FCC PART 15C
TEST REPORT
No. I16Z41860-EMC13

for

OnePlus Technology(Shenzhen) Co., Ltd.

Mobile Phone

Model Name: ONEPLUS A3000

With

Hardware Version: 28

Software Version: oxygen 3.5.1

FCC ID: 2ABZ2-A3000

Issued Date: 2016-11-17

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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CONTENTS

1. TEST LATORATORY

1.1. Testing Location

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: 2016-11-02

Testing End Date: 2016-11-13

1.4. Signature

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(Prepared this test report)

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(Reviewed this test report)

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2. CLIENT INFORMATION

2.1. Applicant Information

Company Name:	OnePlus Technology(Shenzhen) Co., Ltd.
Address:	18/F, Tower C, Tai Ran Building,No.8 Tai Ran Road, Shenzhen, China
City:	Shenzhen
Postal Code:	/
Country:	China
Telephone:	0755 61898696 EXT 7023
Fax:	/

2.2. Manufacturer Information

Company Name:	OnePlus Technology(Shenzhen) Co., Ltd.
Address:	18/F, Tower C, Tai Ran Building,No.8 Tai Ran Road, Shenzhen, China
City:	Shenzhen
Postal Code:	/
Country:	China
Telephone:	0755 61898696 EXT 7023
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 Telecommunication Metrology Center of MIIT of People's Republic of China.

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version
EUT10	860046039213550	28	oxygen 3.5.1

*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	Dummy battery	/	/
AE2	USB Cable	/	/
AE3	Travel Charger	HW-050300E00	K71804F7300274
AE4	Travel Charger	HW-050300B00	K72004F7L00262
AE5	Travel Charger	HW-050300U00	K71704F6V00574
AE6	Travel Charger	HW-050300A00	K72145F7Y00141

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

3.4. General Description

The Equipment Under Test (EUT) is a model of Mobile Phone with integrated antenna. It consists of normal options: lithium battery, charger and USB cable. Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the Client.

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 Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	2015
ANSI C63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2013
KDB789033 D02	Guidelines for Compliance Testing of Unlicensed National Inforamtion Infrastructre(U-NII) Devices Part15,Subpart E	2014

5. LABORATORY ENVIRONMENT

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

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 15 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	>2 MΩ
Ground system resistance	< 1Ω
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

7. **Shielded room** did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35℃
Relative humidity	Min. =20 %, Max. =75 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-1000MHz,>90dB
Electrical insulation	>2MΩ
Ground system resistance	<4Ω

8. SUMMARY OF TEST RESULTS

8.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15C	Sub-clause of IC	Verdict
Band Edges Compliance	15.407 (b)	/	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

8.2. 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.

8.3. 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 3.8V

Humidity 15%~75%

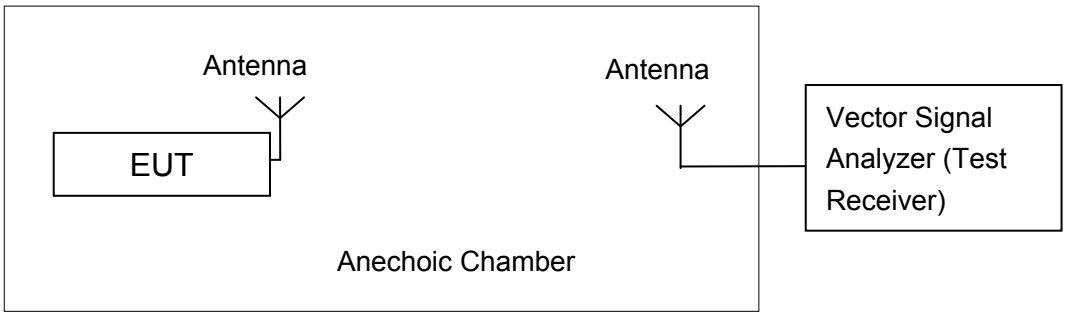
9. TEST EQUIPMENTS UTILIZED

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100235	R&S	2017-03-02	1 year
2	Loop antenna	HFH2-Z2	829324/007	R&S	2017-12-16	3 year
3	EMI Antenna	VULB 9163	9163-514	R&S	2017-12-24	3 year
4	Dual-Ridge Waveguide Horn Antenna	3115	6914	Schwarzbeck	2017-12-15	3 year
5	Dual-Ridge Waveguide Horn Antenna	3116	2661	ETS-Lindgren	2017-06-17	3 year
6	Vector Signal Analyzer	FSV40	101047	ETS-Lindgren	2017-07-02	1 year
7	Semi/full-anechoic chamber	/	CT000332-1074	ETS-Lindgren	/	/

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 26GHz, RBW = 1MHz, VBW = 10Hz;



The measurement is made according to ANSI C63.10.
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)).

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Measurement Uncertainty:

Frequency Range	Uncertainty(dB)
f ≤ 3GHz	U=3.68, K=2
f>3GHz	U= 5.12, K=2

Measurement Results:

802.11a mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	149	1 GHz ~ 3 GHz	Fig.1	P
		3 GHz ~ 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
		3 GHz ~ 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
		3 GHz ~ 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.

802.11a

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Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5725.032	42.1	-17.9	34.9	25.10	H
5724.232	41.6	-17.9	34.9	24.63	H
11493.600	41.5	-16.2	38.7	19.01	H
16785.600	44.9	-15.6	41.5	19.05	H
17250.000	45.7	-14.2	41.2	18.67	H
17614.800	46.1	-13.2	41.1	18.19	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5709.448	59.2	-18.0	34.9	5709.448	H
5724.968	58.8	-17.9	34.9	5724.968	H
17262.600	59.7	-14.1	41.2	17262.600	V
17726.400	59.4	-13.2	41.0	17726.400	H
17860.200	59.3	-13.5	40.9	17860.200	V
17541.000	59.2	-14.0	41.2	17541.000	V

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Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5764.800	42.1	-18.6	34.9	25.81	H
5805.300	40.9	-19.3	35.0	25.23	H
11569.200	39.9	-17.7	38.8	21.30	H
16786.800	44.9	-15.6	41.5	19.01	H
17355.600	45.5	-14.3	41.2	18.58	H
17646.000	46.1	-13.0	41.1	18.03	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5672.550	51.0	-18.2	34.9	34.27	H
5827.050	50.5	-19.7	35.0	35.22	H
17238.000	60.1	-14.2	41.2	33.11	V
17275.200	59.7	-14.0	41.2	32.48	V
17661.600	59.4	-13.1	41.1	31.45	V
17422.800	59.3	-14.7	41.2	32.86	V

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Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5850.000	43.1	-19.9	35.1	27.85	H
5850.160	43.0	-19.9	35.1	27.84	H
11670.000	41.0	-17.0	39.0	19.08	H
17278.800	46.0	-14.0	41.2	18.76	H
17505.600	45.6	-14.4	41.2	18.82	H
17644.800	46.1	-13.0	41.1	18.00	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5853.648	57.7	-19.8	35.1	42.36	H
5870.928	56.8	-19.4	35.1	41.10	H
17717.400	59.9	-13.2	41.0	32.10	V
17656.800	59.6	-13.1	41.1	31.58	V
17244.000	59.5	-14.2	41.2	32.49	V
17678.400	59.3	-13.1	41.1	31.35	H

802.11n-HT20

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Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5724.776	45.3	-17.9	34.9	28.27	H
5724.936	45.3	-17.9	34.9	28.34	H
11500.800	41.2	-16.3	38.7	18.86	H
16779.600	45.0	-15.6	41.5	19.06	H
17250.000	45.6	-14.2	41.2	18.61	H
17644.800	46.1	-13.0	41.1	18.01	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5700.904	58.0	-18.0	34.9	41.16	H
5724.136	58.8	-17.9	34.9	41.81	H
17587.200	59.5	-13.5	41.1	31.86	H
17292.000	59.4	-14.0	41.2	32.16	V
17622.000	59.4	-13.1	41.1	31.40	H
17293.200	59.1	-14.0	41.2	31.85	H

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Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5764.500	41.5	-18.6	34.9	25.14	H
5805.600	40.2	-19.3	35.0	24.54	H
11569.600	45.8	-17.7	38.8	24.72	H
16779.600	45.0	-15.6	41.5	19.06	H
17250.000	46.5	-14.2	41.2	19.43	H
17644.800	46.1	-13.0	41.1	18.01	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5472.150	51.4	-16.9	34.8	33.48	H
5822.400	50.6	-19.6	35.0	35.20	H
11568.600	60.6	-17.7	38.8	39.47	H
11574.600	60.2	-17.8	38.8	39.20	H
17394.000	60.0	-14.5	41.2	33.34	H
17385.000	59.8	-14.5	41.2	33.09	V

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Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5850.032	43.0	-19.9	35.1	27.80	H
5850.256	43.0	-19.8	35.1	27.76	H
11670.000	41.0	-17.0	39.0	19.02	H
17287.200	46.1	-13.9	41.2	18.79	H
17505.600	45.6	-14.4	41.2	18.80	H
17654.400	46.1	-13.1	41.1	18.12	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5850.256	56.6	-19.8	35.1	41.36	H
5866.032	56.8	-19.5	35.1	41.17	H
17653.200	60.2	-13.1	41.1	32.14	V
17602.800	59.9	-13.3	41.1	32.08	V
17272.800	59.8	-14.0	41.2	32.65	H
17635.800	59.7	-13.0	41.1	31.60	H

802.11n-HT40

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Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5724.744	47.1	-17.9	34.9	30.07	H
5724.936	47.1	-17.9	34.9	30.06	H
11510.400	41.9	-16.5	38.7	19.71	H
16775.200	44.9	-15.6	41.5	18.96	H
17264.800	45.8	-14.1	41.2	18.66	H
17640.000	46.3	-13.0	41.1	18.20	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5714.632	66.1	-17.9	34.9	49.17	H
5720.968	68.2	-17.9	34.9	51.23	V
17235.000	59.6	-14.3	41.2	32.69	H
17590.200	59.5	-13.5	41.1	31.87	V
17631.000	59.3	-13.0	41.1	31.26	V
17811.600	59.2	-13.5	41.0	31.76	V

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Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5850.032	42.6	-19.9	35.1	27.44	H
5850.448	42.7	-19.8	35.1	27.45	H
11589.600	44.2	-18.1	38.8	23.42	H
16774.400	44.9	-15.6	41.5	18.96	H
17406.400	45.3	-14.6	41.2	18.71	H
17619.200	46.1	-13.2	41.1	18.14	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5852.496	61.4	-19.8	35.1	46.15	H
5857.776	60.8	-19.7	35.1	45.37	H
17256.000	59.5	-14.1	41.2	32.38	H
17589.600	59.4	-13.5	41.1	31.72	V
17731.200	59.2	-13.3	41.0	31.49	V
17526.600	59.2	-14.2	41.2	32.16	H

802.11ac-HT20

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Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5724.392	44.8	-17.9	34.9	27.81	H
5724.968	44.8	-17.9	34.9	27.81	H
11500.000	41.8	-16.3	38.7	19.38	H
16784.000	44.9	-15.6	41.5	18.98	H
17250.400	45.7	-14.2	41.2	18.69	H
17623.200	46.1	-13.1	41.1	18.10	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5691.624	57.7	-18.1	34.9	40.87	H
5713.224	58.3	-18.0	34.9	41.33	H
17584.800	60.0	-13.5	41.1	32.40	V
17550.600	59.2	-13.9	41.2	31.90	H
17936.400	59.1	-13.6	40.9	31.88	V
17621.400	59.0	-13.1	41.1	31.06	H

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Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5763.900	40.3	-18.6	34.9	23.99	H
5805.000	39.7	-19.3	35.0	24.02	H
11569.200	44.5	-17.7	38.8	23.40	H
16788.000	44.9	-15.6	41.5	19.06	H
17355.600	45.4	-14.3	41.2	18.49	H
17646.000	46.1	-13.0	41.1	18.03	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5741.550	52.0	-18.1	34.9	35.27	H
5946.750	50.6	-18.2	35.2	33.60	H
11568.600	59.8	-17.7	38.8	38.63	V
17306.400	59.6	-14.0	41.2	32.40	H
17642.400	59.4	-13.0	41.1	31.33	V
17302.800	59.2	-14.0	41.2	32.04	H

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Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5850.000	42.8	-19.9	35.1	27.60	H
5850.288	42.8	-19.8	35.1	27.60	H
11670.400	41.0	-17.0	39.0	19.05	H
17295.200	45.9	-14.0	41.2	18.73	H
17504.800	45.6	-14.4	41.2	18.79	H
17638.400	46.2	-13.0	41.1	18.11	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5852.112	56.5	-19.8	35.1	41.21	H
5882.480	57.4	-19.1	35.1	41.39	H
17387.400	59.6	-14.5	41.2	32.89	V
17346.000	59.5	-14.3	41.2	32.62	V
17634.000	59.5	-13.0	41.1	31.44	V
17680.800	59.4	-13.1	41.1	31.50	V

802.11ac-HT40

Ch151

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5724.744	46.0	-17.9	34.9	29.01	H
5725.000	46.0	-17.9	34.9	29.03	H
11509.600	41.8	-16.5	38.7	19.61	H
16780.000	45.0	-15.6	41.5	19.05	H
17264.800	45.9	-14.1	41.2	18.72	H
17639.200	46.2	-13.0	41.1	18.11	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5720.584	67.0	-17.9	34.9	50.02	H
5724.800	67.5	-17.9	34.9	50.47	H
17280.600	59.3	-14.0	41.2	32.03	H
17611.200	59.2	-13.2	41.1	31.32	V
17889.600	59.1	-13.5	40.9	31.80	H
17479.200	59.1	-14.7	41.2	32.63	H

Ch159

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5850.096	42.6	-19.9	35.1	27.40	H
5850.992	42.6	-19.8	35.1	27.41	H
11589.600	43.3	-18.1	38.8	22.57	H
16774.400	44.9	-15.6	41.5	18.96	H
17400.800	45.3	-14.6	41.2	18.68	H
17633.600	46.1	-13.0	41.1	18.04	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5735.100	58.1	-18.0	34.9	41.25	H
5845.500	59.1	-20.0	35.1	43.95	H
17644.200	60.0	-13.0	41.1	31.92	H
17698.200	59.8	-13.2	41.0	31.92	V
17547.000	59.5	-13.9	41.2	32.33	V
17289.600	59.5	-13.9	41.2	32.25	H

802.11ac-HT80

Ch155

Average

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5711.100	41.0	-18.0	34.9	24.55	H
5824.500	40.9	-19.7	35.0	26.10	H
11535.300	40.5	-17.0	38.8	18.80	H
16783.400	44.8	-15.6	41.5	18.91	H
17310.030	45.5	-14.1	41.2	18.36	H
17657.920	46.1	-13.1	41.1	18.11	H

Peak

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5701.950	56.7	-18.0	34.9	39.88	V
5875.500	52.8	-19.3	35.1	37.03	V
17297.400	59.8	-14.0	41.2	32.58	H
17578.200	59.6	-13.6	41.1	32.11	H
17679.000	59.6	-13.1	41.1	31.69	H
17622.000	59.3	-13.1	41.1	31.35	H

Test graphs as below:

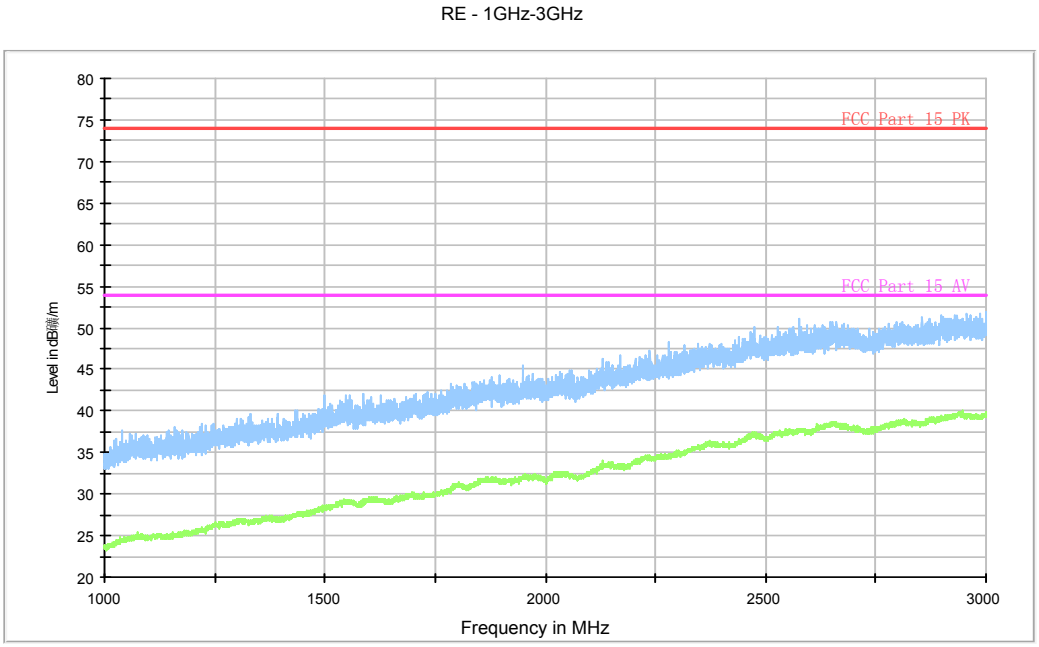

Fig. 1 Radiated Spurious Emission (802.11a, Ch149, 1 GHz-3 GHz)

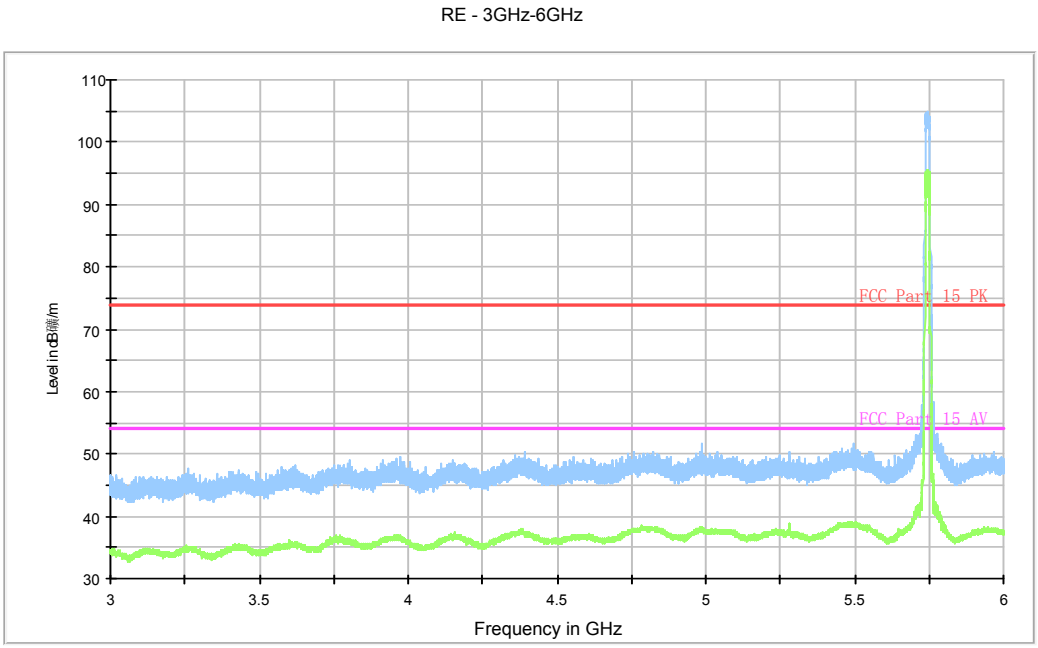

Fig. 2 Radiated Spurious Emission (802.11a, Ch149, 3 GHz-6 GHz)

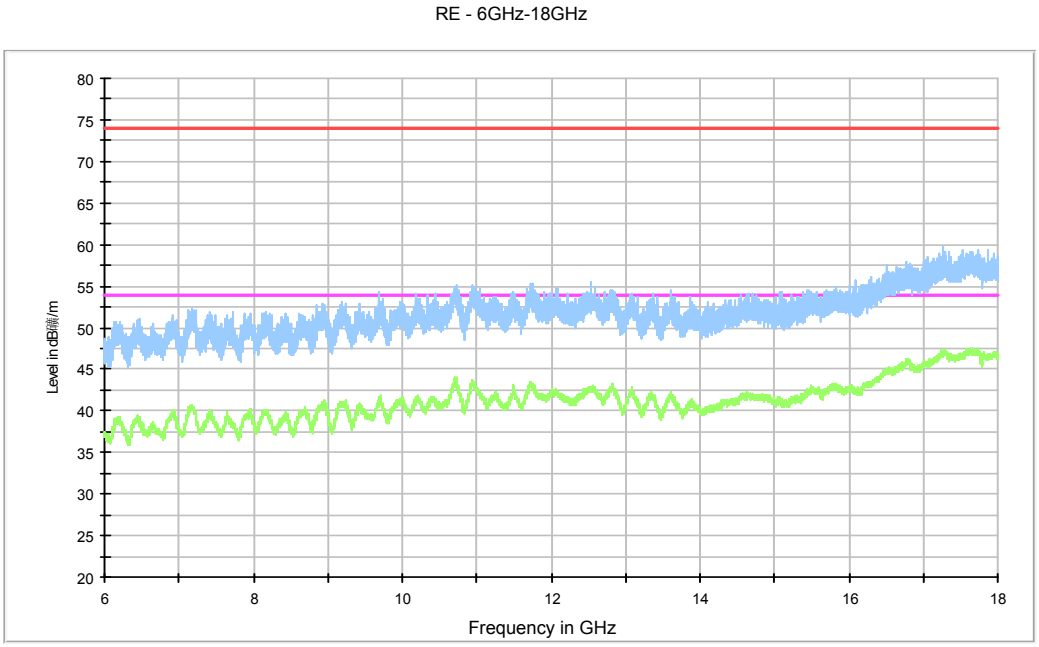

Fig. 3 Radiated Spurious Emission (802.11a, Ch149, 6 GHz-18 GHz)

