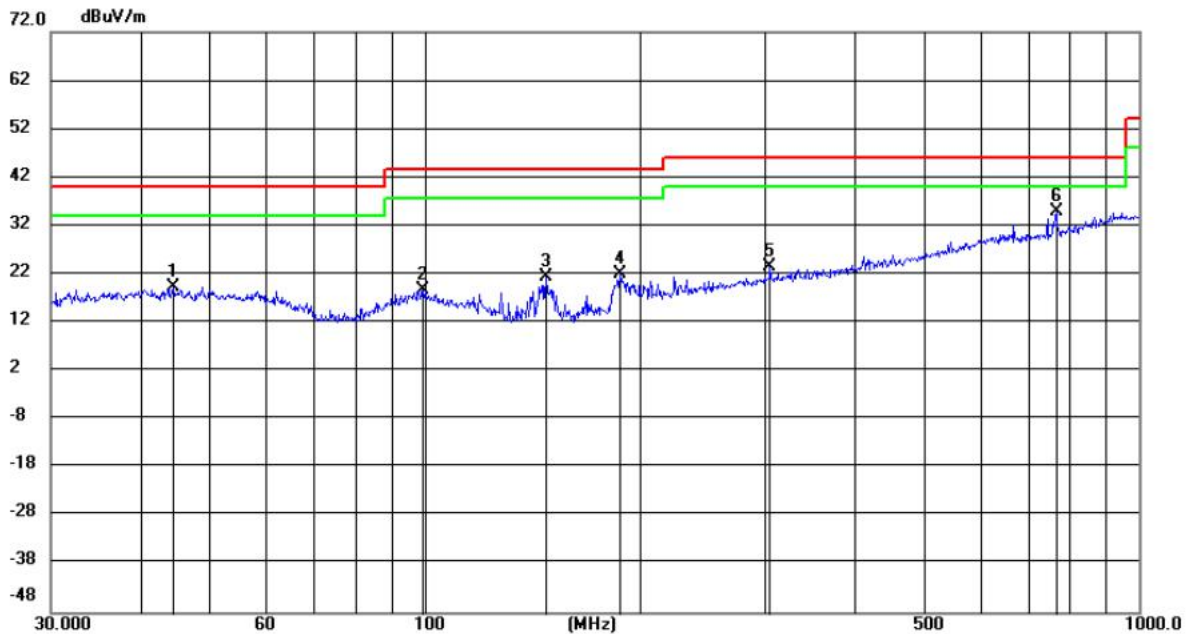
Radiated Spurious Emissions test Data: Radiated Emission below 1GHz

Remark: During the test, the Radiates Emission from 30MHz to 1GHz was performed in all modes, only the worst case lowest channel of 6Mbps for 802.11 a was recorded in the report.

Antenna schemes 1:

Horizontal:

Test Graph

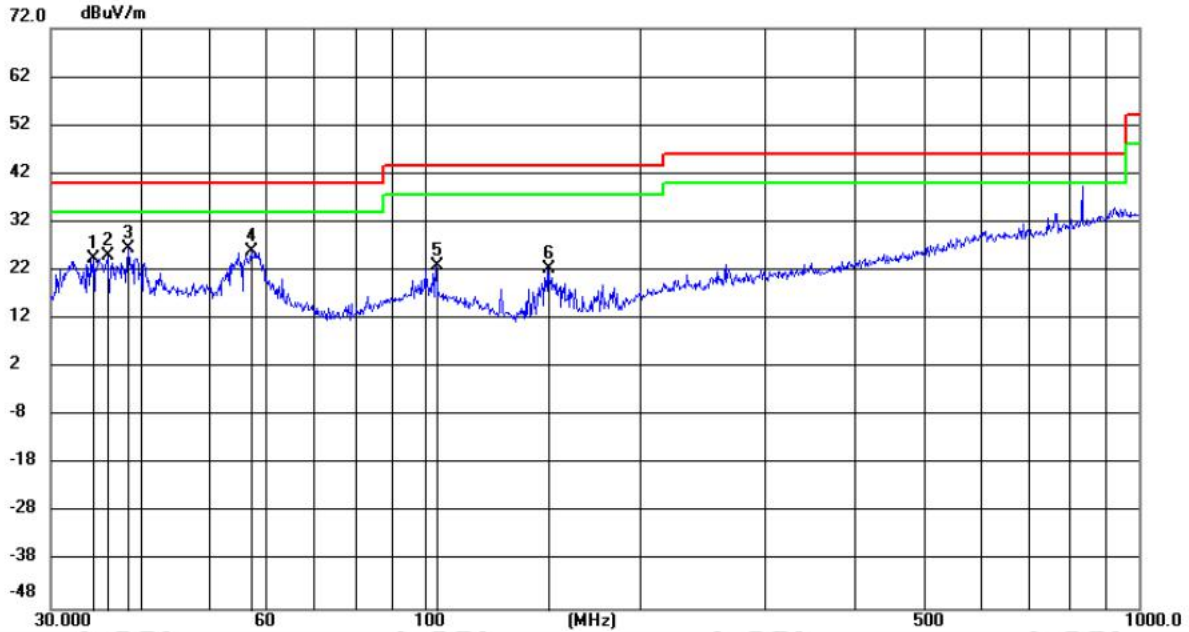


No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Antenna Height cm	Table Degree degree	Comment
1	44.5868	5.03	14.41	19.44	40.00	-20.56	QP 200	169	
2	99.5281	4.73	13.99	18.72	43.50	-24.78	QP 100	267	
3	147.9214	11.67	9.88	21.55	43.50	-21.95	QP 200	356	
4	187.7529	10.32	11.64	21.96	43.50	-21.54	QP 100	20	
5	304.6099	6.21	17.35	23.56	46.00	-22.44	QP 200	356	
6 *	766.0571	9.23	25.83	35.06	46.00	-10.94	QP 200	356	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Measurement = Reading Level + Correct Factor .
3. Margin = Measurement - Limit .
4. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low , , so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

Vertical:
Test Graph



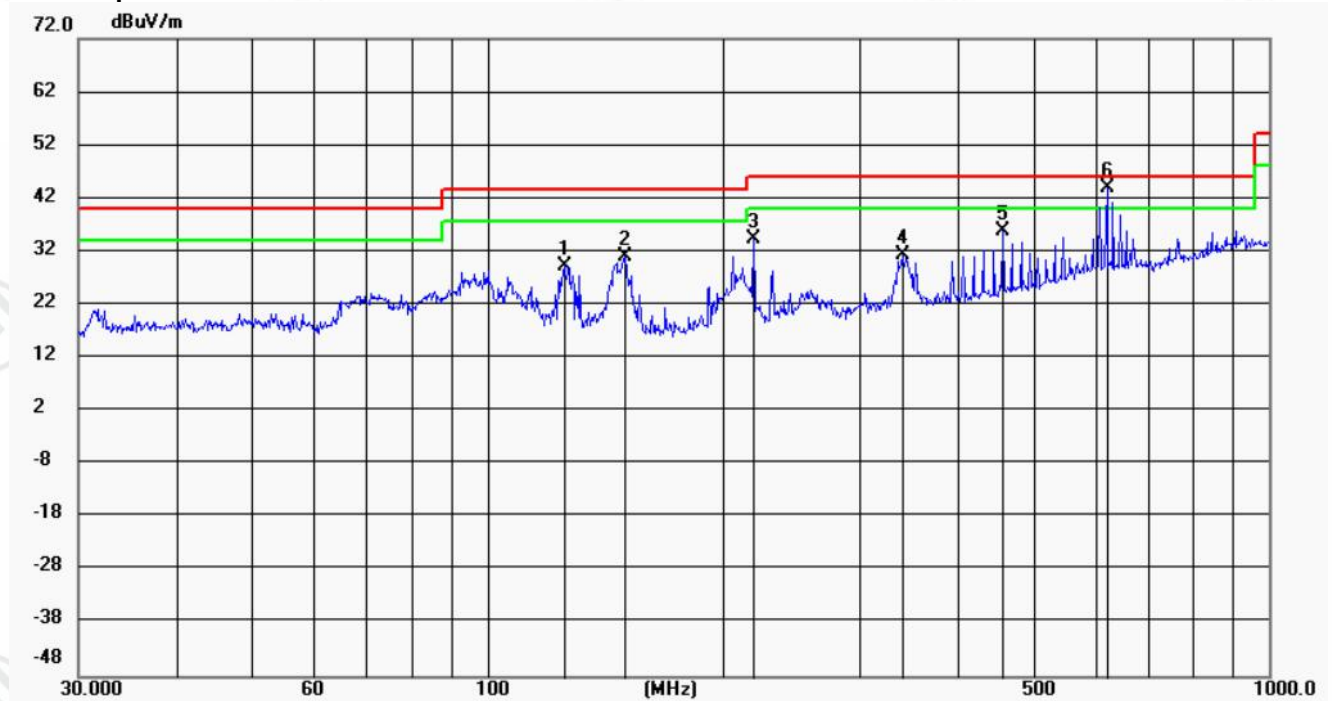
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	
1		34.3964	10.78	13.53	24.31	40.00	-15.69	QP	100	7
2		36.0007	11.10	13.82	24.92	40.00	-15.08	QP	100	356
3	*	38.4809	12.24	14.26	26.50	40.00	-13.50	QP	100	64
4		57.1914	12.27	13.76	26.03	40.00	-13.97	QP	100	356
5		103.8055	9.53	13.50	23.03	43.50	-20.47	QP	100	356
6		148.9625	12.42	9.98	22.40	43.50	-21.10	QP	100	280

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Measurement = Reading Level + Correct Factor .
3. Margin = Measurement - Limit .
4. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low, , so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

Antenna schemes 2:

