



FCC PART 15C TEST REPORT No. I15Z43176-EMC02

for

Huawei Technologies Co., Ltd.

Smart Phone

Model name: EVA-L19

With

FCC ID: QISEVA-L19

Hardware Version: HL1UEVAM

Software Version: A168-L09C900B072

Issued Date: 2016-02-17



Note: The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

Test Laboratory:

FCC 2.948 Listed: No. 525429

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1. TEST LATORATORY

1.1. Testing Location

Location 1: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,
P. R. China 100191

Location 4: CTTL(BDA)

Address: No.18A, Kangding Street, Beijing Economic-Technology
Development Area, Beijing, P. R. China 100176

1.2. Testing Environment

Normal Temperature: 15-35℃

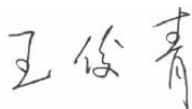
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2016-01-12

Testing End Date: 2016-02-03

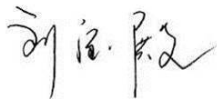
1.4. Signature



Wang Junqing
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Qu Pengfei
(Reviewed this test report)



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2. CLIENT INFORMATION

2.1. Applicant Information

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2.2. Manufacturer Information

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Country: China
Contact Person: zhangheng
Contact Email: ivy.zhangheng@huawei.com
Telephone: 18121057839/021-61752571
Fax: /

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	Smart Phone
Model name	H1511
FCC ID	QISEVA-L19
WLAN Frequency Range	ISM Band: 5725MHz~5850MHz
Type of modulation	OFDM

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL, Telecommunication Technology Labs, Academy of telecommunication Research, MIIT.

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version
EUT1	869827020008203	HL1UEVAM	A168-L09C900B072

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Type	SN
AE1	battery	/	Inbuilt
AE2	Travel Charger	HW-050200C01	1543176CH003
AE3	USB Cable	/	1543176DC003

AE1

Model	HB366481ECW
Manufacturer	Huawei
Capacitance	2900mAh
Nominal voltage	3.82V

AE2

Model	HW-050200C01
Manufacturer	Hangjia
Length of cable	/

AE3

Model	/
Manufacturer	/
Length of cable	100cm

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

Equipment Under Test (EUT) is model of Smart Phone with integrated antenna and inbuilt battery.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the Client.



3.5. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1+ AE1+ AE2 +AE3	Charger

4. REFERENCE DOCUMENTS

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

	FCC CFR 47, Part 15, Subpart C:	
	15.205 Restricted bands of operation;	
FCC Part15	15.209 Radiated emission limits, general requirements;	2014
	15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	
	Methods of Measurement of Radio-Noise Emissions from	
ANSI C63.10	Low-Voltage Electrical and Electronic Equipment in the	2013
	Range of 9 kHz to 40 GHz	
	Guidance for Performing Compliance Measurements on	
KDB558074	Digital Transmission Systems (DTS) Operating Under	2013
	§15.247	
	Guidance for IEEE 802.11ac and Pre-ac Device Emissions	
KDB644545	Testing	2013
	Guidelines for Compliance Testing of Unlicensed National	
KDB 789033 D02	Information Infrastructure (U-NII) Devices Part 15, Subpart E	June 2014

5. LABORATORY ENVIRONMENT

Semi-anechoic chamber SAC-1 (23 meters×17meters×10meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4Ω
Normalised site attenuation (NSA)	< ± 4 dB, 3m/10m distance, from 30 to 1000 MHz
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

Semi-anechoic chamber SAC-2 (10 meters×6.7meters×6.1meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4Ω
Normalised site attenuation (NSA)	< ± 4 dB, 3m distance, from 30 to 1000 MHz
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

6. SUMMARY OF TEST RESULTS

6.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15C	Sub-clause of IC	Verdict
Band Edges Compliance	15.209 (b)	/	P
Transmitter Spurious Emission - Radiated	15.247, 15.205, 15.209	/	P
Transmitter Spurious Emission - Radiated < 30MHz	15.247, 15.209	/	P

Please refer to **ANNEX A** for detail.

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NM	Not measured, The test was not measured by CTTL
NA	Not Applicable, The test was not applicable
F	Fail, The EUT does not comply with the essential requirements in the standard

6.2. Statements

CTTL has evaluated the test cases requested by the client/manufacture as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.1.

This report only deals with the WLAN function among the features described in section 3.

6.3. Test Conditions

For this report, all the test cases are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

Temperature	15℃~35℃
Voltage	3.82V
Humidity	15%~75%

7. TEST EQUIPMENTS UTILIZED

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100376	R&S	2016-10-29	1 Year
2	Test Receiver	FSV40	101047	R&S	2016-07-02	1 Year
3	Loop Antenna	HFH2-Z2	829324/007	R&S	2017-12-16	3 Years
4	EMI Antenna	VULB9163	9163-514	Schwarzbeck	2017-11-24	3 Years
5	EMI Antenna	3117	00139065	ETS-Lindgren	2017-07-01	3 Years
6	EMI Antenna	3116	2661	ETS-Lindgren	2017-06-17	3 Years

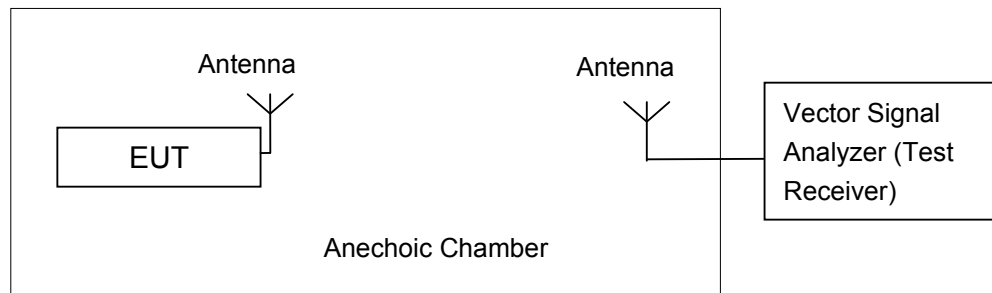
ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

In the case of radiated emission, the used settings are as follows,

Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;

Sweep frequency from 1 GHz to 40GHz, RBW = 1MHz, VBW = 3MHz;



The measurement is made according to ANSI C63.10.

For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m.

The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m or 10m. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.

A.2. Transmitter Spurious Emission

Measurement Limit:

Standard	Frequency (MHz)	Limit (dBm/MHz)
FCC 47 CFR Part 15.407	5725MHz~5850MHz	< -27

The measurement is made according to ANSI C63.10 .

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) (see § 15.205(c)).

Limit in restricted band:

Frequency of emission (MHz)	Field strength (uV/m)	Field strength (dBμV/m)	Measurement distance(m)
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Measurement Uncertainty:

Frequency Range	Uncertainty(dB)	Note
$f \leq 1\text{GHz}$	3.9	k=2
$f > 1\text{GHz}$	4.3	

Measurement Results:

802.11a mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	149	1 GHz ~ 3 GHz	Fig.1	P
		3GHz ~ 6 GHz	Fig.2	P
		6 GHz ~ 18 GHz	Fig.3	P
	157	30 MHz ~1 GHz	Fig.4	P
		1 GHz ~ 3 GHz	Fig.5	P
		3 GHz ~ 6 GHz	Fig.6	P
		6 GHz ~ 18 GHz	Fig.7	P
		18 GHz ~ 26.5 GHz	Fig.8	P
		26.5 GHz~ 40 GHz	Fig.9	P
	165	1 GHz ~ 3 GHz	Fig.10	P
		3 GHz ~ 6 GHz	Fig.11	P
		6 GHz ~ 18 GHz	Fig.12	P

802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	149	1 GHz ~ 3 GHz	Fig.13	P
		3GHz ~ 6 GHz	Fig.14	P
		6 GHz ~ 18 GHz	Fig.15	P
	157	30 MHz ~1 GHz	Fig.16	P
		1 GHz ~ 3 GHz	Fig.17	P
		3 GHz ~ 6 GHz	Fig.18	P
		6 GHz ~ 18 GHz	Fig.19	P
		18 GHz ~ 26.5 GHz	Fig.20	P
		26.5 GHz~ 40 GHz	Fig.21	P
	165	1 GHz ~ 3 GHz	Fig.22	P
		3 GHz ~ 6 GHz	Fig.23	P
		6 GHz ~ 18 GHz	Fig.24	P

802.11n-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT40)	149	30 MHz ~1 GHz	Fig.25	P
		1 GHz ~ 3 GHz	Fig.26	P
		3 GHz ~ 6 GHz	Fig.27	P
		6 GHz ~ 18 GHz	Fig.28	P
		18 GHz ~ 26.5 GHz	Fig.29	P
		26.5 GHz~ 40 GHz	Fig.30	P
	157	1 GHz ~ 3 GHz	Fig.31	P
		3 GHz ~ 6 GHz	Fig.32	P
		6 GHz ~ 18 GHz	Fig.33	P

802.11ac-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac (HT20)	149	1 GHz ~ 3 GHz	Fig.34	P
		3GHz ~ 6 GHz	Fig.35	P
		6 GHz ~ 18 GHz	Fig.36	P
	157	30 MHz ~1 GHz	Fig.37	P
		1 GHz ~ 3 GHz	Fig.38	P
		3 GHz ~ 6 GHz	Fig.39	P
		6 GHz ~ 18 GHz	Fig.40	P
		18 GHz ~ 26.5 GHz	Fig.41	P
		26.5 GHz~ 40 GHz	Fig.42	P
	165	1 GHz ~ 3 GHz	Fig.43	P
		3 GHz ~ 6 GHz	Fig.44	P
		6 GHz ~ 18 GHz	Fig.45	P

802.11ac-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac (HT40)	149	30 MHz ~1 GHz	Fig.46	P
		1 GHz ~ 3 GHz	Fig.47	P
		3 GHz ~ 6 GHz	Fig.48	P
		6 GHz ~ 18 GHz	Fig.49	P
		18 GHz ~ 26.5 GHz	Fig.50	P
		26.5 GHz~ 40 GHz	Fig.51	P
	157	1 GHz ~ 3 GHz	Fig.52	P
		3 GHz ~ 6 GHz	Fig.53	P
		6 GHz ~ 18 GHz	Fig.54	P

802.11ac-HT80 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac (HT80)	149	30 MHz ~1 GHz	Fig.55	P
		1 GHz ~ 3 GHz	Fig.56	P
		3 GHz ~ 6 GHz	Fig.57	P
		6 GHz ~ 18 GHz	Fig.58	P
		18 GHz ~ 26.5 GHz	Fig.59	P
		26.5 GHz~ 40 GHz	Fig.60	P

Conclusion: PASS

Note:

A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

P_{Mea} is the field strength recorded from the instrument.

The measurement results are obtained as described below:

Result= $P_{Mea}+A_{Rpl}= P_{Mea}+Cable\ Loss+Antenna\ Factor$

802.11a

Ch149

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5725.000	49.1	-33.4	34.8	47.738	H
17499.600	43.9	-23.9	41.2	26.553	V
17569.800	43.9	-23.9	41.2	26.553	H
17500.200	43.9	-23.9	41.2	26.553	V
17512.200	43.9	-23.9	41.2	26.553	H
17562.600	43.9	-23.9	41.2	26.553	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5702.240	70.2	-33.4	34.8	68.838	H
17977.800	56.4	-23.3	41.0	38.733	H
17964.000	56.4	-23.3	41.0	38.733	V
17551.800	56.3	-23.9	41.2	38.953	H
17520.600	56.0	-23.9	41.2	38.653	H
17937.000	55.9	-23.3	41.0	38.233	V

Ch157

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17987.400	44.0	-23.3	41.0	26.333	H
17772.600	43.9	-23.4	41.0	26.272	H
17967.600	43.9	-23.3	41.0	26.233	V
17497.200	43.9	-23.9	41.2	26.553	V
17486.400	43.9	-23.9	41.2	26.553	H
17502.000	43.9	-23.9	41.2	26.553	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17940.600	56.3	-23.3	41.0	38.633	H
17569.200	56.1	-23.9	41.2	38.753	V
17948.400	56.0	-23.3	41.0	38.333	V
17614.800	55.8	-23.9	41.2	38.453	V
17716.200	55.8	-23.4	41.2	37.972	V
17617.200	55.8	-23.9	41.2	38.453	H

Ch165

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5850.000	44.7	-33.7	34.9	43.465	H
17992.200	44.0	-23.0	41.0	26.047	V
17496.000	44.0	-23.9	41.2	26.653	V
17454.000	44.0	-24.3	41.2	27.069	V
17456.400	43.9	-24.3	41.2	26.969	H
17954.400	43.9	-23.3	41.0	26.233	V

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5851.156	61.9	-33.7	34.9	60.665	H
17431.800	56.2	-24.3	41.2	39.269	V
17937.600	56.1	-23.3	41.0	38.433	V
17737.200	56.0	-23.4	41.2	38.172	H
17798.400	55.9	-23.4	41.0	38.272	H
17647.200	55.9	-23.4	41.2	38.072	V

802.11n-HT20

Ch149

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.499	48.3	-33.4	34.8	46.938	H
17976.600	44.1	-23.3	41.0	26.433	H
17964.600	44.0	-23.3	41.0	26.333	H
17956.200	44.0	-23.3	41.0	26.333	V
17959.200	44.0	-23.3	41.0	26.333	H
17519.400	43.9	-23.9	41.2	26.553	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.446	69.2	-33.4	34.8	67.838	H
17539.800	56.2	-23.9	41.2	38.853	V
17576.400	56.2	-23.9	41.2	38.853	H
17908.200	56.1	-23.3	41.0	38.433	V
17665.200	56.1	-23.4	41.2	38.272	V
17464.200	56.0	-23.9	41.2	38.653	V

Ch157

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17971.200	44.0	-23.3	41.0	26.333	V
17495.400	44.0	-23.9	41.2	26.653	V
17953.800	43.9	-23.3	41.0	26.233	H
17517.600	43.9	-23.9	41.2	26.553	H
17951.400	43.9	-23.3	41.0	26.233	V
17507.400	43.9	-23.9	41.2	26.553	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17478.600	56.4	-23.9	41.2	39.053	V
16789.800	55.9	-24.7	41.5	39.147	V
17619.000	55.9	-23.9	41.2	38.553	H
17487.000	55.8	-23.9	41.2	38.453	H
17987.400	55.7	-23.3	41.0	38.033	V
17821.800	55.7	-23.3	41.0	38.033	H

Ch165

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5850.364	42.7	-33.7	34.9	41.465	V
17532.600	44.0	-23.9	41.2	26.653	H
17995.200	44.0	-23.0	41.0	26.047	H
17956.200	44.0	-23.3	41.0	26.333	H
17515.800	44.0	-23.9	41.2	26.653	V
17971.800	44.0	-23.3	41.0	26.333	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5850.292	61.9	-33.7	34.9	60.665	V
17941.800	56.0	-23.3	41.0	38.333	H
17986.800	56.0	-23.3	41.0	38.333	H
17814.000	55.9	-23.3	41.0	38.233	H
17747.400	55.9	-23.4	41.2	38.072	V
17692.200	55.9	-23.4	41.2	38.072	V

802.11n-HT40

Ch149

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.944	49.5	-33.4	34.8	48.138	V
17938.800	44.1	-23.3	41.0	26.433	H
17745.000	43.9	-23.4	41.2	26.072	H
17485.800	43.9	-23.9	41.2	26.553	V
17784.600	43.9	-23.4	41.0	26.272	V
17485.200	43.9	-23.9	41.2	26.553	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.944	65.3	-33.7	34.9	64.065	V
17889.000	56.6	-23.3	41.0	38.933	H
17805.000	56.2	-23.4	41.0	38.572	H
17465.400	56.0	-23.9	41.2	38.653	H
17940.600	56.0	-23.3	41.0	38.333	V
17641.800	55.9	-23.4	41.2	38.072	H

Ch157

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.944	41.7	-33.7	34.9	40.465	V
17983.200	44.0	-23.3	41.0	26.333	H
17954.400	44.0	-23.3	41.0	26.333	H
17469.600	44.0	-23.9	41.2	26.653	H
17941.800	44.0	-23.3	41.0	26.333	H
17958.000	44.0	-23.3	41.0	26.333	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.944	55.3	-33.7	34.9	54.065	V
17485.200	56.8	-23.9	41.2	39.453	H
17475.600	56.2	-23.9	41.2	38.853	H
17988.000	56.1	-23.0	41.0	38.147	V
17445.000	56.1	-24.3	41.2	39.169	V
17985.000	55.9	-23.3	41.0	38.233	H

802.11ac-HT20

Ch149

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.992	48.3	-33.4	34.8	46.938	H
17976.600	44.1	-23.3	41.0	26.433	H
17964.600	44.0	-23.3	41.0	26.333	V
17956.200	44.0	-23.3	41.0	26.333	H
17959.200	44.0	-23.3	41.0	26.333	H
17519.400	43.9	-23.9	41.2	26.553	V

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.456	69.2	-33.4	34.8	67.838	V
17539.800	56.2	-23.9	41.2	38.853	H
17576.400	56.2	-23.9	41.2	38.853	V
17908.200	56.1	-23.3	41.0	38.433	V
17665.200	56.1	-23.4	41.2	38.272	V
17464.200	56.0	-23.9	41.2	38.653	V

Ch157

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17989.200	44.0	-23.0	41.0	26.047	H
17971.200	44.0	-23.3	41.0	26.333	V
17495.400	44.0	-23.9	41.2	26.653	V
17953.800	43.9	-23.3	41.0	26.233	H
17517.600	43.9	-23.9	41.2	26.553	H
17487.000	43.9	-23.9	41.2	26.553	V

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17478.600	56.4	-23.9	41.2	39.053	V
16789.800	55.9	-24.7	41.5	39.147	V
17619.000	55.9	-23.9	41.2	38.553	H
17487.000	55.8	-23.9	41.2	38.453	H
17987.400	55.7	-23.3	41.0	38.033	V
17821.800	55.7	-23.3	41.0	38.033	H