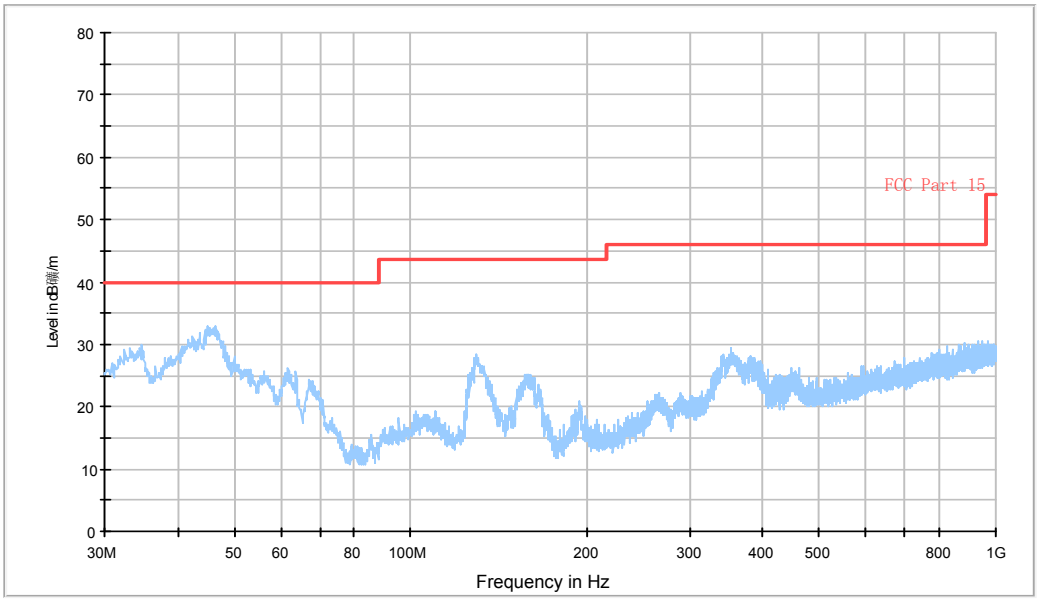

Fig. 4 Radiated Spurious Emission (802.11a, Ch157, 30 MHz-1 GHz)

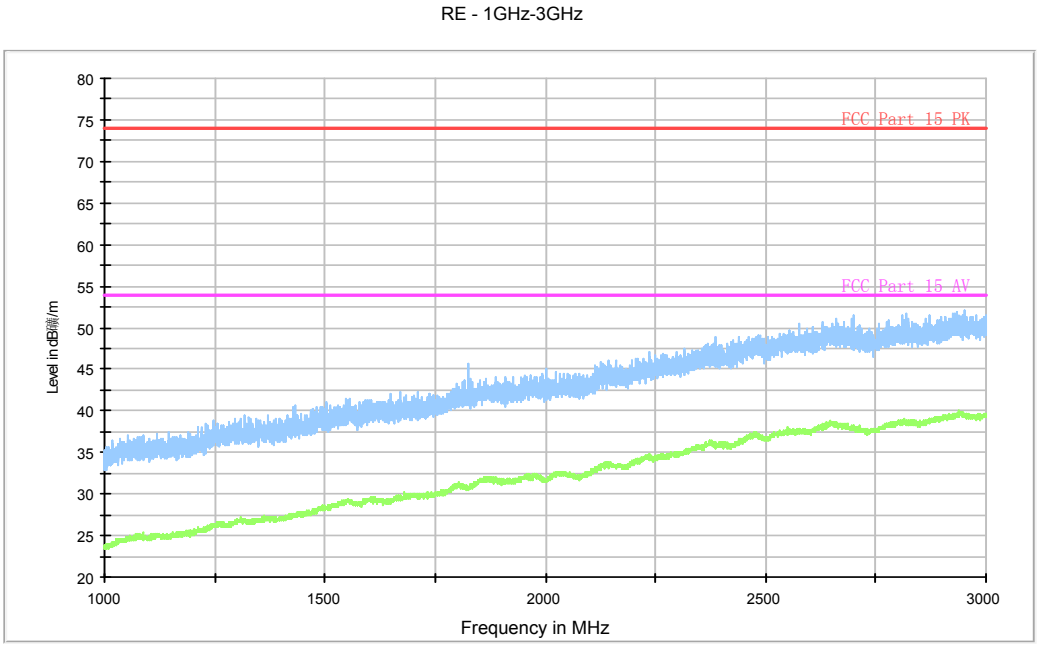

Fig. 5 Radiated Spurious Emission (802.11a, Ch157, 1 GHz-3 GHz)

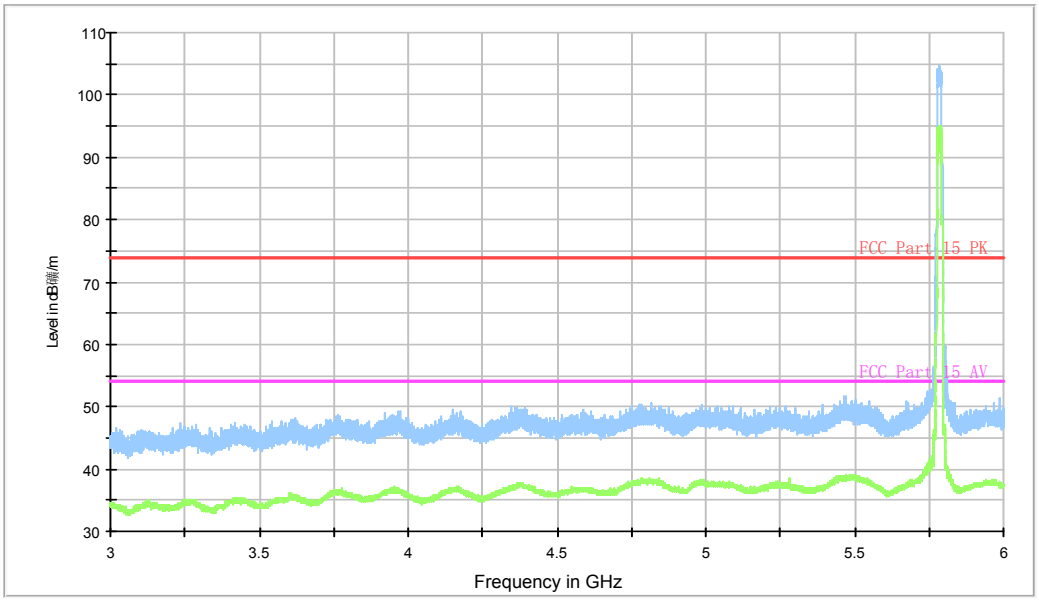

Fig. 6 Radiated Spurious Emission (802.11a, Ch157, 3 GHz-6 GHz)

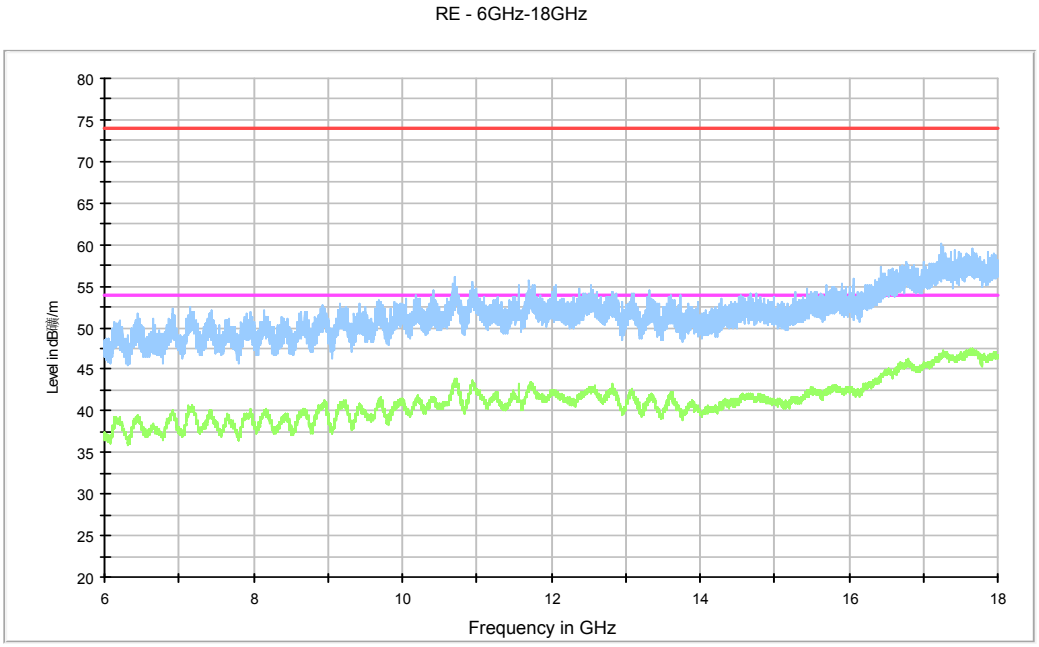

Fig. 7 Radiated Spurious Emission (802.11a, Ch157, 6 GHz-18GHz)

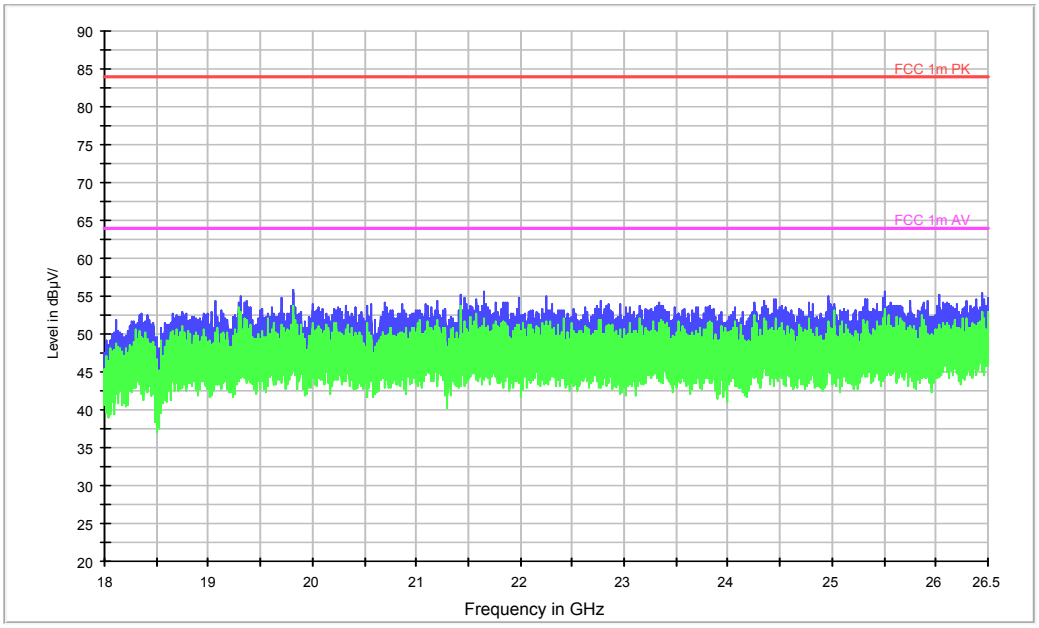

Fig. 8 Radiated Spurious Emission (802.11a, Ch157, 18 GHz-26.5 GHz)

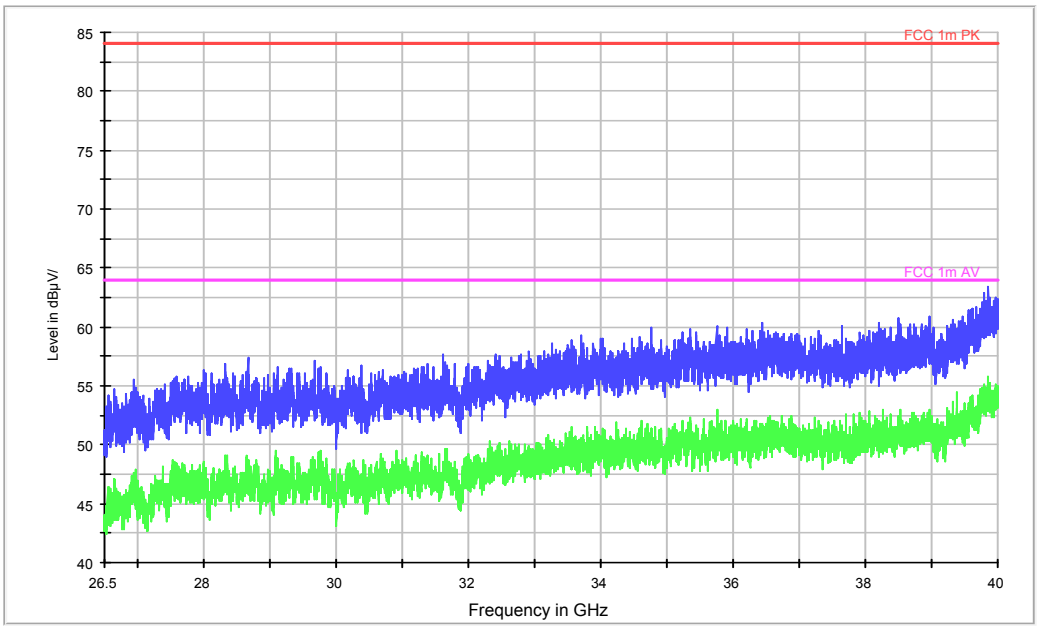

Fig. 9 Radiated emission: 802.11n, (802.11a, Ch157, 26.5 GHz - 40 GHz)

RE - 1GHz-3GHz

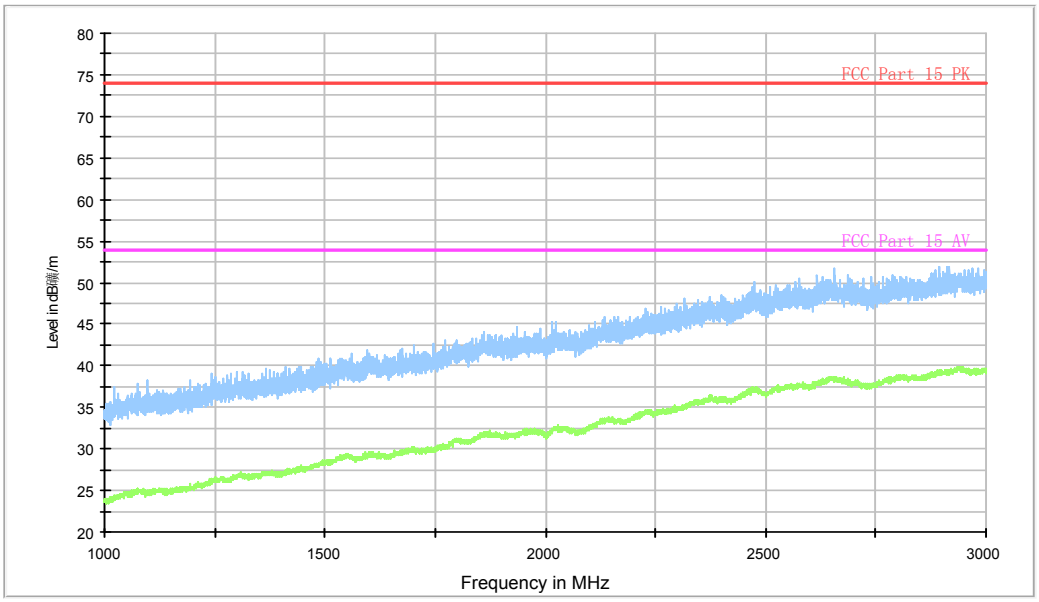

Fig. 10 Radiated Spurious Emission (802.11a, Ch165, 1 GHz-3 GHz)

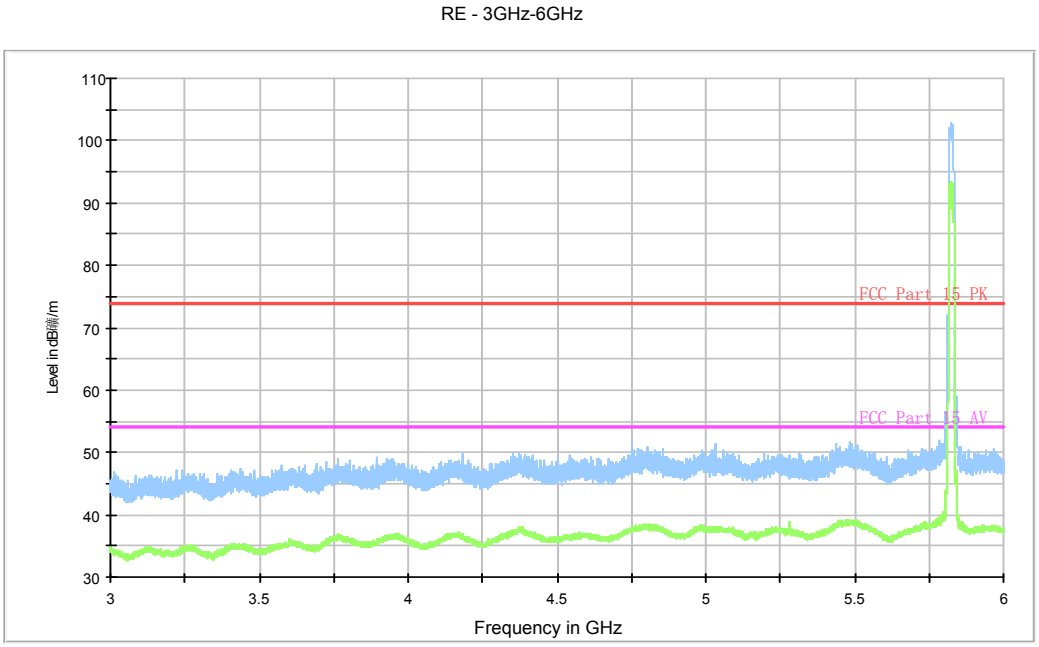

Fig. 11 Radiated Spurious Emission (802.11a, Ch165, 3 GHz-6 GHz)

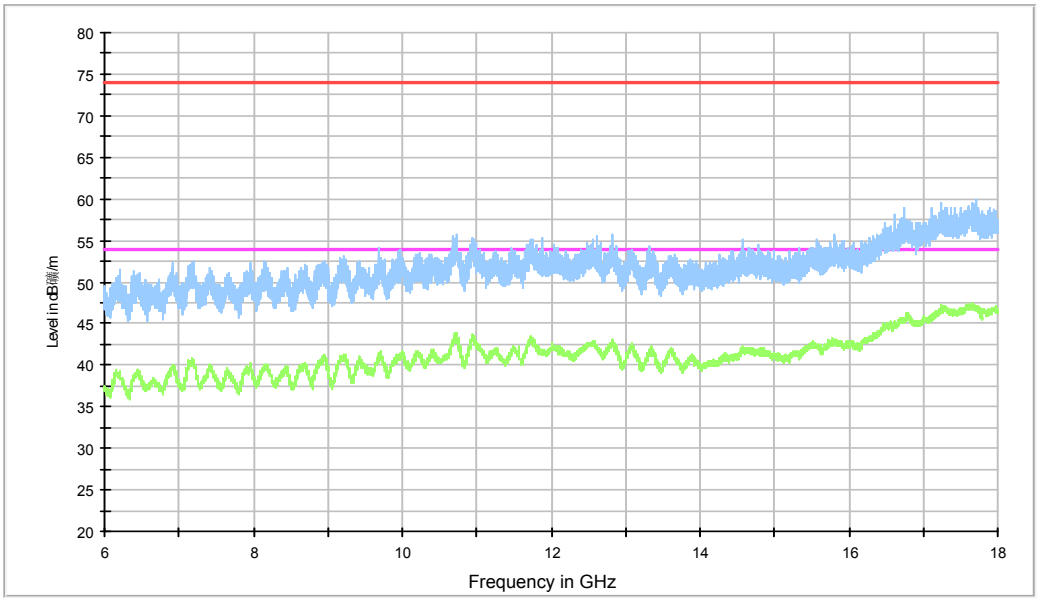

Fig. 12 Radiated Spurious Emission (802.11a, Ch165, 6 GHz-18 GHz)

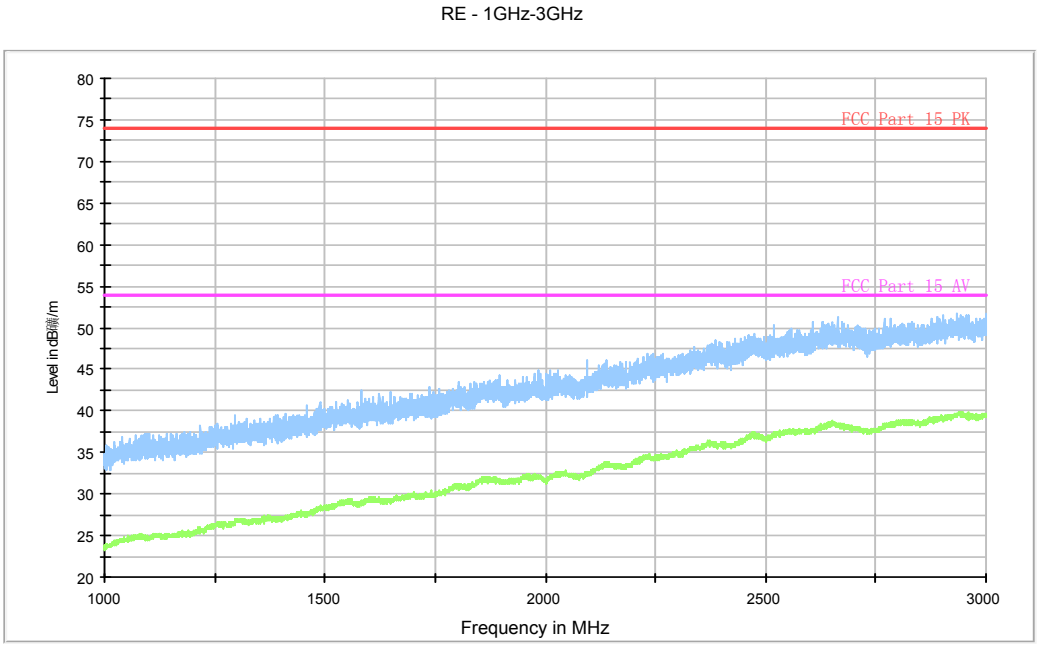

Fig. 13 Radiated Spurious Emission (802.11n-HT20, Ch149, 1 GHz-3 GHz)