Horizontal:
Test Graph

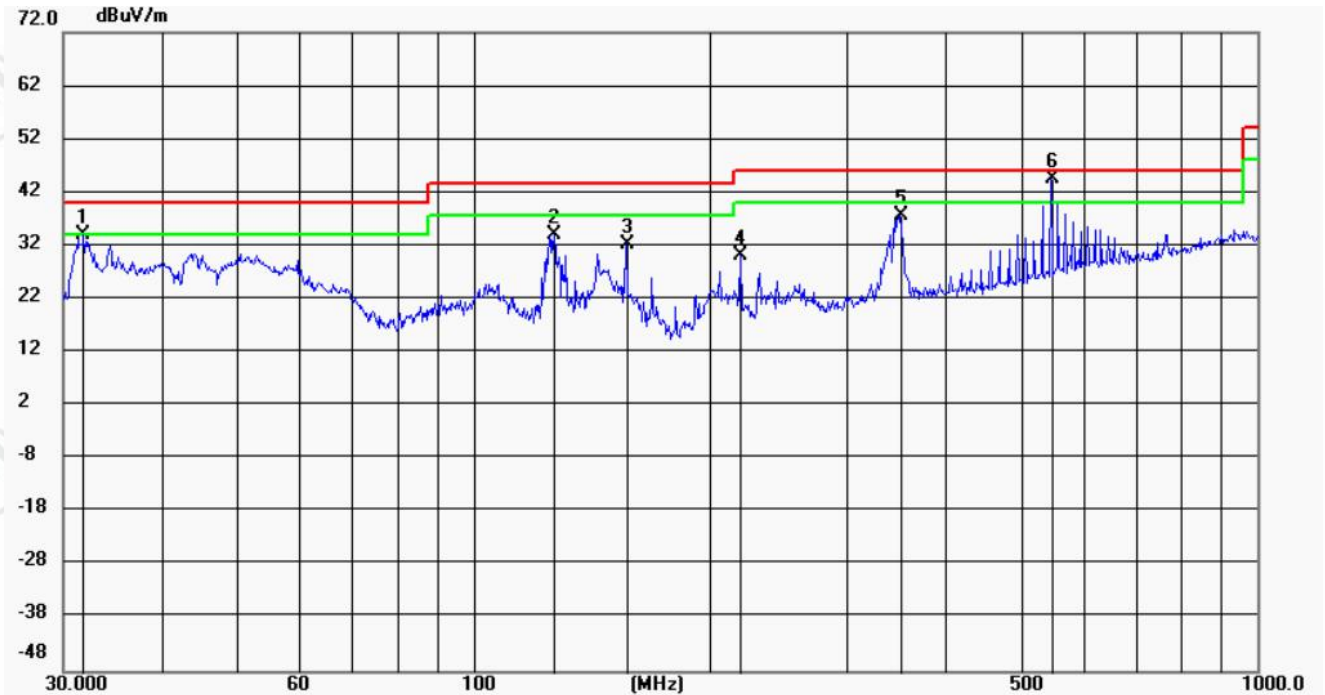


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		125.4457	19.05	10.35	29.40	43.50	-14.10	peak	200	88
2		150.0108	21.05	10.08	31.13	43.50	-12.37	peak	200	131
3		219.0753	19.94	14.44	34.38	46.00	-11.62	peak	200	141
4		339.5887	13.38	18.09	31.47	46.00	-14.53	peak	200	356
5		457.5073	15.32	20.63	35.95	46.00	-10.05	peak	200	99
6	*	620.7096	19.77	24.18	43.95	46.00	-2.05	peak	100	143

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Measurement = Reading Level + Correct Factor .
3. Margin = Measurement - Limit .
4. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low, , so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

Vertical:
Test Graph



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		31.8427	20.87	13.08	33.95	40.00	-6.05	peak	100	205
2		126.7723	23.79	10.14	33.93	43.50	-9.57	peak	100	41
3		156.4578	22.24	9.91	32.15	43.50	-11.35	peak	100	20
4		219.0753	15.64	14.44	30.08	46.00	-15.92	peak	100	124
5		350.4768	19.33	18.33	37.66	46.00	-8.34	peak	200	229
6	*	545.1826	21.77	22.67	44.44	46.00	-1.56	peak	100	103

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Measurement = Reading Level + Correct Factor .
3. Margin = Measurement - Limit .
4. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low, , so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

Transmitter Emission above 1GHz

Remark: During the test, the Radiates Emission above 1GHz was performed in all modes, only the worst case ant1 and ant2 transmit simultaneously was recorded in the report.

Antenna schemes 1:

MIMO

Mode:			802.11 n(HT20) Transmitting			Channel:		5180MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1346.5347	1.29	39.79	41.08	68.20	27.12	PASS	Horizontal	PK
2	2157.8658	4.40	38.08	42.48	68.20	25.72	PASS	Horizontal	PK
3	3950.495	9.17	36.22	45.39	68.20	22.81	PASS	Horizontal	PK
4	7468.9234	-11.34	54.40	43.06	68.20	25.14	PASS	Horizontal	PK
5	10410.1955	-6.30	52.12	45.82	68.20	22.38	PASS	Horizontal	PK
6	16512.9756	0.53	51.49	52.02	68.20	16.18	PASS	Horizontal	PK
7	1572.6073	2.21	38.41	40.62	68.20	27.58	PASS	Vertical	PK
8	2430.143	4.61	38.98	43.59	68.20	24.61	PASS	Vertical	PK
9	4221.6722	10.30	35.17	45.47	68.20	22.73	PASS	Vertical	PK
10	6906.5453	-11.97	56.03	44.06	68.20	24.14	PASS	Vertical	PK
11	10269.3135	-6.49	52.87	46.38	68.20	21.82	PASS	Vertical	PK
12	16609.5805	1.38	51.09	52.47	68.20	15.73	PASS	Vertical	PK

Mode:			802.11 n(HT20) Transmitting			Channel:		5200MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1392.1892	1.42	39.23	40.65	68.20	27.55	PASS	Horizontal	PK
2	2568.7569	5.15	38.34	43.49	68.20	24.71	PASS	Horizontal	PK
3	4436.7437	11.29	35.29	46.58	68.20	21.62	PASS	Horizontal	PK
4	7374.6187	-11.42	54.08	42.66	68.20	25.54	PASS	Horizontal	PK
5	11939.772	-5.20	52.37	47.17	68.20	21.03	PASS	Horizontal	PK
6	17330.6665	3.58	50.32	53.90	68.20	14.30	PASS	Horizontal	PK
7	1462.5963	1.53	39.45	40.98	68.20	27.22	PASS	Vertical	PK
8	2535.2035	5.17	38.90	44.07	68.20	24.13	PASS	Vertical	PK
9	4057.7558	9.53	35.99	45.52	68.20	22.68	PASS	Vertical	PK
10	7418.8959	-11.45	54.05	42.60	68.20	25.60	PASS	Vertical	PK
11	11151.9826	-6.06	51.97	45.91	68.20	22.29	PASS	Vertical	PK
12	16377.2689	0.00	50.68	50.68	68.20	17.52	PASS	Vertical	PK

Mode:			802.11 n(HT20) Transmitting			Channel:		5240MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1279.978	1.08	39.45	40.53	68.20	27.67	PASS	Horizontal	PK
2	2453.2453	4.80	37.83	42.63	68.20	25.57	PASS	Horizontal	PK
3	3950.495	9.17	36.29	45.46	68.20	22.74	PASS	Horizontal	PK
4	7513.2007	-11.19	54.11	42.92	68.20	25.28	PASS	Horizontal	PK
5	12467.6484	-4.19	52.32	48.13	68.20	20.07	PASS	Horizontal	PK
6	17116.7558	1.86	51.43	53.29	68.20	14.91	PASS	Horizontal	PK
7	1448.2948	1.51	39.48	40.99	68.20	27.21	PASS	Vertical	PK
8	2262.3762	4.01	38.80	42.81	68.20	25.39	PASS	Vertical	PK
9	4221.6722	10.30	35.81	46.11	68.20	22.09	PASS	Vertical	PK
10	7554.6027	-10.87	53.06	42.19	68.20	26.01	PASS	Vertical	PK
11	11986.9243	-4.91	52.46	47.55	68.20	20.65	PASS	Vertical	PK
12	17659.008	4.25	49.70	53.95	68.20	14.25	PASS	Vertical	PK

Mode:			802.11 n(HT40) Transmitting			Channel:		5190MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1830.033	3.64	38.73	42.37	68.20	25.83	PASS	Horizontal	PK
2	2702.4202	5.55	38.26	43.81	68.20	24.39	PASS	Horizontal	PK
3	3998.3498	9.43	35.76	45.19	68.20	23.01	PASS	Horizontal	PK
4	7616.1308	-10.64	53.97	43.33	68.20	24.87	PASS	Horizontal	PK
5	11968.5234	-5.03	52.75	47.72	68.20	20.48	PASS	Horizontal	PK
6	13885.0943	-1.07	50.97	49.90	68.20	18.30	PASS	Horizontal	PK
7	1581.4081	2.29	38.54	40.83	68.20	27.37	PASS	Vertical	PK
8	2301.4301	4.05	39.15	43.20	68.20	25.00	PASS	Vertical	PK
9	3949.3949	9.17	35.63	44.80	68.20	23.40	PASS	Vertical	PK
10	6919.771	-11.92	57.74	45.82	68.20	22.38	PASS	Vertical	PK
11	9745.4623	-7.39	53.01	45.62	68.20	22.58	PASS	Vertical	PK
12	13674.0587	-1.72	50.60	48.88	68.20	19.32	PASS	Vertical	PK

Mode:			802.11 n(HT40) Transmitting			Channel:		5230MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1557.7558	2.08	39.33	41.41	68.20	26.79	PASS	Horizontal	PK
2	2936.7437	6.39	38.25	44.64	68.20	23.56	PASS	Horizontal	PK
3	3914.7415	8.98	35.92	44.90	68.20	23.30	PASS	Horizontal	PK
4	9016.3258	-8.44	52.84	44.40	68.20	23.80	PASS	Horizontal	PK
5	12444.6472	-4.12	52.95	48.83	68.20	19.37	PASS	Horizontal	PK
6	14429.0715	0.22	49.50	49.72	68.20	18.48	PASS	Horizontal	PK
7	1427.9428	1.48	39.46	40.94	68.20	27.26	PASS	Vertical	PK
8	2446.0946	4.74	38.43	43.17	68.20	25.03	PASS	Vertical	PK
9	3805.2805	8.56	35.72	44.28	68.20	23.92	PASS	Vertical	PK
10	6973.2487	-11.75	54.41	42.66	68.20	25.54	PASS	Vertical	PK
11	11957.0229	-5.09	53.02	47.93	68.20	20.27	PASS	Vertical	PK
12	16450.8725	0.08	52.49	52.57	68.20	15.63	PASS	Vertical	PK

