FCC PART 15
TEST REPORT
No. I16Z40428-SRD08

for

TCL Communication Ltd.

LTE/UMTS/GSM handheld station

VFD700

With

FCC ID: 2ACCJH051

Hardware Version: PIO

Software Version: v2DS1

Issued Date: 2016-04-26

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:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I16Z40428-SRD08	Rev.0	1st edition	2016-04-01
I16Z40428-SRD08	Rev.1	2ed edition	2016-04-26

CONTENTS

1. TEST LATORATORY

1.1. Testing Location

Location 1:CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China100191

Location 2:CTTL(Shouxiang)

Address: No. 51 Shouxiang Science Building, Xueyuan Road, Haidian District, Beijing, P. R. China100191

Location 3:CTTL(Yuetan)

Address: No. 11 Yue Tan Nan Jie, Xicheng District, Beijing, P. R. China100045

Location 4:CTTL(BDA)

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

Location 5:CTTL(South Branch)

Address: No.12, ShangSha Innovation and Technology Park, Futian District, Shenzhen, Guangdong, P. R. China518048

1.2. Testing Environment

Normal Temperature:	15-35℃
Extreme Temperature:	-20/+55℃
Relative Humidity:	20-75%

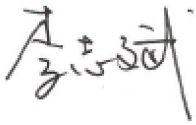
1.3. Project data

Testing Start Date:	2016-03-01
Testing End Date:	2016-03-15

1.4. Signature

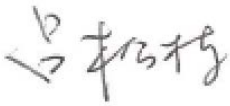
Xu Zhongfei

(Prepared this test report)



Li Zhibin

(Reviewed this test report)



Lv Songdong

(Approved this test report)

2. CLIENT INFORMATION

2.1. Applicant Information

Company Name:	TCL Communication Ltd.
Address:	5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203
City:	Shanghai
Postal Code:	201203
Country:	China
Telephone:	0086-21-31363544
Fax:	0086-21-61460602

2.2. Manufacturer Information

Company Name:	TCL Communication Ltd.
Address:	5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203
City:	Shanghai
Postal Code:	201203
Country:	China
Telephone:	0086-21-31363544
Fax:	0086-21-61460602

3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT(AE)

3.1. About EUT

Description	LTE/UMTS/GSM handheld station
Model name	VFD 700
FCC ID	2ACCJH051
IC ID	/
Type of modulation	OFDM
Antenna	Integral Antenna
Voltage	3.7V DC by Battery

Note: Photographs of EUT are shown in ANNEX C of this test report. Components list, please refer to documents of the manufacturer.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
UT01a	357042070003604	PIO	v2DS1
UT02a	/	PIO	v2DS1

*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	CAC2960003C2	/
AE2	Charger	CBA0061AA0C1	/

*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 LTE/UMTS/GSM handheld station with integrated antenna and inbuilt battery.
It has Bluetooth (EDR) function.
It consists of normal options: travel charger, USB cable and Phone.
Manual and specifications of the EUT were provided to fulfil the test.
Samples undergoing test were selected by the client.

3.5. Interpretation of the Test Environment

For the test methods, the test environment uncertainty figures correspond to an expansion factor k=2.
Measurement Uncertainty

Parameter	Uncertainty
temperature	0.48°C
humidity	2 %
DC voltages	0.003V

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	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices	2015
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014
UNII: KDB 789033	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E	2014-06

5. LABORATORY ENVIRONMENT

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

6. SUMMARY OF TEST RESULTS

6.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15E	Sub-clause of IC	Verdict
Maximum Output Power	15.407	/	**P**
Power Spectral Density	15.407	/	**P**
Occupied 26dB Bandwidth	15.403	/	**P**
Band edge compliance	15.209	/	**P**
Transmitter spurious emissions radiated	15.407	/	**P**
Spurious emissions radiated < 30 MHz	15.407	/	**P**
Spurious emissions conducted < 30 MHz	15.407	/	**P**
Peak Excursion	15.407	/	**P**
Frequency Stability	15.407	/	**NA**
Transmit Power Control	15.407	/	**NA**

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.

This model is a variant product which market name is 5095B; all the test results have been derived from test report of 5095B.,except radiated data.

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	26℃
Voltage	3.7V
Humidity	44%

7. TEST EQUIPMENTS UTILIZED

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Calibration Due date
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	2015-07-08	2016-07-07
2	Test Receiver	ESS	847151/015	Rohde & Schwarz	2015-11-29	2016-11-28
3	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	2015-4-15	2016-4-14
4	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

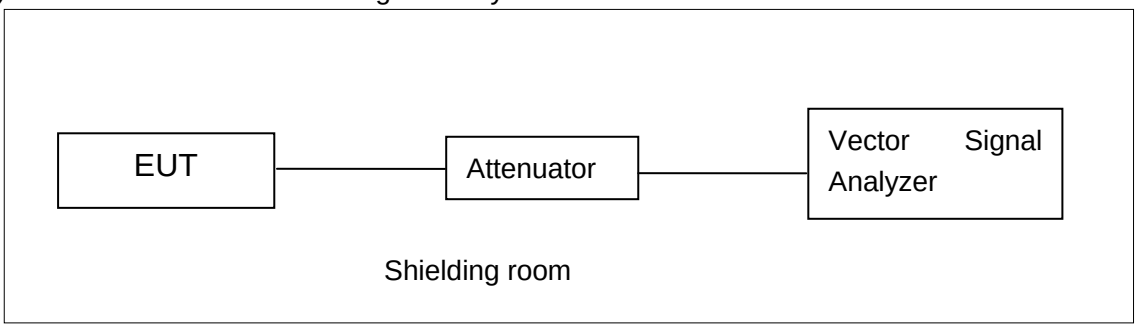
No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Calibration Due date
1	Test Receiver	ESCI 7	100948	Rohde & Schwarz	2015-07-17	2016-07-16
2	Loop antenna	HFH2-Z2	829324/007	Rohde & Schwarz	2014-12-17	2017-12-16
3	BiLog Antenna	VULB9163	234	Schwarzbeck	2013-09-16	2016-09-15
4	Dual-Ridge Waveguide Horn Antenna	3115	6914	EMCO	2014-12-16	2017-12-15
5	Dual-Ridge Waveguide Horn Antenna	3116	2661	ETS-Lindgren	2014-06-18	2017-06-17
6	Vector Signal Analyzer	FSV	101047	Rohde & Schwarz	2015-07-04	2016-07-03
7	Semi-anechoic chamber	/	CT000332-1074	Frankonia German	/	/

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

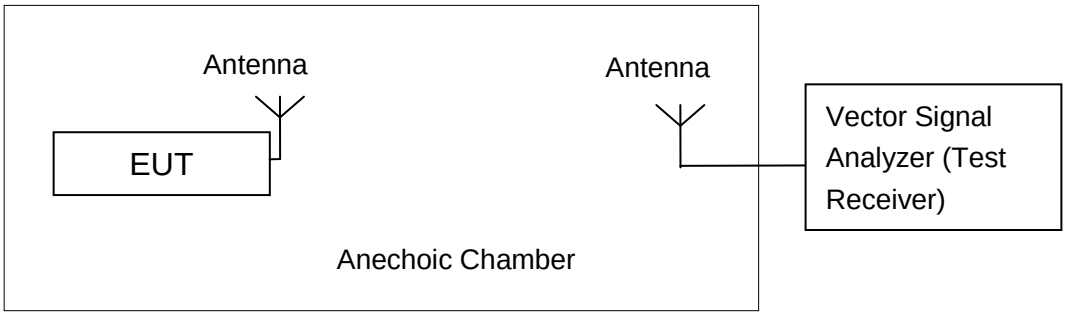
A.1.1. Conducted Measurements

1). Connect the EUT to the test system correctly.
2). Set the EUT to the required work mode.
3). Set the EUT to the required channel.
4). Set the spectrum analyzer to start measurement.
5). Record the values. Vector Signal Analyzer



A.1.2. Radiated Emission Measurements

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 KDB 789033
The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. 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. Maximum output Power

Measurement Limit and Method:

Standard	Frequency (MHz)	Limit (dBm)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	24dBm

The measurement method SA-1 is made according to KDB 789033

Measurement Results:

802.11a mode

Mode	Channel	Test Result (dBm)							
		Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
802.11a	5180MHz (Ch36)	13.77	13.58	13.87	13.81	13.59	13.44	13.63	13.57
	5200MHz (Ch40)	/	/	13.39	/	/	/	/	/
	5240MHz(Ch48)	/	/	13.54	/	/	/	/	/

The data rate 12Mbps is selected as worse condition, and the following cases are performed with this condition.

802.11n-HT20 mode

Mode	Channel	Test Result (dBm)							
		Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n (HT20)	5180MHz (Ch36)	11.75	11.83	11.82	11.69	11.59	11.63	11.58	11.58
	5200MHz (Ch40)	/	11.92	/	/	/	/	/	/
	5240MHz(Ch48)	/	11.80	/	/	/	/	/	/

The data rate MCS1 is selected as worse condition, and the following cases are performed with this condition.

802.11n-HT40 mode

Mode	Channel	Test Result (dBm)							
		Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n (HT40)	5190MHz (Ch38)	12.05	11.91	11.75	11.73	11.59	11.37	11.42	11.35
	5230MHz(Ch46)	12.15	/	/	/	/	/	/	/

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

A.3. Peak Power Spectral Density (conducted)

Measurement Limit:

Standard	Frequency (MHz)	Limit (dBm/MHz)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	11

The output power measurement method SA-1 is made according to KDB 789033

Measurement Results:

Mode	Channel	Power Spectral Density (dBm/MHz)	Conclusion
802.11a	5180 MHz	6.29	P
	5200 MHz	6.14	P
	5240 MHz	6.56	P
802.11n HT20	5180 MHz	3.65	P
	5200 MHz	4.98	P
	5240 MHz	5.37	P
802.11n HT40	5190 MHz	0.56	P
	5230 MHz	0.83	P

Conclusion: PASS

A.4. Occupied 26dB Bandwidth(conducted)

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.403 (i)	/

The measurement is made according to KDB 789033

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz

Measurement Result:

Mode	Channel	Occupied 26dB Bandwidth (kHz)		conclusion
802.11a	5180 MHz	Fig.1	34250	P
	5200 MHz	Fig.2	35500	P
	5240 MHz	Fig.3	33950	P
802.11n HT20	5180 MHz	Fig.4	34600	P
	5200 MHz	Fig.5	33400	P
	5240 MHz	Fig.6	37400	P
802.11n HT40	5190 MHz	Fig.7	73200	P
	5230 MHz	Fig.8	74480	P

Conclusion: PASS

Test graphs as below:

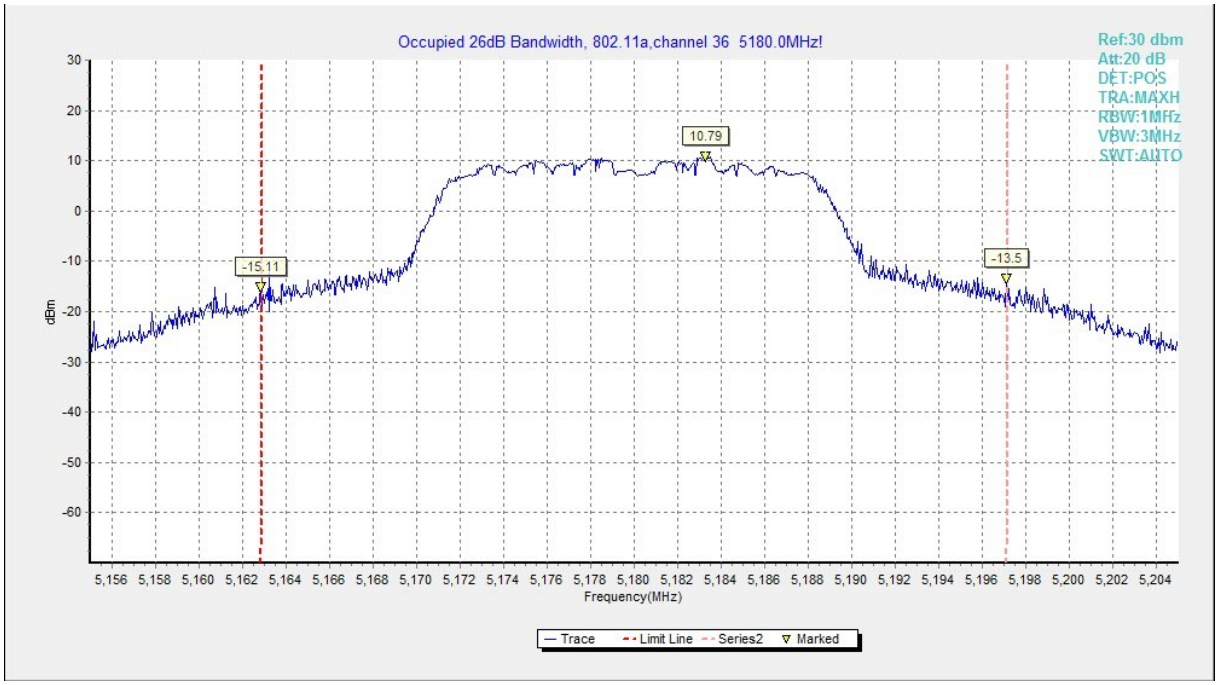


Fig. 1 Occupied 26dB Bandwidth (802.11a, 5180MHz)

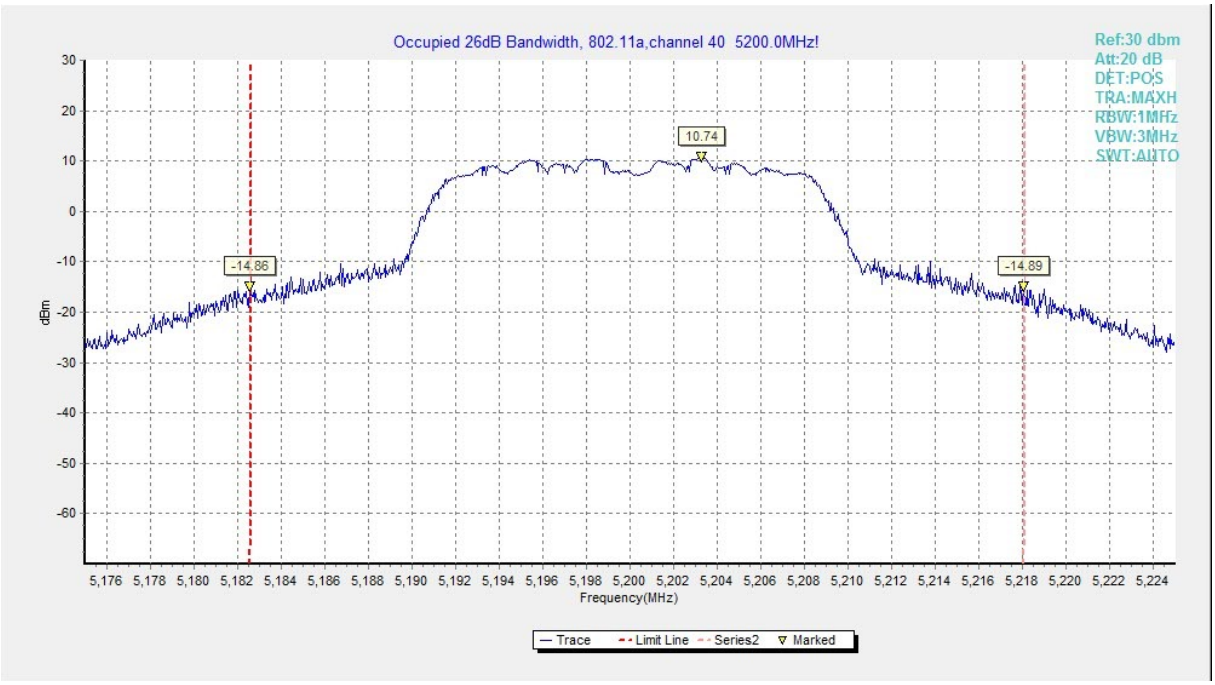


Fig. 2 Occupied 26dB Bandwidth (802.11a, 5200MHz)