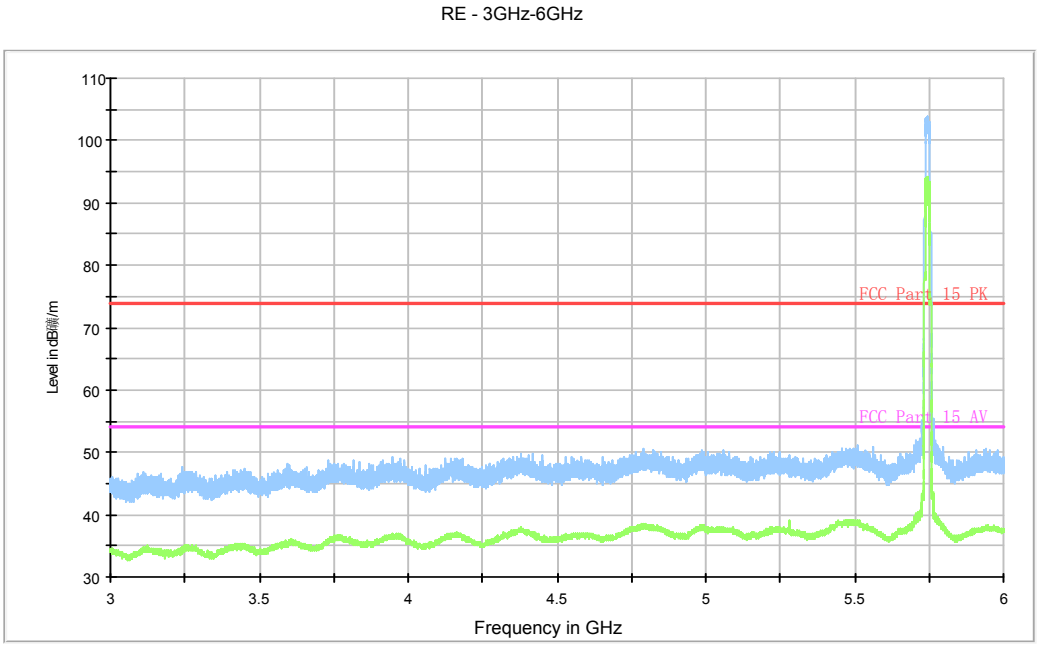

Fig. 14 Radiated Spurious Emission (802.11n-HT20, Ch149, 3 GHz-6 GHz)

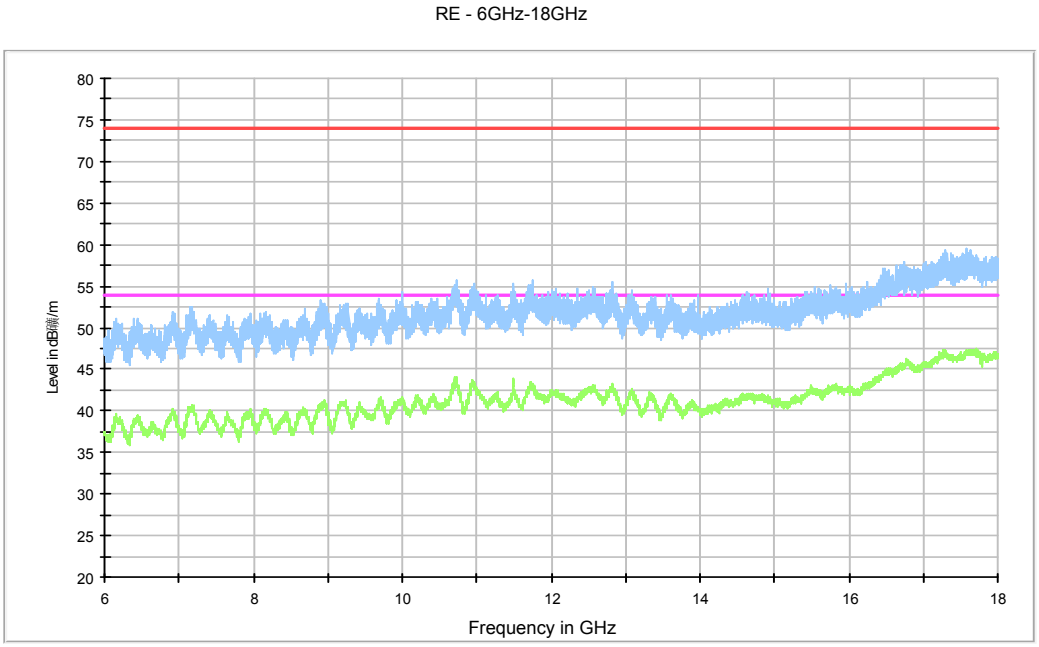

Fig. 15 Radiated Spurious Emission (802.11n-HT20, Ch149, 6 GHz-18 GHz)

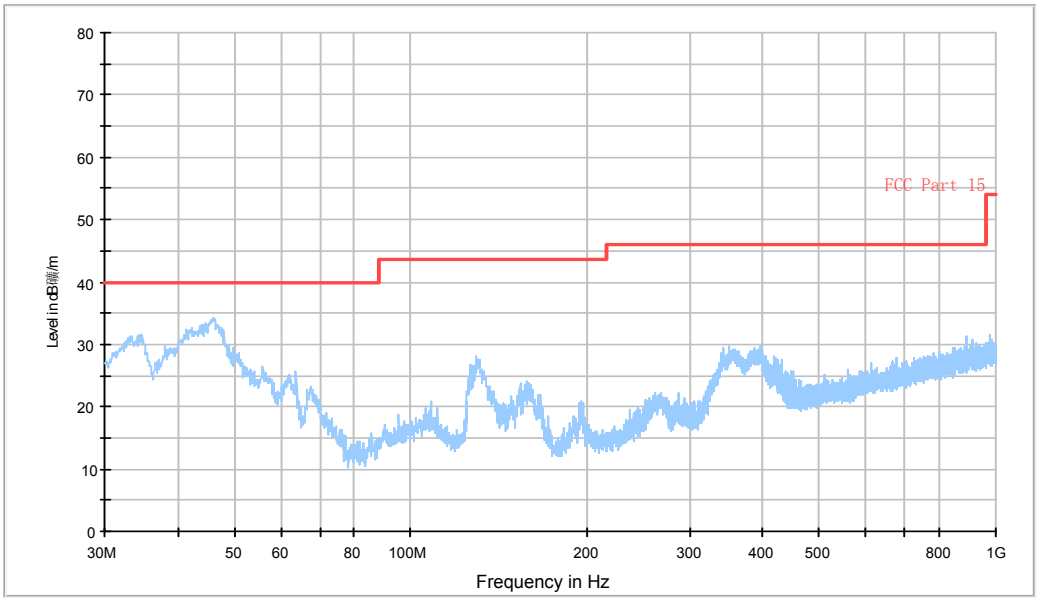

Fig. 16 Radiated Spurious Emission (802.11n-HT20, Ch157, 30 MHz-1 GHz)

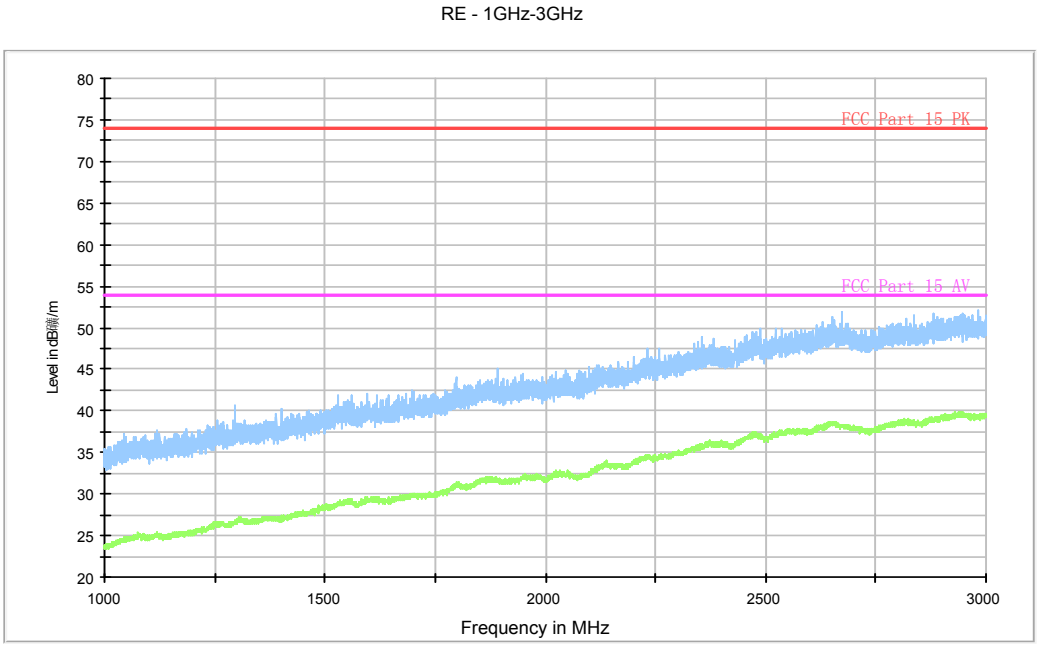

Fig. 17 Radiated Spurious Emission (802.11n-HT20, Ch157, 1 GHz-3 GHz)

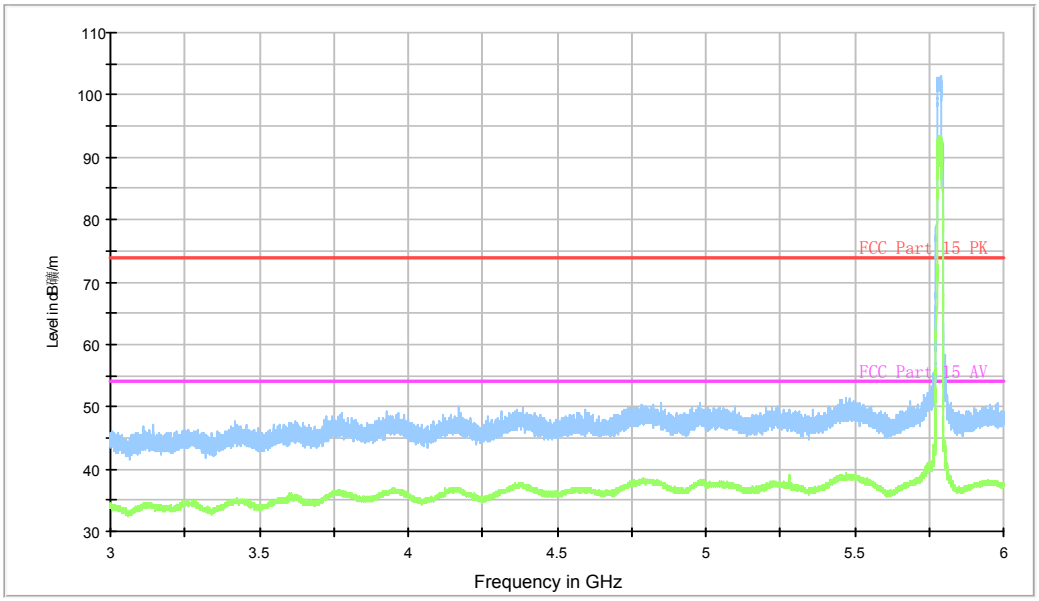

Fig. 18 Radiated Spurious Emission (802.11n-HT20, Ch157, 3 GHz-6 GHz)

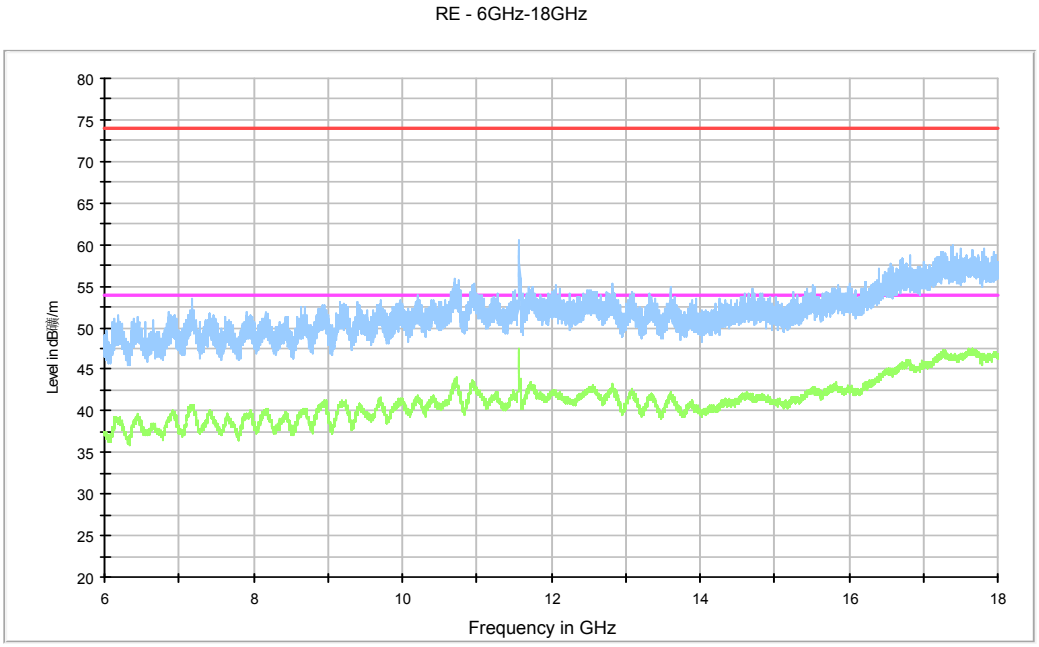

Fig. 19 Radiated Spurious Emission (802.11n-HT20, Ch157, 6 GHz-18 GHz)

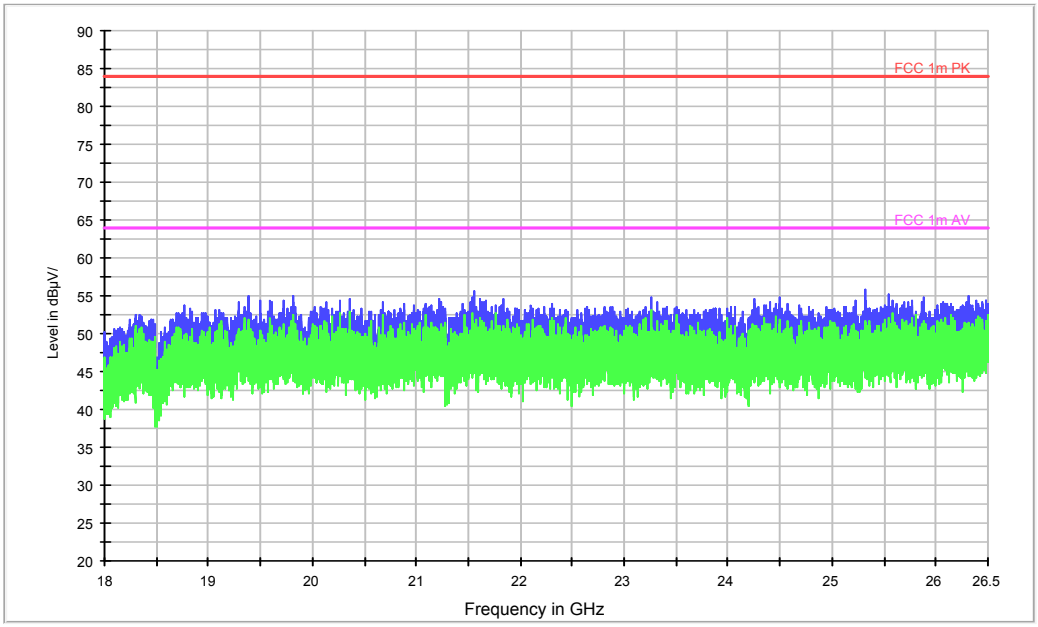

Fig. 20 Radiated Spurious Emission (802.11n-HT20, Ch157, 18 GHz-26.5 GHz)

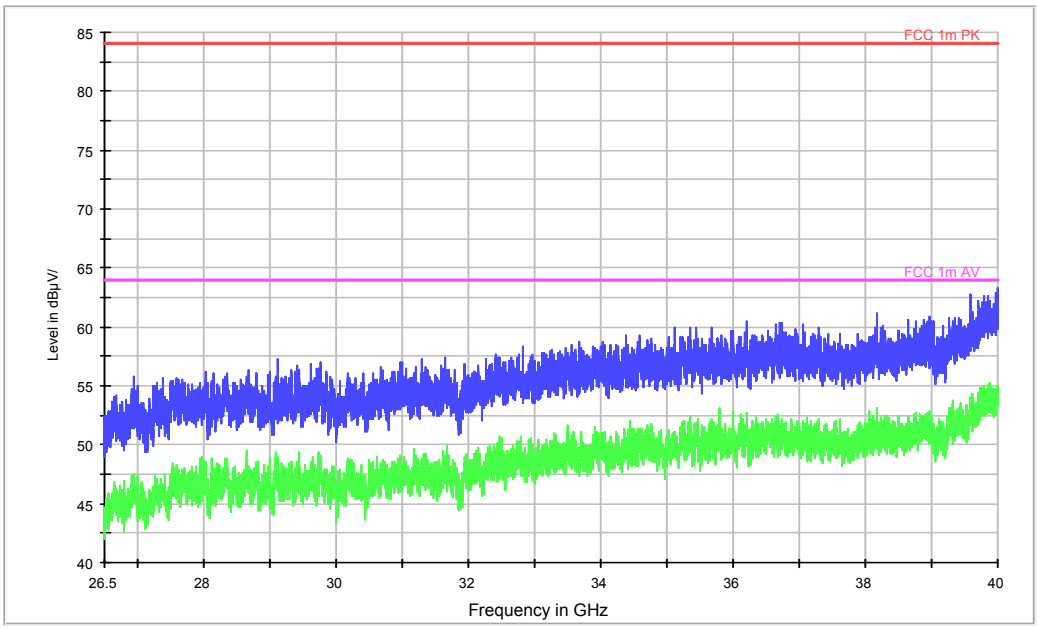

Fig. 21 Radiated emission: 802.11n, (802.11n-HT20, Ch157, 26.5 GHz - 40 GHz)

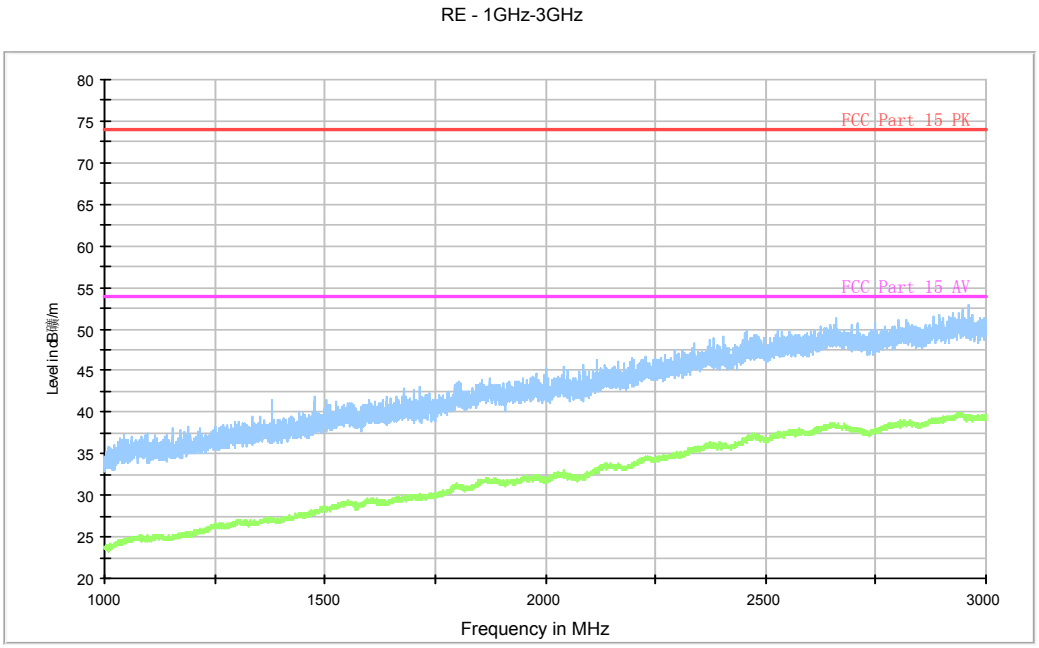

Fig. 22 Radiated Spurious Emission (802.11n-HT20, Ch165, 1 GHz-3 GHz)

