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# TEST REPORT

## FCC PART 15.407

Report Reference No. ....: CTL1705267011-WF-02

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Product Name.....: VoIP Wireless Router

Model/Type reference .....: FWR9202

List Model(s).....: FWR9201, FWR9200

Trade Mark.....: Flyingvoice

FCC ID.....: 2AL9D-FWR9202

Applicant's name .....: **Flyingvoice Network Technology Co., Ltd**

Address of applicant .....: Room102, 1F East, Bldg 3#, Minqi Park, Pingshan, Xili, Nanshan District, Shenzhen, China

Test Firm .....: **Shenzhen CTL Testing Technology Co., Ltd.**

Address of Test Firm .....: Floor 1-A, Baisha Technology Park, No.3011, Shaheji Road, Nanshan District, Shenzhen, China 518055

Test specification.....:

Standard.....: **FCC Part 15 Subpart E—Unlicensed National Information Infrastructure Devices**

TRF Originator .....: Shenzhen CTL Testing Technology Co., Ltd.

Master TRF .....: Dated 2011-01

Date of Receipt.....: June 09, 2017

Date of Test Date.....: June 09, 2017–July 10, 2017

Data of Issue.....: July 10, 2017

Result.....: Pass

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# TEST REPORT

<b>Test Report No. :</b>	<b>CTL1705267011-WF-02</b>	July 10, 2017 Date of issue
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Equipment under Test : VoIP Wireless Router

Model /Type : FWR9202, FWR9201, FWR9200

**Applicant** : **Flyingvoice Network Technology Co., Ltd**

Address : Room102, 1F East, Bldg 3#, Minqi Park, Pingshan, Xili,  
Nanshan District, Shenzhen, China

**Manufacturer** : **Flyingvoice Network Technology Co., Ltd**

Address : Room102, 1F East, Bldg 3#, Minqi Park, Pingshan, Xili,  
Nanshan District, Shenzhen, China

<b>Test result</b>	<b>Pass *</b>
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\* In the configuration tested, the EUT complied with the standards specified page 5.

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

**\*\* Modified History \*\***

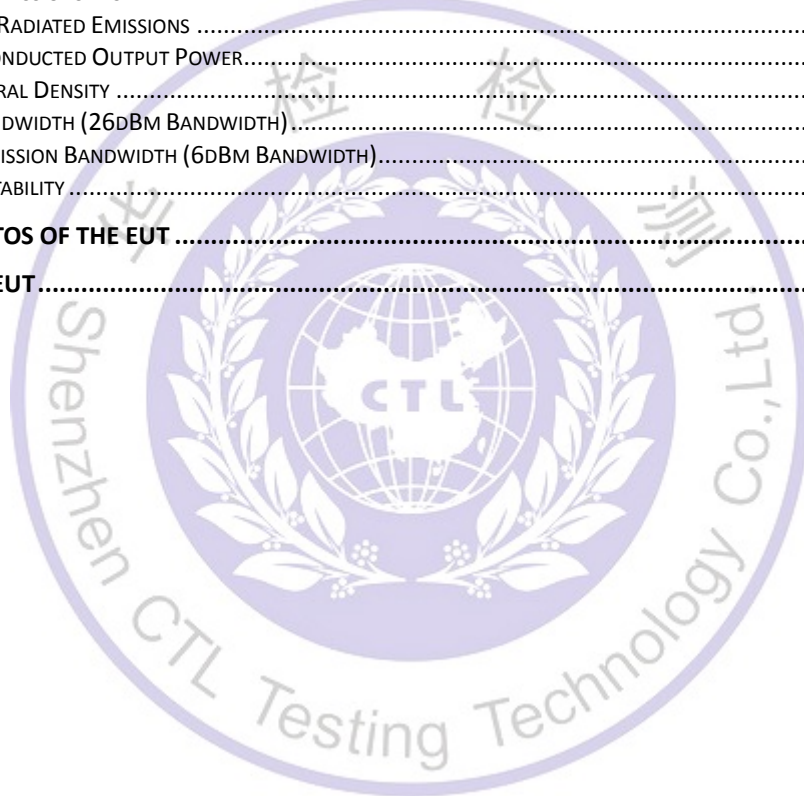
Revisions	Description	Issued Data	Report No.	Remark
Version 1.0	Initial Test Report Release	2017-07-10	CTL1705267011-WF-02	Tracy Qi



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# 1. SUMMARY

## 1.1. TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules Part 15 Subpart E](#)—Unlicensed National Information Infrastructure Devices

[ANSI C63.10:2013](#) : American National Standard for Testing Unlicensed Wireless Devices

[ANSI C63.4: 2014](#): American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz  
Range of 9 kHz to 40GHz

[KDB789033 D02](#): General UNII Test Procedures New Rules v01r02

## 1.2. Test Description

FCC Requirement		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.407(a)	Emission Bandwidth(26dBm Bandwidth)	PASS <sub>Note1</sub>
FCC Part 15.407(e)	Minimum Emission Bandwidth(6dBm Bandwidth)	PASS <sub>Note2</sub>
FCC Part 15.407(a)	Maximum Conducted Output Power	PASS
FCC Part 15.407(a)	Peak Power Spectral Density	PASS
FCC Part 15.407(g)	Frequency Stability	PASS
FCC Part 15.407(b)	Undesirable emission	PASS
FCC Part 15.407(b)/15.205/15.209	Radiated Emissions	PASS
FCC Part 15.407(h)	Dynamic Frequency Selection	N/A
FCC Part 15.203/15.247(b)	Antenna Requirement	PASS

Note 1: Apply to U-NII 1, U-NII 2A, and U-NII 2C band.

