



FCC PART 15C TEST REPORT No. I16Z40476-EMC04

for

OnePlus Technology(Shenzhen) Co., Ltd.

Mobile Phone

Model name: ONEPLUS A3000

With

FCC ID: 2ABZ2-A3000

Hardware Version: 16

Software Version: Qxygen OS 3.1.0

Issued Date: 2016-05-05



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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REPORT HISTORY

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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

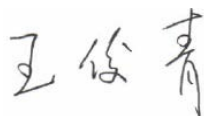
1.2. Testing Environment

Normal Temperature: 15-35℃
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2016-04-20
Testing End Date: 2016-05-04

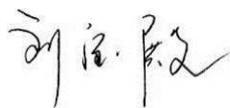
1.4. Signature



Wang Junqing
(Prepared this test report)



Qu Pengfei
(Reviewed this test report)



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(Approved this test report)



2. CLIENT INFORMATION

2.1. Applicant Information

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2.2. Manufacturer Information

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Country: China
Contact Person: Kevin Ke
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Fax: /

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

3.1. About EUT

Description	Mobile Phone
Model name	ONEPLUS A3000
FCC ID	2ABZ2-A3000
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
EUT3	860152030018277	16	Qxygen OS 3.1.0

*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	Note
AE1	Battery	/	inbuilt
AE2	USB cable	/	1640476DC001
AE3	Travel charger	/	1640476CH002

AE1

Model	/
Manufacturer	/
Capacitance	mAh
Nominal voltage	V

AE2

Model	/
Manufacturer	/
Length of cable	105cm

AE3

Model	HK0504
Manufacturer	HUNTKEY
Length of cable	/

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

3.4. General Description

Equipment Under Test (EUT) is model of Mobile Phone with integrated antenna and inbuilt battery. It supports GSM 850/1900MHz bands, WCDMA Bands 2/4/5 and LTE FDD Band2/4/5/7/12/17/30 and LTE TDD Band41. It also supports GPRS service with multi-slots class 33 and EGPRS class33. The HSDPA, HSUPA, HSPA+ and DC-HSDPA services are also supported.

It has MP3, Camera, FM radio, USB, Bluetooth (EDR and LE), WLAN (802.11a/b/g/n/ac, 11n 20MHz and 40MHz, 11ac 20MHz, 40MHz and 80MHz) and GPS functions.

Manual and specifications of the EUT were provided to fulfill 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.2	EUT3+ 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:	
FCC Part15	15.205 Restricted bands of operation;	2015
	15.209 Radiated emission limits, general requirements;	
	15.407 General technical requirements.	
ANSI C63.10	Methods of Measurement of Radio-Noise Emissions from	2013
	Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	

5. LABORATORY ENVIRONMENT

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 Part15	Sub-clause of IC	Verdict
Band Edges Compliance	15.407, 15.209	/	P
Transmitter Spurious Emission - Radiated	15.407, 15.205, 15.209	/	P
Transmitter Spurious Emission - Radiated < 30MHz	15.407, 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/manufacturer 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°C~35°C
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

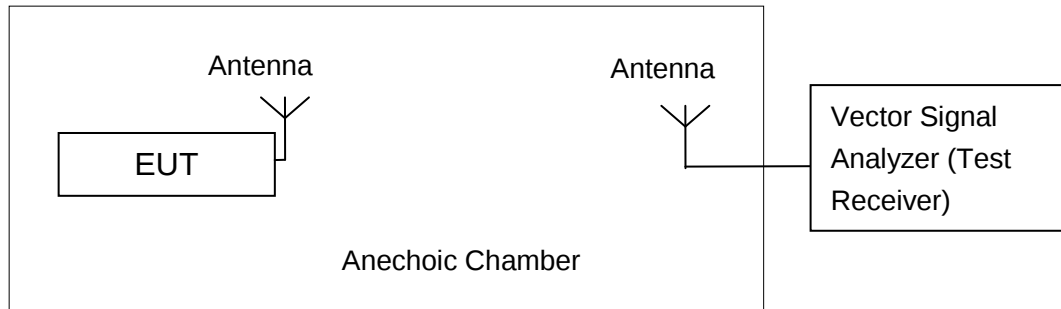
ANNEX A: MEASUREMENT RESULTS

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)	151	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
	159	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)	151	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
	159	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)	155	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
5724.744	48.9	-18.2	34.8	32.264	H
17652.600	46.4	-13.0	41.2	18.205	H
17742.000	46.3	-13.0	41.2	18.105	H
17671.800	46.3	-13.0	41.2	18.105	V
17676.600	46.3	-13.0	41.2	18.105	V
17721.600	46.3	-13.0	41.2	18.105	V

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.976	62.0	-18.2	34.8	45.364	H
17569.200	58.3	-14.9	41.2	32.018	H
17170.800	58.2	-15.1	41.4	31.893	V
17301.600	58.2	-13.9	41.2	30.923	H
17475.600	57.9	-14.9	41.2	31.618	V
17737.200	57.8	-13.0	41.2	29.605	H

Ch157

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17704.800	46.4	-13.0	41.2	18.205	V
17664.600	46.3	-13.0	41.2	18.105	H
17737.800	46.3	-13.0	41.2	18.105	H
17286.600	46.3	-13.9	41.2	19.023	H
17634.000	46.3	-13.0	41.2	18.105	V
17701.200	46.2	-13.0	41.2	18.005	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17950.800	58.7	-13.5	41.0	31.162	H
17641.800	58.3	-13.0	41.2	30.105	V
17813.400	58.1	-13.5	41.0	30.562	V
17715.000	58.1	-13.0	41.2	29.905	H
17928.600	58.0	-13.5	41.0	30.462	H
17742.600	57.9	-13.0	41.2	29.705	V

Ch165

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5850.044	39.9	-20.0	34.9	25.003	H
17657.400	46.2	-13.0	41.2	18.005	V
17616.000	46.2	-14.9	41.2	19.918	H
17655.000	46.2	-13.0	41.2	18.005	V
17625.600	46.2	-14.9	41.2	19.918	V
17727.600	46.2	-13.0	41.2	18.005	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5852.812	52.9	-20.0	34.9	38.003	H
17563.800	58.6	-14.9	41.2	32.318	V
17653.800	58.5	-13.0	41.2	30.305	H
17650.800	58.4	-13.0	41.2	30.205	H
17280.000	58.3	-15.1	41.2	32.193	V
17560.200	58.3	-14.9	41.2	32.018	H

802.11n-HT20

Ch149

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.728	43.1	-18.2	34.8	26.464	H
17710.800	46.3	-13.0	41.2	18.105	V
17707.200	46.3	-13.0	41.2	18.105	V
17625.600	46.3	-14.9	41.2	20.018	H
17700.000	46.3	-13.0	41.2	18.105	V
17661.600	46.3	-13.0	41.2	18.105	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5723.800	56.5	-18.2	34.8	39.864	V
17558.400	58.9	-14.9	41.2	32.618	V
17663.400	58.3	-13.0	41.2	30.105	V
17259.600	58.2	-15.1	41.2	32.093	H
17634.000	58.1	-13.0	41.2	29.905	H
17271.600	58.1	-15.1	41.2	31.993	H

Ch157

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17635.800	46.5	-13.0	41.2	18.305	V
17721.600	46.4	-13.0	41.2	18.205	H
17702.400	46.3	-13.0	41.2	18.105	V
17663.400	46.3	-13.0	41.2	18.105	H
17658.000	46.3	-13.0	41.2	18.105	H
17715.000	46.3	-13.0	41.2	18.105	V

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17673.600	58.7	-13.0	41.2	30.505	H
17952.600	58.5	-13.5	41.0	30.962	H
17961.600	58.2	-13.5	41.0	30.662	V
17741.400	58.1	-13.0	41.2	29.905	V
17663.400	58.0	-13.0	41.2	29.805	H
17271.600	58.0	-15.1	41.2	31.893	V

Ch165

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5850.104	37.2	-20.0	34.9	22.303	H
17692.800	46.5	-13.0	41.2	18.305	H
17638.200	46.4	-13.0	41.2	18.205	H
17632.200	46.3	-14.9	41.2	20.018	H
17726.400	46.3	-13.0	41.2	18.105	V
17660.400	46.3	-13.0	41.2	18.105	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5860.528	50.4	-20.0	34.9	35.503	H
17655.000	58.5	-13.0	41.2	30.305	H
17686.200	58.1	-13.0	41.2	29.905	H
17671.800	58.0	-13.0	41.2	29.805	V
17565.600	57.9	-14.9	41.2	31.618	V
17636.400	57.8	-13.0	41.2	29.605	H

802.11n-HT40

Ch151

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.996	49.9	-18.2	34.8	33.264	H
17689.200	46.3	-13.0	41.2	18.105	V
17659.200	46.3	-13.0	41.2	18.105	H
17637.600	46.3	-13.0	41.2	18.105	H
17659.800	46.3	-13.0	41.2	18.105	H
17744.400	46.3	-13.0	41.2	18.105	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.956	68.7	-18.2	34.8	52.064	V
17890.800	59.0	-13.5	41.0	31.462	H
17528.400	58.6	-14.9	41.2	32.318	H
17667.000	58.3	-13.0	41.2	30.105	V
17662.800	58.1	-13.0	41.2	29.905	V
17698.200	58.1	-13.0	41.2	29.905	V

Ch159

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5850.000	38.5	-20.0	34.9	23.603	H
18000.000	45.2	-13.5	40.8	17.888	H
17999.400	45.2	-13.6	41.0	17.842	H
17998.800	45.1	-13.6	41.0	17.742	H
17998.200	45.7	-13.6	41.0	18.342	H
17997.600	45.4	-13.6	41.0	18.042	V

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5851.712	61.9	-20.0	34.9	47.003	V
17614.200	58.7	-14.9	41.2	32.418	V
17932.200	58.5	-13.5	41.0	30.962	H
17745.600	58.4	-13.0	41.2	30.205	V
17475.000	58.4	-14.9	41.2	32.118	H
17694.000	58.3	-13.0	41.2	30.105	V

802.11ac-HT20

Ch149

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5723.920	42.5	-18.2	34.8	25.864	V
17709.600	46.4	-13.0	41.2	18.205	V
17614.800	46.4	-14.9	41.2	20.118	V
17655.000	46.4	-13.0	41.2	18.205	H
17710.800	46.4	-13.0	41.2	18.205	H
17656.800	46.3	-13.0	41.2	18.105	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.084	58.3	-18.2	34.8	41.664	H
17709.600	58.9	-13.0	41.2	30.705	H
17710.200	58.2	-13.0	41.2	30.005	V
17605.200	58.1	-14.9	41.2	31.818	V
17707.800	58.0	-13.0	41.2	29.805	H
17670.000	57.9	-13.0	41.2	29.705	V

Ch157

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17661.600	46.5	-13.0	41.2	18.305	V
17622.000	46.4	-14.9	41.2	20.118	H
17652.600	46.3	-13.0	41.2	18.105	H
17631.000	46.3	-14.9	41.2	20.018	V
17632.800	46.3	-14.9	41.2	20.018	H
17678.400	46.3	-13.0	41.2	18.105	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17986.800	59.1	-13.5	41.0	31.562	V
17673.000	58.7	-13.0	41.2	30.505	V
17684.400	58.4	-13.0	41.2	30.205	H
17689.800	58.4	-13.0	41.2	30.205	V
17695.200	58.3	-13.0	41.2	30.105	V
17630.400	58.3	-14.9	41.2	32.018	H

Ch165

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5850.224	37.8	-20.0	34.9	22.903	H
17698.800	46.3	-13.0	41.2	18.105	H
17699.400	46.3	-13.0	41.2	18.105	H
17676.000	46.3	-13.0	41.2	18.105	V
17623.800	46.3	-14.9	41.2	20.018	H
17607.600	46.3	-14.9	41.2	20.018	V

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5853.404	52.5	-20.0	34.9	37.603	V
17545.200	58.3	-14.9	41.2	32.018	H
17658.000	58.3	-13.0	41.2	30.105	V
17652.000	58.2	-13.0	41.2	30.005	H
17546.400	58.2	-14.9	41.2	31.918	V
17693.400	58.1	-13.0	41.2	29.905	V

802.11ac-HT40

Ch151

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5850.224	37.8	-20.0	34.9	22.903	V
17629.800	46.4	-14.9	41.2	20.118	H
17711.400	46.4	-13.0	41.2	18.205	V
17636.400	46.3	-13.0	41.2	18.105	H
17696.400	46.3	-13.0	41.2	18.105	H
17637.000	46.3	-13.0	41.2	18.105	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5724.072	62.4	-18.2	34.8	45.764	H
17655.000	59.2	-13.0	41.2	31.005	H
17685.600	58.3	-13.0	41.2	30.105	H
17638.200	58.3	-13.0	41.2	30.105	H
17670.600	58.2	-13.0	41.2	30.005	V
17996.400	58.1	-13.6	41.0	30.742	V

Ch159

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5850.000	36.9	-20.0	34.9	22.003	V
17633.400	46.4	-13.0	41.2	18.205	V
17660.400	46.3	-13.0	41.2	18.105	V
17632.200	46.3	-14.9	41.2	20.018	H
17728.200	46.3	-13.0	41.2	18.105	H
17657.400	46.3	-13.0	41.2	18.105	V

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
5853.876	50.8	-20.0	34.9	35.903	V
17292.000	59.1	-13.9	41.2	31.823	H
17688.000	58.5	-13.0	41.2	30.305	H
17728.800	58.2	-13.0	41.2	30.005	H
17748.600	58.1	-13.0	41.2	29.905	V
17622.600	57.9	-14.9	41.2	31.618	V

802.11ac-HT80

Ch155

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17688.600	46.4	-13.0	41.2	18.205	H
17729.400	46.4	-13.0	41.2	18.205	H
17704.200	46.4	-13.0	41.2	18.205	V
17664.600	46.3	-13.0	41.2	18.105	V
17634.600	46.3	-13.0	41.2	18.105	V
17680.200	46.3	-13.0	41.2	18.105	V

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17715.000	59.4	-13.0	41.2	31.205	H
17220.000	58.4	-15.1	41.4	32.093	V
17962.800	58.2	-13.5	41.0	30.662	H
17074.200	58.2	-16.3	41.4	33.141	V
17730.600	58.2	-13.0	41.2	30.005	H
17673.000	58.1	-13.0	41.2	29.905	H

Test graphs as below:

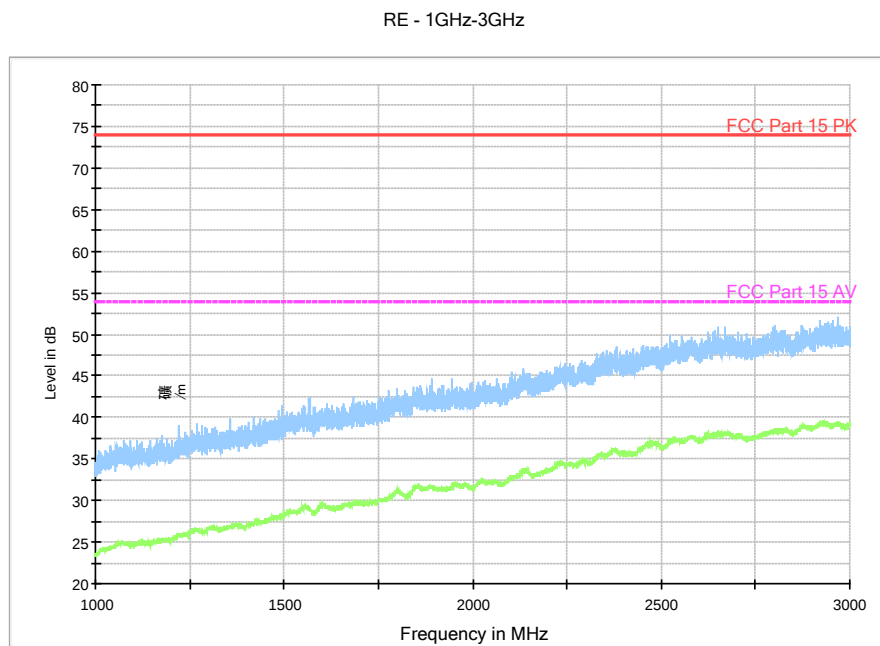
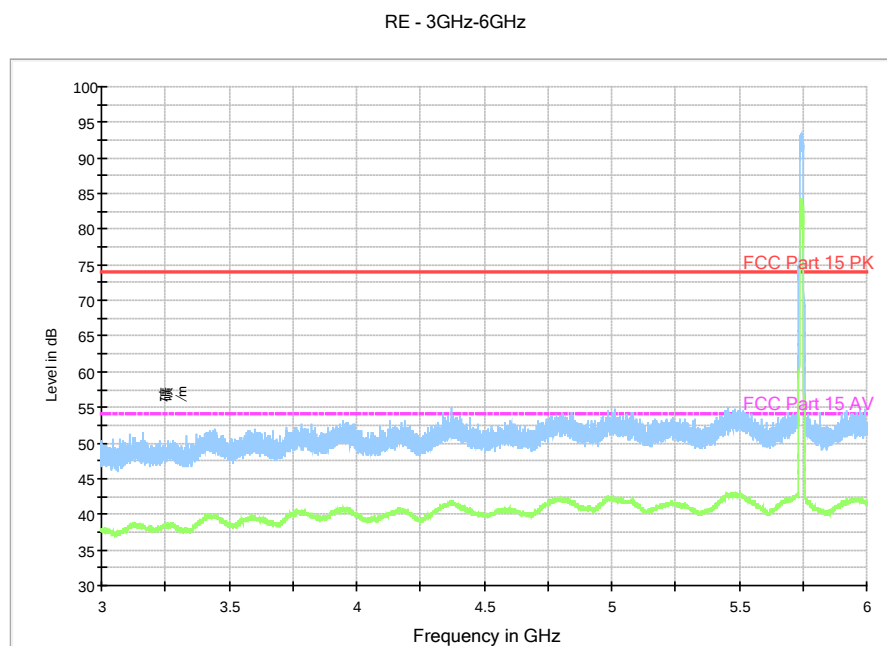


Fig. 1 Radiated Spurious Emission (802.11a, Ch149, 1 GHz-3 GHz)



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)