Mode:			802.11 ac(VHT80) Transmitting			Channel:		5210MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1314.6315	1.19	39.79	40.98	68.20	27.22	PASS	Horizontal	PK
2	2176.5677	4.20	38.72	42.92	68.20	25.28	PASS	Horizontal	PK
3	3893.8394	8.88	36.25	45.13	68.20	23.07	PASS	Horizontal	PK
4	7591.9796	-10.59	53.25	42.66	68.20	25.54	PASS	Horizontal	PK
5	10740.262	-6.17	52.22	46.05	68.20	22.15	PASS	Horizontal	PK
6	15958.0729	-0.08	50.90	50.82	68.20	17.38	PASS	Horizontal	PK
7	1698.0198	3.01	39.54	42.55	68.20	25.65	PASS	Vertical	PK
8	2583.6084	5.14	38.14	43.28	68.20	24.92	PASS	Vertical	PK
9	3311.3311	7.41	37.59	45.00	68.20	23.20	PASS	Vertical	PK
10	6996.2498	-11.68	54.54	42.86	68.20	25.34	PASS	Vertical	PK
11	11788.5394	-6.15	53.66	47.51	68.20	20.69	PASS	Vertical	PK
12	14980.524	-0.95	50.80	49.85	68.20	18.35	PASS	Vertical	PK

Mode:			802.11 n(HT20) Transmitting			Channel:		5745MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1649.615	3.14	38.63	41.77	68.20	26.43	PASS	Horizontal	PK
2	2590.209	5.67	38.12	43.79	68.20	24.41	PASS	Horizontal	PK
3	3801.4301	9.37	36.53	45.90	68.20	22.30	PASS	Horizontal	PK
4	8479.6653	-10.61	52.65	42.04	68.20	26.16	PASS	Horizontal	PK
5	12404.4936	-4.02	51.09	47.07	68.20	21.13	PASS	Horizontal	PK
6	15954.397	-0.06	51.41	51.35	68.20	16.85	PASS	Horizontal	PK
7	1634.2134	3.01	38.87	41.88	68.20	26.32	PASS	Vertical	PK
8	3051.7052	7.40	38.17	45.57	68.20	22.63	PASS	Vertical	PK
9	3856.9857	9.56	39.64	49.20	68.20	19.00	PASS	Vertical	PK
10	8432.1288	-10.64	53.44	42.80	68.20	25.40	PASS	Vertical	PK
11	12499.5666	-4.27	53.19	48.92	68.20	19.28	PASS	Vertical	PK
12	16514.8677	0.54	51.09	51.63	68.20	16.57	PASS	Vertical	PK

Mode:			802.11 n(HT20) Transmitting			Channel:		5825MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1666.6667	3.29	38.86	42.15	68.20	26.05	PASS	Horizontal	PK
2	2737.6238	6.25	39.05	45.30	68.20	22.90	PASS	Horizontal	PK
3	3963.6964	10.13	36.69	46.82	68.20	21.38	PASS	Horizontal	PK
4	8797.0865	-9.12	51.62	42.50	68.20	25.70	PASS	Horizontal	PK
5	12363.8576	-4.56	52.29	47.73	68.20	20.47	PASS	Horizontal	PK
6	16521.7681	0.61	52.03	52.64	68.20	15.56	PASS	Horizontal	PK
7	1432.3432	1.85	39.36	41.21	68.20	26.99	PASS	Vertical	PK
8	2039.0539	5.29	38.19	43.48	68.20	24.72	PASS	Vertical	PK
9	3883.3883	9.65	39.25	48.90	68.20	19.30	PASS	Vertical	PK
10	7426.1951	-11.43	53.92	42.49	68.20	25.71	PASS	Vertical	PK
11	11443.7963	-6.04	52.76	46.72	68.20	21.48	PASS	Vertical	PK
12	15968.9646	-0.12	51.92	51.80	68.20	16.40	PASS	Vertical	PK

Mode:			802.11 n(HT40) Transmitting			Channel:		5755MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dB μ V]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Result	Polarity	Remark
1	1508.2508	1.98	39.11	41.09	68.20	27.11	PASS	Horizontal	PK
2	2184.2684	4.57	39.38	43.95	68.20	24.25	PASS	Horizontal	PK
3	3287.6788	8.26	38.27	46.53	68.20	21.67	PASS	Horizontal	PK
4	9770.8181	-7.29	52.33	45.04	68.20	23.16	PASS	Horizontal	PK
5	13753.1502	-2.11	50.34	48.23	68.20	19.97	PASS	Horizontal	PK
6	17730.1153	4.64	49.87	54.51	68.20	13.69	PASS	Horizontal	PK
7	1729.3729	3.63	39.06	42.69	68.20	25.51	PASS	Vertical	PK
8	2936.7437	7.07	37.50	44.57	68.20	23.63	PASS	Vertical	PK
9	3836.6337	9.49	38.78	48.27	68.20	19.93	PASS	Vertical	PK
10	7456.8638	-11.37	54.57	43.20	68.20	25.00	PASS	Vertical	PK
11	11209.9473	-5.80	51.92	46.12	68.20	22.08	PASS	Vertical	PK
12	15945.1963	-0.03	51.17	51.14	68.20	17.06	PASS	Vertical	PK

Mode:			802.11 n(HT40) Transmitting			Channel:		5795MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dB μ V]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Result	Polarity	Remark
1	1691.9692	3.52	38.16	41.68	68.20	26.52	PASS	Horizontal	PK
2	2679.868	6.04	38.10	44.14	68.20	24.06	PASS	Horizontal	PK
3	4323.4323	11.90	34.22	46.12	68.20	22.08	PASS	Horizontal	PK
4	7412.3942	-11.47	54.03	42.56	68.20	25.64	PASS	Horizontal	PK
5	11910.7274	-5.37	52.71	47.34	68.20	20.86	PASS	Horizontal	PK
6	16603.8069	1.36	51.14	52.50	68.20	15.70	PASS	Horizontal	PK
7	1688.6689	3.49	38.28	41.77	68.20	26.43	PASS	Vertical	PK
8	2723.8724	6.21	38.06	44.27	68.20	23.93	PASS	Vertical	PK
9	3863.5864	9.58	39.40	48.98	68.20	19.22	PASS	Vertical	PK
10	7505.167	-11.24	54.34	43.10	68.20	25.10	PASS	Vertical	PK
11	10269.1846	-6.49	53.28	46.79	68.20	21.41	PASS	Vertical	PK
12	14456.2304	-0.18	50.04	49.86	68.20	18.34	PASS	Vertical	PK

Mode:			802.11 ac(VHT80) Transmitting			Channel:		5775MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1711.7712	3.61	38.27	41.88	68.20	26.32	PASS	Horizontal	PK
2	2734.8735	6.25	38.70	44.95	68.20	23.25	PASS	Horizontal	PK
3	4375.6876	12.20	34.94	47.14	68.20	21.06	PASS	Horizontal	PK
4	9267.8512	-7.62	51.72	44.10	68.20	24.10	PASS	Horizontal	PK
5	13885.7924	-1.06	49.56	48.50	68.20	19.70	PASS	Horizontal	PK
6	17010.9341	2.86	50.57	53.43	68.20	14.77	PASS	Horizontal	PK
7	1771.1771	3.70	38.95	42.65	68.20	25.55	PASS	Vertical	PK
8	3027.5028	7.27	38.53	45.80	68.20	22.40	PASS	Vertical	PK
9	3849.835	9.53	39.12	48.65	68.20	19.55	PASS	Vertical	PK
10	9152.8435	-8.16	52.30	44.14	68.20	24.06	PASS	Vertical	PK
11	11953.6636	-5.12	53.29	48.17	68.20	20.03	PASS	Vertical	PK
12	17086.0724	1.75	51.93	53.68	68.20	14.52	PASS	Vertical	PK

2.4G WiFi+5G WiFi:

Mode:			/			Channel:		/	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1295.6296	1.05	39.60	40.65	74.00	33.35	PASS	Horizontal	PK
2	1756.8757	3.14	38.98	42.12	74.00	31.88	PASS	Horizontal	PK
3	3850.0567	-19.17	61.04	41.87	74.00	32.13	PASS	Horizontal	PK
4	5748.1832	-13.75	59.45	45.70	74.00	28.30	PASS	Horizontal	PK
5	11471.5648	-6.20	52.68	46.48	74.00	27.52	PASS	Horizontal	PK
6	17284.9523	3.85	50.05	53.90	74.00	20.10	PASS	Horizontal	PK
7	1328.4328	1.16	39.02	40.18	74.00	33.82	PASS	Vertical	PK
8	1871.8872	3.81	38.62	42.43	74.00	31.57	PASS	Vertical	PK
9	3850.0567	-19.17	63.18	44.01	74.00	29.99	PASS	Vertical	PK
10	5751.1834	-13.74	58.42	44.68	74.00	29.32	PASS	Vertical	PK
11	11491.5661	-6.22	53.25	47.03	74.00	26.97	PASS	Vertical	PK
12	17235.9491	3.20	47.32	50.52	74.00	23.48	PASS	Vertical	PK

Note:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor

Antenna schemes 2:

MIMO:

Mode:			802.11 n(HT20) Transmitting			Channel:		5180MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dB μ V]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Result	Polarity	Remark
1	1426.2926	1.48	40.90	42.38	68.20	25.82	PASS	Horizontal	PK
2	2545.1045	5.16	38.05	43.21	68.20	24.99	PASS	Horizontal	PK
3	3808.5809	8.58	35.77	44.35	68.20	23.85	PASS	Horizontal	PK
4	7540.227	-10.98	53.78	42.80	68.20	25.40	PASS	Horizontal	PK
5	11947.8224	-5.15	53.11	47.96	68.20	20.24	PASS	Horizontal	PK
6	15918.3959	0.07	50.78	50.85	68.20	17.35	PASS	Horizontal	PK
7	1434.5435	1.48	39.52	41.00	68.20	27.20	PASS	Vertical	PK
8	2427.9428	4.60	38.35	42.95	68.20	25.25	PASS	Vertical	PK
9	3802.5303	8.56	36.66	45.22	68.20	22.98	PASS	Vertical	PK
10	6906.5453	-11.97	55.77	43.80	68.20	24.40	PASS	Vertical	PK
11	10787.4144	-6.18	51.91	45.73	68.20	22.47	PASS	Vertical	PK
12	14331.8916	-0.10	50.15	50.05	68.20	18.15	PASS	Vertical	PK

Mode:			802.11 n(HT20) Transmitting			Channel:		5200MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dB μ V]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Result	Polarity	Remark
1	1570.407	2.19	38.43	40.62	68.20	27.58	PASS	Horizontal	PK
2	2436.7437	4.67	38.68	43.35	68.20	24.85	PASS	Horizontal	PK
3	3806.9307	8.58	36.86	45.44	68.20	22.76	PASS	Horizontal	PK
4	7538.5019	-11.00	53.41	42.41	68.20	25.79	PASS	Horizontal	PK
5	11237.6619	-6.04	52.96	46.92	68.20	21.28	PASS	Horizontal	PK
6	15909.1955	0.10	50.33	50.43	68.20	17.77	PASS	Horizontal	PK
7	1606.1606	2.48	38.93	41.41	68.20	26.79	PASS	Vertical	PK
8	2731.5732	5.65	38.74	44.39	68.20	23.81	PASS	Vertical	PK
9	3806.9307	8.58	36.81	45.39	68.20	22.81	PASS	Vertical	PK
10	8211.2856	-10.89	53.54	42.65	68.20	25.55	PASS	Vertical	PK
11	12495.8248	-4.26	52.38	48.12	68.20	20.08	PASS	Vertical	PK
12	15962.6731	-0.09	51.49	51.40	68.20	16.80	PASS	Vertical	PK

Mode:			802.11 n(HT20) Transmitting			Channel:		5240MHz		
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark	
1	1623.7624	2.59	38.37	40.96	68.20	27.24	PASS	Horizontal	PK	
2	2174.9175	4.21	38.34	42.55	68.20	25.65	PASS	Horizontal	PK	
3	3872.3872	8.81	35.65	44.46	68.20	23.74	PASS	Horizontal	PK	
4	7580.479	-10.67	53.25	42.58	68.20	25.62	PASS	Horizontal	PK	
5	10300.365	-6.25	53.21	46.96	68.20	21.24	PASS	Horizontal	PK	
6	15503.8002	0.47	49.38	49.85	68.20	18.35	PASS	Horizontal	PK	
7	1624.8625	2.59	38.79	41.38	68.20	26.82	PASS	Vertical	PK	
8	2470.297	4.94	38.17	43.11	68.20	25.09	PASS	Vertical	PK	
9	3959.846	9.23	36.20	45.43	68.20	22.77	PASS	Vertical	PK	
10	7319.416	-11.25	53.99	42.74	68.20	25.46	PASS	Vertical	PK	
11	11893.7697	-5.48	52.99	47.51	68.20	20.69	PASS	Vertical	PK	
12	14425.0463	0.28	49.70	49.98	68.20	18.22	PASS	Vertical	PK	

Mode:			802.11 n(HT40) Transmitting			Channel:		5190MHz		
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark	
1	1513.7514	1.70	39.76	41.46	68.20	26.74	PASS	Horizontal	PK	
2	2743.6744	5.69	38.29	43.98	68.20	24.22	PASS	Horizontal	PK	
3	4511.0011	11.46	35.99	47.45	68.20	20.75	PASS	Horizontal	PK	
4	8500.525	-10.59	53.15	42.56	68.20	25.64	PASS	Horizontal	PK	
5	13866.6933	-1.36	49.71	48.35	68.20	19.85	PASS	Horizontal	PK	
6	17046.0273	2.34	50.92	53.26	68.20	14.94	PASS	Horizontal	PK	
7	1441.1441	1.50	39.48	40.98	68.20	27.22	PASS	Vertical	PK	
8	2671.6172	5.43	38.58	44.01	68.20	24.19	PASS	Vertical	PK	
9	3956.5457	9.21	35.98	45.19	68.20	23.01	PASS	Vertical	PK	
10	6919.771	-11.92	57.68	45.76	68.20	22.44	PASS	Vertical	PK	
11	10394.6697	-6.27	52.24	45.97	68.20	22.23	PASS	Vertical	PK	
12	15542.3271	0.44	49.96	50.40	68.20	17.80	PASS	Vertical	PK	

Mode:			802.11 n(HT40) Transmitting			Channel:		5230MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dB μ V]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Result	Polarity	Remark
1	1635.3135	2.65	38.53	41.18	68.20	27.02	PASS	Horizontal	PK
2	2688.1188	5.50	38.40	43.90	68.20	24.30	PASS	Horizontal	PK
3	3837.7338	8.68	35.92	44.60	68.20	23.60	PASS	Horizontal	PK
4	7439.597	-11.41	54.07	42.66	68.20	25.54	PASS	Horizontal	PK
5	11813.2657	-6.10	53.46	47.36	68.20	20.84	PASS	Horizontal	PK
6	17098.9299	1.56	51.56	53.12	68.20	15.08	PASS	Horizontal	PK
7	1661.7162	2.80	38.73	41.53	68.20	26.67	PASS	Vertical	PK
8	2706.8207	5.57	38.30	43.87	68.20	24.33	PASS	Vertical	PK
9	4410.341	11.24	35.29	46.53	68.20	21.67	PASS	Vertical	PK
10	9008.2754	-8.42	52.38	43.96	68.20	24.24	PASS	Vertical	PK
11	11901.8201	-5.43	53.63	48.20	68.20	20.00	PASS	Vertical	PK
12	14991.4496	-0.95	50.54	49.59	68.20	18.61	PASS	Vertical	PK

Mode:			802.11 n(HT20) Transmitting			Channel:		5745MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dB μ V]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Result	Polarity	Remark
1	1322.3322	1.68	39.97	41.65	68.20	26.55	PASS	Horizontal	PK
2	2146.3146	5.04	39.21	44.25	68.20	23.95	PASS	Horizontal	PK
3	4348.1848	12.04	34.40	46.44	68.20	21.76	PASS	Horizontal	PK
4	8620.7414	-10.42	52.65	42.23	68.20	25.97	PASS	Horizontal	PK
5	12445.8964	-4.13	52.30	48.17	68.20	20.03	PASS	Horizontal	PK
6	16966.4644	2.89	50.40	53.29	68.20	14.91	PASS	Horizontal	PK
7	1337.7338	1.71	40.16	41.87	68.20	26.33	PASS	Vertical	PK
8	2108.3608	5.52	38.76	44.28	68.20	23.92	PASS	Vertical	PK
9	3830.033	9.47	37.77	47.24	68.20	20.96	PASS	Vertical	PK
10	8337.8225	-10.88	53.42	42.54	68.20	25.66	PASS	Vertical	PK
11	11904.5936	-5.42	52.85	47.43	68.20	20.77	PASS	Vertical	PK
12	15899.1933	0.12	51.50	51.62	68.20	16.58	PASS	Vertical	PK

Mode:			802.11 n(HT20) Transmitting			Channel:		5825MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1424.6425	1.84	38.84	40.68	68.20	27.52	PASS	Horizontal	PK
2	2716.1716	6.18	38.83	45.01	68.20	23.19	PASS	Horizontal	PK
3	3863.0363	9.58	36.90	46.48	68.20	21.72	PASS	Horizontal	PK
4	8467.3978	-10.61	53.35	42.74	68.20	25.46	PASS	Horizontal	PK
5	12001.9668	-4.85	51.67	46.82	68.20	21.38	PASS	Horizontal	PK
6	16283.3189	0.91	50.16	51.07	68.20	17.13	PASS	Horizontal	PK
7	1537.4037	2.21	40.49	42.70	68.20	25.50	PASS	Vertical	PK
8	2736.5237	6.25	37.92	44.17	68.20	24.03	PASS	Vertical	PK
9	3883.3883	9.65	38.20	47.85	68.20	20.35	PASS	Vertical	PK
10	8465.0977	-10.61	53.61	43.00	68.20	25.20	PASS	Vertical	PK
11	11962.0975	-5.06	53.09	48.03	68.20	20.17	PASS	Vertical	PK
12	17629.6753	3.77	49.44	53.21	68.20	14.99	PASS	Vertical	PK

Mode:			802.11 n(HT40) Transmitting			Channel:		5755MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1570.9571	2.48	39.44	41.92	68.20	26.28	PASS	Horizontal	PK
2	2689.2189	6.07	38.35	44.42	68.20	23.78	PASS	Horizontal	PK
3	4146.3146	10.66	35.27	45.93	68.20	22.27	PASS	Horizontal	PK
4	9795.353	-7.19	52.37	45.18	68.20	23.02	PASS	Horizontal	PK
5	13819.8547	-2.11	50.30	48.19	68.20	20.01	PASS	Horizontal	PK
6	16609.1739	1.38	50.22	51.60	68.20	16.60	PASS	Horizontal	PK
7	1545.6546	2.27	39.40	41.67	68.20	26.53	PASS	Vertical	PK
8	2401.5402	4.87	38.49	43.36	68.20	24.84	PASS	Vertical	PK
9	3836.6337	9.49	38.26	47.75	68.20	20.45	PASS	Vertical	PK
10	7542.7362	-10.96	54.24	43.28	68.20	24.92	PASS	Vertical	PK
11	11131.7421	-6.20	52.97	46.77	68.20	21.43	PASS	Vertical	PK
12	15495.8997	0.42	49.56	49.98	68.20	18.22	PASS	Vertical	PK