Note 2: Apply to U-NII 3 band only.



### 1.3. Test Facility

#### 1.3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.

Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 22/EN 55022 requirements.

#### 1.3.2 Laboratory accreditation

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

##### IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

##### FCC-Registration No.: 970318

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 970318, December 19, 2013.

### 1.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Measurement Uncertainty	Notes
Transmitter power conducted	$\pm 0.57$ dB	(1)
Transmitter power Radiated	$\pm 2.20$ dB	(1)
Conducted spurious emission 9KHz-40 GHz	$\pm 2.20$ dB	(1)
Occupied Bandwidth	$\pm 0.01$ ppm	(1)
Radiated Emission 30~1000MHz	$\pm 4.10$ dB	(1)
Radiated Emission Above 1GHz	$\pm 4.32$ dB	(1)
Conducted Disturbance 0.15~30MHz	$\pm 3.20$ dB	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## 2. GENERAL INFORMATION

### 2.1. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

### 2.2. General Description of EUT

Product Name:	VoIP Wireless Router			
Model:	FWR9202			
Power supply:	AC 120V/60Hz			
Adapter 1 information:	Model: S18B72-120A150-C4 Input: 100-240V~, 50/60Hz, 0.7A Max Output: 12V---1.5A			
Adapter 2 information:	Model: S12B22-120A100-C4 Input: 100-240V~, 50/60Hz, 0.5A Max Output: 12V---1A			
WIFI				
Supported type:	20MHz system	40MHz system	80MHz system	160MHz system
	802.11a 802.11n 802.11ac	802.11n 802.11ac	N/A	N/A
Operation frequency:	5180MHz-5240MHz 5745MHz-5825MHz	5190MHz-5230MHz 5755MHz-5795MHz	N/A	N/A
Modulation:	OFDM	OFDM	N/A	N/A
Channel number:	9	4	N/A	N/A
Channel separation:	20MHz	40MHz	N/A	N/A
Antenna type:	Internal antenna 2T2R			
Antenna gain:	2.0dBi			

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

Directional gain =  $2 + 10 \log 2 = 5.01 \text{ dBi}$

802.11a is SISO mode only

802.11n, 802.11ac is MIMO mode only

## 2.3. Description of Test Modes and Test Frequency

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing.

All test performed at the low, middle and high of operational frequency range of each mode.

Operation Frequency List WIFI on 5G Band:

Operating band	20MHz		40MHz		80MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
U-NII 1 (5150MHz-5250MHz)	36	5180	38	5190	--	--
	40	5200				
	44	5220	46	5230		
	48	5240				
U-NII 3 (5725MHz-5850MHz)	149	5745	151	5755	--	--
	153	5765				
	157	5785	159	5795		
	161	5805				
	165	5825	--	--	--	--

Note:

1. "--"Means no channel(s) available any more.
2. The line display in grey is those Channels/Frequencies select to test is this report for each operation mode.

### Data Rate Used:

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate
Maximum Conducted Output Power Power Spectral Density Emission Bandwidth(26dBm Bandwidth) Minimum Emission Bandwidth(6dBm Bandwidth) Undesirable emission Frequency Stability	11a/OFDM	6 Mbps
	11n(20MHz),11ac(20MHz)/OFDM	7.2 Mbps
	11n(40MHz),11ac(40MHz)/OFDM	15.0Mbps



## 2.4. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	3560.6550.12	2017/05/20	2018/05/19
LISN	R&S	ESH2-Z5	860014/010	2017/05/20	2018/05/19
Power Meter	Agilent	U2531A	TW53323507	2017/05/20	2018/05/19
Power Sensor	Agilent	U2021XA	MY5365004	2017/05/20	2018/05/19
EMI Test Receiver	R&S	ESCI	103710	2017/05/20	2018/05/19
Spectrum Analyzer	Agilent	E4407B	MY41440676	2017/05/20	2018/05/19
Spectrum Analyzer	Agilent	N9020	US46220290	2017/05/20	2018/05/19
Controller	EM Electronics	Controller EM 1000	N/A	2017/05/20	2018/05/19
Active Loop Antenna	Daze	ZN30900A	N/A	2017/05/20	2018/05/19
Bilog Antenna	Sunol Sciences Corp.	JB1	A061713	2017/05/20	2018/05/19
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2017/05/20	2018/05/19
Horn Antenna	SCHWARZBACK	BBHA 9170	BBHA9170184	2017/05/20	2018/05/19
Amplifier	Agilent	8349B	3008A02306	2017/05/20	2018/05/19
Amplifier	Agilent	8447D	2944A10176	2017/05/20	2018/05/19
Temperature/Humidity Meter	Gangxing	CTH-608	02	2017/05/20	2018/05/19
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	N/A	2017/05/20	2018/05/19
High-Pass Filter	K&L	41H10-1375/U12750-O/O	N/A	2017/05/20	2018/05/19
Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	2017/05/20	2018/05/19
Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	2017/05/20	2018/05/19
Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	2017/05/20	2018/05/19
RF Cable	Megalon	RF-A303	N/A	2017/05/20	2018/05/19

The calibration interval was one year

## 2.5. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with Section 15.407 of the FCC Part 15, Subpart E Rules.

## 2.6. Modifications

No modifications were implemented to meet testing criteria.