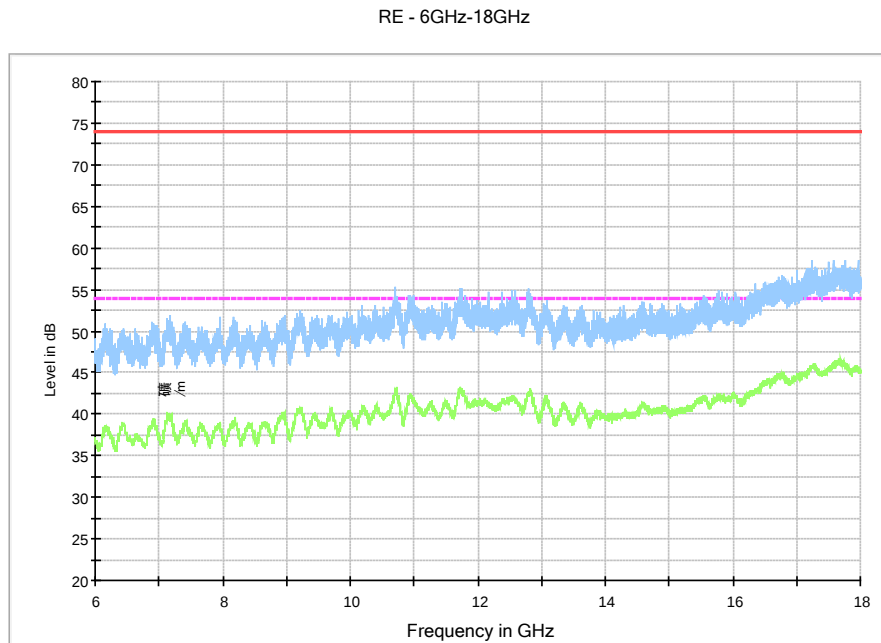


Fig. 3 Radiated Spurious Emission (802.11a, Ch149, 6 GHz-18 GHz)

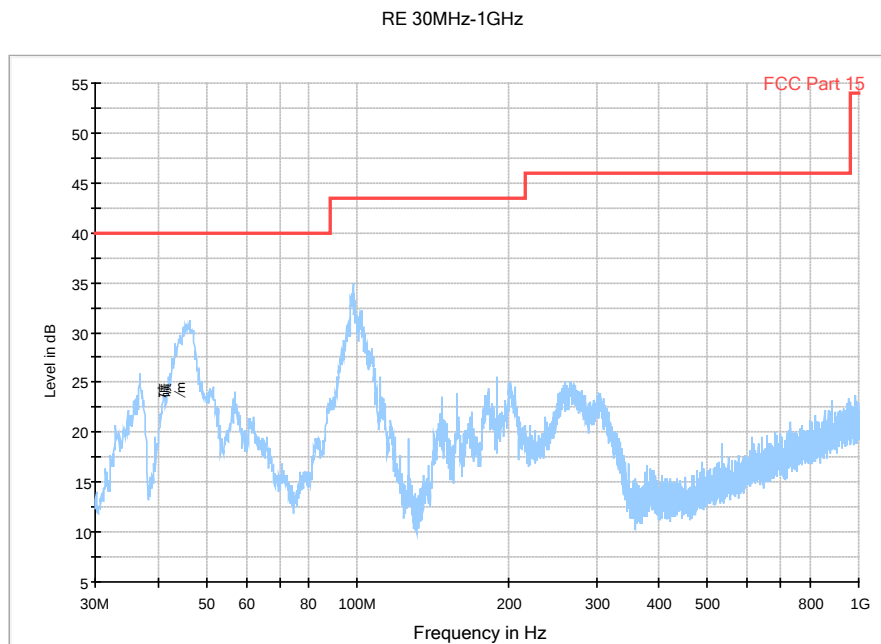


Fig. 4 Radiated Spurious Emission (802.11a, Ch157, 30 MHz-1 GHz)

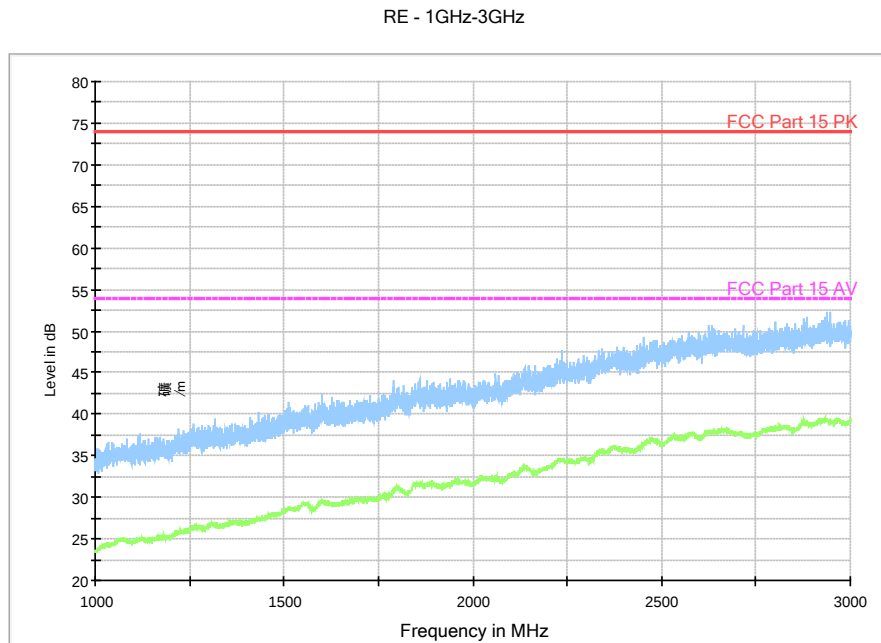
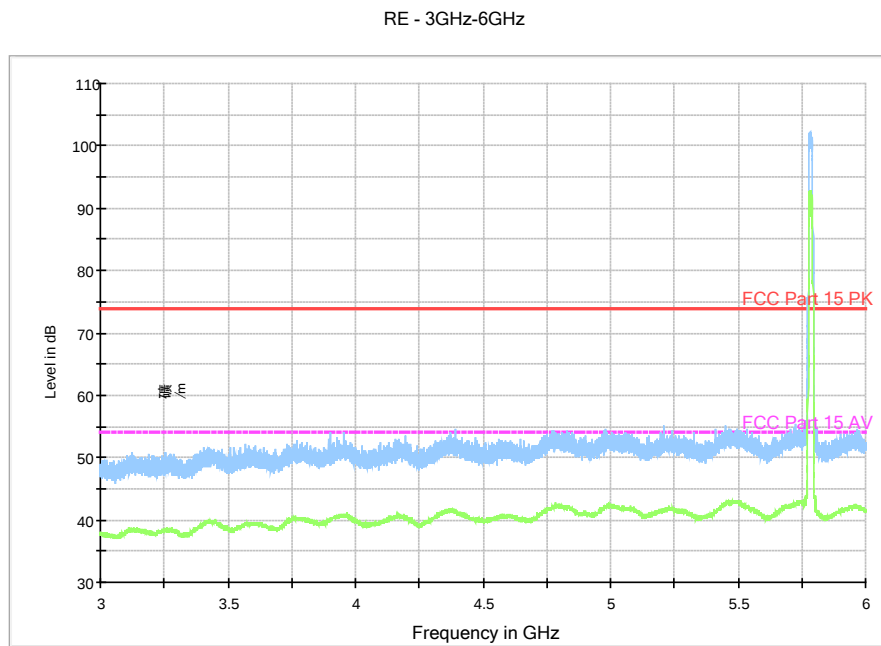


Fig. 5 Radiated Spurious Emission (802.11a, Ch157, 1 GHz-3 GHz)



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)

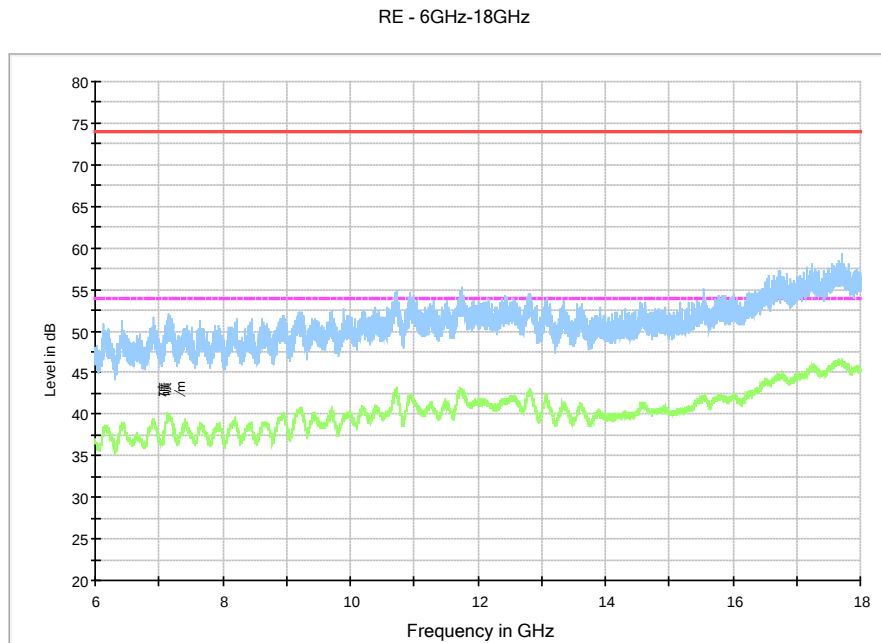


Fig. 7 Radiated Spurious Emission (802.11a, Ch157, 6 GHz-18GHz)

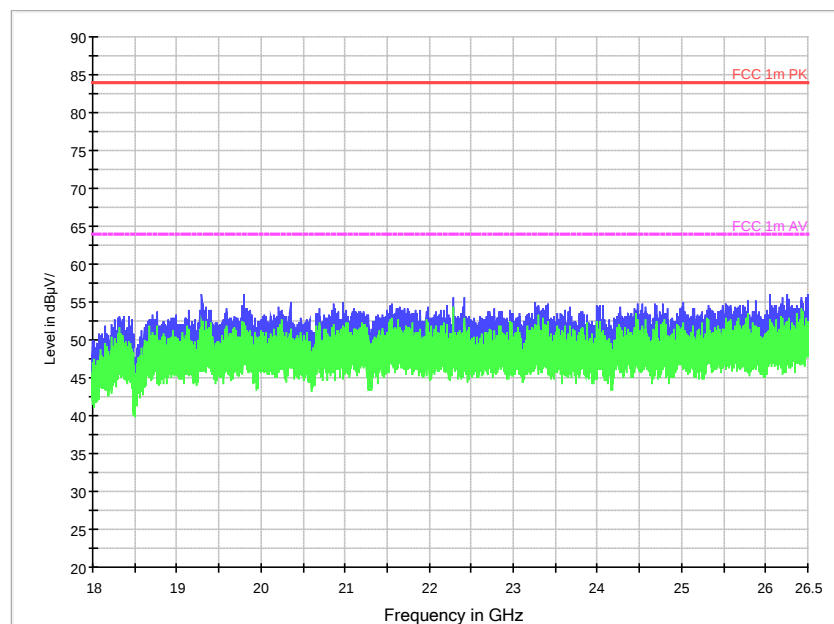


Fig. 8 Radiated Spurious Emission (802.11a, Ch157, 18 GHz-26.5 GHz)

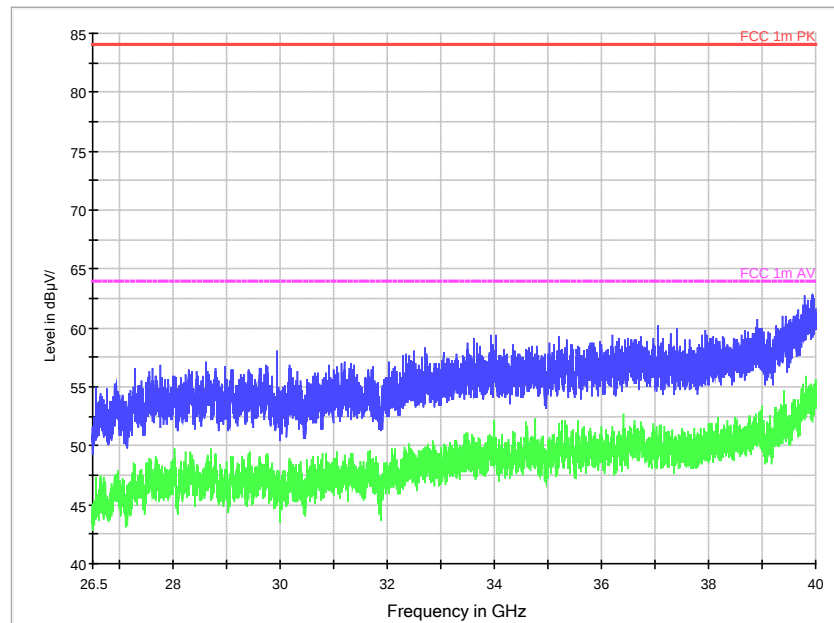


Fig. 9 Radiated Spurious Emission (802.11a, Ch157, 26.5 GHz - 40 GHz)

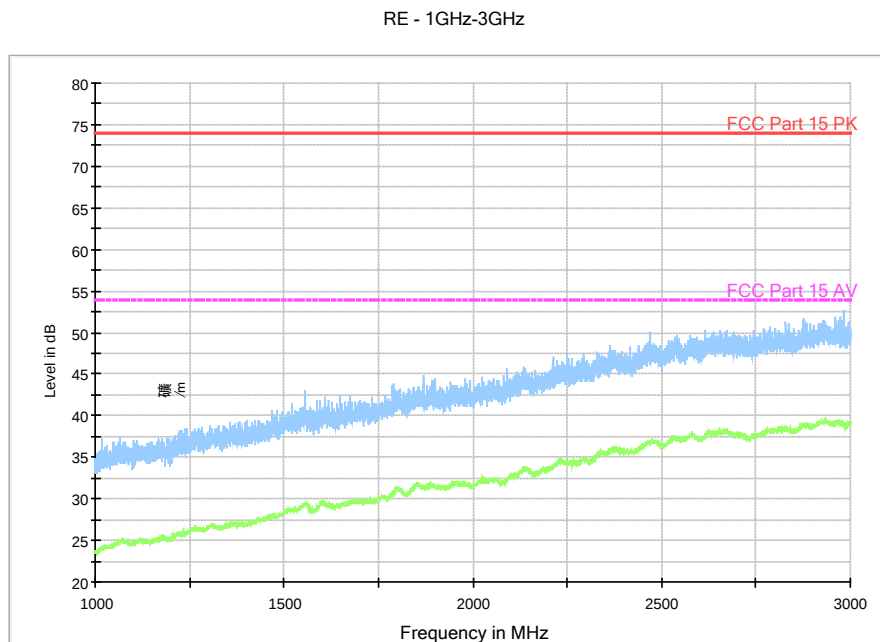
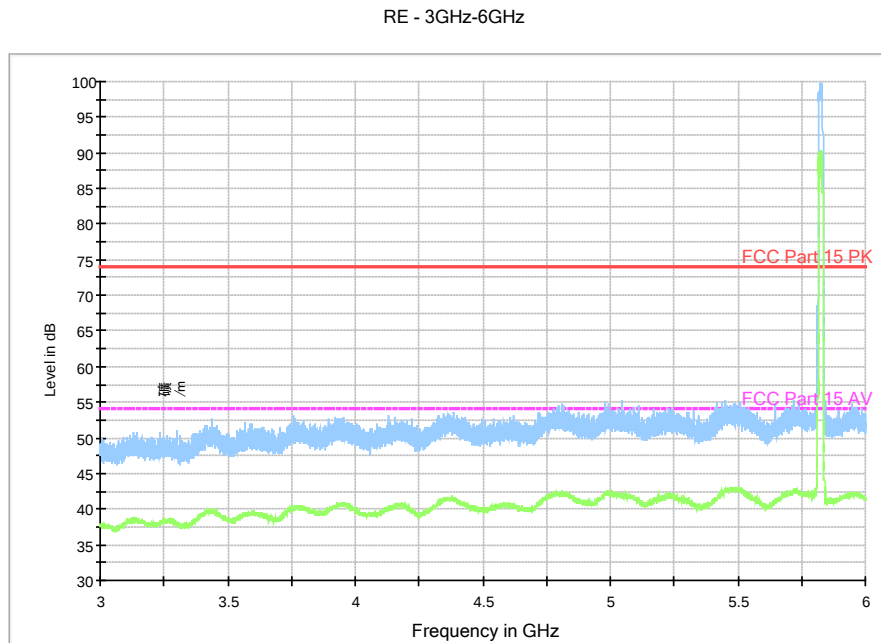


Fig. 10 Radiated Spurious Emission (802.11a, Ch165, 1 GHz-3 GHz)



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)

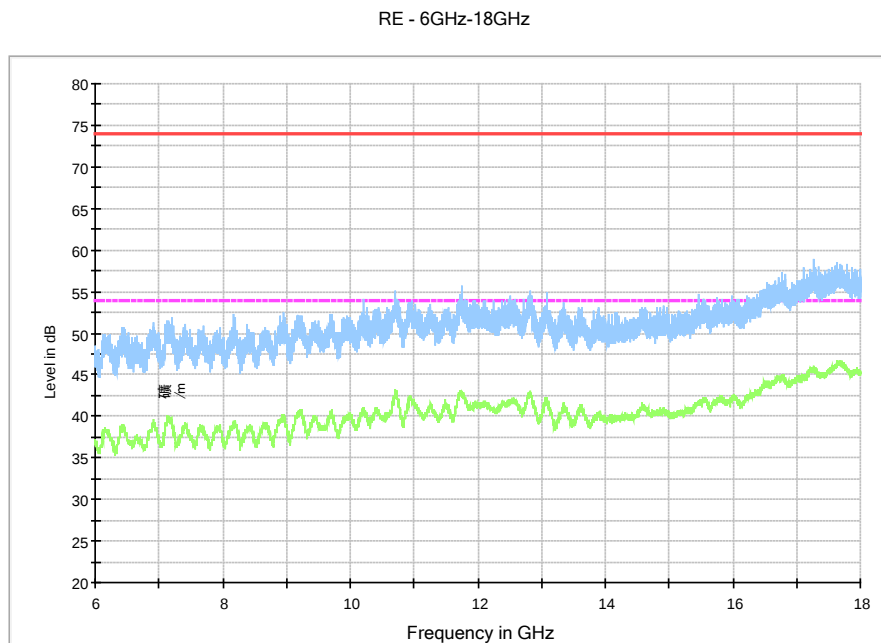


Fig. 12 Radiated Spurious Emission (802.11a, Ch165, 6 GHz-18 GHz)