Mode:			802.11 n(HT40) Transmitting			Channel:		5795MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1433.9934	1.85	39.88	41.73	68.20	26.47	PASS	Horizontal	PK
2	2129.813	5.25	38.38	43.63	68.20	24.57	PASS	Horizontal	PK
3	4467.5468	12.23	35.36	47.59	68.20	20.61	PASS	Horizontal	PK
4	8876.0584	-9.23	52.89	43.66	68.20	24.54	PASS	Horizontal	PK
5	11952.8969	-5.12	52.78	47.66	68.20	20.54	PASS	Horizontal	PK
6	16275.6517	0.92	50.01	50.93	68.20	17.27	PASS	Horizontal	PK
7	1579.758	2.55	38.73	41.28	68.20	26.92	PASS	Vertical	PK
8	2569.857	5.62	38.47	44.09	68.20	24.11	PASS	Vertical	PK
9	3863.5864	9.58	38.29	47.87	68.20	20.33	PASS	Vertical	PK
10	7568.8046	-10.77	53.71	42.94	68.20	25.26	PASS	Vertical	PK
11	11954.4303	-5.11	52.82	47.71	68.20	20.49	PASS	Vertical	PK
12	15718.2479	0.47	49.86	50.33	68.20	17.87	PASS	Vertical	PK

2.4G WiFi+5G WiFi:

Mode:						Channel:			
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1401.0401	1.39	39.15	40.54	74.00	33.46	PASS	Horizontal	PK
2	2001.9002	4.55	38.27	42.82	74.00	31.18	PASS	Horizontal	PK
3	3474.0316	-20.07	54.71	34.64	74.00	39.36	PASS	Horizontal	PK
4	4669.1113	-16.62	52.91	36.29	74.00	37.71	PASS	Horizontal	PK
5	7909.3273	-10.98	51.23	40.25	74.00	33.75	PASS	Horizontal	PK
6	12047.6032	-5.54	51.15	45.61	74.00	28.39	PASS	Horizontal	PK
7	1309.631	1.09	39.68	40.77	74.00	33.23	PASS	Vertical	PK
8	2042.1042	4.69	39.09	43.78	74.00	30.22	PASS	Vertical	PK
9	3850.0567	-19.17	59.68	40.51	74.00	33.49	PASS	Vertical	PK
10	5751.1834	-13.74	58.42	44.68	74.00	29.32	PASS	Vertical	PK
11	9301.4201	-7.95	50.69	42.74	74.00	31.26	PASS	Vertical	PK
12	14409.7607	1.08	47.02	48.10	74.00	25.90	PASS	Vertical	PK

Note:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Pre-amplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading - Correct Factor

Correct Factor = Pre-amplifier Factor - Antenna Factor - Cable Factor

Transmitter Emission above 18GHz

Remark: During the test, the Radiates Emission above 18GHz was performed in all modes, only the worst case MIMO of 802.11 n(HT20) Transmitting mode was recorded in the report.

Antenna schemes 1:

Mode:			802.11 n(HT20) Transmitting			Channel:		5180MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	19823.4329	-23.55	67.86	44.31	74.00	29.69	PASS	Horizontal	PK
2	21066.9227	-24.73	66.50	41.77	74.00	32.23	PASS	Horizontal	PK
3	25405.4962	-19.32	63.25	43.93	74.00	30.07	PASS	Horizontal	PK
4	29518.7808	-19.58	65.34	45.76	74.00	28.24	PASS	Horizontal	PK
5	33913.6765	-16.10	60.71	44.61	74.00	29.39	PASS	Horizontal	PK
6	38488.9796	-12.17	57.29	45.12	74.00	28.88	PASS	Horizontal	PK
7	19631.5853	-23.89	66.19	42.30	74.00	31.70	PASS	Vertical	PK
8	22513.7005	-24.37	65.73	41.36	74.00	32.64	PASS	Vertical	PK
9	25299.012	-19.08	63.23	44.15	74.00	29.85	PASS	Vertical	PK
10	27917.1167	-20.36	64.87	44.51	74.00	29.49	PASS	Vertical	PK
11	32833.8734	-16.40	61.91	45.51	74.00	28.49	PASS	Vertical	PK
12	36470.1788	-14.69	59.40	44.71	74.00	29.29	PASS	Vertical	PK

Antenna schemes 2:

Mode:			802.11 n(HT20) Transmitting			Channel:		5180MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	19426.5371	-23.94	65.98	42.04	74.00	31.96	PASS	Horizontal	PK
2	21203.3281	-24.63	65.41	40.78	74.00	33.22	PASS	Horizontal	PK
3	24369.6948	-19.98	63.80	43.82	74.00	30.18	PASS	Horizontal	PK
4	29135.0854	-20.24	64.90	44.66	74.00	29.34	PASS	Horizontal	PK
5	31915.9966	-17.54	60.94	43.40	74.00	30.60	PASS	Horizontal	PK
6	35054.2022	-15.24	58.92	43.68	74.00	30.32	PASS	Horizontal	PK
7	19813.7526	-23.58	65.19	41.61	74.00	32.39	PASS	Vertical	PK
8	22347.3739	-24.50	64.74	40.24	74.00	33.76	PASS	Vertical	PK
9	25971.3589	-19.07	63.31	44.24	74.00	29.76	PASS	Vertical	PK
10	30645.2258	-18.58	63.03	44.45	74.00	29.55	PASS	Vertical	PK
11	33814.2326	-16.00	60.59	44.59	74.00	29.41	PASS	Vertical	PK
12	36007.2803	-15.28	57.59	42.31	74.00	31.69	PASS	Vertical	PK

Note:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor

7.9 Radiated Emission which fall in the restricted bands

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.407 (b)				
Test Method:	ANSI C63.10 2013				
Test Site:	Measurement Distance: 3m (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	100 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Peak		1MHz	10kHz	Average	
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
<p>*(1) 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.</p> <p>(2) 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.</p> <p>(3) 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.</p> <p>(4) For transmitters operating in the 5.725-5.85 GHz band:</p> <p>(i) 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.</p> <p>Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated</p>					

emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

Note:

(j) $EIRP = ((E \cdot d)^2) / 30$
 where:

- E is the field strength in V/m;
- d is the measurement distance in meters;
- EIRP is the equivalent isotropically radiated power in watts.

(ii) Working in dB units, the above equation is equivalent to:
 $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$

(iii) Or, if d is 3 meters:
 $EIRP[dBm] = E[dB\mu V/m] - 95.2$

Test Setup:

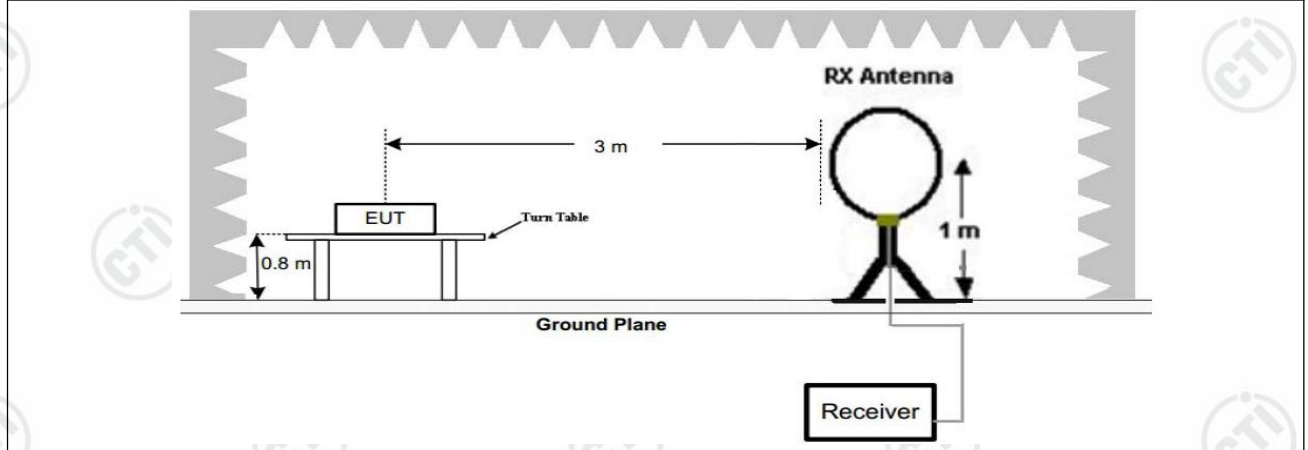


Figure 1. Below 30MHz

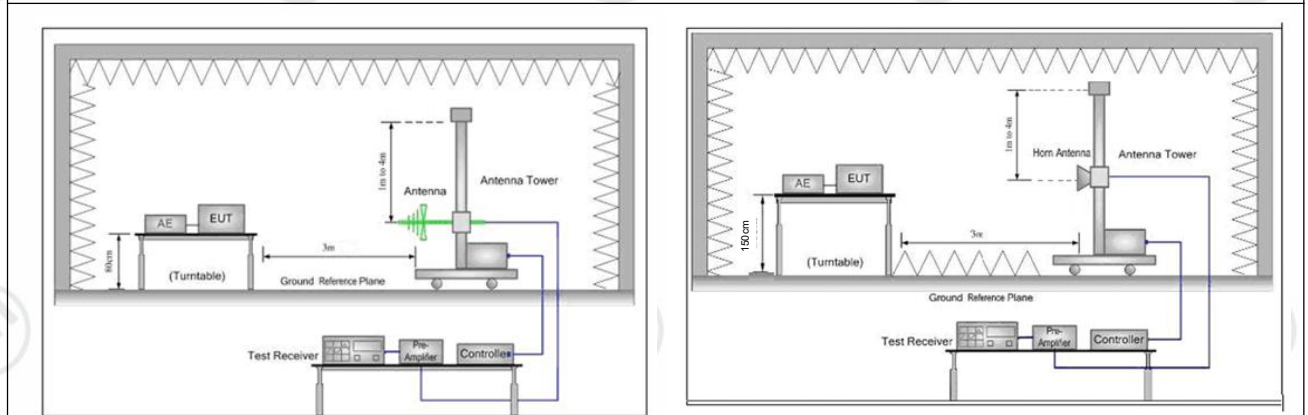


Figure 2. 30MHz to 1GHz

Figure 3. Above 1 GHz

Test Procedure:

j. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

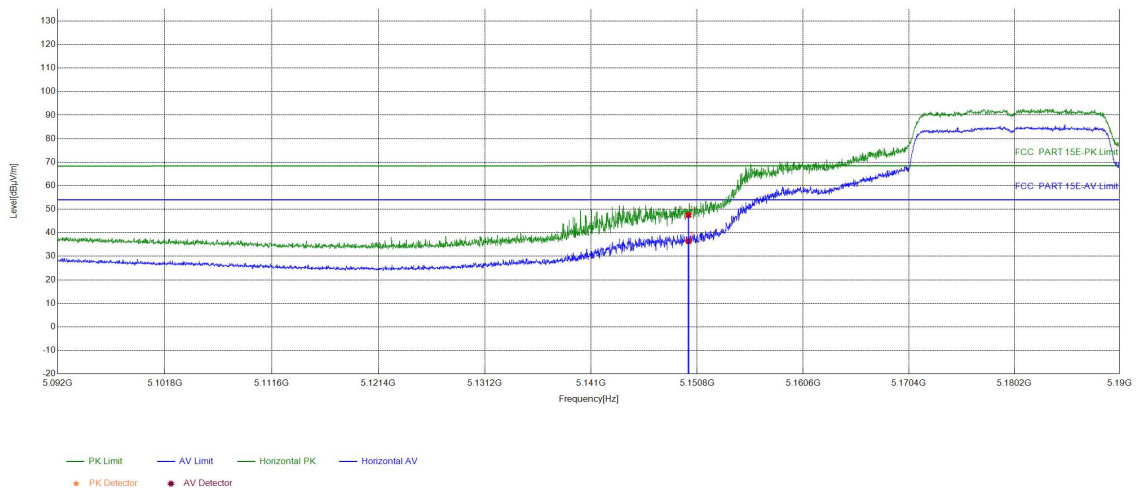
	<p>Note: For the radiated emission test above 1GHz: Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.</p> <ul style="list-style-type: none"> k. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. l. 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. m. 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. n. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. o. 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. p. Test the EUT in the lowest channel, the Highest channel q. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. r. Repeat above procedures until all frequencies measured was complete.
<p>Test Mode:</p>	<p>All modes were tested, only the worst case ant1 and ant2 transmit simultaneously was recorded in the report.</p>
<p>Test Results:</p>	<p>Pass</p>

Antenna schemes 1:

Test Data:

Test_Mode	802.11 n(HT20) Transmitting	Test_Frequency	5180MHz
Remark			

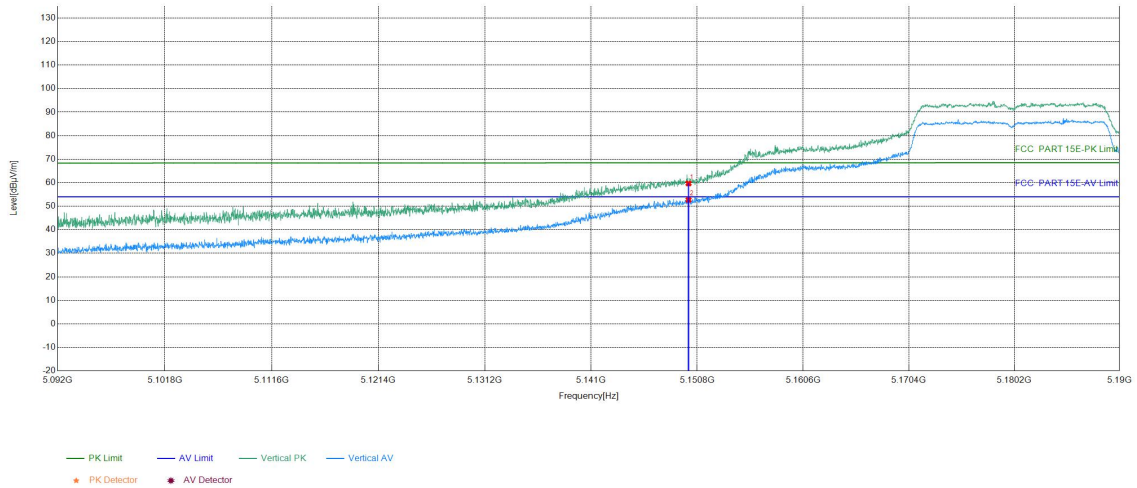
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	5150	-15.08	62.57	47.49	68.44	20.95	PASS	Horizontal	PK
2	5150	-15.08	51.48	36.40	54.00	17.60	PASS	Horizontal	AV

Test_Mode	802.11 n(HT20) Transmitting	Test_Frequency	5180MHz
Remark			

Test Graph

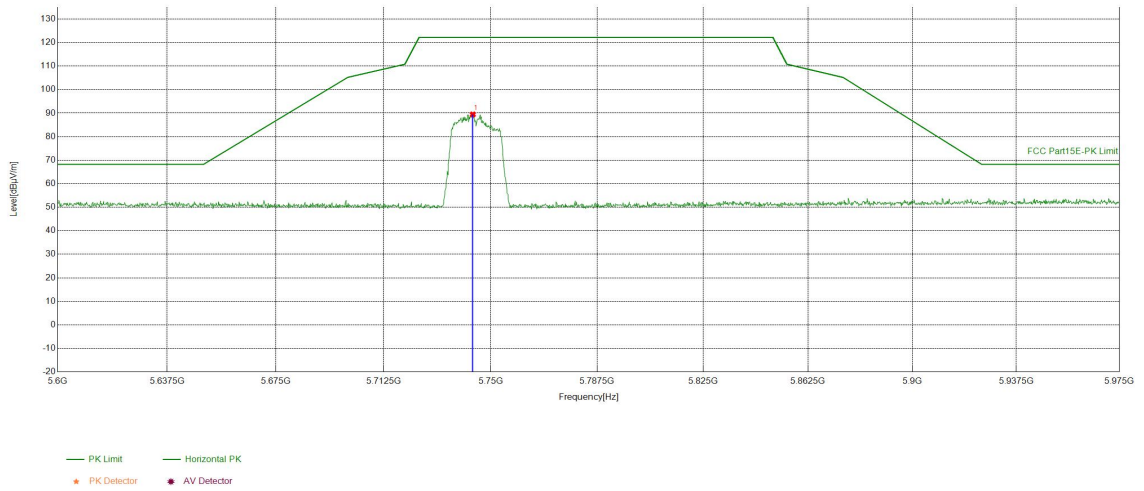


Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	5150	-15.08	74.75	59.67	68.44	8.77	PASS	Vertical	PK
2	5150	-15.08	67.76	52.68	54.00	1.32	PASS	Vertical	AV

Test_Mode	802.11 n(HT20) Transmitting	Test_Frequency	5745MHz
Remark			

Test Graph

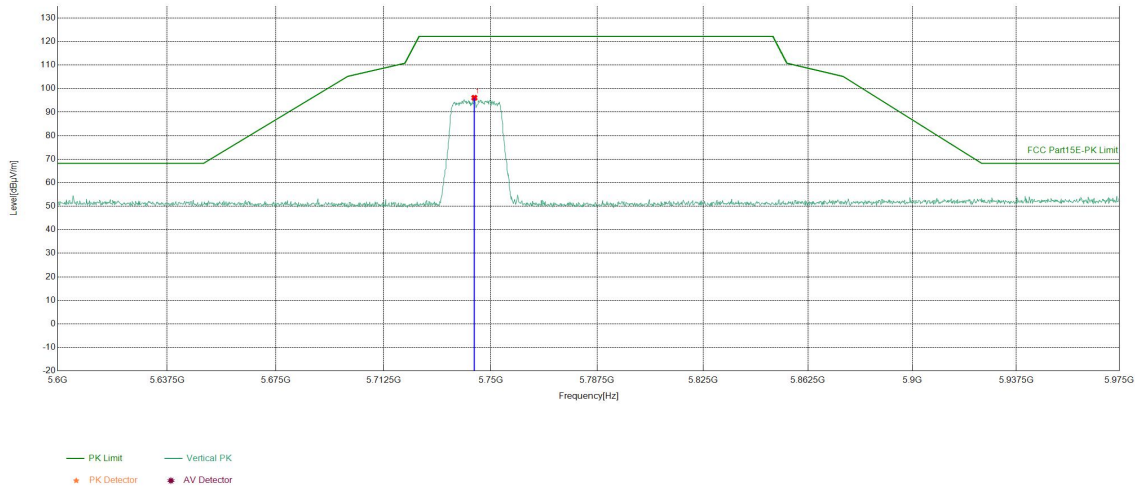


Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	5743.6968	13.84	75.60	89.44	122.20	32.76	PASS	Horizontal	PK