Ch165

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5850.364	42.7	-33.7	34.9	41.465	V
17983.200	44.1	-23.3	41.0	26.433	H
17959.200	44.0	-23.3	41.0	26.333	H
17491.200	43.9	-23.9	41.2	26.553	V
17464.200	43.9	-23.9	41.2	26.553	V
17554.200	43.9	-23.9	41.2	26.553	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5850.292	61.9	-33.7	34.9	60.665	V
17889.000	56.6	-23.3	41.0	38.933	H
17988.600	56.0	-23.0	41.0	38.047	V
17983.200	55.9	-23.3	41.0	38.233	H
17541.000	55.9	-23.9	41.2	38.553	H
17779.800	55.9	-23.4	41.0	38.272	V

802.11ac-HT40

Ch149

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.892	49.5	-33.4	34.8	48.138	V
17970.000	44.1	-23.3	41.0	26.433	V
17959.800	44.0	-23.3	41.0	26.333	H
17544.000	44.0	-23.9	41.2	26.653	V
17485.800	44.0	-23.9	41.2	26.653	H
17492.400	44.0	-23.9	41.2	26.653	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.944	65.3	-33.4	34.8	63.938	V
17470.800	55.9	-23.9	41.2	38.553	V
17160.600	55.8	-24.2	41.4	38.585	V
17976.000	55.8	-23.3	41.0	38.133	V
17520.000	55.8	-23.9	41.2	38.453	V
17503.800	55.7	-23.9	41.2	38.353	H

Ch157

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5850.336	41.7	-33.7	34.9	40.465	H
17497.800	44.0	-23.9	41.2	26.653	V
17949.600	44.0	-23.3	41.0	26.333	H
17951.400	44.0	-23.3	41.0	26.333	V
17947.200	44.0	-23.3	41.0	26.333	H
17507.400	44.0	-23.9	41.2	26.653	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5851.428	55.3	-33.7	34.9	54.065	H
17535.600	56.3	-23.9	41.2	38.953	H
17641.200	56.0	-23.4	41.2	38.172	V
17597.400	55.9	-23.9	41.2	38.553	H
17125.200	55.9	-24.2	41.4	38.685	V
17641.800	55.9	-23.4	41.2	38.072	V

802.11ac-HT80

Ch149

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17968.200	44.1	-23.3	41.0	26.433	V
17507.400	44.1	-23.9	41.2	26.753	H
17535.600	44.1	-23.9	41.2	26.753	H
17521.200	44.0	-23.9	41.2	26.653	H
17675.400	44.0	-23.4	41.2	26.172	H
17956.800	44.0	-23.3	41.0	26.333	V

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17532.000	56.0	-23.9	41.2	38.653	V
17763.000	55.8	-23.4	41.0	38.172	H
17103.600	55.8	-24.6	41.4	39.015	V
17721.000	55.7	-23.4	41.2	37.872	H
17983.200	55.6	-23.3	41.0	37.933	H
17950.200	55.6	-23.3	41.0	37.933	H

Test graphs as below:

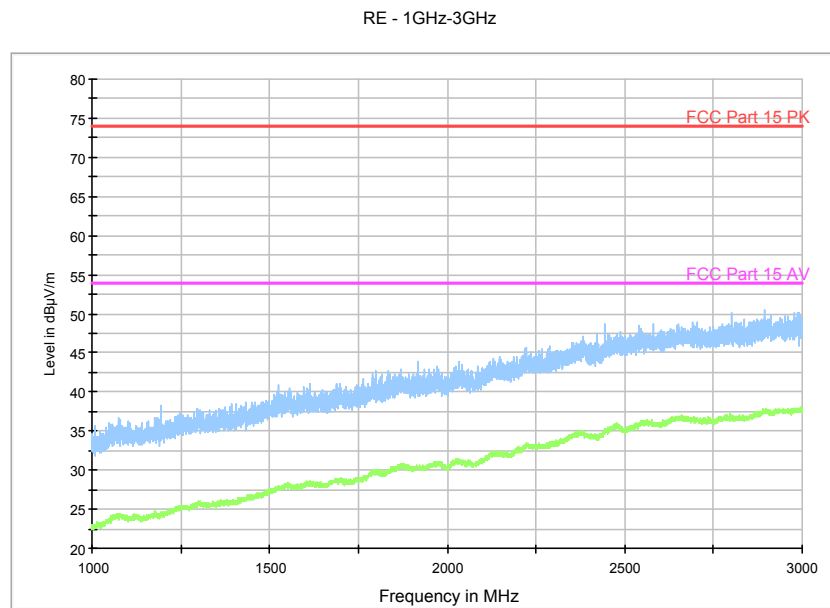
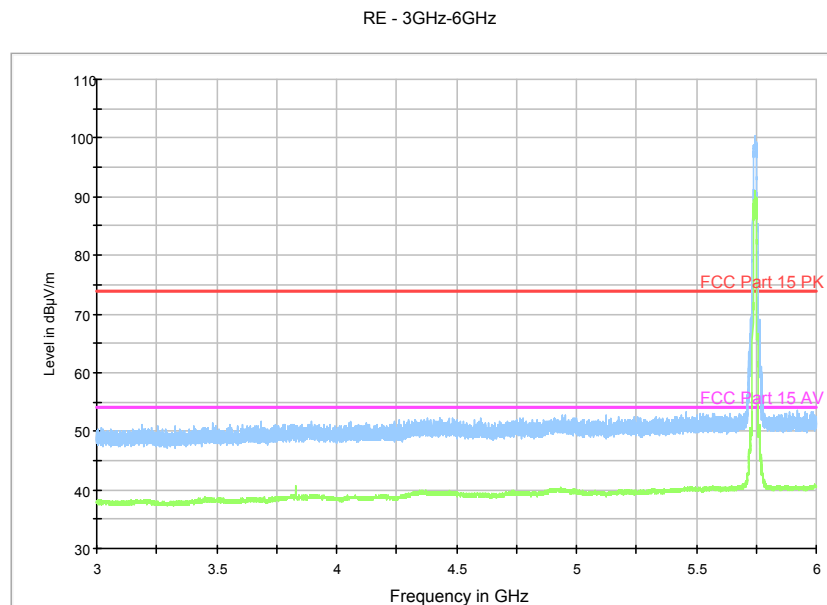


Fig. 1 Radiated Spurious Emission (802.11a, Ch149, 1 GHz-3 GHz)



Note: the spike over the limit is the WLAN carrier frequency and coming from the radio equipment.

Fig. 2 Radiated Spurious Emission (802.11a, Ch149, 3 GHz-6 GHz)

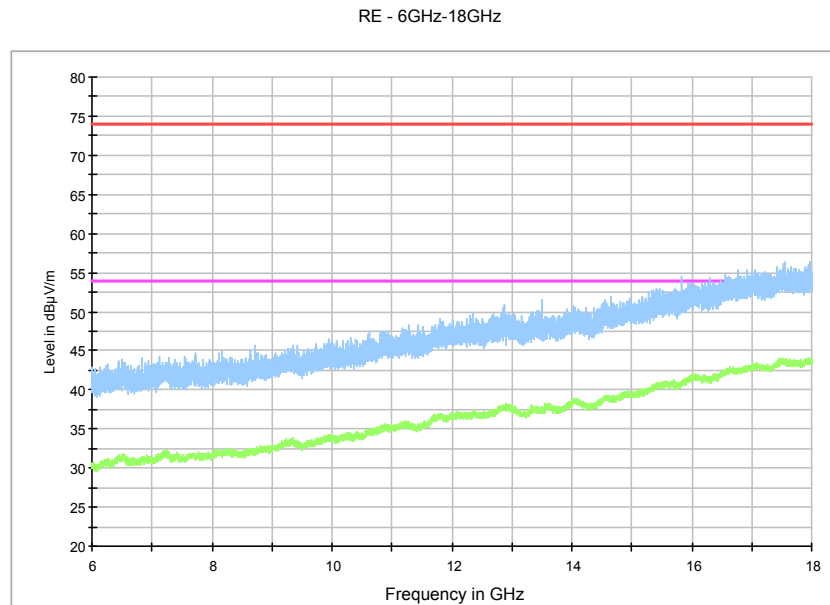


Fig. 3 Radiated Spurious Emission (802.11a, Ch149, 6 GHz-18 GHz)

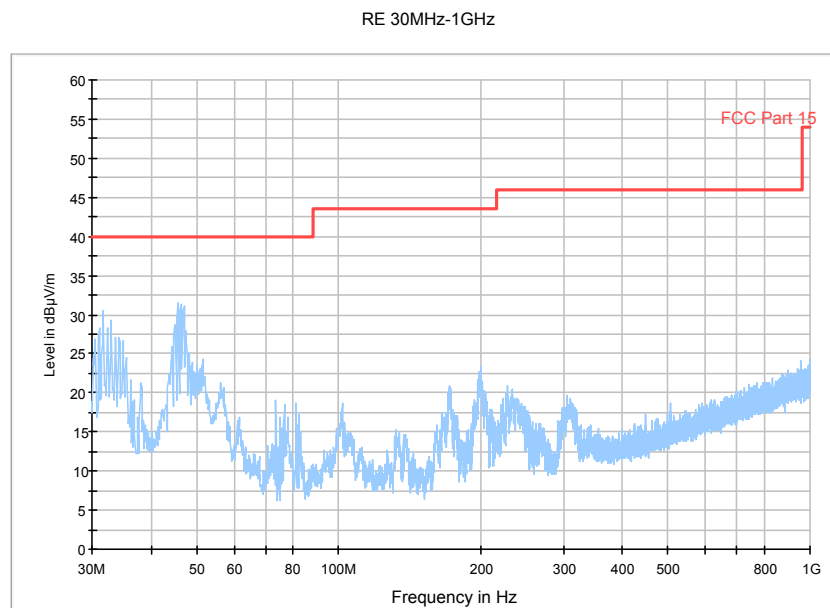


Fig. 4 Radiated Spurious Emission (802.11a, Ch157, 30 MHz-1 GHz)

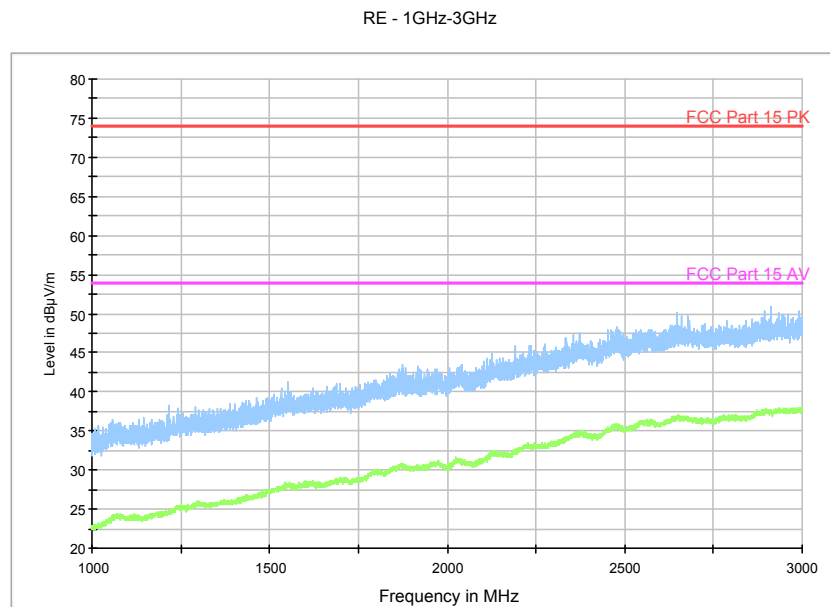
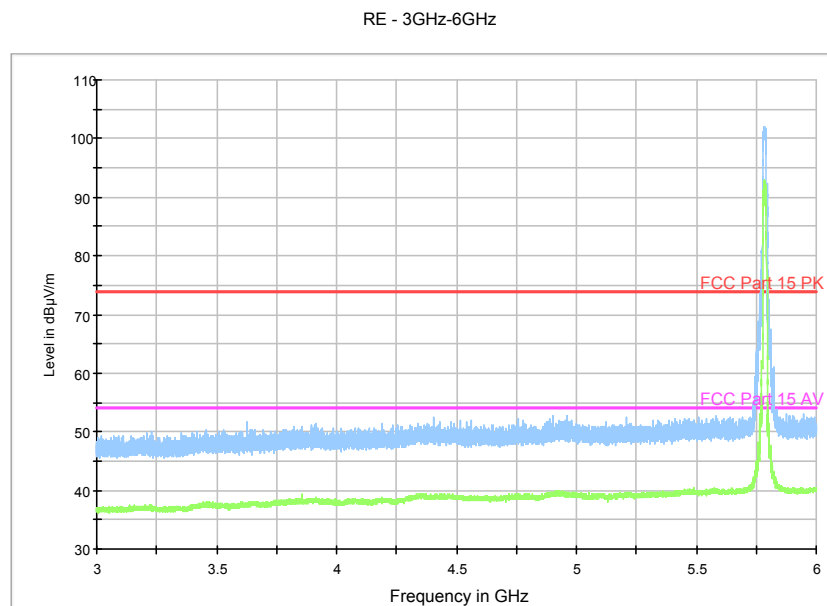


Fig. 5 Radiated Spurious Emission (802.11a, Ch157, 1 GHz-3 GHz)



Note: the spike over the limit is the WLAN carrier frequency and coming from the radio equipment.

Fig. 6 Radiated Spurious Emission (802.11a, Ch157, 3 GHz-6 GHz)

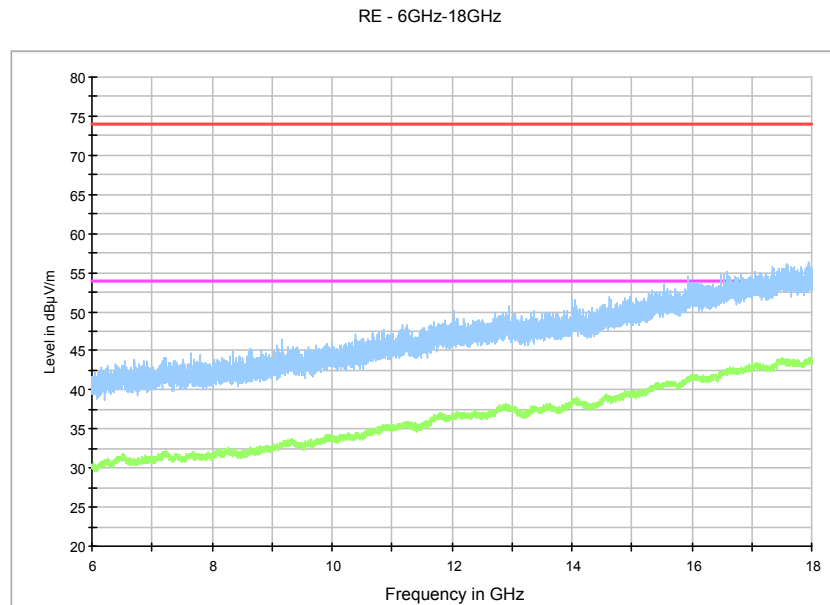


Fig. 7 Radiated Spurious Emission (802.11a, Ch157, 6 GHz-18GHz)

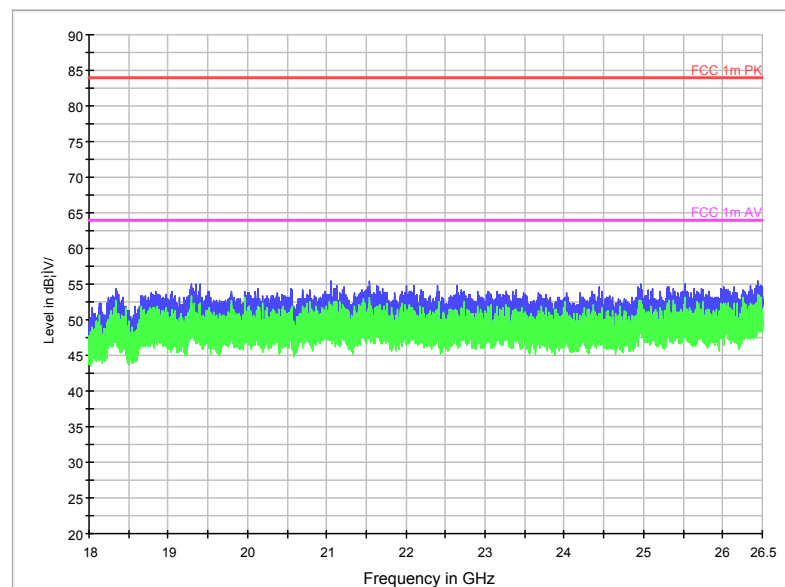


Fig. 8 Radiated Spurious Emission (802.11a, Ch157, 18 GHz-26.5 GHz)

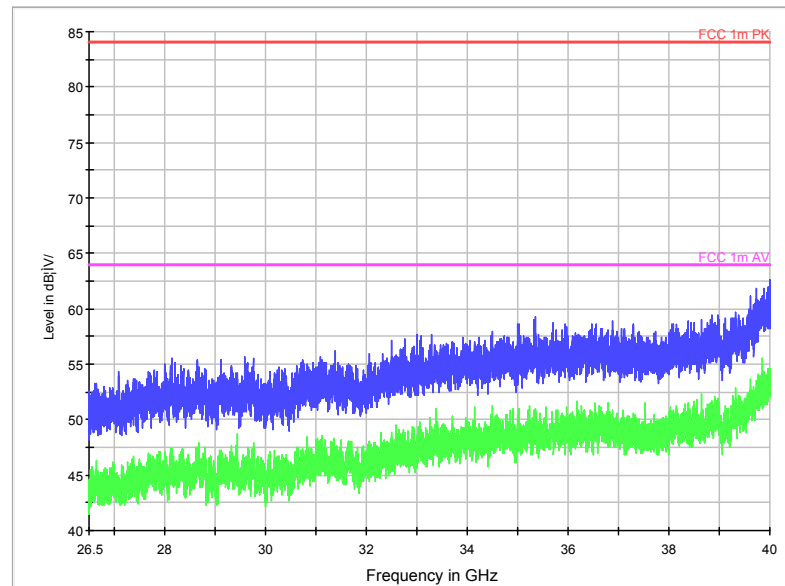


Fig. 9 Radiated Spurious Emission (802.11a, Ch157, 26.5 GHz - 40 GHz)