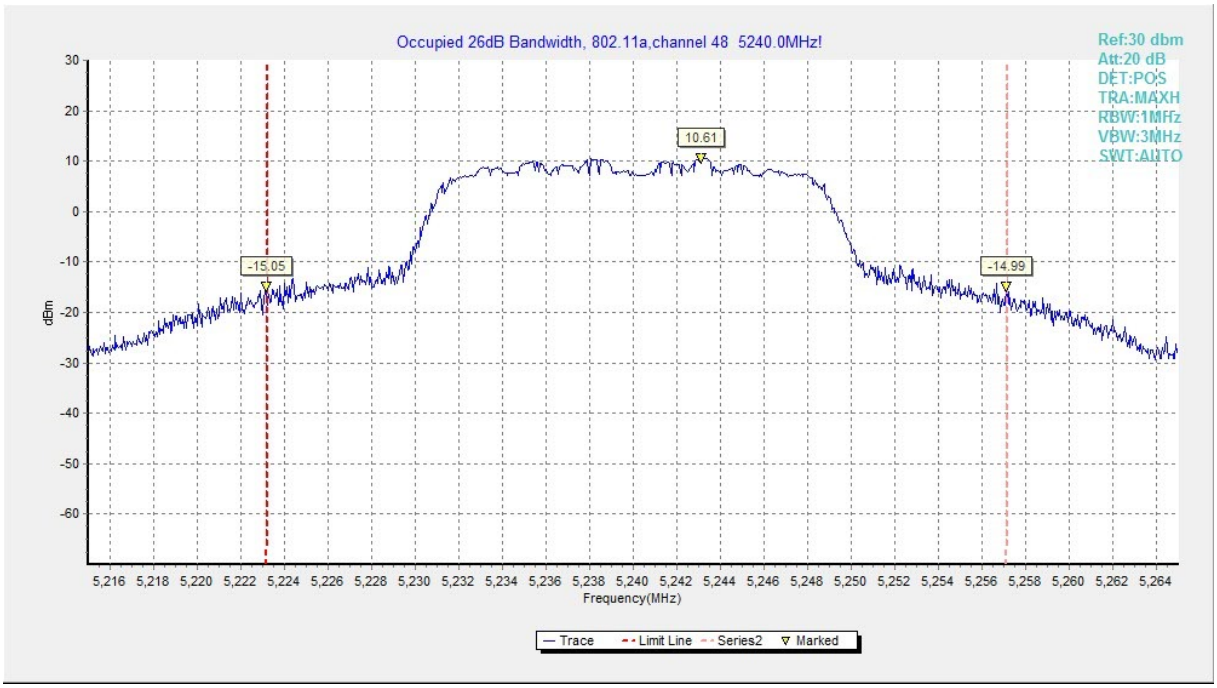


Fig. 3 Occupied 26dB Bandwidth (802.11a, 5240MHz)

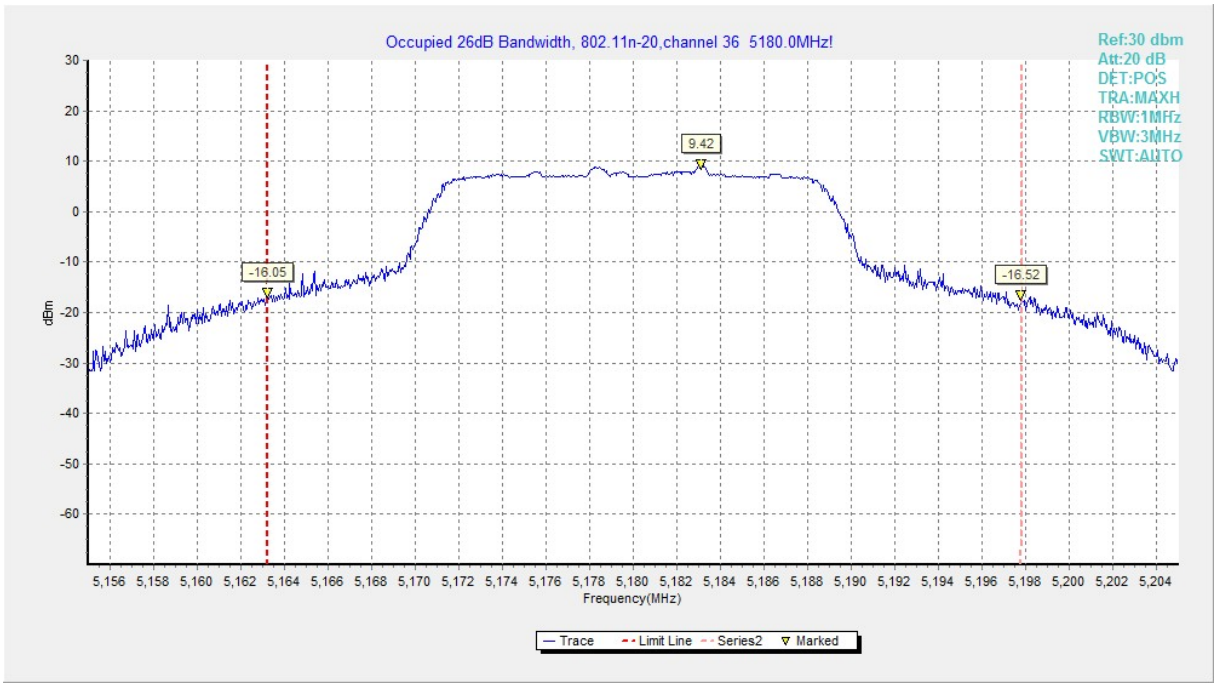


Fig. 4 Occupied 26dB Bandwidth (802.11n-HT20, 5180MHz)

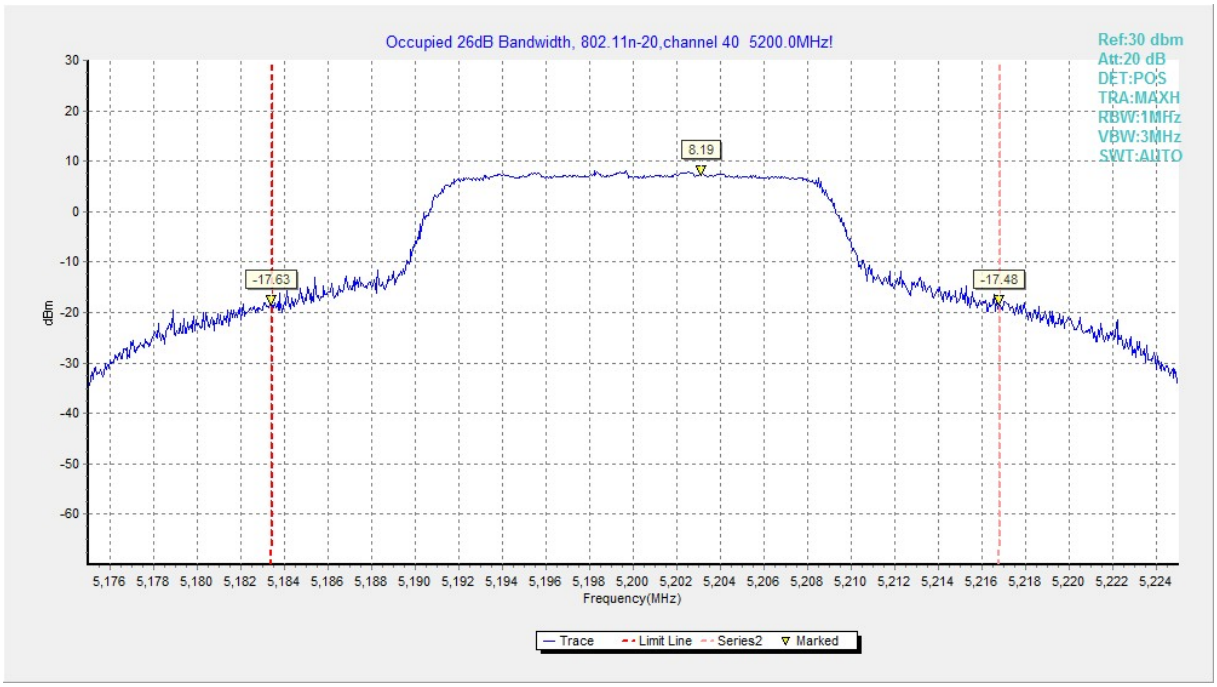


Fig. 5 Occupied 26dB Bandwidth (802.11n-HT20, 5200MHz)

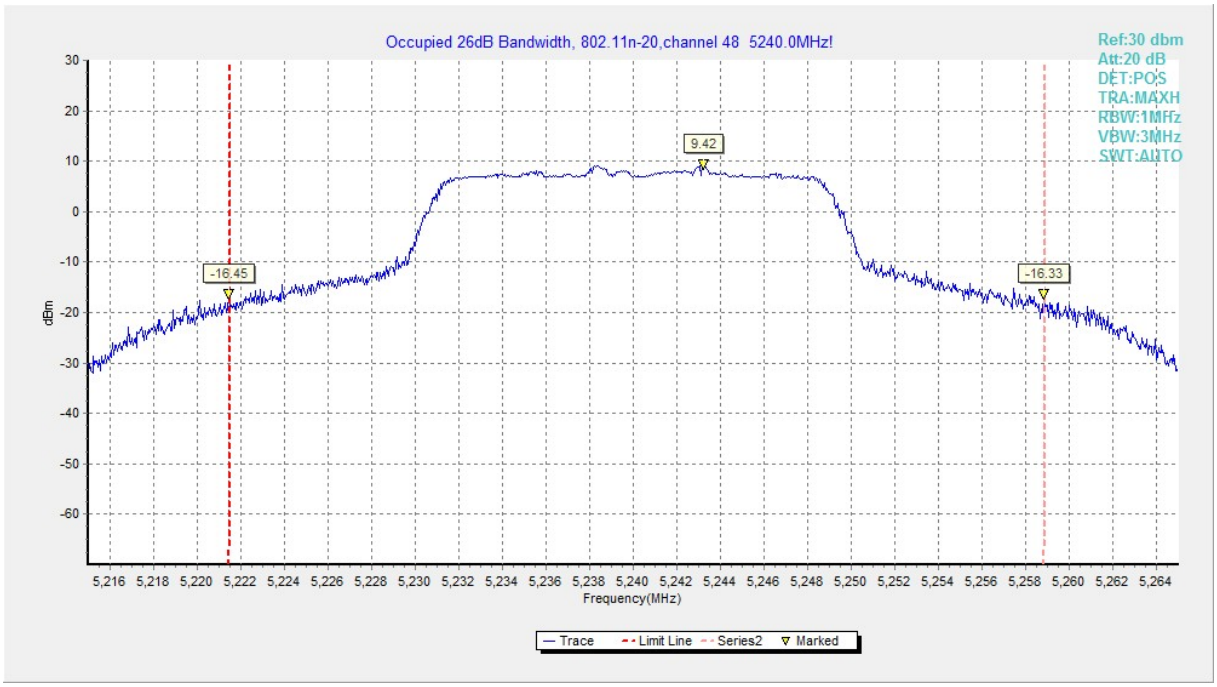


Fig. 6 Occupied 26dB Bandwidth (802.11n-HT20, 5240MHz)

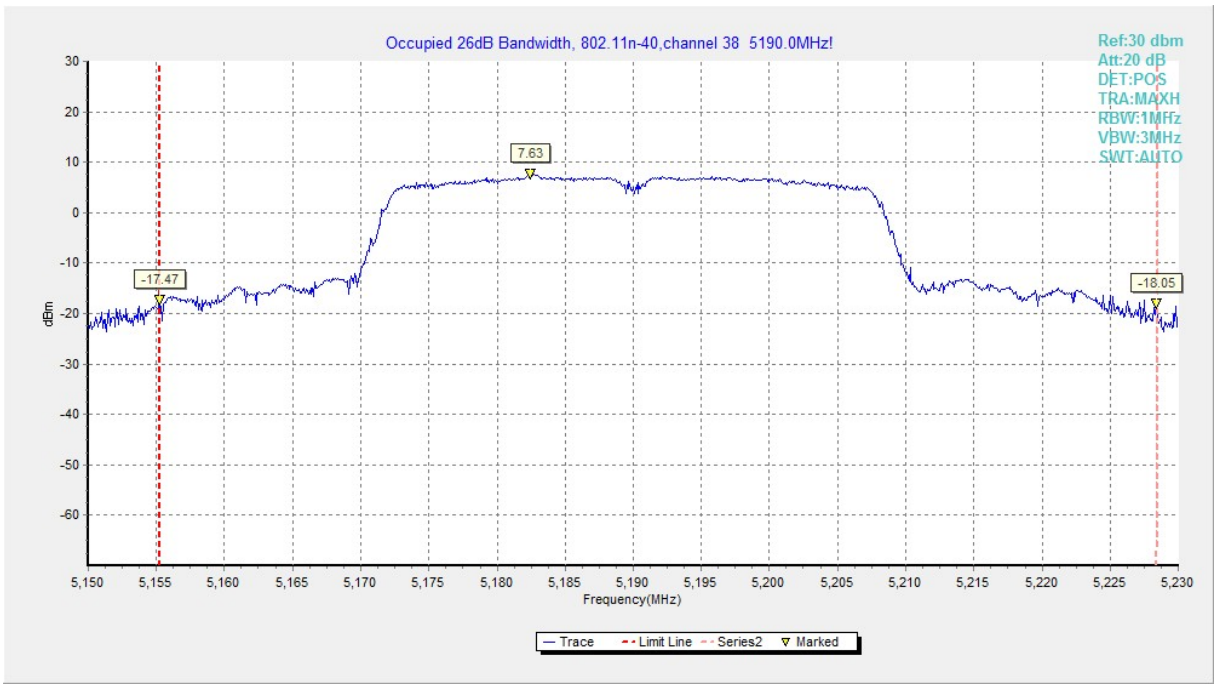


Fig. 7 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

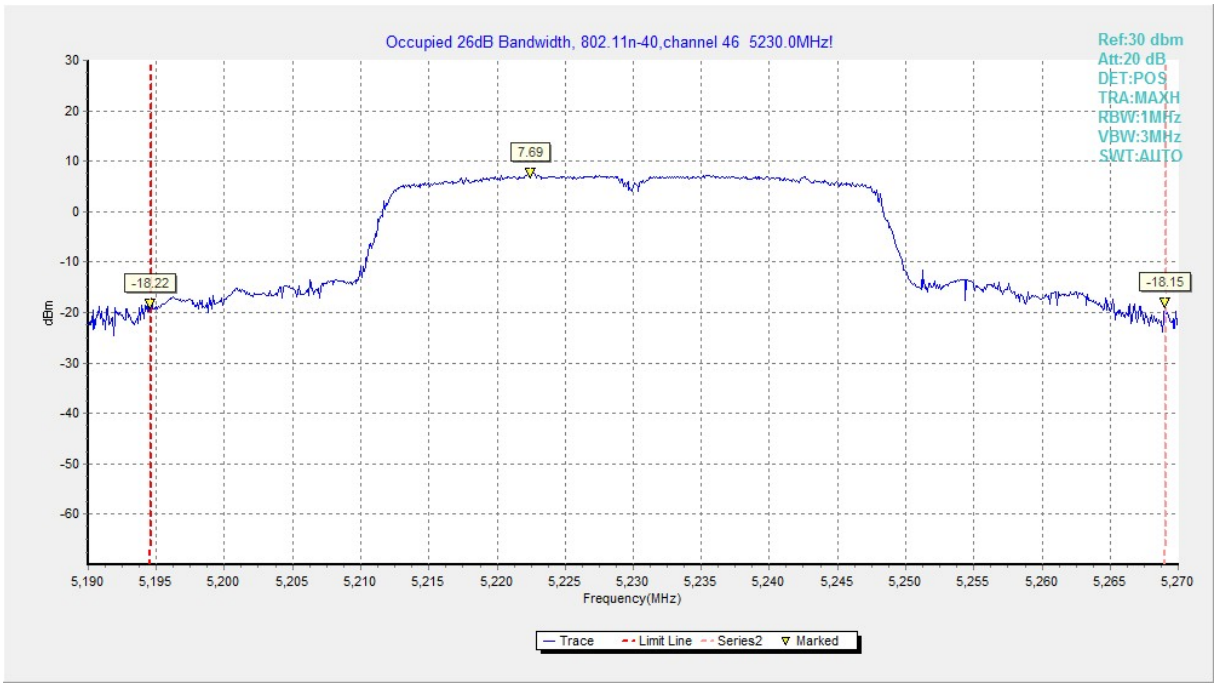


Fig. 8 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

A.5. Band Edges Compliance

A5.1 Band Edges - conducted

Measurement Limit:

Standard	Limit (dBm/MHz)
FCC 47 CFR Part 15.407	< -27

The measurement is made according to KDB 789033

Measurement Uncertainty:

Measurement Uncertainty	0.75dB

Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5180 MHz	Fig.9	P
	5240 MHz	Fig.10	P
802.11n HT20	5180 MHz	Fig.11	P
	5240 MHz	Fig.12	P
802.11n HT40	5190 MHz	Fig.13	P
	5230 MHz	Fig.14	P

Conclusion: PASS

Test graphs as below:

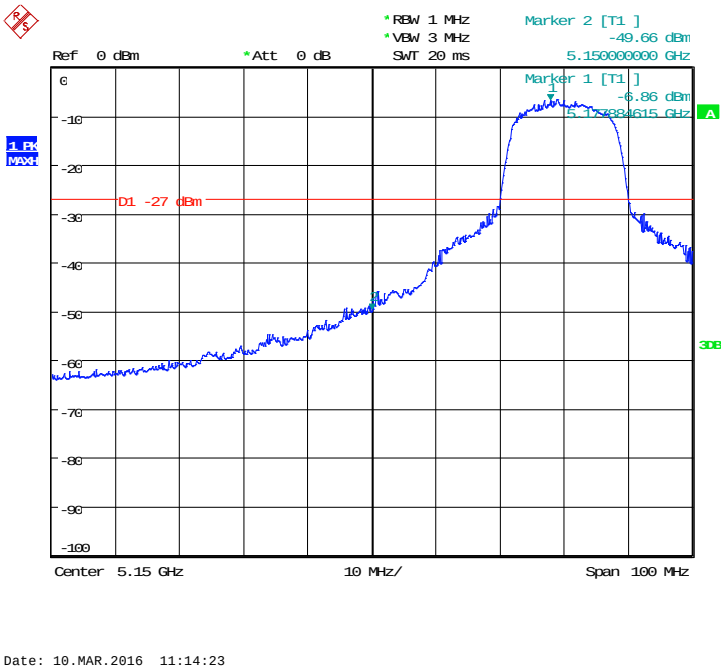


Fig. 9 Band Edges (802.11a, 5180MHz)

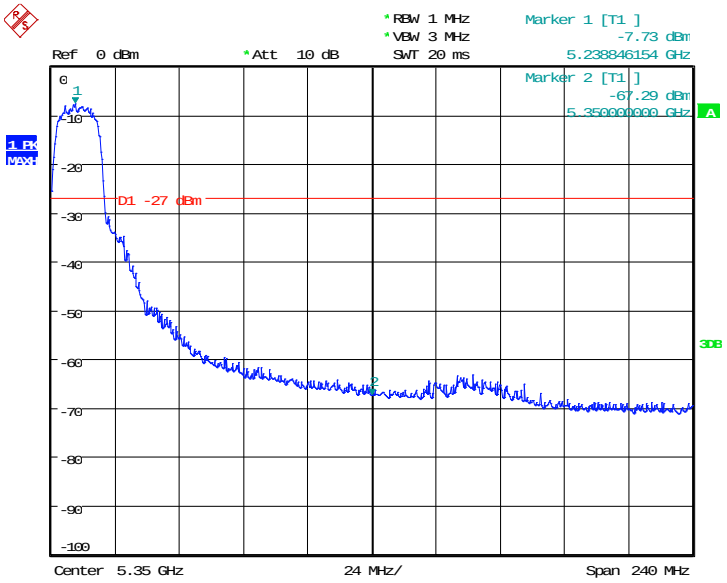


Fig. 10 Band Edges (802.11a, 5240MHz)

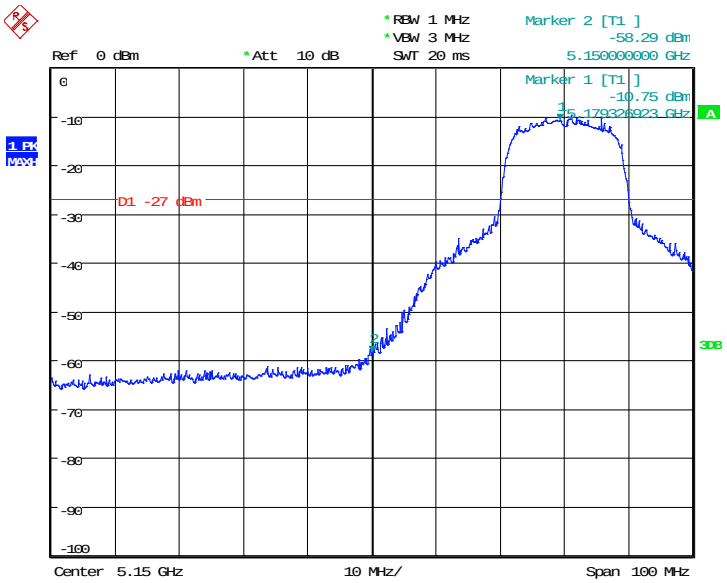


Fig. 11 Band Edges (802.11n-HT20, 5180MHz)

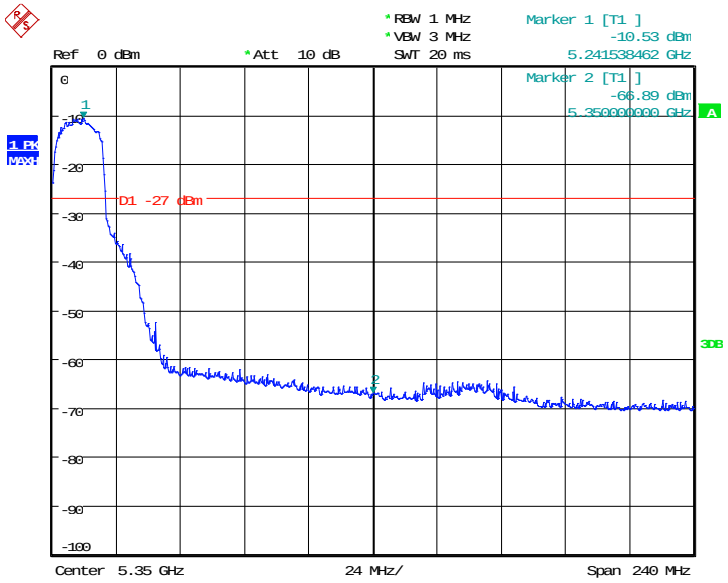


Fig. 12 Band Edges (802.11n-HT20, 5240MHz)

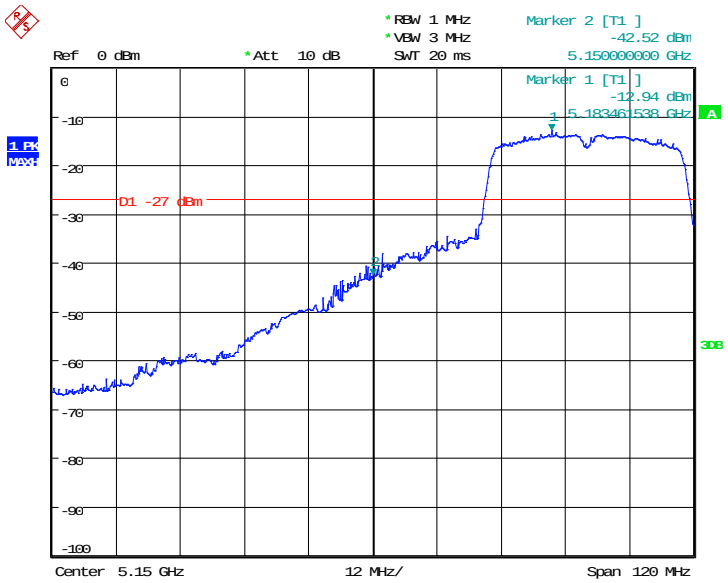


Fig. 13 Band Edges (802.11n-HT40, 5190MHz)

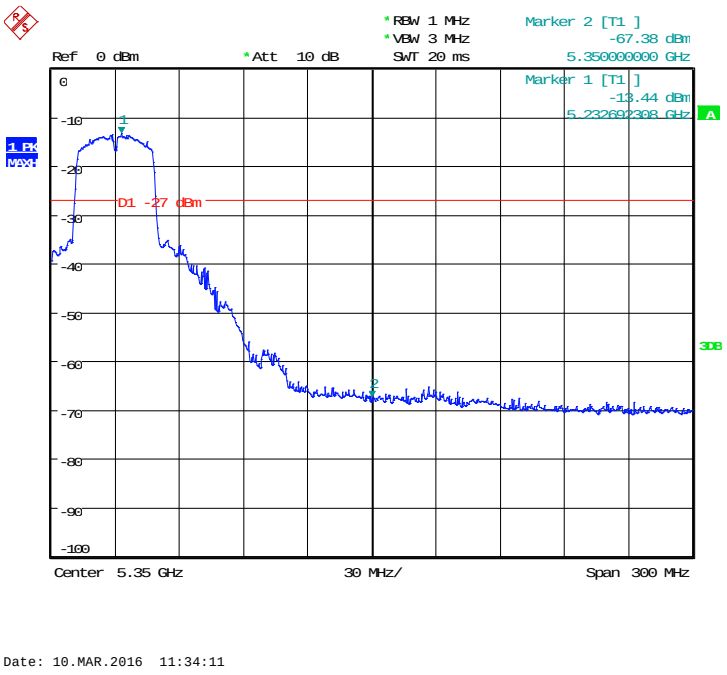


Fig. 14 Band Edges (802.11n-HT40, 5230MHz)

A5.2 Band Edges - Radiated

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

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 Uncertainty:

Measurement Uncertainty	0.75dB

Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5180 MHz	Fig.15	P
802.11n HT20	5180 MHz	Fig.16	P
802.11n HT40	5190 MHz	Fig.17	P

Conclusion: PASS

Test graphs as below:

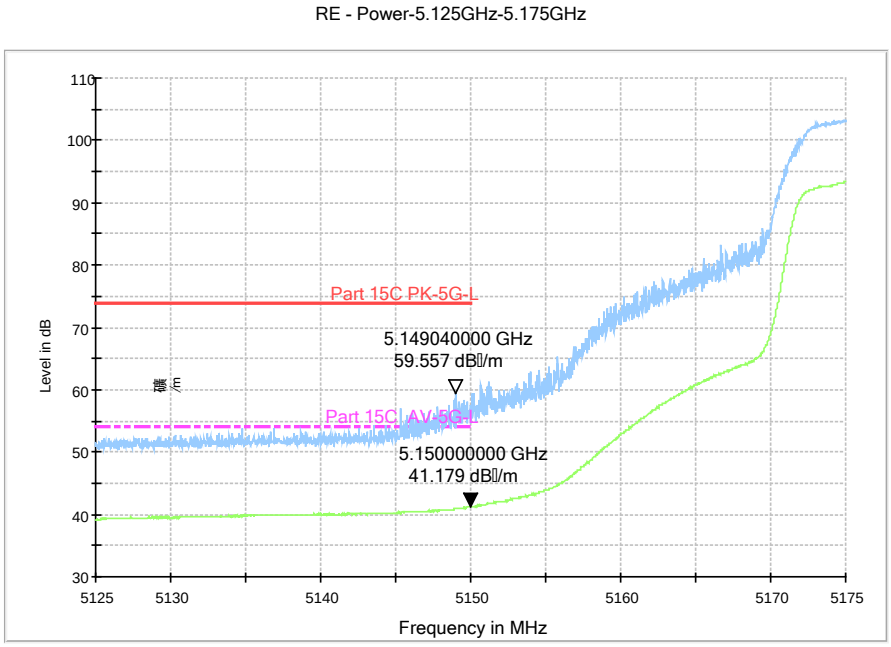


Fig. 15 Band Edges (802.11a, 5180MHz)

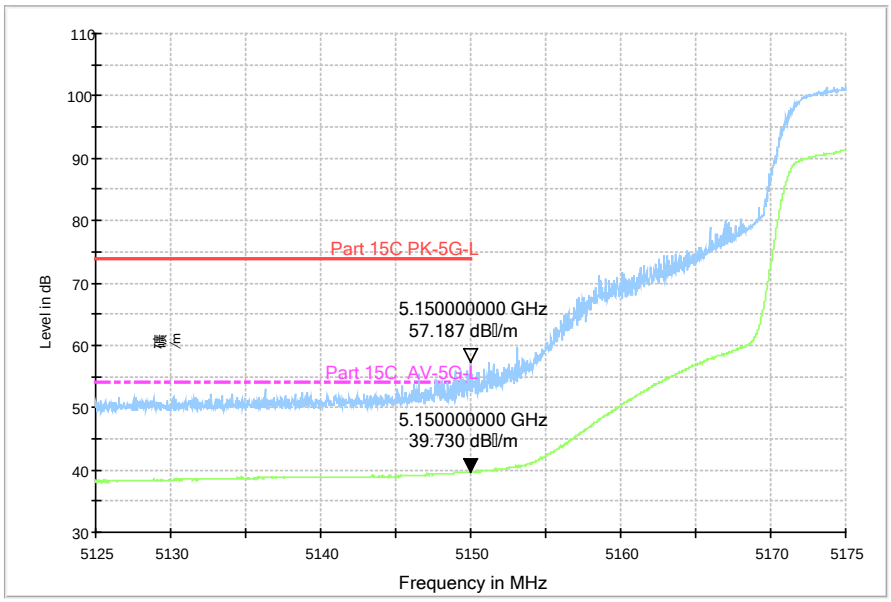


Fig. 16 Band Edges (802.11n-HT20, 5180MHz)

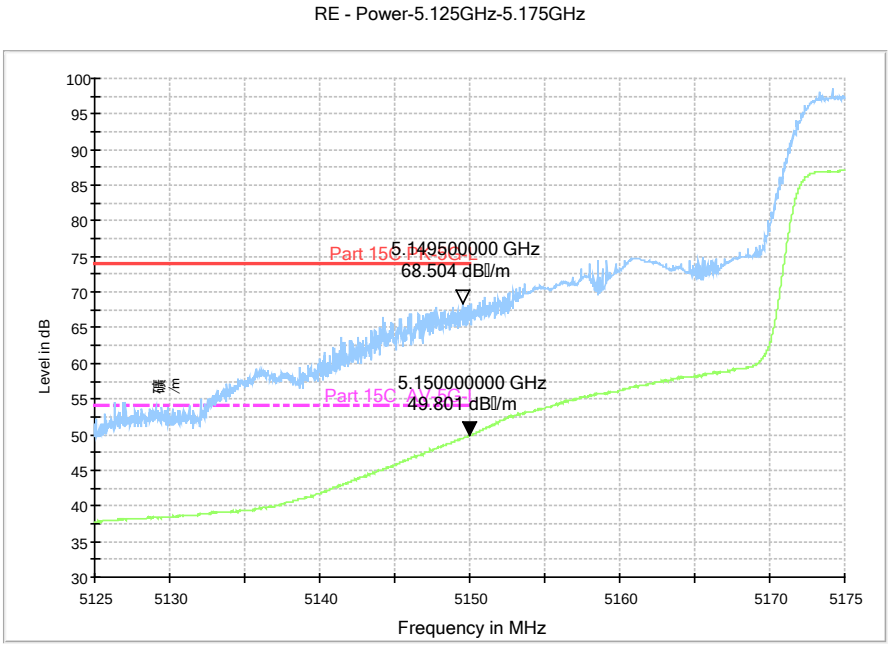


Fig. 17 Band Edges (802.11n-HT40, 5190MHz)

A.6. Transmitter Spurious Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.407	-27 dBm/MHz

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)).

Limit in restricted band:

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

Note: for frequency range below 960MHz, the limit in 15.209 is defined in 10m test distance. The limit used above is calculated from 10m to 3m

Measurement uncertainty:
Expanded measurement uncertainty for this test item is U =3.9 dB, k=2.