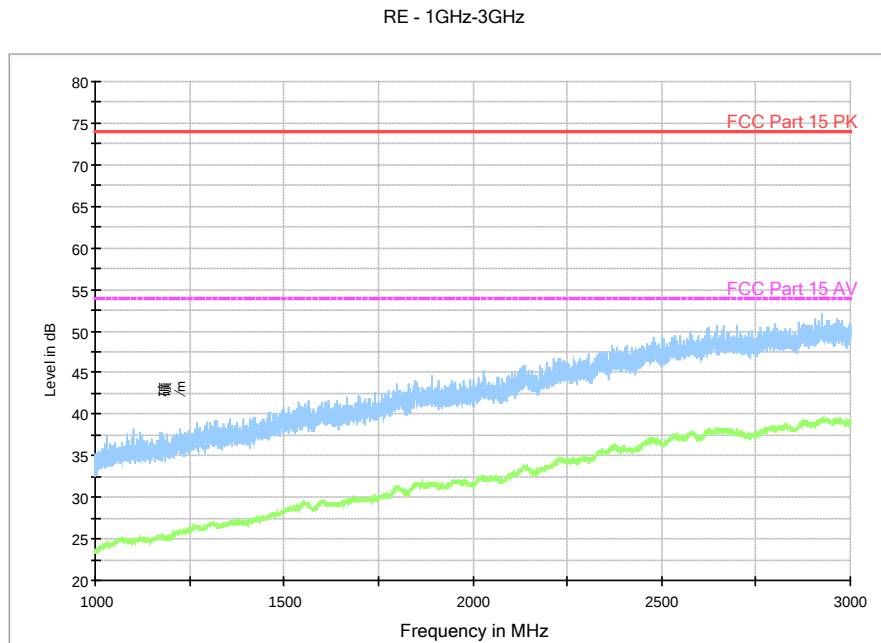
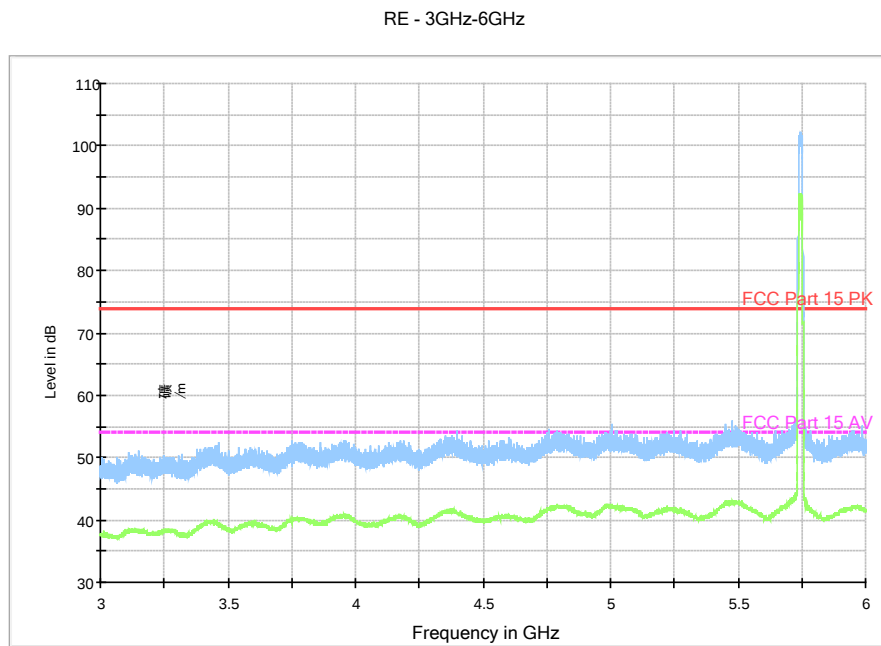


Fig. 13 Radiated Spurious Emission (802.11n-HT20, Ch149, 1 GHz-3 GHz)



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)

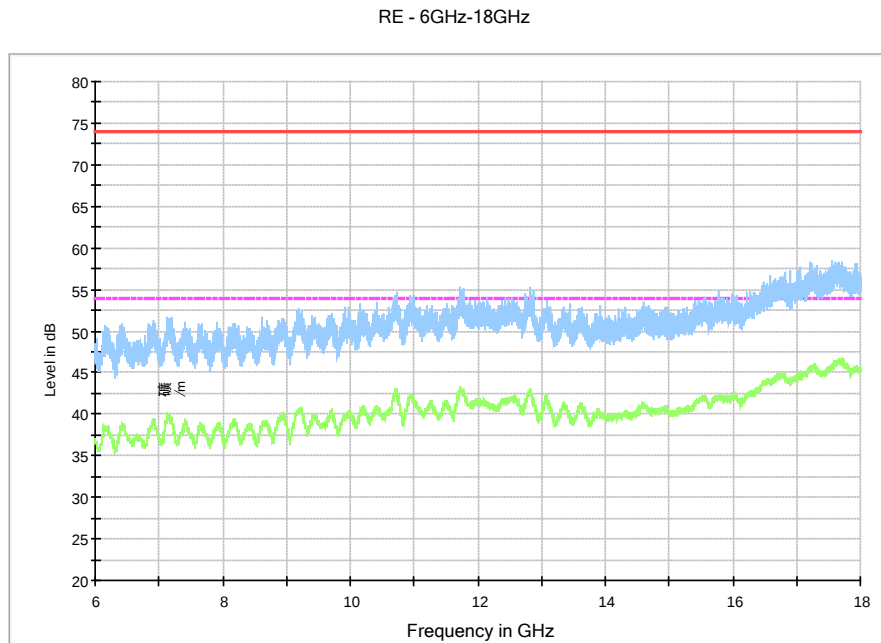


Fig. 15 Radiated Spurious Emission (802.11n-HT20, Ch149, 6 GHz-18 GHz)

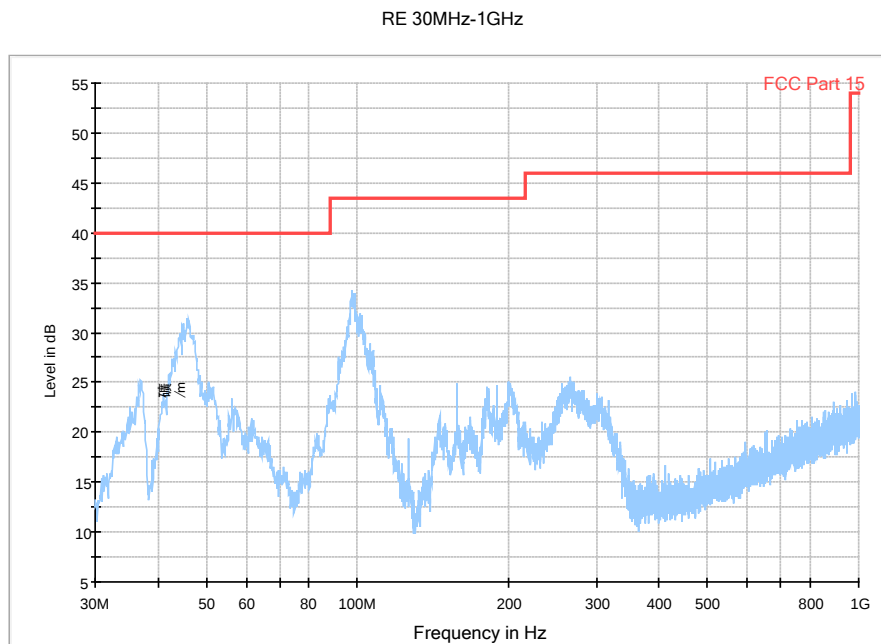


Fig. 16 Radiated Spurious Emission (802.11n-HT20, Ch157, 30 MHz-1 GHz)

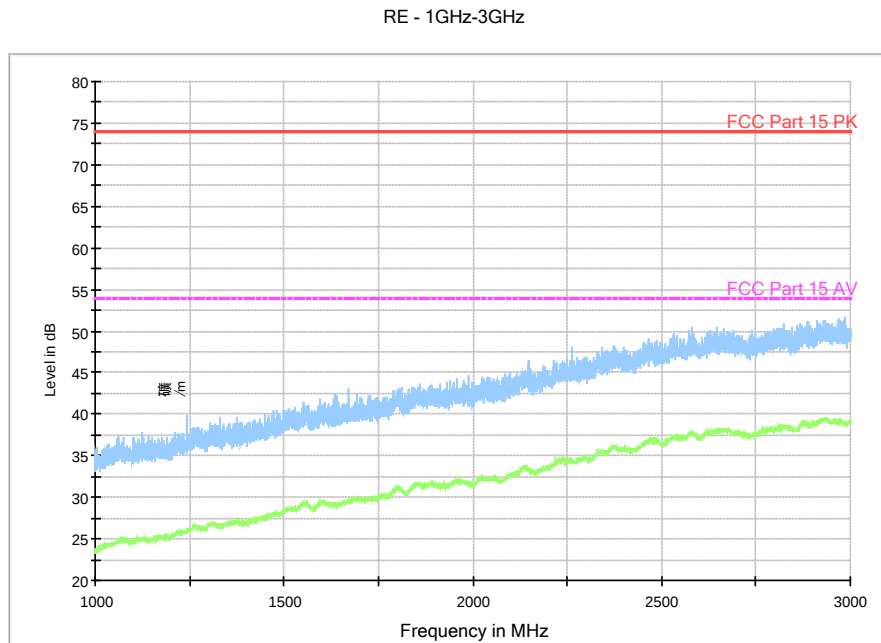
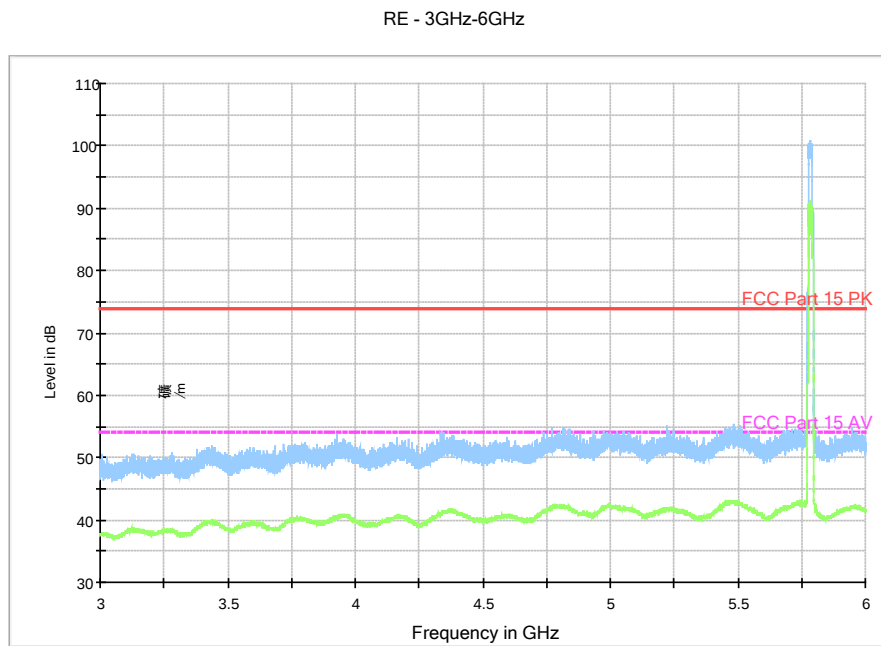


Fig. 17 Radiated Spurious Emission (802.11n-HT20, Ch157, 1 GHz-3 GHz)



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)

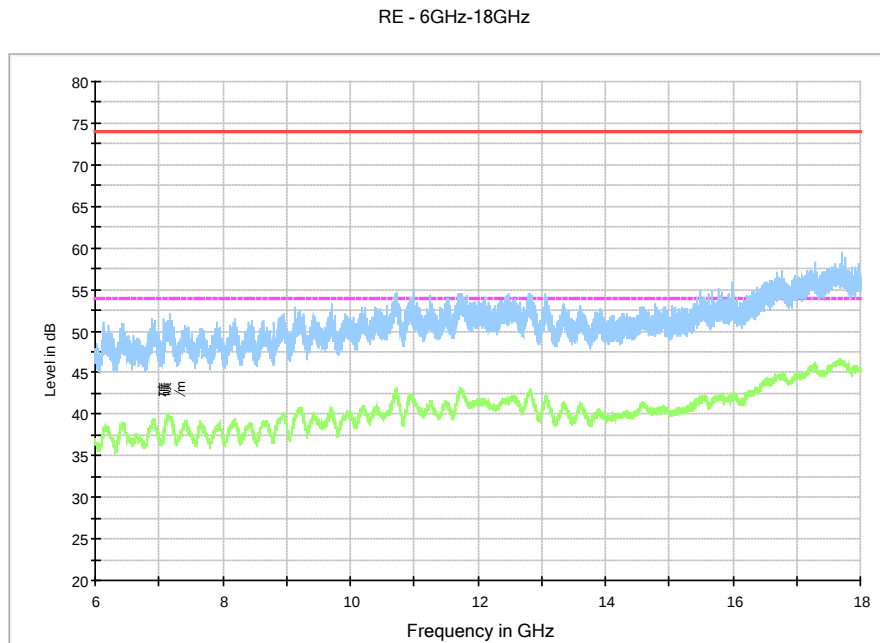


Fig. 19 Radiated Spurious Emission (802.11n-HT20, Ch157, 6 GHz-18 GHz)

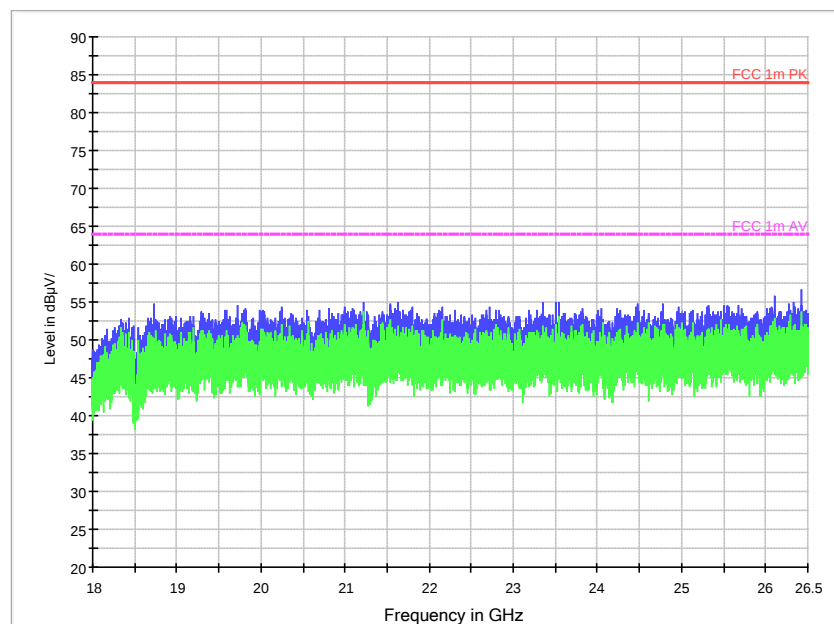


Fig. 20 Radiated Spurious Emission (802.11n-HT20, Ch157, 18 GHz-26.5 GHz)

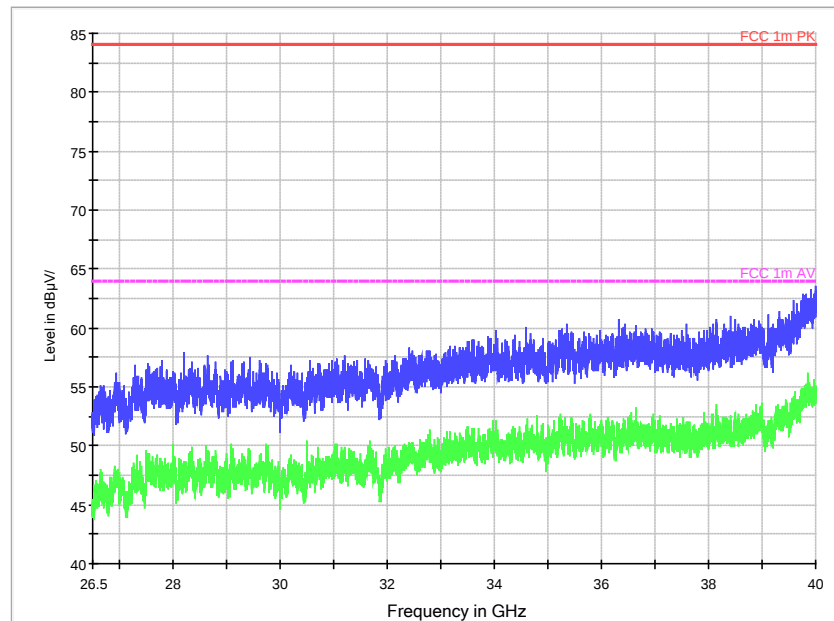


Fig. 21 Radiated Spurious Emission (802.11n-HT20, Ch157, 26.5 GHz - 40 GHz)

