



FCC PART 15C/IC RSS-210 TEST REPORT

No. I14Z45895-SRD03

for

TCT Mobile Limited

HSUPA/HSDPA/UMTS dualband / GSM quadband mobile phone

With

Model name: 6043A

FCC ID: RAD493

IC: 9238A-0033

Hardware Version: PIO

Software Version: vAK2

Issued Date: 2014-06-18

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 TMC Beijing.

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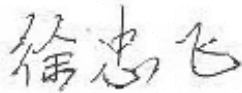
1.1. Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT
Address: No. 52, Huayuan Bei Road, Haidian District, Beijing, P. R. China
Postal Code: 100191
Telephone: +86-10-62304633-2561
Fax: +86-10-62304633-2504

1.2. Project data

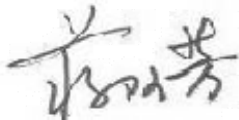
Testing Start Date: 2014-05-16
Testing End Date: 2014-06-17

1.3. Signature



Xu Zhongfei

(Prepared this test report)



Jiang Afang

(Reviewed this test report)



Xiao Li

Deputy Director of the laboratory

(Approved this test report)

2. CLIENT INFORMATION

2.1. Applicant Information

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2.2. Manufacturer Information

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Pudong Area Shanghai, P.R. China. 201203
Contact Person: Gong Zhizhou
Telephone: 0086-21-51798260
Fax: 0086-21-61460602

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

3.1. About EUT

Description	HSUPA/HSDPA/UMTS dualband / GSM quadband mobile phone
Model name	6043A
FCC ID	RAD493
IC ID	9238A-0033
WLAN Frequency Range	ISM Band: 5725MHz~5850MHz
Type of modulation	OFDM
MAX Conducted Power	20.30dBm(OFDM)
Extreme Temperature	-20/+55°C
Extreme vol. Limits	3.5VDC to 4.35VDC (nominal: 3.8VDC)

Note: Photographs of EUT are shown in ANNEX C of this test report. 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
EUT1	014086000000698	PIO	vAK2
EUT2	014086000000011	PIO	vAK2

*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	Travel Charger	CAC2500017C2	/
AE2	USB Cable	CBA0003AG0C1	/

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

3.4. General Description

Equipment Under Test (EUT) is a model of HSUPA/HSDPA/UMTS dualband / GSM quadband mobile phone with integrated antenna. It consists of normal options: Battery and Charger.

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;	Oct, 2012
	15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	
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	2009
KDB558074	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247	2013
KDB644545	Guidance for IEEE 802.11ac and Pre-ac Device Emissions Testing	2013
RSS-GEN	Spectrum Management and Telecommunications – Radio Standards Specification General Requirements and Information for the Certification of Radio communication Equipment	Issue 3
RSS-210	Spectrum Management and Telecommunications – Radio Standards Specification Low-power License-exempt Radio communication Devices (All Frequency Bands): Category I Equipment	Issue 8

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 Part15C	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.247 (b)	A8,A9	P
Peak Power Spectral Density	15.247 (e)	A8,A9	P
Occupied 6dB Bandwidth	15.247 (a)	A8	P
Band Edges Compliance	15.247 (b)	A8	P
Transmitter Spurious Emission - Conducted	15.247	A8	P
Transmitter Spurious Emission - Radiated	15.247, 15.205, 15.209	A8	P
AC Powerline Conducted Emission	15.107, 15.207	A8,A9	P
99% Occupied Bandwidth	/	RSS-Gen 4.6.1	P
Transmitter Spurious Emission - Radiated < 30MHz	15.247, 15.209	7.2.2	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 TMC
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

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

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

6.3. Test Conditions

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

Temperature	26℃
Voltage	3.8V
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	2013-07-08	2014-07-07
2	Test Receiver	ESS	847151/015	Rohde & Schwarz	2013-11-29	2014-11-28
3	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	2014-4-15	2015-4-14
4	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

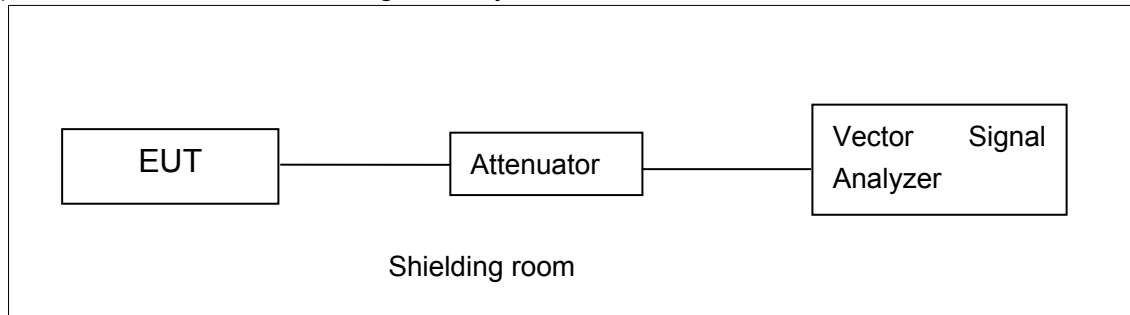
No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Calibration Due date
1	Test Receiver	ESU26	100376	Rohde & Schwarz	2013-11-6	2014-11-5
2	BiLog Antenna	VULB9163	9163-514	Schwarzbeck	2011-11-11	2014-11-10
3	Dual-Ridge Waveguide Horn Antenna	3117	00119024	ETS-Lindgren	2014-4-20	2017-4-19
4	Dual-Ridge Waveguide Horn Antenna	3116	2661	EMCO	2011-7-1	2014-06-30
5	Loop antenna	HFH2-Z2	829324/007	Rohde & Schwarz	2011-12-21	2014-12-20
6	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

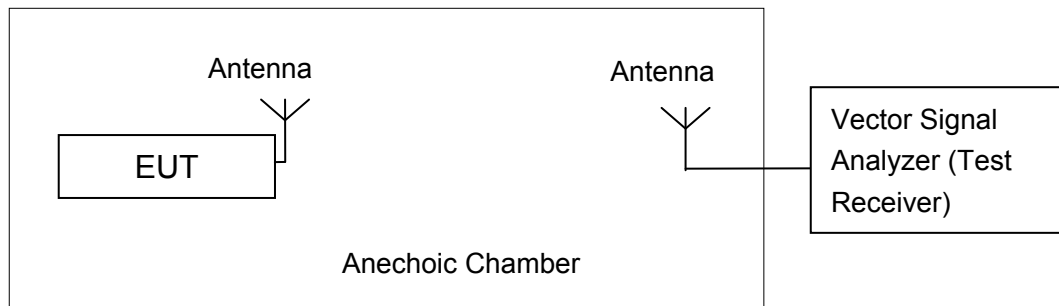


A.1.2. Radiated Emission Measurements

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 ANSI C63.10 and KDB558074

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 Peak Output Power

Measurement Limit and Method:

Standard	Limit (dBm)
FCC CRF Part 15.247(b)	< 30

The measurement is made according to ANSI C63.10 .

Measurement Uncertainty:

Measurement Uncertainty	0.75dB
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A.2.1. Maximum Peak Output Power-conducted

Measurement Results:

802.11a mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5825MHz (Ch165)
802.11a	6	19.86	/	/
	9	19.94	/	/
	12	19.85	/	/
	18	19.7	/	/
	24	19.99	/	/
	36	20.05	20.30	19.52
	48	19.94	/	/
	54	19.97	/	/

The data rate 36Mbps is selected as worse condition, and the following cases are performed with this condition.

802.11n-HT20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5825MHz (Ch165)
802.11n (20MHz)	MCS0	19.19	19.51	18.96
	MCS1	18.75	/	/
	MCS2	18.34	/	/
	MCS3	19.18	/	/
	MCS4	18.47	/	/
	MCS5	18.69	/	/
	MCS6	19.14	/	/
	MCS7	19.16	/	/

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

802.11n-HT40 mode

Mode	Data Rate (Index)	Test Result (dBm)	
		5755MHz (Ch151)	5795MHz (Ch159)
802.11n (40MHz)	MCS0	19.42	19.49
	MCS1	18.53	/
	MCS2	18.80	/
	MCS3	18.66	/
	MCS4	18.97	/
	MCS5	18.61	/
	MCS6	18.89	/
	MCS7	18.81	/

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

Conclusion: PASS

A.2.2. Maximum Average Output Power-Conducted
802.11a mode

Mode	Test Result (dBm)		
	5745MHz (Ch149)	5785MHz (Ch157)	5825MHz (Ch165)
802.11a	11.63	12.17	11.50

802.11n-HT20 mode

Mode	Test Result (dBm)		
	5745MHz (Ch149)	5785MHz (Ch157)	5825MHz (Ch165)
802.11n (20MHz)	10.67	10.95	10.38

802.11n-HT40 mode

Mode	Test Result (dBm)	
	5755MHz (Ch151)	5795MHz (Ch159)
802.11n (40MHz)	10.28	10.43

Conclusion: PASS

A.3. Peak Power Spectral Density

Measurement Limit:

Standard	Limit
FCC CRF Part 15.247(e)	< 8 dBm/3 kHz

The measurement is made according to ANSI C63.10 and KDB558074

Measurement Uncertainty:

Measurement Uncertainty	0.75dB
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Measurement Results:

Mode	Channel	Power Spectral Density (dBm/3 kHz)	Conclusion
802.11a	149	-12.79	P
	157	-11.06	P
	165	-12.27	P
802.11n HT20	149	-13.82	P
	157	-13.08	P
	165	-13.51	P
802.11n HT40	151	-16.90	P
	159	-15.40	P

Conclusion: PASS

A.4. Occupied 6dB Bandwidth

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a)	≥ 500

The measurement is made according to ANSI C63.10 .

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz
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Measurement Result:

Mode	Channel	Occupied 6dB Bandwidth (kHz)		conclusion
802.11a	149	Fig.1	16500	P
	157	Fig.2	16450	P
	165	Fig.3	16500	P
802.11n HT20	149	Fig.4	15100	P
	157	Fig.5	15100	P
	165	Fig.6	15050	P
802.11n HT40	151	Fig.7	35120	P
	159	Fig.8	35040	P

Conclusion: PASS

Test graphs as below:

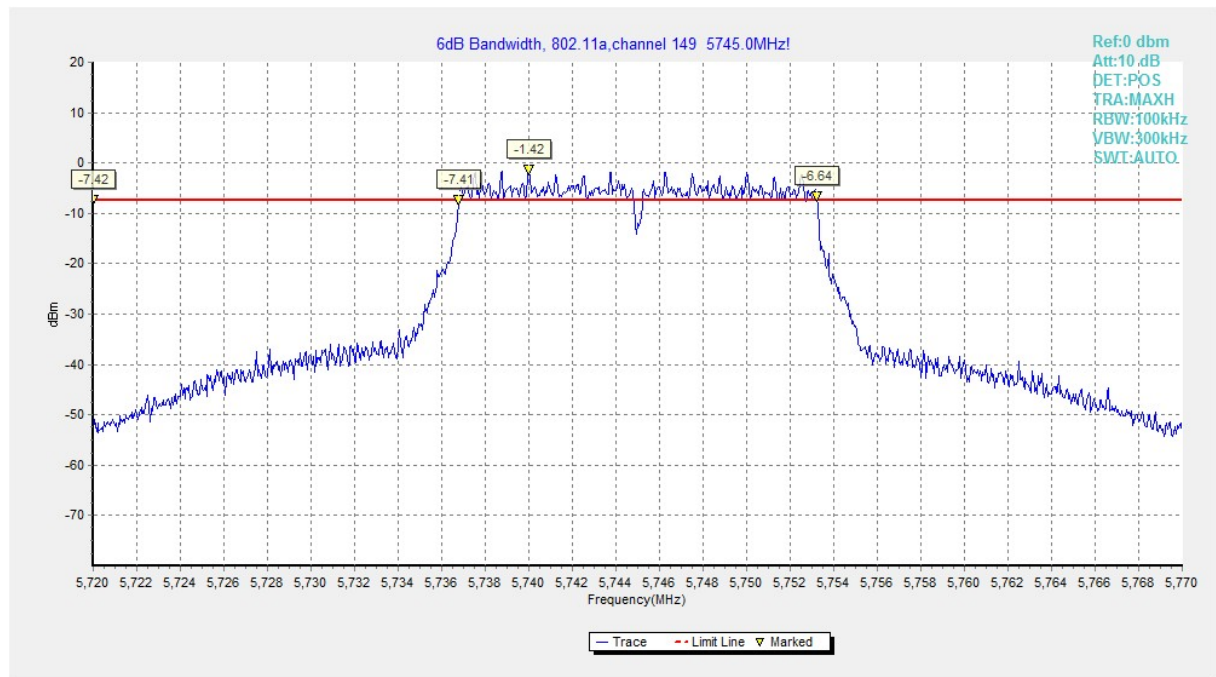


Fig. 1 Occupied 6dB Bandwidth (802.11a, Ch 149)

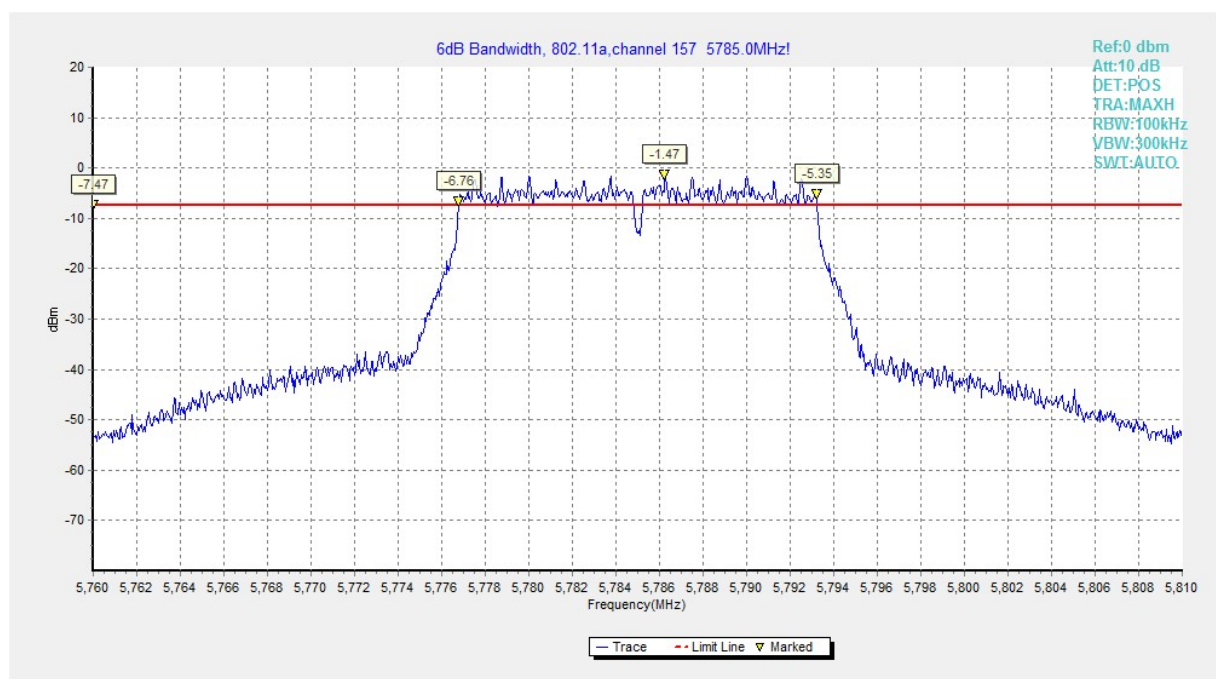


Fig. 2 Occupied 6dB Bandwidth (802.11a, Ch 157)

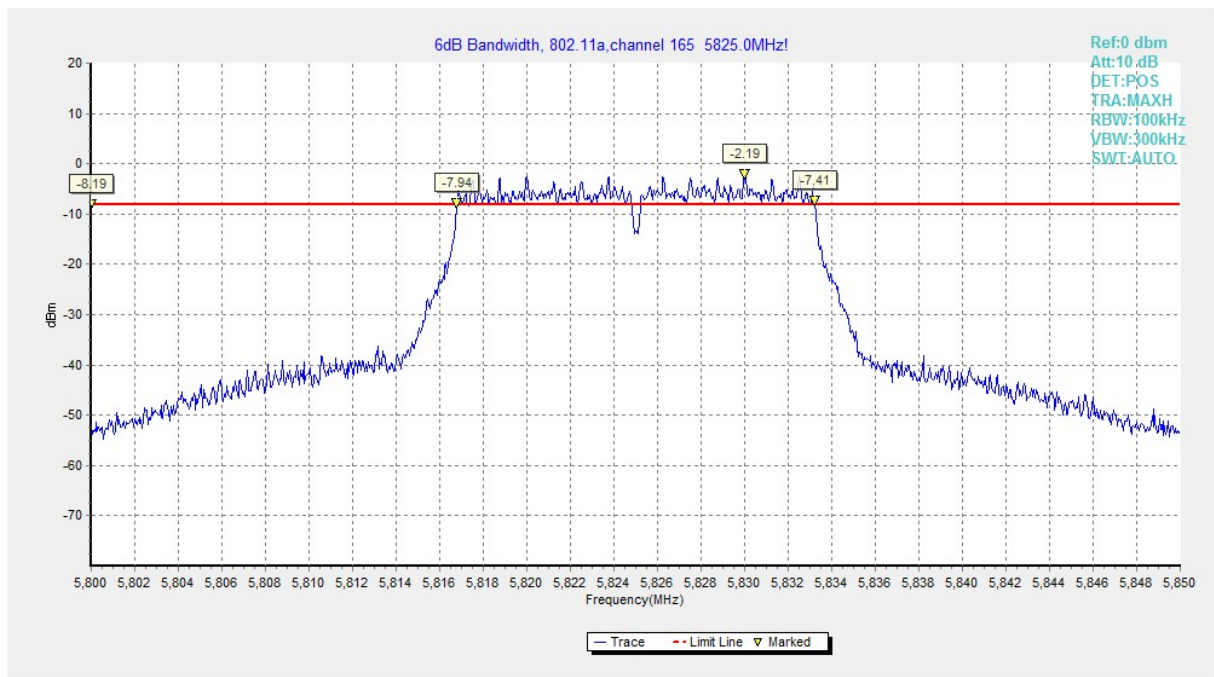


Fig. 3 Occupied 6dB Bandwidth (802.11a, Ch 165)

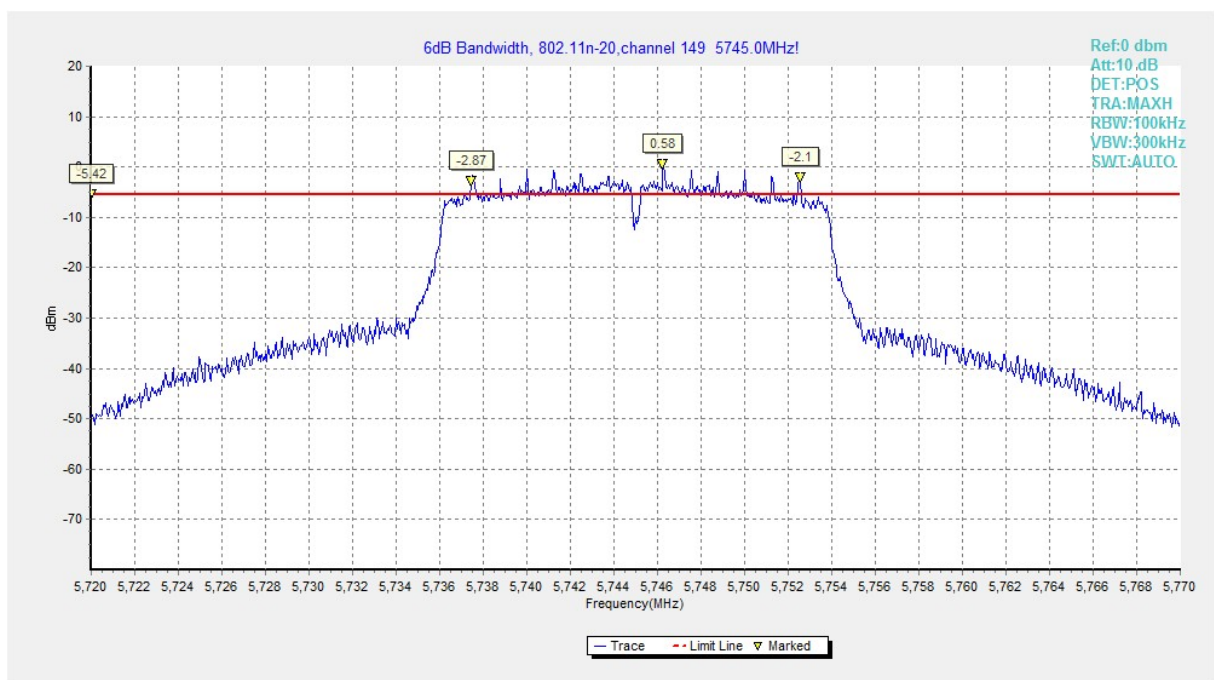


Fig. 4 Occupied 6dB Bandwidth (802.11n-HT20, Ch 149)