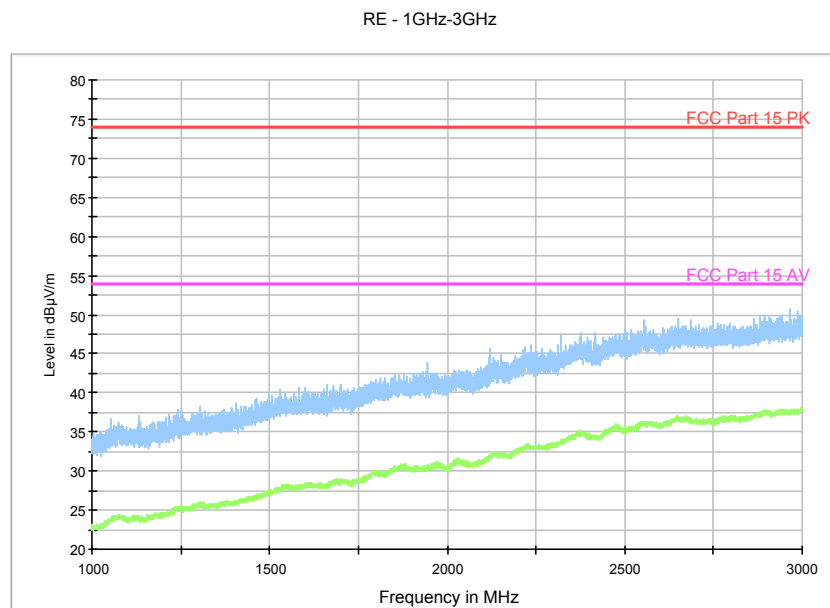
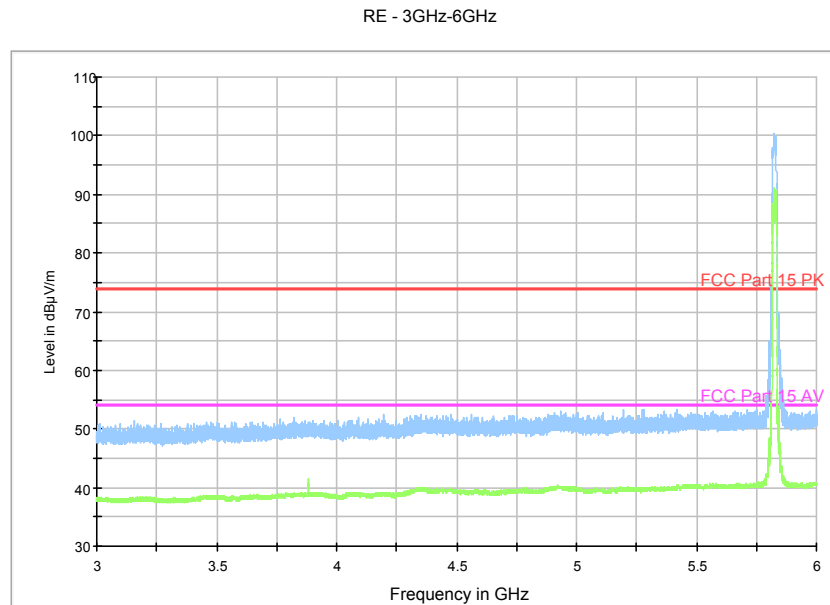


Fig. 10 Radiated Spurious Emission (802.11a, Ch165, 1 GHz-3 GHz)



Note: the spike over the limit is the WLAN carrier frequency and coming from the radio equipment.

Fig. 11 Radiated Spurious Emission (802.11a, Ch165, 3 GHz-6 GHz)

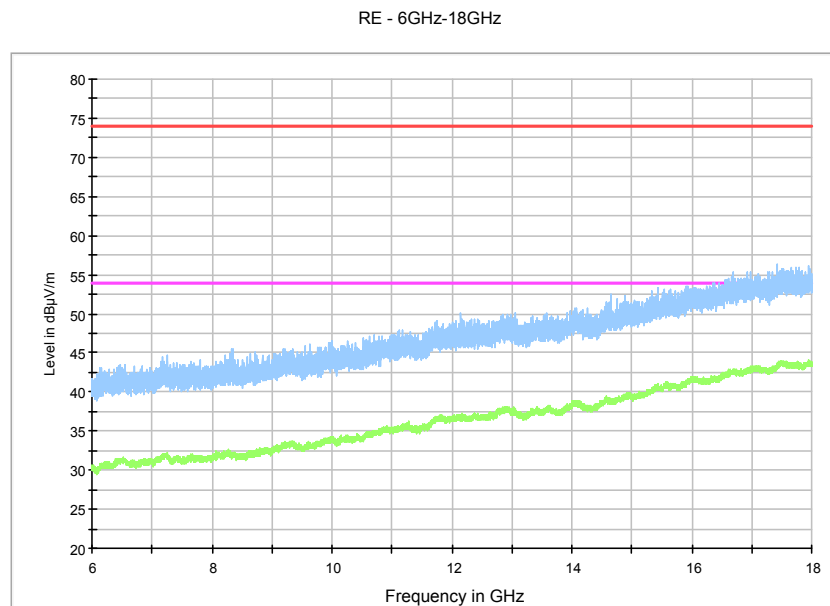


Fig. 12 Radiated Spurious Emission (802.11a, Ch165, 6 GHz-18 GHz)

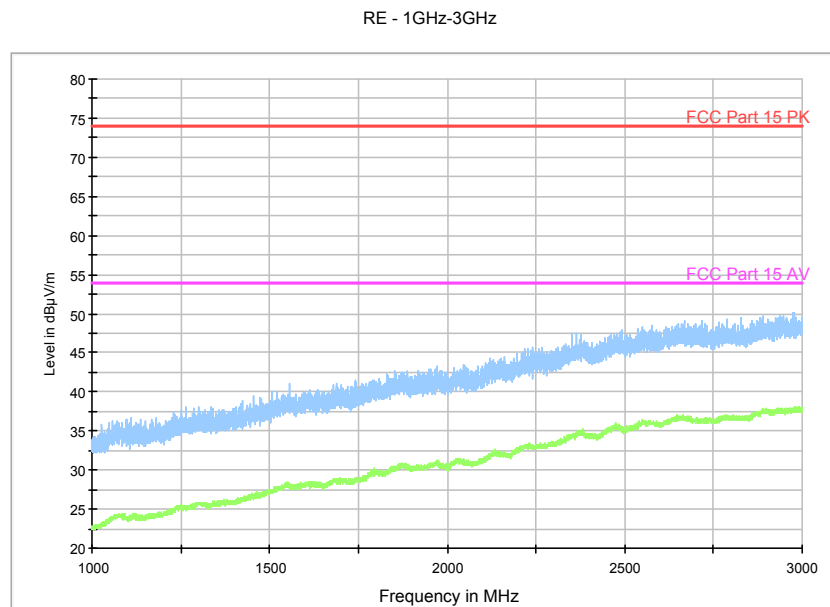
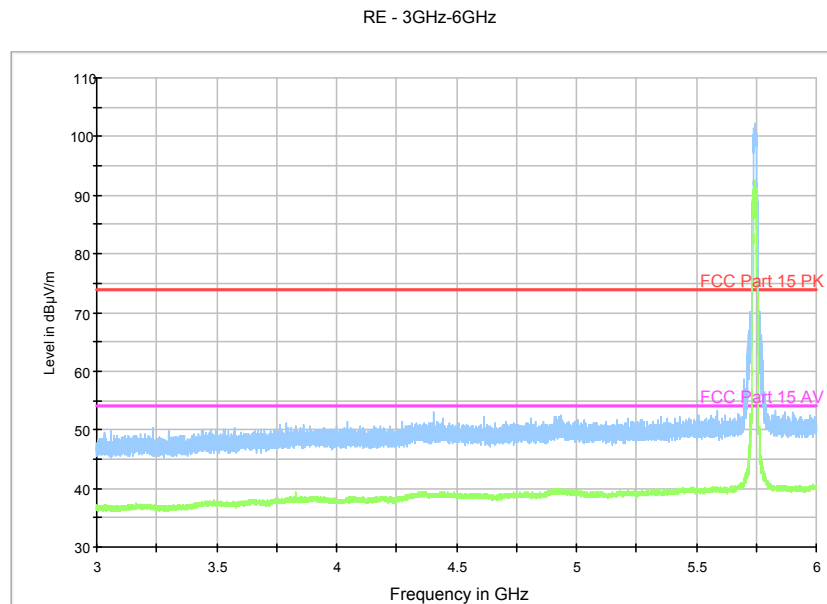


Fig. 13 Radiated Spurious Emission (802.11n-HT20, Ch149, 1 GHz-3 GHz)



Note: the spike over the limit is the WLAN carrier frequency and coming from the radio equipment.

Fig. 14 Radiated Spurious Emission (802.11n-HT20, Ch149, 3 GHz-6GHz)

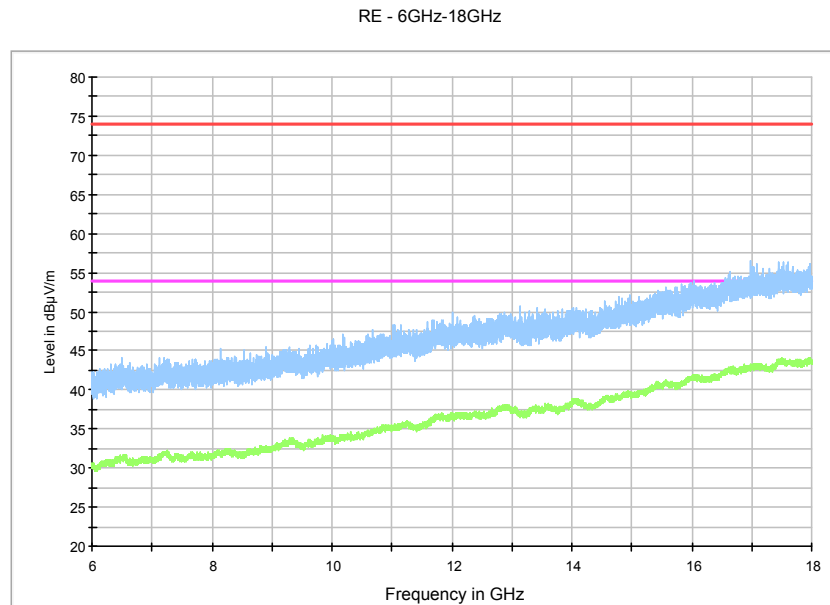


Fig. 15 Radiated Spurious Emission (802.11n-HT20, Ch149, 6 GHz-18 GHz)

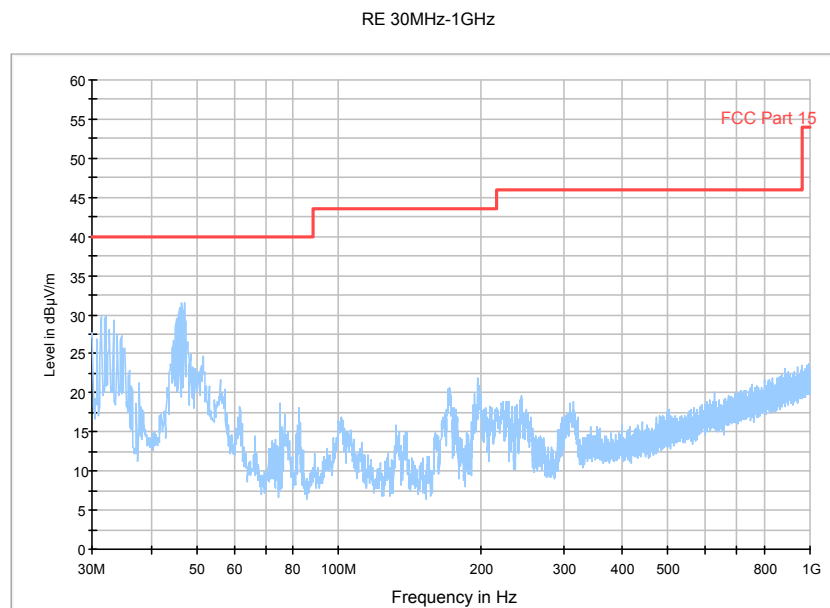


Fig. 16 Radiated Spurious Emission (802.11n-HT20, Ch157, 30 MHz-1 GHz)

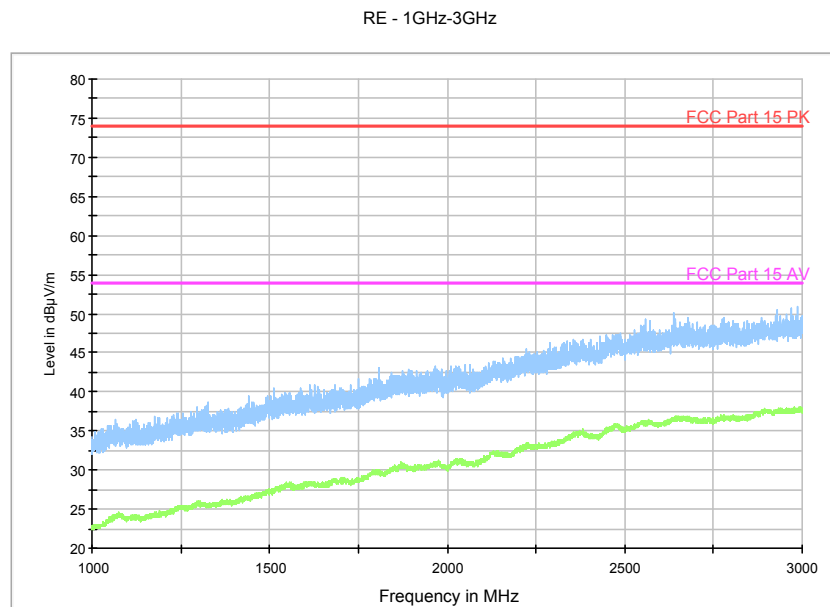
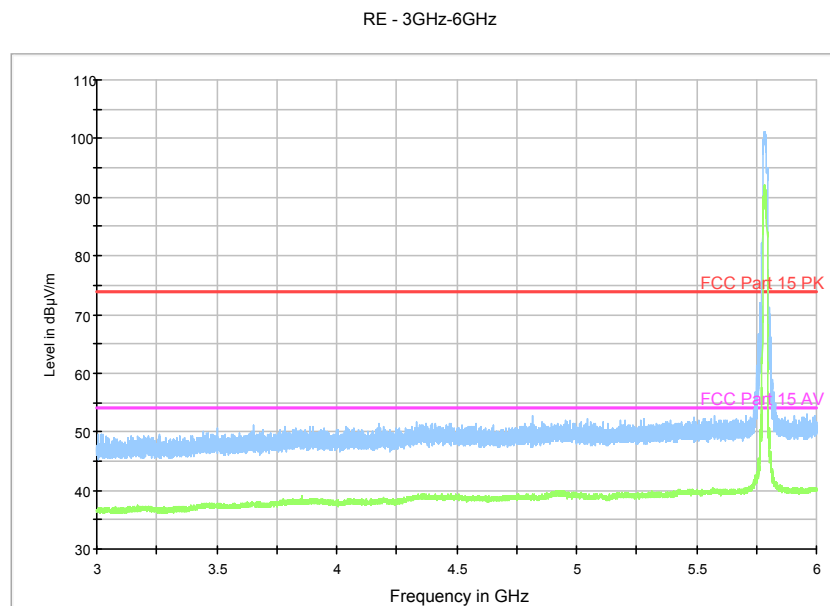


Fig. 17 Radiated Spurious Emission (802.11n-HT20, Ch157, 1 GHz-3 GHz)



Note: the spike over the limit is the WLAN carrier frequency and coming from the radio equipment.