Measurement Results:

802.11a mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	36(5180MHz)	1 GHz ~ 3 GHz	Fig.18	P
		3 GHz ~ 6 GHz	Fig.19	P
		6 GHz ~ 18 GHz	Fig.20	P
	40(5200MHz)	30 MHz ~1 GHz	Fig.21	P
		1 GHz ~ 3 GHz	Fig.22	P
		3 GHz ~ 6 GHz	Fig.23	P
		6 GHz ~ 18 GHz	Fig.24	P
		18 GHz ~ 26.5 GHz	Fig.25	P
		26.5 GHz ~ 40 GHz	Fig.26	P
	48(5240MHz)	1 GHz ~ 3 GHz	Fig.27	P
		3 GHz ~ 6 GHz	Fig.28	P
		6 GHz ~ 18 GHz	Fig.29	P

802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n -HT20	36(5180MHz)	1 GHz ~ 3 GHz	Fig.30	P
		3 GHz ~ 6 GHz	Fig.31	P
		6 GHz ~ 18 GHz	Fig.32	P
	40(5200MHz)	30 MHz ~1 GHz	Fig.33	P
		1 GHz ~ 3 GHz	Fig.34	P
		3 GHz ~ 6 GHz	Fig.35	P
		6 GHz ~ 18 GHz	Fig.36	P
		18 GHz ~ 26.5 GHz	Fig.37	P
		26.5 GHz ~ 40 GHz	Fig.38	P
	48(5240MHz)	1 GHz ~ 3 GHz	Fig.39	P
		3 GHz ~ 6 GHz	Fig.40	P
		6 GHz ~ 18 GHz	Fig.41	P

802.11n-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n HT40	38(5190MHz)	30 MHz ~1 GHz	Fig.42	P
		1 GHz ~ 3 GHz	Fig.43	P
		3 GHz ~ 6 GHz	Fig.44	P
		6 GHz ~ 18 GHz	Fig.45	P
		18 GHz ~ 26.5 GHz	Fig.46	P
		26.5 GHz ~ 40 GHz	Fig.47	P
	46(5230MHz)	1 GHz ~ 3 GHz	Fig.48	P
		3 GHz ~ 6 GHz	Fig.49	P
		6 GHz ~ 18 GHz	Fig.50	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

Channel 36

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5149.040	59.6	-19.5	34.5	44.647	V
17808.600	58.5	-13.0	41.0	30.505	V
17671.800	58.5	-13.0	41.2	30.305	V
17646.600	58.0	-13.0	41.2	29.805	H
17884.200	57.8	-13.5	41.0	30.262	V
17628.000	57.8	-14.9	41.2	31.518	V

Channel 40

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17735.400	58.9	-13.0	41.2	30.705	H
17659.800	58.6	-13.0	41.2	30.405	H
17689.800	58.5	-13.0	41.2	30.305	V
17345.400	58.2	-13.9	41.2	30.923	V
17668.200	58.1	-13.0	41.2	29.905	V
17745.000	58.1	-13.0	41.2	29.905	V

Channel 48

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17620.800	58.8	-14.9	41.2	32.518	V
17601.000	58.6	-14.9	41.2	32.318	H
17685.000	58.5	-13.0	41.2	30.305	H
17760.000	58.5	-13.0	41.0	30.505	V
17290.200	58.0	-13.9	41.2	30.723	H
17612.400	58.0	-14.9	41.2	31.718	H

802.11n-HT20

Channel 36

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5150.000	57.2	-19.5	34.5	42.247	H
17610.600	58.3	-14.9	41.2	32.018	V
17253.600	58.3	-15.1	41.2	32.193	H
17661.600	58.0	-13.0	41.2	29.805	V
17473.800	58.0	-14.9	41.2	31.718	V
17708.400	58.0	-13.0	41.2	29.805	V

Channel 40

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17770.800	58.6	-13.0	41.0	30.605	V
17885.400	58.4	-13.5	41.0	30.862	V
17293.200	58.3	-13.9	41.2	31.023	V
17793.000	58.3	-13.0	41.0	30.305	H
17676.000	58.2	-13.0	41.2	30.005	V
17911.200	58.2	-13.5	41.0	30.662	H

Channel 48

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17739.000	58.8	-13.0	41.2	30.605	H
17795.400	58.7	-13.0	41.0	30.705	V
17751.600	58.7	-13.0	41.0	30.705	V
17605.800	58.5	-14.9	41.2	32.218	V
17685.600	58.5	-13.0	41.2	30.305	V
17629.200	58.4	-14.9	41.2	32.118	V

802.11n-HT40

Channel 38

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5149.500	68.5	-19.5	34.5	53.547	H
17661.600	59.0	-13.0	41.2	30.805	V
17726.400	58.9	-13.0	41.2	30.705	V
17638.800	58.4	-13.0	41.2	30.205	V
17224.200	58.3	-15.1	41.4	31.993	H
17724.000	58.2	-13.0	41.2	30.005	V

Channel 46

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17559.000	58.7	-14.9	41.2	32.418	H
17707.800	58.3	-13.0	41.2	30.105	V
17227.800	58.3	-15.1	41.4	31.993	H
17663.400	58.2	-13.0	41.2	30.005	H
17668.800	58.2	-13.0	41.2	30.005	V
17740.800	58.0	-13.0	41.2	29.805	V

Test graphs as below:

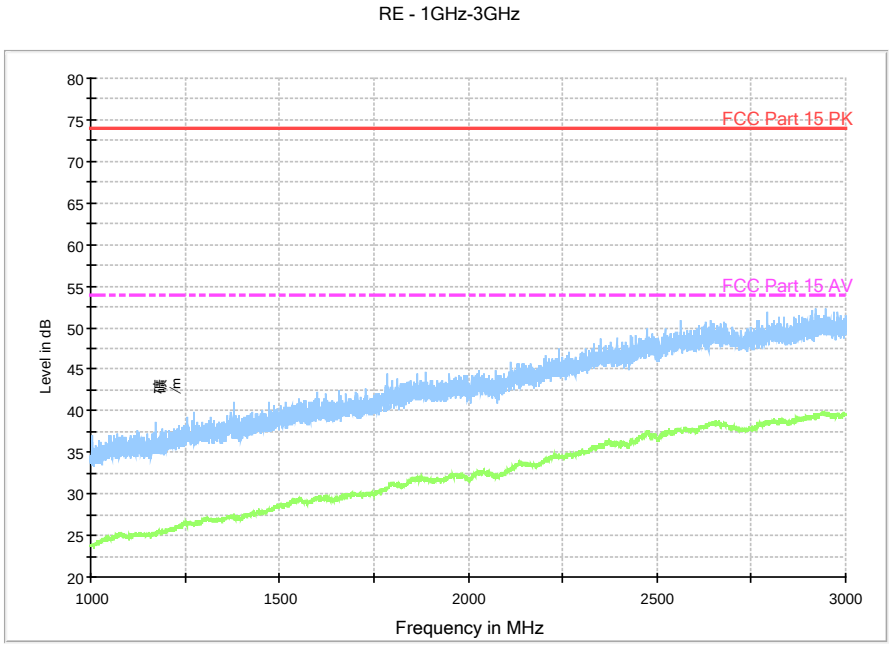


Fig. 18 Radiated Spurious Emission (802.11a, ch36, 1 GHz-3 GHz)

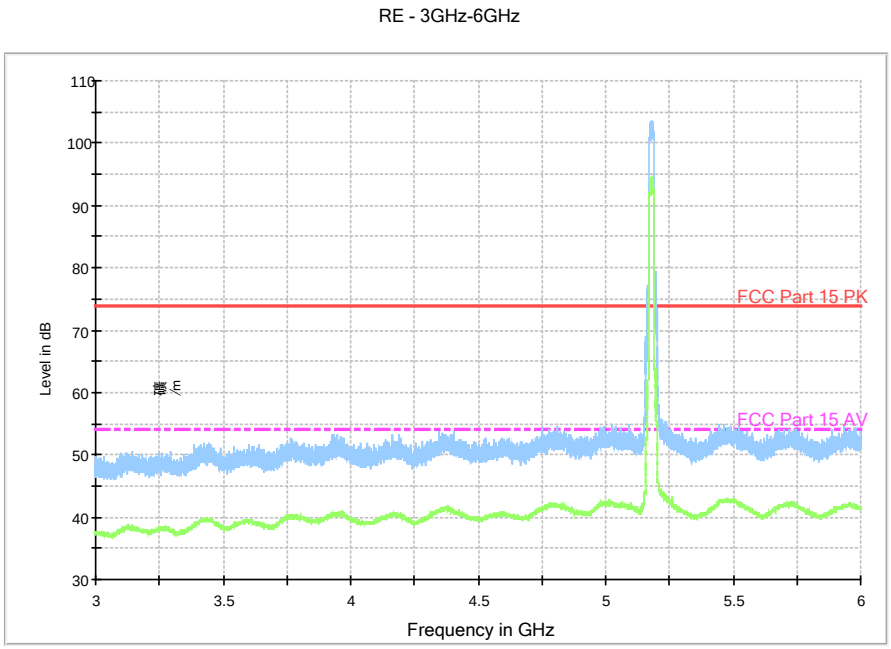


Fig. 19 Radiated Spurious Emission (802.11a, ch36, 3 GHz-6 GHz)

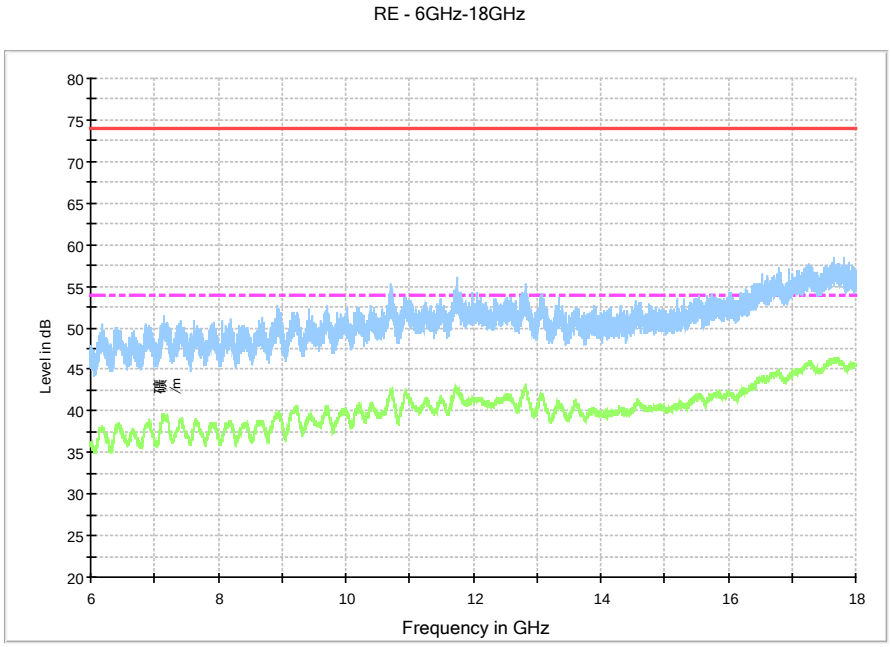


Fig. 20 Radiated Spurious Emission (802.11a, ch36, 6 GHz-18 GHz)

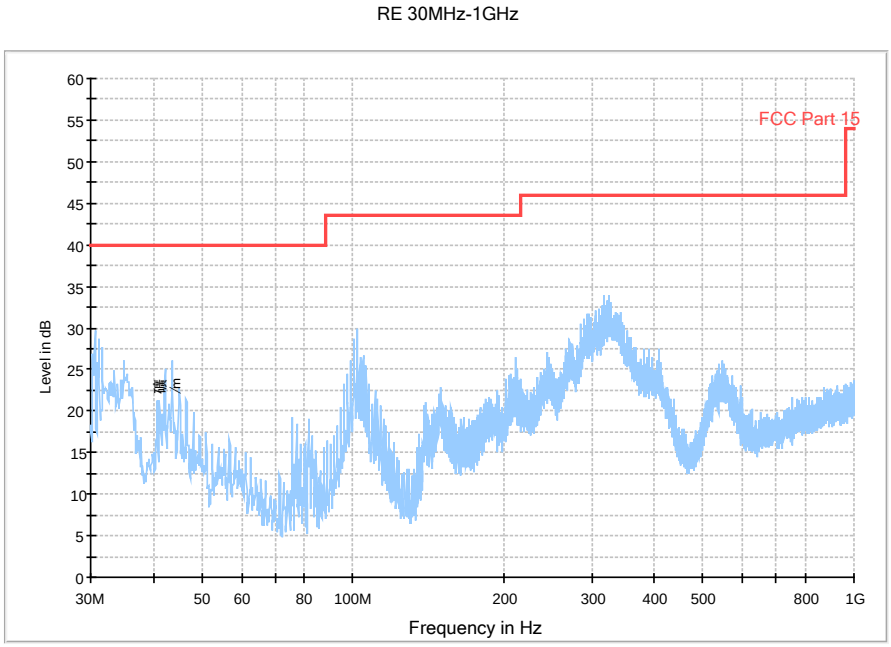


Fig. 21 Radiated Spurious Emission (802.11a, ch40, 30 MHz-1 GHz)

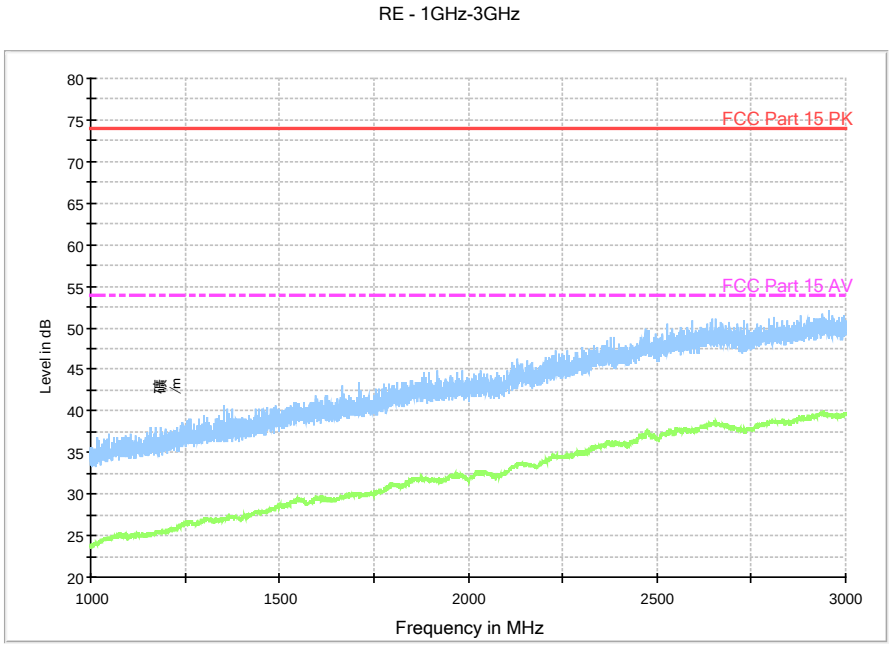


Fig. 22 Radiated Spurious Emission (802.11a, ch40, 1 GHz-3 GHz)

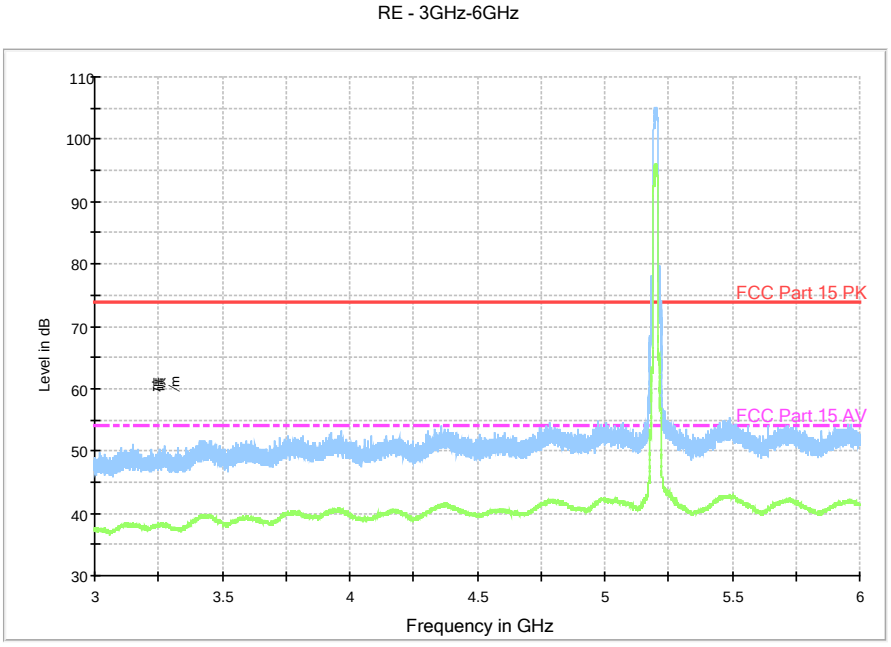


Fig. 23 Radiated Spurious Emission (802.11a, ch40, 3 GHz-6 GHz)