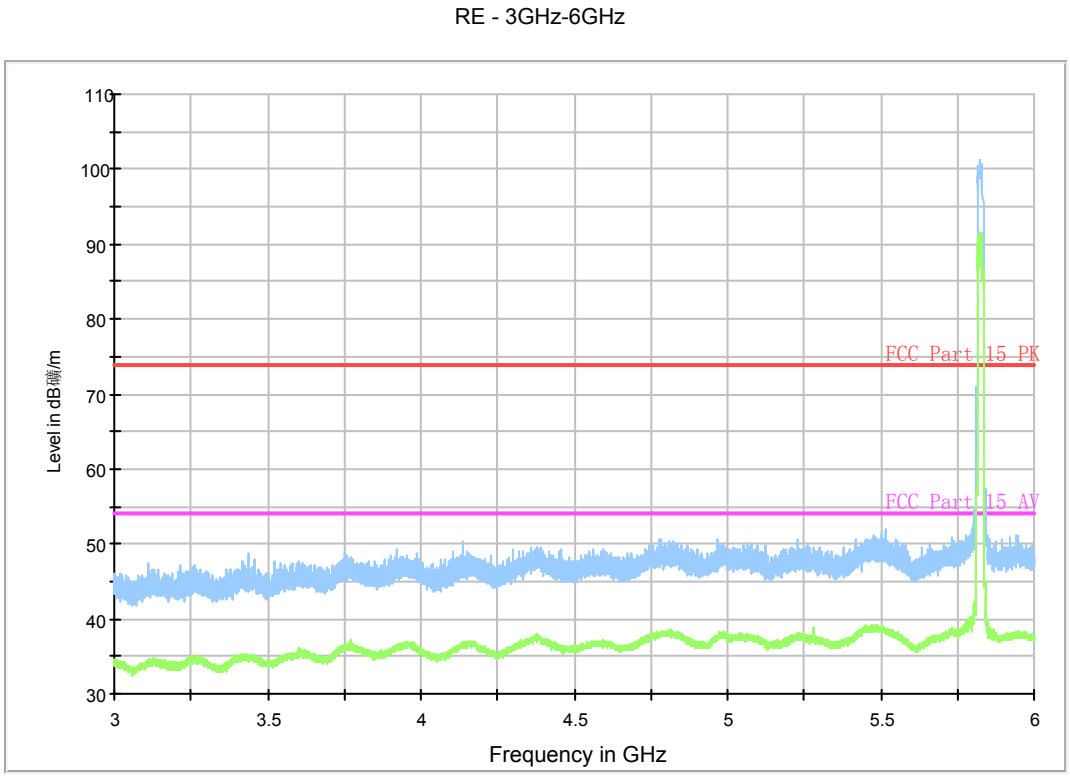

Fig. 23 Radiated Spurious Emission (802.11n-HT20, Ch165, 3 GHz-6 GHz)

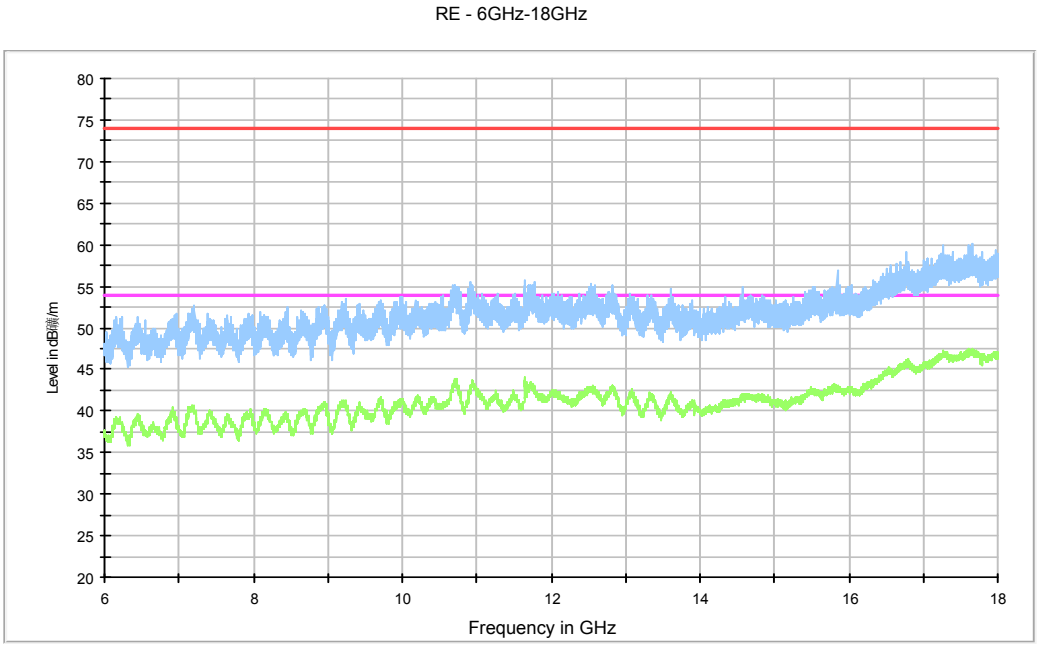

Fig. 24 Radiated Spurious Emission (802.11n-HT20, Ch165, 6 GHz-18 GHz)

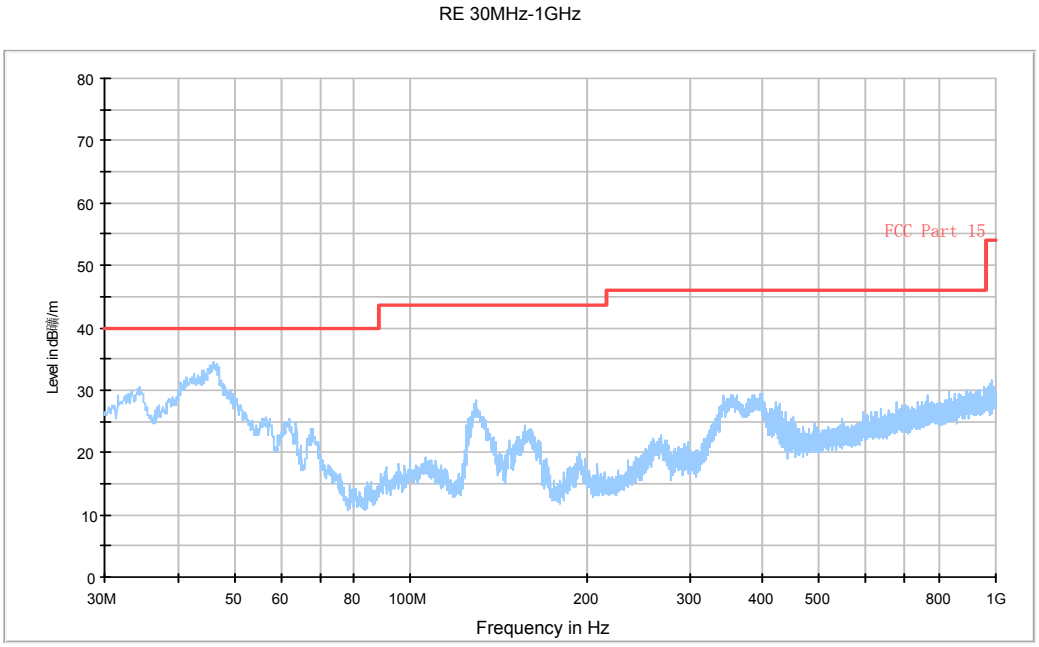

Fig. 25 Radiated Spurious Emission (802.11n-HT40, Ch151, 30 MHz-1 GHz)

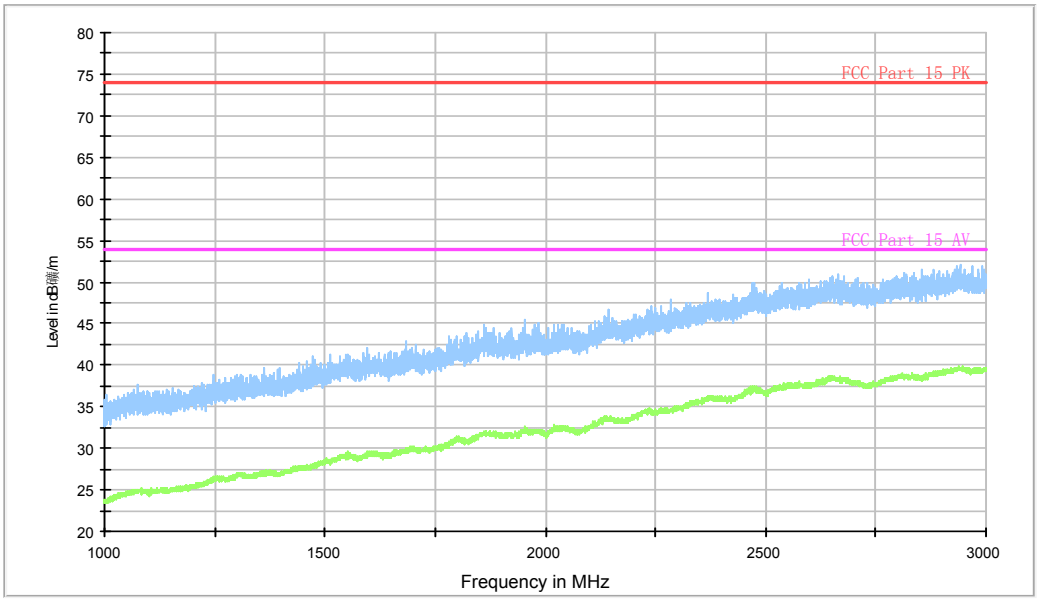

Fig. 26 Radiated Spurious Emission (802.11n-HT40, Ch151, 1 GHz-3GHz)

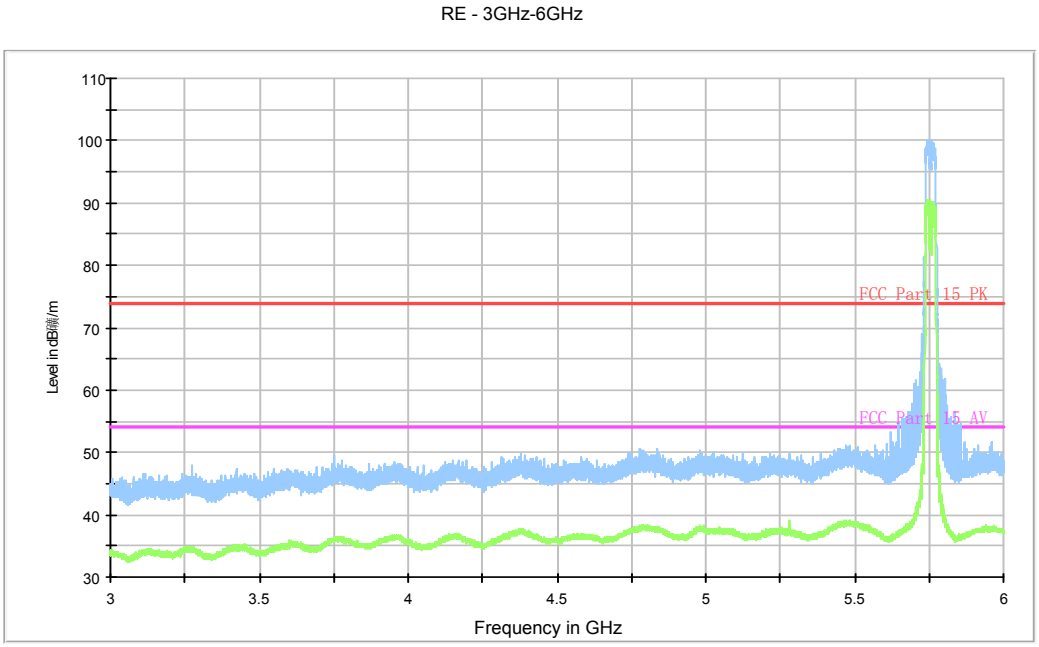

Fig. 27 Radiated Spurious Emission (802.11n-HT40, Ch151, 3 GHz-6GHz)

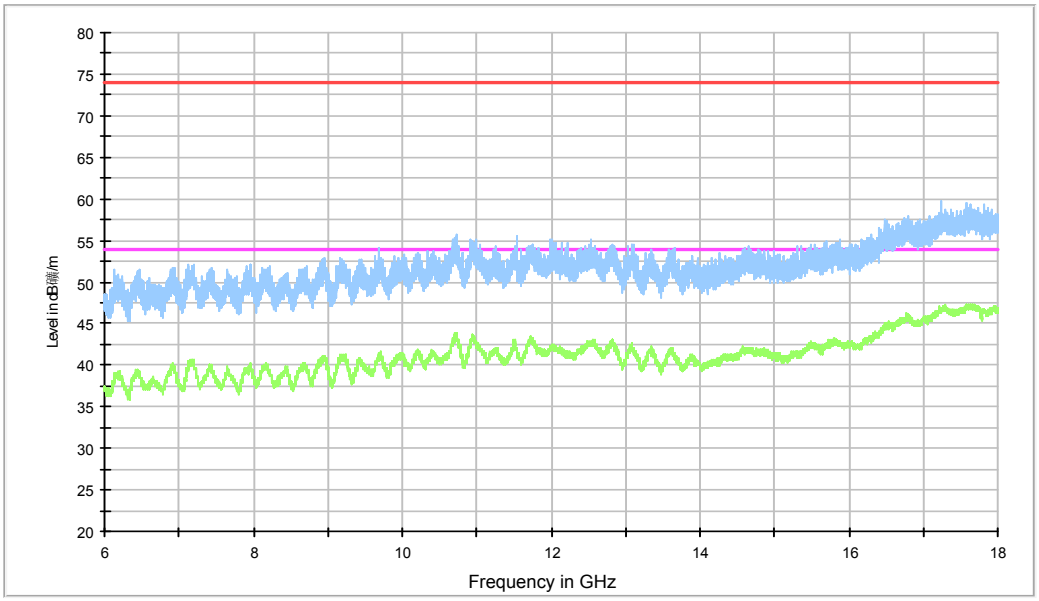

Fig. 28 Radiated Spurious Emission (802.11n-HT40, Ch151, 6 GHz-18 GHz)

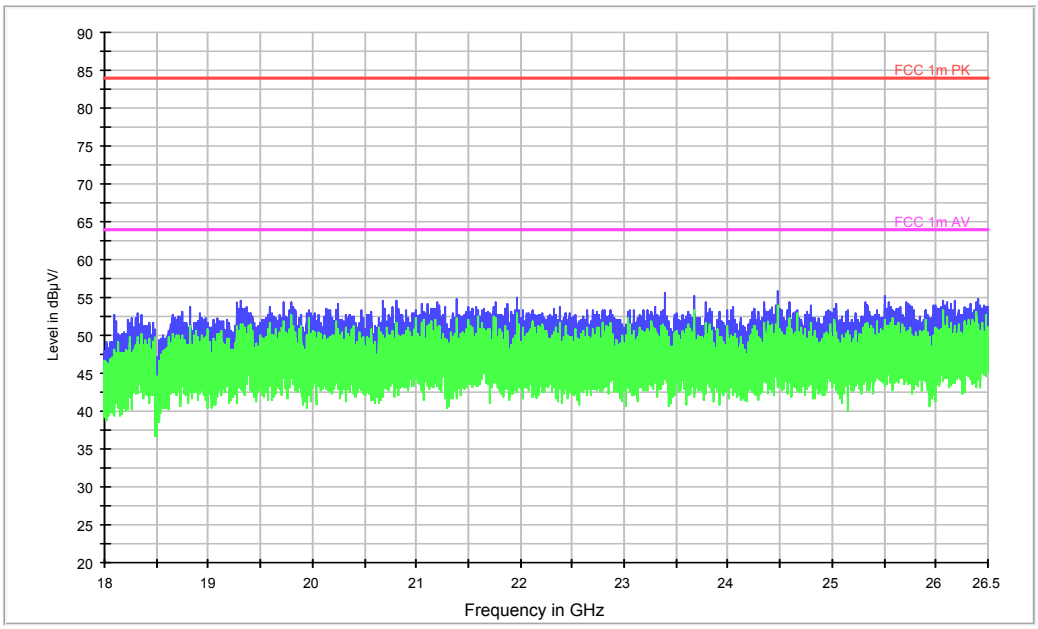

Fig. 29 Radiated Spurious Emission (802.11n-HT40, Ch151, 18 GHz-26.5 GHz)

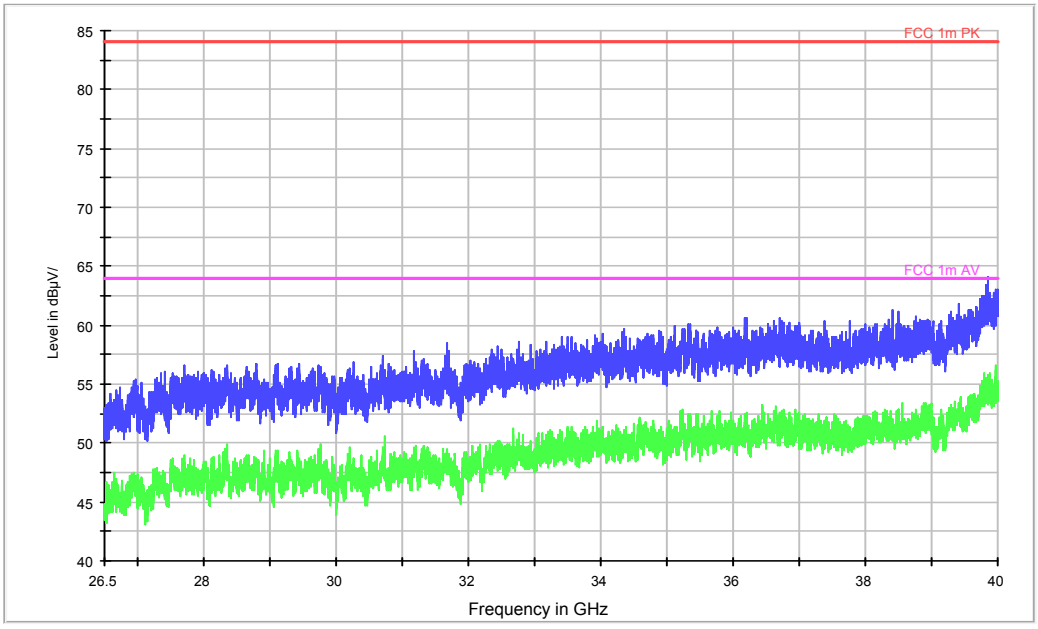

Fig. 30 Radiated emission: 802.11n, (802.11n-HT40, Ch151, 26.5 GHz - 40 GHz)

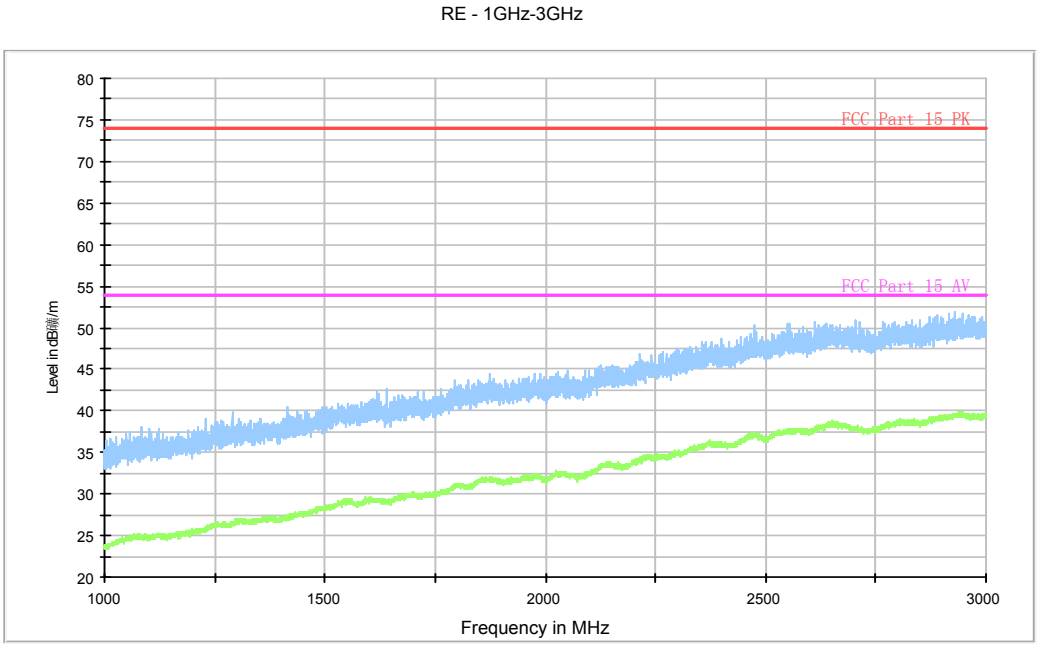

Fig. 31 Radiated Spurious Emission (802.11n-HT40, Ch159 1 GHz-3GHz)

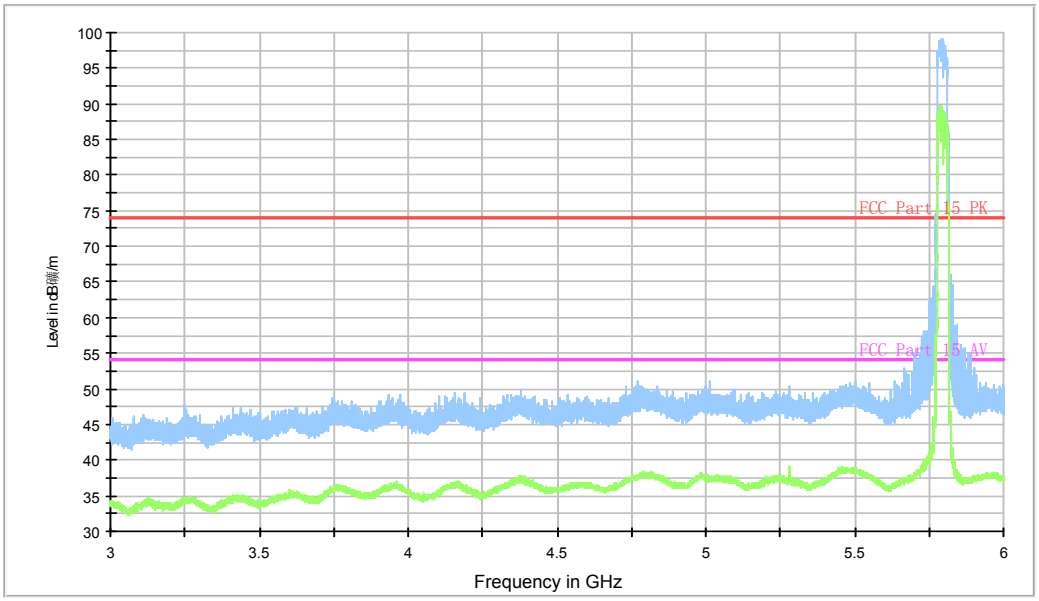

Fig. 32 Radiated Spurious Emission (802.11n-HT40, Ch159 3 GHz-6GHz)