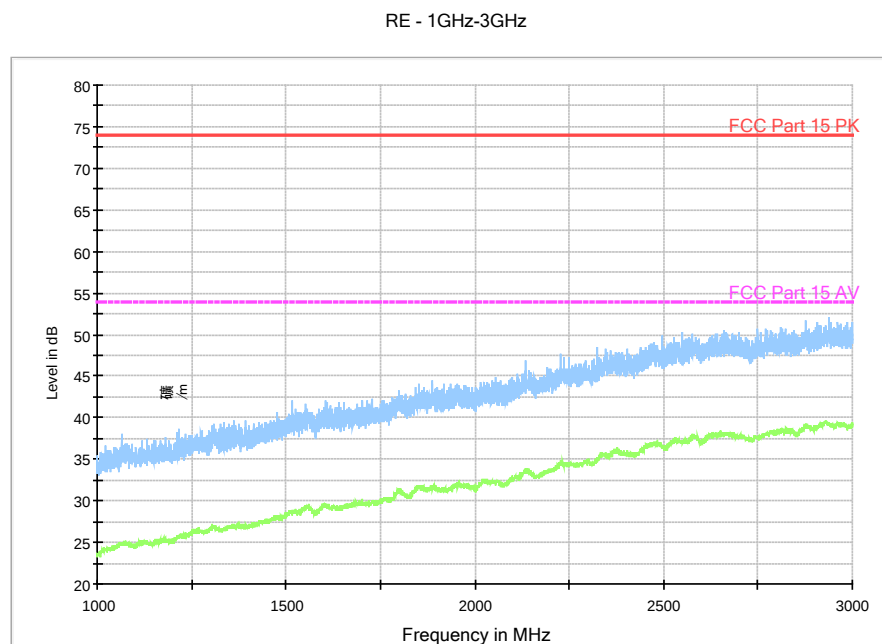
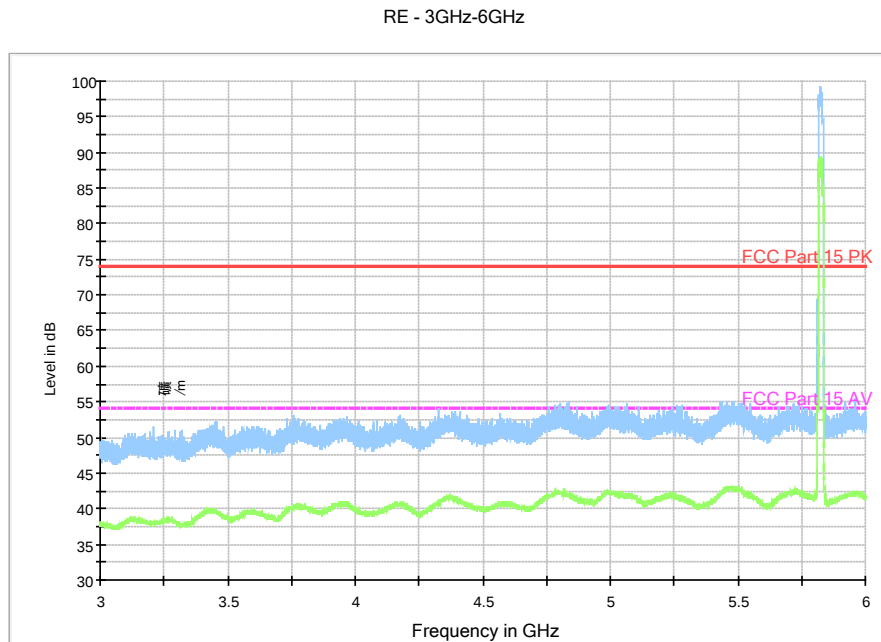


Fig. 22 Radiated Spurious Emission (802.11n-HT20, Ch165, 1 GHz-3 GHz)



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)

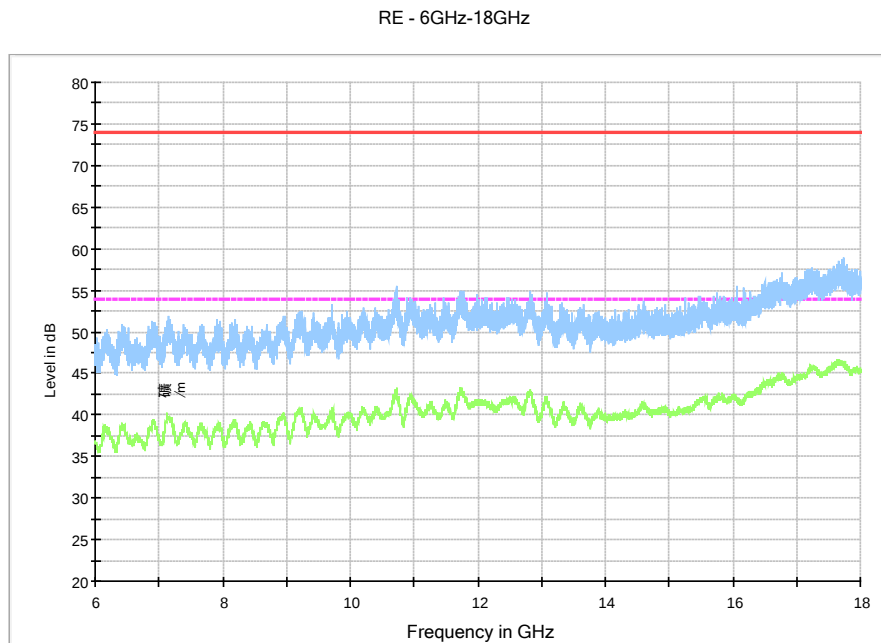


Fig. 24 Radiated Spurious Emission (802.11n-HT20, Ch165, 6 GHz-18 GHz)

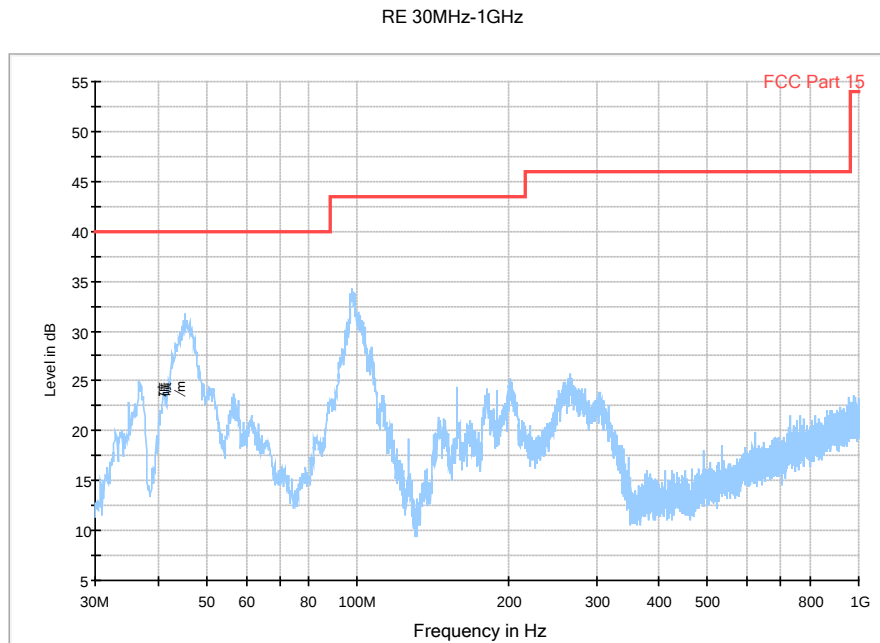


Fig. 25 Radiated Spurious Emission (802.11n-HT40, Ch151, 30 MHz-1 GHz)

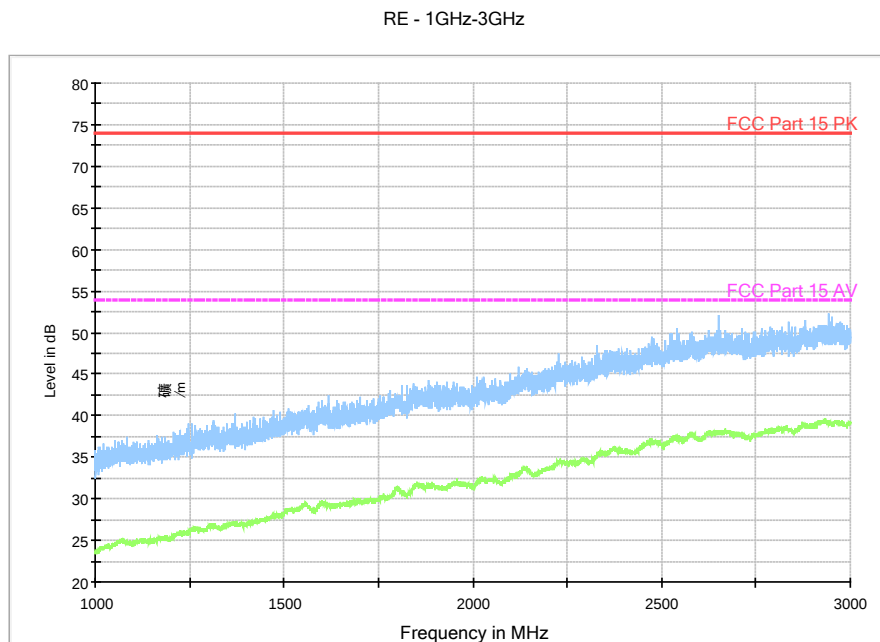
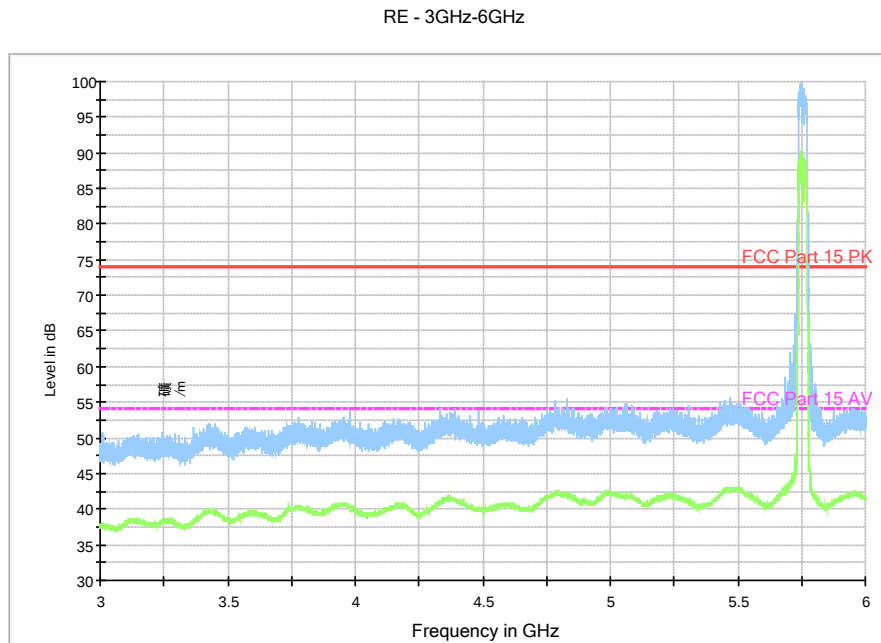


Fig. 26 Radiated Spurious Emission (802.11n-HT40, Ch151, 1 GHz-3GHz)



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, Ch151, 3 GHz-6GHz)

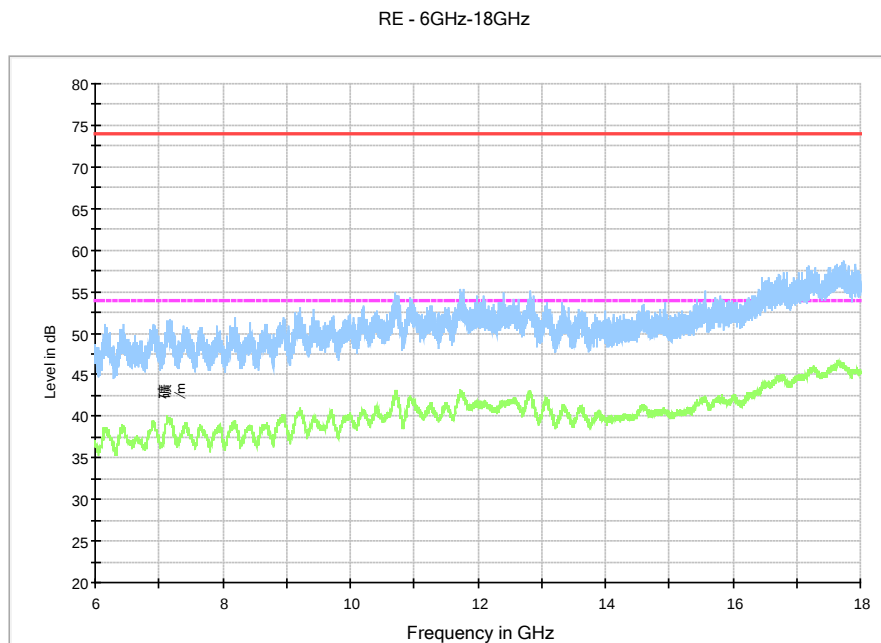


Fig. 28 Radiated Spurious Emission (802.11n-HT40, Ch151, 6 GHz-18 GHz)

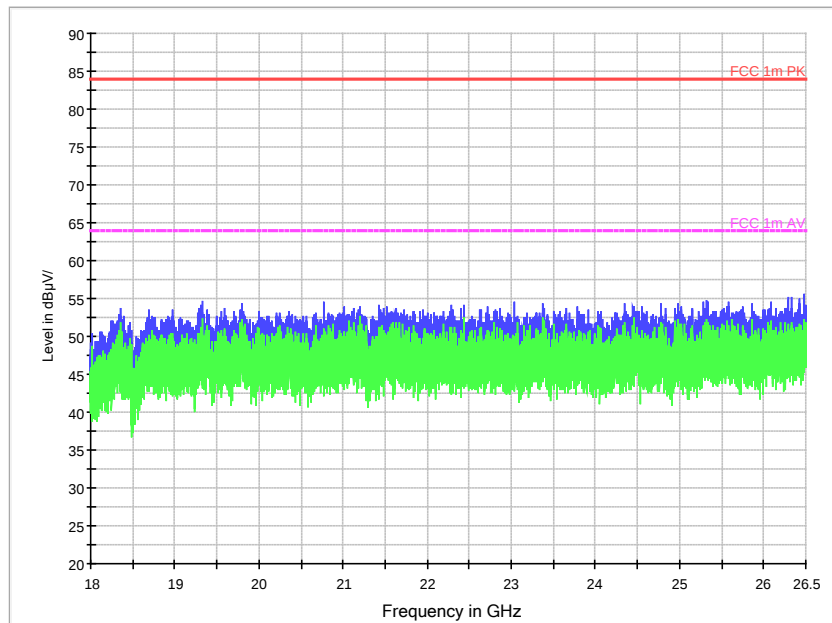


Fig. 29 Radiated Spurious Emission (802.11n-HT40, Ch151, 18 GHz-26.5 GHz)

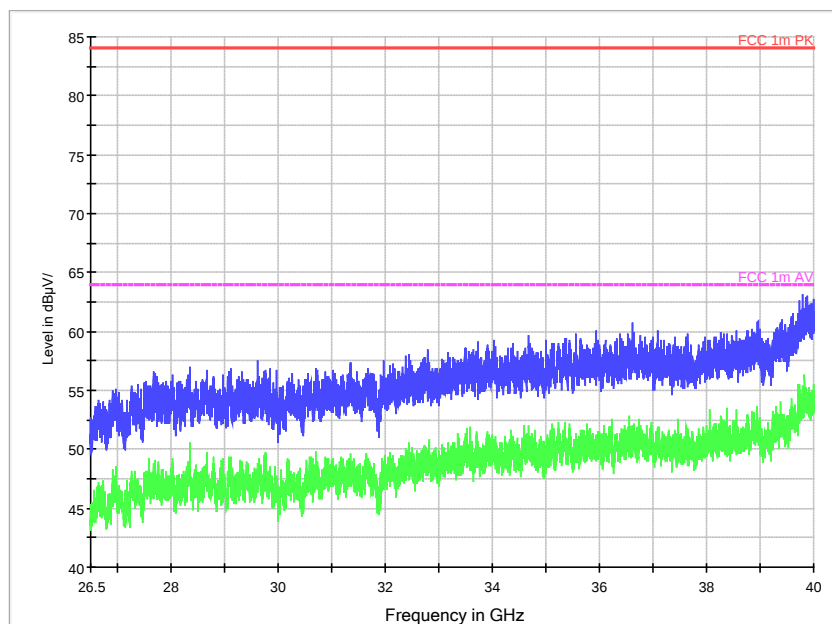


Fig. 30 Radiated Spurious Emission (802.11n-HT40, Ch151, 26.5 GHz - 40 GHz)

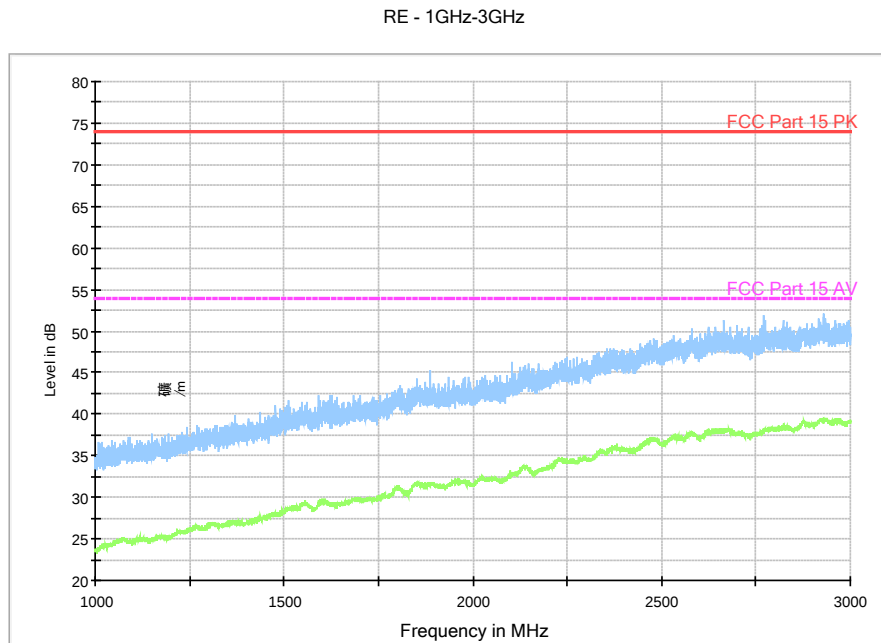
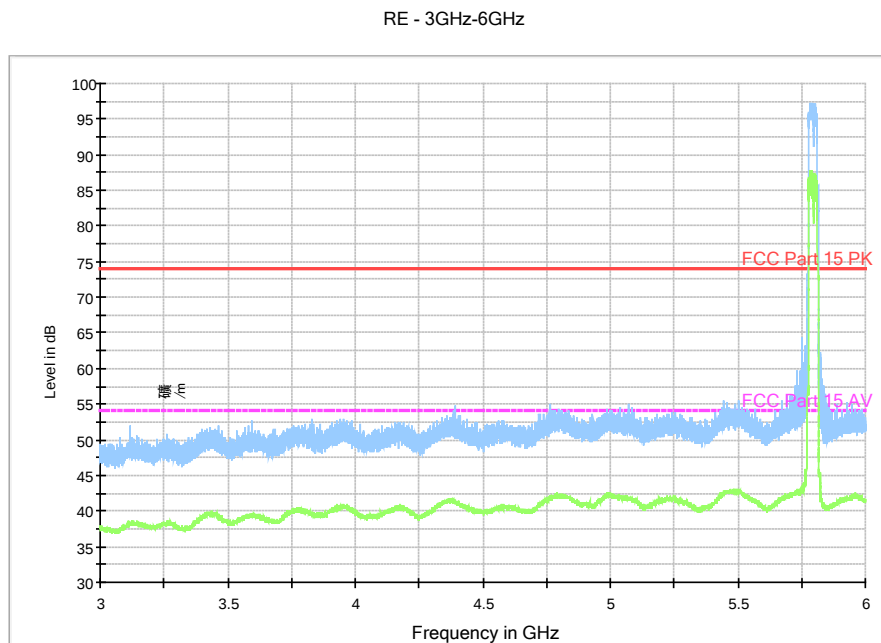