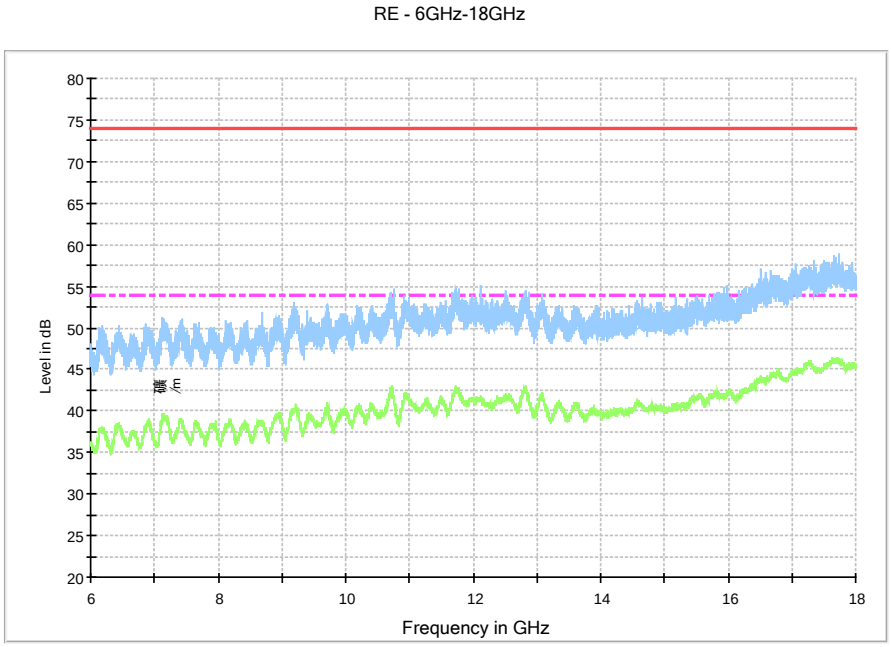


Fig. 24 Radiated Spurious Emission (802.11a, ch40, 6 GHz-18 GHz)

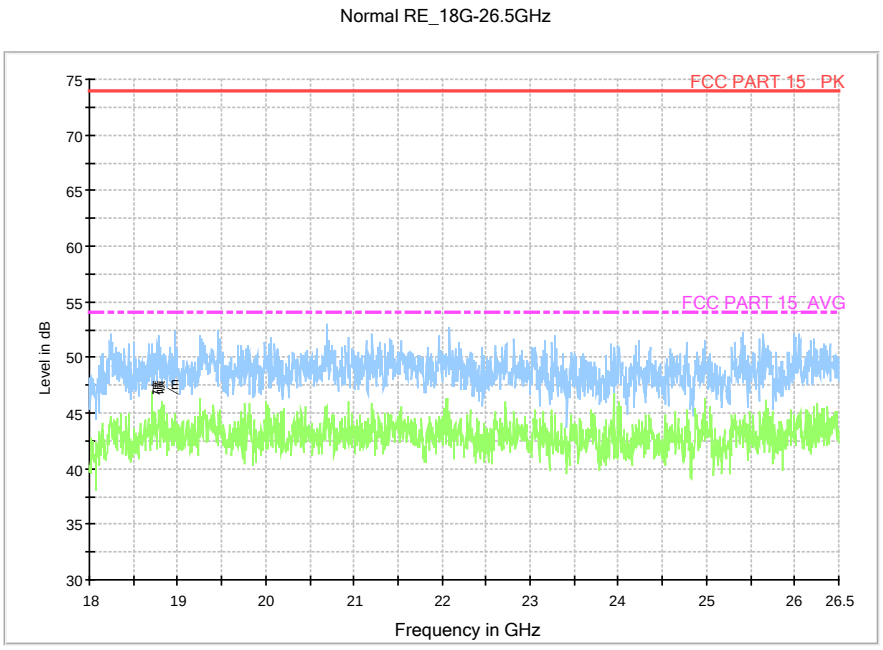


Fig. 25 Radiated Spurious Emission (802.11a, ch40, 18 GHz-26.5 GHz)

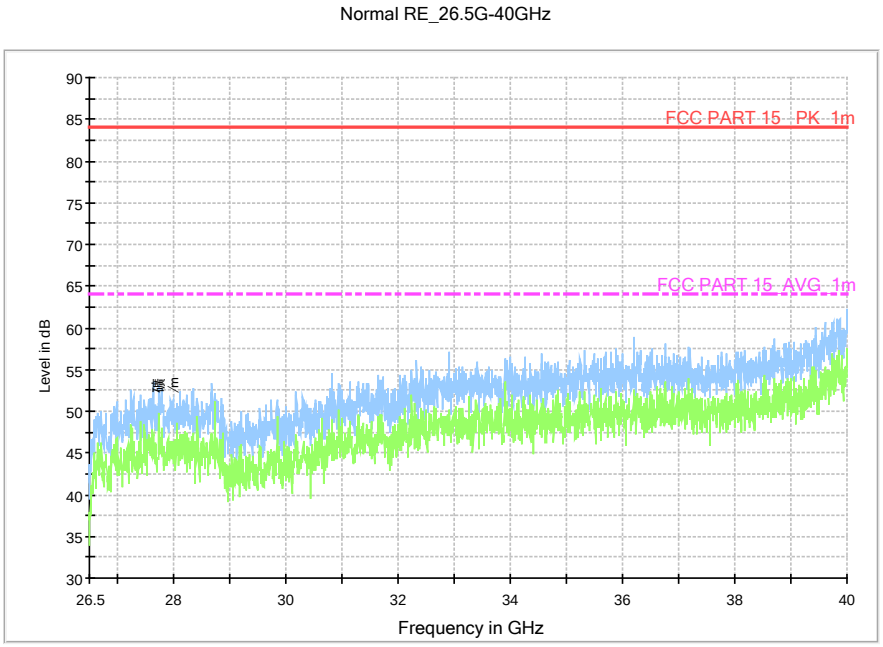


Fig. 26 Radiated Spurious Emission (802.11a, ch40, 26.5 GHz-40 GHz)

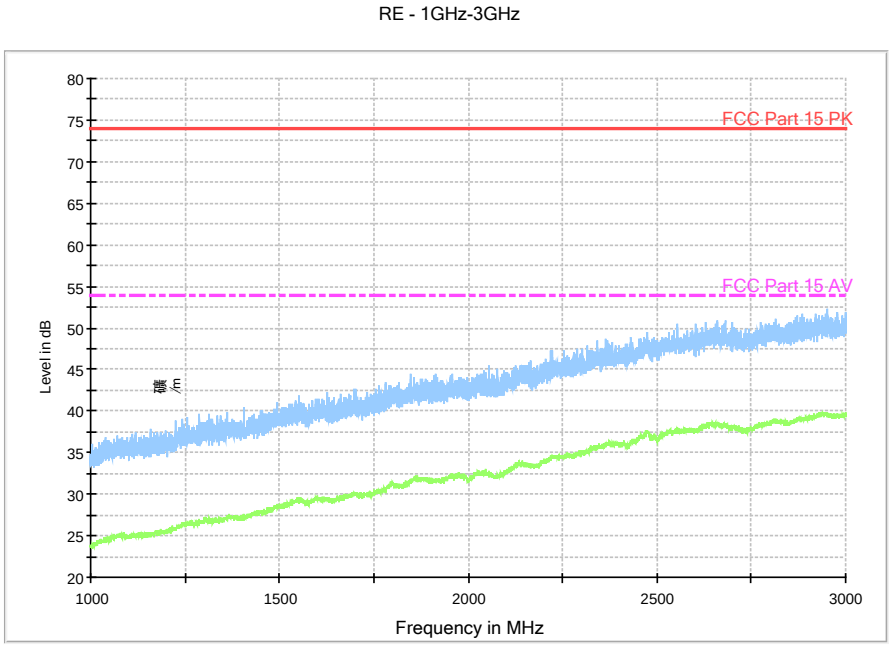


Fig. 27 Radiated Spurious Emission (802.11a, ch48, 1 GHz-3 GHz)

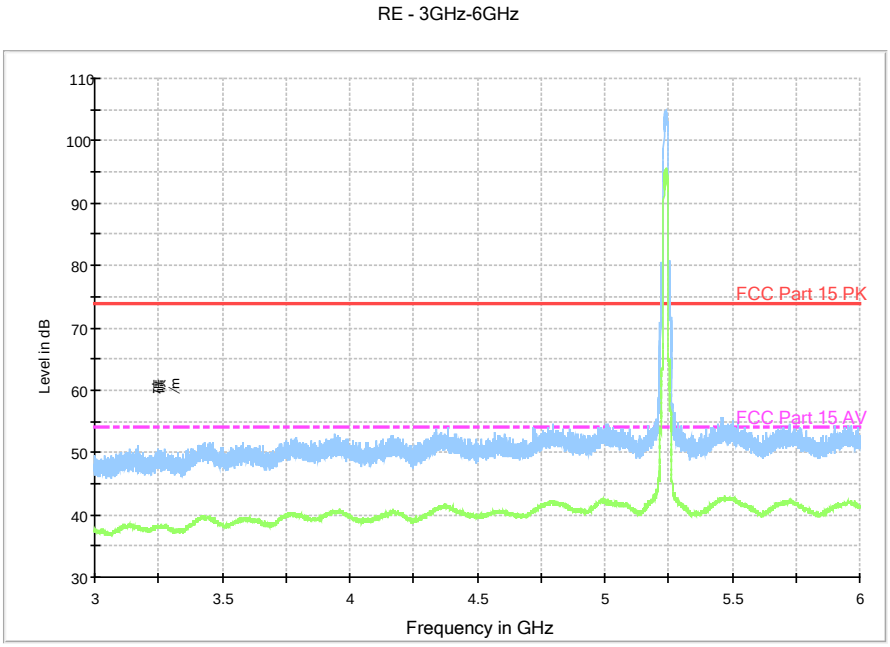


Fig. 28 Radiated Spurious Emission (802.11a, ch48, 3 GHz-6 GHz)

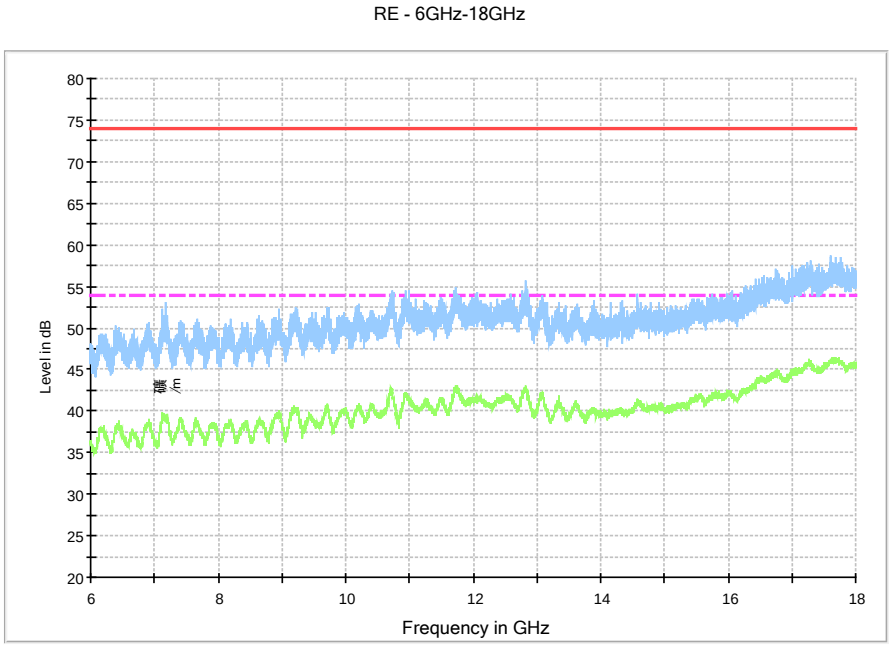


Fig. 29 Radiated Spurious Emission (802.11a, ch48, 6 GHz-18 GHz)

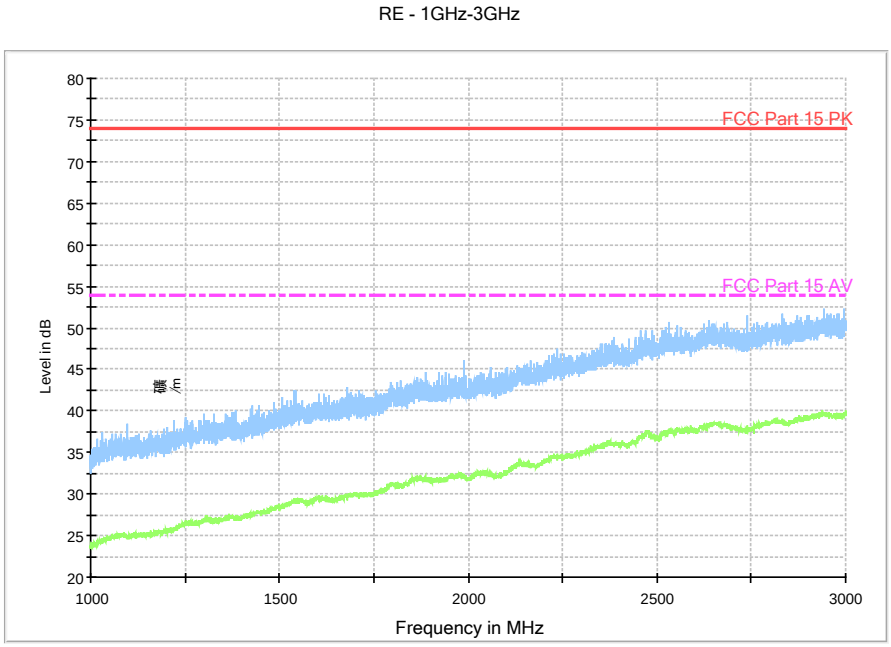


Fig. 30 Radiated Spurious Emission (802.11n-HT20, ch36, 1 GHz-3 GHz)

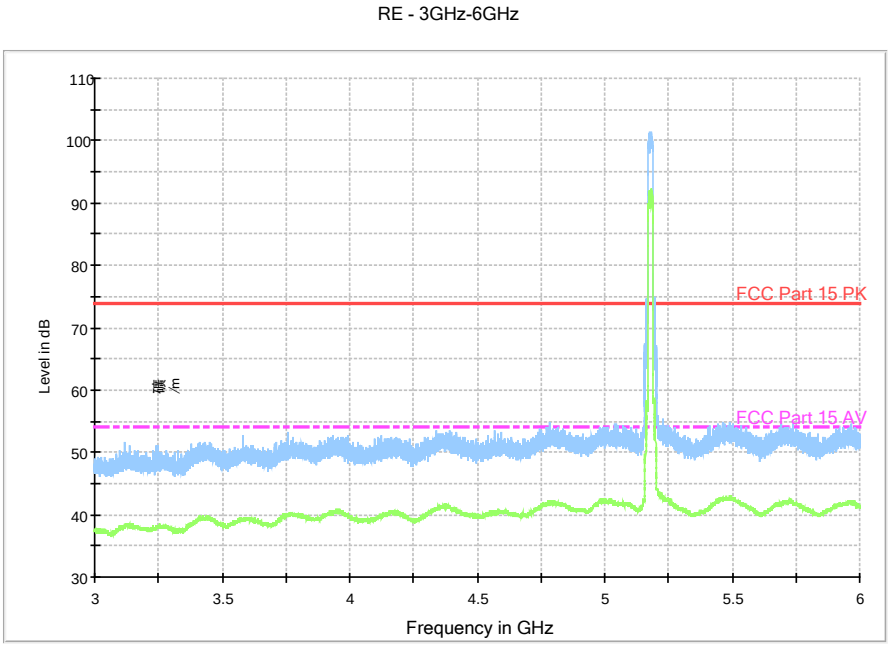


Fig. 31 Radiated Spurious Emission (802.11n-HT20, ch36, 3 GHz-6 GHz)