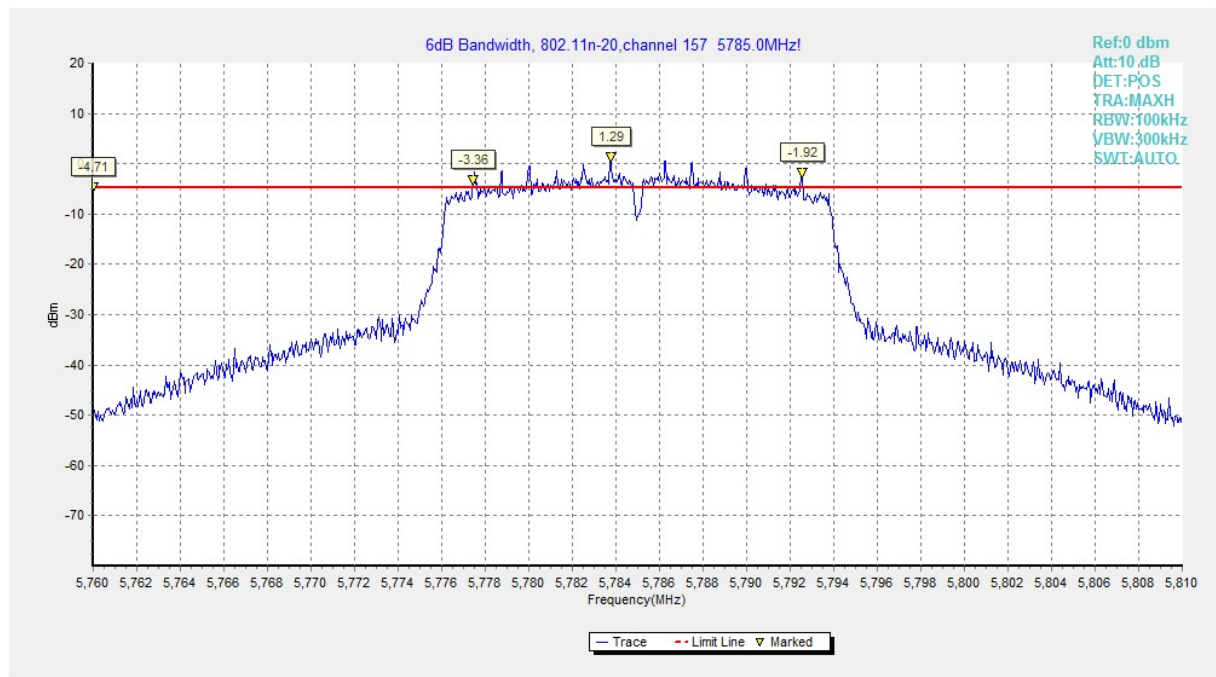


Fig. 5 Occupied 6dB Bandwidth (802.11n-HT20, Ch 157)

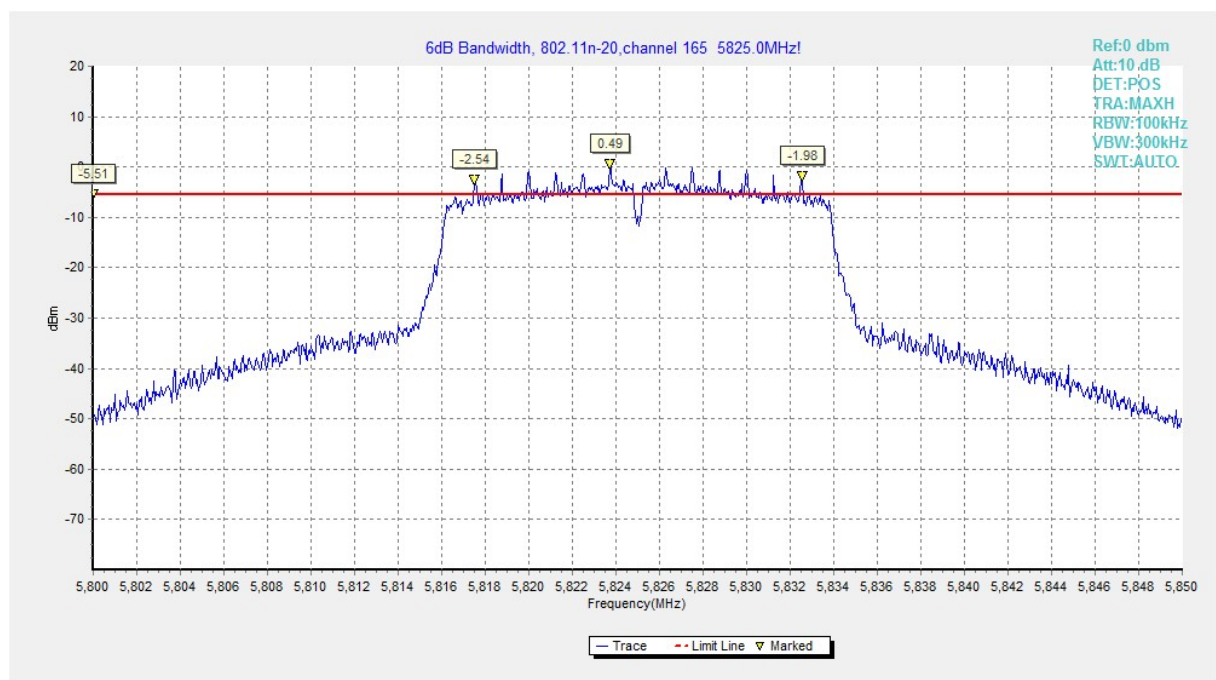


Fig. 6 Occupied 6dB Bandwidth (802.11n-HT20, Ch 165)

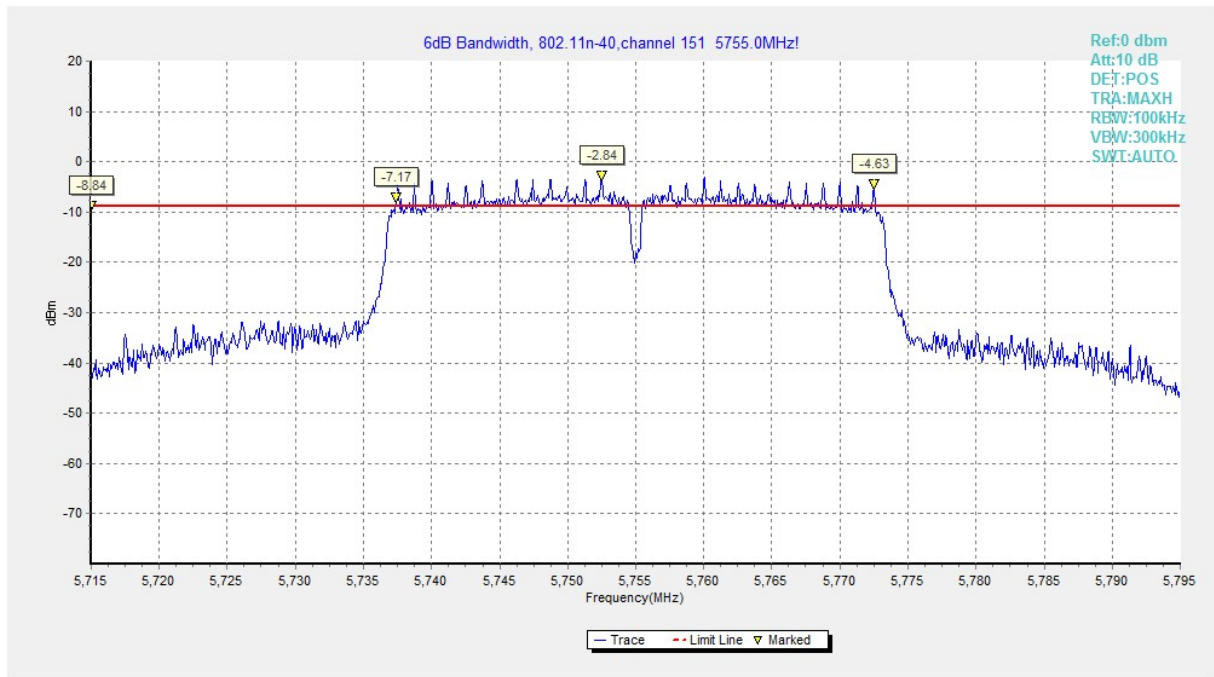


Fig. 7 Occupied 6dB Bandwidth (802.11n-HT40, Ch 151)

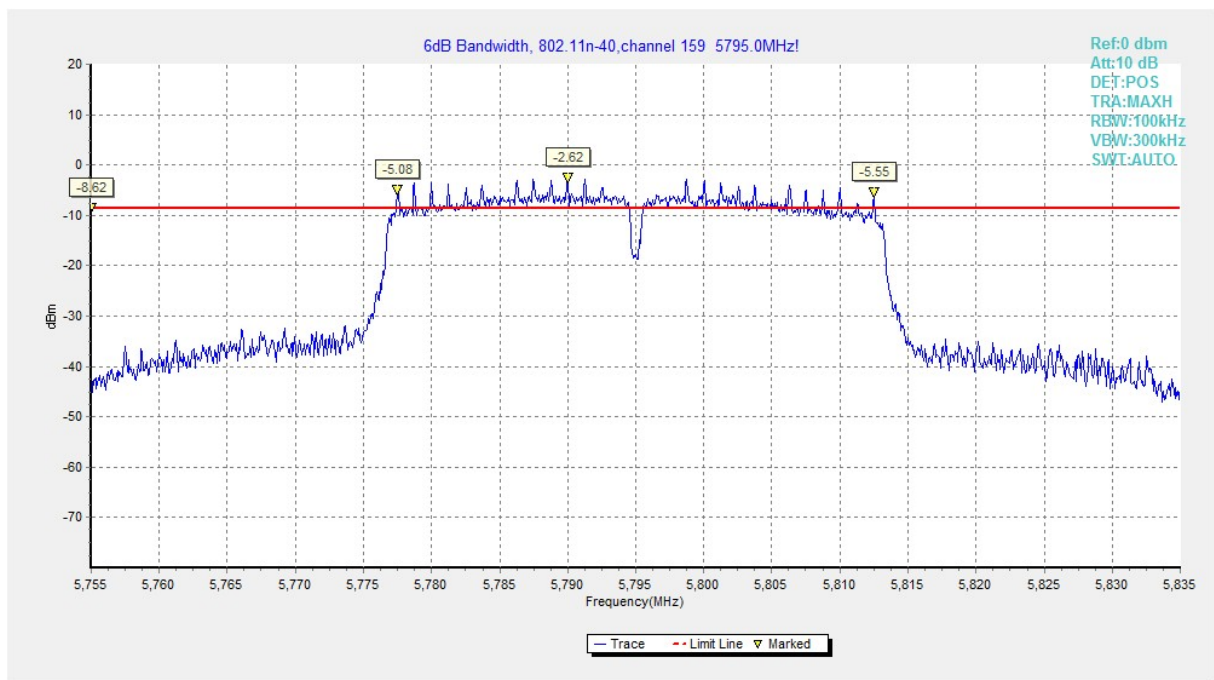


Fig. 8 Occupied 6dB Bandwidth (802.11n-HT40, Ch 159)

A.5. Transmitter Spurious Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d)	20dB below peak output power in 100 kHz bandwidth

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)
30MHz ≤ f ≤ 2GHz	0.63
2GHz ≤ f ≤ 3.6GHz	0.82
3.6GHz ≤ f ≤ 8GHz	1.55
8GHz ≤ f ≤ 20GHz	1.86
20GHz ≤ f ≤ 22GHz	1.90
22GHz ≤ f ≤ 26GHz	2.20

A.5.1 Transmitter Spurious Emission - Conducted

Measurement Results:

802.11a mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11a	149	5.745 GHz	Fig.9	P
		30 MHz ~ 12 GHz	Fig.10	P
		12 GHz ~ 25 GHz	Fig.11	P
	157	5.785 GHz	Fig.12	P
		30 MHz ~ 12 GHz	Fig.13	P
		12 GHz ~ 25 GHz	Fig.14	P
	165	5.825 GHz	Fig.15	P
		30 MHz ~ 12 GHz	Fig.16	P
		12 GHz ~ 25 GHz	Fig.17	P

802.11n-HT20 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n HT20	149	5.745 GHz	Fig.18	P
		30 MHz ~ 12 GHz	Fig.19	P
		12 GHz ~ 25 GHz	Fig.20	P
		25 GHz ~ 40 GHz	Fig.21	P
	157	5.785 GHz	Fig.22	P
		30 MHz ~ 12 GHz	Fig.23	P
		12 GHz ~ 25 GHz	Fig.24	P
		25 GHz ~ 40 GHz	Fig.25	P
	165	5.825 GHz	Fig.26	P
		30 MHz ~ 12 GHz	Fig.27	P
		12 GHz ~ 25 GHz	Fig.28	P
		25 GHz ~ 40 GHz	Fig.29	P

802.11n-HT40 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n HT40	151	5.755 GHz	Fig.30	P
		30 MHz ~ 12 GHz	Fig.31	P
		12 GHz ~ 25 GHz	Fig.32	P
		25 GHz ~ 40 GHz	Fig.33	P
	159	5.795 GHz	Fig.34	P
		30 MHz ~ 12 GHz	Fig.35	P
		12 GHz ~ 25 GHz	Fig.36	P
		25 GHz ~ 40 GHz	Fig.37	P

Conclusion: PASS

Test graphs as below:

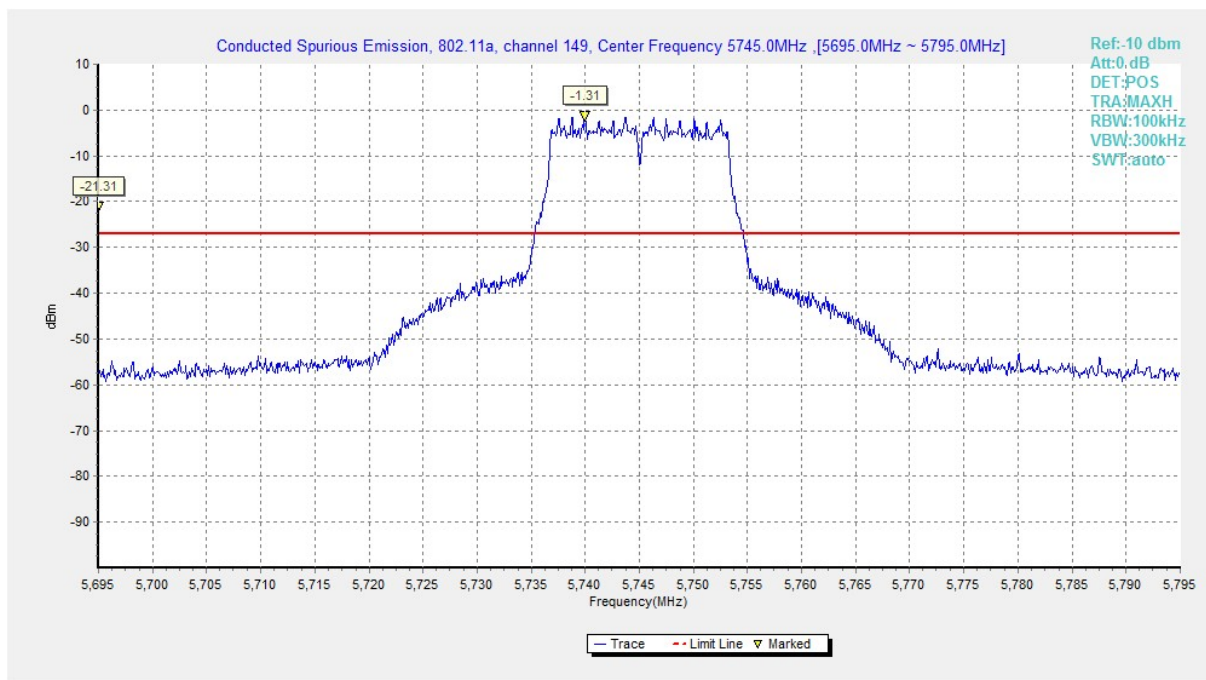


Fig. 9 Conducted Spurious Emission (802.11a, Ch149, Center Frequency)

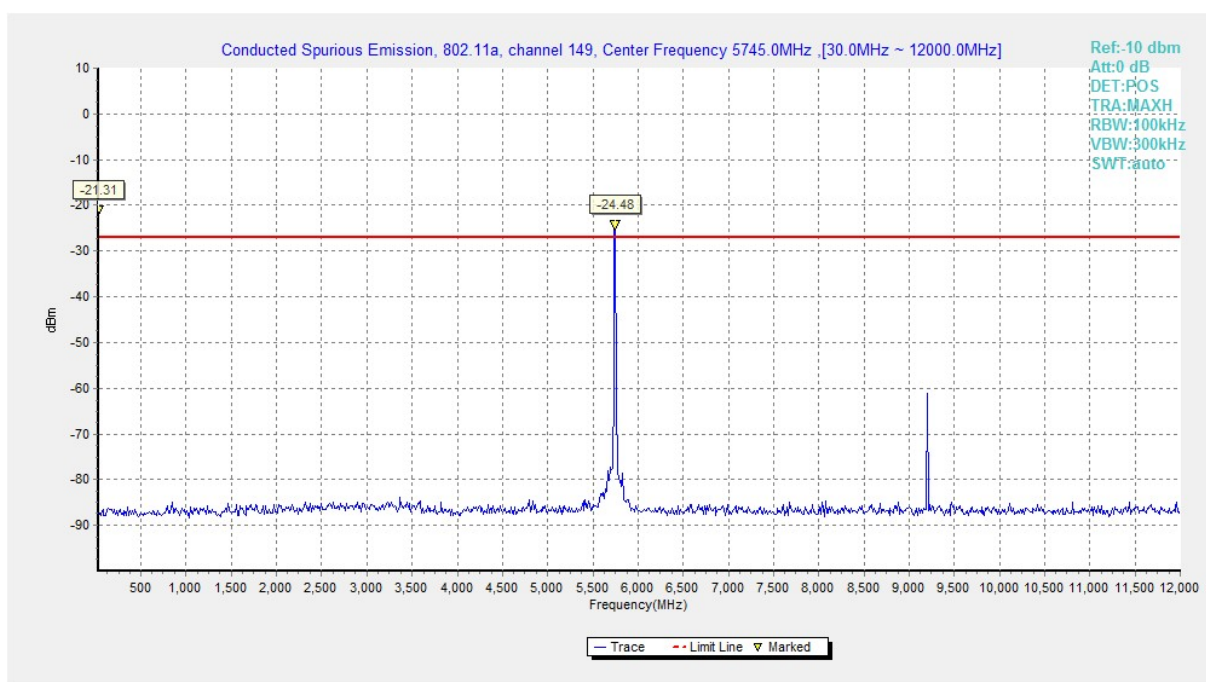


Fig. 10 Conducted Spurious Emission (802.11a, Ch149, 30 MHz-12 GHz)

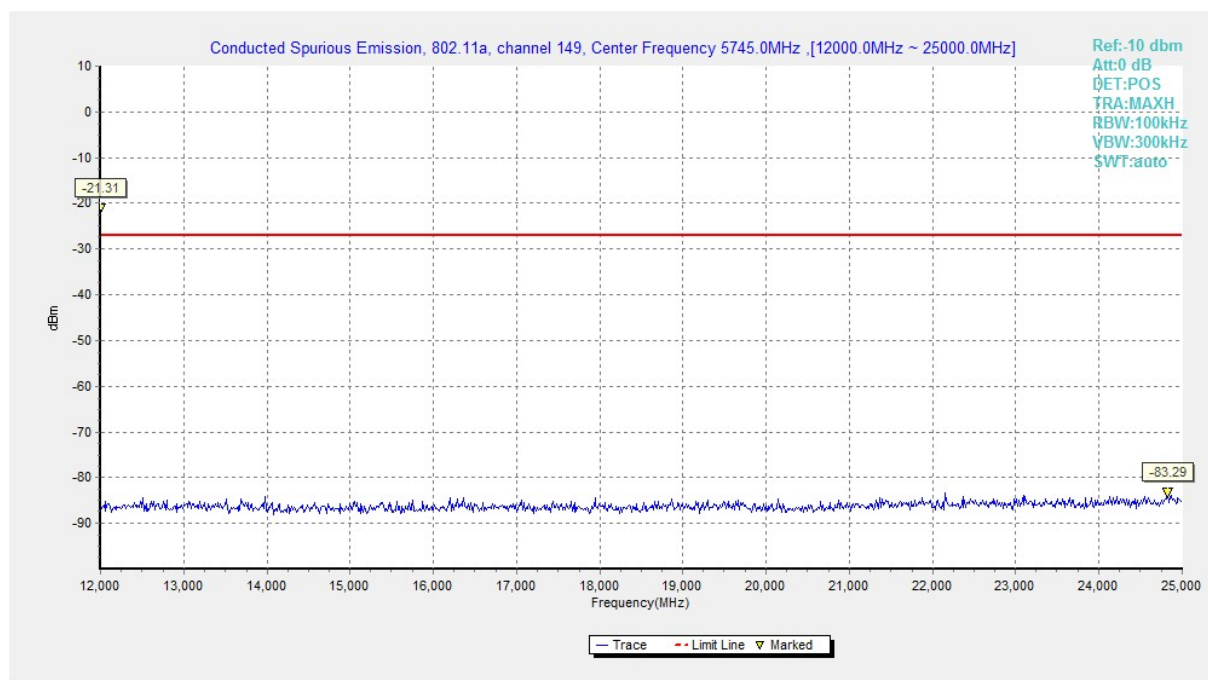


Fig. 11 Conducted Spurious Emission (802.11a, Ch149, 12 GHz-25 GHz)

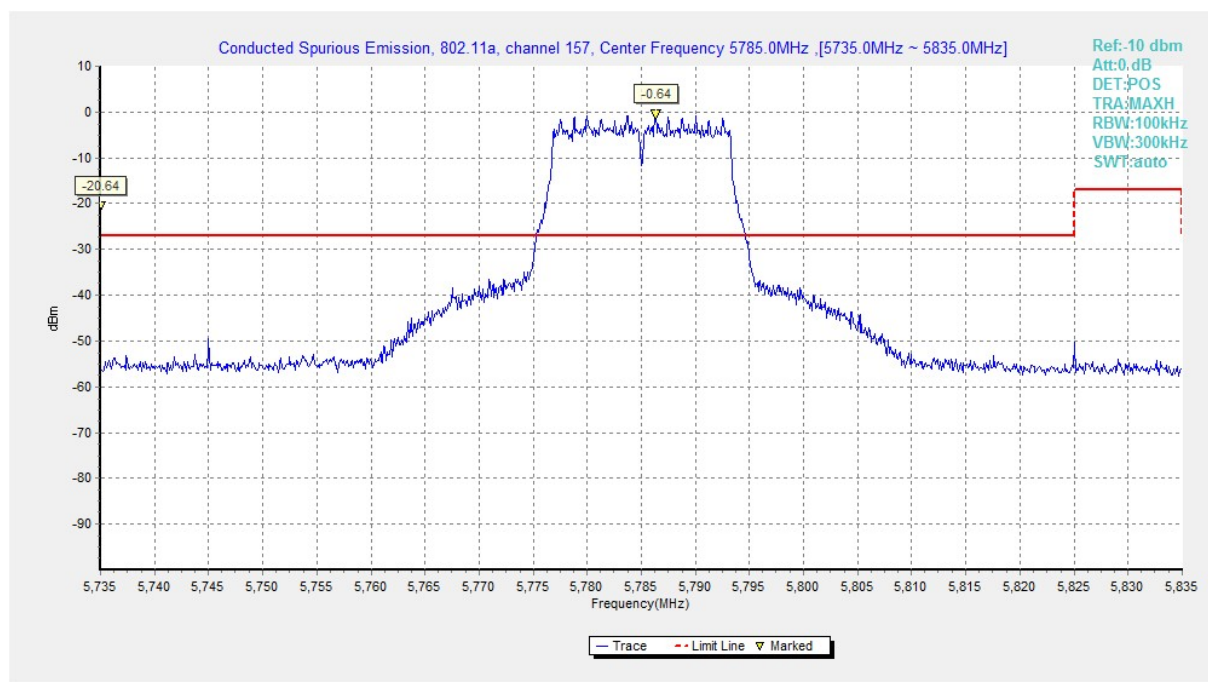


Fig. 12 Conducted Spurious Emission (802.11a, Ch157, Center Frequency)