Fig. 31 Radiated Spurious Emission (802.11n-HT40, Ch159 1 GHz-3GHz)



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, Ch159 3 GHz-6GHz)

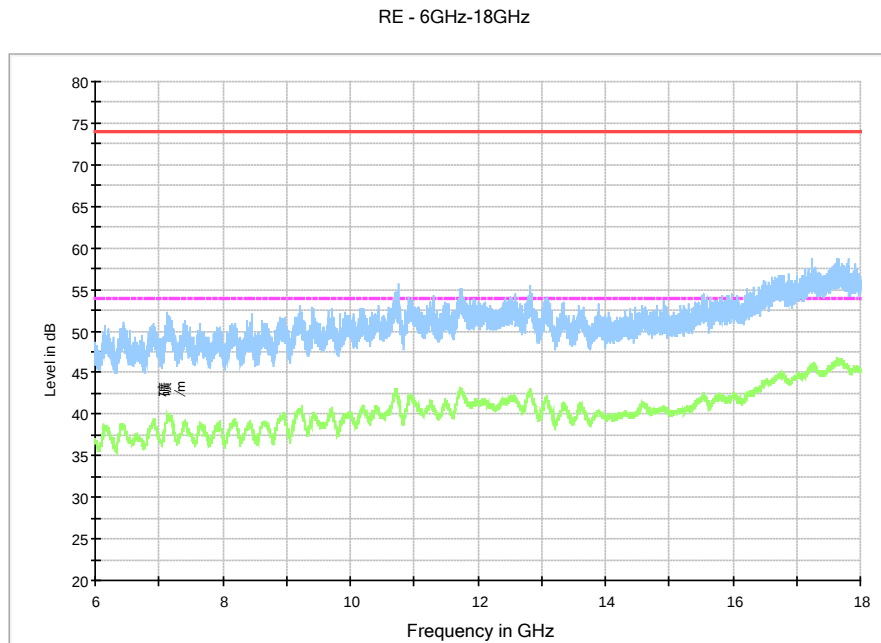


Fig. 33 Radiated Spurious Emission (802.11n-HT40, Ch159, 6 GHz-18 GHz)

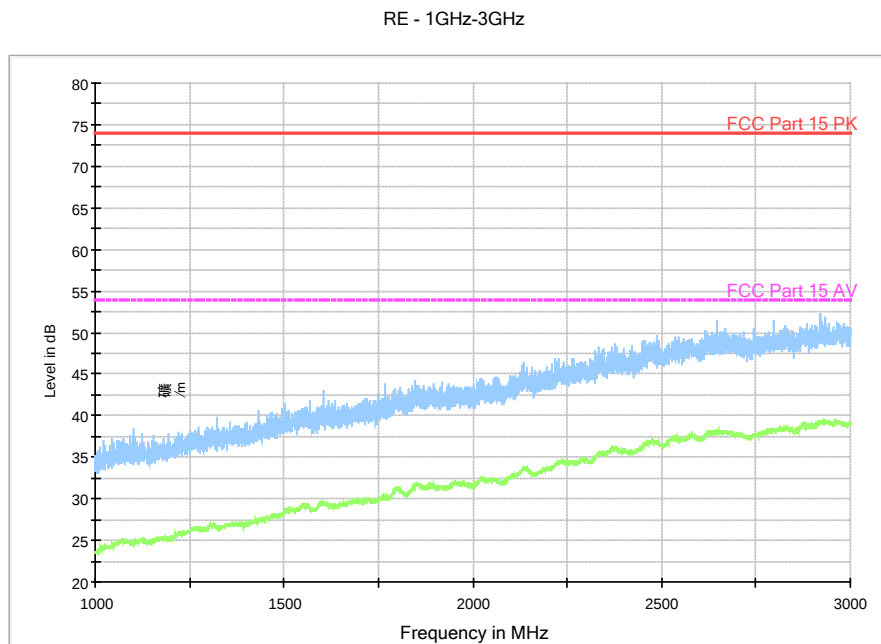
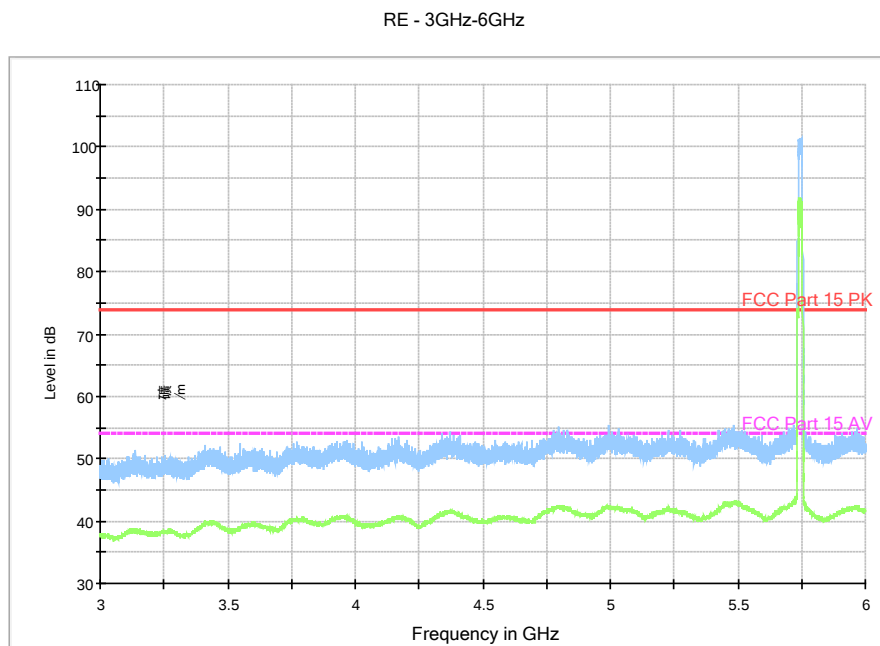


Fig. 34 Radiated Spurious Emission (802.11ac-HT20, Ch149, 1 GHz-3 GHz)



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)

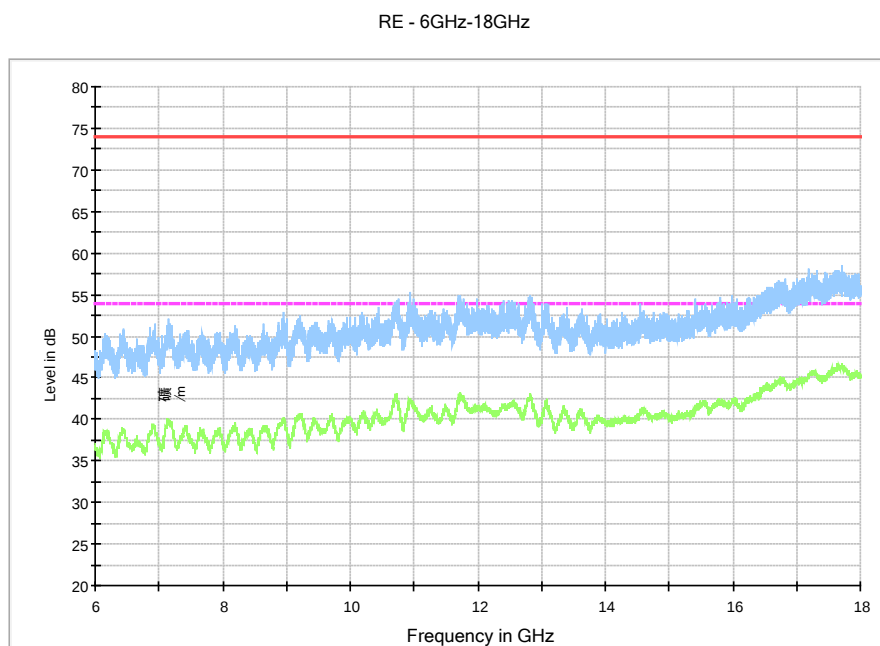


Fig. 36 Radiated Spurious Emission (802.11ac-HT20, Ch149, 6 GHz-18 GHz)

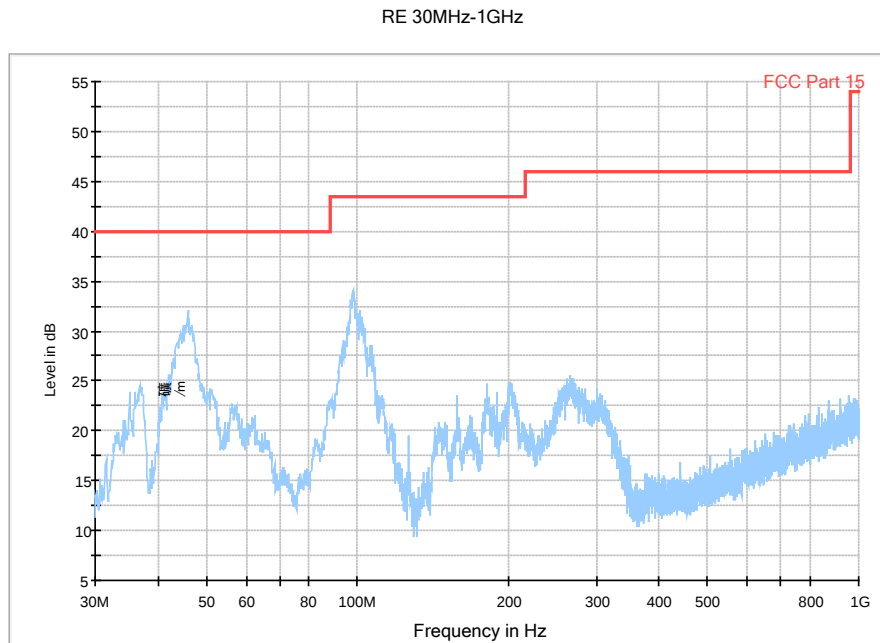


Fig. 37 Radiated Spurious Emission (802.11ac-HT20, Ch157, 30 MHz-1 GHz)

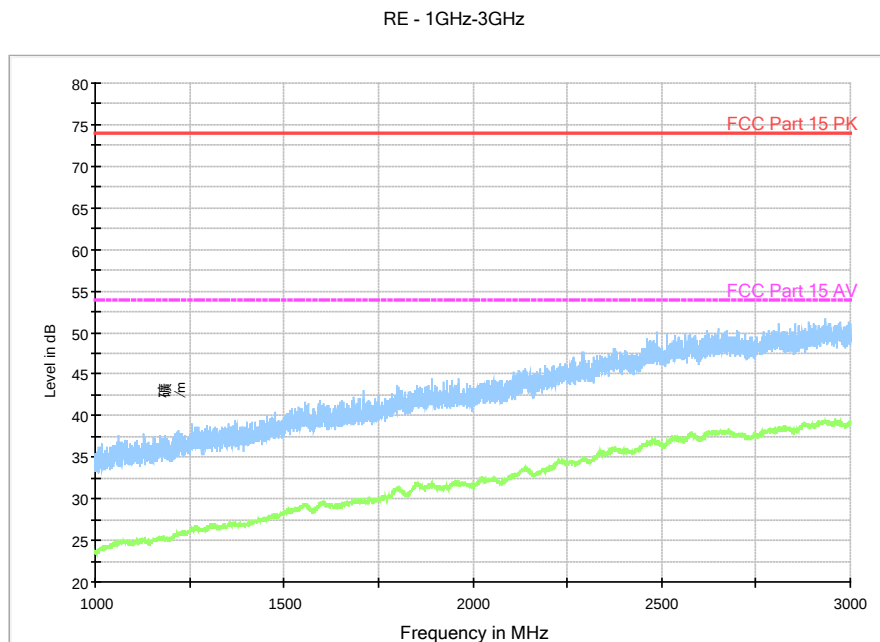
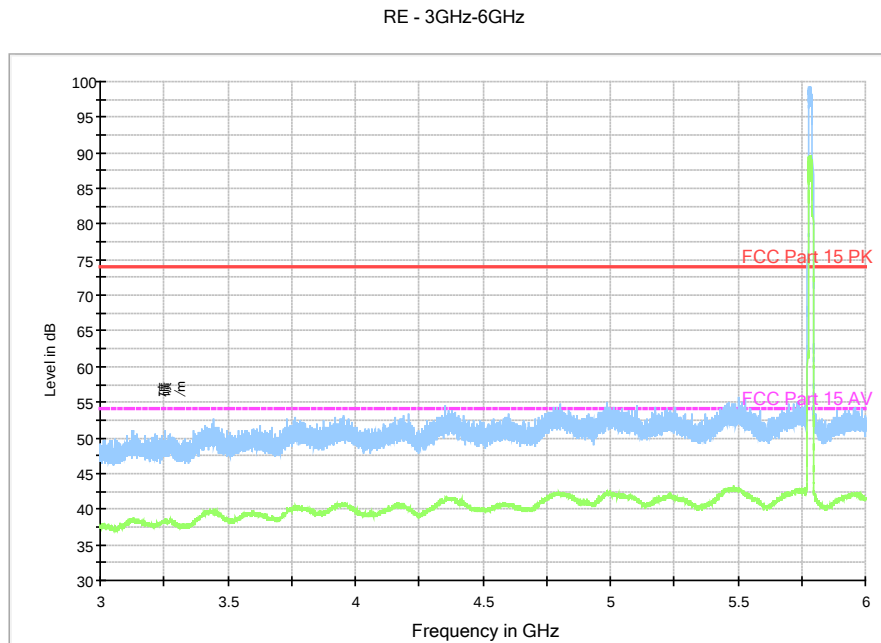


Fig. 38 Radiated Spurious Emission (802.11ac-HT20, Ch157, 1 GHz-3 GHz)



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)

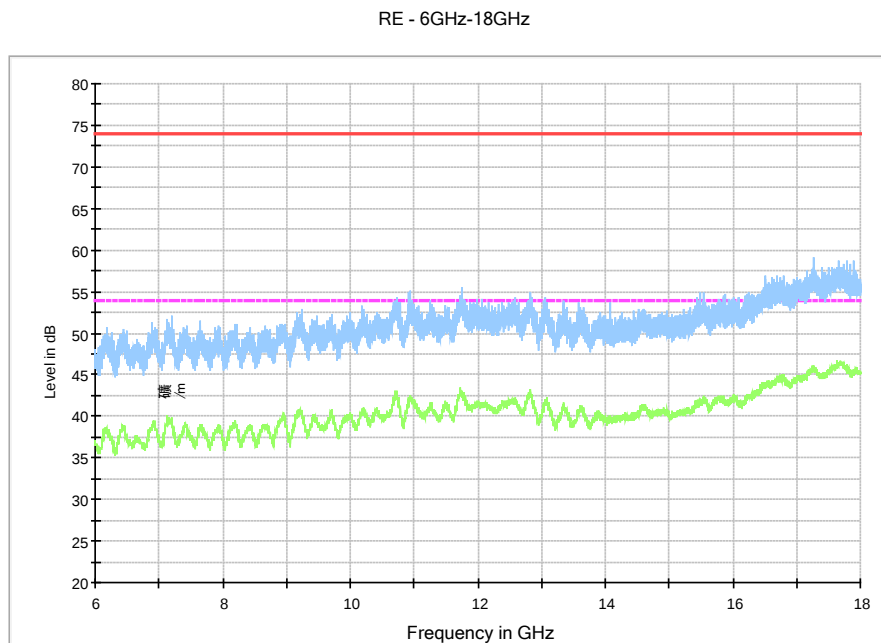


Fig. 40 Radiated Spurious Emission (802.11ac-HT20, Ch157, 6 GHz-18 GHz)

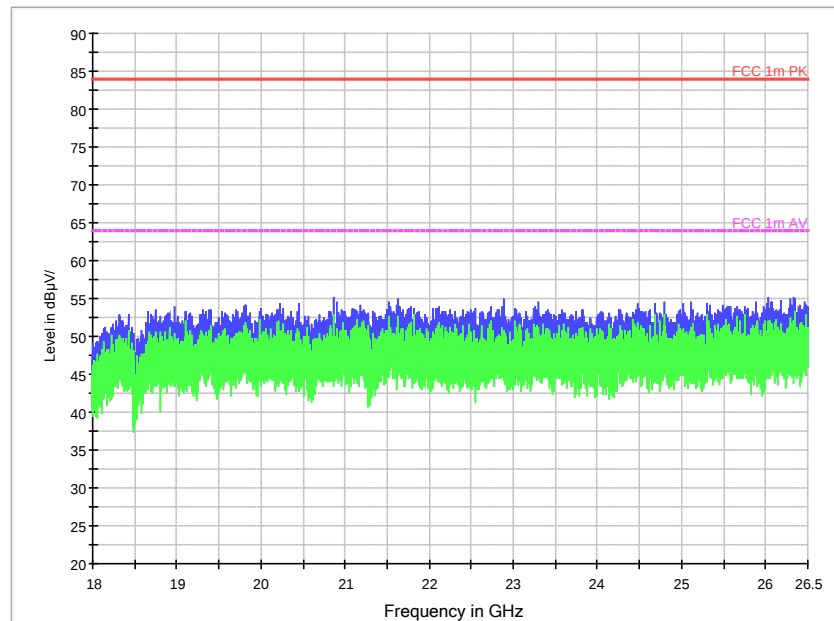


Fig. 41 Radiated Spurious Emission (802.11ac-HT20, Ch157, 18 GHz-26.5 GHz)