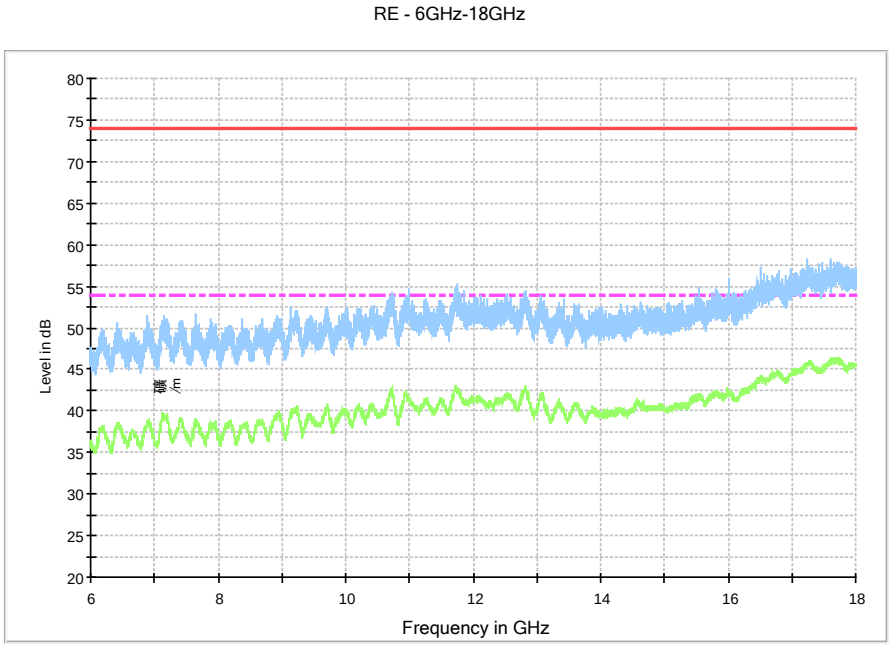


Fig. 32 Radiated Spurious Emission (802.11n-HT20, ch36, 6 GHz-18 GHz)

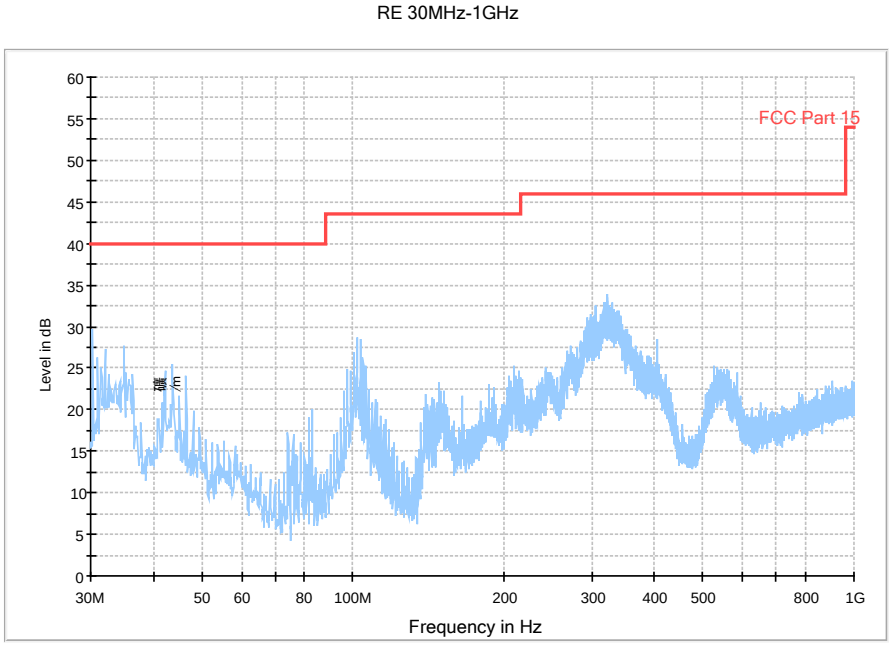


Fig. 33 Radiated Spurious Emission (802.11n-HT20, ch40, 30 MHz-1 GHz)

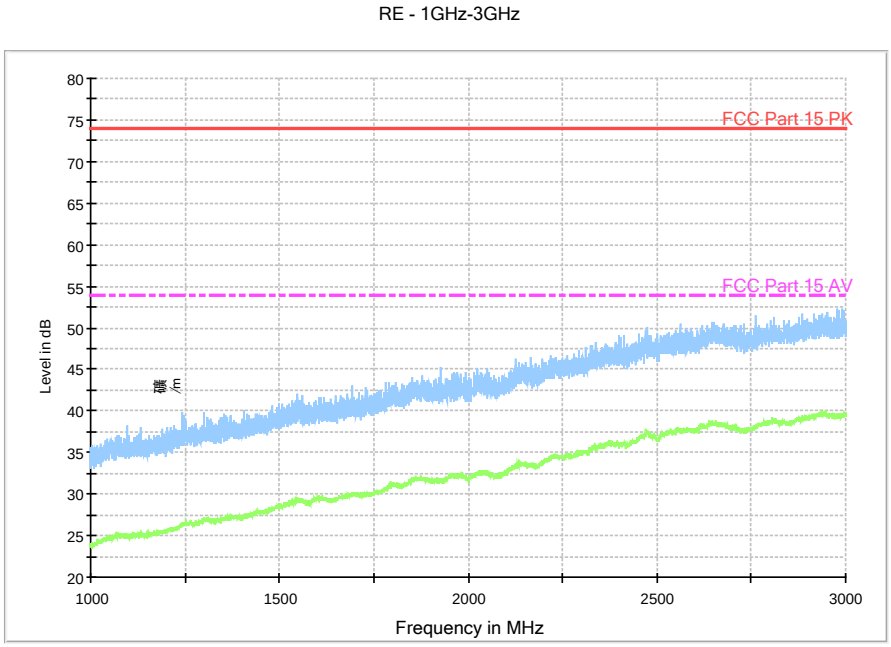


Fig. 34 Radiated Spurious Emission (802.11n-HT20, ch40, 1 GHz-3 GHz)

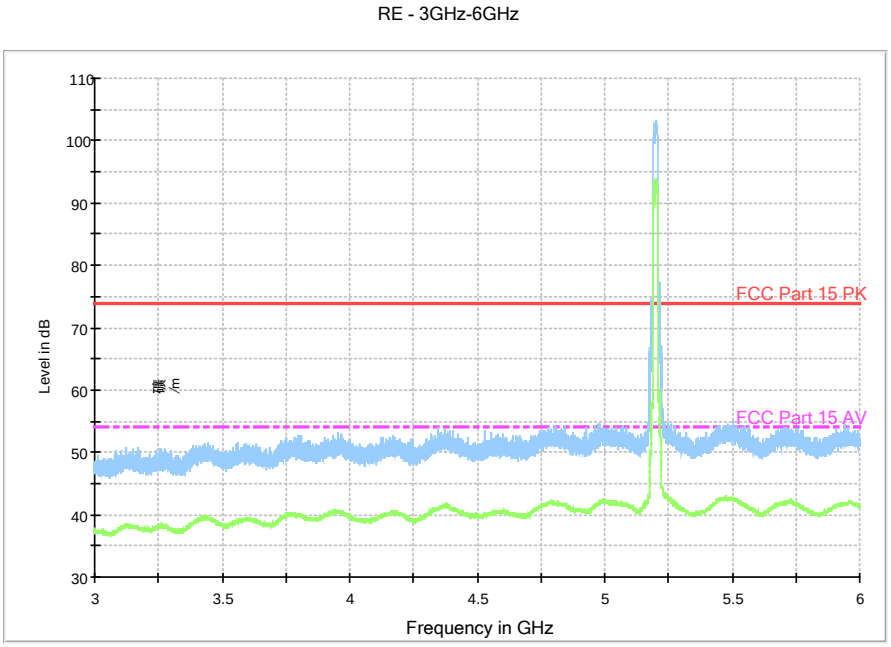


Fig. 35 Radiated Spurious Emission (802.11n-HT20, ch40, 3 GHz-6 GHz)

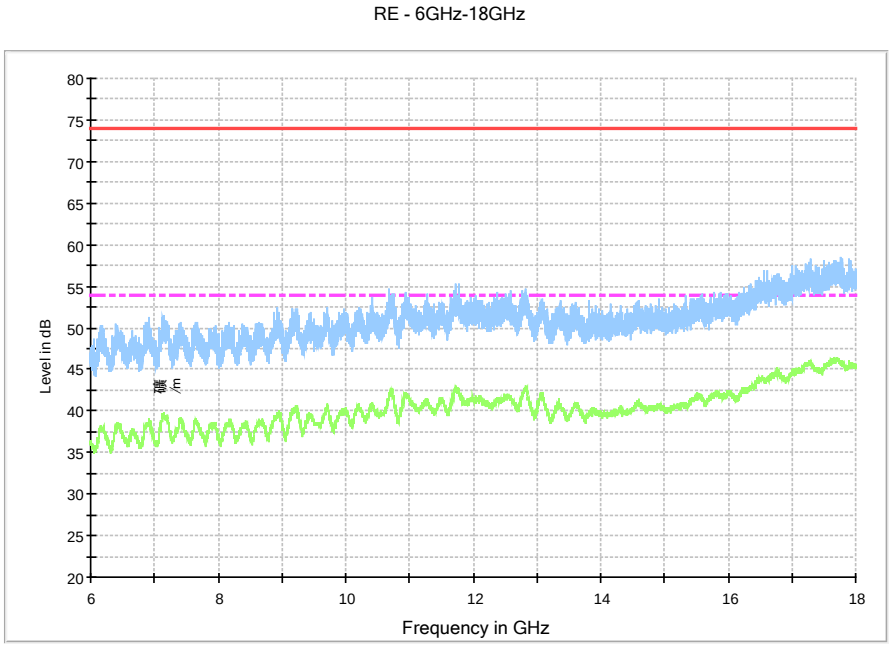


Fig. 36 Radiated Spurious Emission (802.11n-HT20, ch40, 6 GHz-18 GHz)

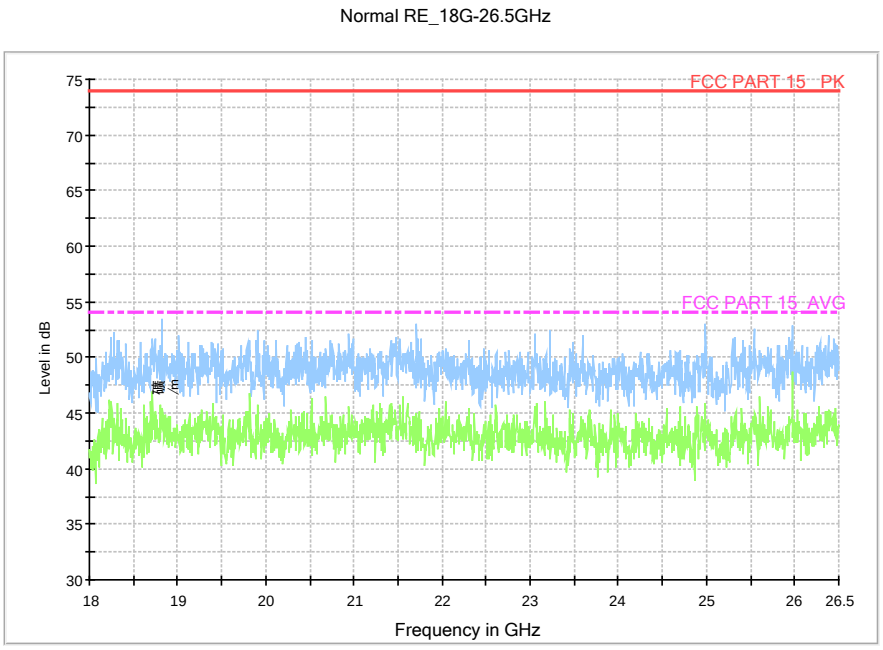


Fig. 37 Radiated Spurious Emission (802.11n-HT20, ch40, 18 GHz-26.5 GHz)

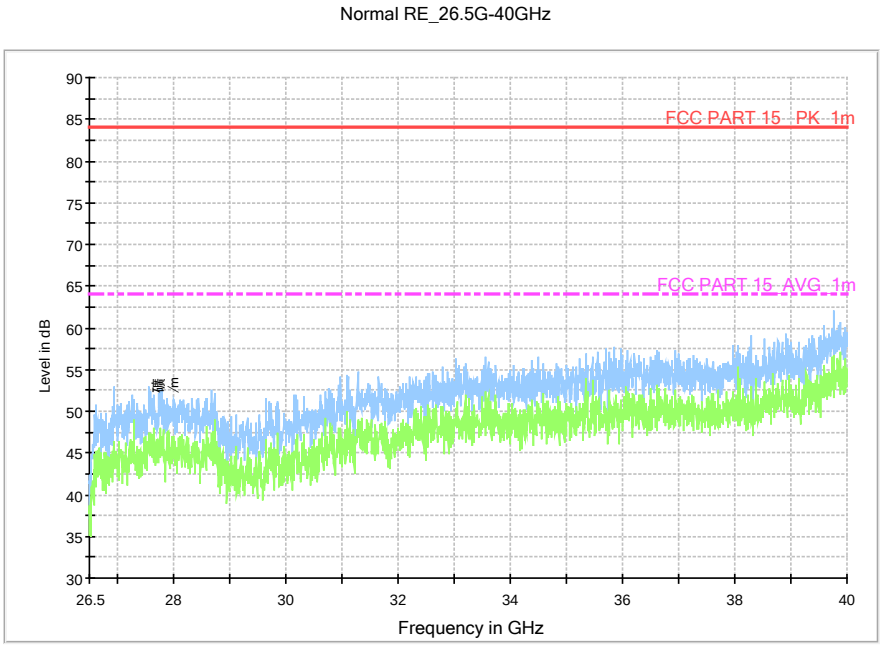


Fig. 38 Radiated Spurious Emission (802.11n-HT20, ch40, 26.5 GHz-40 GHz)

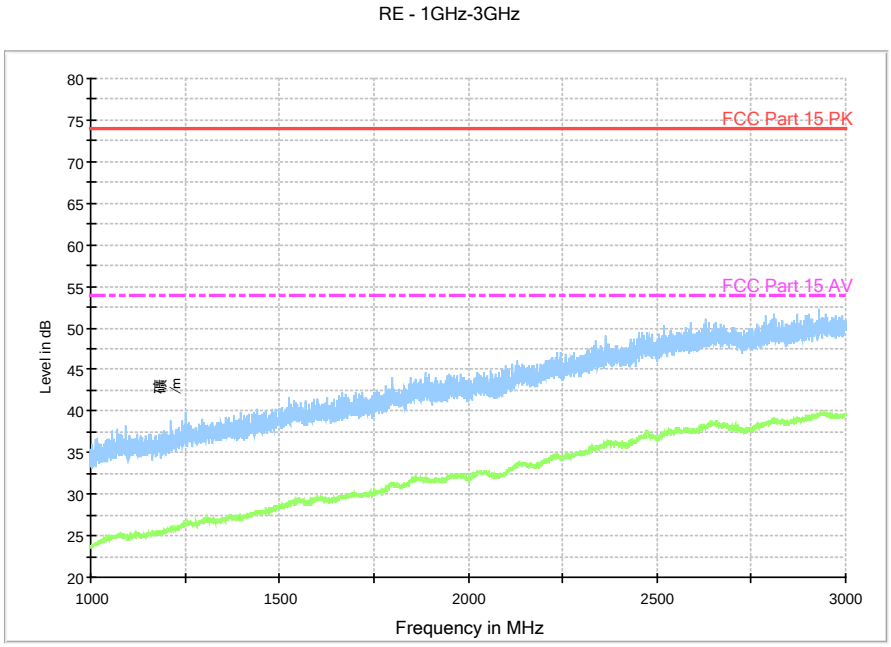


Fig. 39 Radiated Spurious Emission (802.11n-HT20, ch48, 1 GHz-3GHz)