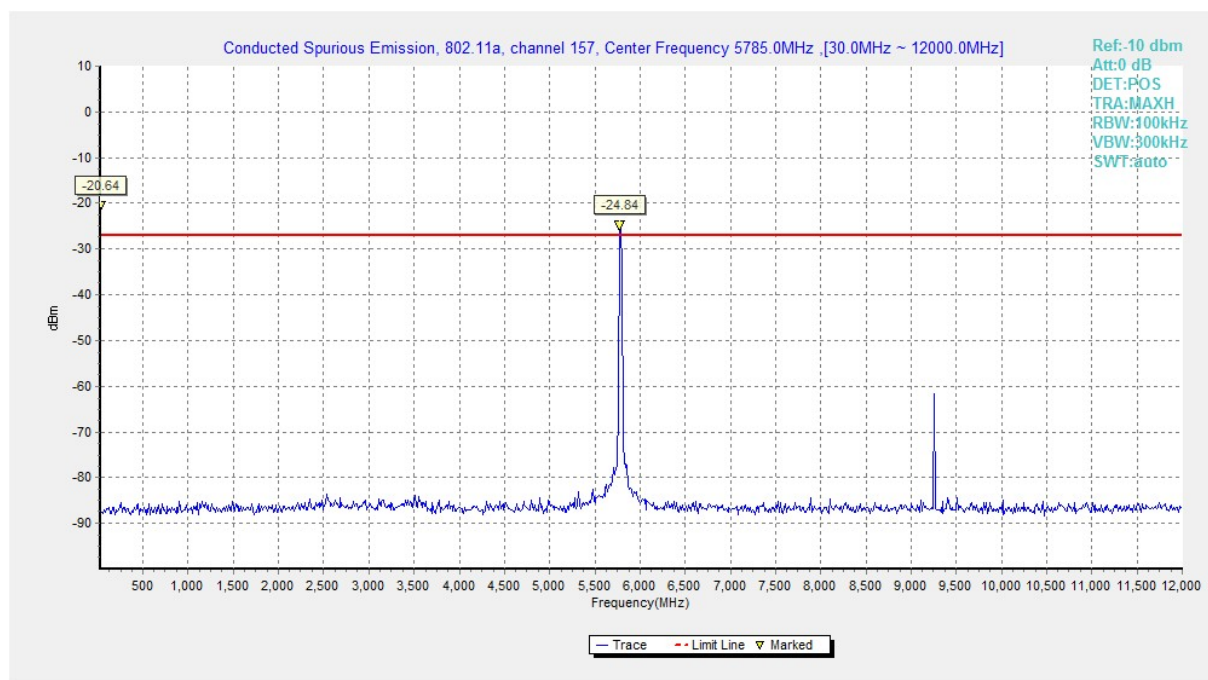


Fig. 13 Conducted Spurious Emission (802.11a, Ch157, 30 MHz-12 GHz)

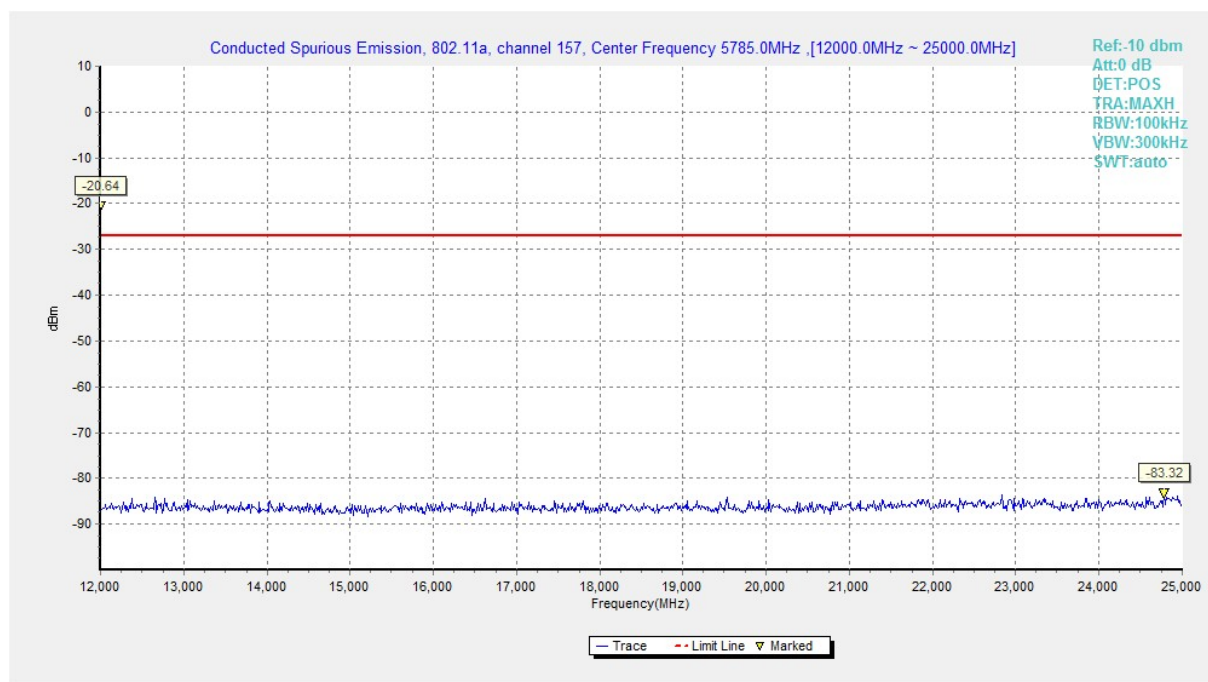


Fig. 14 Conducted Spurious Emission (802.11a, Ch157, 12 GHz-25 GHz)

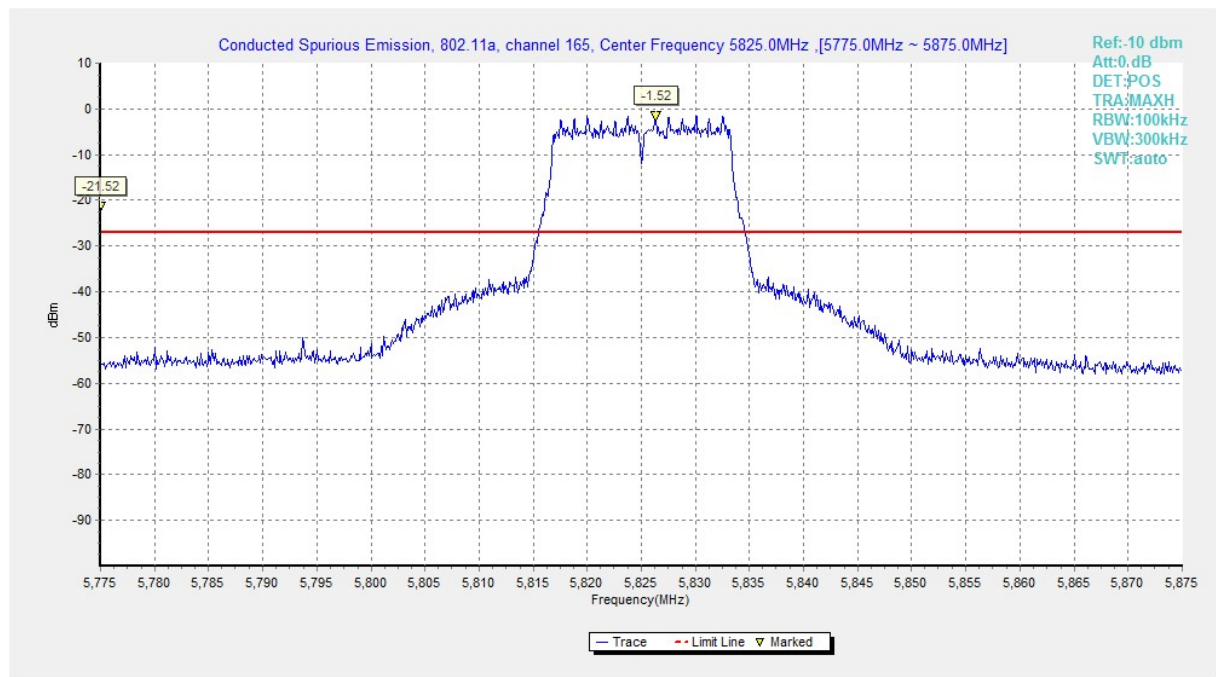


Fig. 15 Conducted Spurious Emission (802.11a, Ch165, Center Frequency)

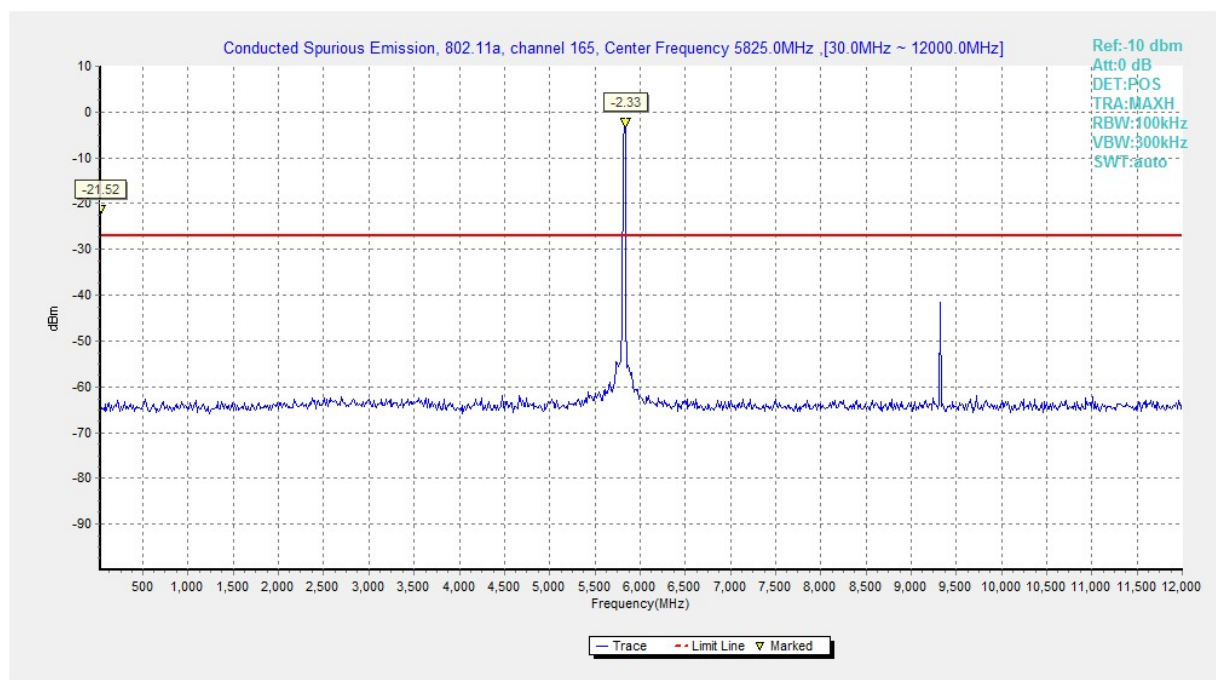


Fig. 16 Conducted Spurious Emission (802.11a, Ch165, 30 MHz-12 GHz)

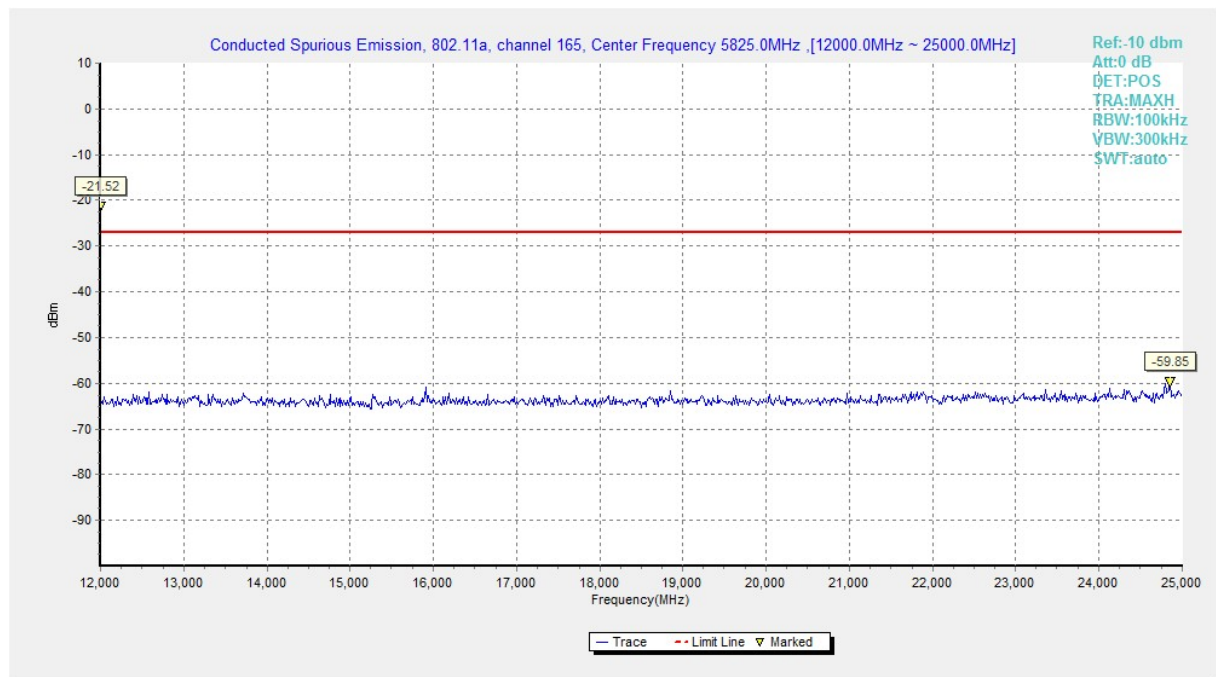


Fig. 17 Conducted Spurious Emission (802.11a, Ch165, 12 GHz-25 GHz)

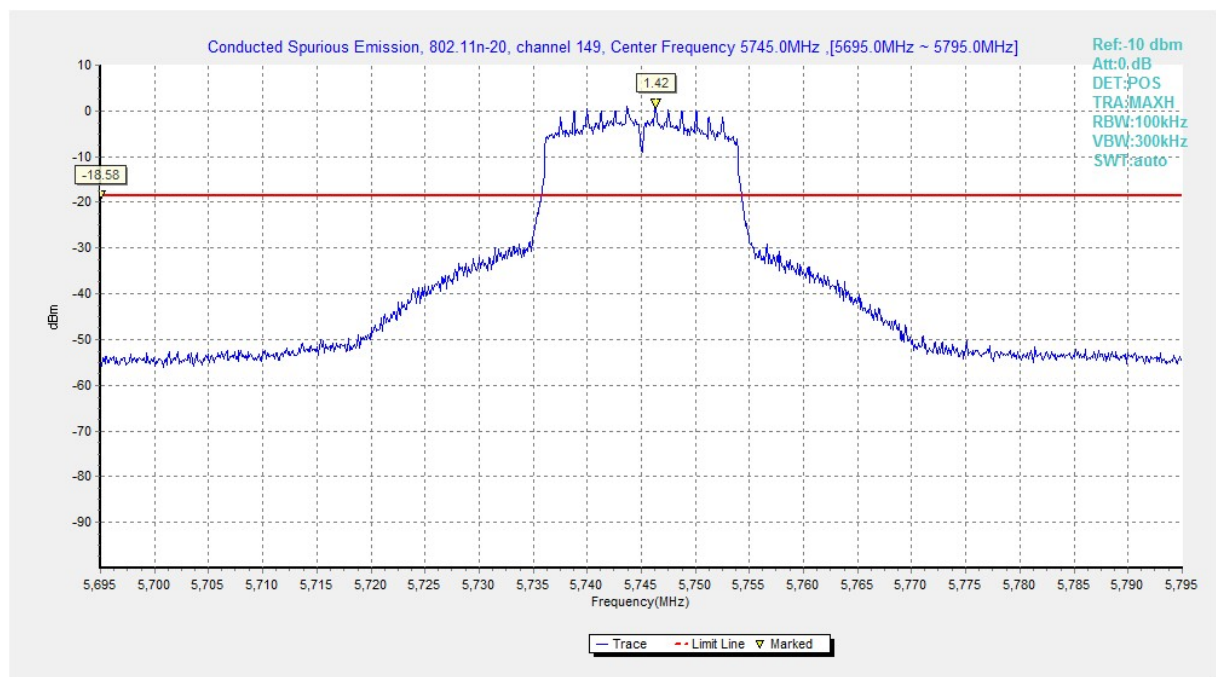


Fig. 18 Conducted Spurious Emission (802.11n-HT20, Ch149, Center Frequency)

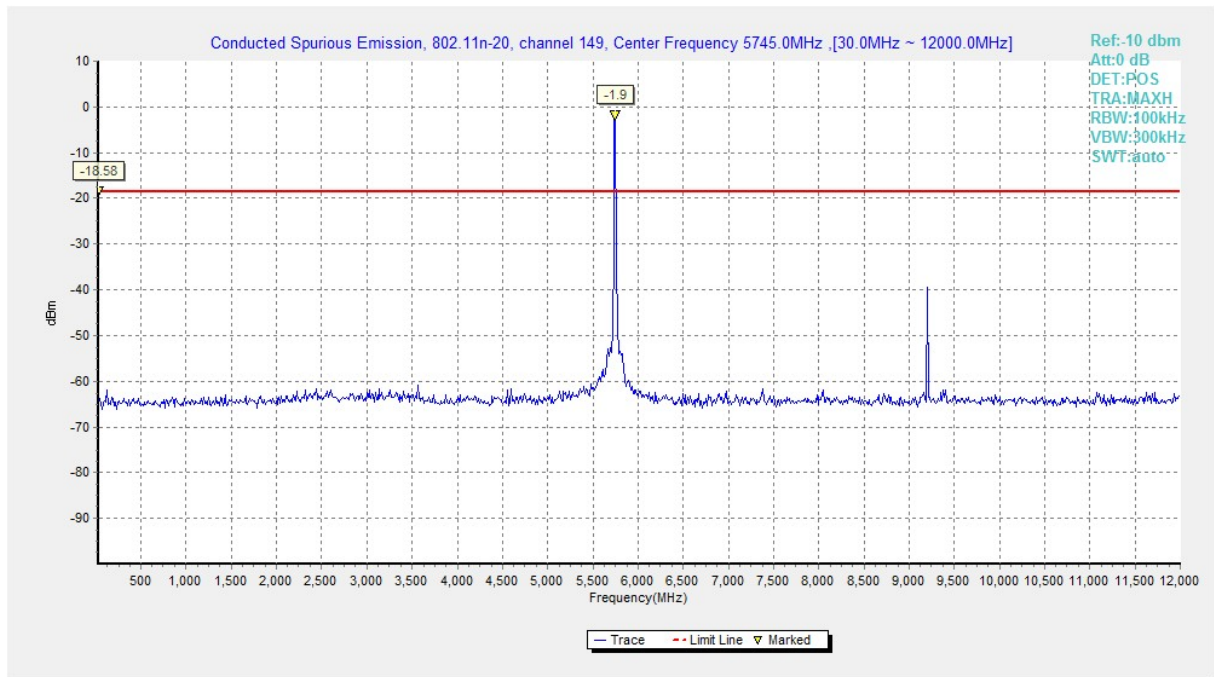


Fig. 19 Conducted Spurious Emission (802.11n-HT20, Ch149, 30 MHz-12 GHz)

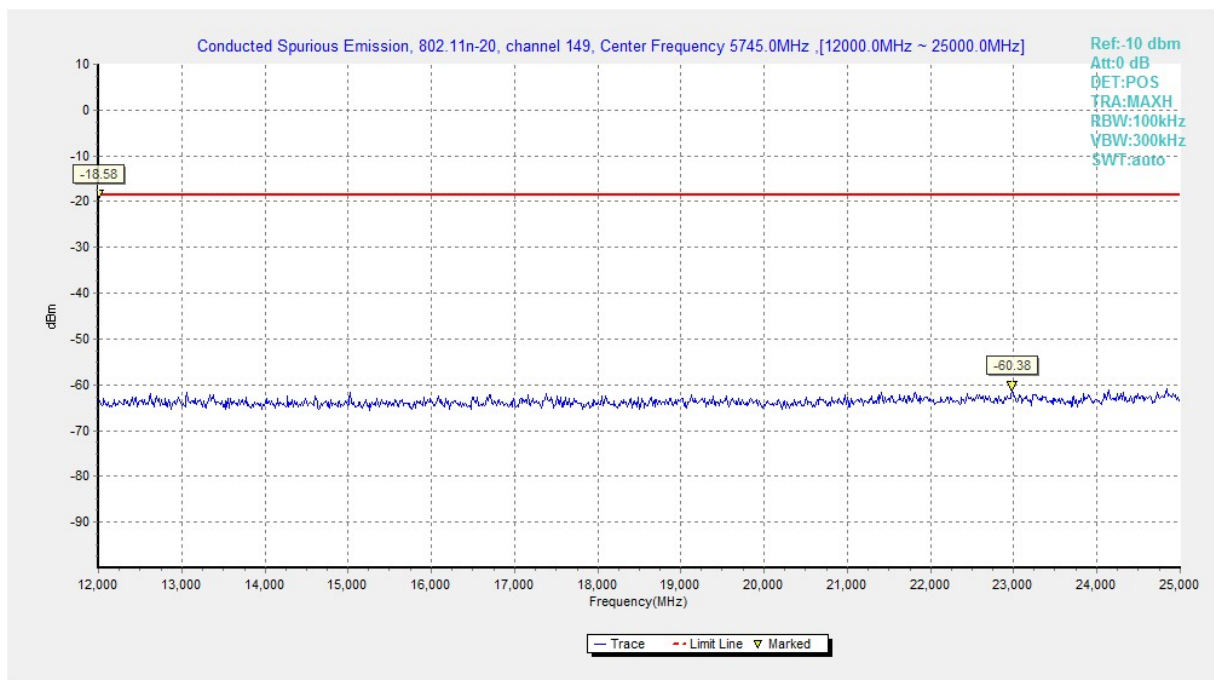


Fig. 20 Conducted Spurious Emission (802.11n-HT20, Ch149, 12 GHz-25 GHz)