Fig. 18 Radiated Spurious Emission (802.11n-HT20, Ch157, 3 GHz-6 GHz)

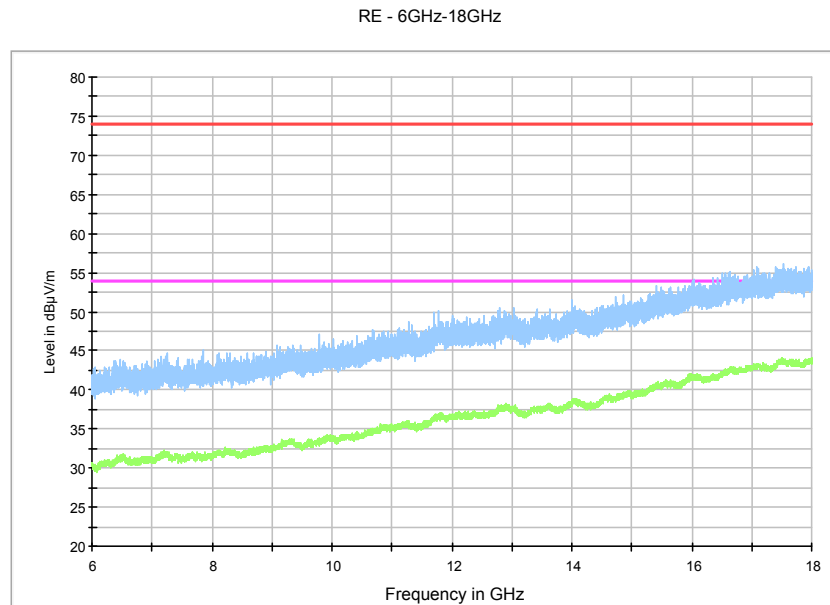


Fig. 19 Radiated Spurious Emission (802.11n-HT20, Ch157, 6 GHz-18 GHz)

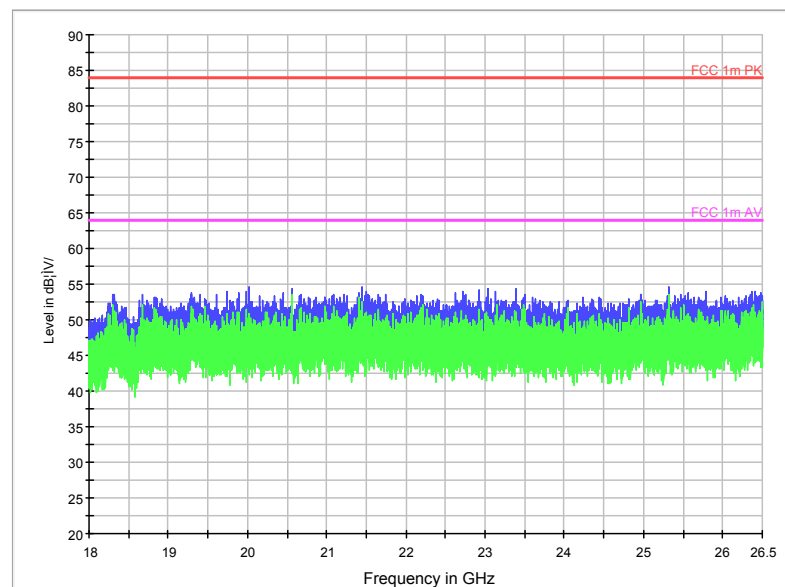


Fig. 20 Radiated Spurious Emission (802.11n-HT20, Ch157, 18 GHz-26.5 GHz)

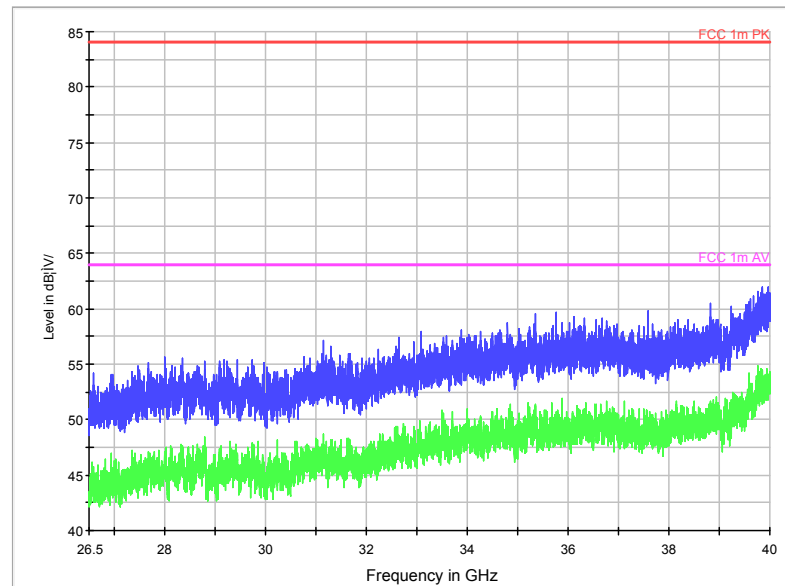


Fig. 21 Radiated Spurious Emission (802.11n-HT20, Ch157, 26.5 GHz - 40 GHz)

RE - 1GHz-3GHz

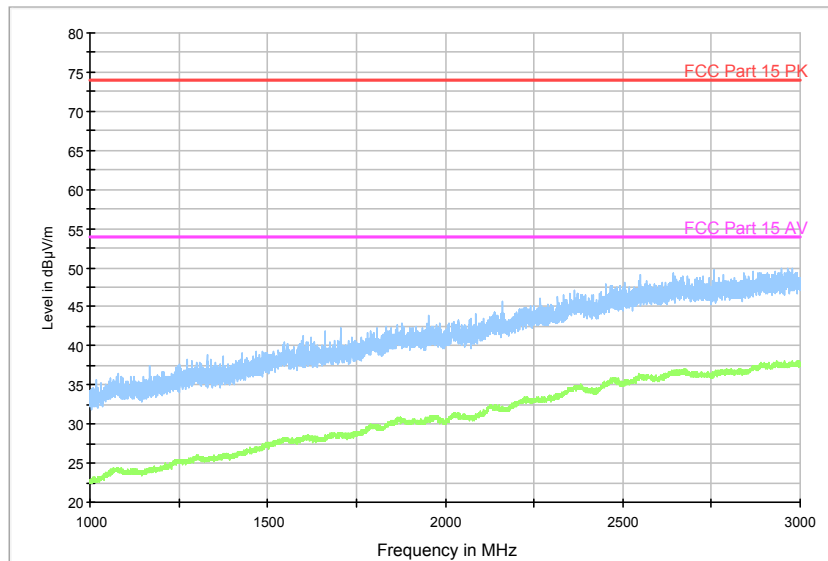
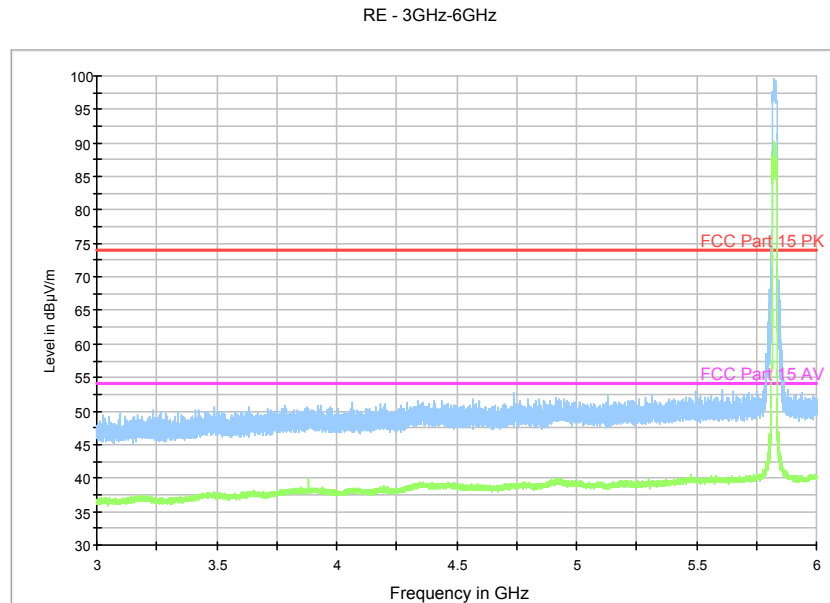


Fig. 22 Radiated Spurious Emission (802.11n-HT20, Ch165, 1 GHz-3 GHz)



Note: the spike over the limit is the WLAN carrier frequency and coming from the radio equipment.

Fig. 23 Radiated Spurious Emission (802.11n-HT20, Ch165, 3 GHz-6 GHz)

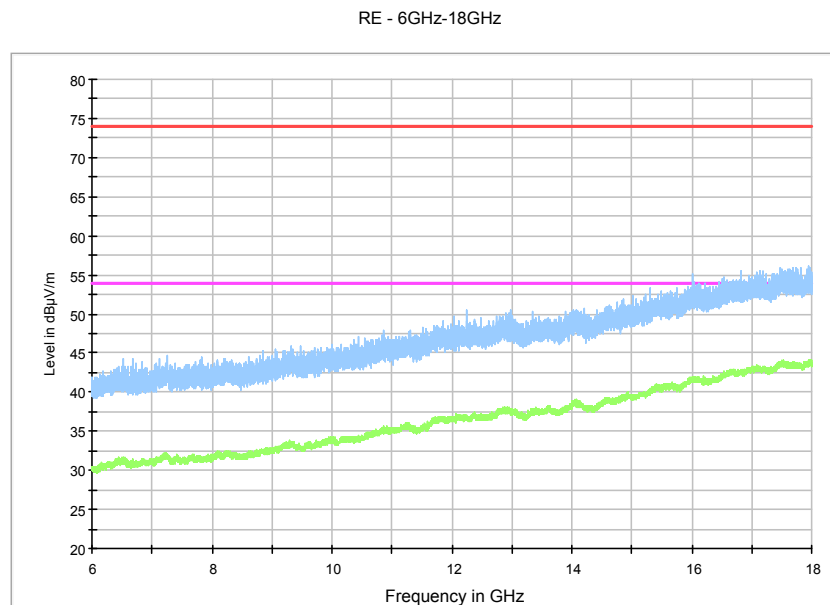


Fig. 24 Radiated Spurious Emission (802.11n-HT20, Ch165, 6 GHz-18 GHz)

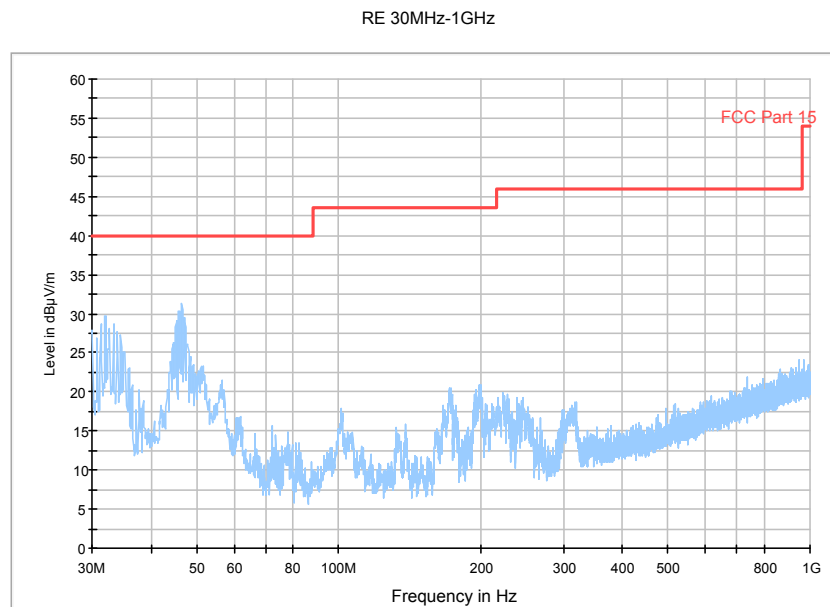


Fig. 25 Radiated Spurious Emission (802.11n-HT40, Ch149, 30 MHz-1 GHz)

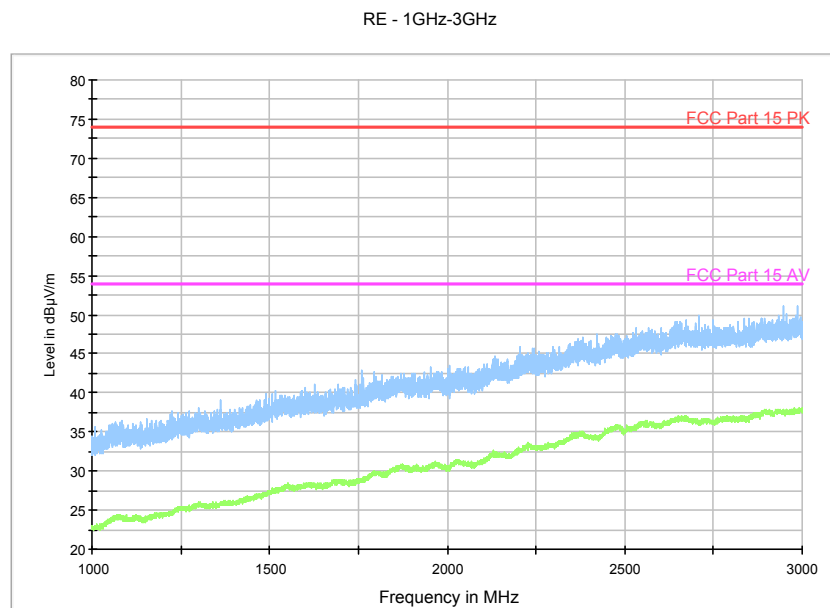
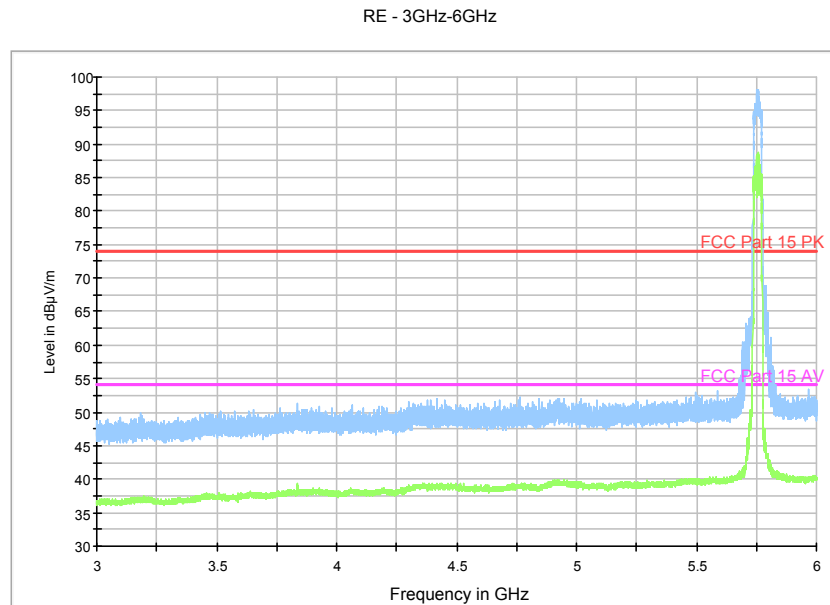


Fig. 26 Radiated Spurious Emission (802.11n-HT40, Ch149, 1 GHz-3GHz)



Note: the spike over the limit is the WLAN carrier frequency and coming from the radio equipment.

Fig. 27 Radiated Spurious Emission (802.11n-HT40, Ch149, 3 GHz-6GHz)

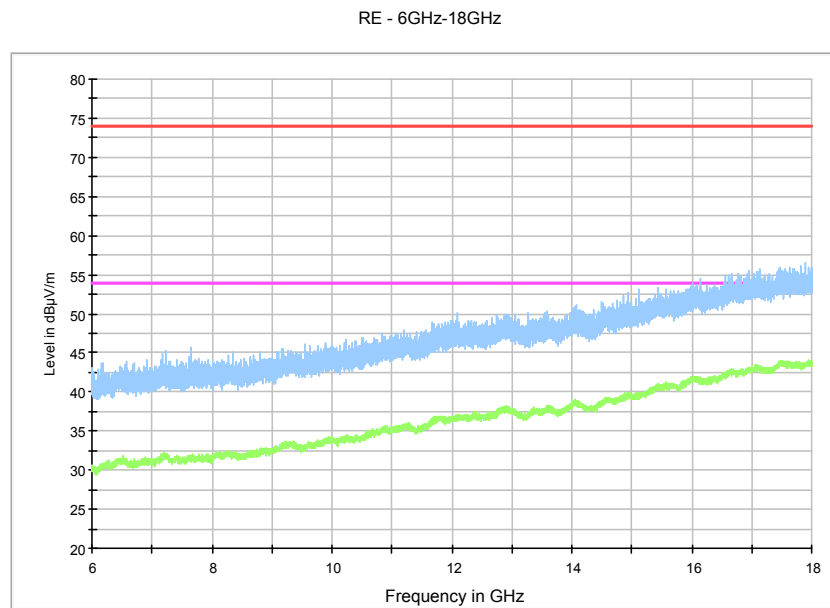


Fig. 28 Radiated Spurious Emission (802.11n-HT40, Ch149, 6 GHz-18 GHz)

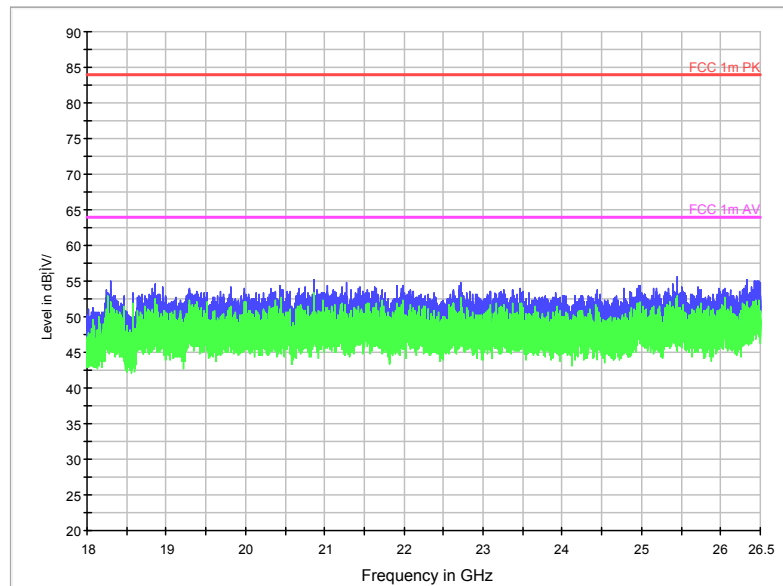


Fig. 29 Radiated Spurious Emission (802.11n-HT40, Ch149, 18 GHz-26.5 GHz)

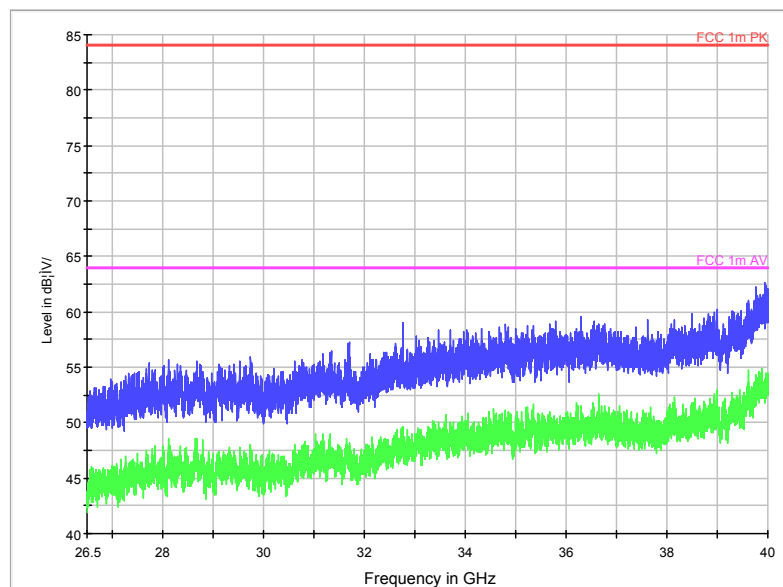


Fig. 30 Radiated Spurious Emission (802.11n-HT40, Ch149, 26.5 GHz - 40 GHz)