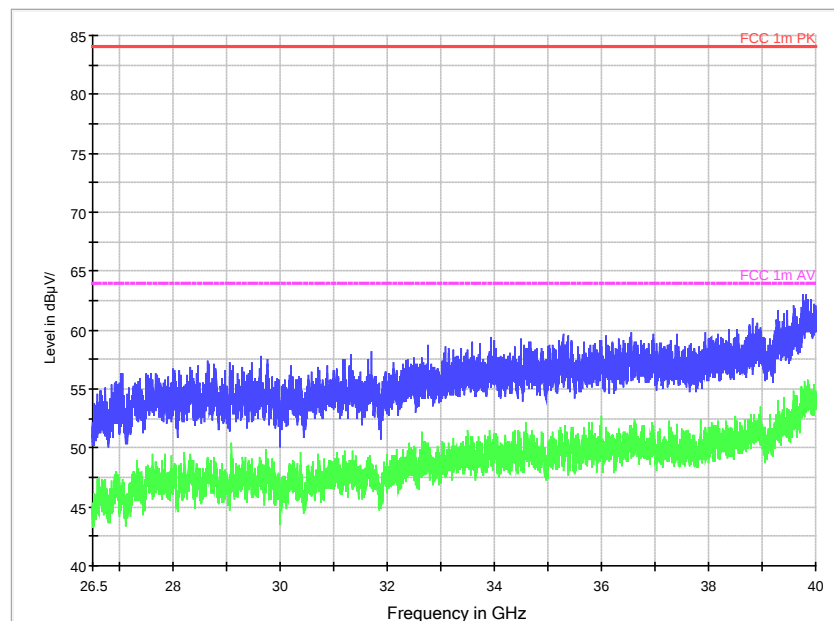


Fig. 42 Radiated Spurious Emission (802.11ac-HT20, Ch157, 26.5 GHz - 40 GHz)

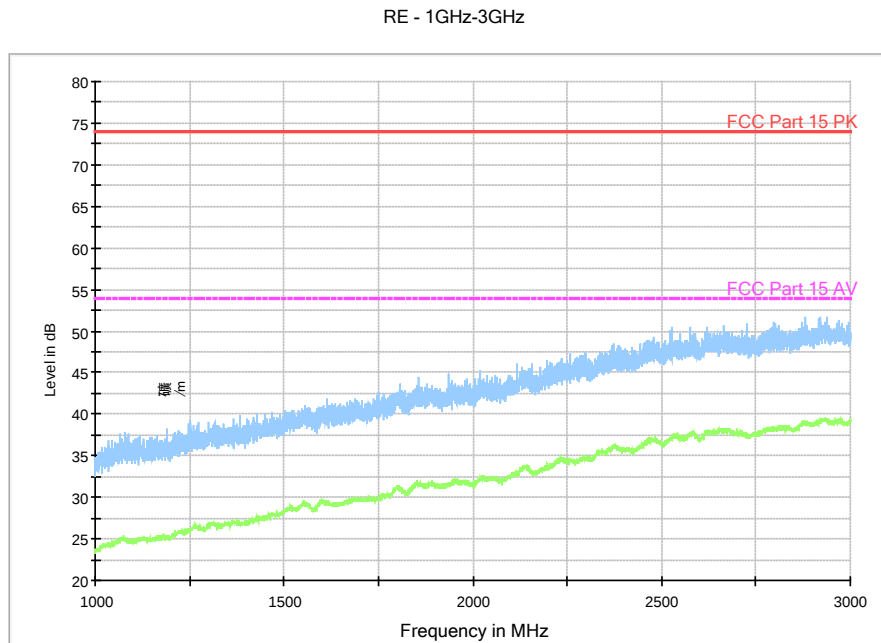
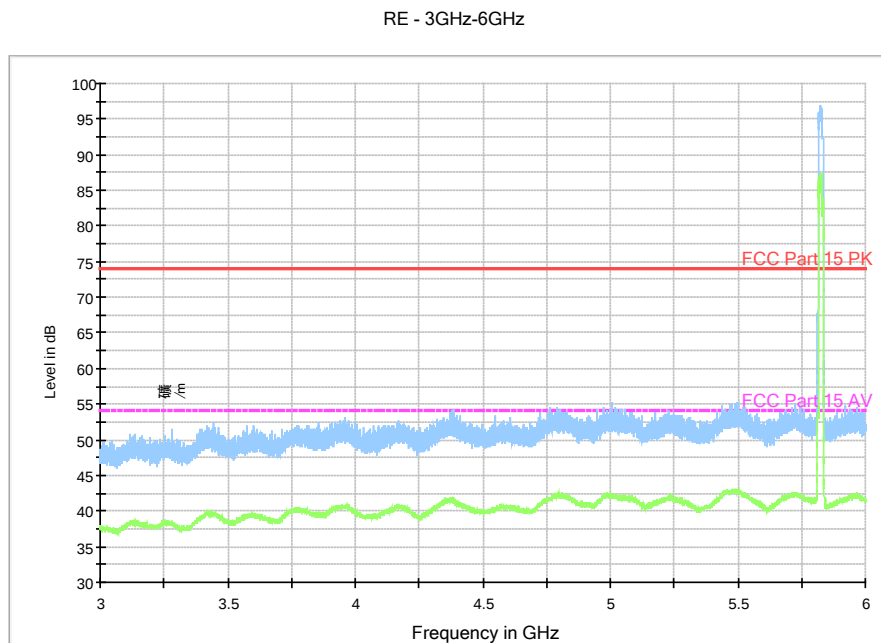


Fig. 43 Radiated Spurious Emission (802.11ac-HT20, Ch165, 1 GHz-3 GHz)



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)

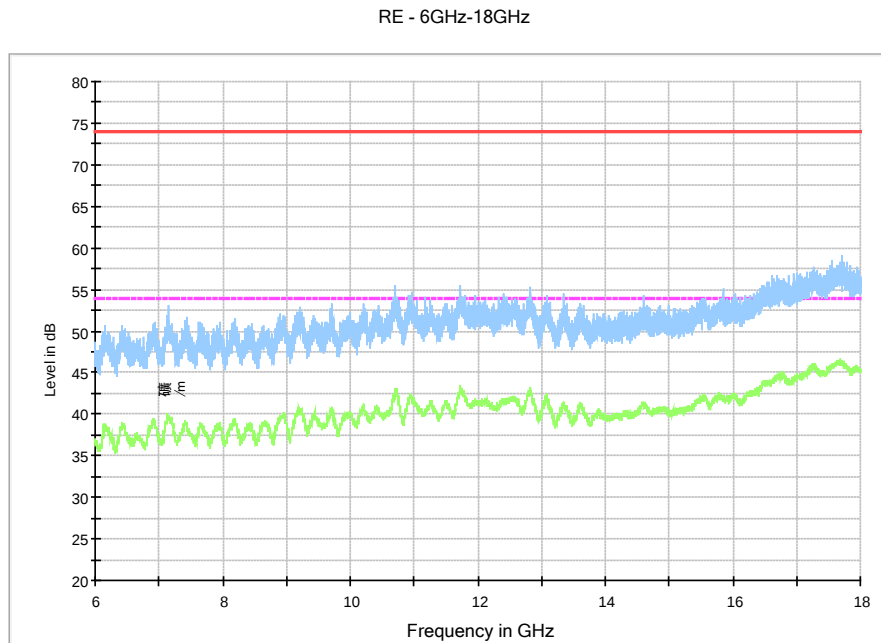


Fig. 45 Radiated Spurious Emission (802.11ac-HT20, Ch165, 6 GHz-18 GHz)

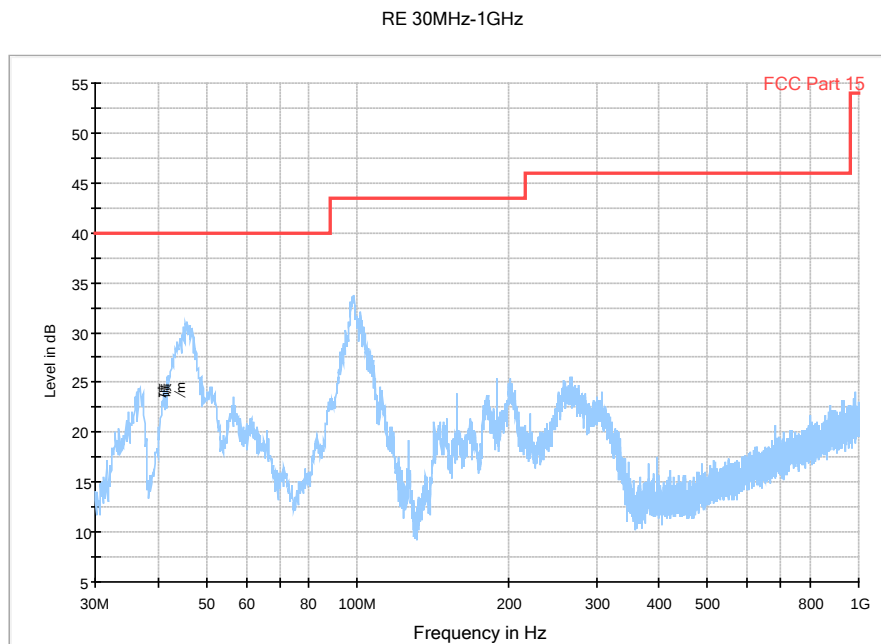


Fig. 46 Radiated Spurious Emission (802.11ac-HT40, Ch151, 30 MHz-1 GHz)

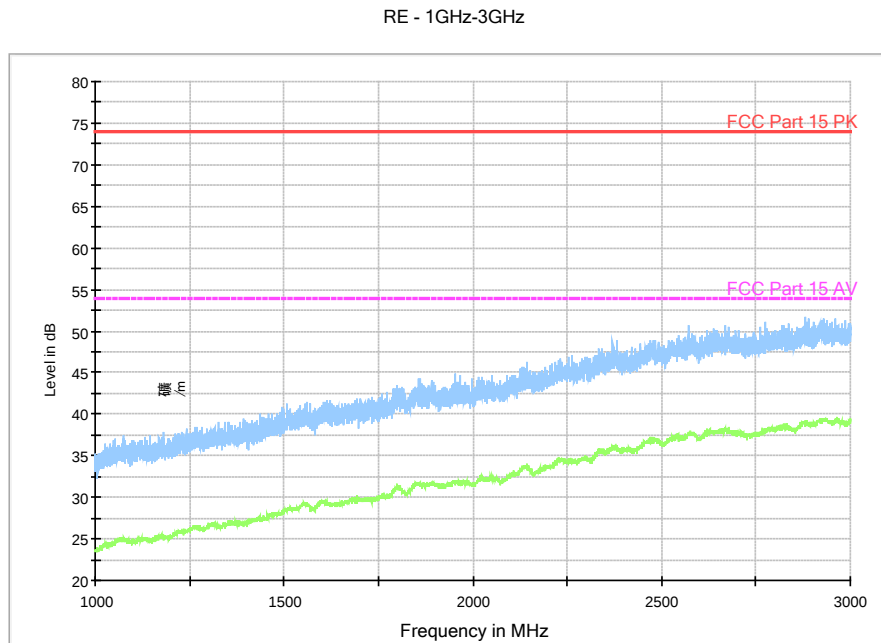
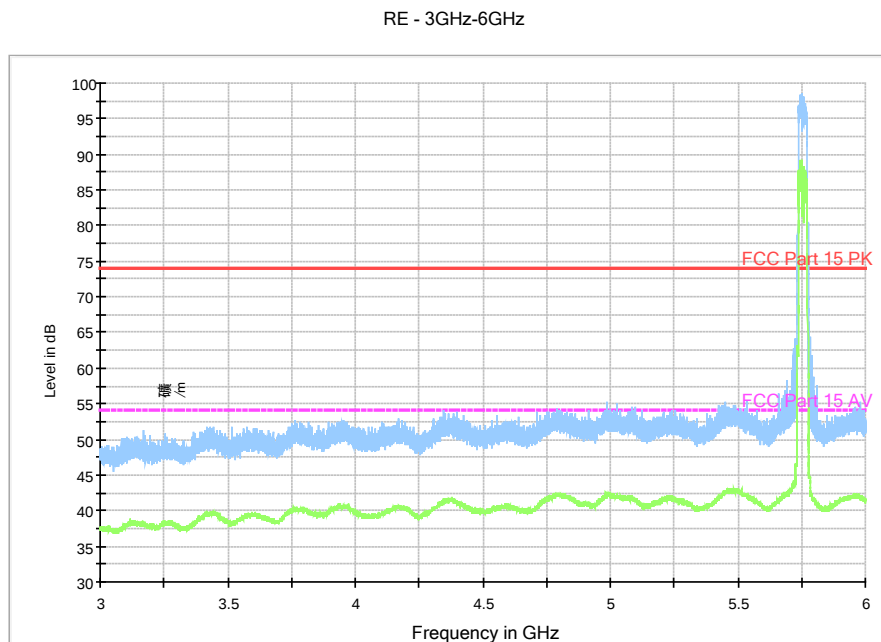


Fig. 47 Radiated Spurious Emission (802.11ac-HT40, Ch151, 1 GHz-3GHz)



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, Ch151, 3 GHz-6GHz)

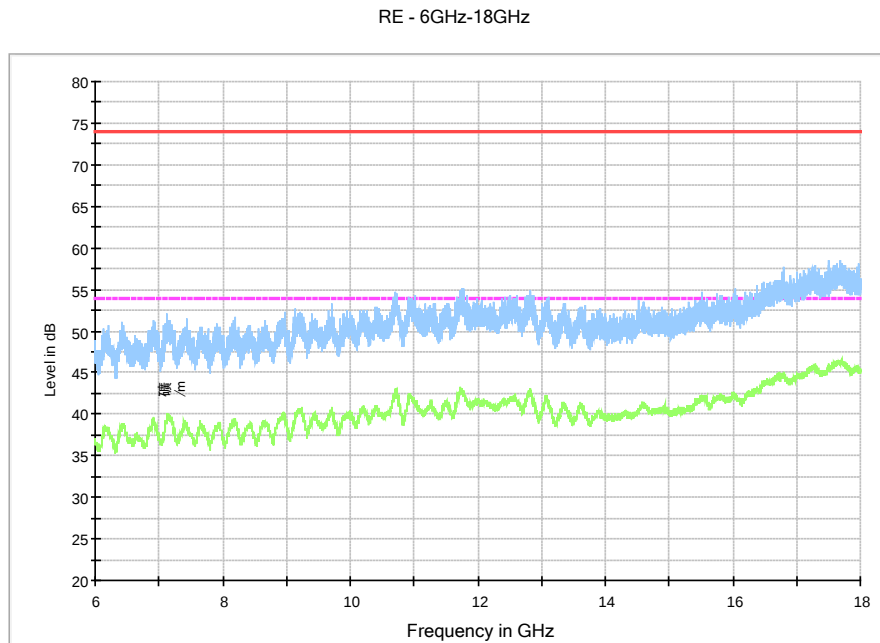


Fig. 49 Radiated Spurious Emission (802.11ac-HT40, Ch151, 6 GHz-18 GHz)

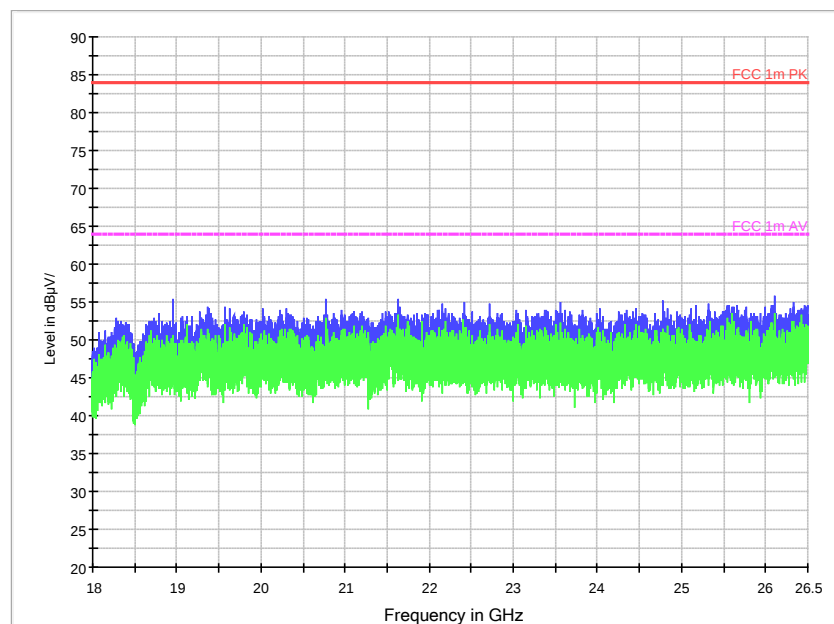


Fig. 50 Radiated Spurious Emission (802.11ac-HT40, Ch151, 18 GHz-26.5 GHz)

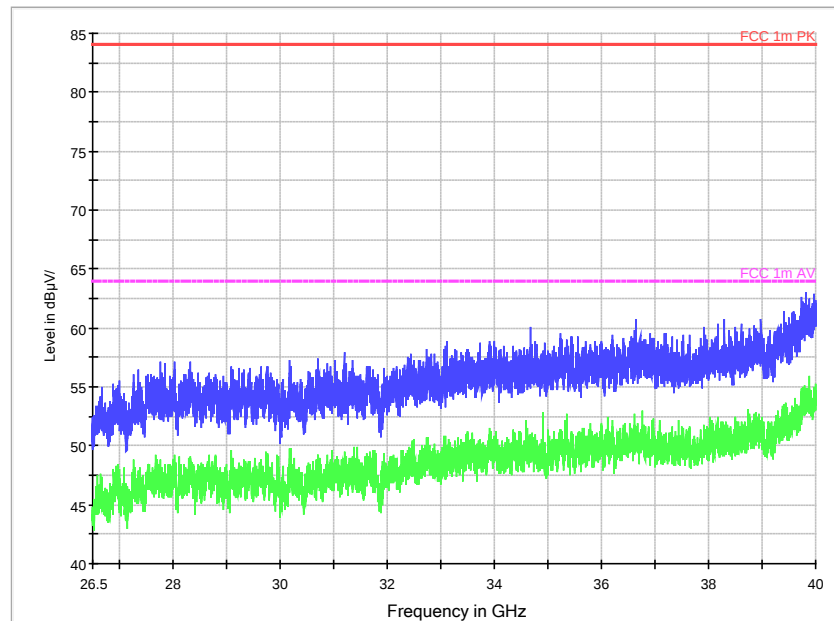


Fig. 51 Radiated Spurious Emission (802.11ac-HT40, Ch151, 26.5 GHz - 40 GHz)