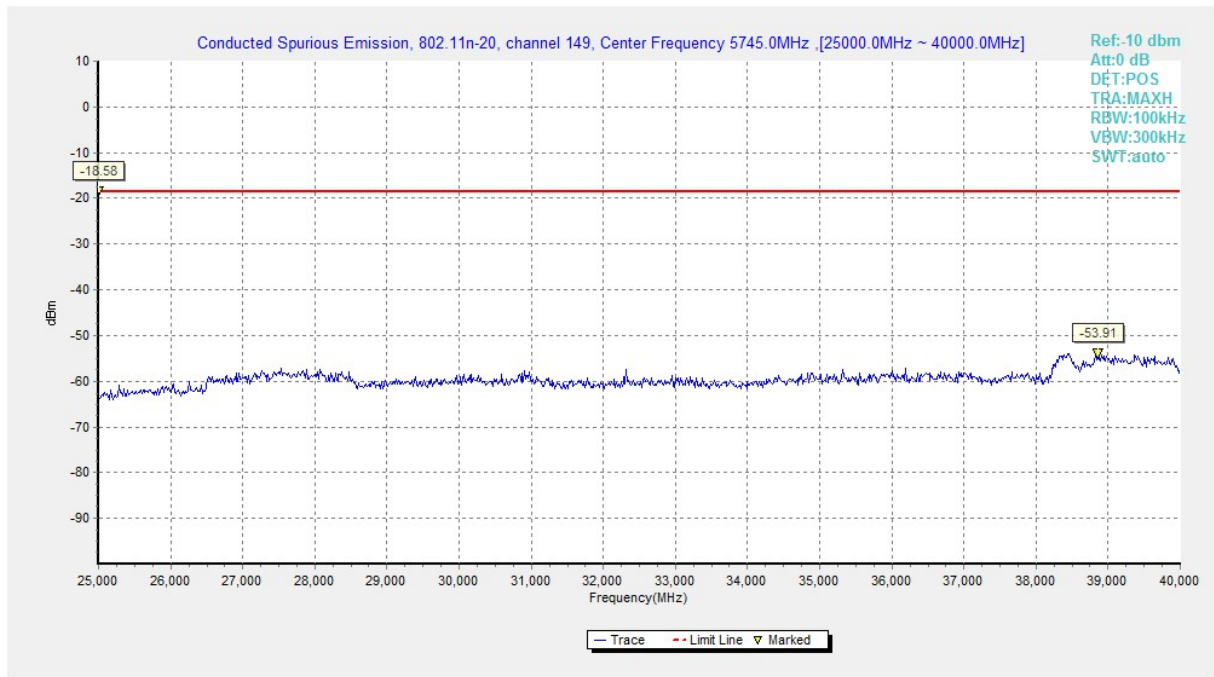


Fig. 21 Conducted Spurious Emission (802.11n-HT20, Ch149, 25 GHz-40 GHz)

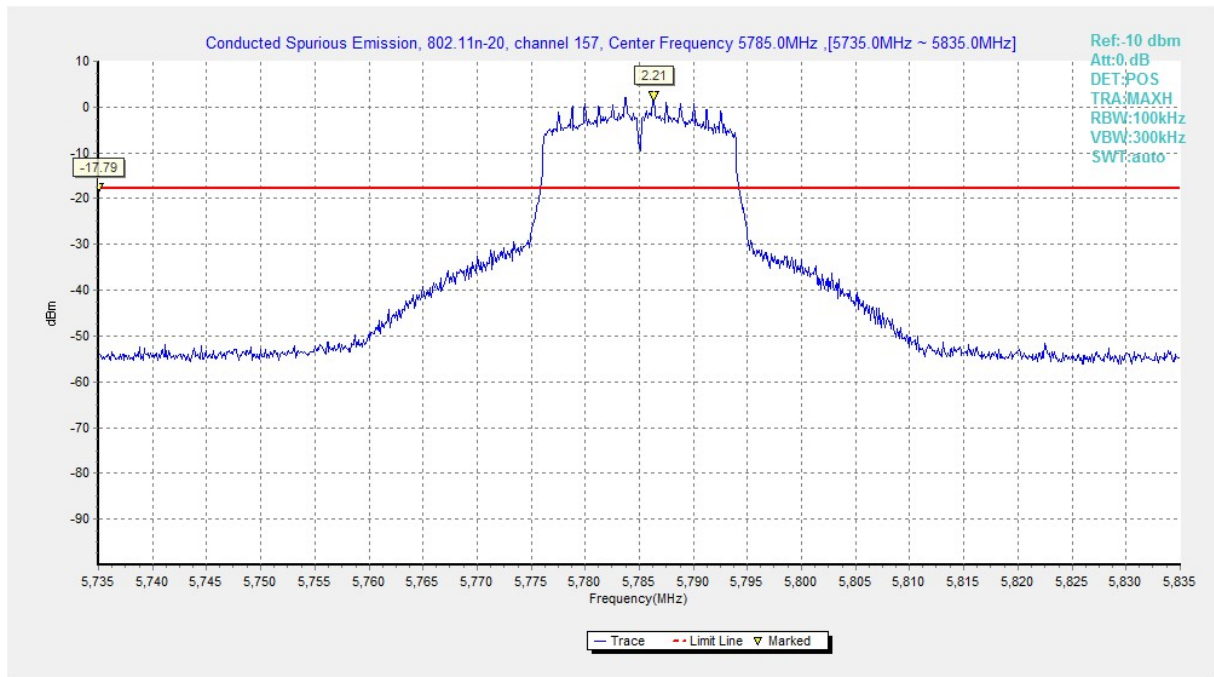


Fig. 22 Conducted Spurious Emission (802.11n-HT20, Ch157, Center Frequency)

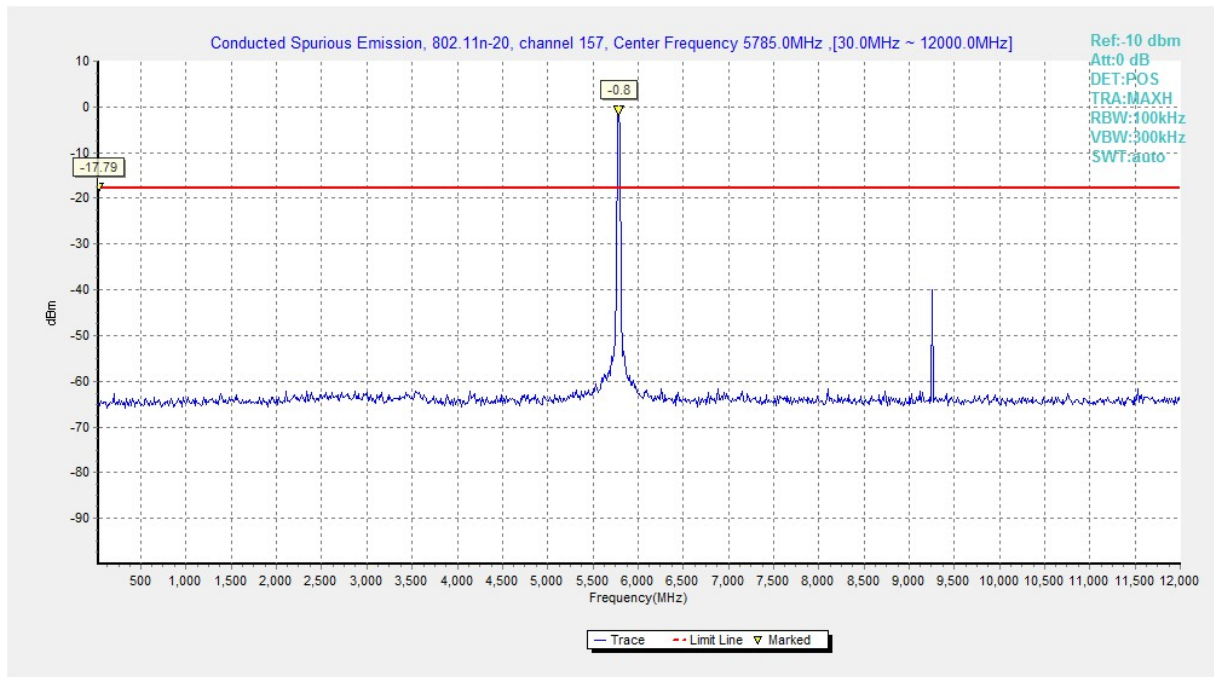


Fig. 23 Conducted Spurious Emission (802.11n-HT20, Ch157, 30 MHz-12 GHz)

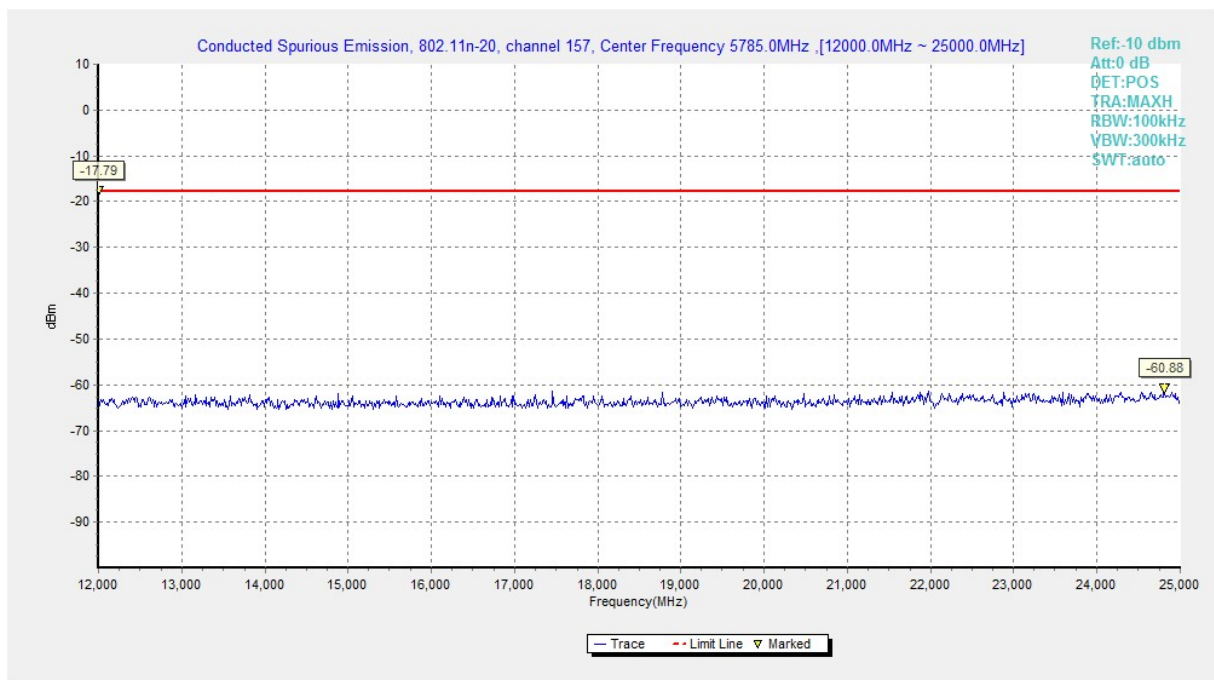


Fig. 24 Conducted Spurious Emission (802.11n-HT20, Ch157, 12 GHz-25 GHz)

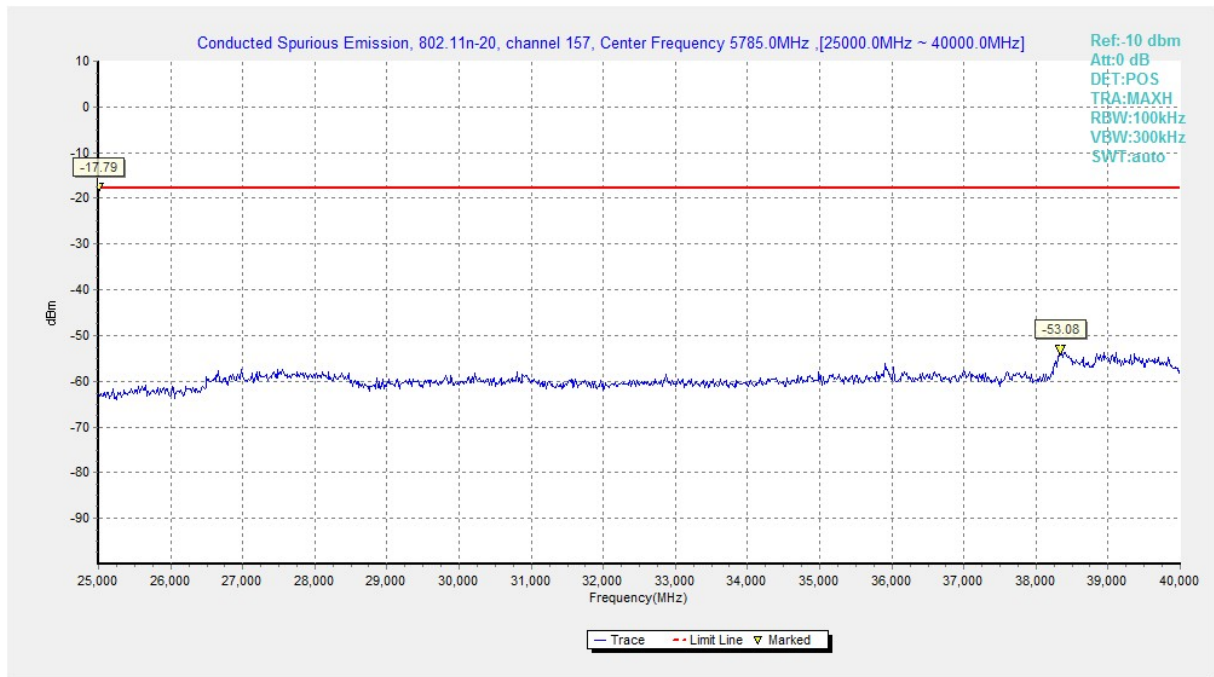


Fig. 25 Conducted Spurious Emission (802.11n-HT20, Ch157, 25 GHz-40 GHz)

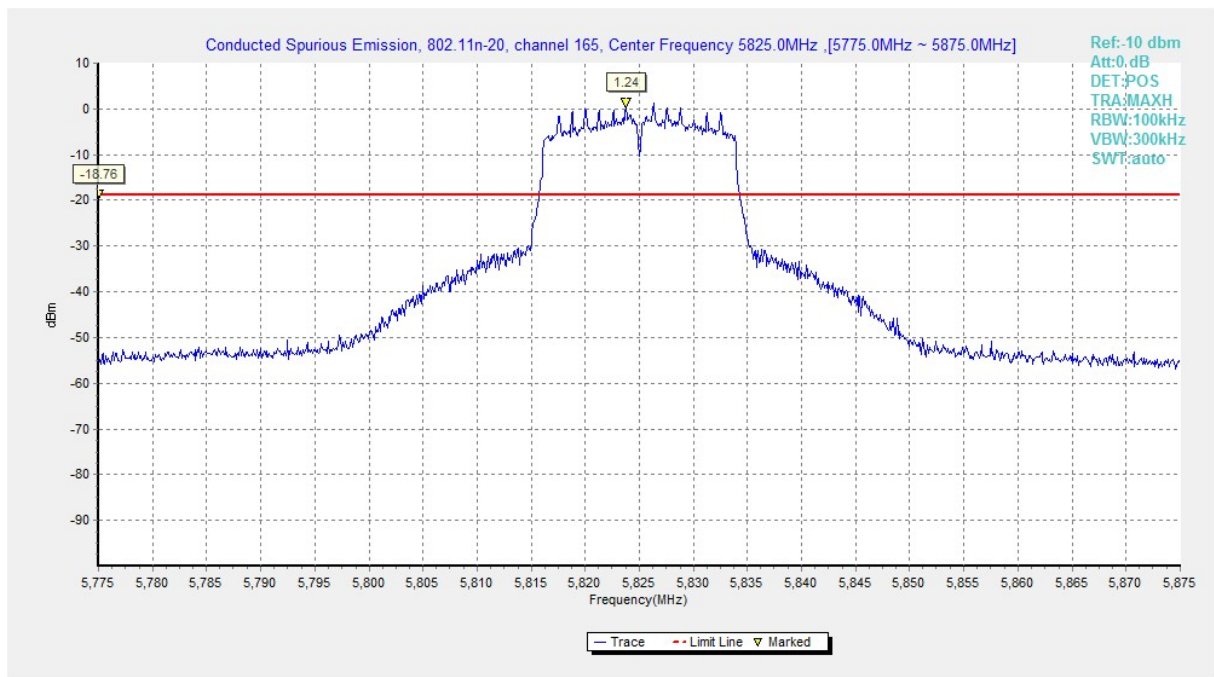


Fig. 26 Conducted Spurious Emission (802.11n-HT20, Ch165, Center Frequency)

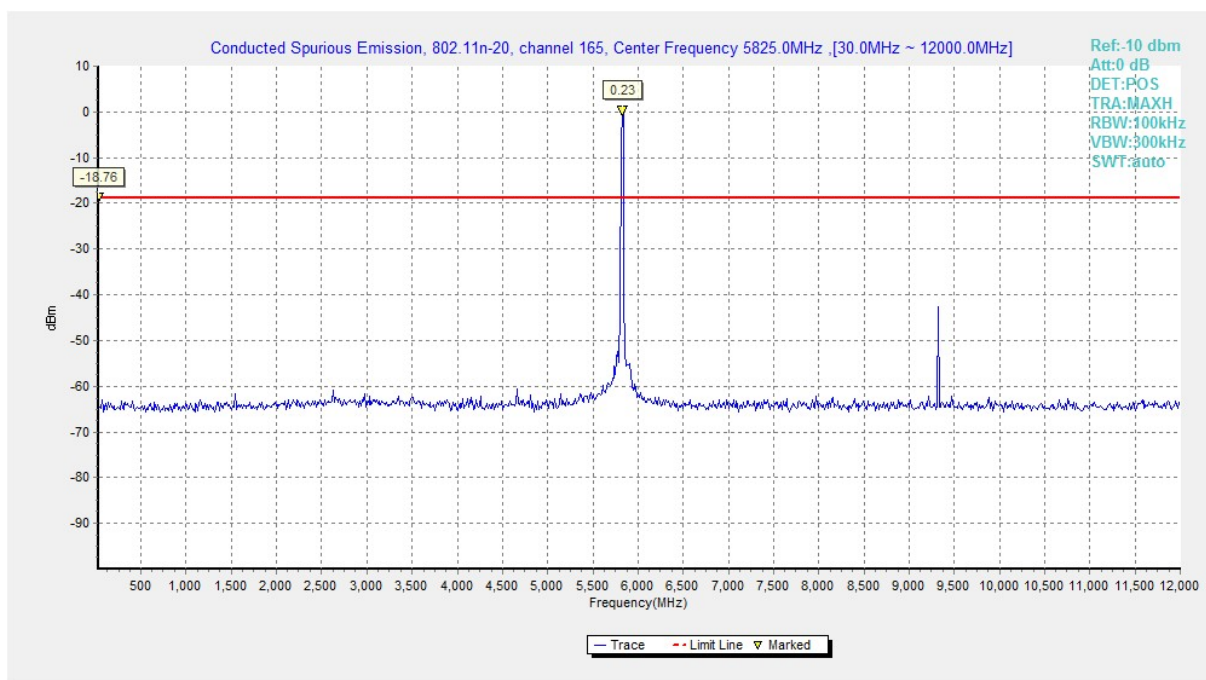


Fig. 27 Conducted Spurious Emission (802.11n-HT20, Ch165, 30 MHz-12 GHz)

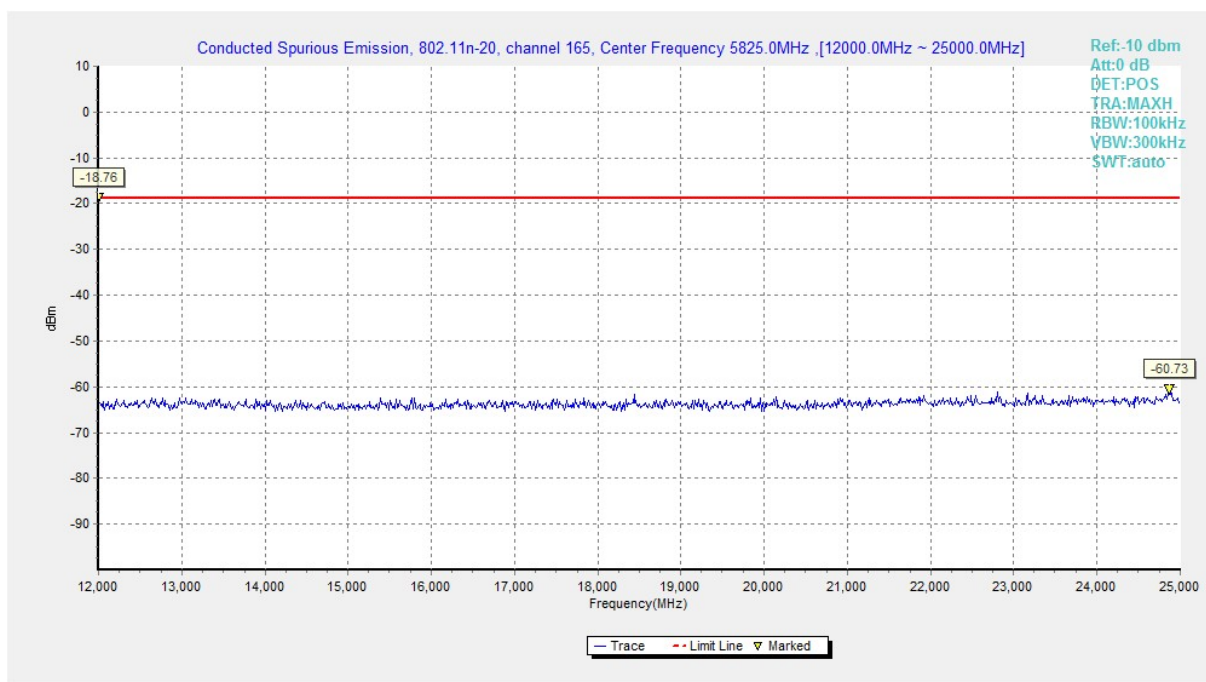


Fig. 28 Conducted Spurious Emission (802.11n-HT20, Ch165, 12 GHz-25 GHz)