Test_Mode	802.11 n(HT20) Transmitting	Test_Frequency	5745MHz
Remark			

Test Graph

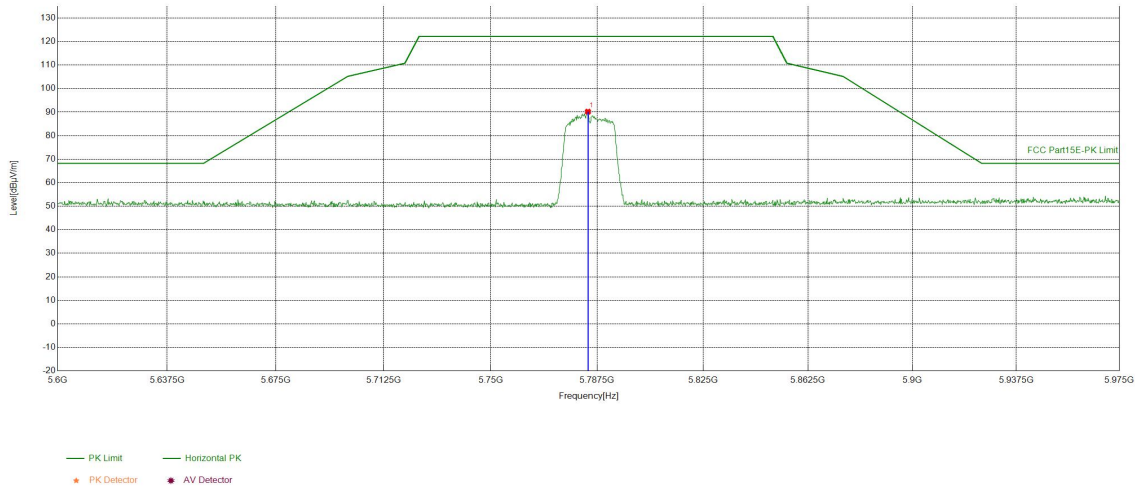


Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	5744.2596	13.84	82.25	96.09	122.20	26.11	PASS	Vertical	PK

Test_Mode	802.11 n(HT20) Transmitting	Test_Frequency	5785MHz
Remark			

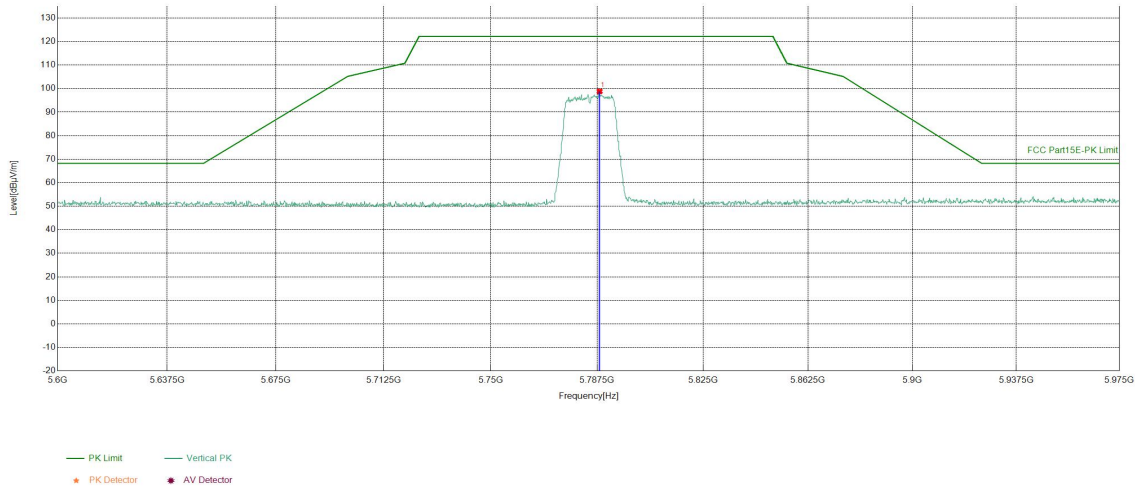
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	5784.2171	13.91	76.29	90.20	122.20	32.00	PASS	Horizontal	PK

Test_Mode	802.11 n(HT20) Transmitting	Test_Frequency	5785MHz
Remark			

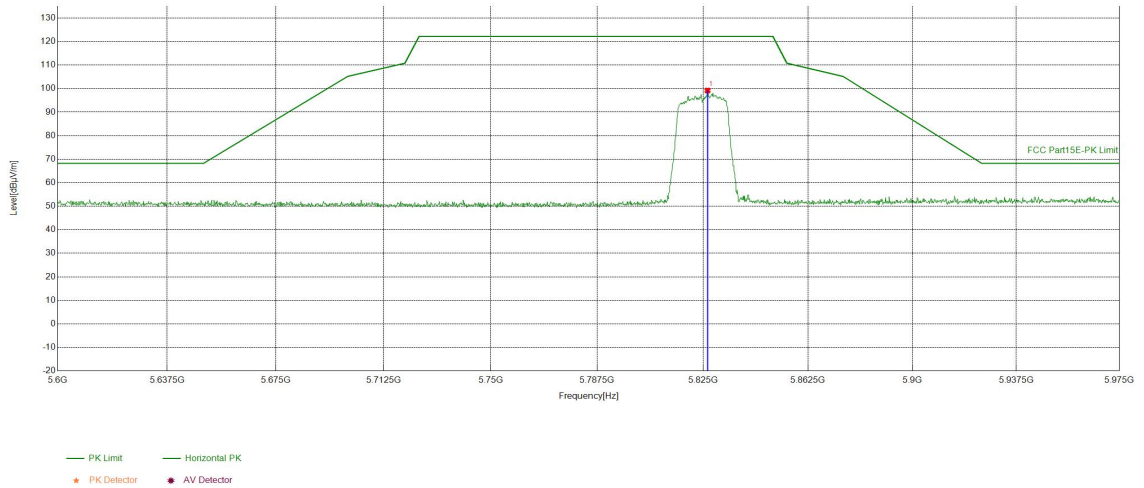
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	5788.3442	13.92	84.90	98.82	122.20	23.38	PASS	Vertical	PK

Test_Mode	802.11 n(HT20) Transmitting	Test_Frequency	5825MHz
Remark			

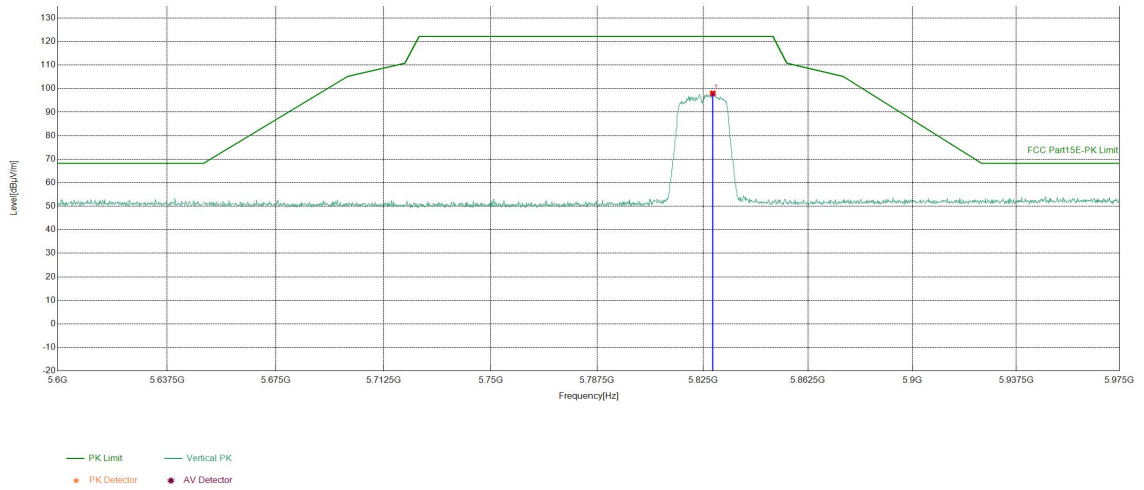
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	5826.6133	14.04	85.14	99.18	122.20	23.02	PASS	Horizontal	PK

Test_Mode	802.11 n(HT20) Transmitting	Test_Frequency	5825MHz
Remark			

Test Graph

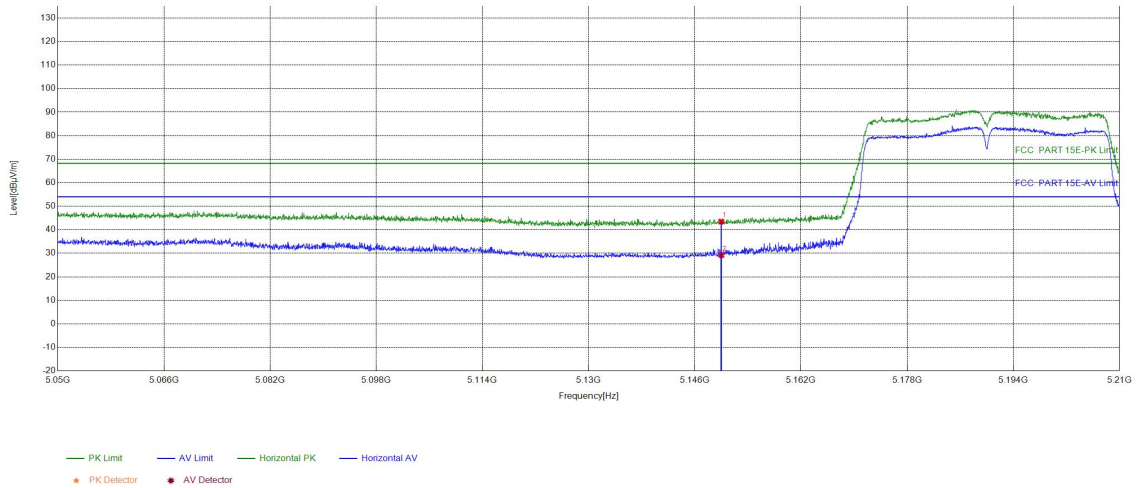


Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	5828.4892	14.05	83.90	97.95	122.20	24.25	PASS	Vertical	PK