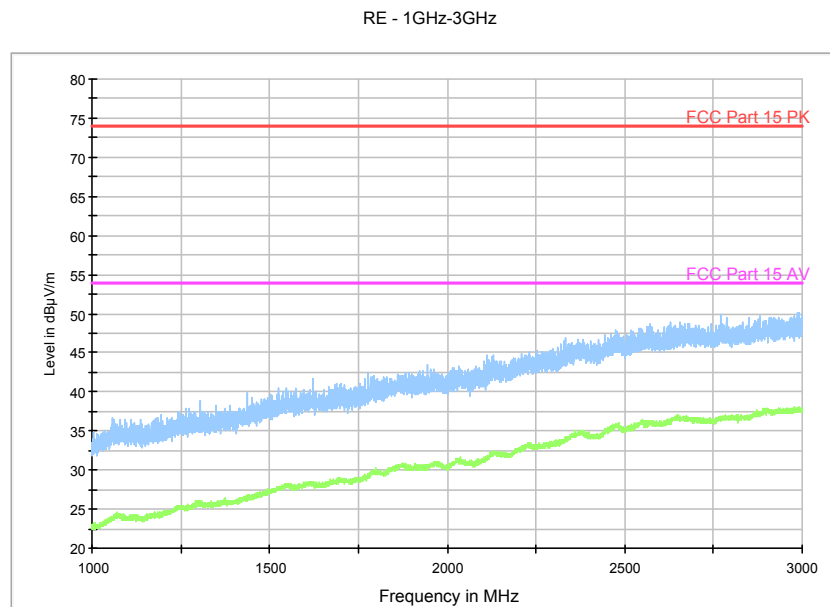
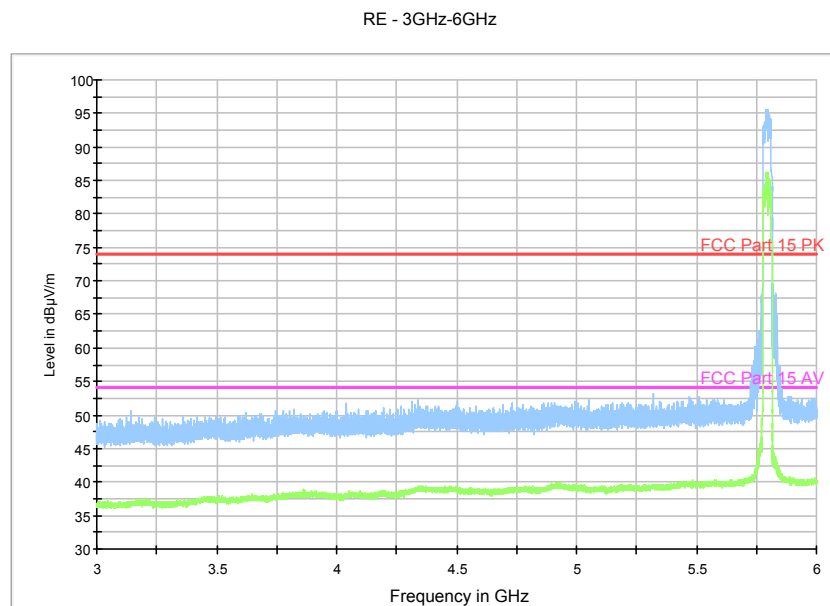


Fig. 31 Radiated Spurious Emission (802.11n-HT40, Ch157 1 GHz-3GHz)



Note: the spike over the limit is the WLAN carrier frequency and coming from the radio equipment.

Fig. 32 Radiated Spurious Emission (802.11n-HT40, Ch157 3 GHz-6GHz)

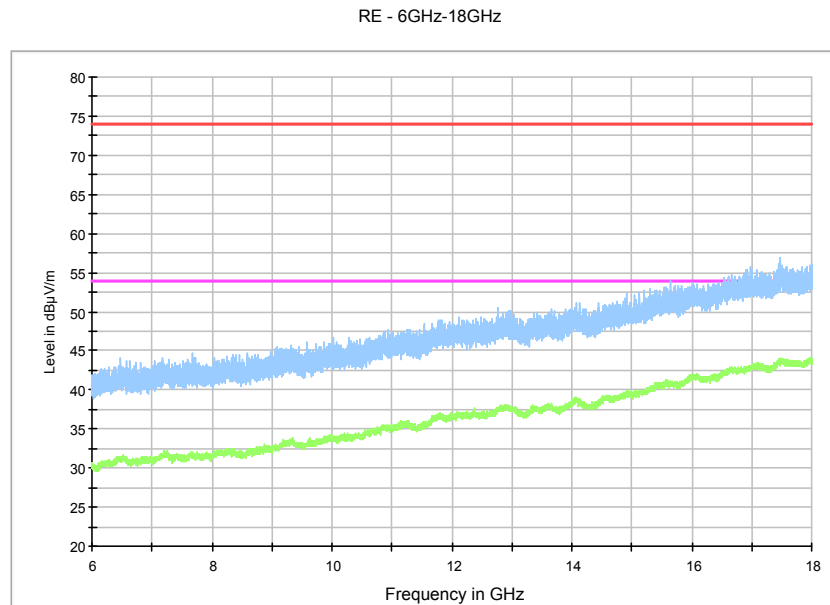


Fig. 33 Radiated Spurious Emission (802.11n-HT40, Ch157, 6 GHz-18 GHz)

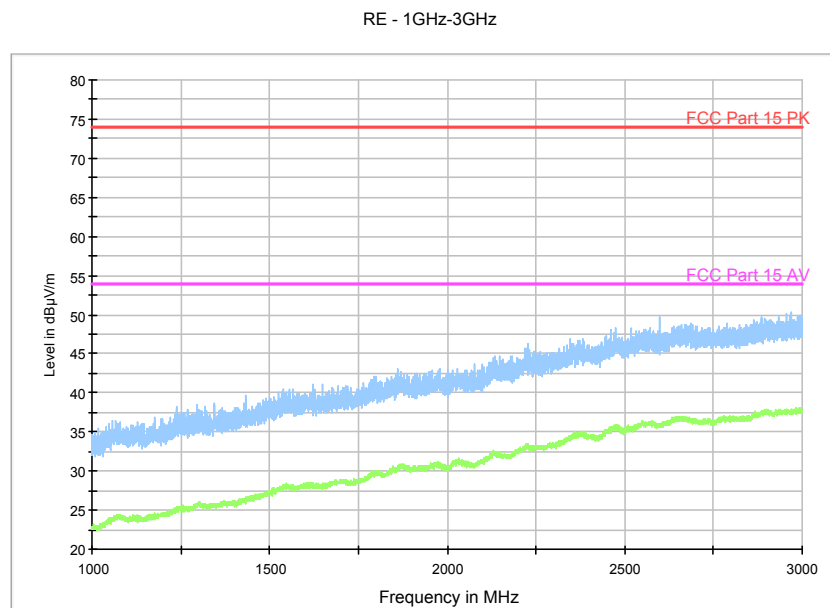
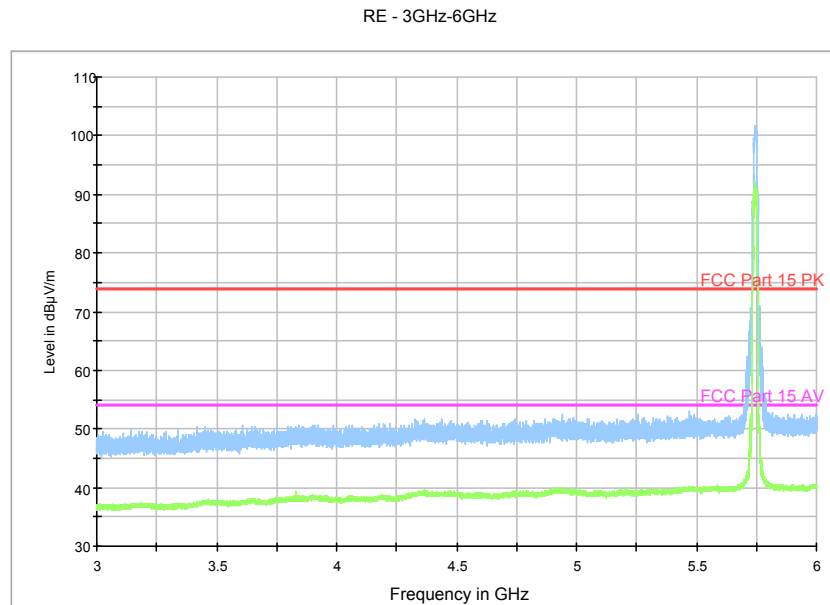


Fig. 34 Radiated Spurious Emission (802.11ac-HT20, Ch149, 1 GHz-3 GHz)



Note: the spike over the limit is the WLAN carrier frequency and coming from the radio equipment.

Fig. 35 Radiated Spurious Emission (802.11ac-HT20, Ch149, 3 GHz-6 GHz)

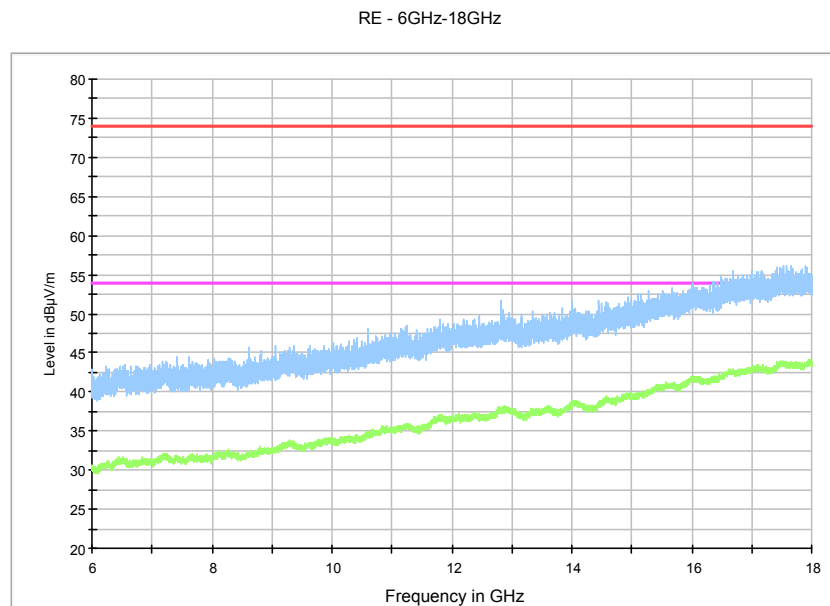


Fig. 36 Radiated Spurious Emission (802.11ac-HT20, Ch149, 6 GHz-18 GHz)

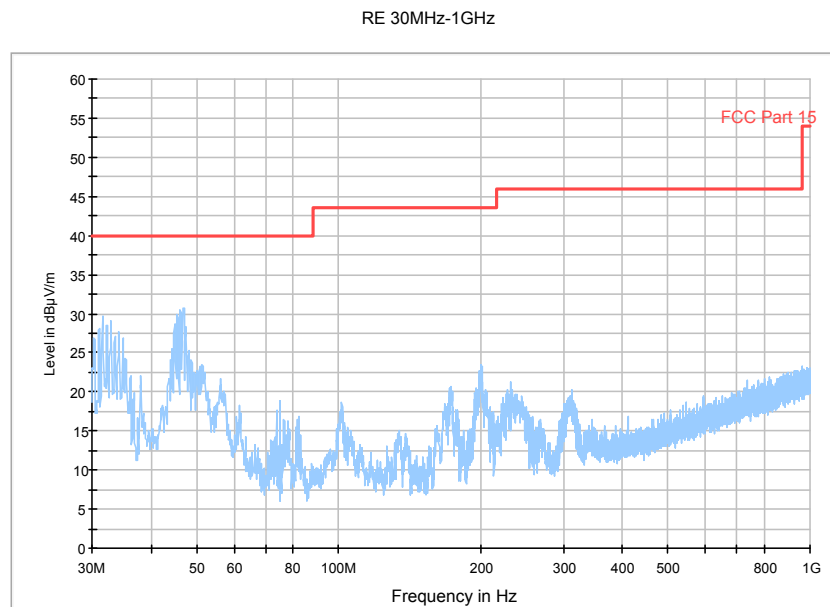


Fig. 37 Radiated Spurious Emission (802.11ac-HT20, Ch157, 30 MHz-1 GHz)

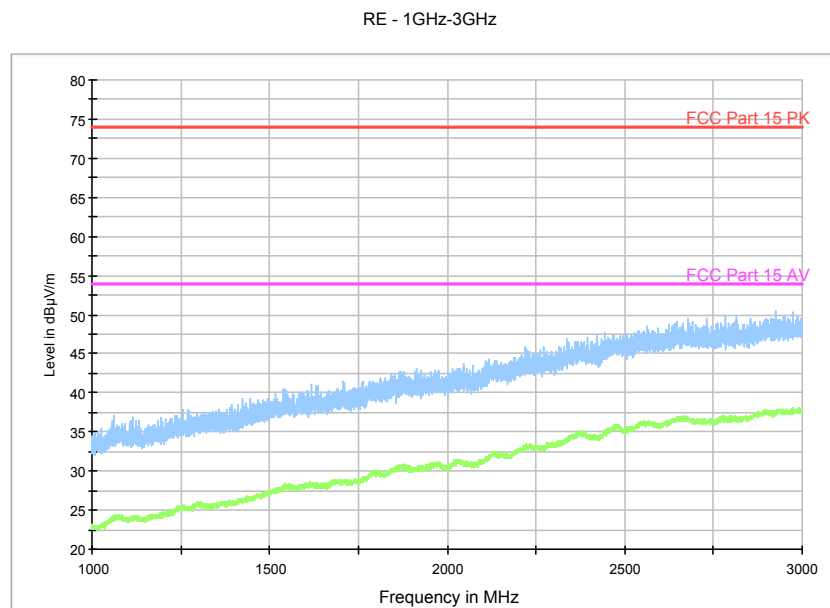
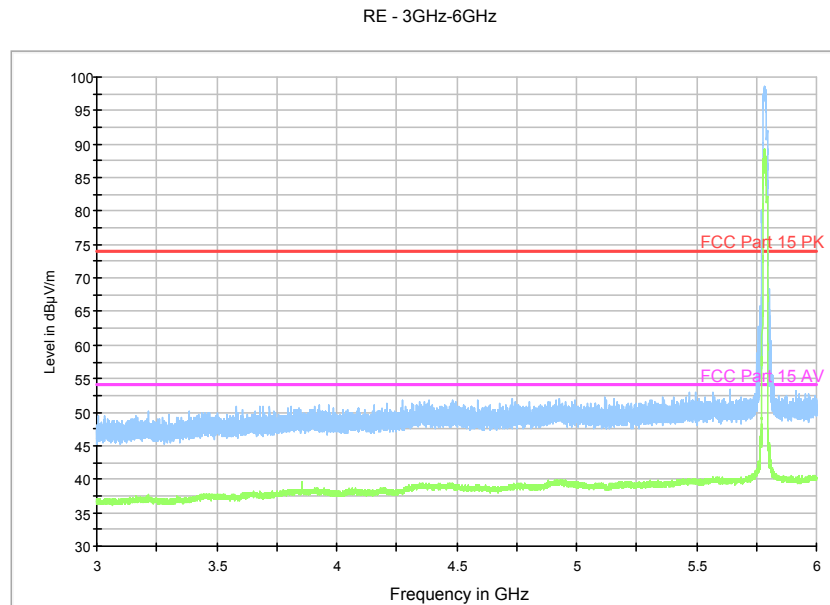


Fig. 38 Radiated Spurious Emission (802.11ac-HT20, Ch157, 1 GHz-3 GHz)



Note: the spike over the limit is the WLAN carrier frequency and coming from the radio equipment.

Fig. 39 Radiated Spurious Emission (802.11ac-HT20, Ch157, 3 GHz-6 GHz)

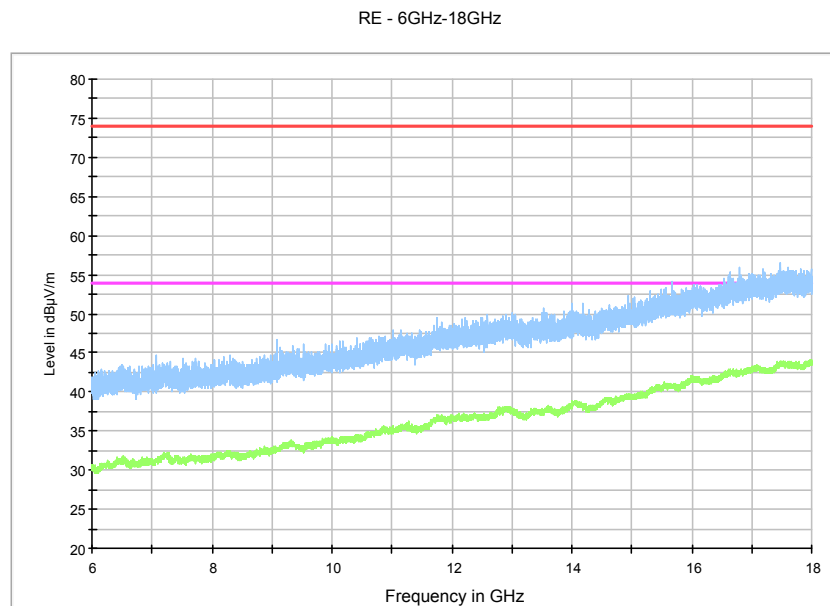


Fig. 40 Radiated Spurious Emission (802.11ac-HT20, Ch157, 6 GHz-18 GHz)

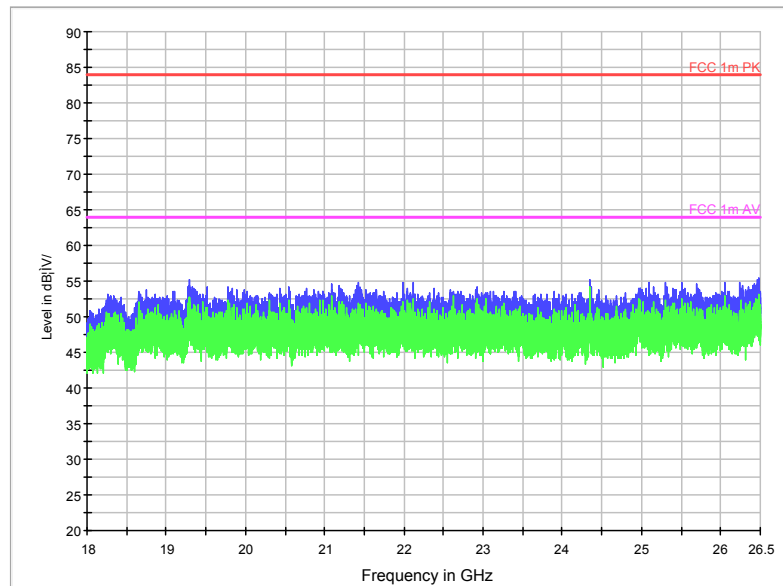


Fig. 41 Radiated Spurious Emission (802.11ac-HT20, Ch157, 18 GHz-26.5 GHz)