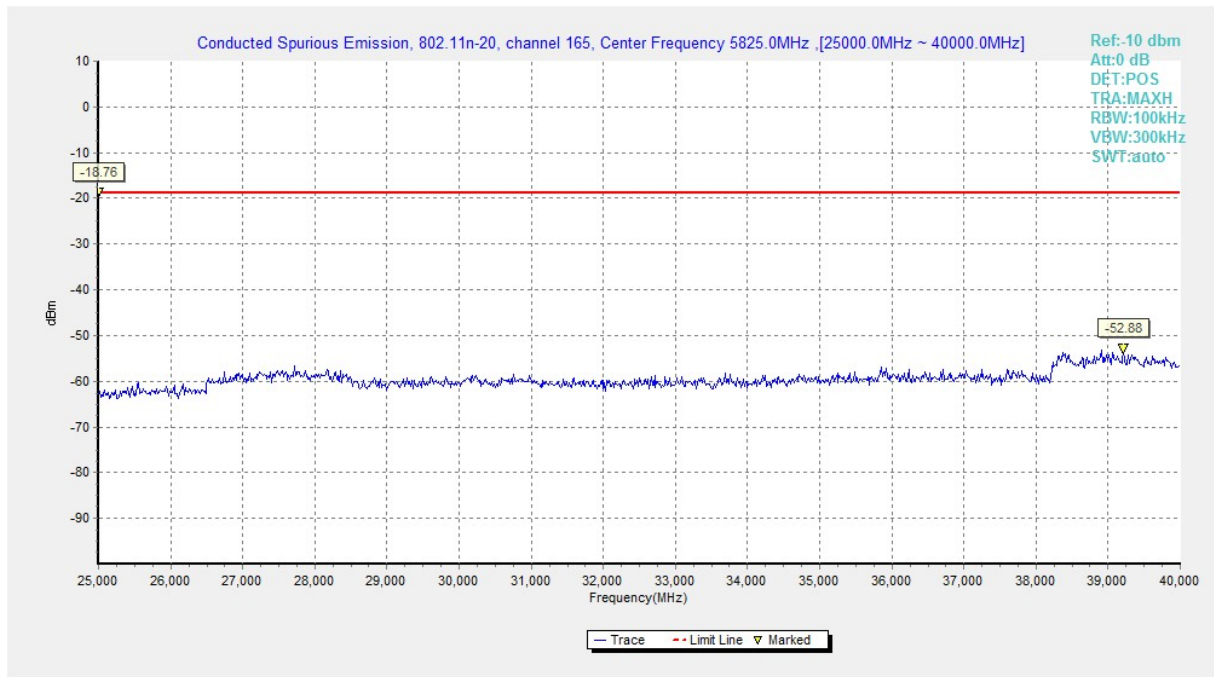


Fig. 29 Conducted Spurious Emission (802.11n-HT20, Ch165, 25 GHz-40 GHz)

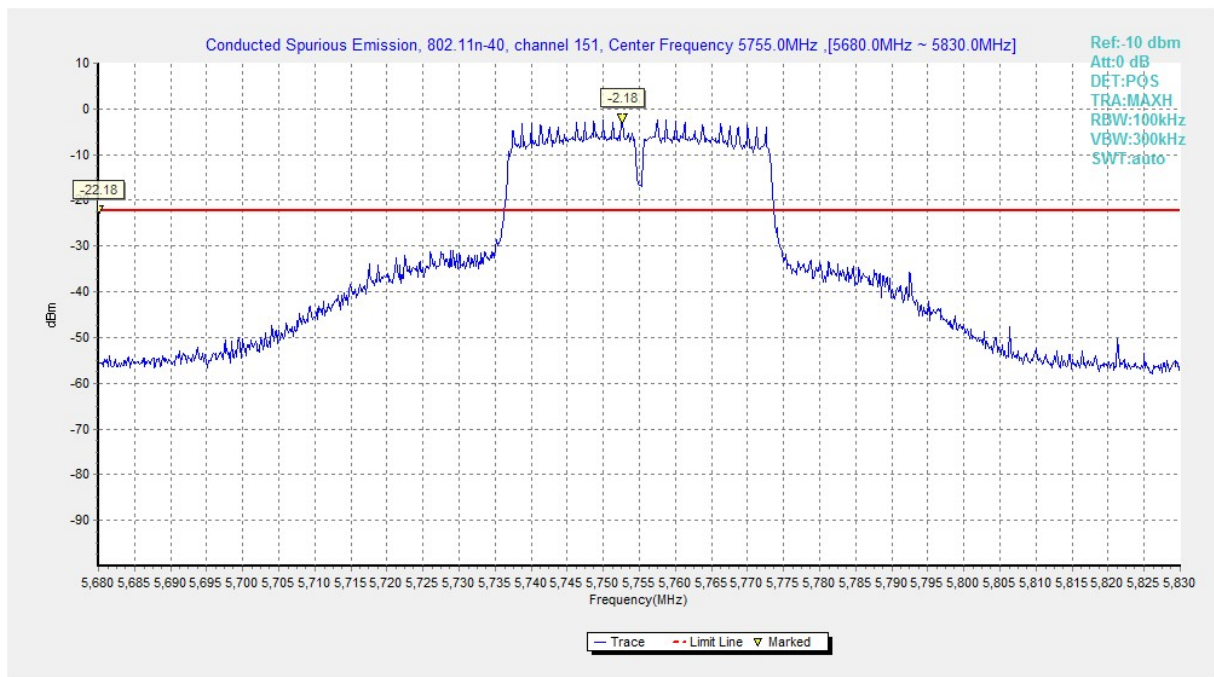


Fig. 30 Conducted Spurious Emission (802.11n-HT40, Ch151, Center Frequency)

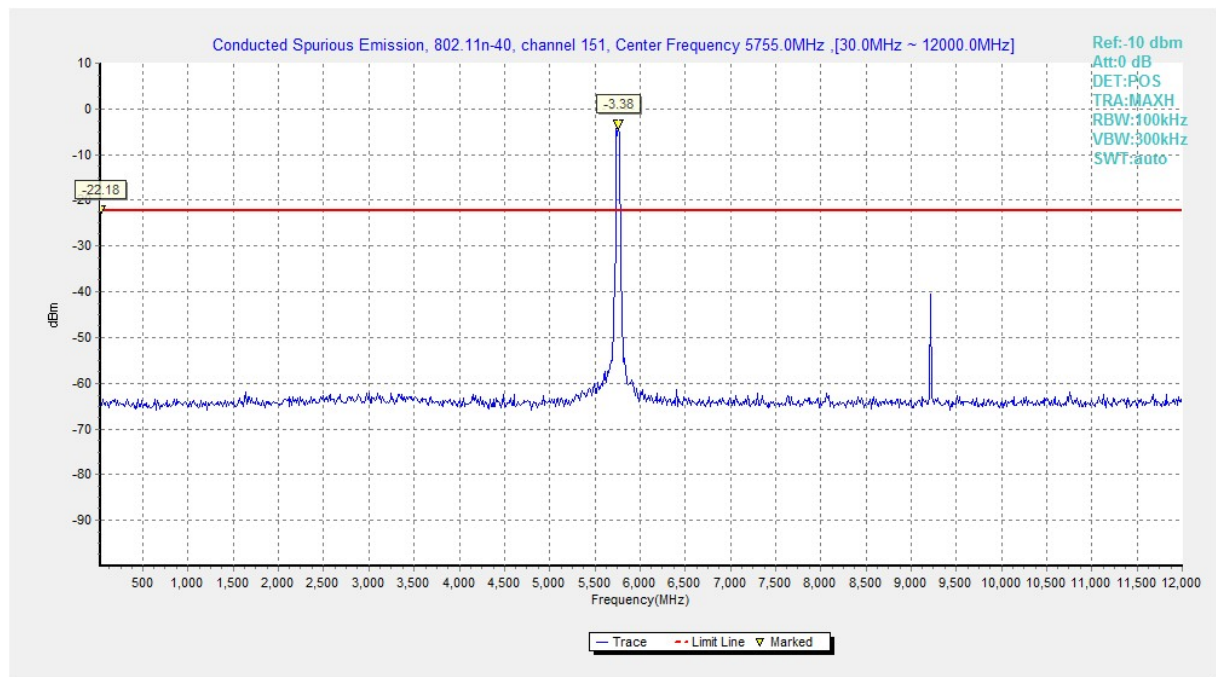


Fig. 31 Conducted Spurious Emission (802.11n-HT40, Ch151, 30 MHz-12 GHz)

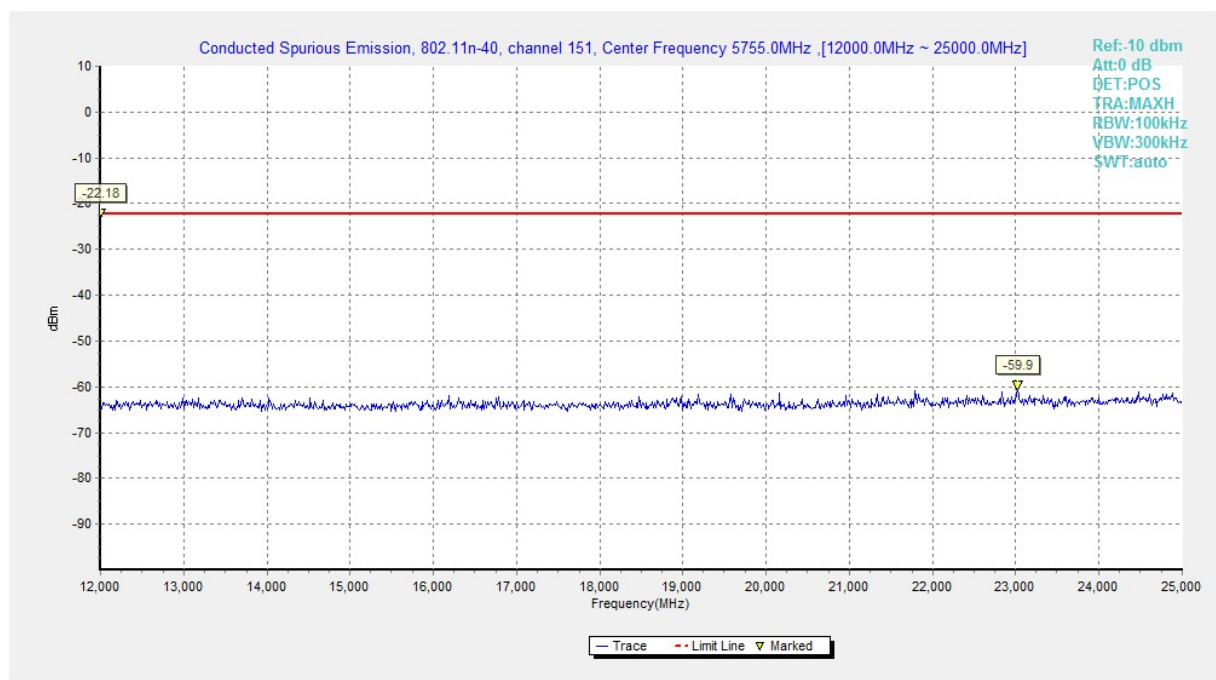


Fig. 32 Conducted Spurious Emission (802.11n-HT40, Ch151, 12 GHz-25 GHz)

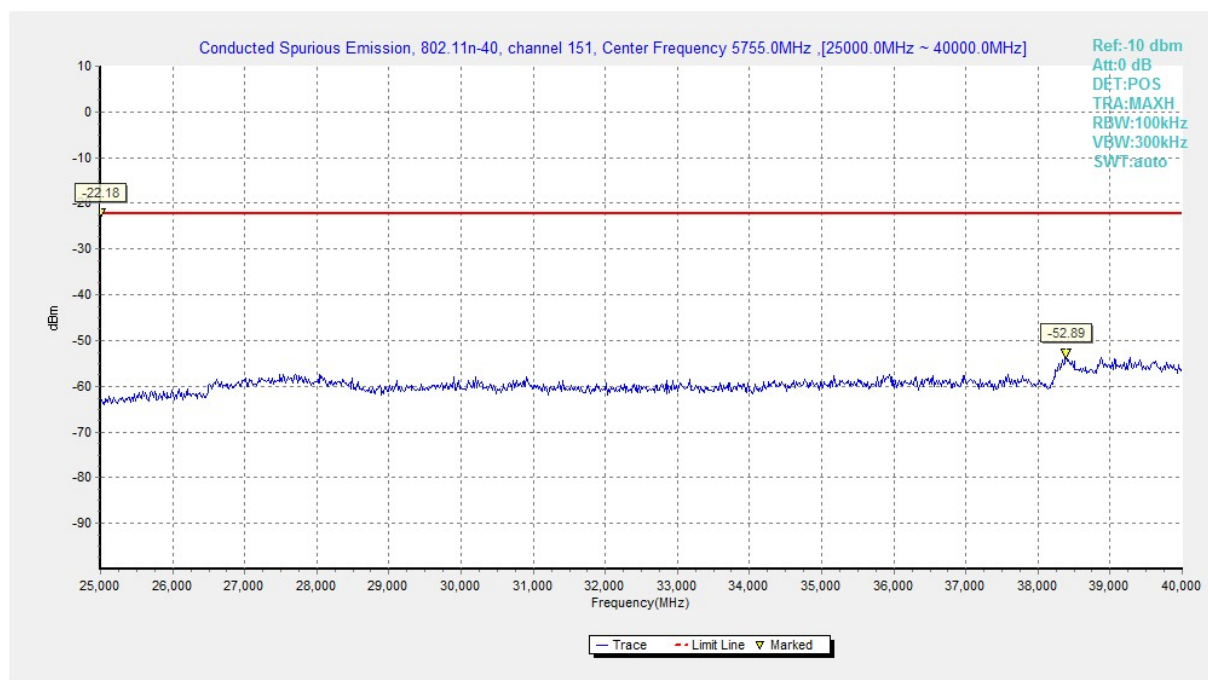


Fig. 33 Conducted Spurious Emission (802.11n-HT40, Ch151, 25 GHz-40 GHz)

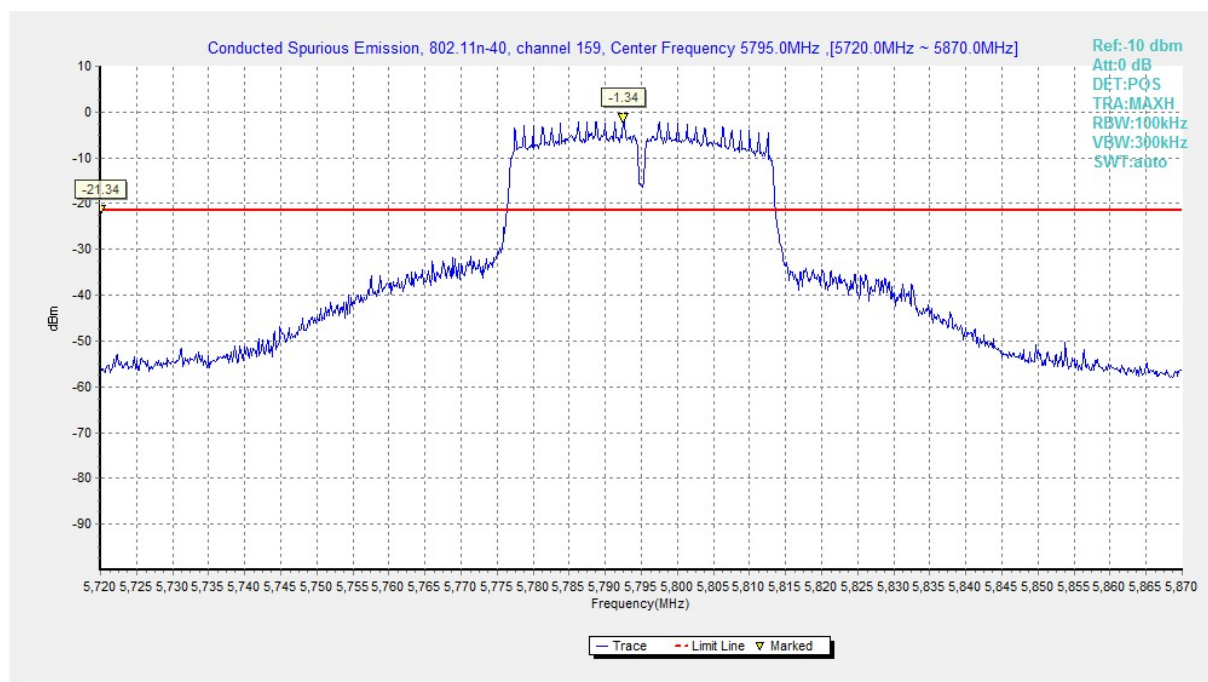


Fig. 34 Conducted Spurious Emission (802.11n-HT40, Ch159, Center Frequency)

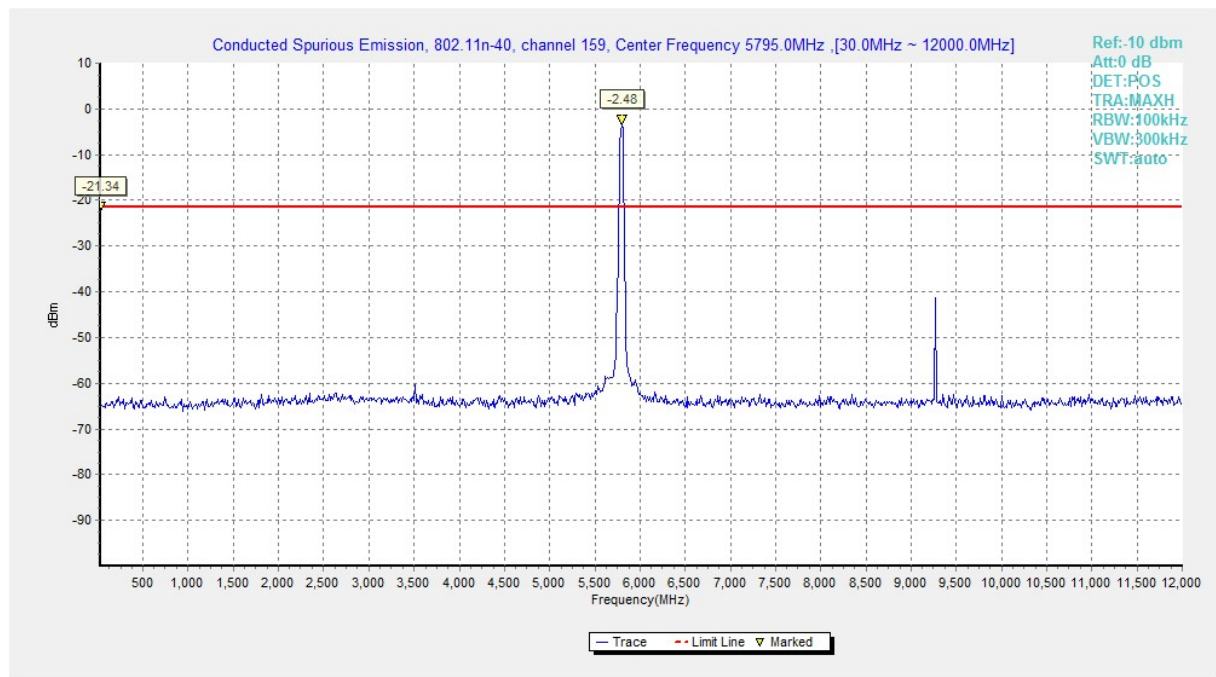


Fig. 35 Conducted Spurious Emission (802.11n-HT40, Ch159, 30 MHz-12 GHz)