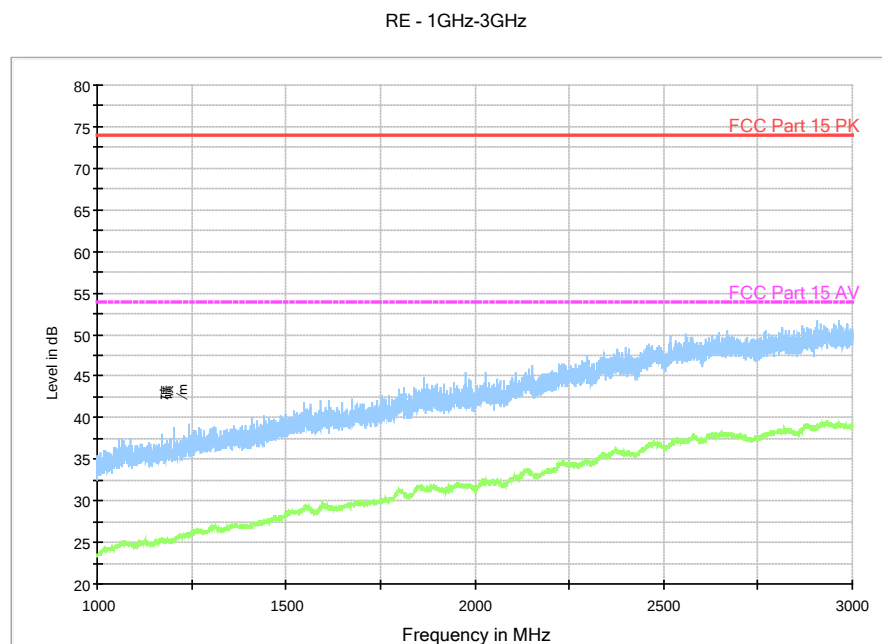
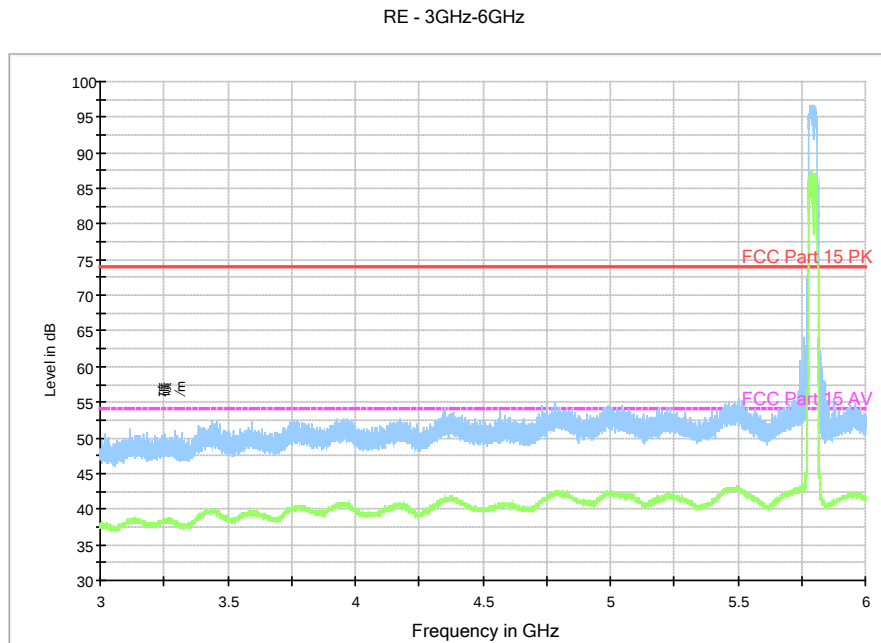


Fig. 52 Radiated Spurious Emission (802.11ac-HT40, Ch159 1 GHz-3GHz)



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, Ch159 3 GHz-6GHz)

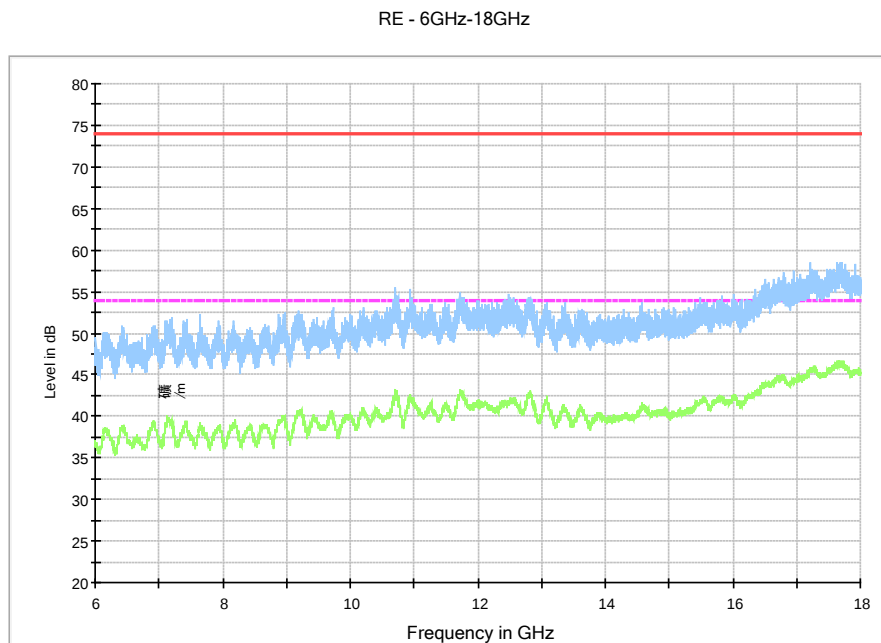


Fig. 54 Radiated Spurious Emission (802.11ac-HT40, Ch159, 6 GHz-18 GHz)

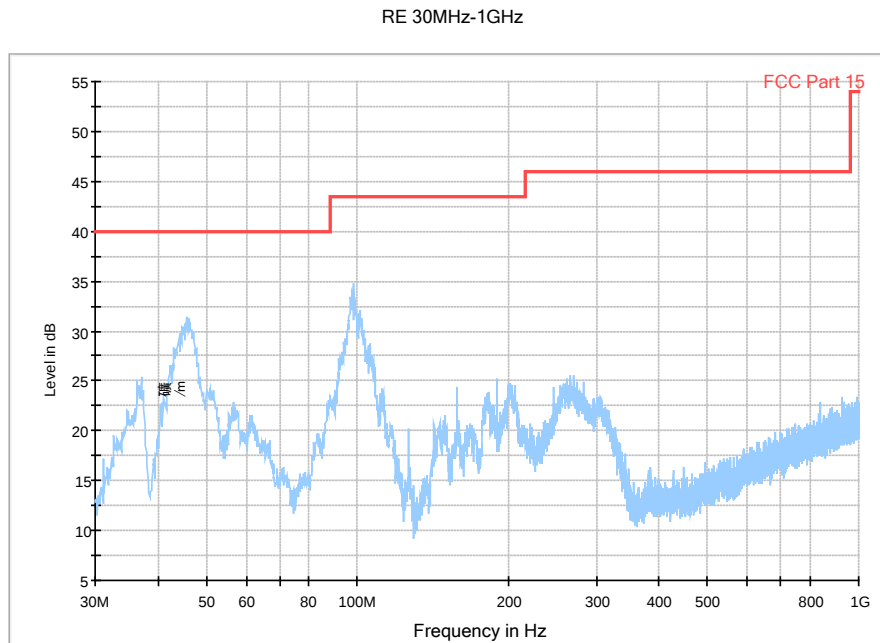


Fig. 55 Radiated Spurious Emission (802.11ac-HT80, Ch155, 30 MHz-1 GHz)

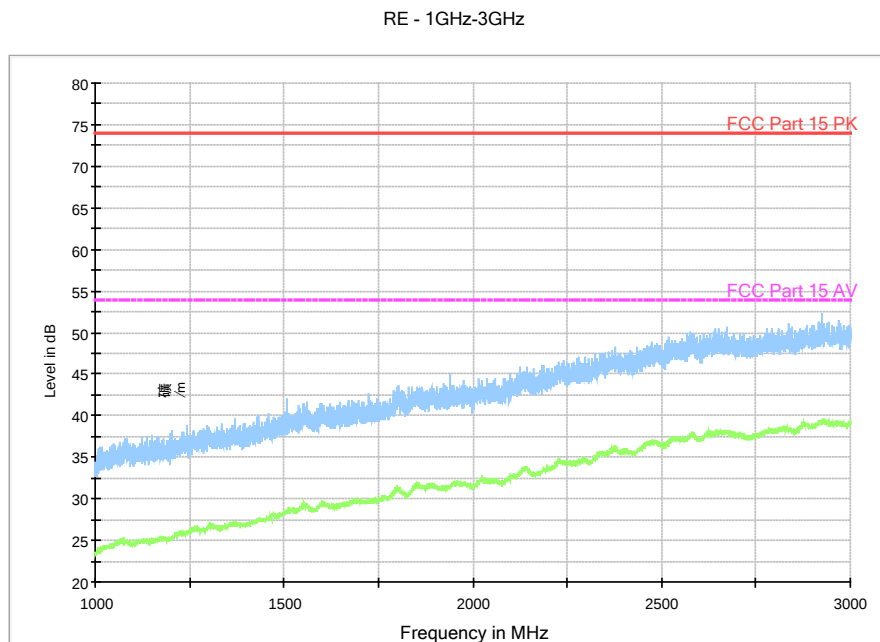
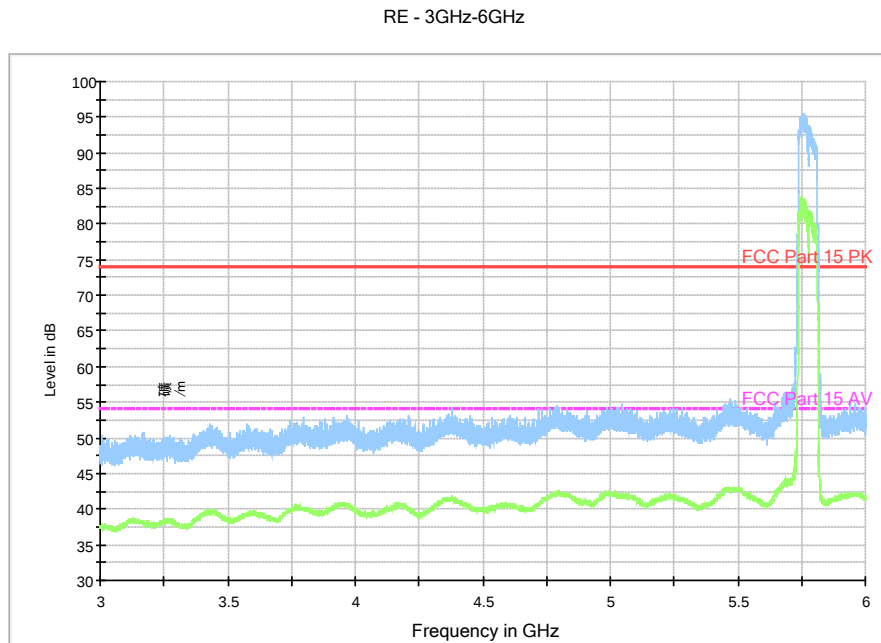


Fig. 56 Radiated Spurious Emission (802.11ac-HT80, Ch155, 1 GHz-3GHz)



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, Ch155, 3 GHz-6GHz)

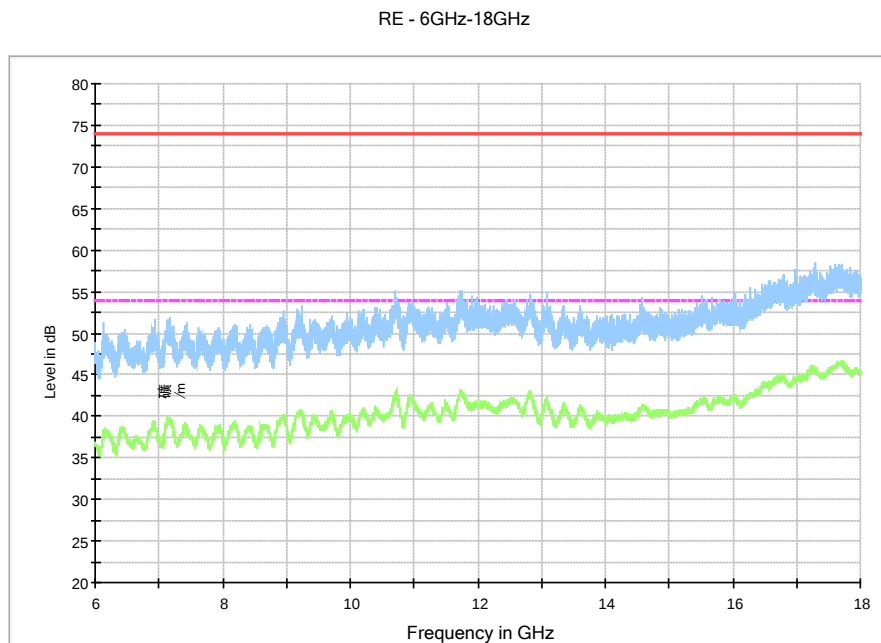


Fig. 58 Radiated Spurious Emission (802.11ac-HT80, Ch155, 6 GHz-18 GHz)

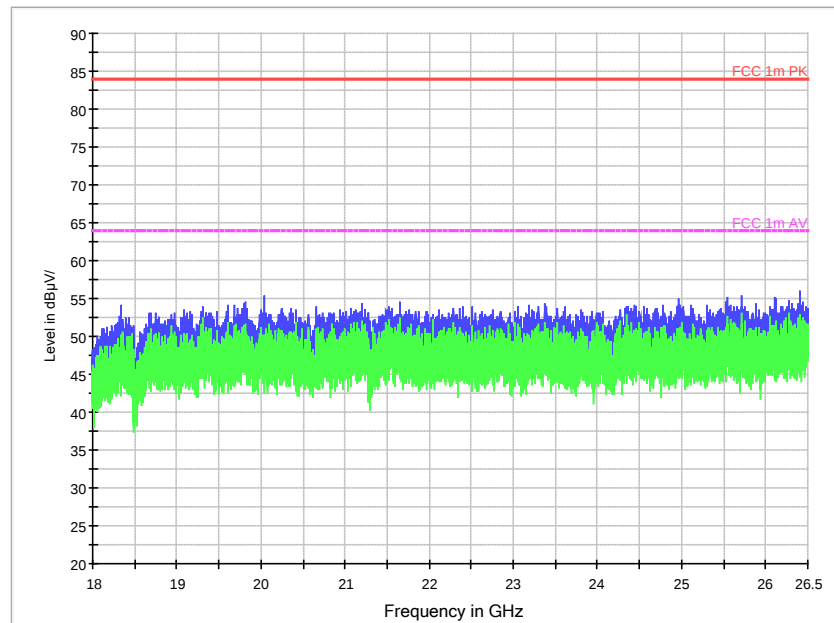


Fig. 59 Radiated Spurious Emission (802.11ac-HT80, Ch155, 18 GHz-26.5 GHz)

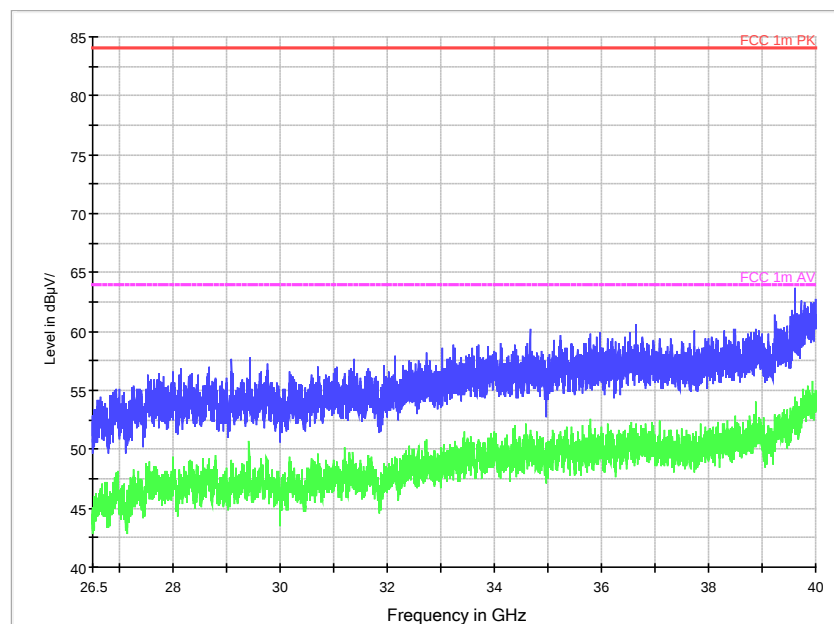


Fig. 60 Radiated Spurious Emission (802.11ac-HT80, Ch155, 26.5 GHz - 40 GHz)

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 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)).