### 3. TEST CONDITIONS AND RESULTS

#### 3.1. Conducted Emissions Test

##### LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

##### TEST CONFIGURATION



##### TEST PROCEDURE

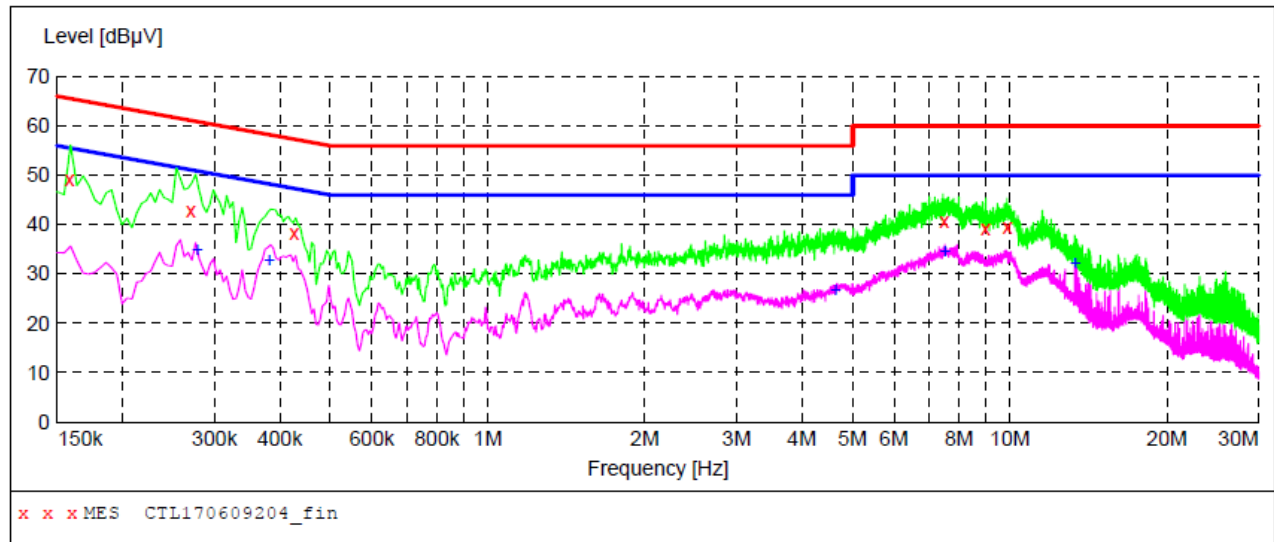
1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
4. The EUT received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

**TEST RESULTS****Adapter 1**

Remark: 802.11a / 802.11n (HT20) / 802.11ac (HT20) / 802.11n (HT40) / 802.11ac (HT40) mode all have been tested, only worse case is reported

**SCAN TABLE: "Voltage (9K-30M)FIN"**

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "CTL170609204\_fin"**

6/9/2017 5:31PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.158000	49.30	10.2	66	16.3	QP	L1	GND
0.270000	42.70	10.2	61	18.4	QP	L1	GND
0.426000	38.20	10.2	57	19.1	QP	L1	GND
7.496000	40.70	10.5	60	19.3	QP	L1	GND
8.978000	39.20	10.6	60	20.8	QP	L1	GND
9.896000	39.50	10.6	60	20.5	QP	L1	GND