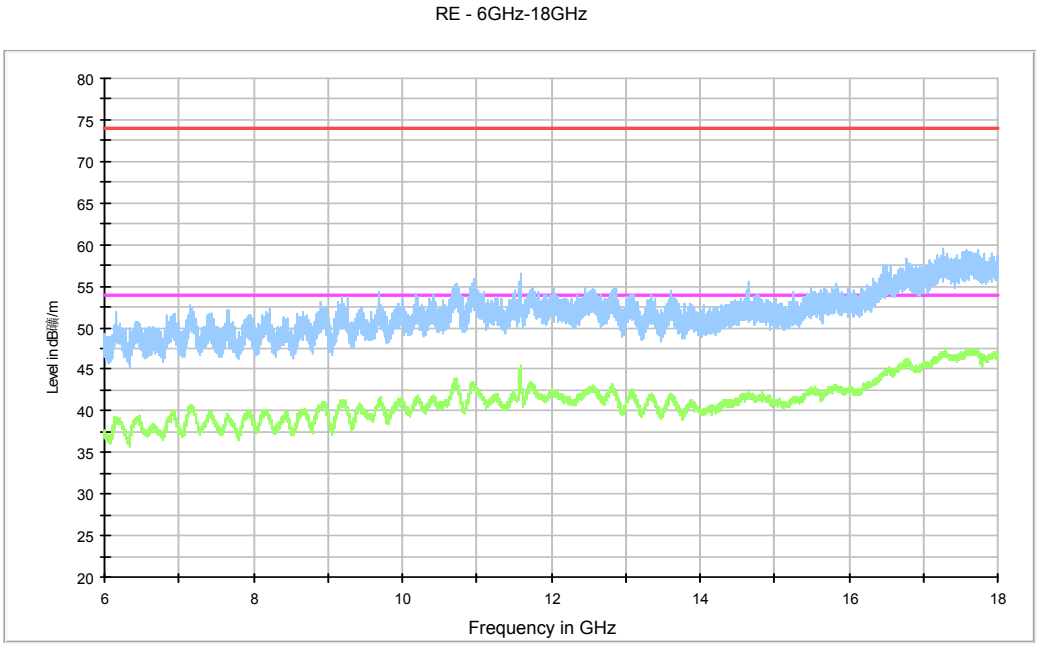

Fig. 33 Radiated Spurious Emission (802.11n-HT40, Ch159, 6 GHz-18 GHz)

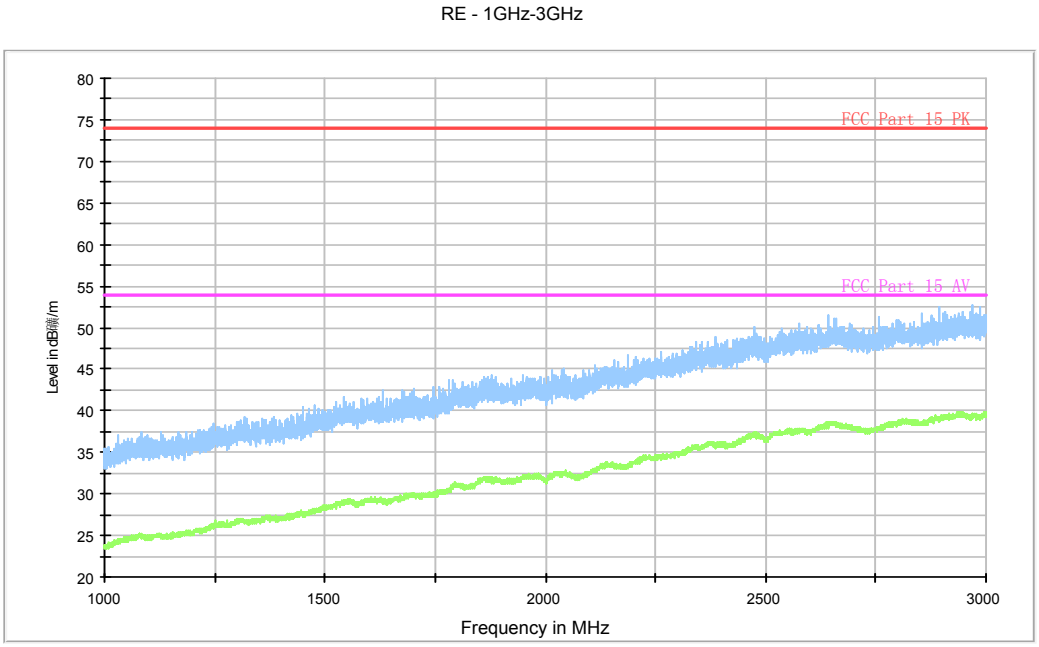

Fig. 34 Radiated Spurious Emission (802.11ac-HT20, Ch149, 1 GHz-3 GHz)

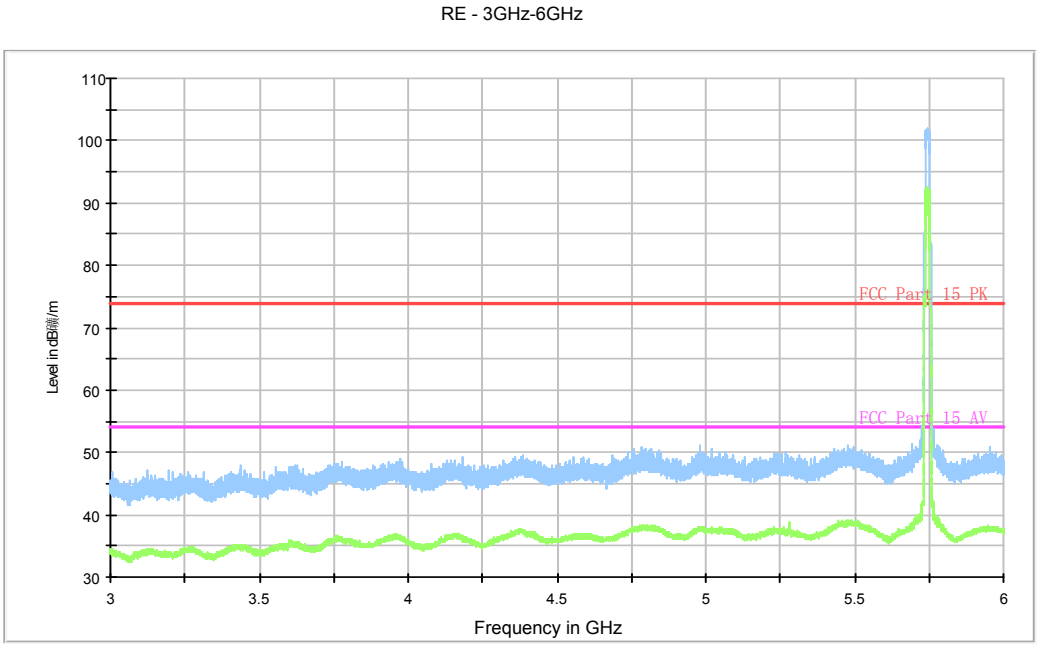

Fig. 35 Radiated Spurious Emission (802.11ac-HT20, Ch149, 3 GHz-6 GHz)

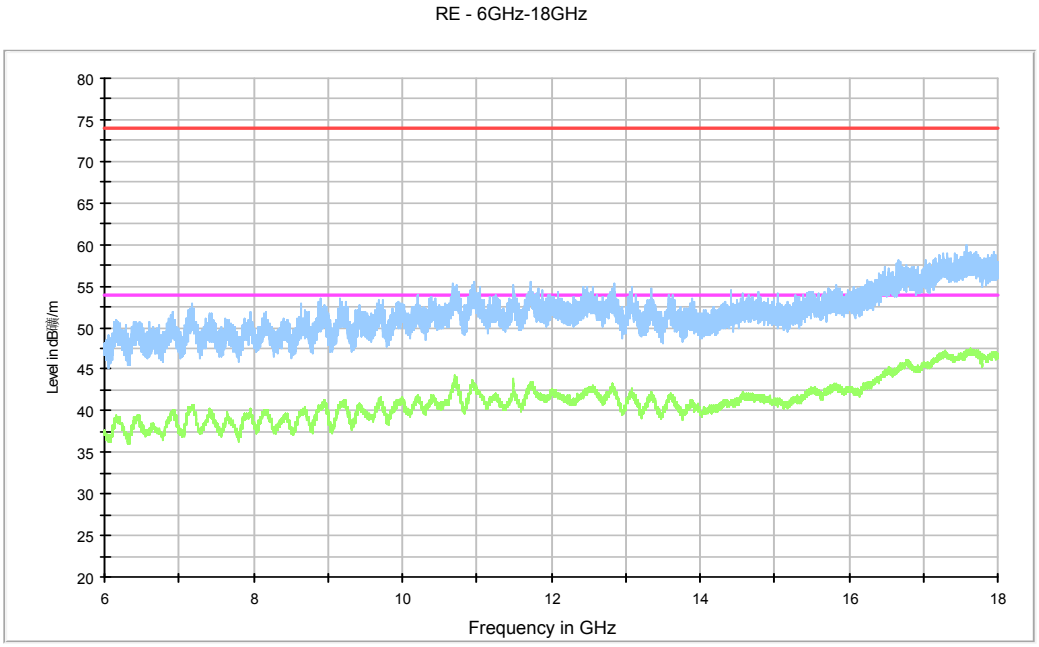

Fig. 36 Radiated Spurious Emission (802.11ac-HT20, Ch149, 6 GHz-18 GHz)

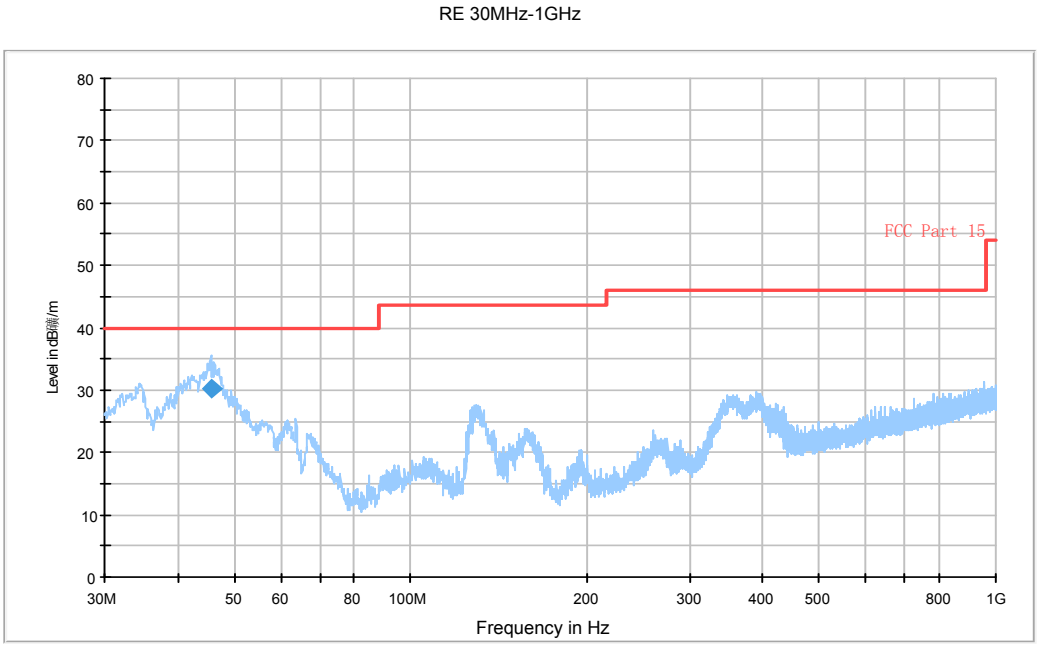

Fig. 37 Radiated Spurious Emission (802.11ac-HT20, Ch157, 30 MHz-1 GHz)

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
45.617000	30.3	100.0	V	-18.0	-18.1	9.7	40.0

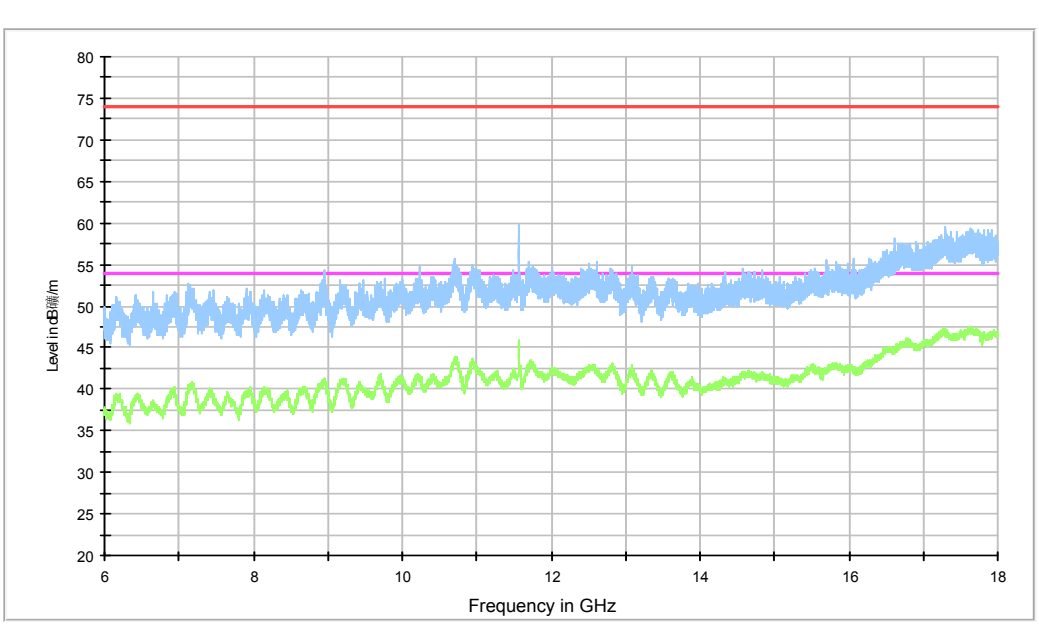

Fig. 38 Radiated Spurious Emission (802.11ac-HT20, Ch157, 1 GHz-3 GHz)

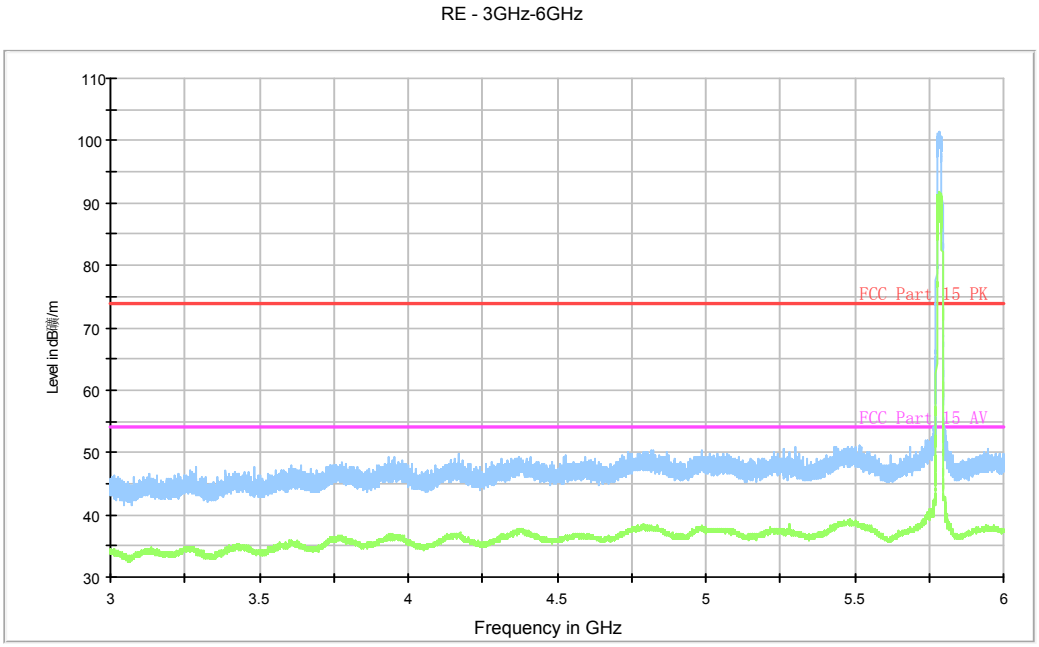

Fig. 39 Radiated Spurious Emission (802.11ac-HT20, Ch157, 3 GHz-6 GHz)

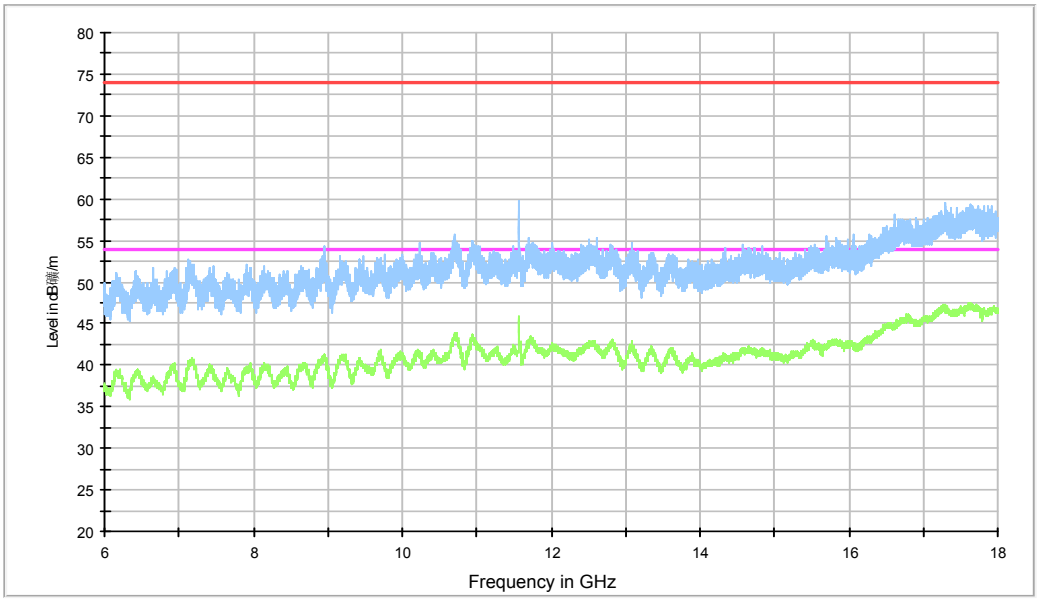

Fig. 40 Radiated Spurious Emission (802.11ac-HT20, Ch157, 6 GHz-18 GHz)

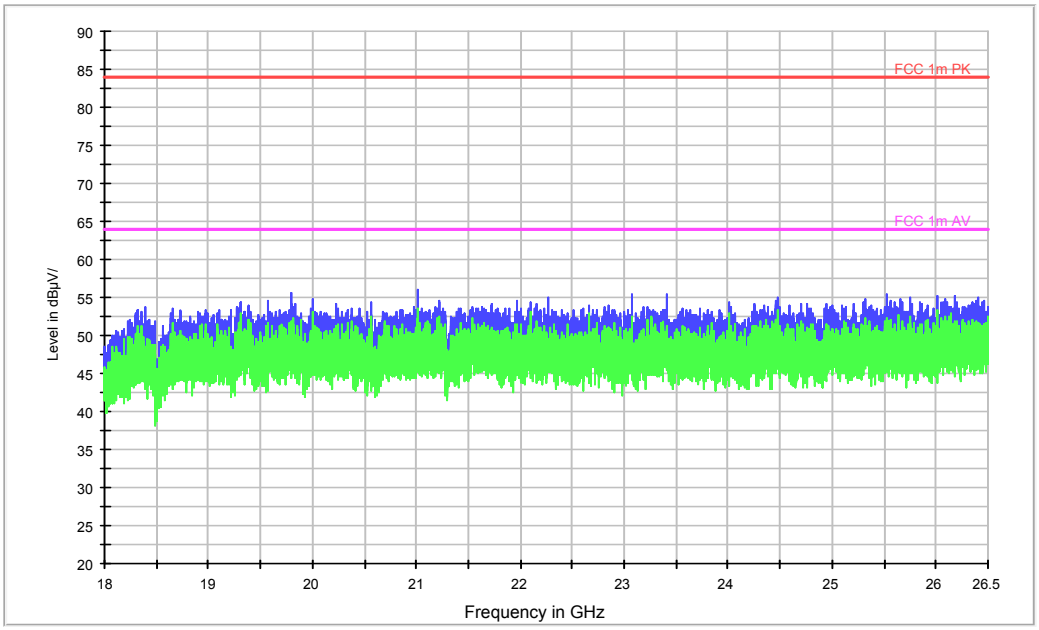

Fig. 41 Radiated Spurious Emission (802.11ac-HT20, Ch157, 18 GHz-26.5 GHz)