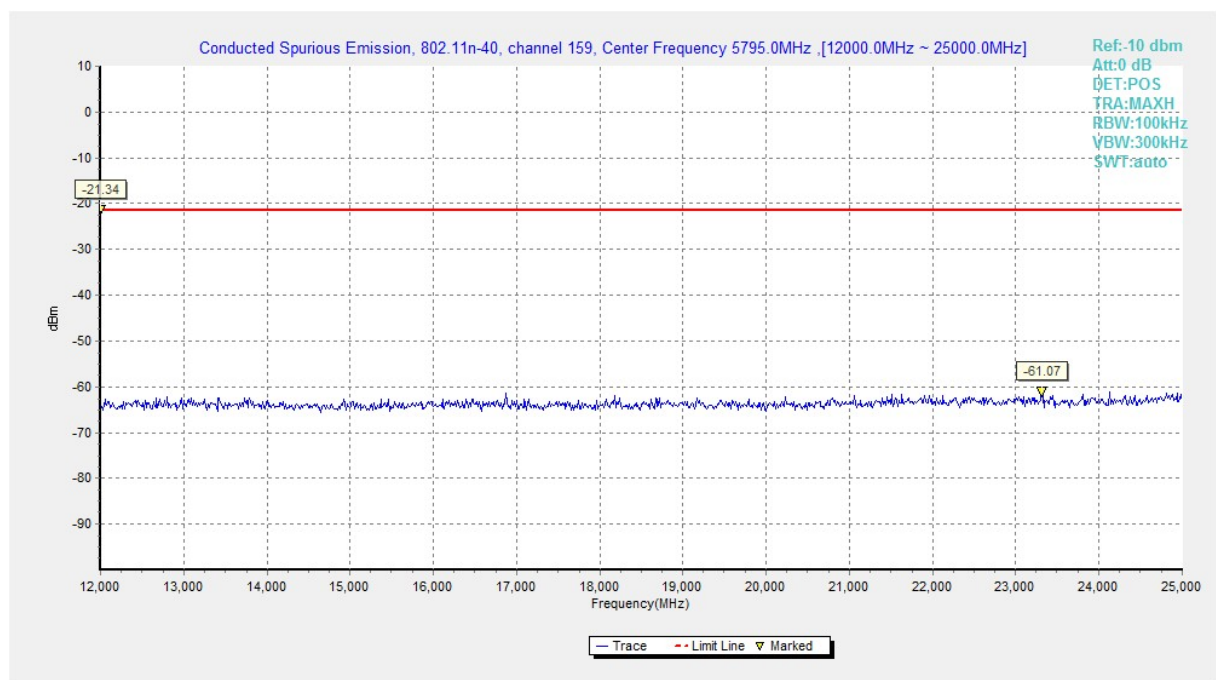


Fig. 36 Conducted Spurious Emission (802.11n-HT40, Ch159, 12 GHz-25 GHz)

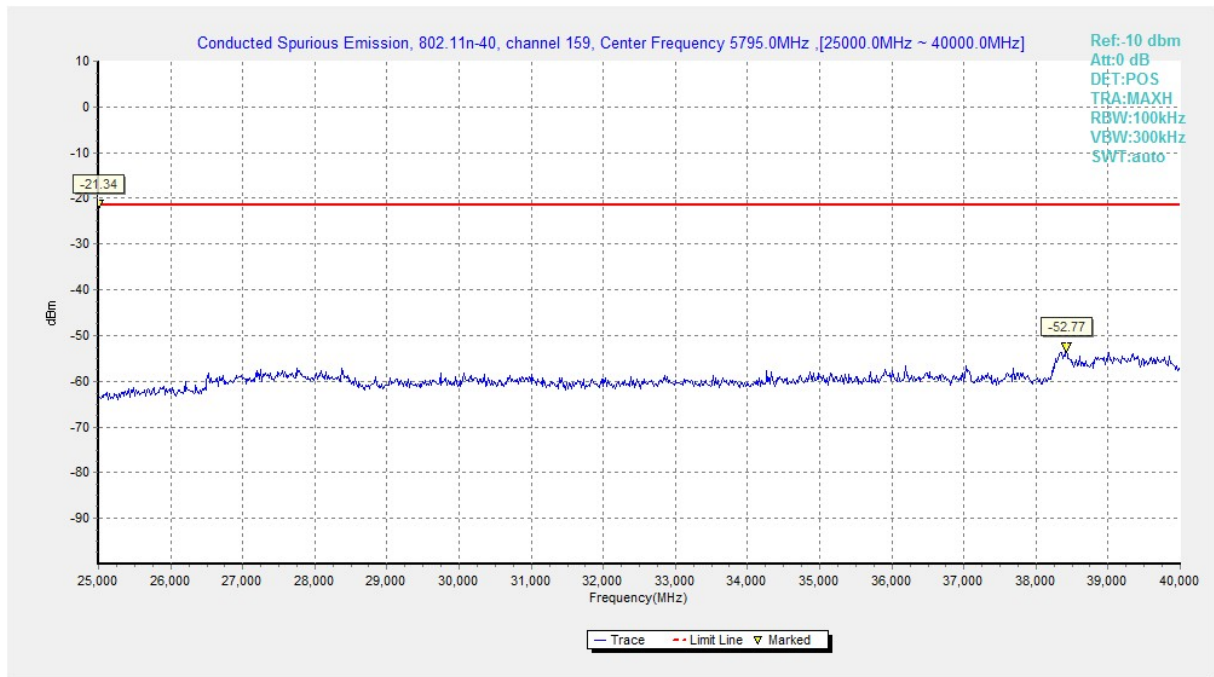


Fig. 37 Conducted Spurious Emission (802.11n-HT40, Ch159, 25 GHz-40 GHz)

A.5.2 Transmitter Spurious Emission - Radiated

Measurement Uncertainty:

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

Measurement Results:

802.11a mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	149	1 GHz ~ 6 GHz	Fig.38	P
		6 GHz ~ 18 GHz	Fig.39	P
	157	30 MHz ~1 GHz	Fig.40	P
		1 GHz ~ 6 GHz	Fig.41	P
		6 GHz ~ 18 GHz	Fig.42	P
		18 GHz ~ 26.5 GHz	Fig.43	P
		26.5 GHz~ 40 GHz	Fig.44	P
	165	1 GHz ~ 6 GHz	Fig.45	P
		6 GHz ~ 18 GHz	Fig.46	P

802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	149	1 GHz ~ 6 GHz	Fig.47	P
		6 GHz ~ 18 GHz	Fig.48	P
	157	30 MHz ~1 GHz	Fig.49	P
		1 GHz ~ 6 GHz	Fig.50	P
		6 GHz ~ 18 GHz	Fig.51	P
		18 GHz ~ 26.5 GHz	Fig.52	P
		26.5 GHz~ 40 GHz	Fig.53	P
	165	1 GHz ~ 6 GHz	Fig.54	P
		6 GHz ~ 18 GHz	Fig.55	P

802.11n-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT40)	151	30 MHz ~1 GHz	Fig.56	P
		1 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
	159	1 GHz ~ 6 GHz	Fig.61	P
		6 GHz ~ 18 GHz	Fig.62	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
Ch149

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17982.000	52.0	-17.7	45.6	24.100	V
17841.000	51.7	-18.5	45.6	24.600	V
17799.000	51.5	-18.5	45.6	24.400	V
17707.500	51.3	-18.9	45.6	24.600	V
17976.000	51.3	-17.7	45.6	23.400	H
17776.500	51.1	-18.5	45.6	24.000	V

Ch157

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17998.500	52.4	-17.7	45.6	24.500	V
17674.500	51.9	-18.9	45.6	25.200	V
17688.000	51.6	-18.9	45.6	24.900	V
17827.500	51.1	-18.5	45.6	24.000	H
17979.000	51.0	-17.7	45.6	23.100	V
17685.000	50.8	-18.9	45.6	24.100	V

Ch165

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17976.000	51.4	-17.7	45.6	23.500	V
17979.000	51.3	-17.7	45.6	23.400	V
17989.500	51.3	-17.7	45.6	23.400	V
17766.000	51.1	-18.5	45.6	24.000	V
17773.500	51.0	-18.5	45.6	23.900	V
17803.500	51.0	-18.5	45.6	23.900	H

802.11n-HT20
Ch149

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17958.000	51.4	-17.7	45.6	23.500	V
17878.500	50.9	-18.5	45.6	23.800	V
17995.500	50.8	-17.7	45.6	22.900	V
17796.000	50.7	-18.5	45.6	23.600	V
17911.500	50.7	-18.5	45.6	23.600	V
17914.500	50.6	-17.7	45.6	22.700	V

Ch157

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17853.000	52.3	-18.5	45.6	25.200	V
17946.000	51.8	-17.7	45.6	23.900	V
17668.500	51.6	-18.9	45.6	24.900	V
17796.000	51.6	-18.5	45.6	24.500	V
17982.000	51.1	-17.7	45.6	23.200	V
17722.500	51.1	-18.9	45.6	24.400	H

Ch165

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17962.500	51.4	-17.7	45.6	23.500	H
17712.000	51.0	-18.9	45.6	24.300	V
17914.500	51.0	-17.7	45.6	23.100	V
17958.000	50.9	-17.7	45.6	23.000	V
17860.500	50.9	-18.5	45.6	23.800	V
17874.000	50.9	-18.5	45.6	23.800	V

802.11n-HT40

Ch151

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17808.000	50.9	-18.5	45.6	23.800	V
17874.000	50.8	-18.5	45.6	23.700	V
17965.500	50.8	-17.7	45.6	22.900	V
17869.500	50.8	-18.5	45.6	23.700	V
17982.000	50.7	-17.7	45.6	22.800	V
17851.500	50.7	-18.5	45.6	23.600	V

Ch159

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17964.000	50.7	-17.7	45.6	22.800	V
17989.500	50.2	-17.7	45.6	22.300	V
17758.500	50.0	-18.5	45.6	22.900	H
17770.500	50.0	-18.5	45.6	22.900	V
17706.000	49.9	-18.9	45.6	23.200	V
17841.000	49.9	-18.5	45.6	22.800	V

Test graphs as below:

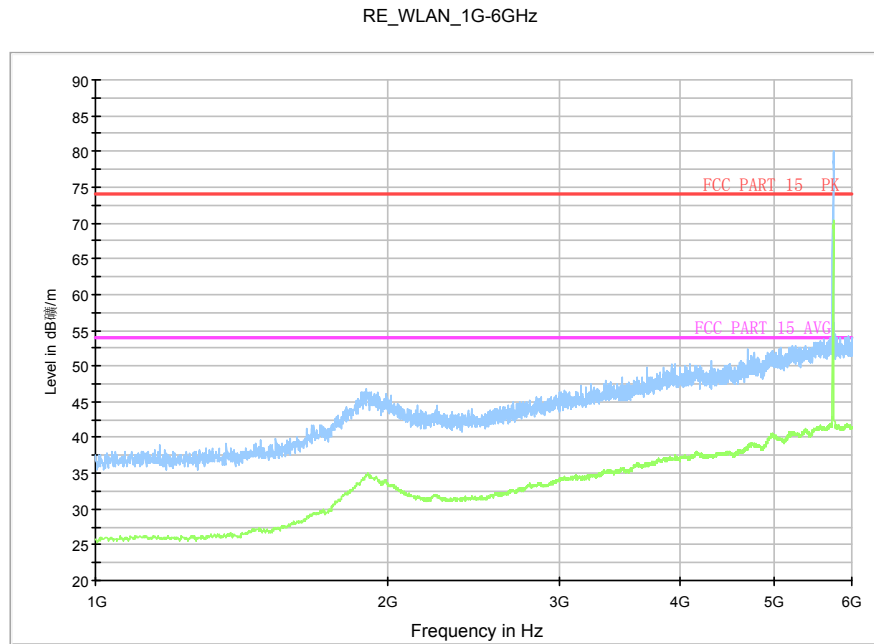


Fig. 38 Radiated Spurious Emission (802.11a, Ch149, 1 GHz-6 GHz)

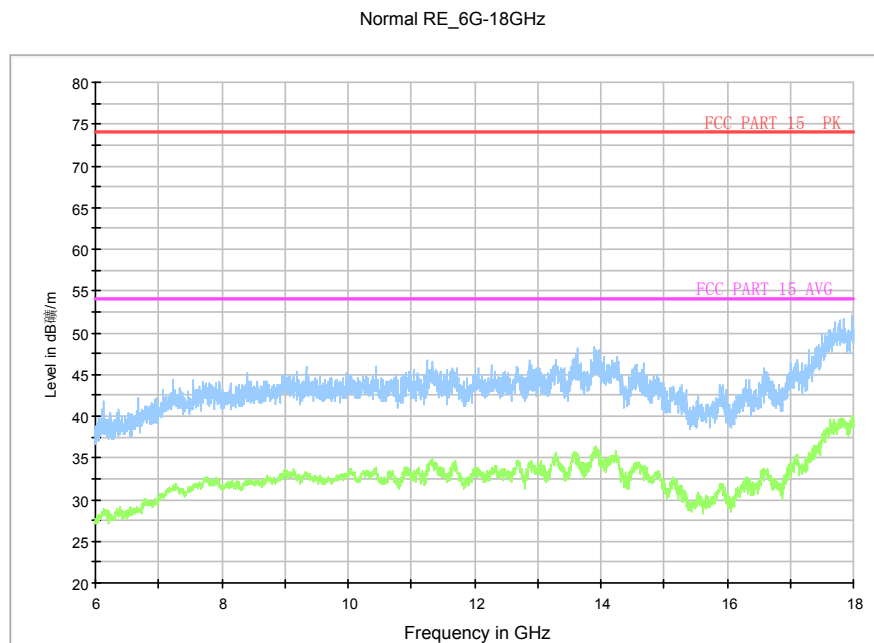


Fig. 39 Radiated Spurious Emission (802.11a, Ch149, 6 GHz-18 GHz)

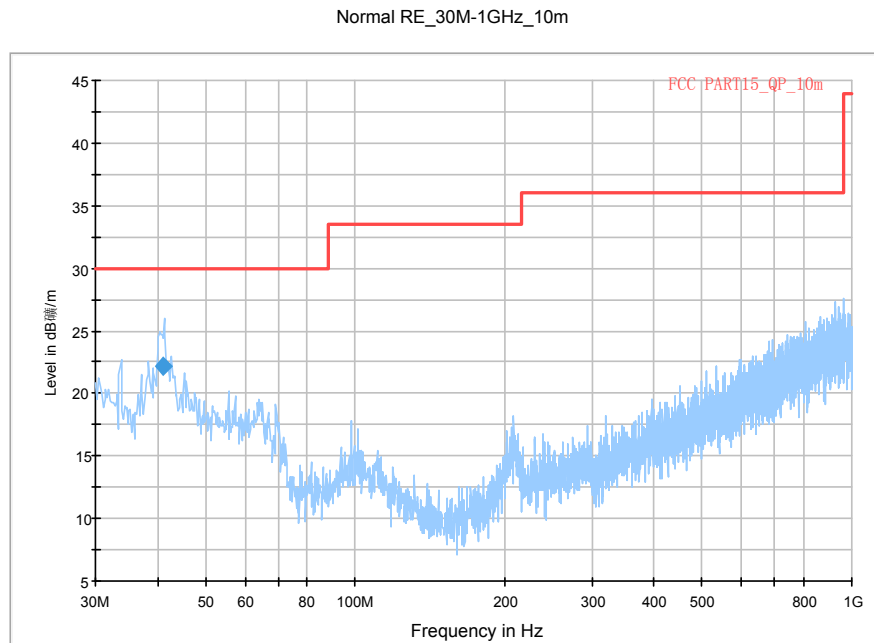


Fig. 40 Radiated Spurious Emission (802.11a, Ch157, 30 MHz-1 GHz)

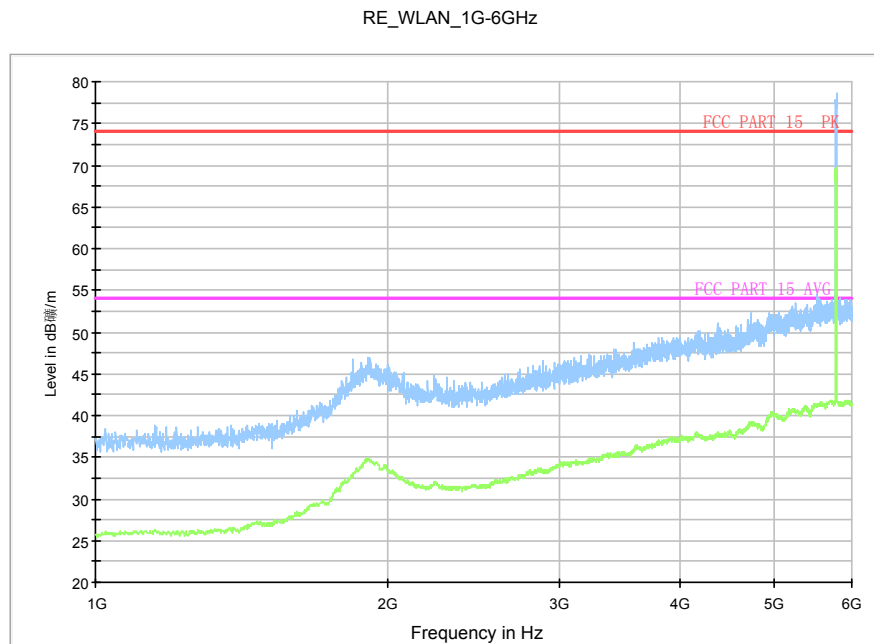


Fig. 41 Radiated Spurious Emission (802.11a, Ch157, 1 GHz-6 GHz)

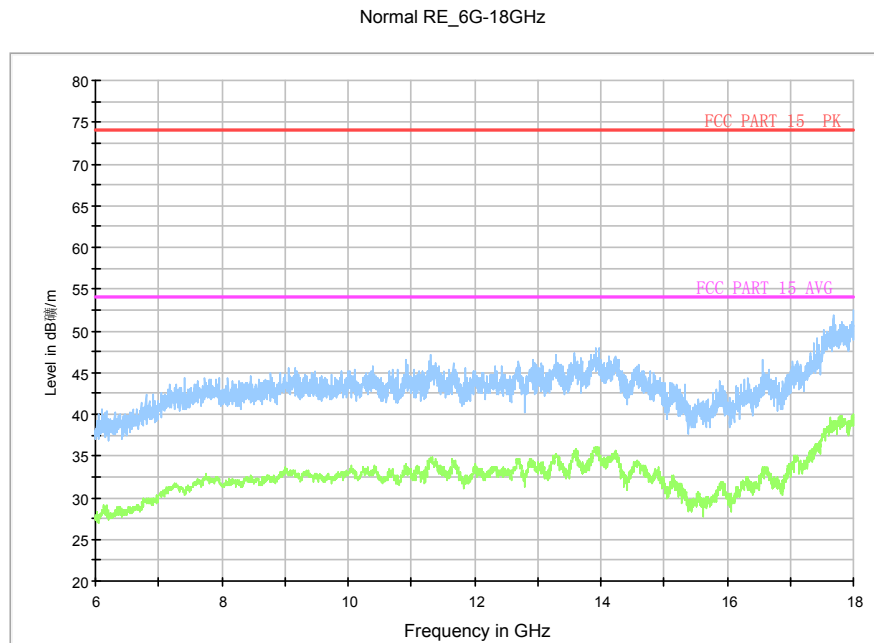


Fig. 42 Radiated Spurious Emission (802.11a, Ch157, 6 GHz-18 GHz)

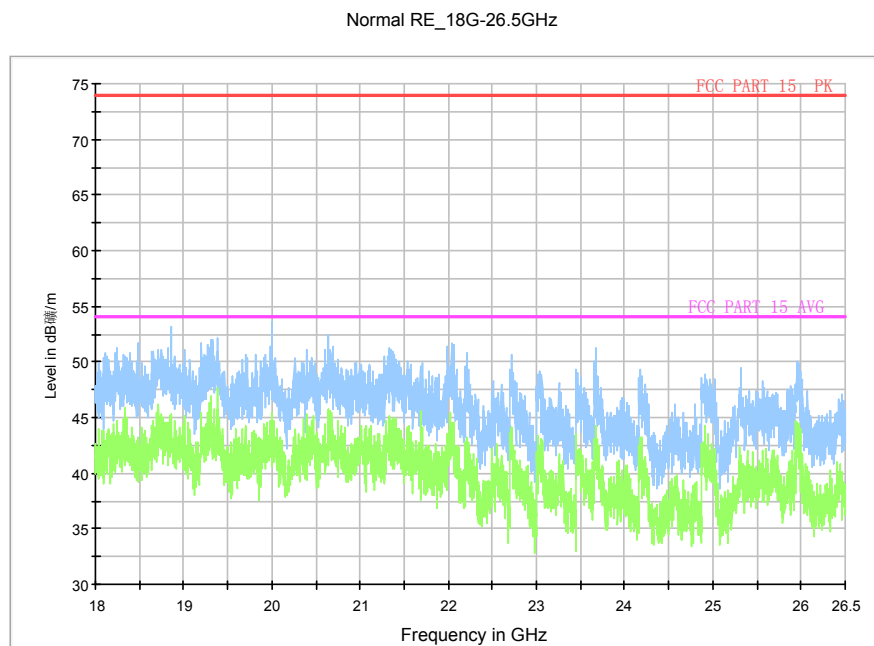


Fig. 43 Radiated Spurious Emission (802.11a, Ch157, 18 GHz-26.5 GHz)

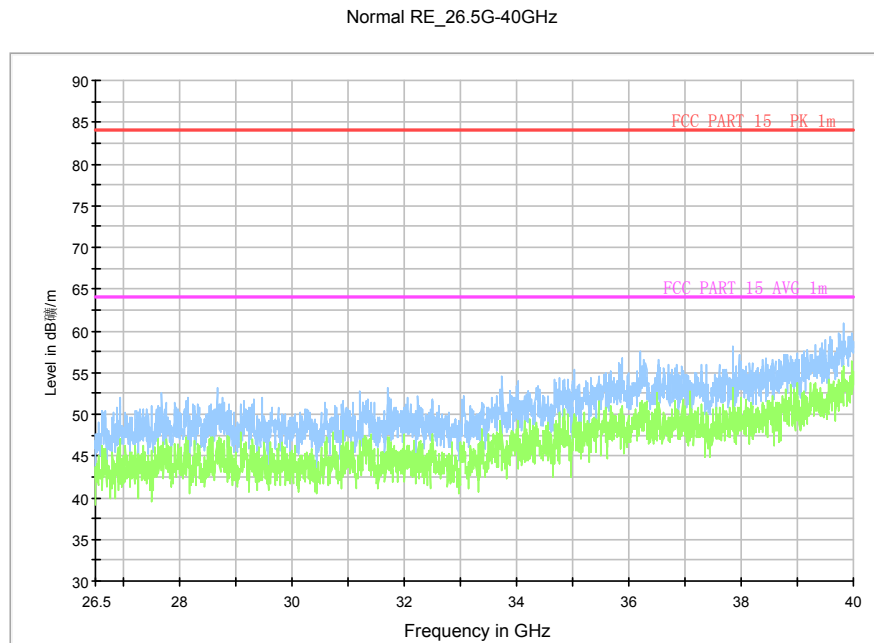


Fig. 44 Radiated emission: 802.11n, (802.11a, Ch157, 26.5 GHz - 40 GHz)