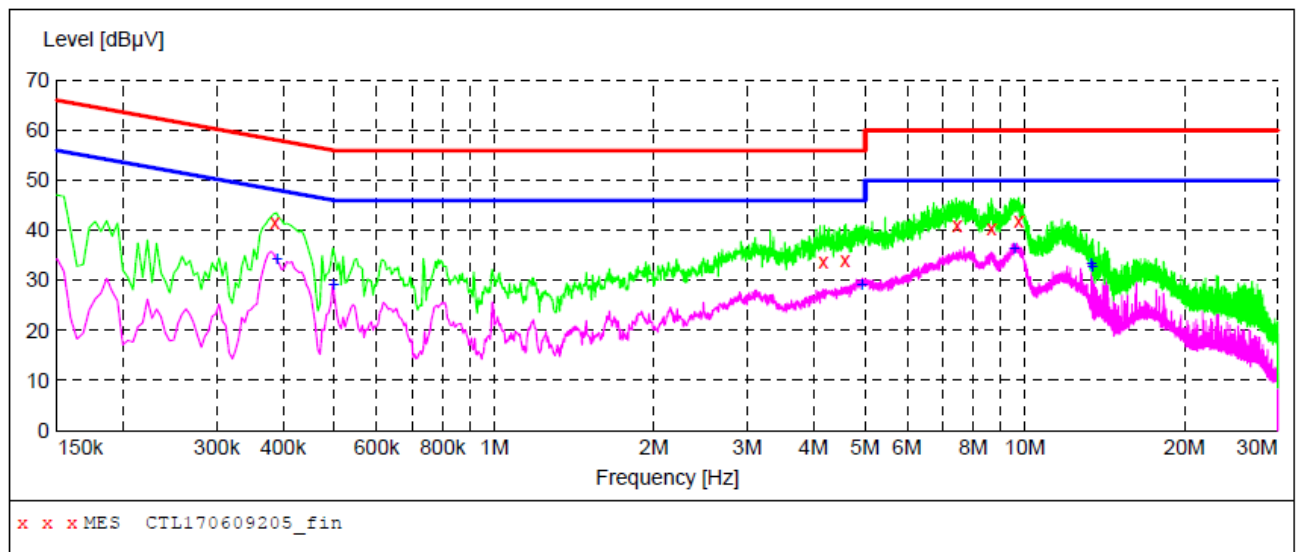
**MEASUREMENT RESULT: "CTL170609204\_fin2"**

6/9/2017 5:31PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.278000	35.10	10.2	51	15.8	AV	L1	GND
0.382000	32.80	10.2	48	15.4	AV	L1	GND
4.634000	26.90	10.4	46	19.1	AV	L1	GND
7.502000	34.70	10.5	50	15.3	AV	L1	GND
13.358000	32.20	10.6	50	17.8	AV	L1	GND

**SCAN TABLE: "Voltage (9K-30M)FIN"**

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "CTL170609205\_fin"**

6/9/2017 5:35PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.386000	41.70	10.2	58	16.4	QP	N	GND
4.172000	33.80	10.4	56	22.2	QP	N	GND
4.580000	34.20	10.4	56	21.8	QP	N	GND
7.454000	41.10	10.5	60	18.9	QP	N	GND
8.654000	40.50	10.6	60	19.5	QP	N	GND
9.728000	41.90	10.6	60	18.1	QP	N	GND

**MEASUREMENT RESULT: "CTL170609205\_fin2"**

6/9/2017 5:35PM

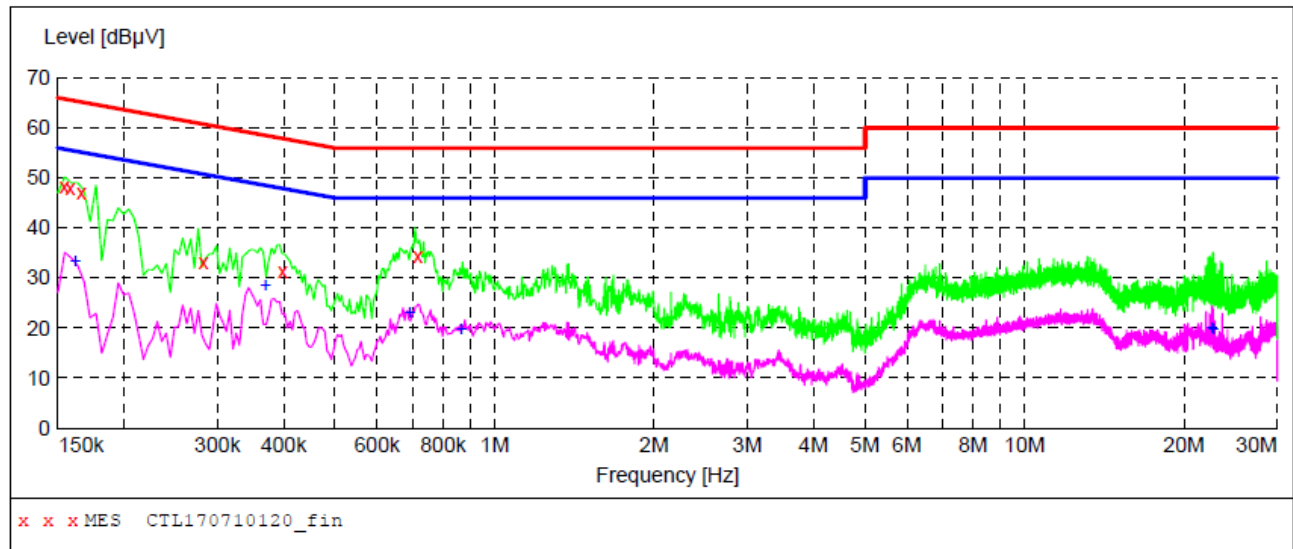
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.390000	34.40	10.2	48	13.7	AV	N	GND
0.498000	29.20	10.2	46	16.8	AV	N	GND
4.928000	29.10	10.4	46	16.9	AV	N	GND
9.566000	36.60	10.6	50	13.4	AV	N	GND
13.358000	33.60	10.6	50	16.4	AV	N	GND
13.418000	33.00	10.6	50	17.0	AV	N	GND

**Adapter 2**

Remark: 802.11a / 802.11n (HT20) / 802.11ac (HT20) / 802.11n (HT40) / 802.11ac (HT40) mode all have been tested, only worse case is reported