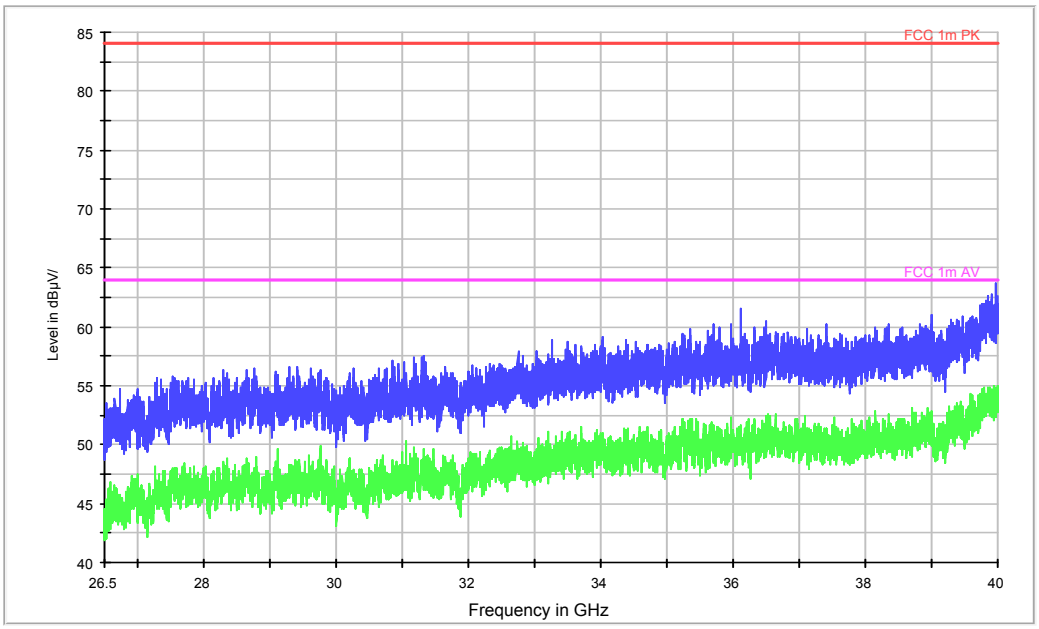

Fig. 42 Radiated emission: 802.11n, (802.11ac-HT20, Ch157, 26.5 GHz - 40 GHz)

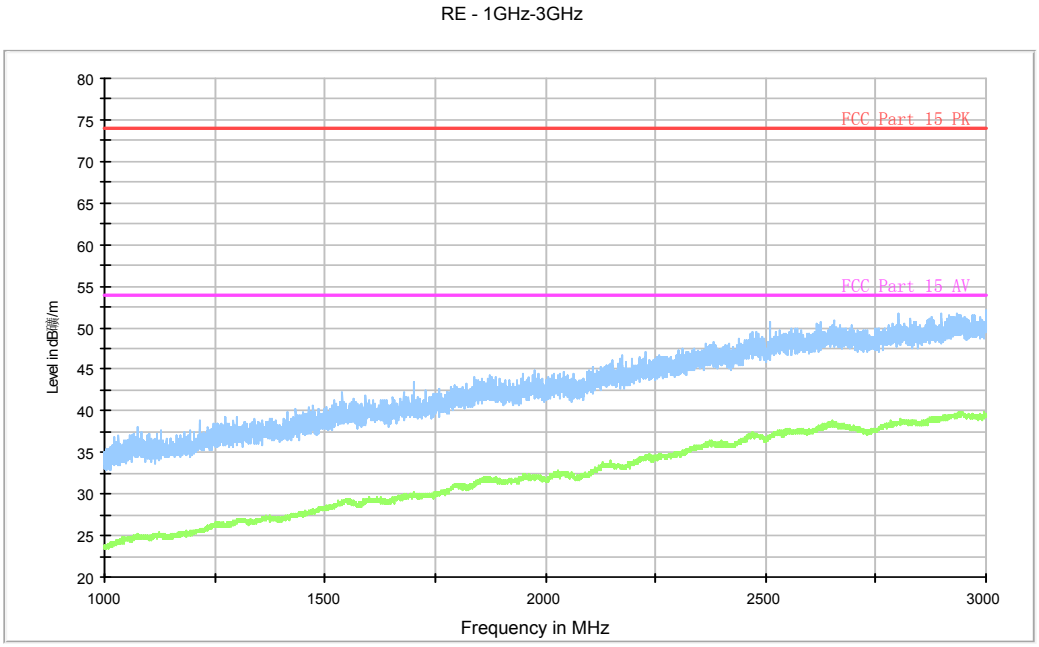

Fig. 43 Radiated Spurious Emission (802.11ac-HT20, Ch165, 1 GHz-3 GHz)

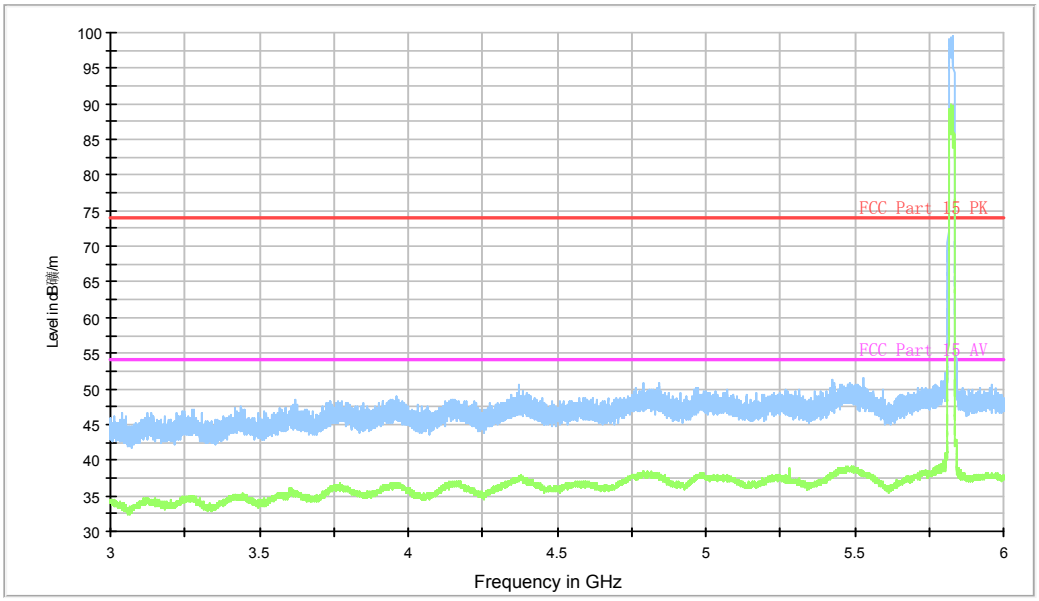

Fig. 44 Radiated Spurious Emission (802.11ac-HT20, Ch165, 3 GHz-6 GHz)

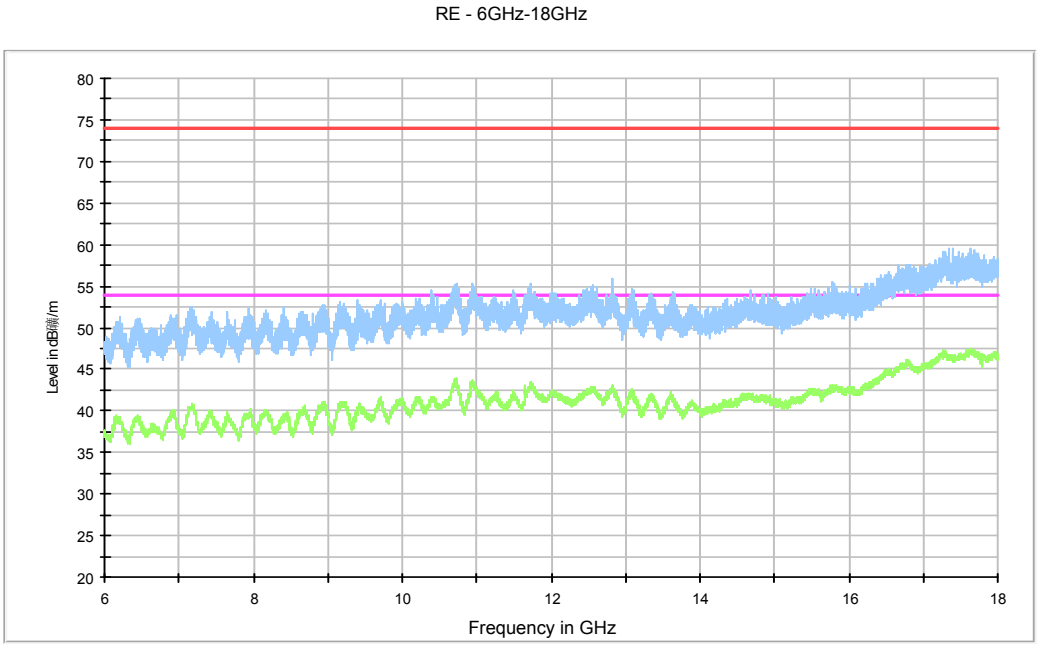

Fig. 45 Radiated Spurious Emission (802.11ac-HT20, Ch165, 6 GHz-18 GHz)

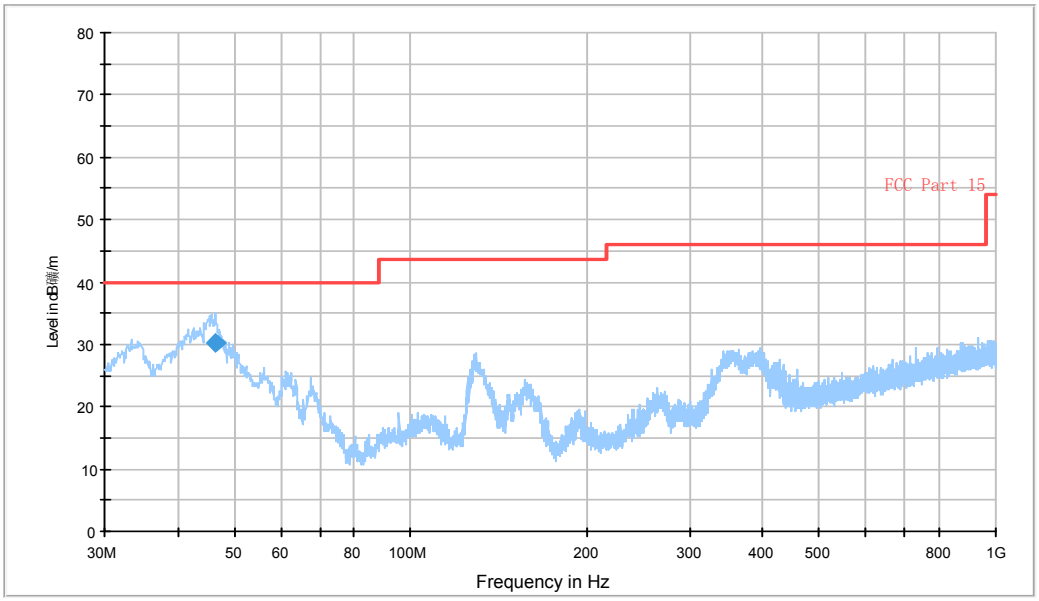

Fig. 46 Radiated Spurious Emission (802.11ac-HT40, Ch151, 30 MHz-1 GHz)

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
46.393000	30.2	100.0	V	28.0	-18.1	9.8	40.0

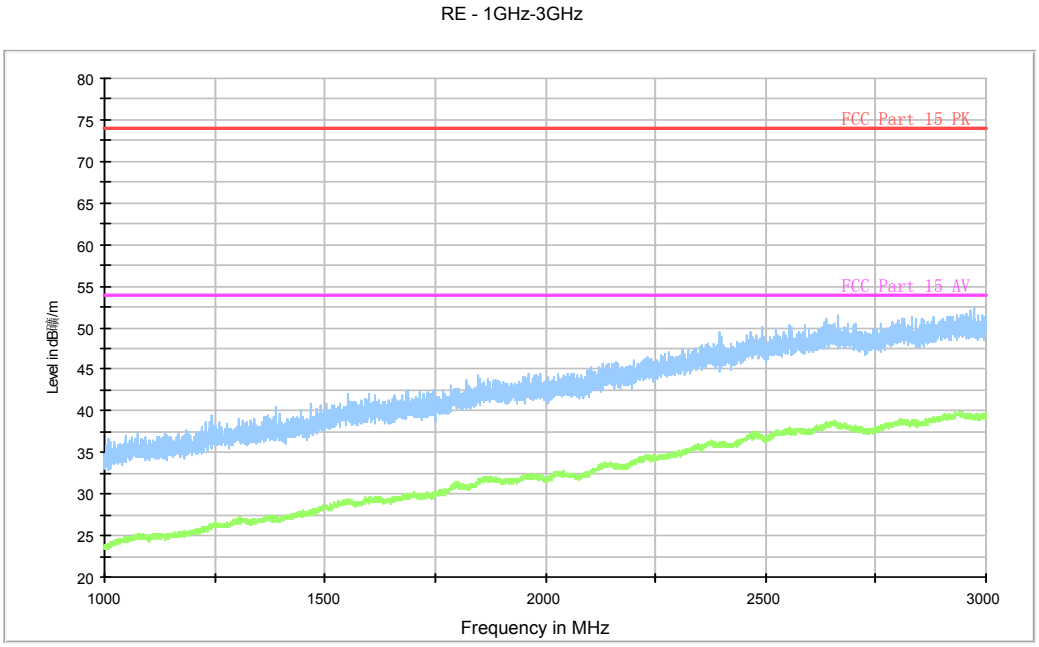

Fig. 47 Radiated Spurious Emission (802.11ac-HT40, Ch151, 1 GHz-3GHz)

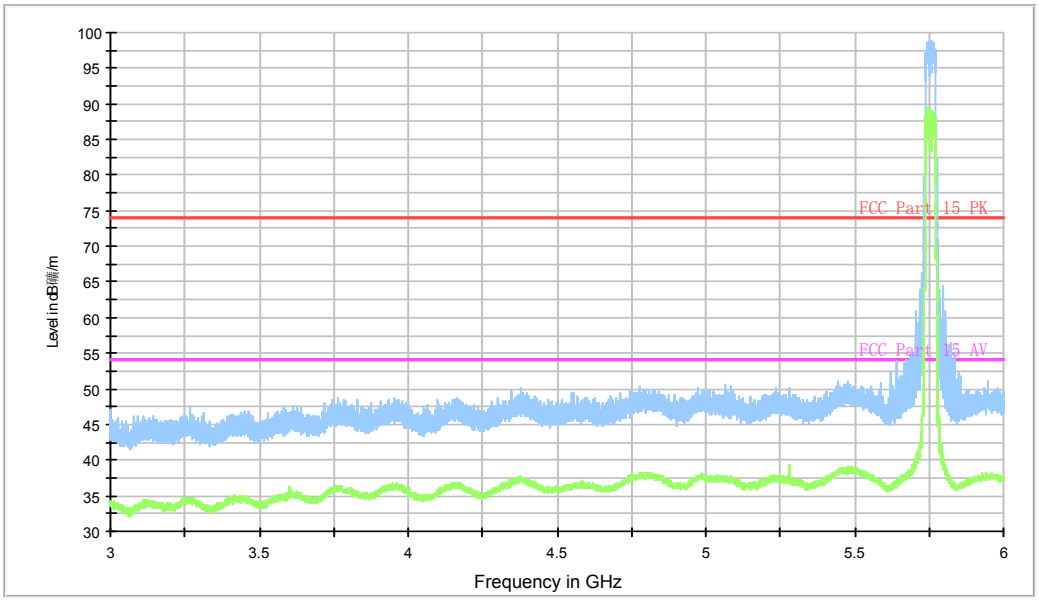

Fig. 48 Radiated Spurious Emission (802.11ac-HT40, Ch151, 3 GHz-6GHz)

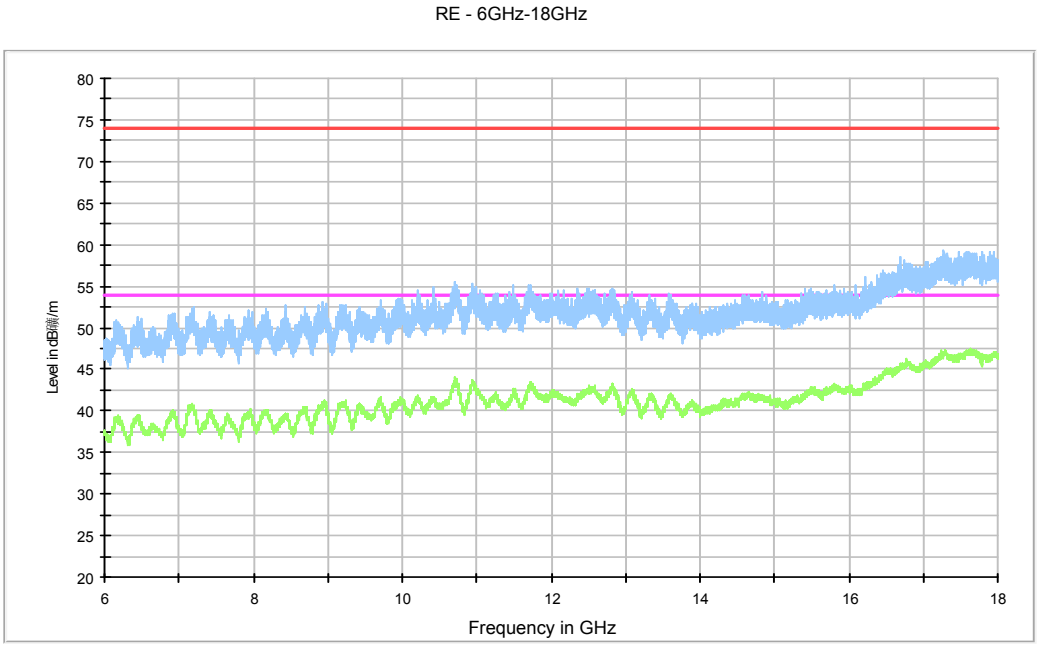

Fig. 49 Radiated Spurious Emission (802.11ac-HT40, Ch151, 6 GHz-18 GHz)

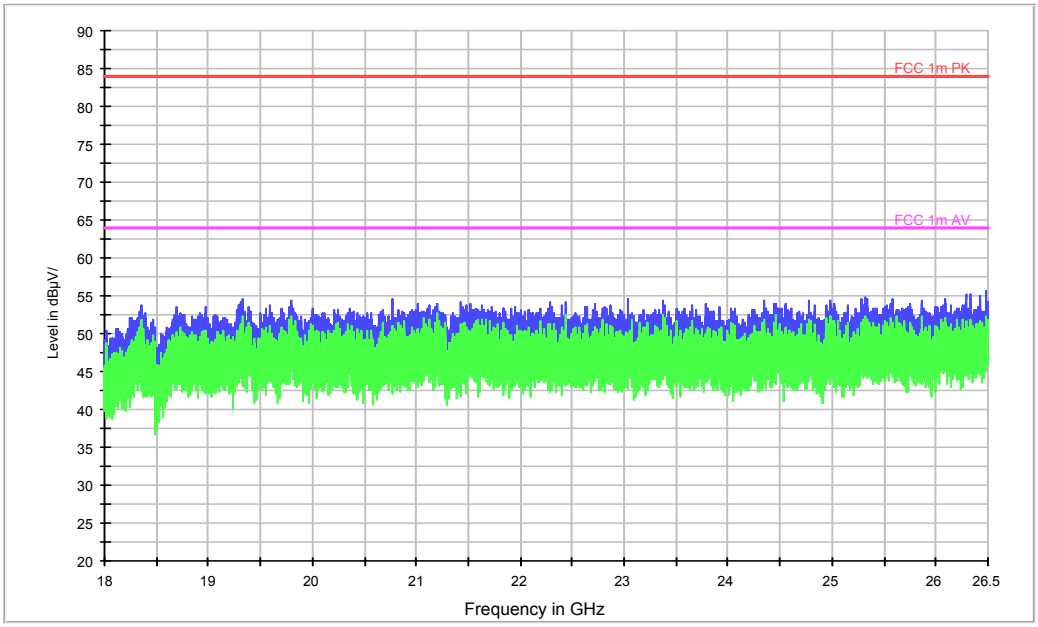

Fig. 50 Radiated Spurious Emission (802.11ac-HT40, Ch151, 18 GHz-26.5 GHz)

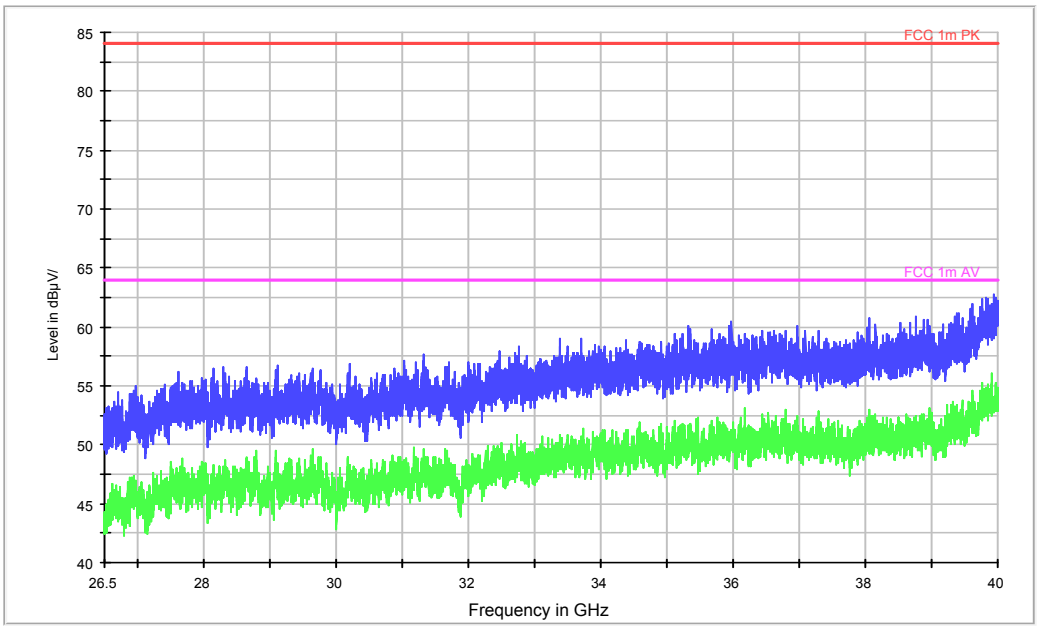

Fig. 51 Radiated emission: 802.11n, (802.11ac-HT40, Ch151, 26.5 GHz - 40 GHz)