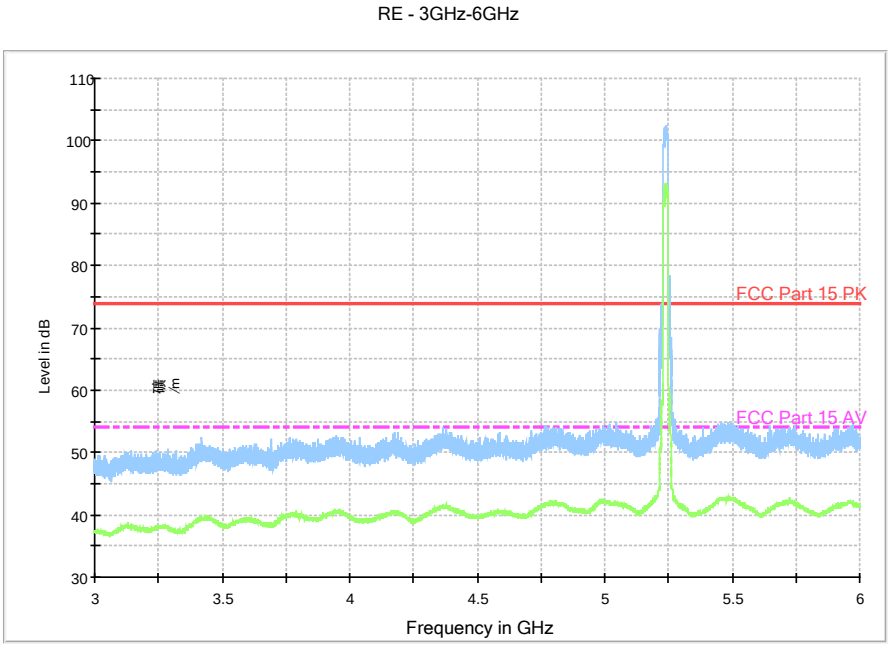


Fig. 40 Radiated Spurious Emission (802.11n-HT20, ch48, 3 GHz-6 GHz)

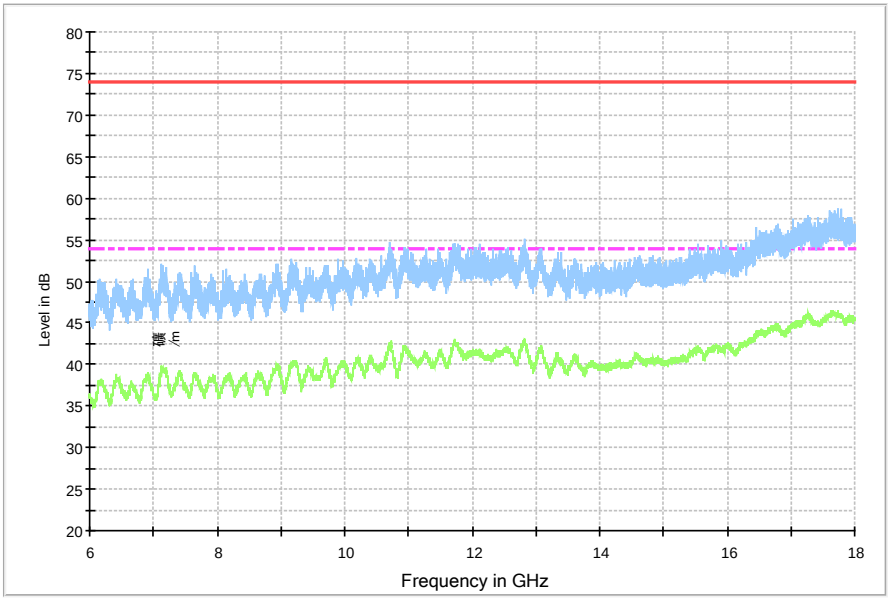


Fig. 41 Radiated Spurious Emission (802.11n-HT20, ch48, 6 GHz-18 GHz)

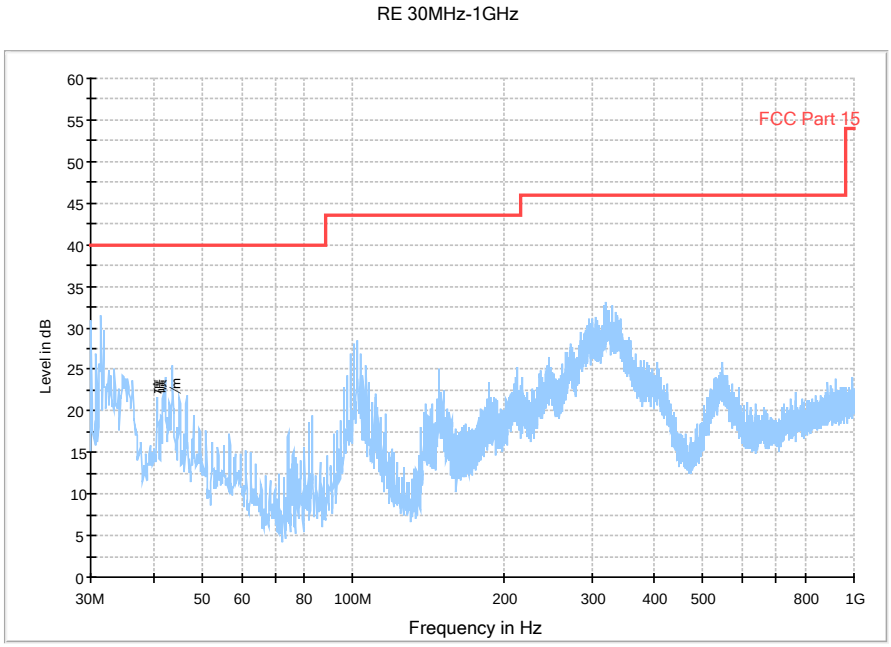


Fig. 42 Radiated Spurious Emission (802.11n-HT40, ch38, 30 MHz-1 GHz)

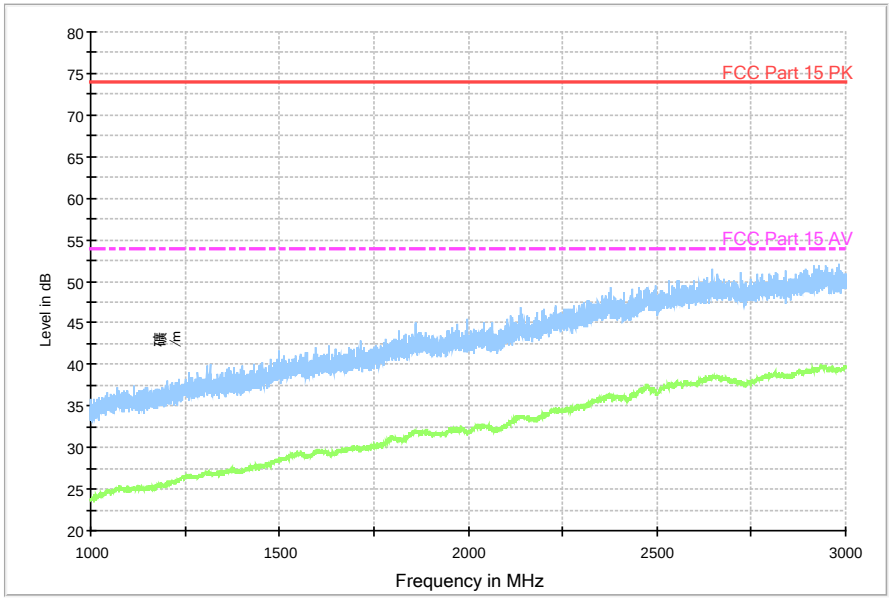


Fig. 43 Radiated Spurious Emission (802.11n-HT40, ch38, 1 GHz-3 GHz)

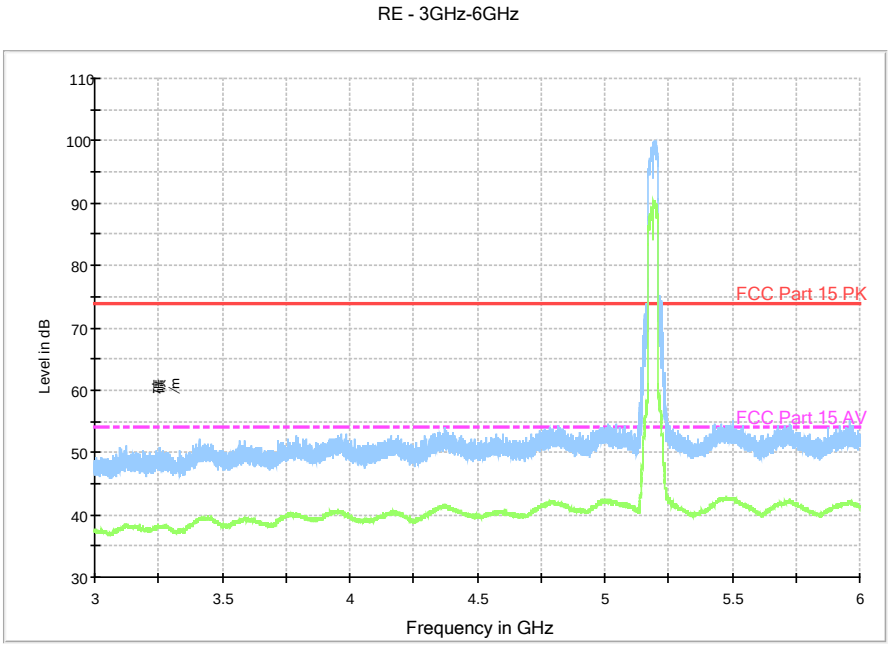


Fig. 44 Radiated Spurious Emission (802.11n-HT40, ch38, 3 GHz-6 GHz)

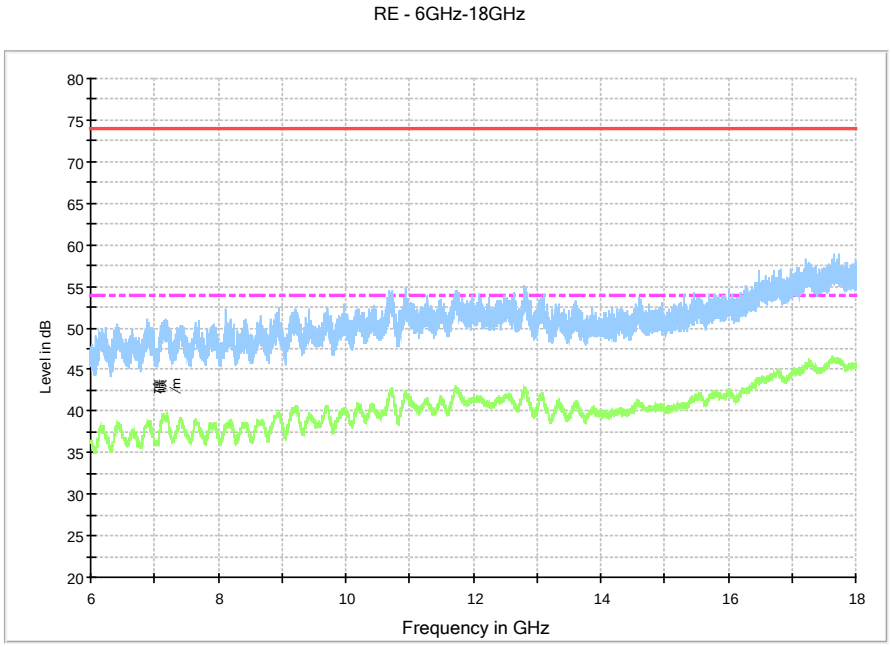


Fig. 45 Radiated Spurious Emission (802.11n-HT40, ch38, 6 GHz-18 GHz)

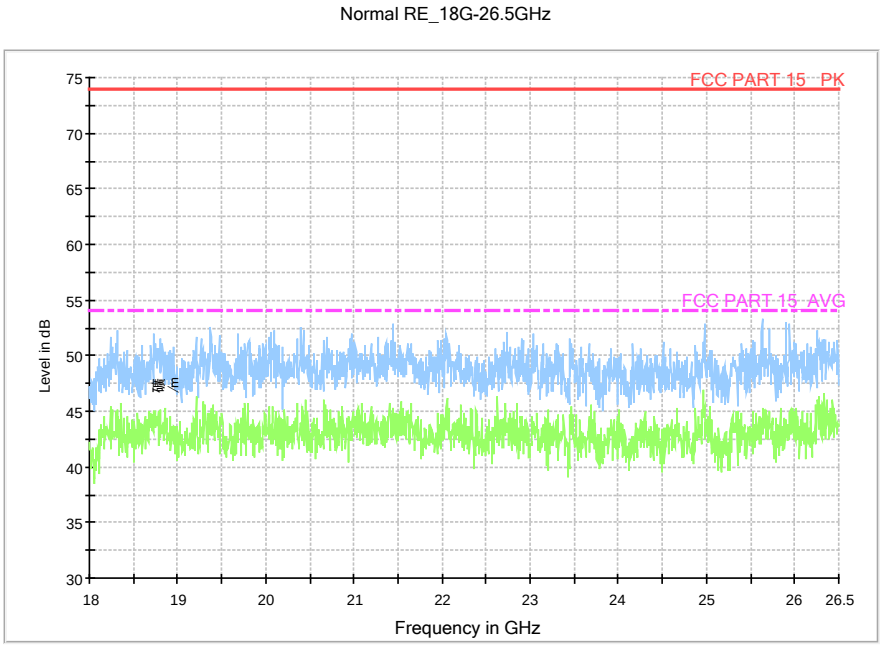


Fig. 46 Radiated Spurious Emission (802.11n-HT40, ch38, 18 GHz-26.5 GHz)

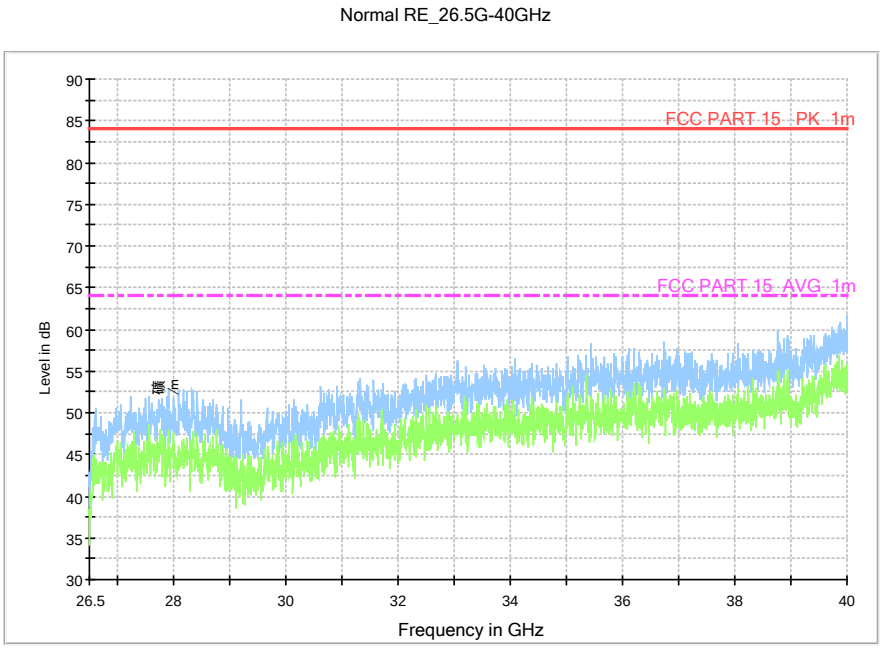


Fig. 47 Radiated Spurious Emission (802.11n-HT40, ch38, 26.5 GHz-40 GHz)

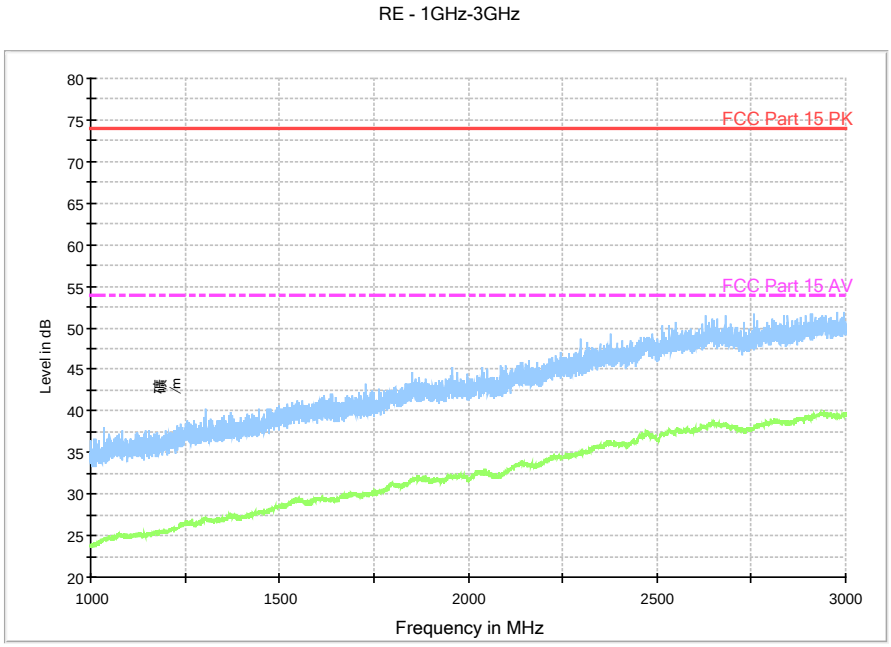


Fig. 48 Radiated Spurious Emission (802.11n-HT40, ch46, 1 GHz-3 GHz)