**SCAN TABLE: "Voltage (9K-30M)FIN"**

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "CTL170710120\_fin"**

7/10/2017 4:25PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.154000	48.40	10.2	66	17.4	QP	L1	GND
0.158000	48.00	10.2	66	17.6	QP	L1	GND
0.166000	47.00	10.2	65	18.2	QP	L1	GND
0.282000	33.10	10.2	61	27.7	QP	L1	GND
0.398000	31.30	10.2	58	26.6	QP	L1	GND
0.716000	34.50	10.2	56	21.5	QP	L1	GND

**MEASUREMENT RESULT: "CTL170710120\_fin2"**

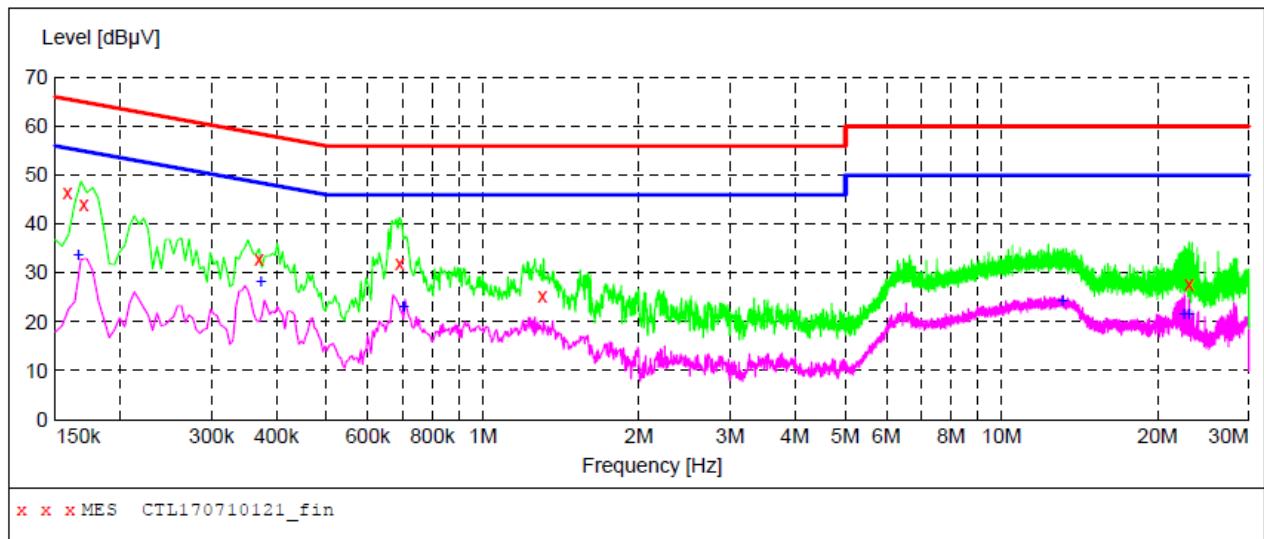
7/10/2017 4:25PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.162000	33.50	10.2	55	21.9	AV	L1	GND
0.370000	28.50	10.2	49	20.0	AV	L1	GND
0.692000	23.10	10.2	46	22.9	AV	L1	GND
0.866000	19.90	10.2	46	26.1	AV	L1	GND
22.592000	20.20	11.0	50	29.8	AV	L1	GND
22.718000	19.80	11.0	50	30.2	AV	L1	GND



**SCAN TABLE: "Voltage (9K-30M)FIN"**

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "CTL170710121\_fin"**

7/10/2017 4:29PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.158000	46.60	10.2	66	19.0	QP	N	GND
0.170000	44.10	10.2	65	20.9	QP	N	GND
0.370000	32.90	10.2	59	25.6	QP	N	GND
0.692000	32.10	10.2	56	23.9	QP	N	GND
1.304000	25.30	10.3	56	30.7	QP	N	GND
22.994000	27.60	11.1	60	32.4	QP	N	GND

**MEASUREMENT RESULT: "CTL170710121\_fin2"**

7/10/2017 4:29PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.166000	33.80	10.2	55	21.4	AV	N	GND
0.374000	28.20	10.2	48	20.2	AV	N	GND
0.704000	23.30	10.2	46	22.7	AV	N	GND
13.112000	24.50	10.6	50	25.5	AV	N	GND
22.478000	21.60	11.0	50	28.4	AV	N	GND
23.030000	21.80	11.1	50	28.2	AV	N	GND

### 3.2. Undesirable Radiated Emissions

#### Limit

The maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (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.
- (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.
- (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.
- (4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

#### Undesirable emission limits

Requirement	Limit(EIRP)	Limit (Field strength at 3m) <sup>Note3</sup>
15.407(b)(1)	PK:-27(dBm/MHz)	PK:68.2(dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK:-27(dBm/MHz) <sup>Note1</sup> PK:-17(dBm/MHz) <sup>Note2</sup>	PK:68.2(dBμV/m) <sup>Note1</sup> PK:78.2(dBμV/m) <sup>Note2</sup>

Note1: For frequencies beyond 10MHz of band edge.