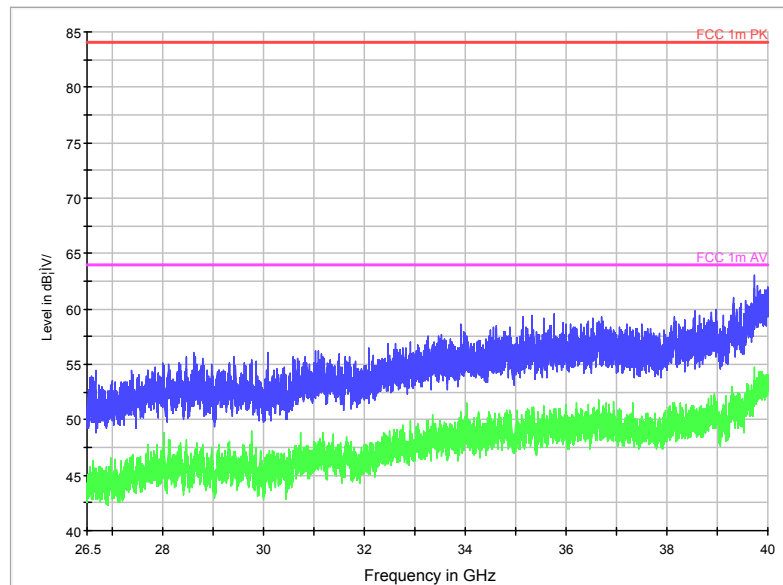


Fig. 42 Radiated Spurious Emission (802.11ac-HT20, Ch157, 26.5 GHz - 40 GHz)

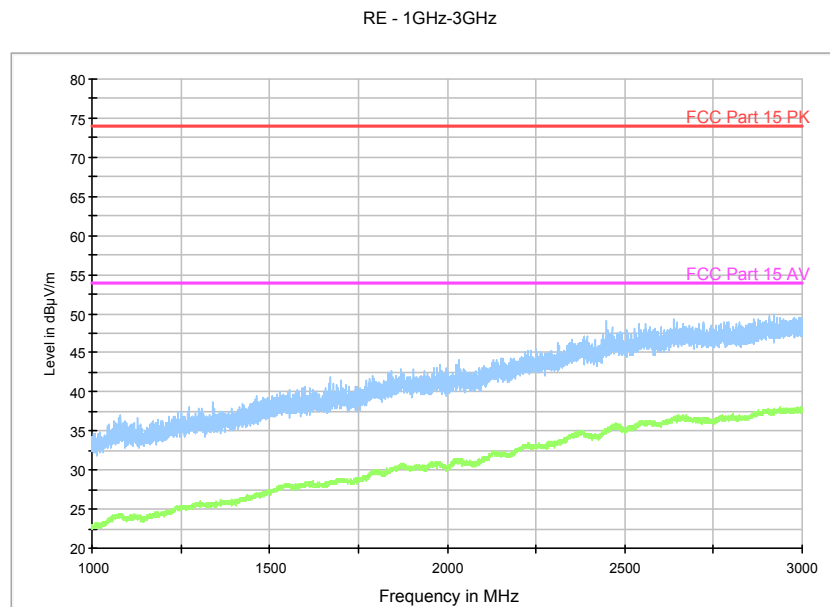
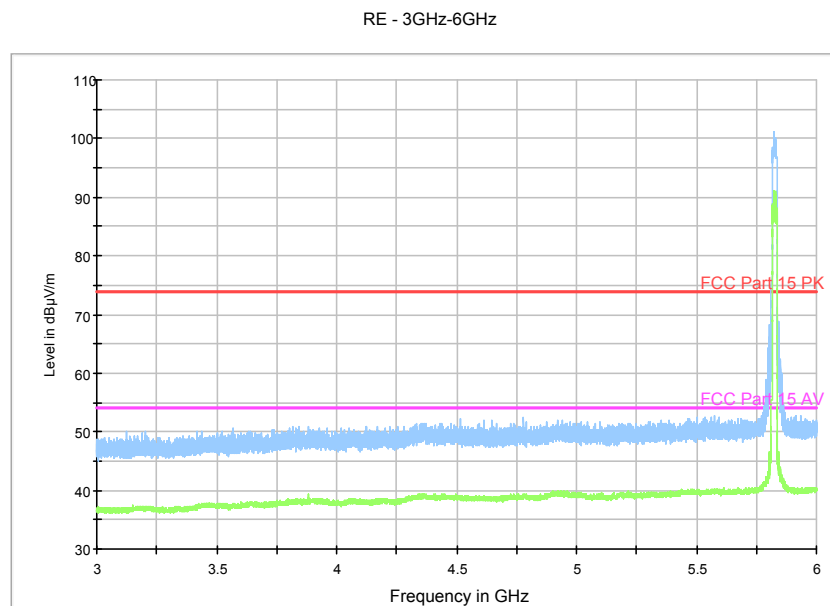


Fig. 43 Radiated Spurious Emission (802.11ac-HT20, Ch165, 1 GHz-3 GHz)



Note: the spike over the limit is the WLAN carrier frequency and coming from the radio equipment.

Fig. 44 Radiated Spurious Emission (802.11ac-HT20, Ch165, 3 GHz-6 GHz)

RE - 6GHz-18GHz

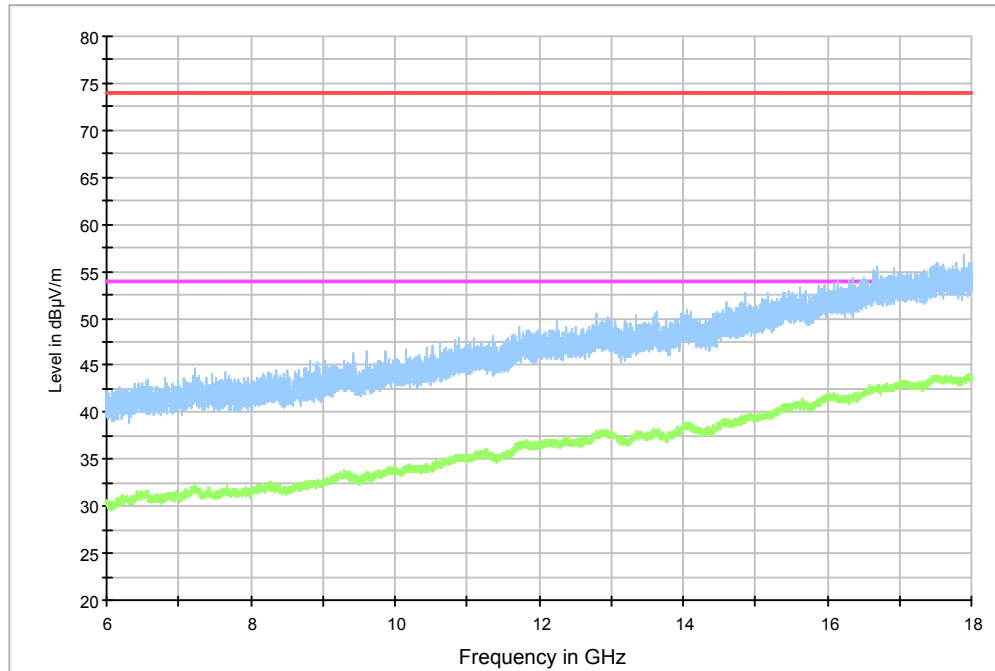


Fig. 45 Radiated Spurious Emission (802.11ac-HT20, Ch165, 6 GHz-18 GHz)

RE 30MHz-1GHz

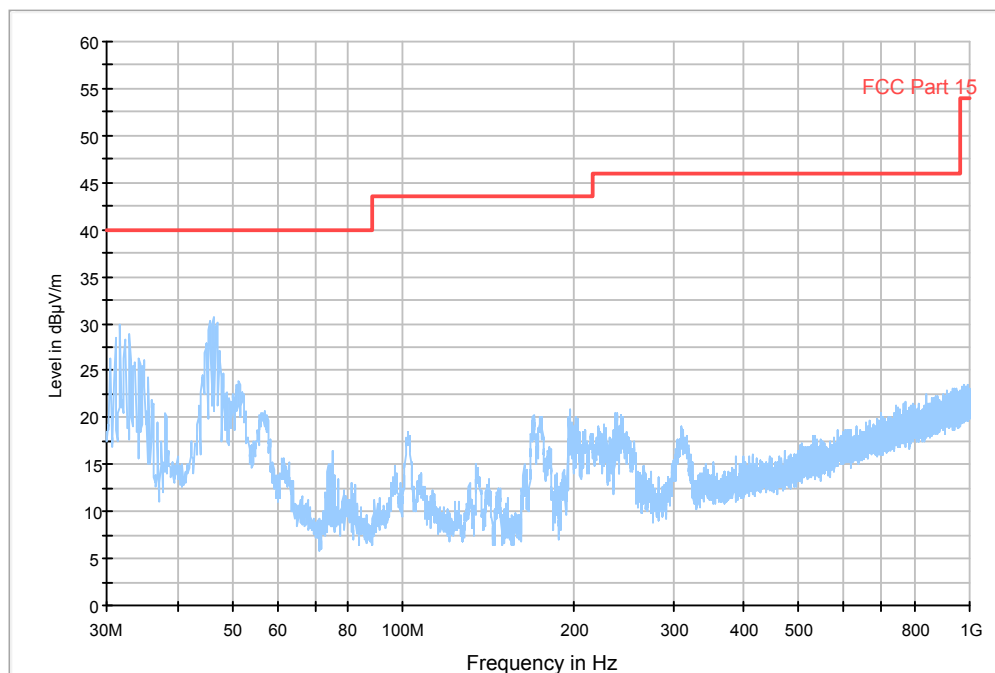


Fig. 46 Radiated Spurious Emission (802.11ac-HT40, Ch149, 30 MHz-1 GHz)

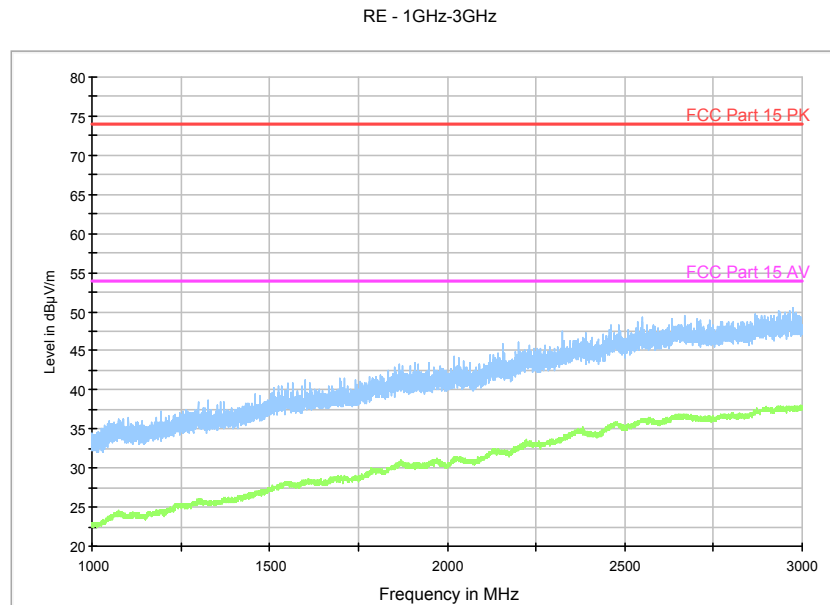
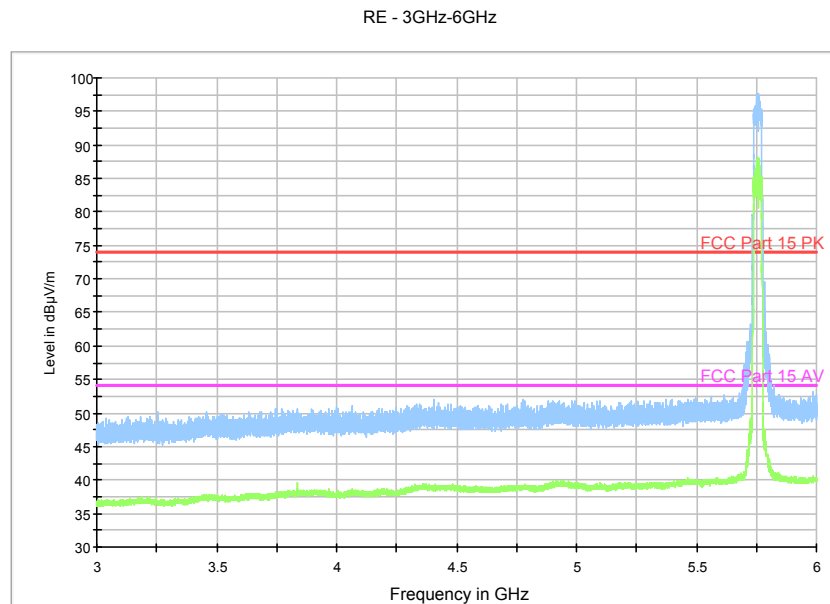


Fig. 47 Radiated Spurious Emission (802.11ac-HT40, Ch149, 1 GHz-3GHz)



Note: the spike over the limit is the WLAN carrier frequency and coming from the radio equipment.

Fig. 48 Radiated Spurious Emission (802.11ac-HT40, Ch149, 3 GHz-6GHz)

RE - 6GHz-18GHz

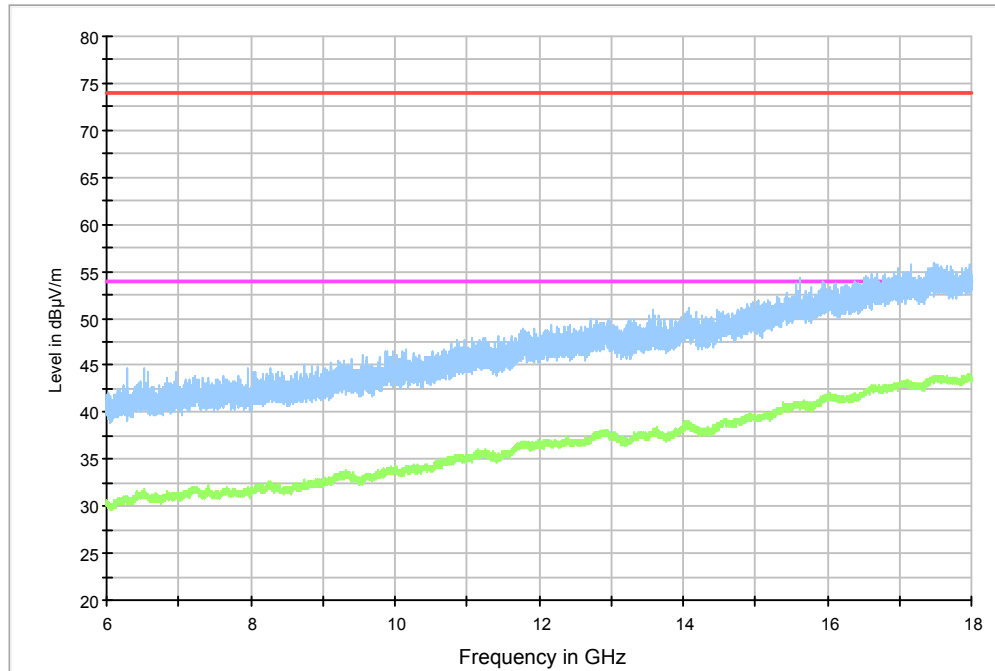


Fig. 49 Radiated Spurious Emission (802.11ac-HT40, Ch149, 6 GHz-18 GHz)

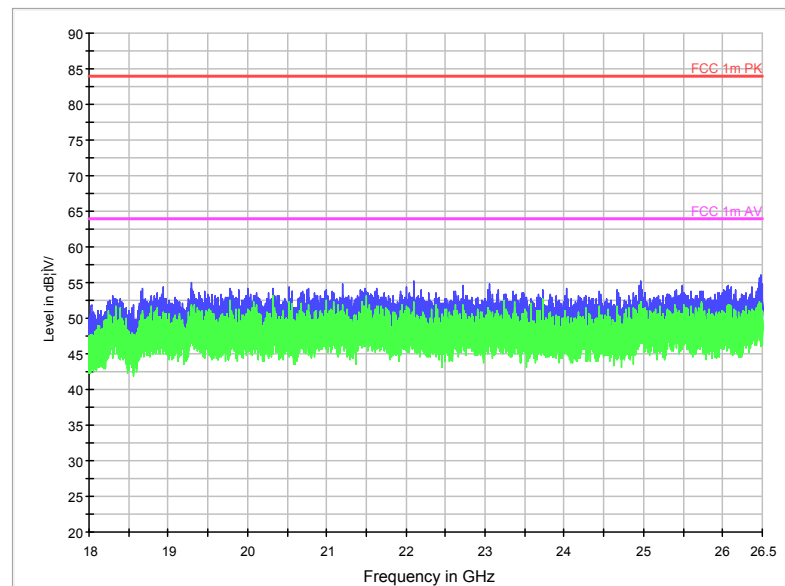


Fig. 50 Radiated Spurious Emission (802.11ac-HT40, Ch149, 18 GHz-26.5 GHz)