RE - 1GHz-3GHz

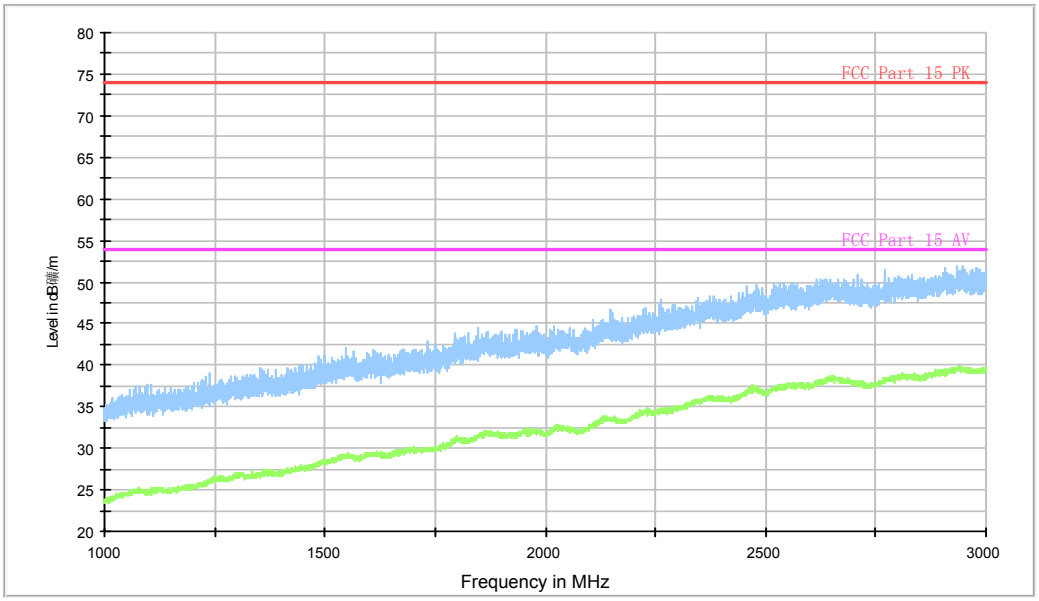

Fig. 52 Radiated Spurious Emission (802.11ac-HT40, Ch159 1 GHz-3GHz)

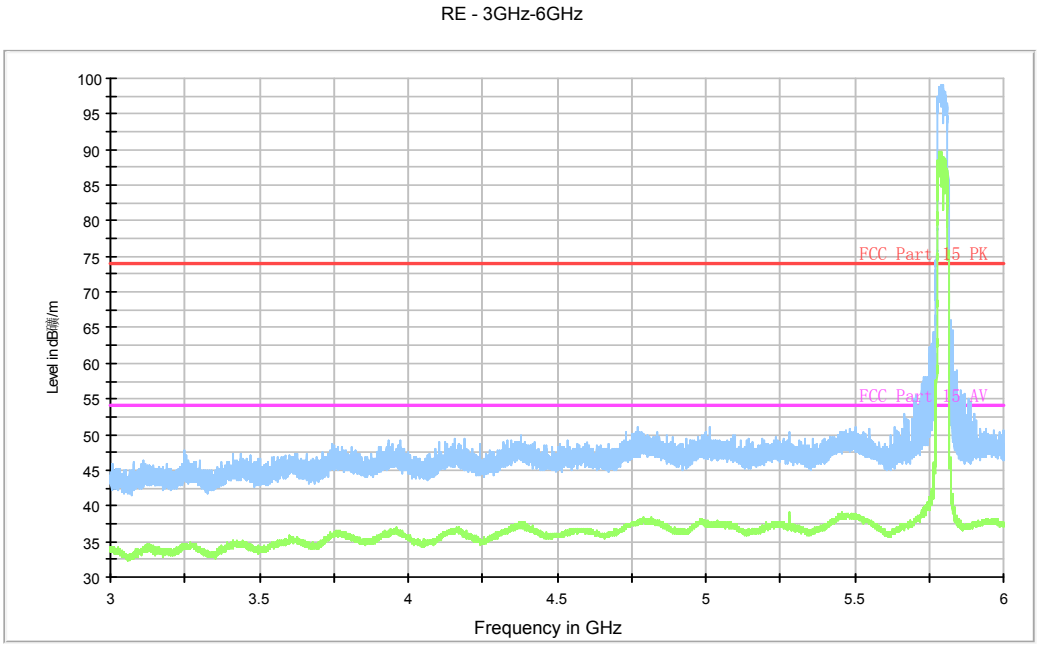

Fig. 53 Radiated Spurious Emission (802.11ac-HT40, Ch159 3 GHz-6GHz)

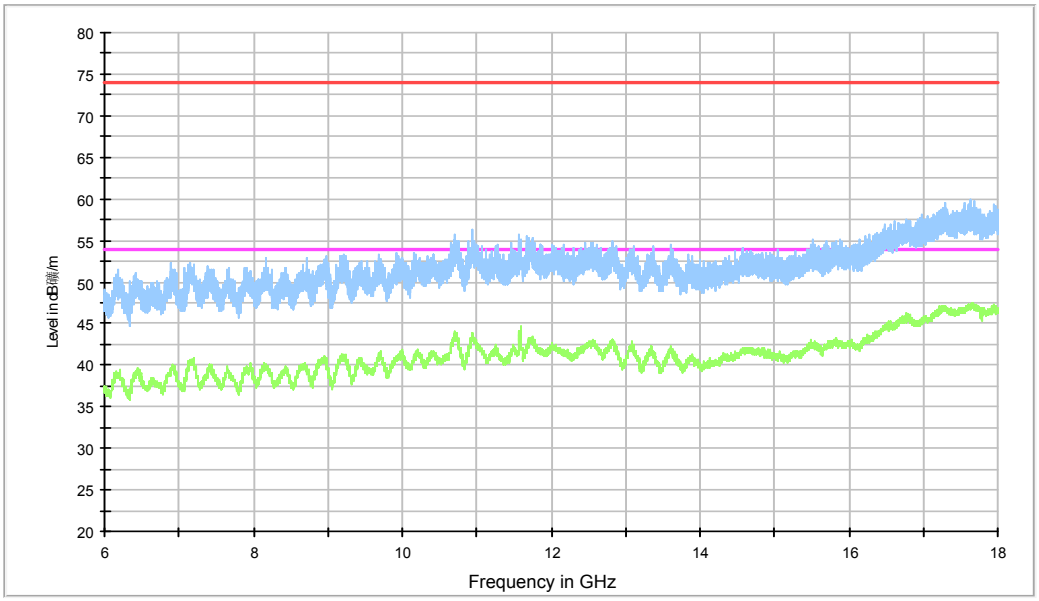

Fig. 54 Radiated Spurious Emission (802.11ac-HT40, Ch159, 6 GHz-18 GHz)

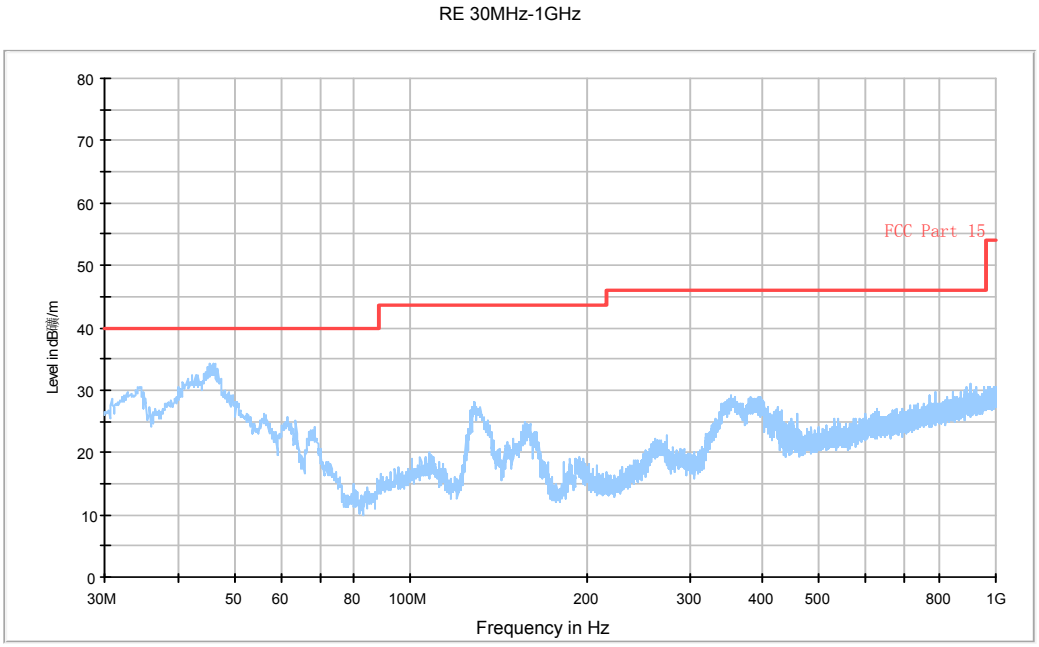

Fig. 55 Radiated Spurious Emission (802.11ac-HT80, Ch155, 30 MHz-1 GHz)

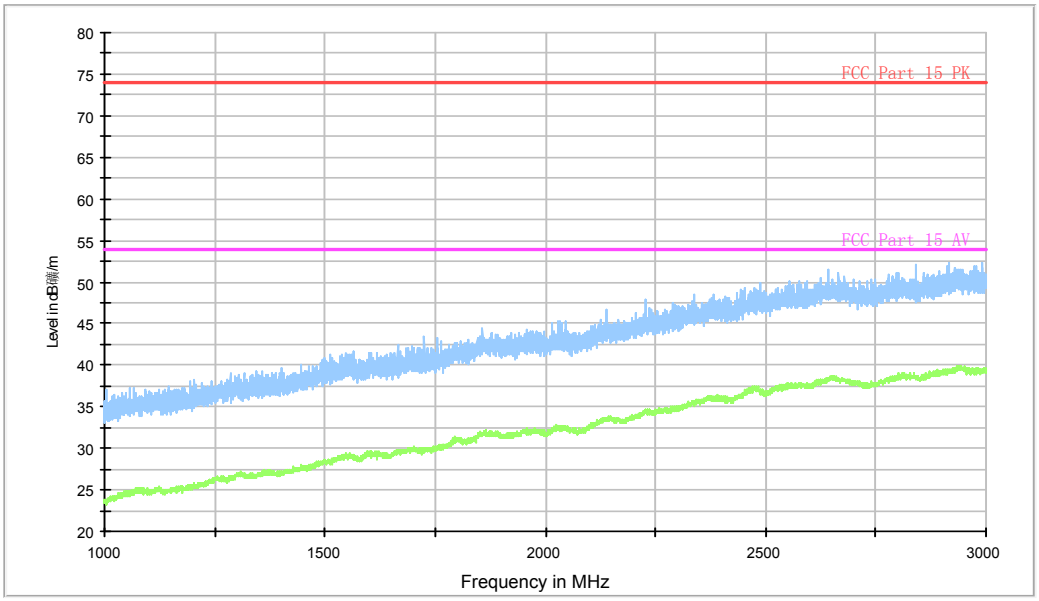

Fig. 56 Radiated Spurious Emission (802.11ac-HT80, Ch155, 1 GHz-3GHz)

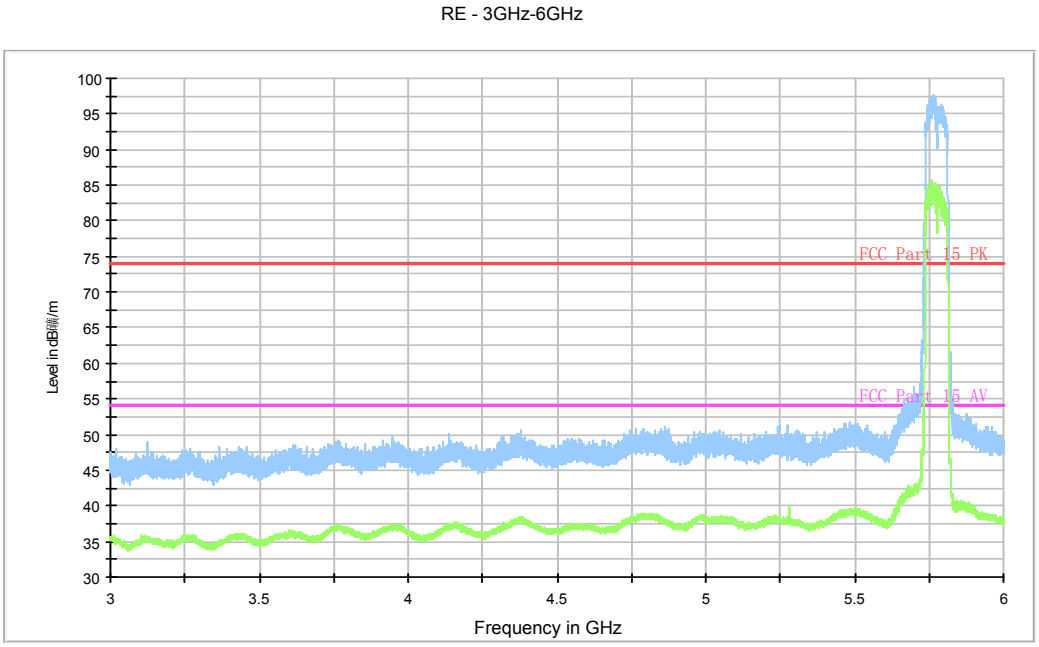

Fig. 57 Radiated Spurious Emission (802.11ac-HT80, Ch155, 3 GHz-6GHz)

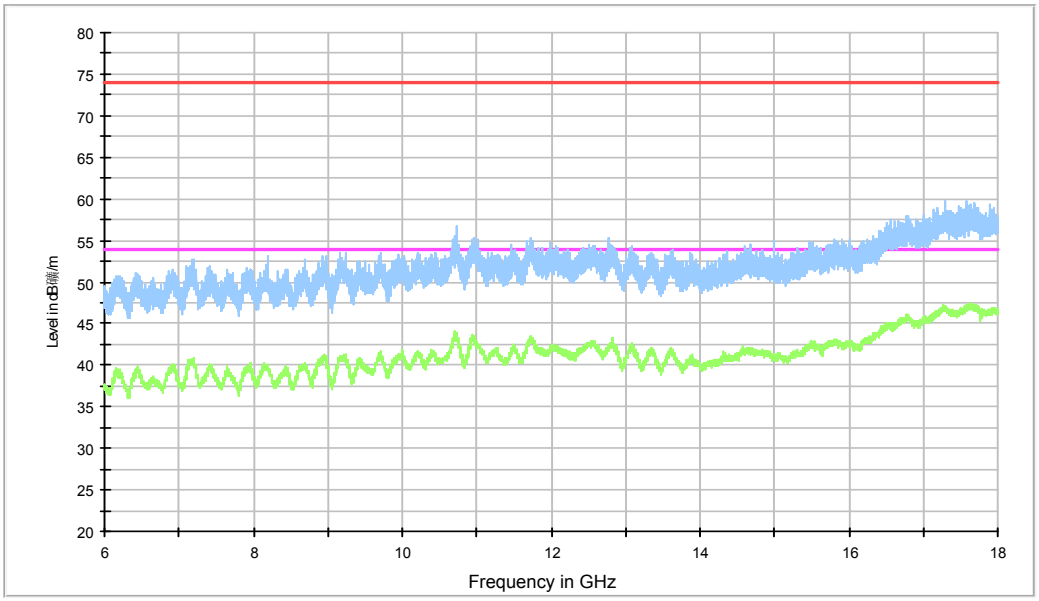

Fig. 58 Radiated Spurious Emission (802.11ac-HT80, Ch155, 6 GHz-18 GHz)

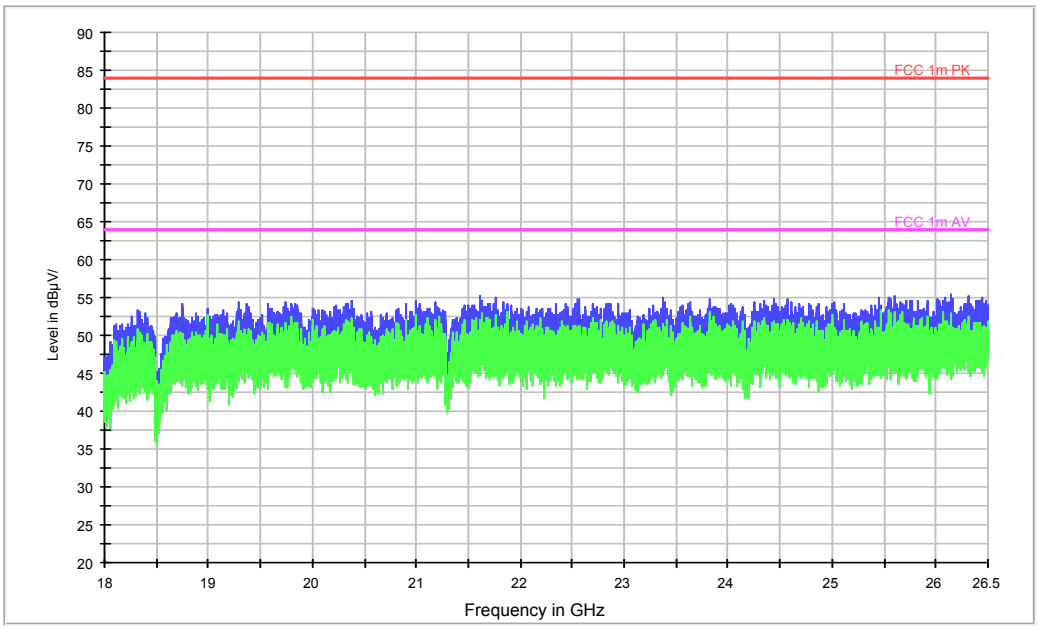

Fig. 59 Radiated Spurious Emission (802.11ac-HT80, Ch155, 18 GHz-26.5 GHz)

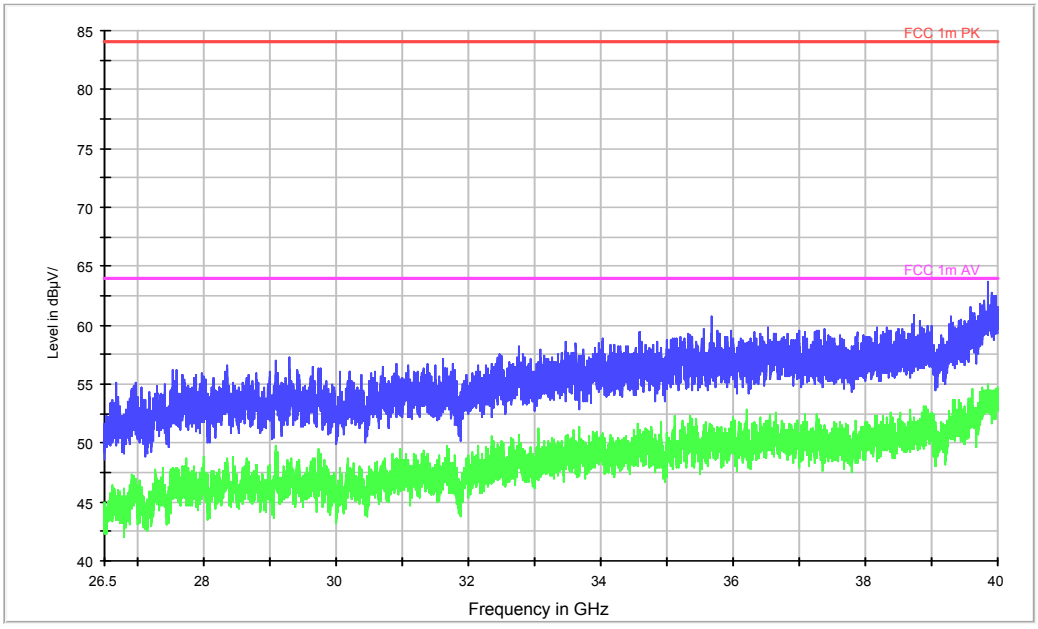

Fig. 60 Radiated emission: (802.11ac-HT80, Ch155, 26.5 GHz - 40 GHz)

A.6. 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:

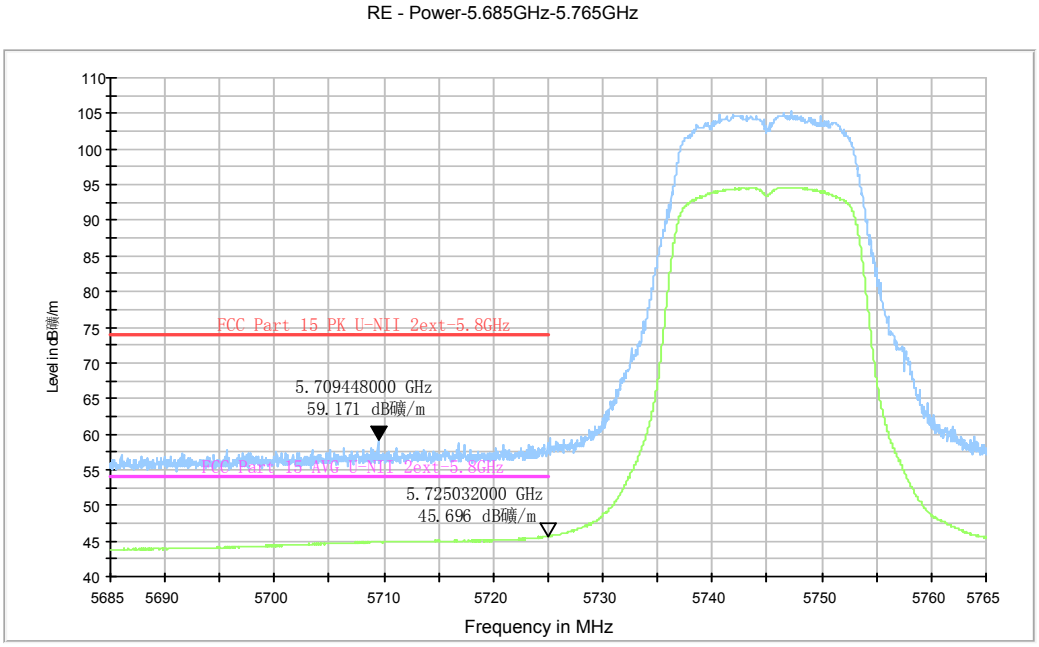

Fig. 61 Band Edges (802.11a, 5745MHz)