Test_Mode	802.11 n(HT40) Transmitting	Test_Frequency	5190MHz
Remark			

Test Graph

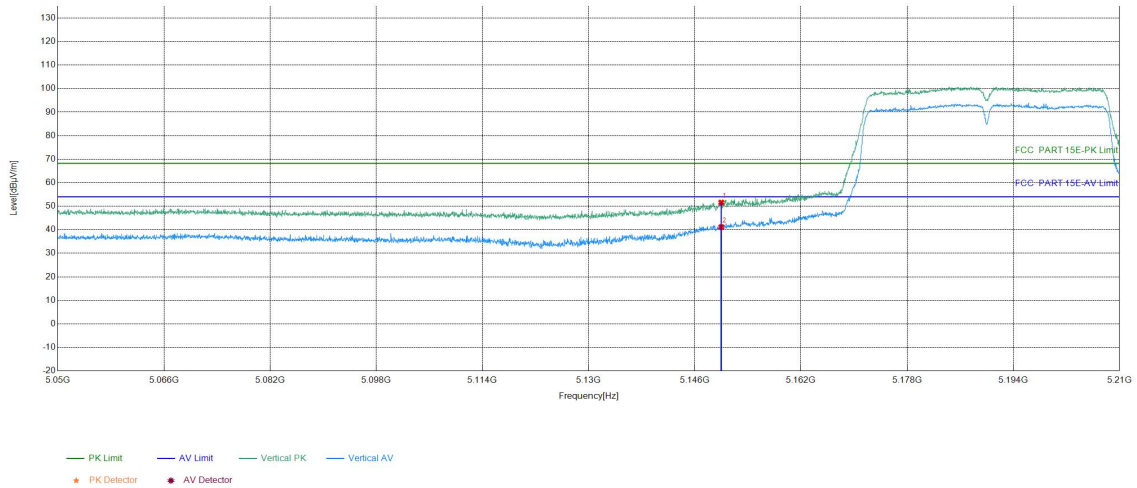


Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	5150	12.35	31.16	43.51	68.20	24.69	PASS	Horizontal	PK
2	5150	12.35	16.80	29.15	54.00	24.85	PASS	Horizontal	AV

Test_Mode	802.11 n(HT40) Transmitting	Test_Frequency	5190MHz
Remark			

Test Graph

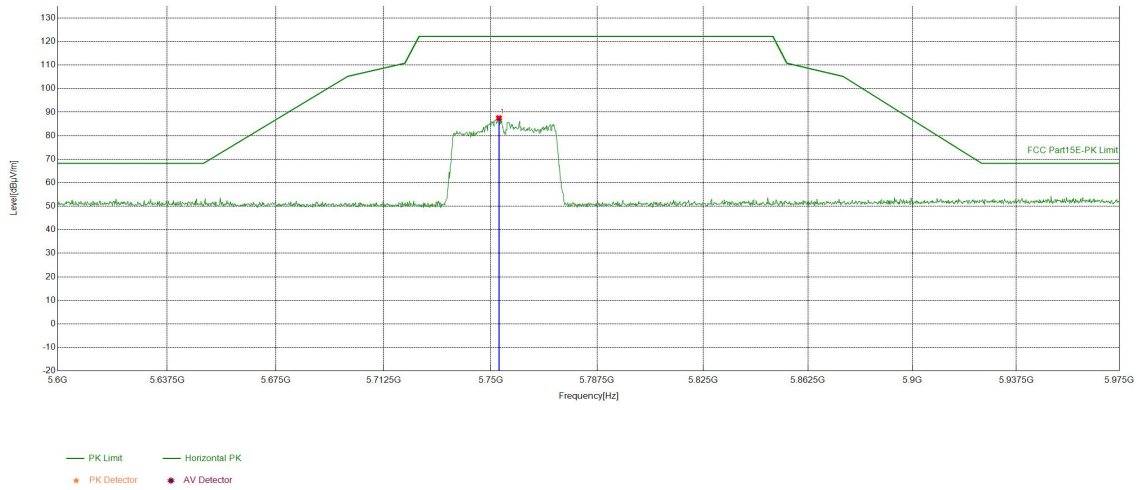


Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	5150	12.35	39.23	51.58	68.20	16.62	PASS	Vertical	PK
2	5150	12.35	28.81	41.16	54.00	12.84	PASS	Vertical	AV

Test_Mode	802.11 n(HT40) Transmitting	Test_Frequency	5755MHz
Remark			

Test Graph

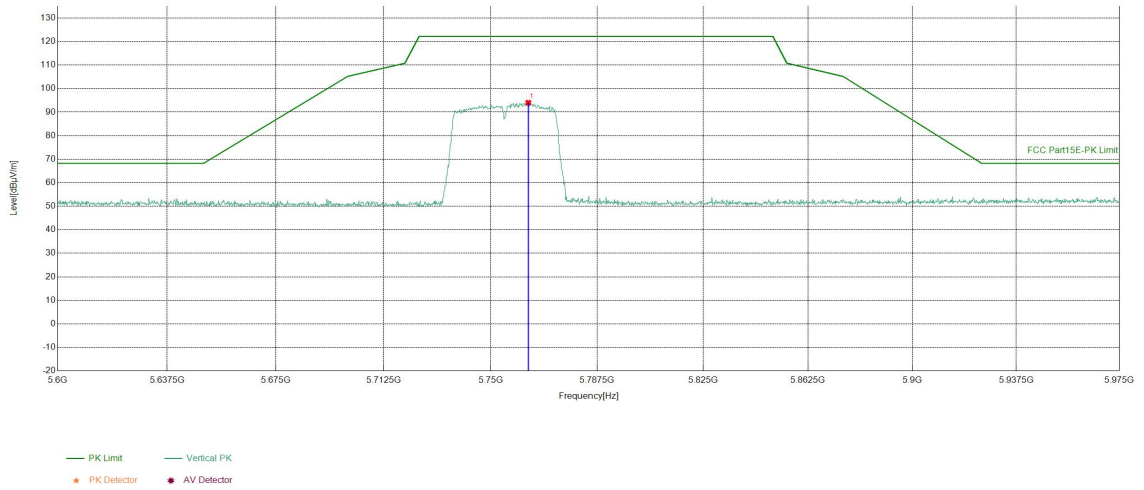


Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	5752.8889	13.86	73.61	87.47	122.20	34.73	PASS	Horizontal	PK

Test_Mode	802.11 n(HT40) Transmitting	Test_Frequency	5755MHz
Remark			

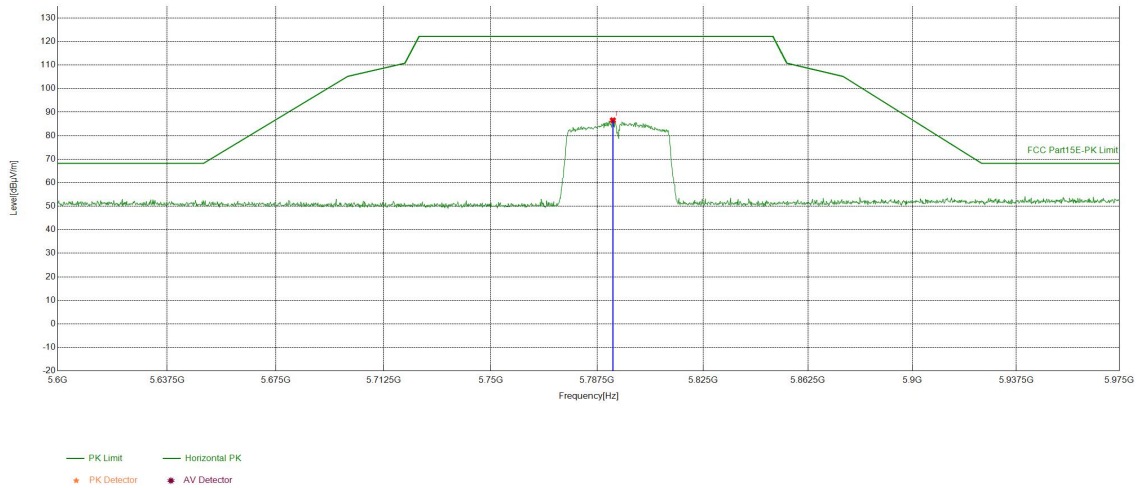
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	5763.2066	13.88	80.11	93.99	122.20	28.21	PASS	Vertical	PK

Test_Mode	802.11 n(HT40) Transmitting	Test_Frequency	5795MHz
Remark			

Test Graph

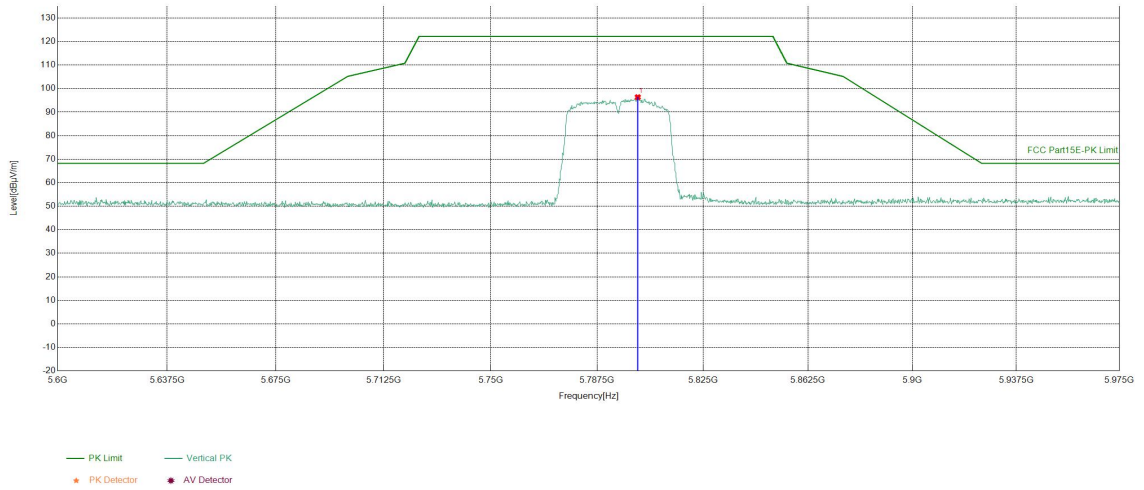


Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	5793.034	13.93	72.61	86.54	122.20	35.66	PASS	Horizontal	PK

Test_Mode	802.11 n(HT40) Transmitting	Test_Frequency	5795MHz
Remark			

Test Graph



Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	5801.8509	13.94	82.41	96.35	122.20	25.85	PASS	Vertical	PK