Note2: For frequencies within 10MHz of band edge.

Note3: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts)}$$

(5) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209

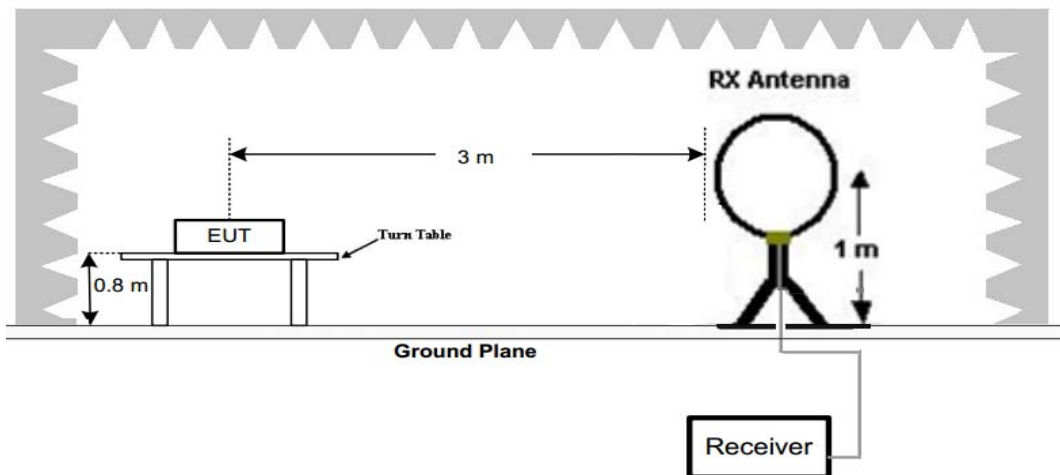
(6) In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

#### Radiated emission limits

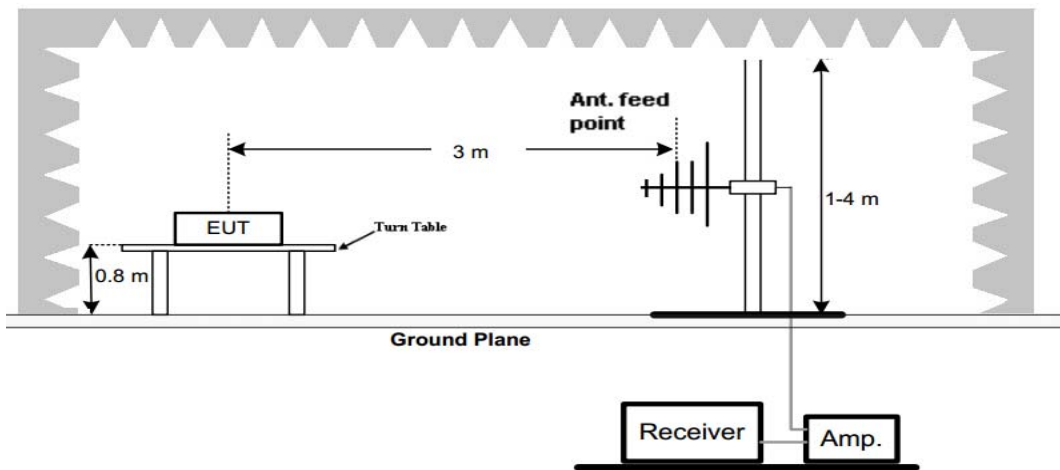
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz}))+40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30)+40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

**TEST CONFIGURATION**

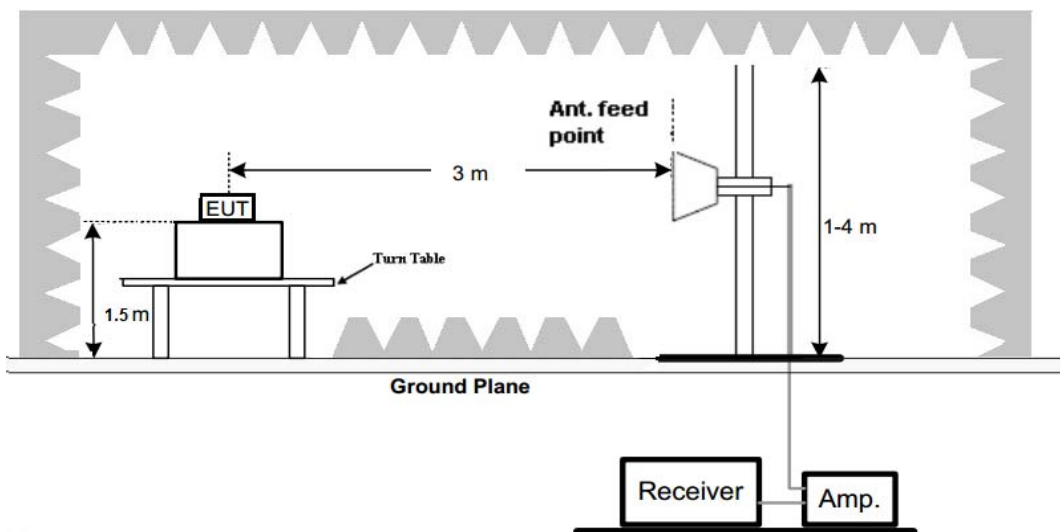
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



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



### **Test Procedure**

1. Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
4. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.
5. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT
6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. Repeat above procedures until all frequency measurements have been completed.