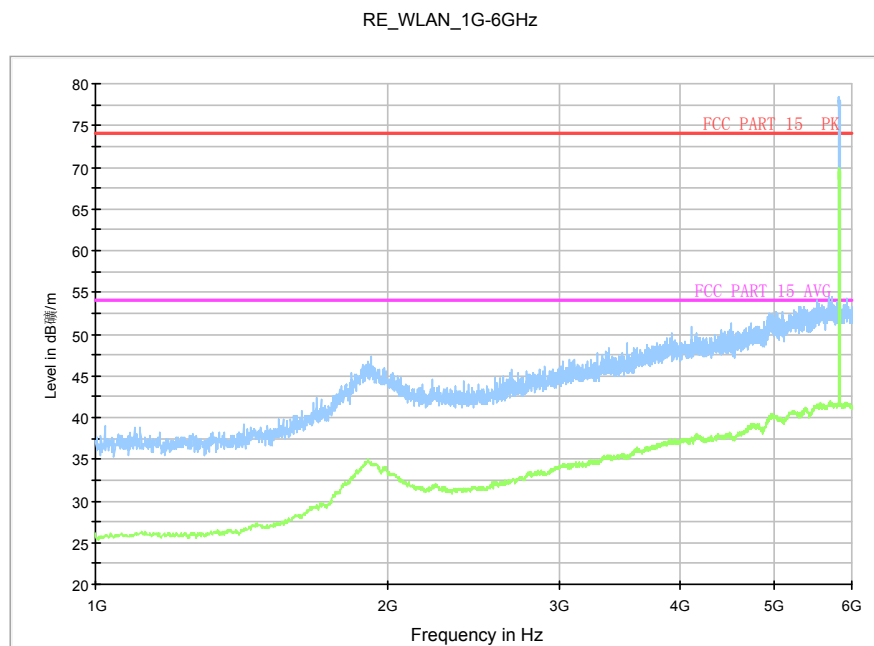


Fig. 45 Radiated Spurious Emission (802.11a, Ch165, 1 GHz-6 GHz)

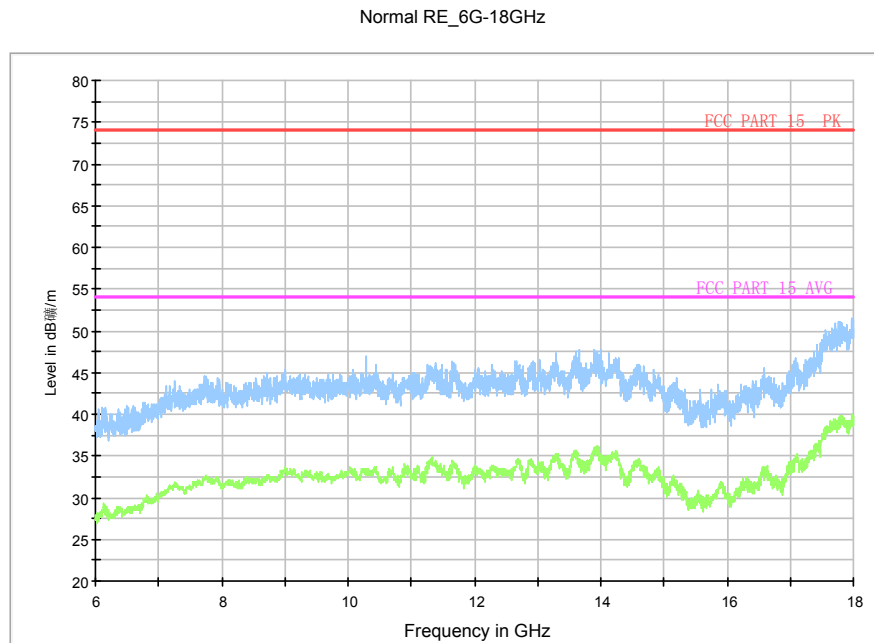


Fig. 46 Radiated Spurious Emission (802.11a, Ch165, 6 GHz-18 GHz)

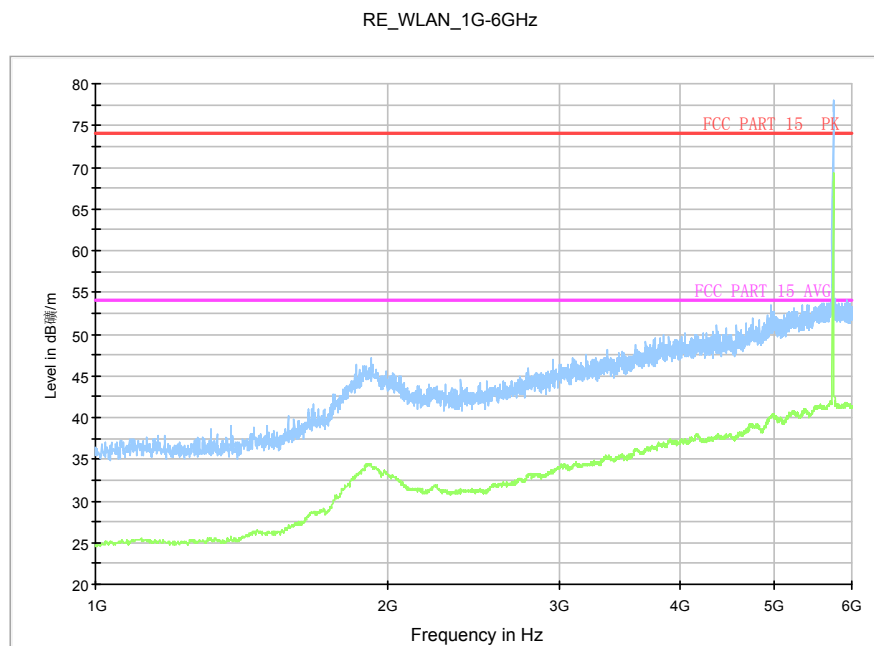


Fig. 47 Radiated Spurious Emission (802.11n-HT20, Ch149, 1 GHz-6 GHz)

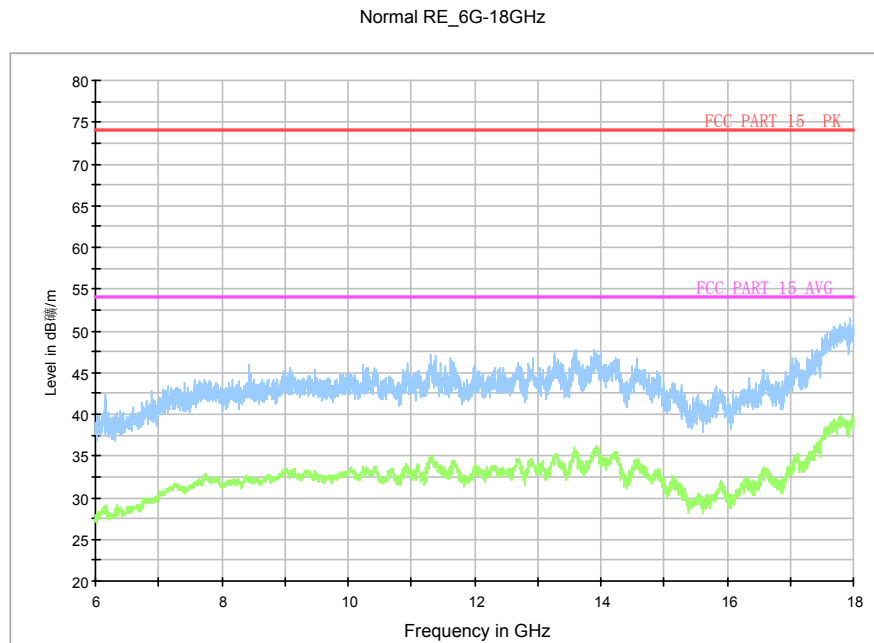


Fig. 48 Radiated Spurious Emission (802.11n-HT20, Ch149, 6 GHz-18 GHz)

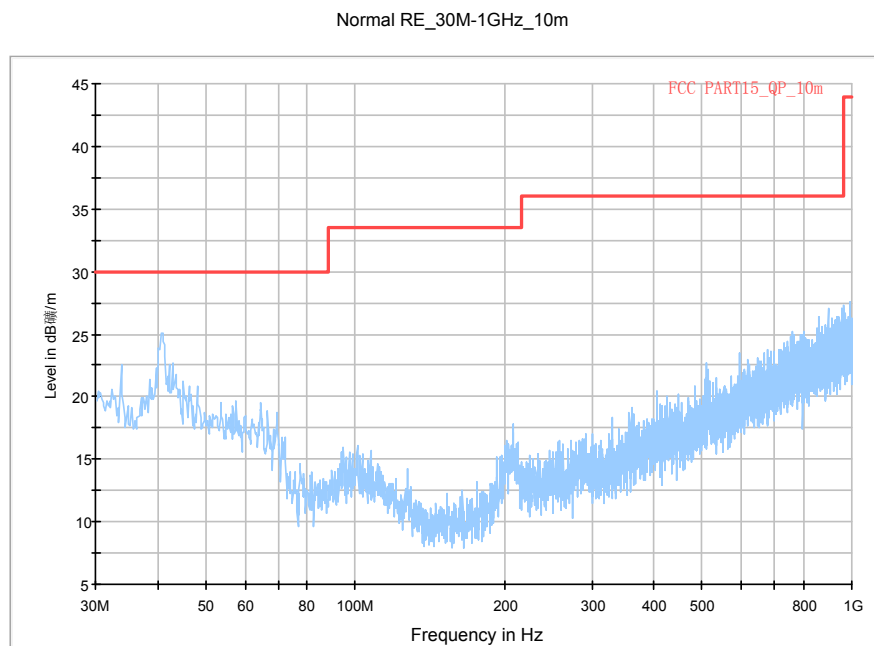


Fig. 49 Radiated Spurious Emission (802.11n-HT20, Ch157, 30 MHz-1 GHz)

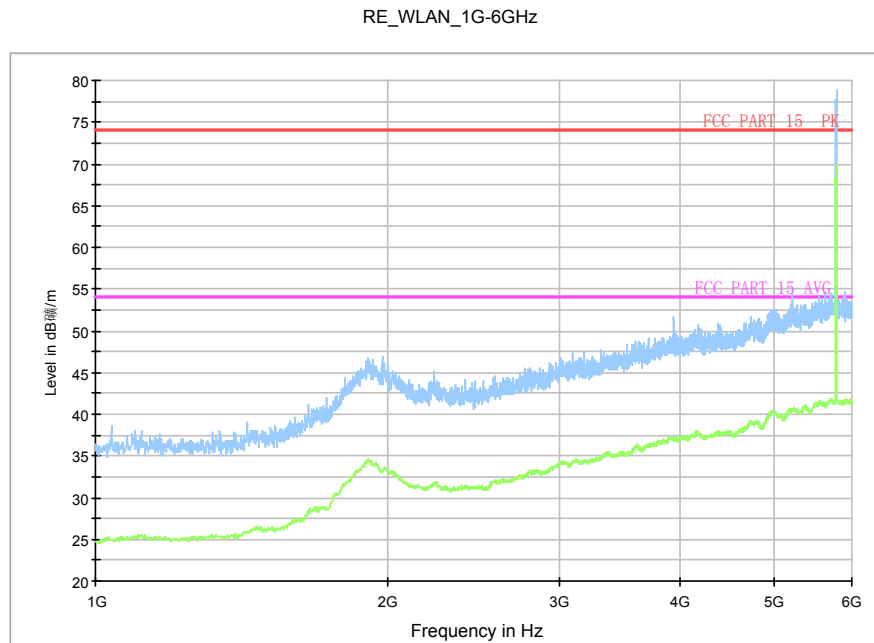


Fig. 50 Radiated Spurious Emission (802.11n-HT20, Ch157, 1 GHz-6 GHz)

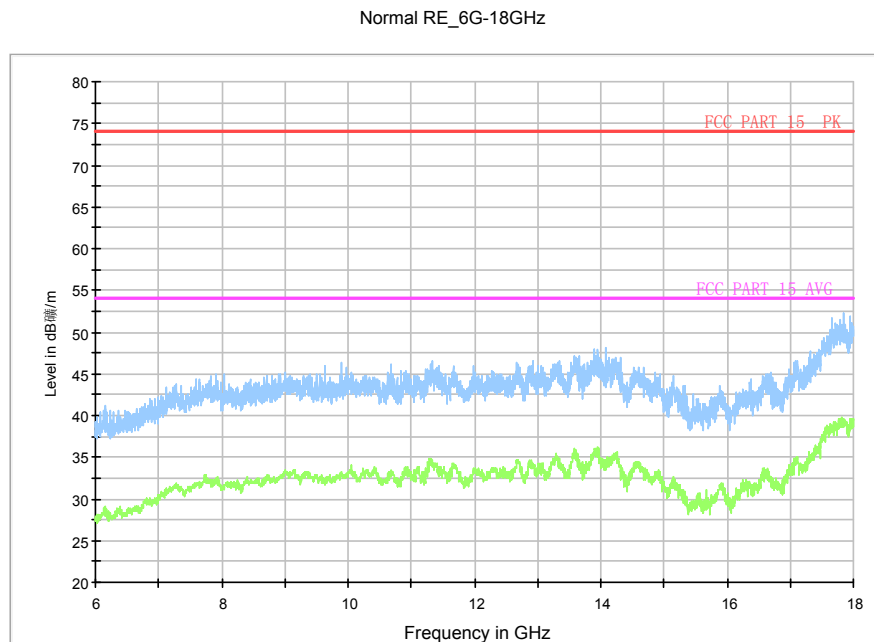


Fig. 51 Radiated Spurious Emission (802.11n-HT20, Ch157, 6 GHz-18 GHz)

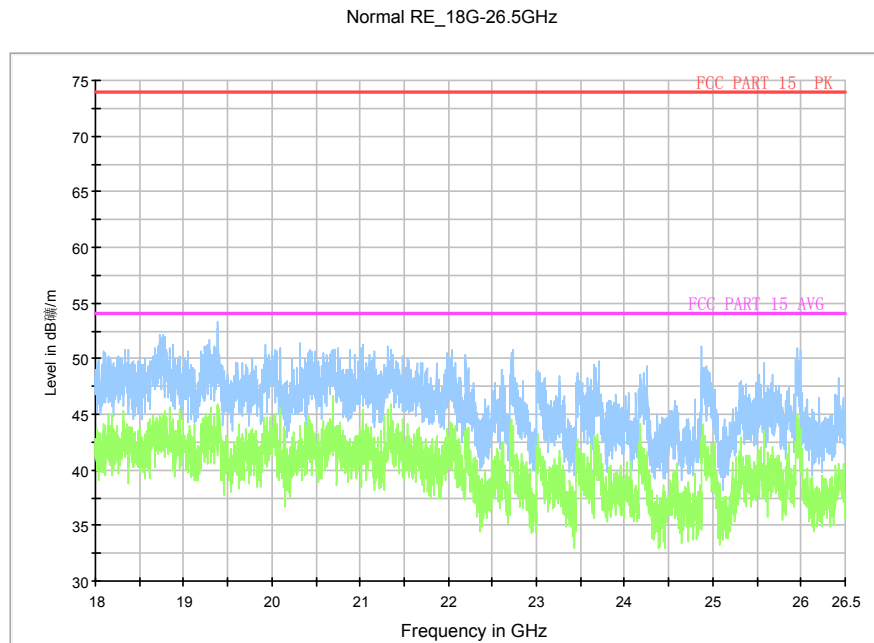


Fig. 52 Radiated Spurious Emission (802.11n-HT20, Ch157, 18 GHz-26.5 GHz)

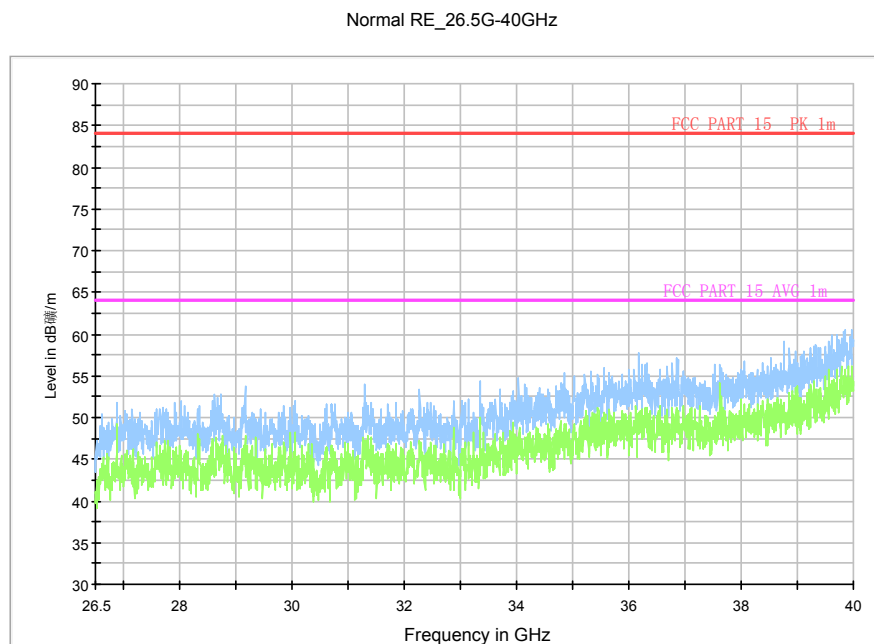


Fig. 53 Radiated emission: 802.11n, (802.11n-HT20, Ch157, 26.5 GHz - 40 GHz)

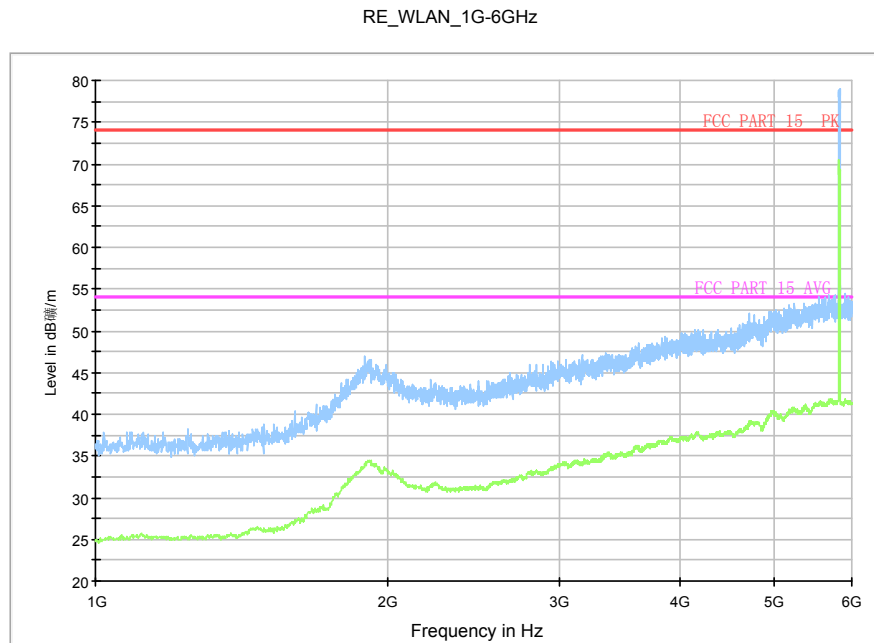


Fig. 54 Radiated Spurious Emission (802.11n-HT20, Ch165, 1 GHz-6 GHz)

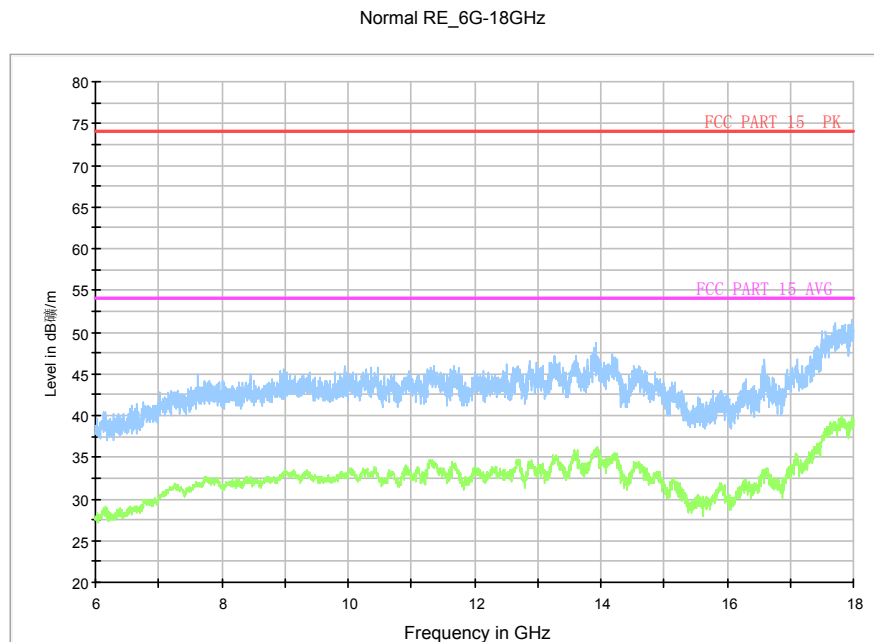


Fig. 55 Radiated Spurious Emission (802.11n-HT20, Ch165, 6 GHz-18 GHz)

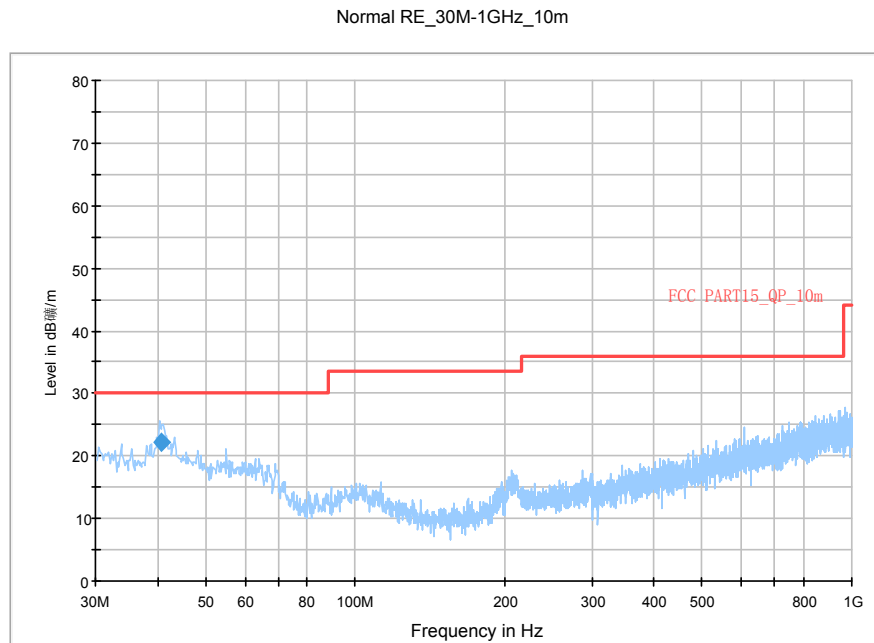


Fig. 56 Radiated Spurious Emission (802.11n-HT40, Ch151, 30 MHz-1 GHz)