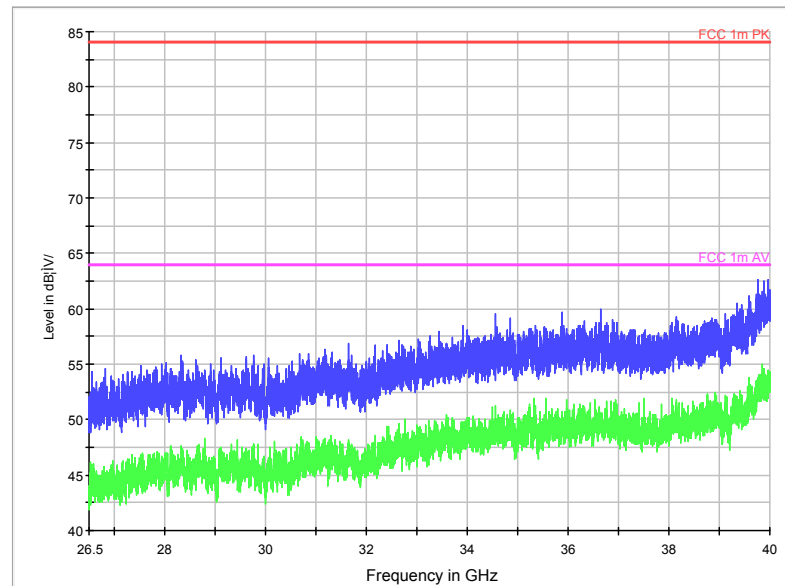


Fig. 51 Radiated Spurious Emission (802.11ac-HT40, Ch149, 26.5 GHz - 40 GHz)

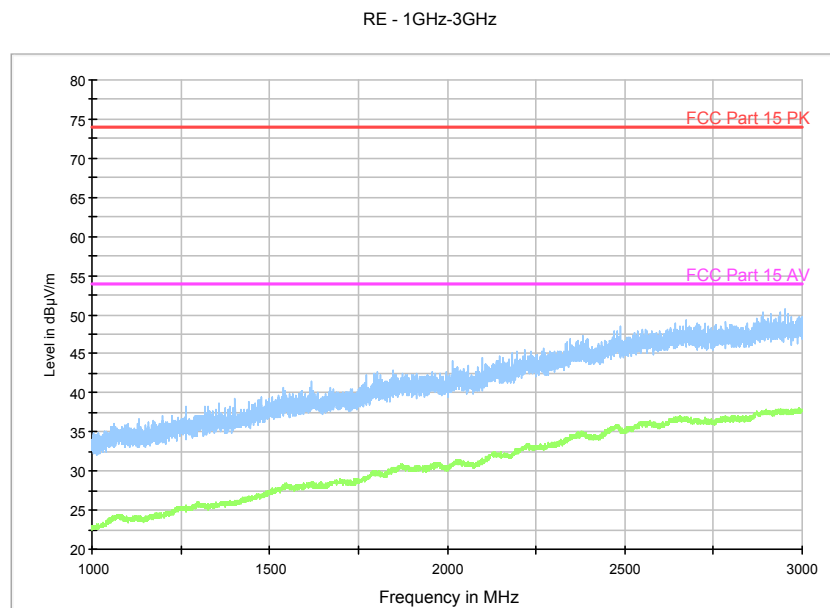
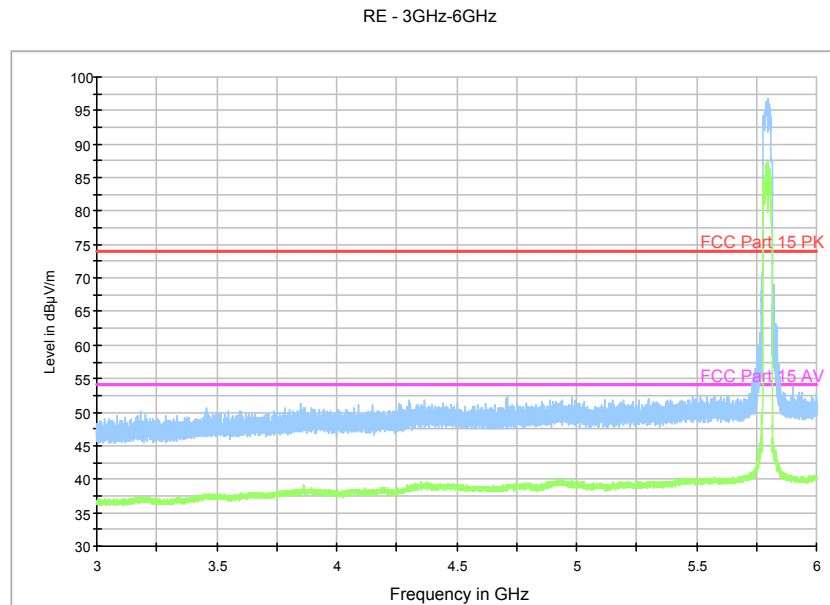


Fig. 52 Radiated Spurious Emission (802.11ac-HT40, Ch157 1 GHz-3GHz)



Note: the spike over the limit is the WLAN carrier frequency and coming from the radio equipment.

Fig. 53 Radiated Spurious Emission (802.11ac-HT40, Ch157 3 GHz-6GHz)

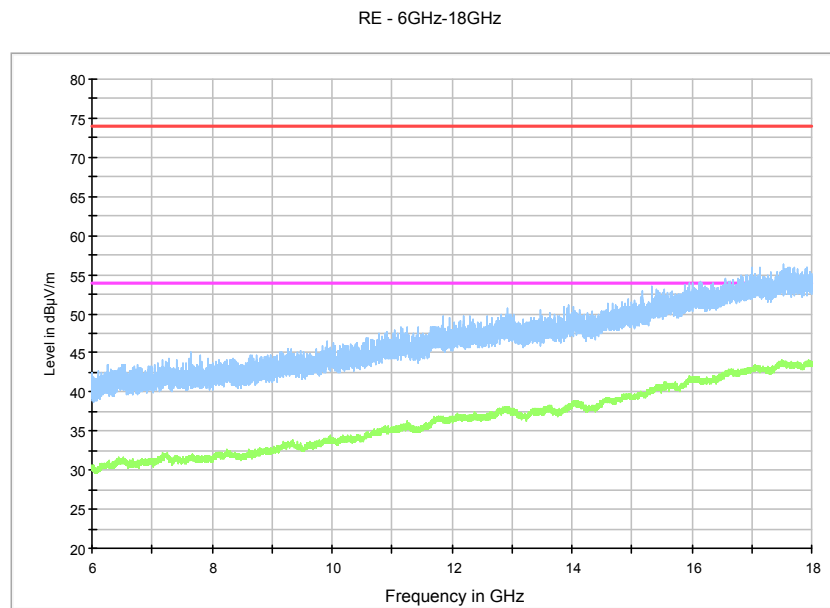


Fig. 54 Radiated Spurious Emission (802.11ac-HT40, Ch157, 6 GHz-18 GHz)

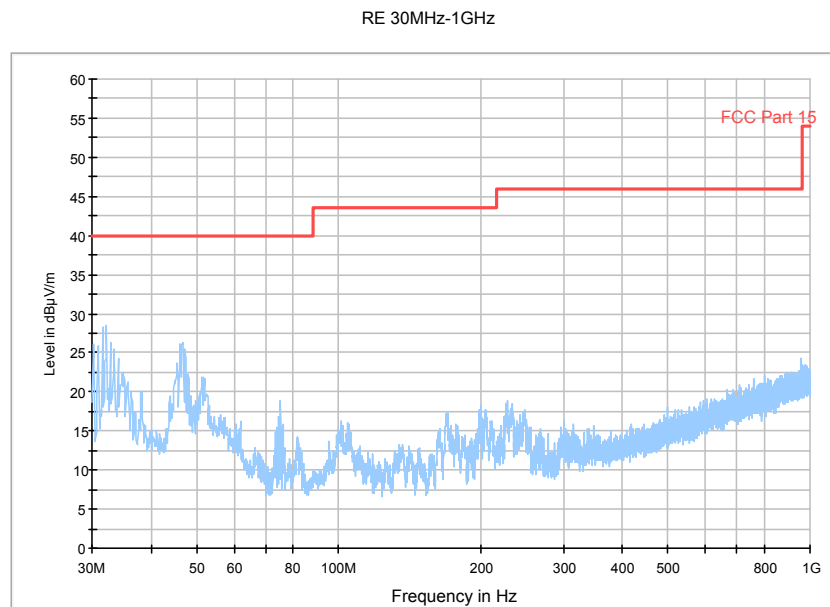


Fig. 55 Radiated Spurious Emission (802.11ac-HT80, Ch149, 30 MHz-1 GHz)

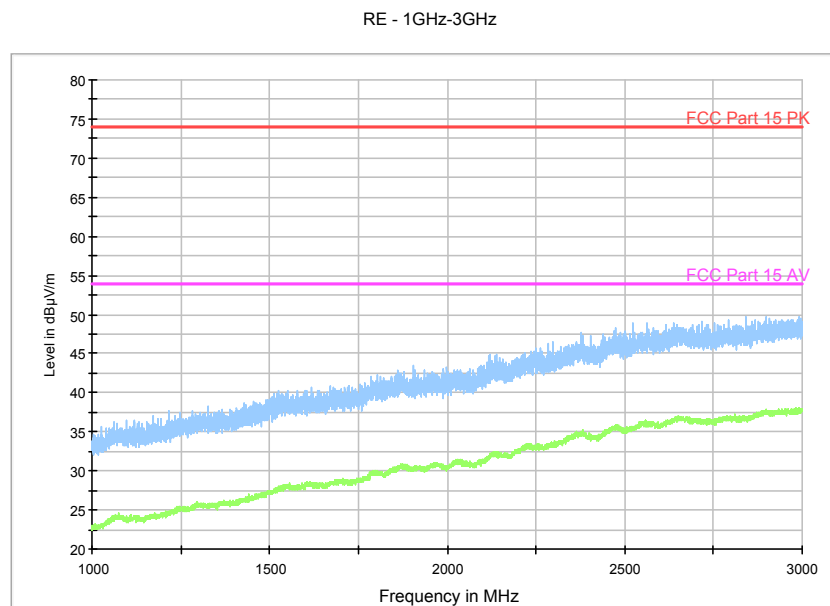
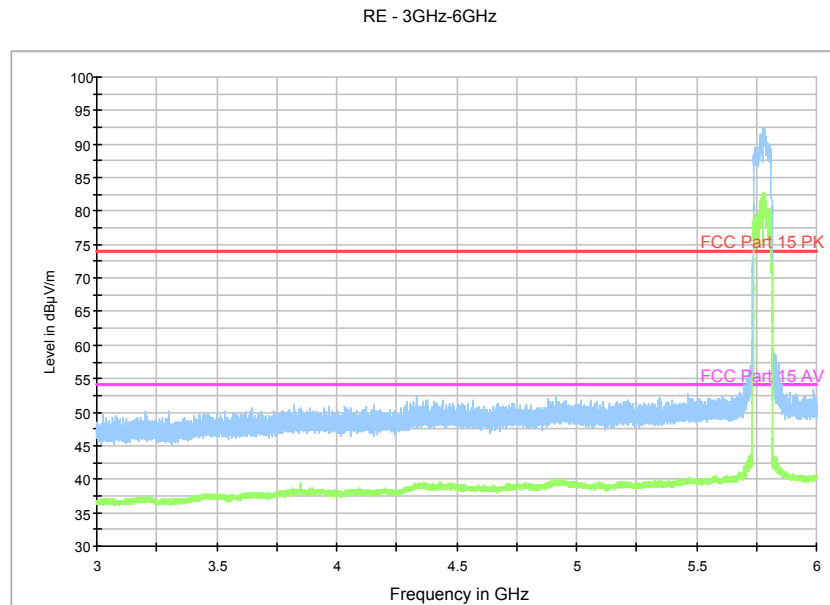


Fig. 56 Radiated Spurious Emission (802.11ac-HT80, Ch149, 1 GHz-3GHz)



Note: the spike over the limit is the WLAN carrier frequency and coming from the radio equipment.

Fig. 57 Radiated Spurious Emission (802.11ac-HT80, Ch149, 3 GHz-6GHz)

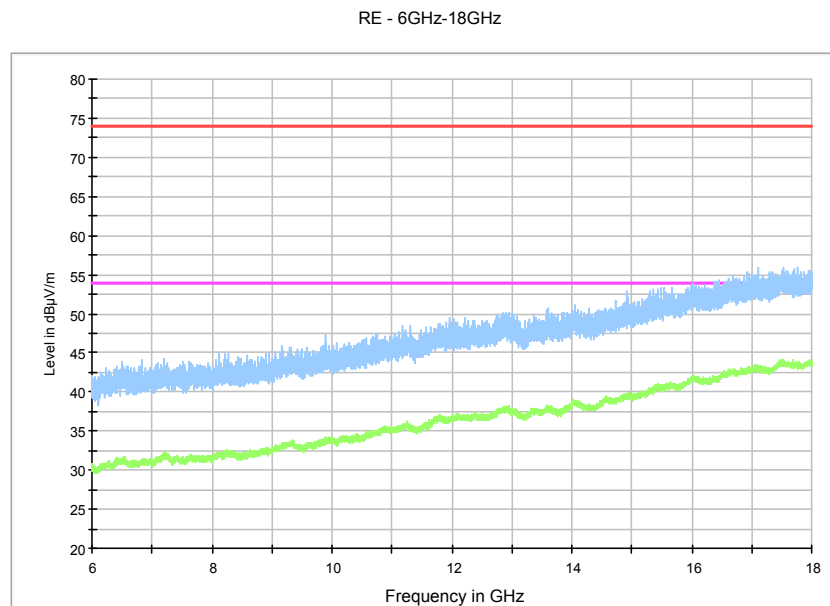


Fig. 58 Radiated Spurious Emission (802.11ac-HT80, Ch149, 6 GHz-18 GHz)

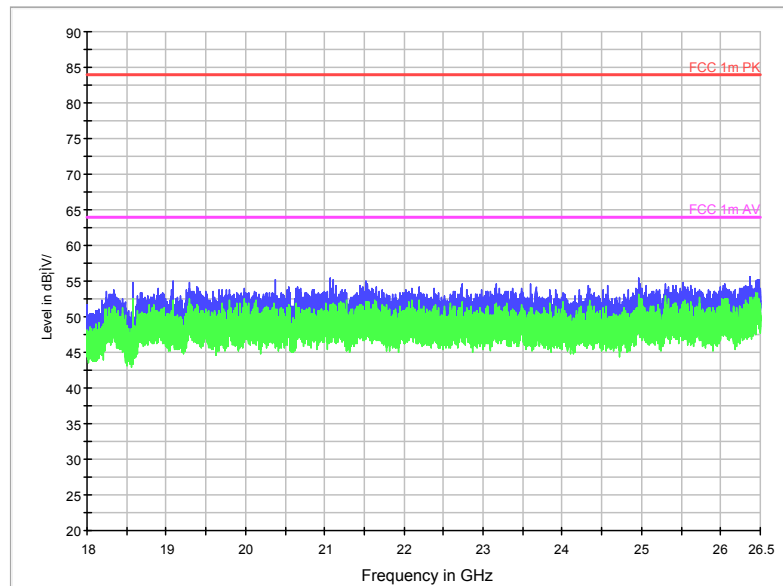


Fig. 59 Radiated Spurious Emission (802.11ac-HT80, Ch149, 18 GHz-26.5 GHz)

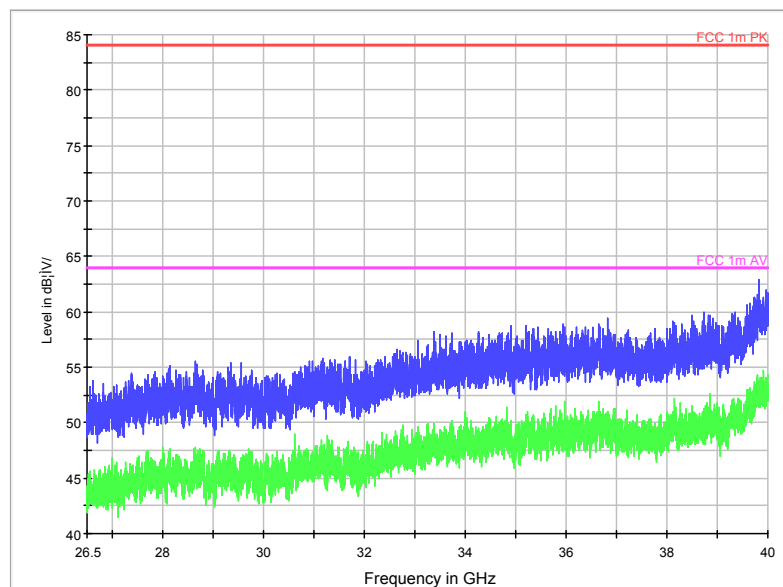


Fig. 60 Radiated Spurious Emission (802.11ac-HT80, Ch149, 26.5 GHz - 40 GHz)

A.3. Band Edges Compliance

Measurement Limit:

Standard	Limit (dB μ V/m)	
FCC 47 CFR Part 15.209	Peak	74
	Average	54

The measurement is made according to KDB 789033 D02

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) (see § 15.205(c)).

Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5745 MHz	Fig.61	P
	5825 MHz	Fig.62	P
802.11n HT20	5745 MHz	Fig.63	P
	5825 MHz	Fig.64	P
802.11n HT40	5755 MHz	Fig.65	P
	5795 MHz	Fig.66	P
802.11ac HT20	5745 MHz	Fig.67	P
	5825 MHz	Fig.68	P
802.11ac HT40	5755 MHz	Fig.69	P
	5795 MHz	Fig.70	P

Conclusion: PASS

Test graphs as below:

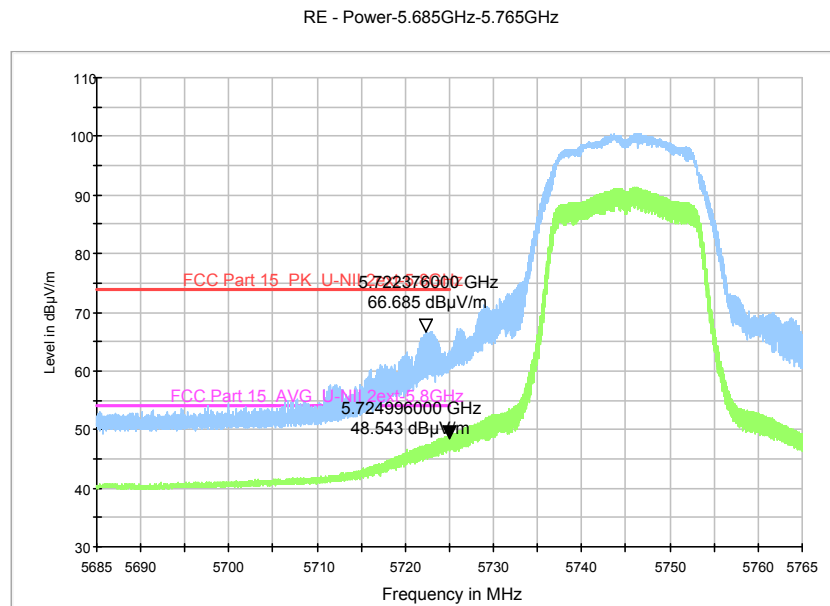


Fig. 61 Band Edges (802.11a, 5745MHz)

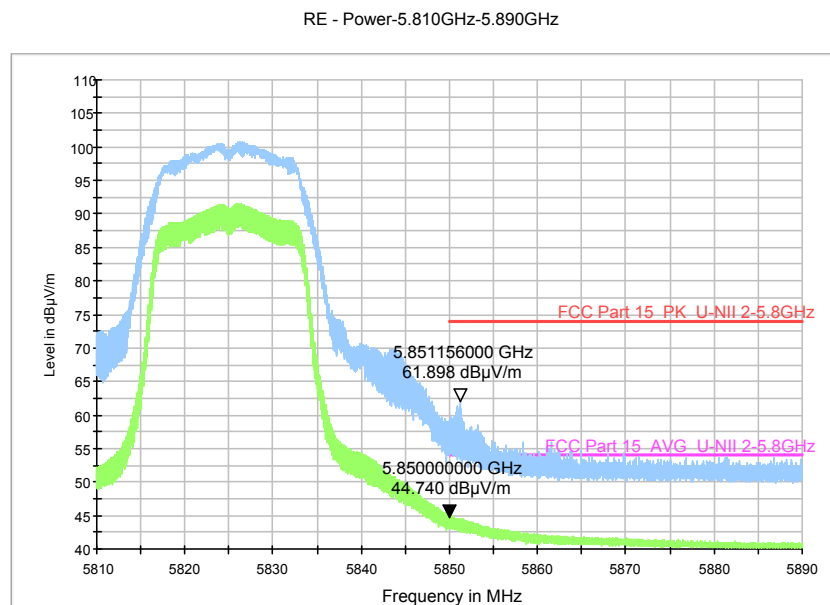


Fig. 62 Band Edges (802.11a, 5825MHz)

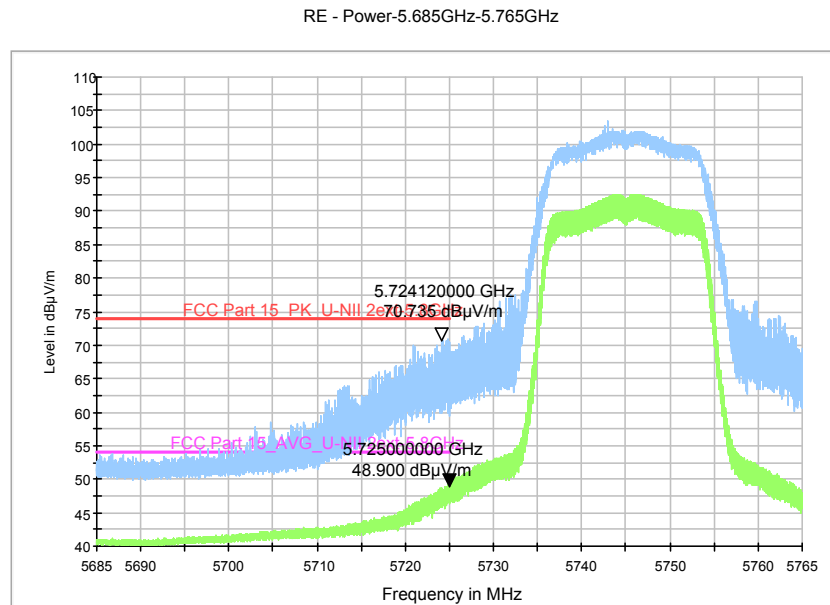


Fig. 63 Band Edges (802.11n-HT20, 5745MHz)

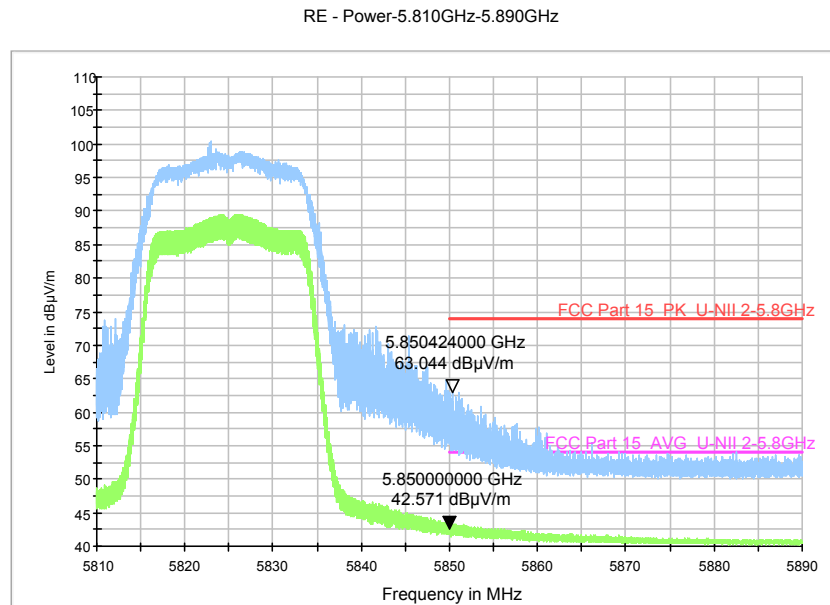


Fig. 64 Band Edges (802.11n-HT20, 5825MHz)

RE - Power-5.685GHz-5.765GHz

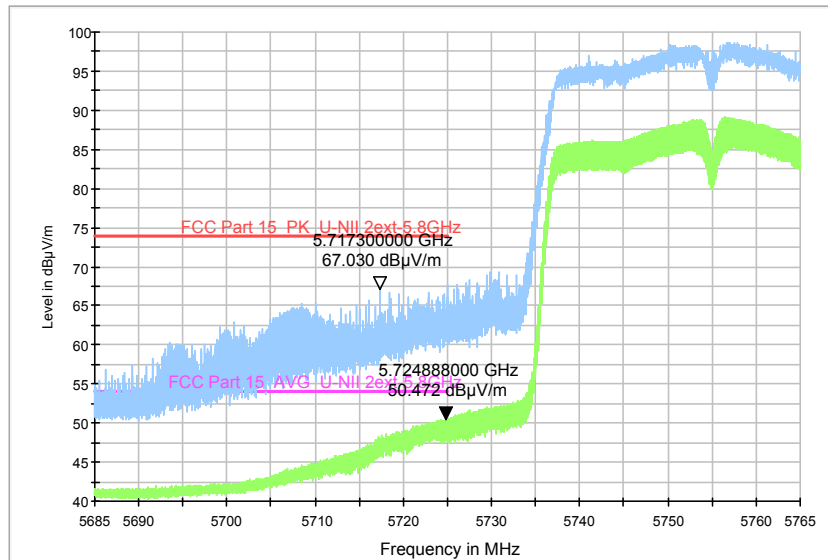


Fig. 65 Band Edges (802.11n-HT40, 5755MHz)

RE - Power-5.810GHz-5.890GHz

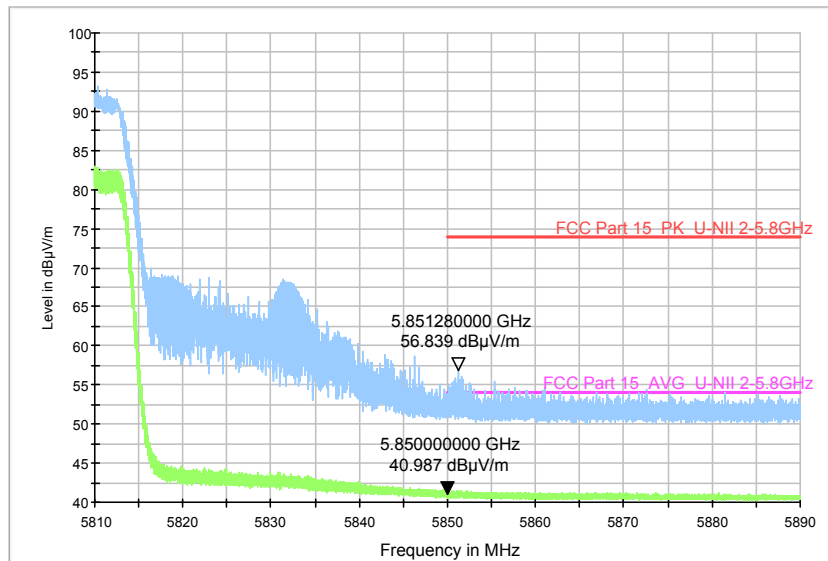


Fig. 66 Band Edges (802.11n-HT40, 5795MHz)

RE - Power-5.685GHz-5.765GHz

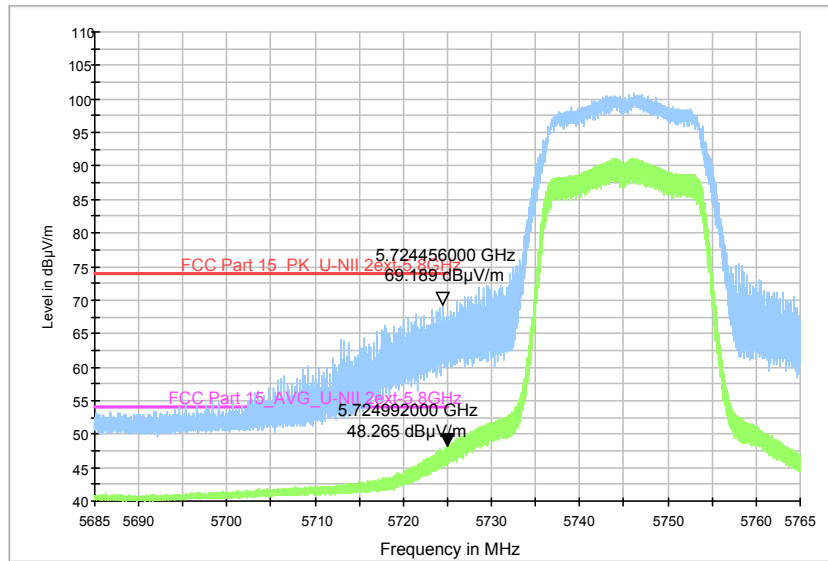


Fig. 67 Band Edges (802.11ac-HT20, 5745MHz)

RE - Power-5.810GHz-5.890GHz

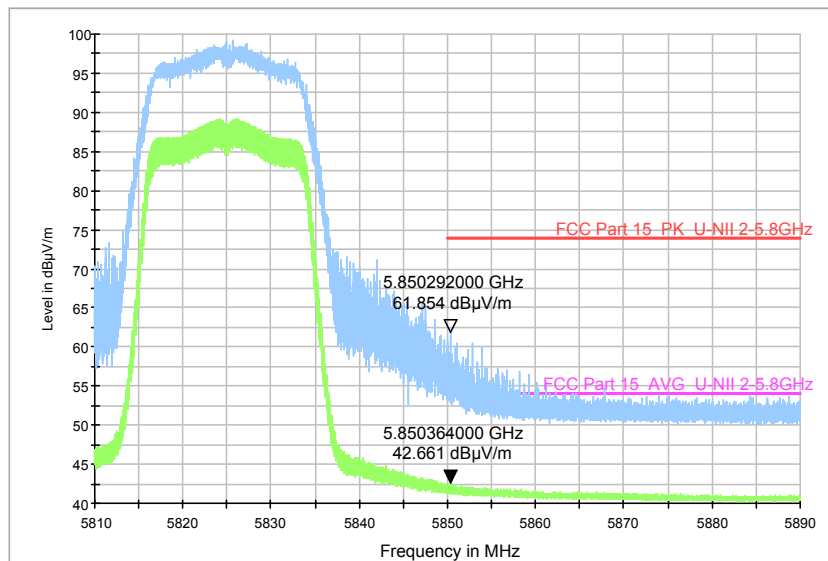


Fig. 68 Band Edges (802.11ac-HT20, 5825MHz)

RE - Power-5.685GHz-5.765GHz

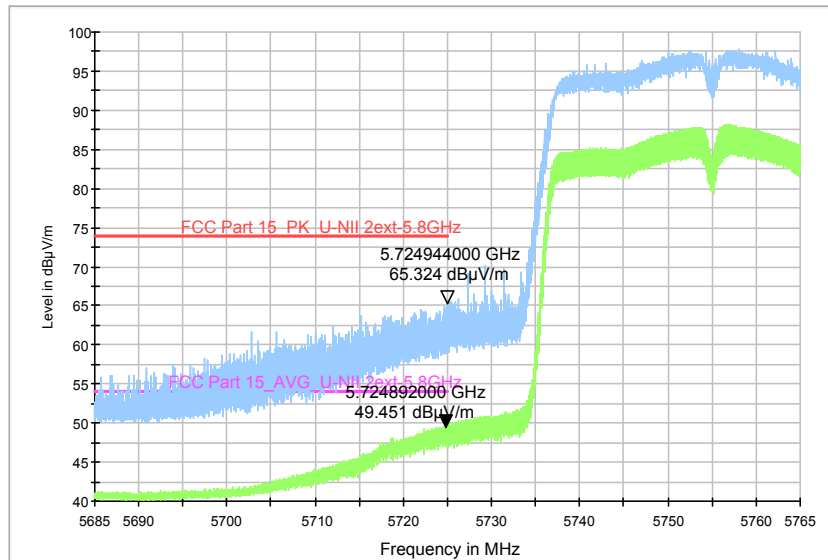


Fig. 69 Band Edges (802.11ac-HT40, 5755MHz)

RE - Power-5.810GHz-5.890GHz

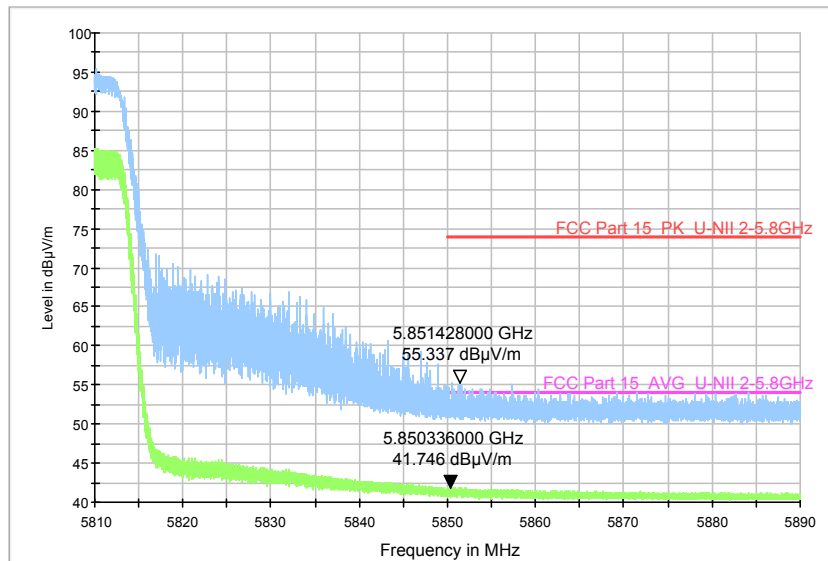


Fig. 70 Band Edges (802.11ac-HT40, 5795MHz)

A.4. Spurious Emissions Radiated < 30MHz

Measurement Limit (15.209):

Frequency (MHz)	Field strength($\mu\text{V/m}$)	Measurement distance(m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

The measurement is made according to KDB 789033.

Note: The measurement distance during the test is 3m. The limit used in plots is recalculated based on the extrapolation factor of 40 dB/decade.

Measurement uncertainty:

Expanded measurement uncertainty for this test item is $U = 2.6\text{dB}$, $k=2$.

Measurement Results:

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	157(5785MHz)	9 kHz ~30 MHz	Fig.71	P

Conclusion: PASS

Test graphs as below:

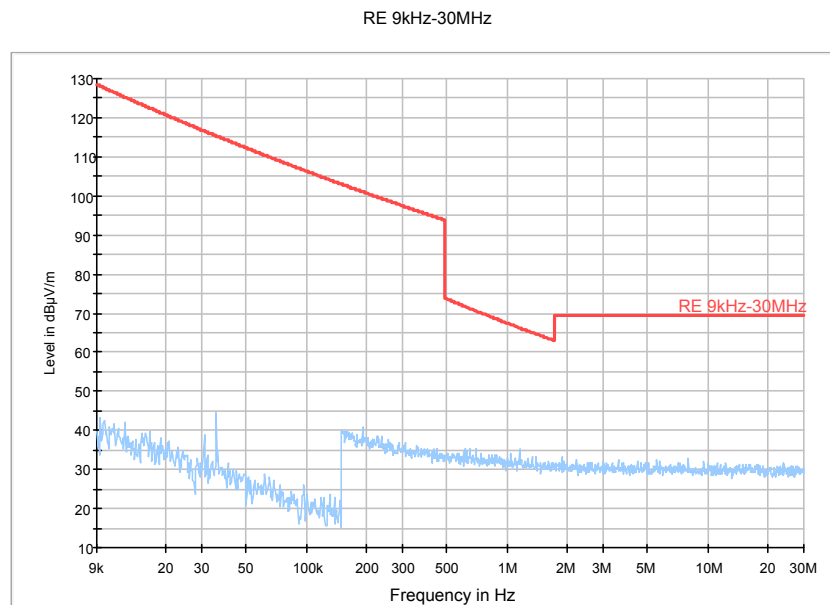


Fig. 71 Radiated Spurious Emission (802.11a, ch157, 9 kHz ~30 MHz)

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