### **TEST RESULTS**

#### **Remark:**

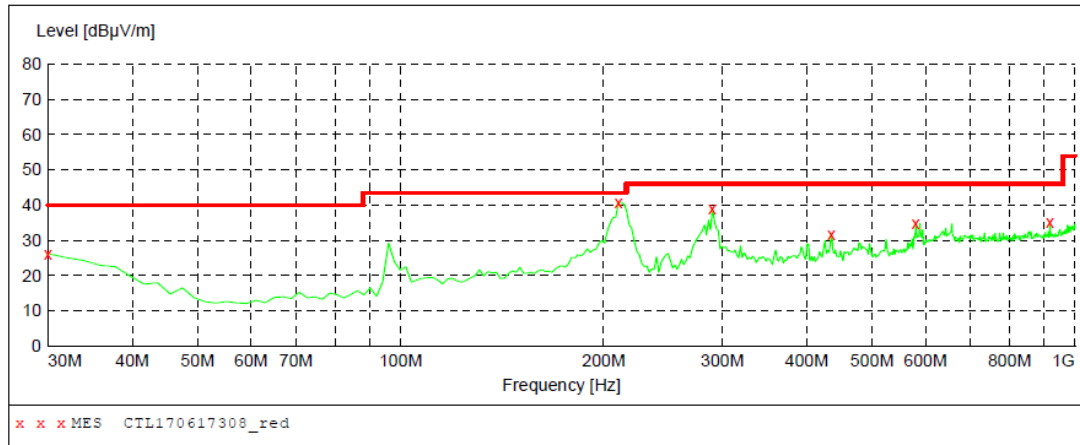
1. All 802.11a SISO mode / 802.11n (HT20) & 802.11ac (HT20) & 802.11n (HT40) & 802.11ac (HT40) MIMO modes have been tested for below 1GHz test, only the worst case 802.11ac (HT20) MIMO mode low channel of U-NII 1 band was recorded.
2. All 802.11a SISO mode / 802.11n (HT20) & 802.11ac (HT20) & 802.11n (HT40) & 802.11ac (HT40) MIMO modes have been tested for above 1GHz test, only the worst case 802.11ac (HT20) MIMO mode was recorded.
3. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

## For 30MHz-1GHz

## Horizontal

**SWEEP TABLE: "test (30M-1G)"**

Short Description:		Field Strength			
Start	Stop	Detector	Meas. Time	IF Bandw.	Transducer
Frequency 30.0 MHz	Frequency 1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1

**MEASUREMENT RESULT: "CTL170617308\_red"**

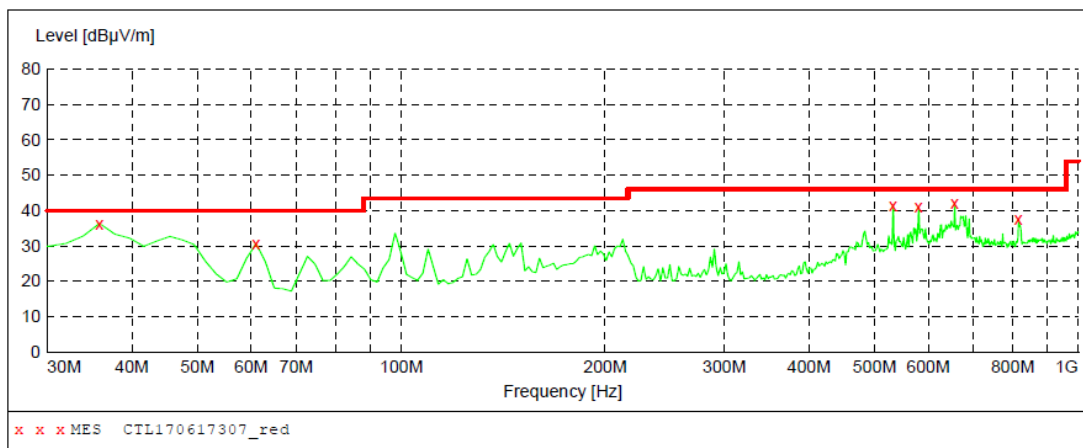
6/17/2017 10:16AM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	26.10	22.1	40.0	13.9	---	0.0	0.00	HORIZONTAL
210.420000	40.80	14.5	43.5	2.7	---	0.0	0.00	HORIZONTAL
289.960000	39.00	15.8	46.0	7.0	---	0.0	0.00	HORIZONTAL
435.460000	31.80	19.1	46.0	14.2	---	0.0	0.00	HORIZONTAL
580.960000	34.80	22.6	46.0	11.2	---	0.0	0.00	HORIZONTAL
918.520000	35.10	26.6	46.0	10.9	---	0.0	0.00	HORIZONTAL