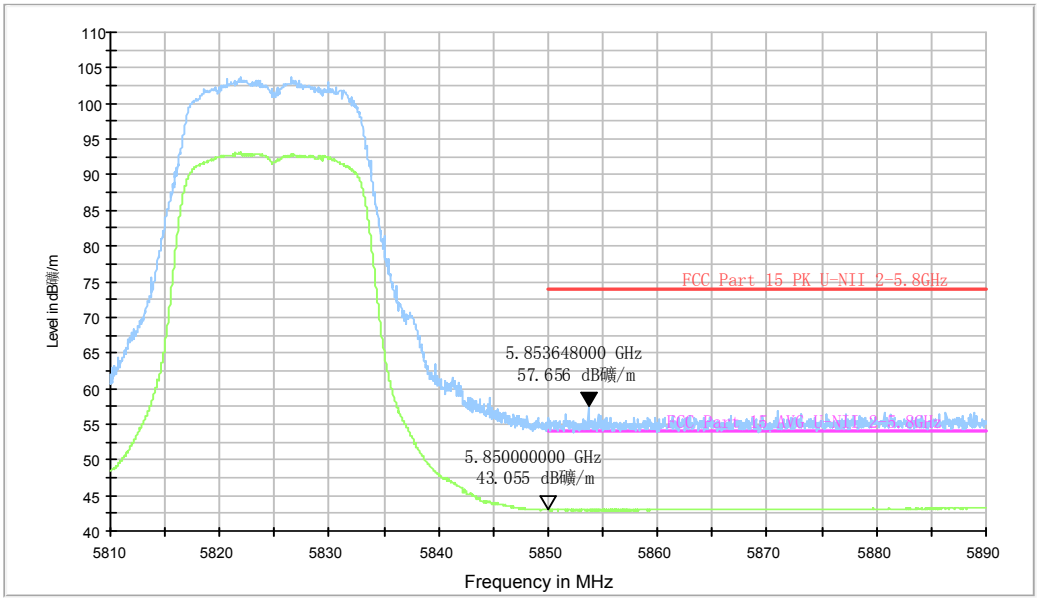

Fig. 62 Band Edges (802.11a, 5825MHz)

RE - Power-5.685GHz-5.765GHz

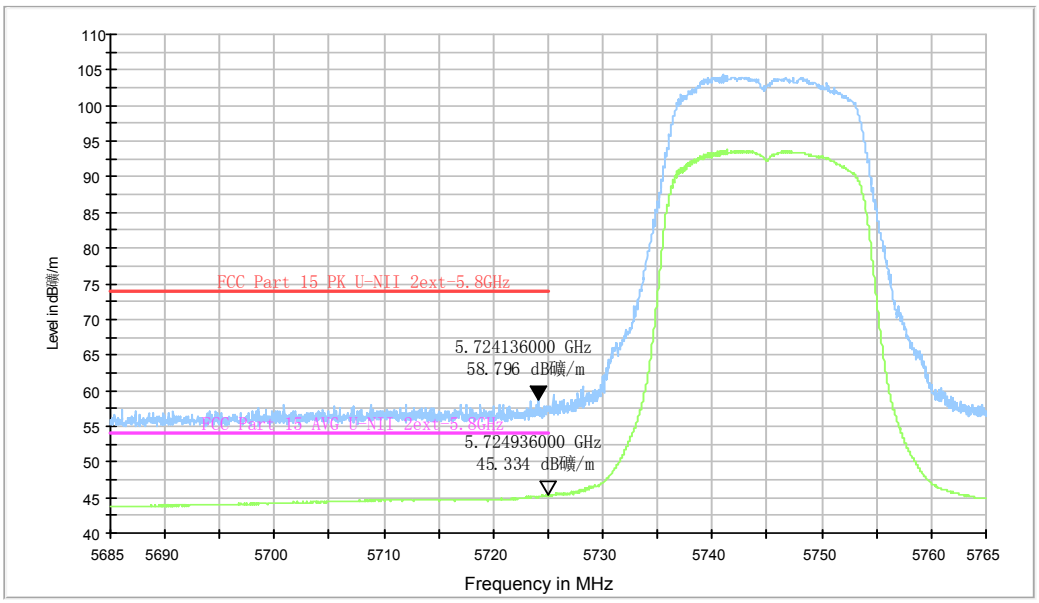

Fig. 63 Band Edges (802.11n-HT20, 5745MHz)

RE - Power-5.810GHz-5.890GHz

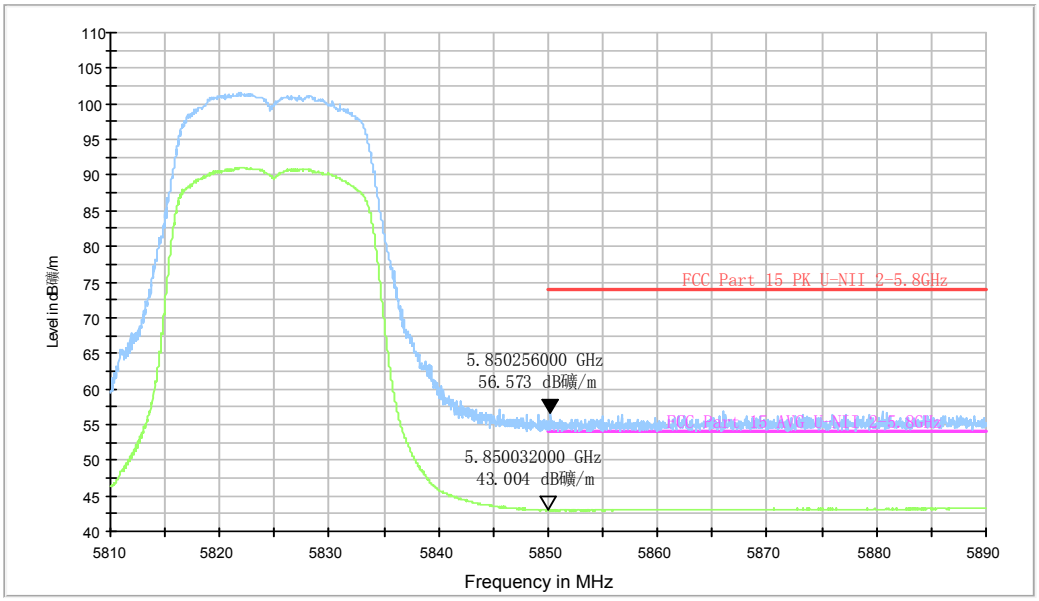

Fig. 64 Band Edges (802.11n-HT20, 5825MHz)

RE - Power-5.685GHz-5.765GHz

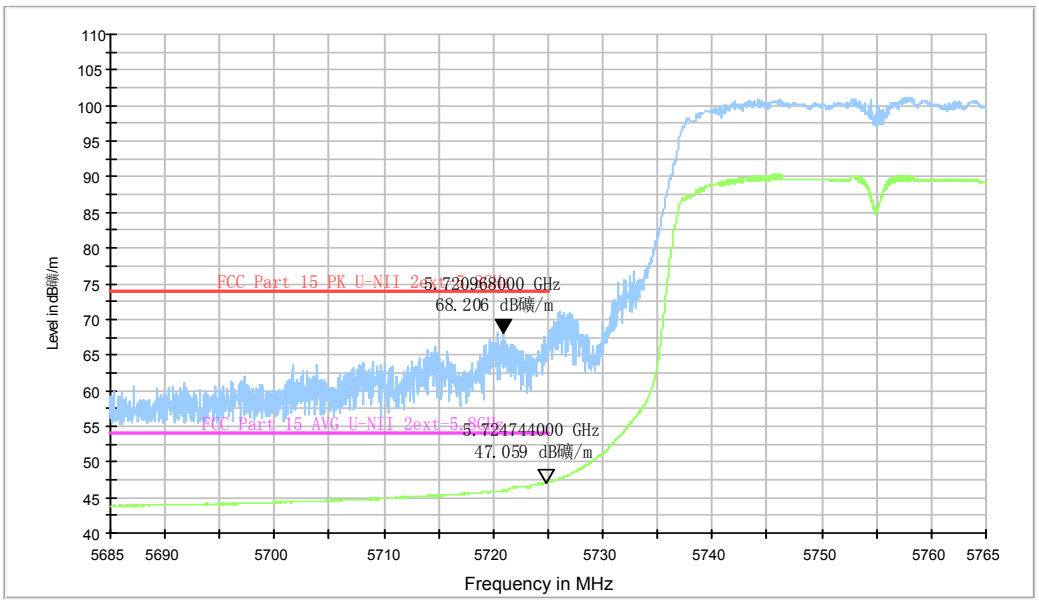

Fig. 65 Band Edges (802.11n-HT40, 5755MHz)

RE - Power-5.810GHz-5.890GHz

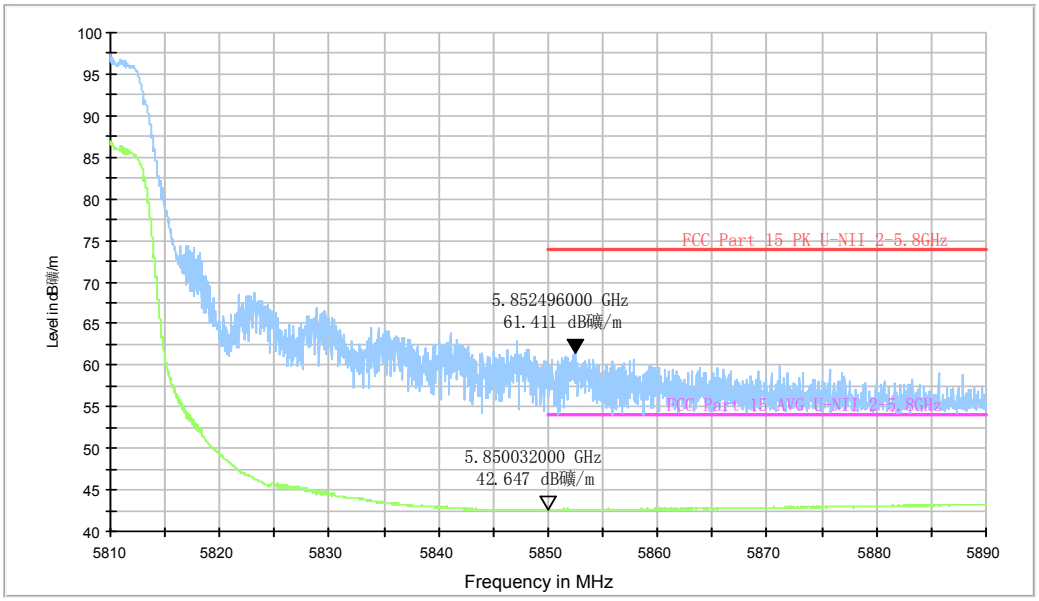

Fig. 66 Band Edges (802.11n-HT40, 5795MHz)

RE - Power-5.685GHz-5.765GHz

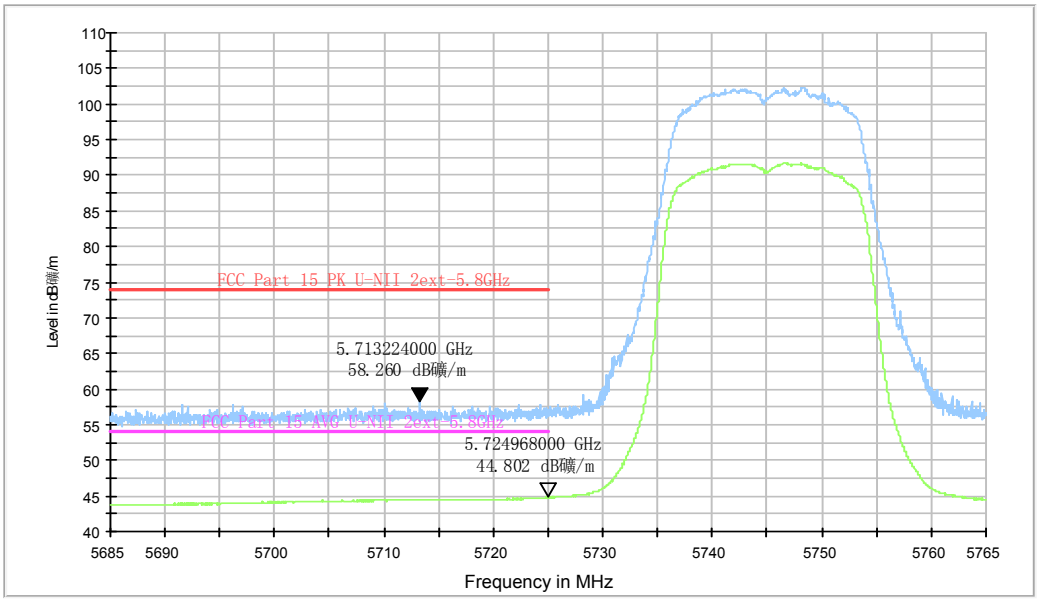

Fig. 67 Band Edges (802.11ac-HT20, 5745MHz)

RE - Power-5.810GHz-5.890GHz

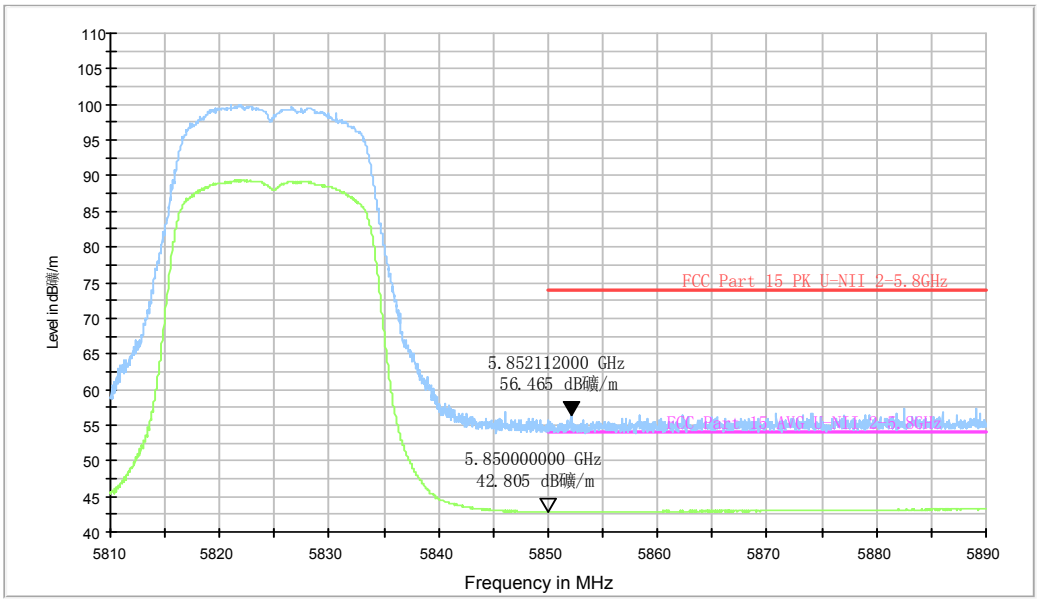

Fig. 68 Band Edges (802.11ac-HT20, 5825MHz)

RE - Power-5.685GHz-5.765GHz

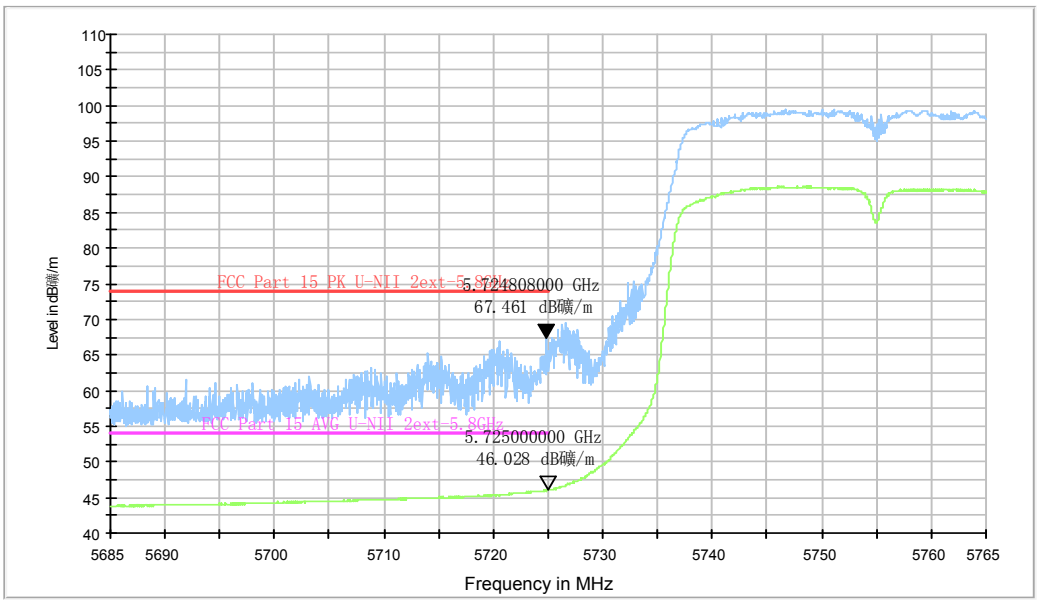

Fig. 69 Band Edges (802.11ac-HT40, 5755MHz)

RE - Power-5.810GHz-5.890GHz

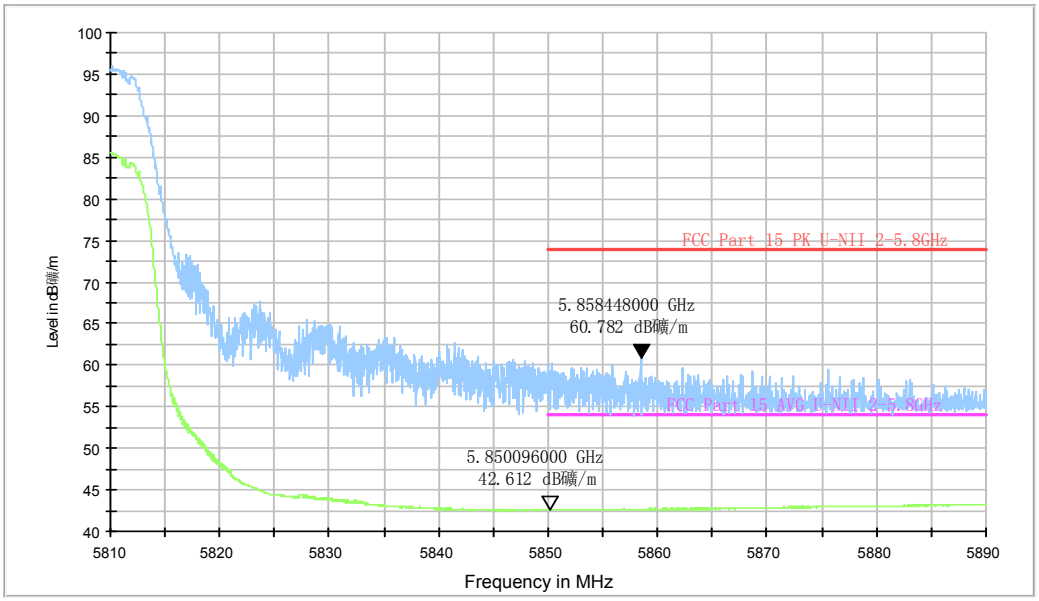

Fig. 70 Band Edges (802.11n-HT40, 5795MHz)

A.3. Spurious Emissions Radiated < 30MHz

Measurement Limit:

Frequency (MHz)	Field strength(dBμV/m)	Measurement distance
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

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 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:

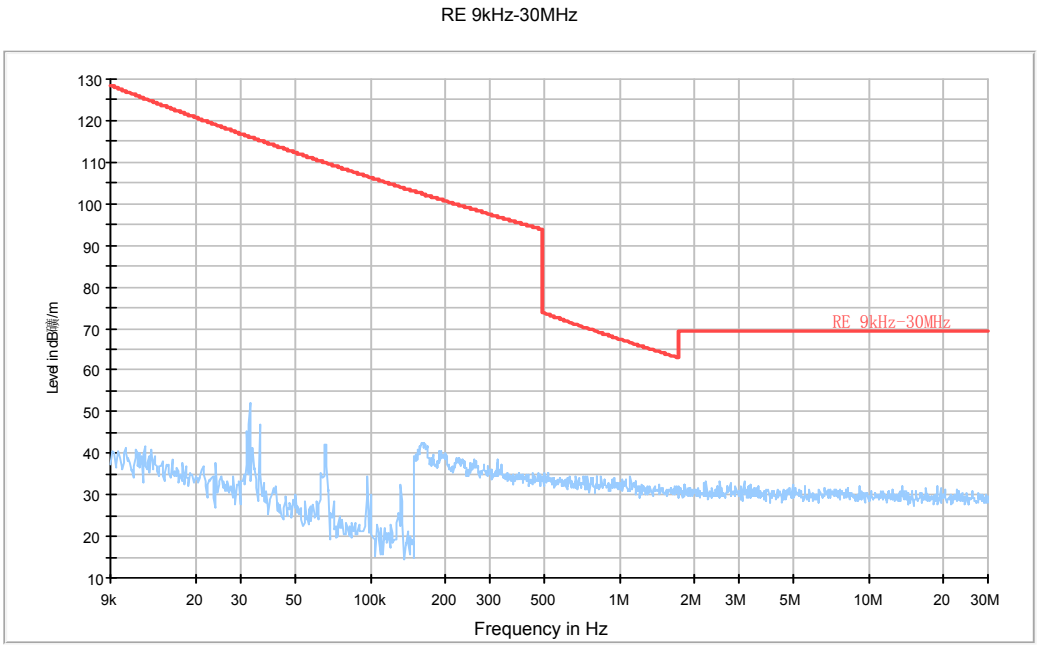

Fig. 71 Radiated Spurious Emission (802.11a, ch157, 9 kHz ~30 MHz)

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