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:

RE - Power-5.685GHz-5.765GHz

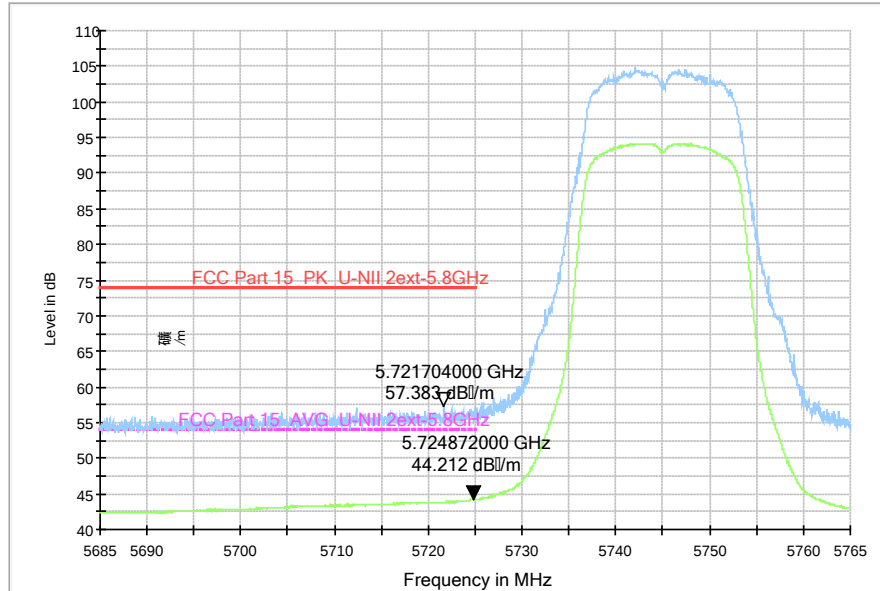


Fig. 61 Band Edges (802.11a, 5745MHz)

RE - Power-5.810GHz-5.890GHz

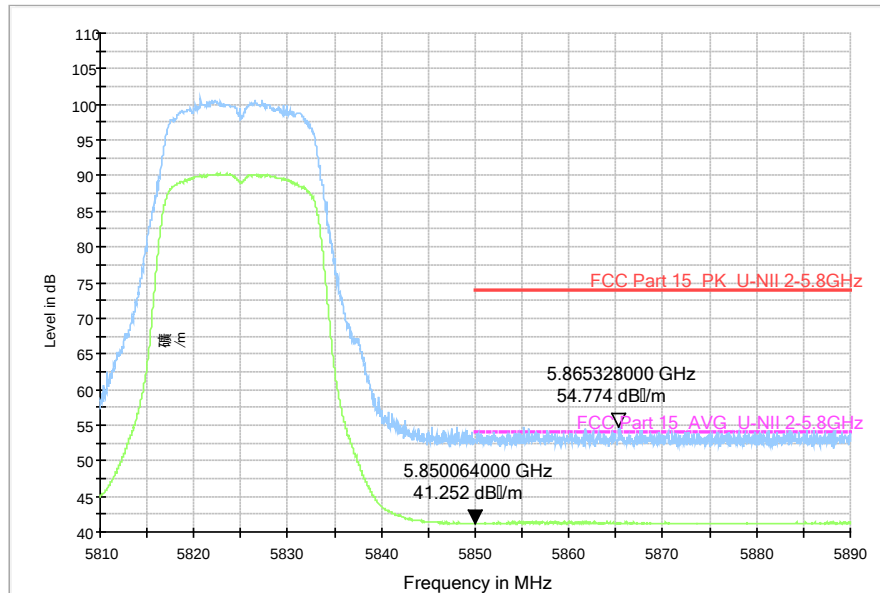


Fig. 62 Band Edges (802.11a, 5825MHz)

RE - Power-5.685GHz-5.765GHz

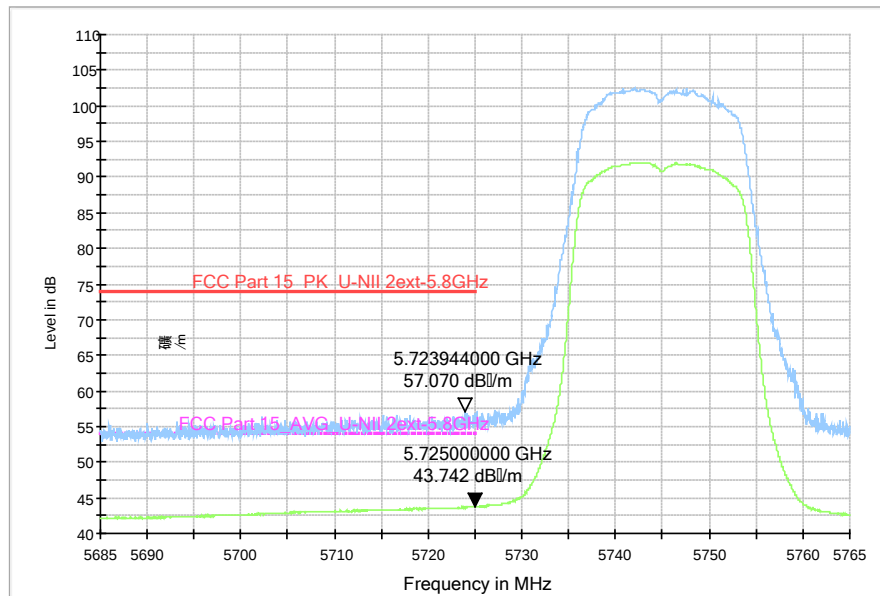


Fig. 63 Band Edges (802.11n-HT20, 5745MHz)

RE - Power-5.810GHz-5.890GHz

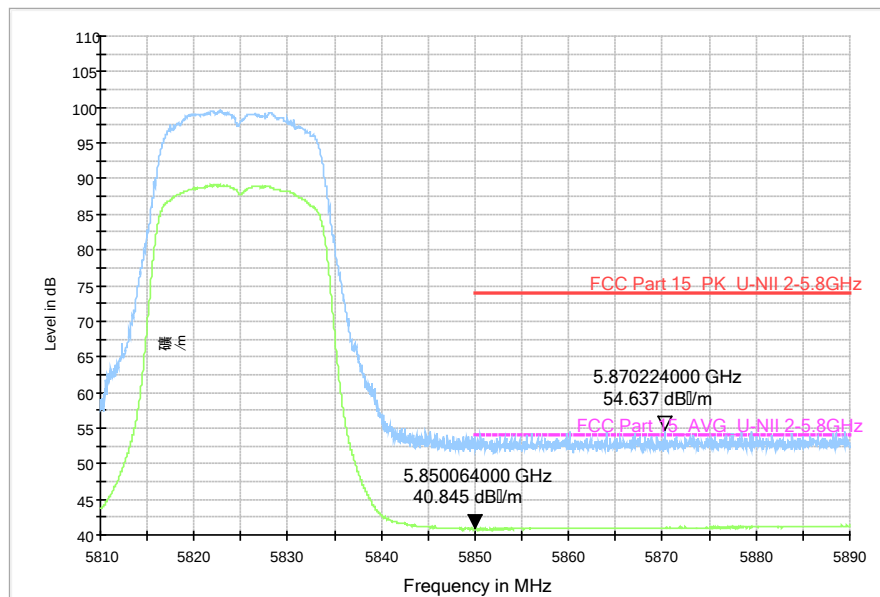


Fig. 64 Band Edges (802.11n-HT20, 5825MHz)

RE - Power-5.685GHz-5.765GHz

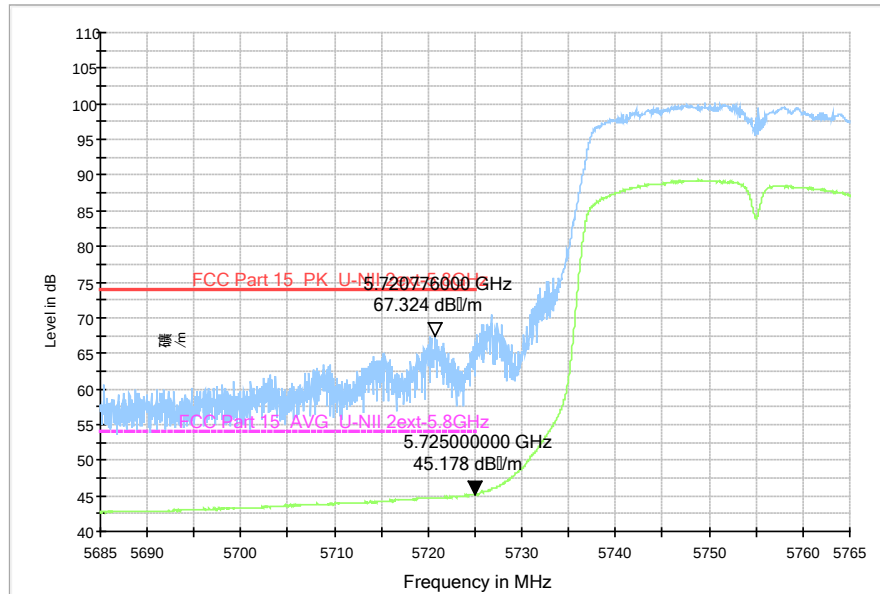


Fig. 65 Band Edges (802.11n-HT40, 5755MHz)

RE - Power-5.810GHz-5.890GHz

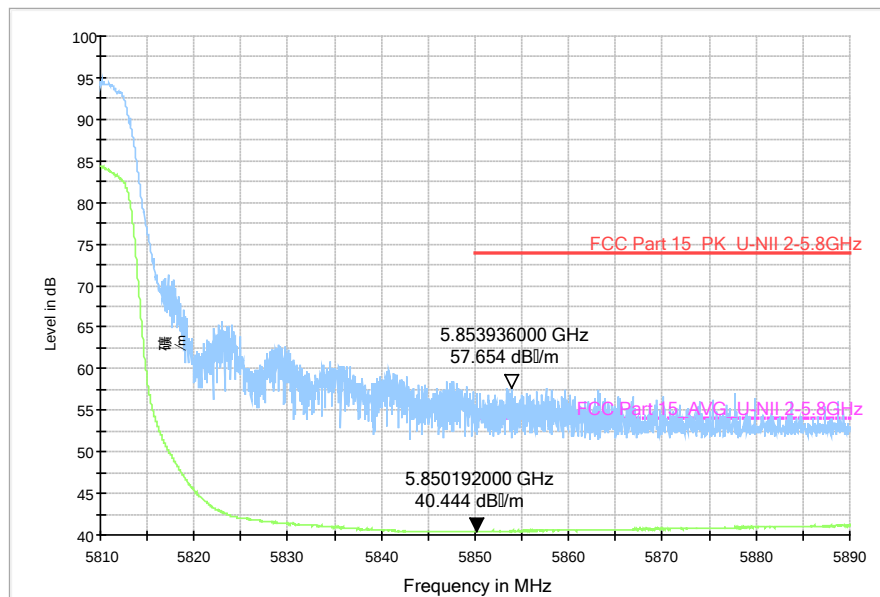


Fig. 66 Band Edges (802.11n-HT40, 5795MHz)

RE - Power-5.685GHz-5.765GHz

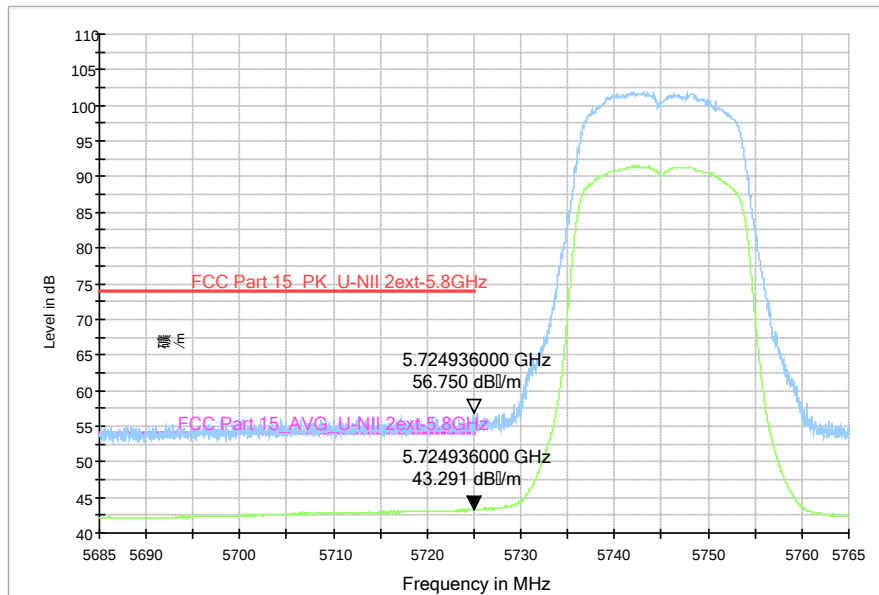


Fig. 67 Band Edges (802.11ac-HT20, 5745MHz)

RE - Power-5.810GHz-5.890GHz

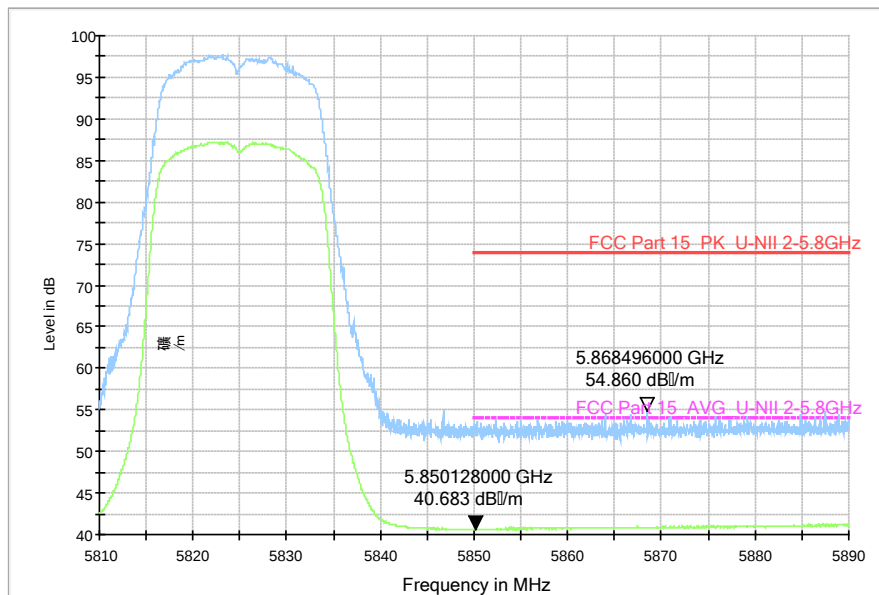


Fig. 68 Band Edges (802.11ac-HT20, 5825MHz)

RE - Power-5.685GHz-5.765GHz

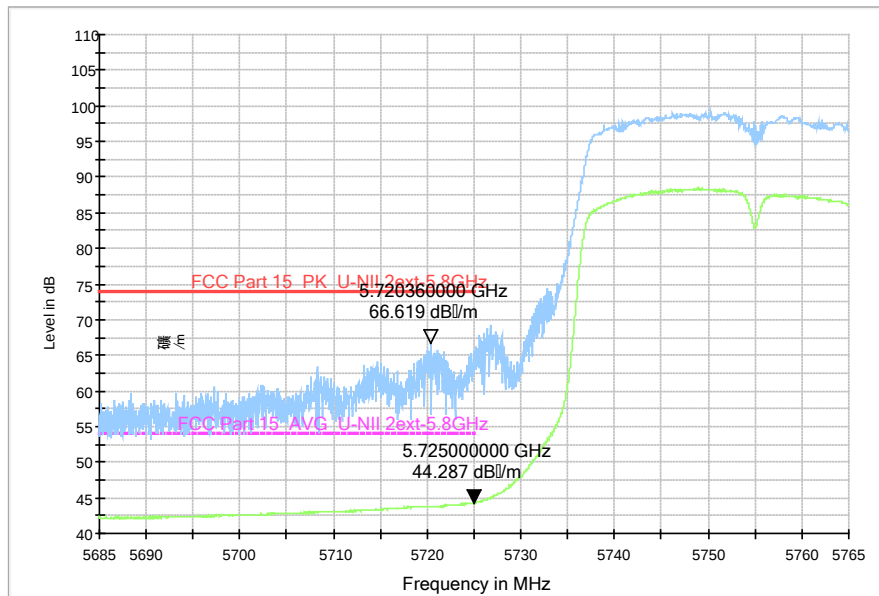


Fig. 69 Band Edges (802.11ac-HT40, 5755MHz)

RE - Power-5.810GHz-5.890GHz

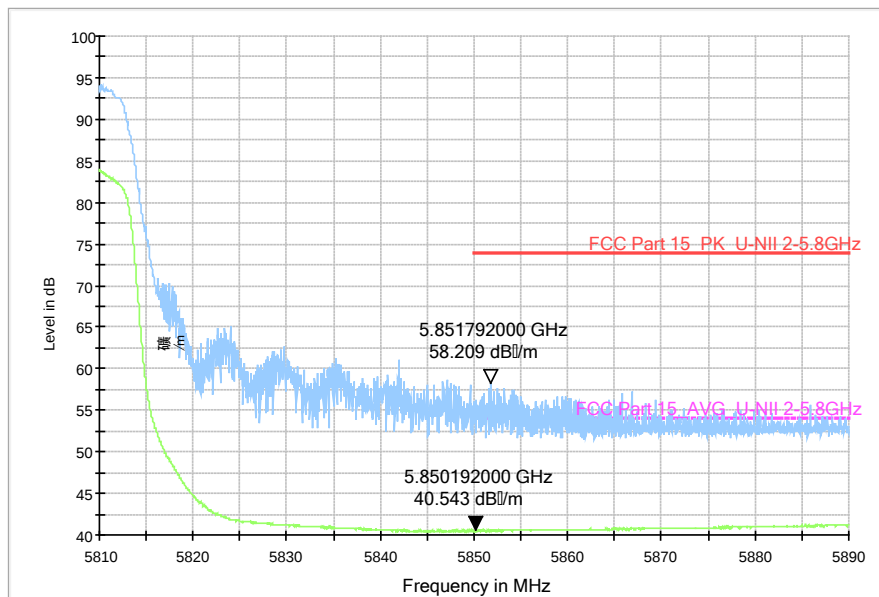


Fig. 70 Band Edges (802.11ac-HT40, 5795MHz)

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 ANSI 63.10.

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:

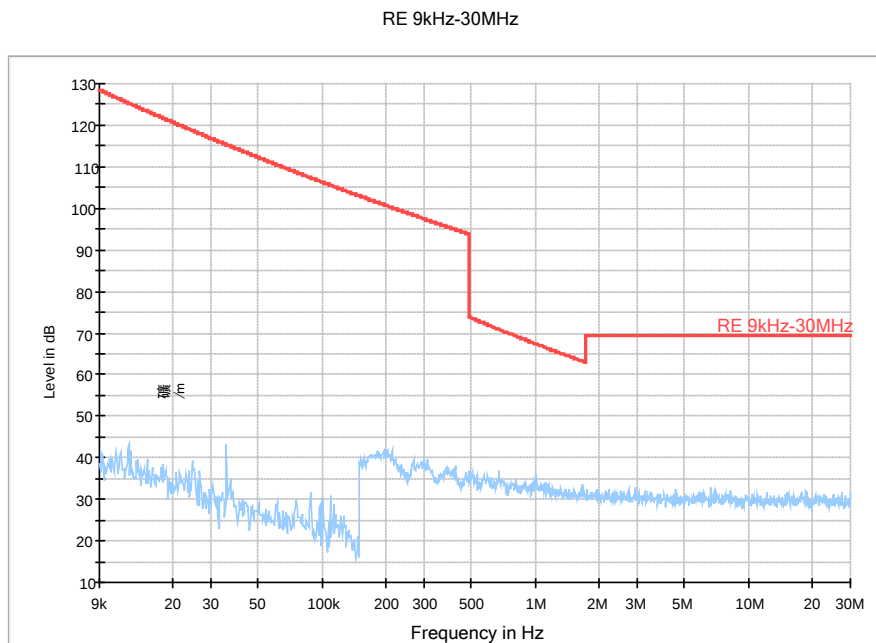


Fig. 71 Radiated Spurious Emission (802.11a, ch157, 9 kHz ~30 MHz)

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