## Vertical

**SWEEP TABLE: "test (30M-1G)"**

Short Description:		Field Strength			
Start	Stop	Detector	Meas. Time	IF Bandw.	Transducer
Frequency 30.0 MHz	Frequency 1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1

**MEASUREMENT RESULT: "CTL170617307\_red"**

6/17/2017 10:14AM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
35.820000	36.30	18.3	40.0	3.7	---	0.0	0.00	VERTICAL
61.040000	30.60	7.9	40.0	9.4	---	0.0	0.00	VERTICAL
532.460000	41.50	21.4	46.0	4.5	---	0.0	0.00	VERTICAL
580.960000	41.00	22.6	46.0	5.0	---	0.0	0.00	VERTICAL
656.620000	42.10	23.7	46.0	3.9	---	0.0	0.00	VERTICAL
815.700000	37.50	25.7	46.0	8.5	---	0.0	0.00	VERTICAL



**For 1GHz to 25GHz**

All 802.11a SISO mode / 802.11n (HT20) & 802.11ac (HT20) & 802.11n (HT40) & 802.11ac (HT40) MIMO modes have been tested for above 1GHz test, only the worst case 802.11ac (HT20) MIMO mode was recorded.

**U-NII 1 & 802.11ac (HT20) Mode (above 1GHz)**

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
36.00 (5180MHz)	5150.00	57.19	PK	H	68.20	11.01	49.91	34.44	7.12	34.28	7.28
	5150.00	50.35	AV	H	54.00	3.65	43.07	34.44	7.12	34.28	7.28
	10360.00	48.96	PK	H	68.20	19.24	33.23	39.20	11.45	34.92	15.73
	--	--	--	--	--	--	--	--	--	--	--
40.00 (5200MHz)	10400.00	49.13	PK	H	68.20	19.07	33.32	39.22	11.48	34.89	15.81
	--	--	--	--	--	--	--	--	--	--	--
48.00 (5240MHz)	5350.50	53.42	PK	H	68.20	14.78	46.39	34.23	7.36	34.56	7.03
	10480.00	47.91	PK	H	68.20	20.29	30.76	39.41	11.83	34.09	17.15
	--	--	--	--	--	--	--	--	--	--	--

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
36.00 (5180MHz)	5150.00	56.71	PK	V	68.20	11.49	49.43	34.44	7.12	34.28	7.28
	5150.00	49.83	AV	V	54.00	4.17	42.55	34.44	7.12	34.28	7.28
	10360.00	47.26	PK	V	68.20	20.94	31.53	39.20	11.45	34.92	15.73
	--	--	--	--	--	--	--	--	--	--	--
40.00 (5200MHz)	10400.00	49.04	PK	V	68.20	19.16	33.23	39.22	11.48	34.89	15.81
	--	--	--	--	--	--	--	--	--	--	--
48.00 (5240MHz)	5350.50	53.06	PK	V	68.20	15.14	46.03	34.23	7.36	34.56	7.03
	10480.00	48.12	PK	V	68.20	20.08	30.97	39.41	11.83	34.09	17.15
	--	--	--	--	--	--	--	--	--	--	--

**U-NII 3 & 802.11ac (HT20) Mode (above 1GHz)**

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
149 (5745MHz)	5725.00	54.28	PK	H	68.20	13.92	46.55	34.79	7.43	34.49	7.73
	5725.00	47.03	AV	H	54.00	6.97	39.30	34.79	7.43	34.49	7.73
	10950.00	48.18	PK	H	68.20	20.02	31.13	39.53	11.97	34.45	17.05
	--	--	--	--	--	--	--	--	--	--	--
157 (5785MHz)	11570.00	47.25	PK	H	68.20	20.95	28.8	39.71	13.05	34.31	18.45
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165 (5825MHz)	5850.00	53.96	PK	H	68.20	14.24	46.18	34.81	7.51	34.54	7.78
	5850.00	47.21	AV	H	54.00	6.79	39.43	34.81	7.51	34.54	7.78
	11650.00	48.09	PK	H	68.20	20.11	29.47	39.73	13.19	34.30	18.62
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Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
149 (5745MHz)	5725.00	55.03	PK	V	68.20	13.17	47.3	34.79	7.43	34.49	7.73
	5725.00	46.17	AV	V	54.00	7.83	38.44	34.79	7.43	34.49	7.73
	10950.00	47.08	PK	V	68.20	21.12	30.03	39.53	11.97	34.45	17.05
	--	--	--	--	--	--	--	--	--	--	--
157 (5785MHz)	11570.00	48.58	PK	V	68.20	19.62	30.13	39.71	13.05	34.31	18.45
	--	--	--	--	--	--	--	--	--	--	--
165 (5825MHz)	5850.00	56.01	PK	V	68.20	12.19	48.23	34.81	7.51	34.54	7.78
	5850.00	47.27	AV	V	54.00	6.73	39.49	34.81	7.51	34.54	7.78
	11650.00	47.69	PK	V	68.20	20.51	29.07	39.73	13.19	34.30	18.62
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REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Factor
3. Margin value = Limit value - Emission level.
4. -- Mean the other emission levels were very low against the limit.
5. RBW 1MHz VBW 3MHz Peak detector is for PK value; RMS detector is for AV value.