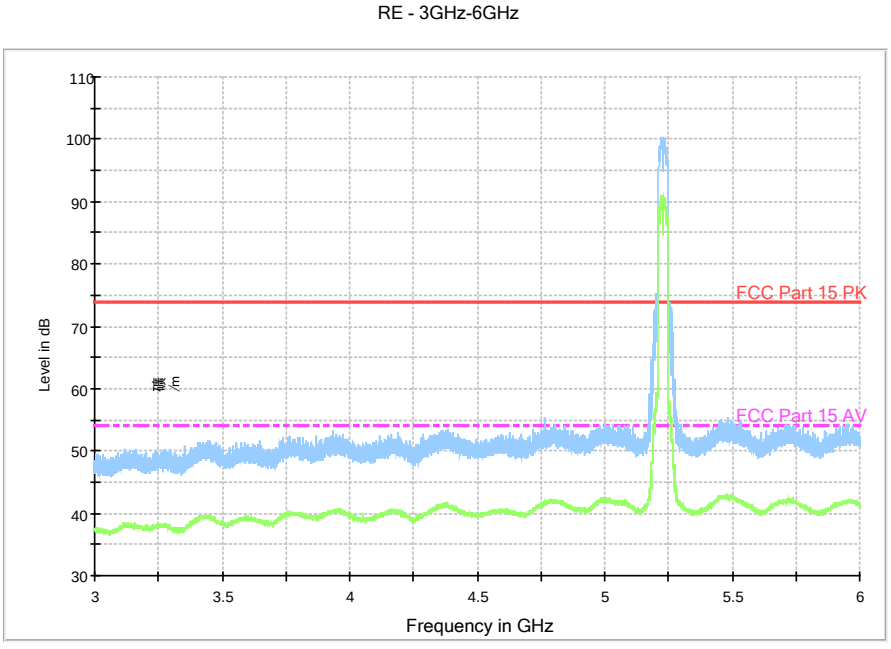


Fig. 49 Radiated Spurious Emission (802.11n-HT40, ch46, 3 GHz-6 GHz)

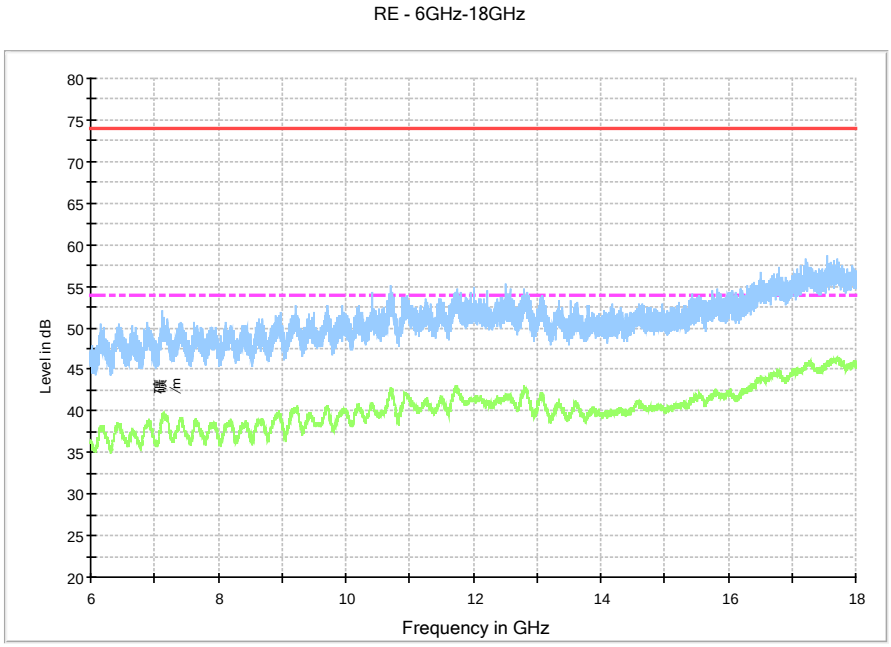


Fig. 50 Radiated Spurious Emission (802.11n-HT40, ch46, 6 GHz-18 GHz)

A.7. Spurious Emissions Radiated < 30MHz

Measurement Limit(15.209, 9kHz-30MHz):

Frequency (MHz)	Field strength(μV/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 =2.6dB, k=2.

Measurement Results:

Mode	Frequency Range	Test Results	Conclusion
802.11a	9 kHz ~30 MHz	Fig.51	P

Conclusion: PASS
Test graphs as below:

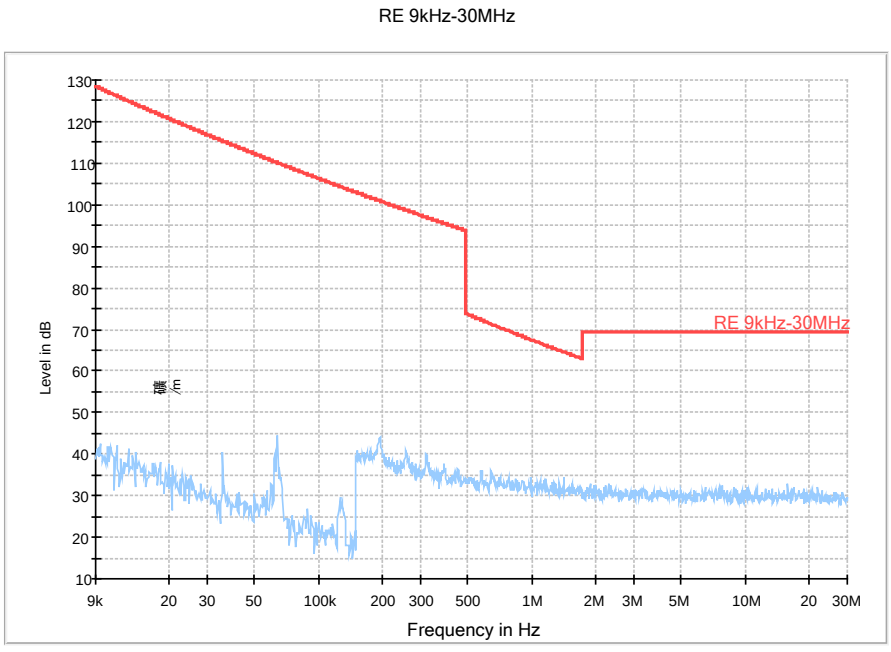


Fig. 51 Radiated Spurious Emission (802.11a, ch40, 9 kHz ~30 MHz)

A.8. Conducted Emission (150kHz- 30MHz)

Test Condition:

Voltage（V）	Frequency（Hz）
110	60

Measurement uncertainty:
Expanded measurement uncertainty for this test item is U =3.2dB, k=2.

Measurement Result and limit:
WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		11a mode	Idle	
0.15 to 0.5	66 to 56	Fig. 127	Fig. 128	P
0.5 to 5	56			
5 to 30	60			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		11a mode	Idle	
0.15 to 0.5	56 to 46	Fig.52	Fig.53	P
0.5 to 5	46			
5 to 30	50			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Conclusion: PASS
Test graphs as below:

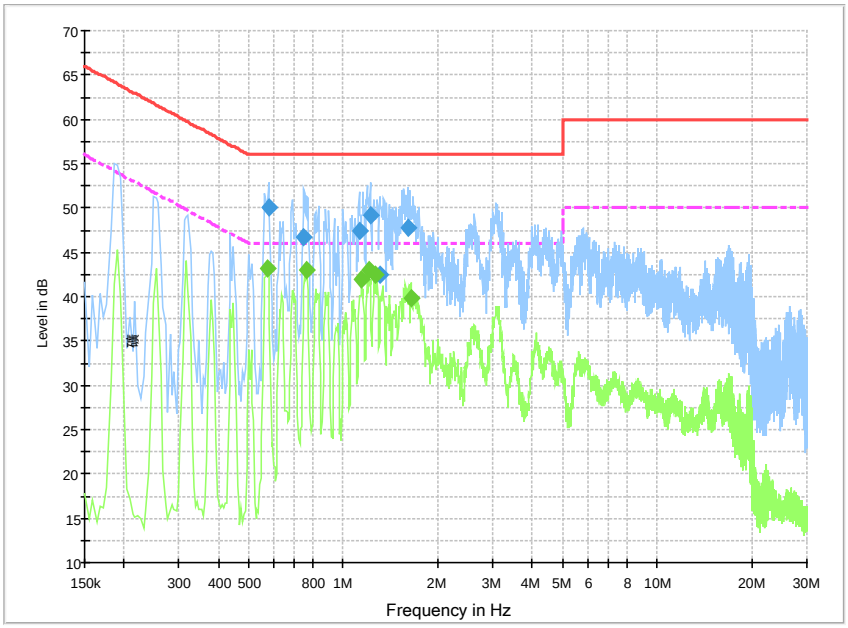


Fig. 52 Conducted Emission(802.11a, Ch40, TX)

Measurement Result:

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.577501	50.1	GND	L1	10.3	5.9	56.0
0.748501	46.7	GND	L1	10.3	9.3	56.0
1.126501	47.5	GND	L1	10.3	8.5	56.0
1.221001	49.2	GND	L1	10.3	6.8	56.0
1.306501	42.5	GND	L1	10.3	13.5	56.0
1.608001	47.7	GND	L1	10.4	8.3	56.0

Measurement Result:

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.573001	43.1	GND	N	10.3	2.9	46.0
0.766501	43.0	GND	N	10.3	3.0	46.0
1.144501	41.9	GND	N	10.3	4.1	46.0
1.207501	42.9	GND	N	10.3	3.1	46.0
1.266001	42.5	GND	N	10.3	3.5	46.0
1.639501	39.8	GND	N	10.4	6.2	46.0

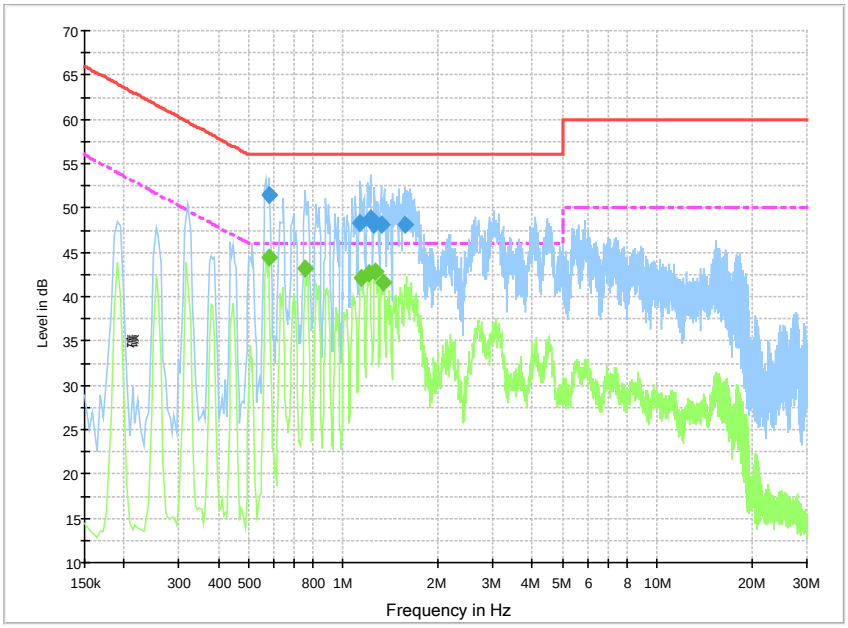


Fig. 53 Conducted Emission(802.11a, IDLE)

Measurement Result:

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.577501	51.5	GND	L1	10.3	4.5	56.0
1.131001	48.3	GND	L1	10.3	7.7	56.0
1.225501	48.8	GND	L1	10.3	7.2	56.0
1.257001	48.1	GND	L1	10.3	7.9	56.0
1.320001	48.1	GND	L1	10.3	7.9	56.0
1.572001	48.1	GND	N	10.4	7.9	56.0

Measurement Result:

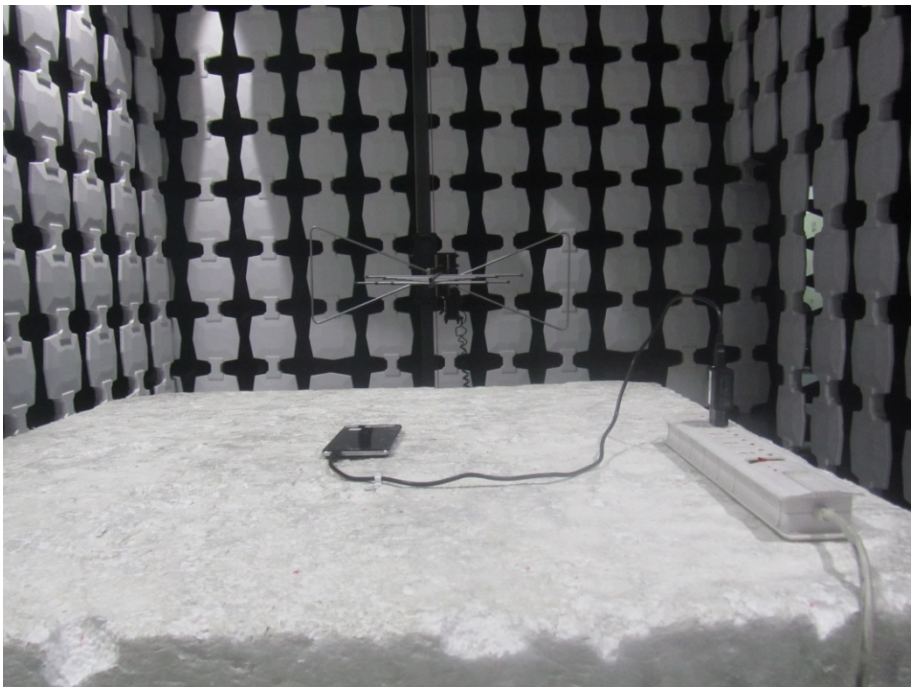
Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.577501	44.4	GND	N	10.3	1.6	46.0
0.757501	43.2	GND	N	10.3	2.8	46.0
1.144501	42.1	GND	N	10.3	3.9	46.0
1.207501	42.6	GND	N	10.3	3.4	46.0
1.270501	42.8	GND	N	10.3	3.2	46.0
1.333501	41.5	GND	N	10.3	4.5	46.0

A.9. Frequency Stability

Manufacturers ensured the EUT meet the requirement of frequency stability, such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

ANNEX B: PHOTOGRAPHS OF THE TEST SET-UP

Layout of Radiated Spurious Emission Test



ANNEX C: Accreditation Certificate

China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(No. CNAS L0570)

Telecommunication Technology Labs,

Academy of Telecommunication Research, MIIT

No.52, Huayuan North Road, Haidian District, Beijing, China

No.51, Xueyuan Road, Haidian District, Beijing, China

to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing and calibration.

The scope of accreditation is detailed in the attached schedule bearing the same accreditation number as above. The schedule forms an integral part of this certificate.

Date of Issue: 2014-10-29

Date of Expiry: 2017-06-19

Date of Initial Accreditation: 1998-07-03

Signed on behalf of China National Accreditation Service for Conformity Assessment

China National Accreditation Service for Conformity Assessment (CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CNCA) to operate the national accreditation schemes for conformity assessment. CNAS is the signatory to International Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (ILAC MRA) and Asia Pacific Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (APLAC MRA).

No.CNAS AL 2

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***** END OF REPORT BODY *****