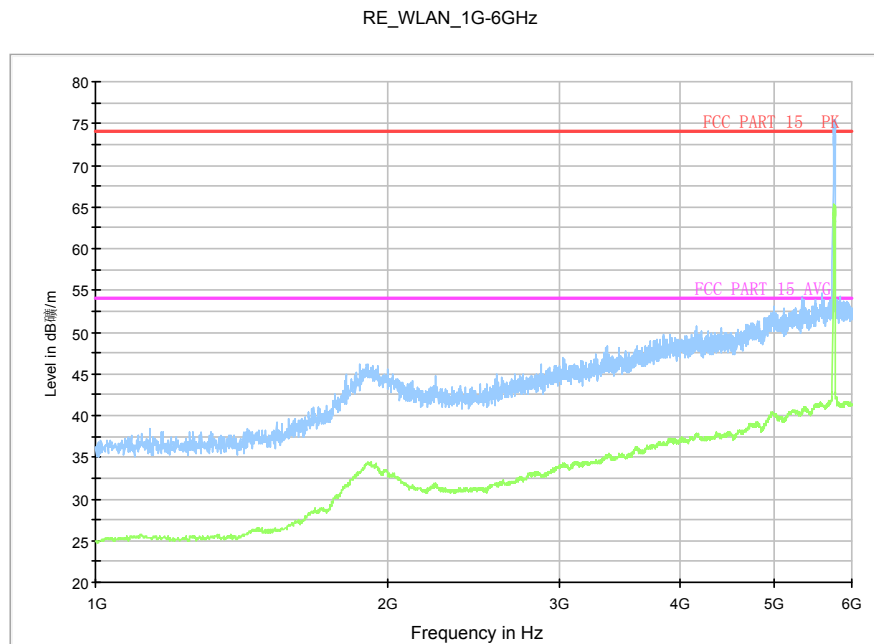


Fig. 57 Radiated Spurious Emission (802.11n-HT40, Ch151, 1 GHz-6 GHz)

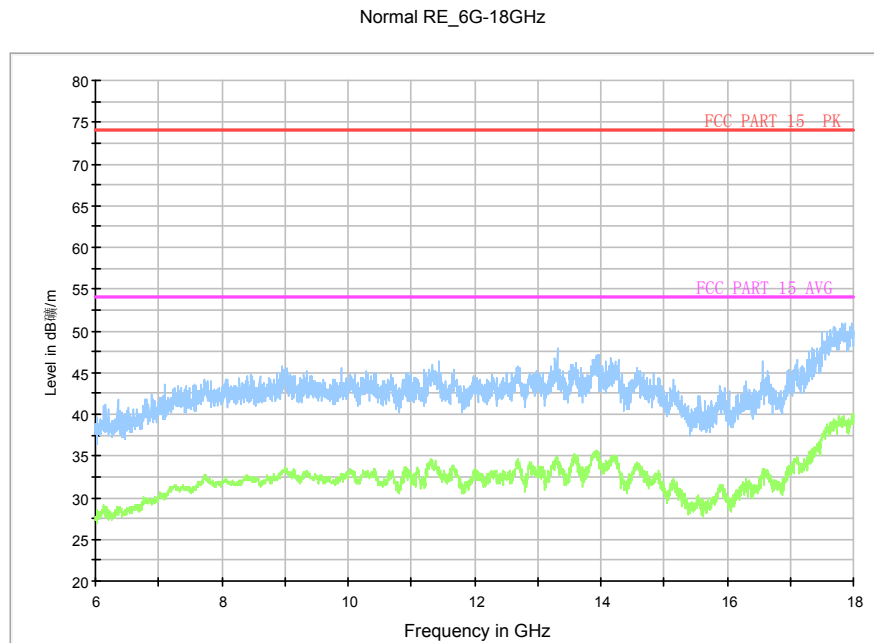


Fig. 58 Radiated Spurious Emission (802.11n-HT40, Ch151, 6 GHz-18 GHz)

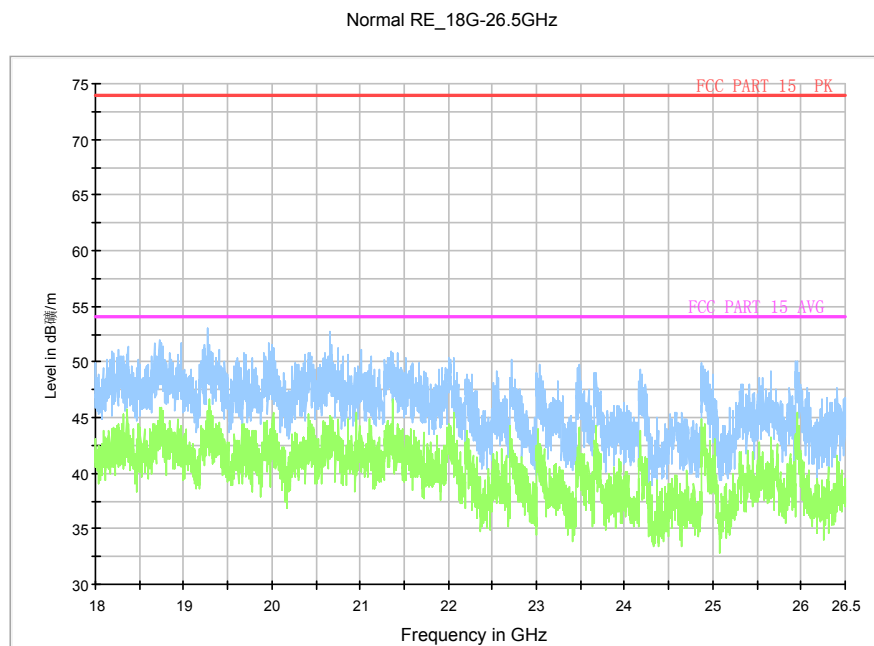


Fig. 59 Radiated Spurious Emission (802.11n-HT40, Ch151, 18 GHz-26.5 GHz)

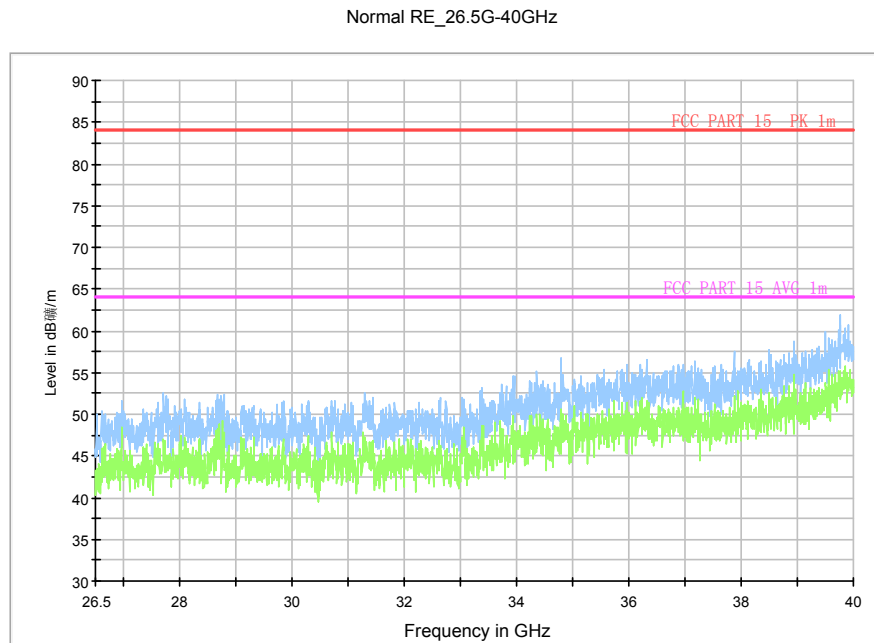


Fig. 60 Radiated emission: 802.11n, (802.11n-HT40, Ch151, 26.5 GHz - 40 GHz)

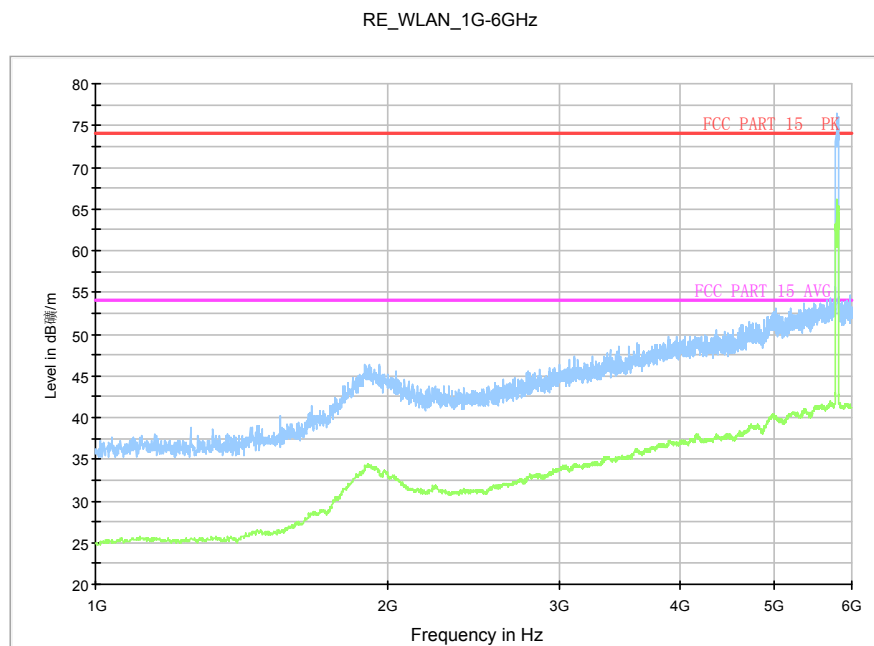


Fig. 61 Radiated Spurious Emission (802.11n-HT40, Ch159 1 GHz-6 GHz)

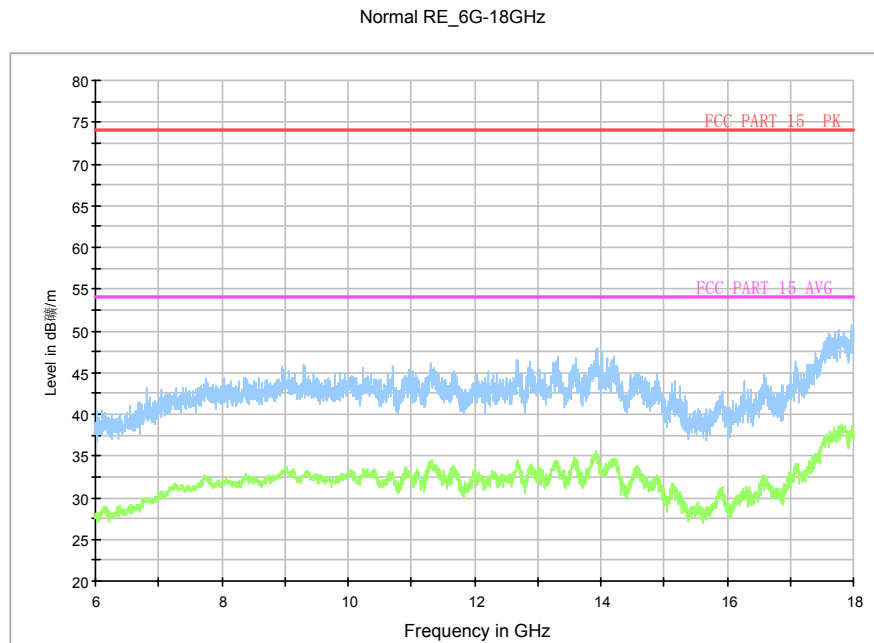


Fig. 62 Radiated Spurious Emission (802.11n-HT40, Ch159, 6 GHz-18 GHz)

A.6. AC Powerline Conducted Emission

Test Condition:

Voltage (V)	Frequency (Hz)
110	60

Measurement uncertainty:

Expanded measurement uncertainty for this test item is $U = 3.2\text{dB}$, $k=2$.

Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		802.11a	Idle	
0.15 to 0.5	66 to 56	Fig.63	Fig.64	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		
		802.11a	Idle	
0.15 to 0.5	56 to 46	Fig.63	Fig.64	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.

The measurement is made according to ANSI C63.10 .

Conclusion: PASS

Test graphs as below:

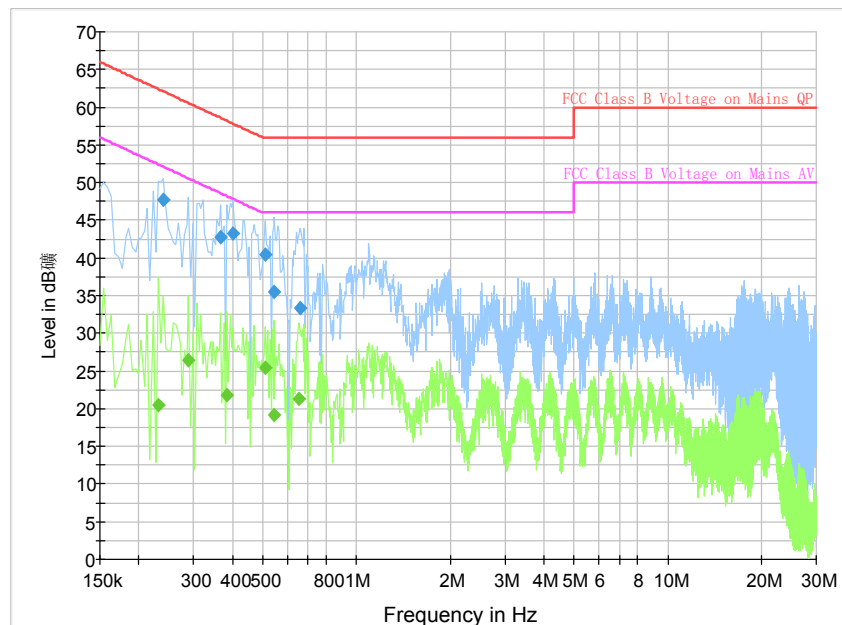


Fig. 63 AC Powerline Conducted Emission-802.11a

Measurement Result 1:

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.240000	47.7	GND	L1	9.8	14.4	62.1
0.366000	42.8	GND	N	9.8	15.8	58.6
0.402000	43.2	GND	L1	9.8	14.6	57.8
0.510000	40.5	GND	L1	9.8	15.5	56.0
0.546000	35.5	GND	L1	9.8	20.5	56.0
0.658500	33.4	GND	N	9.8	22.6	56.0

Measurement Result 2:

Frequency (MHz)	Average (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.231000	20.4	GND	N	9.8	32.0	52.4
0.289500	26.5	GND	L1	9.8	24.1	50.5
0.384000	21.7	GND	N	9.8	26.5	48.2
0.510000	25.4	GND	L1	9.8	20.6	46.0
0.546000	19.1	GND	L1	9.8	26.9	46.0
0.654000	21.2	GND	L1	9.8	24.8	46.0

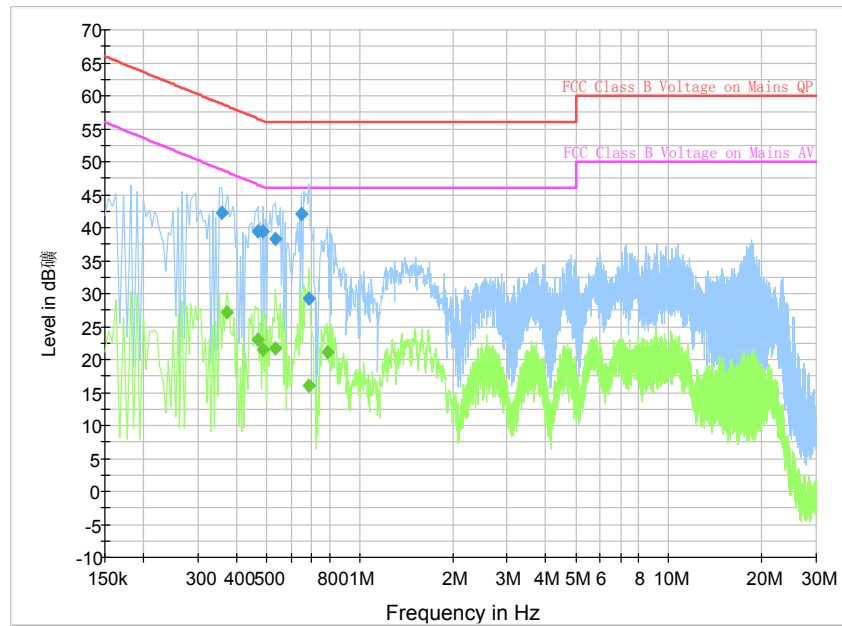


Fig. 64 AC Powerline Conducted Emission-Idle

Measurement Result 1:

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.357000	42.2	GND	L1	9.8	16.6	58.8
0.469500	39.4	GND	N	9.8	17.1	56.5
0.487500	39.4	GND	N	9.8	16.8	56.2
0.532500	38.3	GND	N	9.8	17.7	56.0
0.649500	42.1	GND	L1	9.8	13.9	56.0
0.685500	29.2	GND	N	9.8	26.8	56.0

Measurement Result 2:

Frequency (MHz)	Average (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.370500	27.2	GND	N	9.8	21.3	48.5
0.469500	23.0	GND	L1	9.8	23.5	46.5
0.487500	21.5	GND	L1	9.8	24.7	46.2
0.532500	21.6	GND	N	9.8	24.4	46.0
0.685500	16.0	GND	N	9.8	30.0	46.0
0.784500	21.1	GND	L1	9.8	24.9	46.0

A.7 99% Occupied Channel Bandwidth

Reference : RSS-Gen 4.6.1

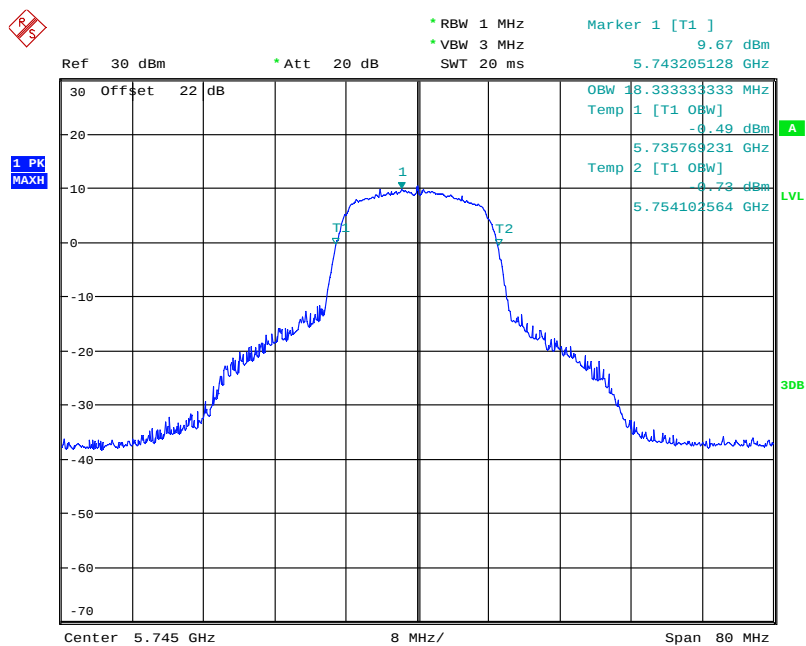
Measurement Uncertainty:

Measurement Uncertainty	60.80Hz
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Measurement Result:

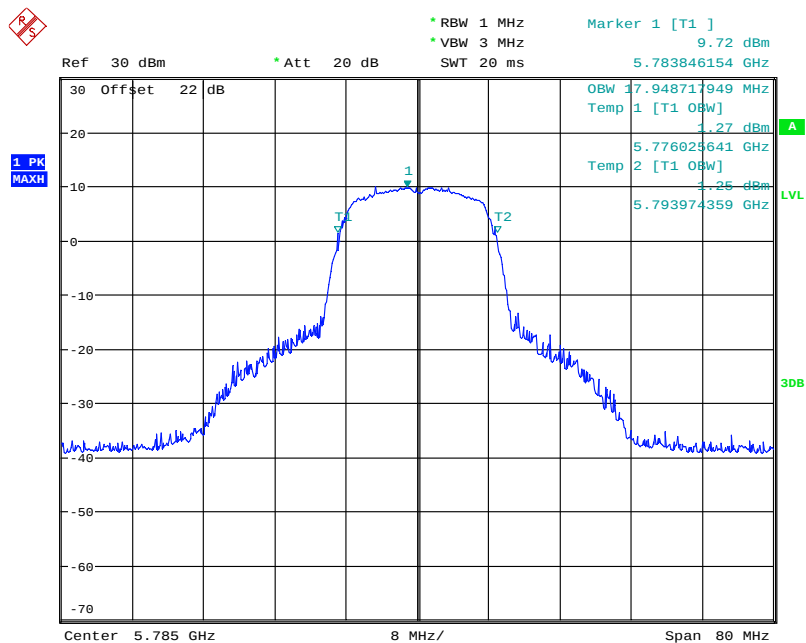
Mode	Channel	Occupied Bandwidth (kHz)		conclusion
802.11a	149	Fig.65	18333	P
	157	Fig.66	17949	P
	165	Fig.67	18077	P
802.11n HT20	149	Fig.68	18846	P
	157	Fig.69	18718	P
	165	Fig.70	18846	P
802.11n HT40	151	Fig.71	37051	P
	159	Fig.72	36667	P

Conclusion: PASS



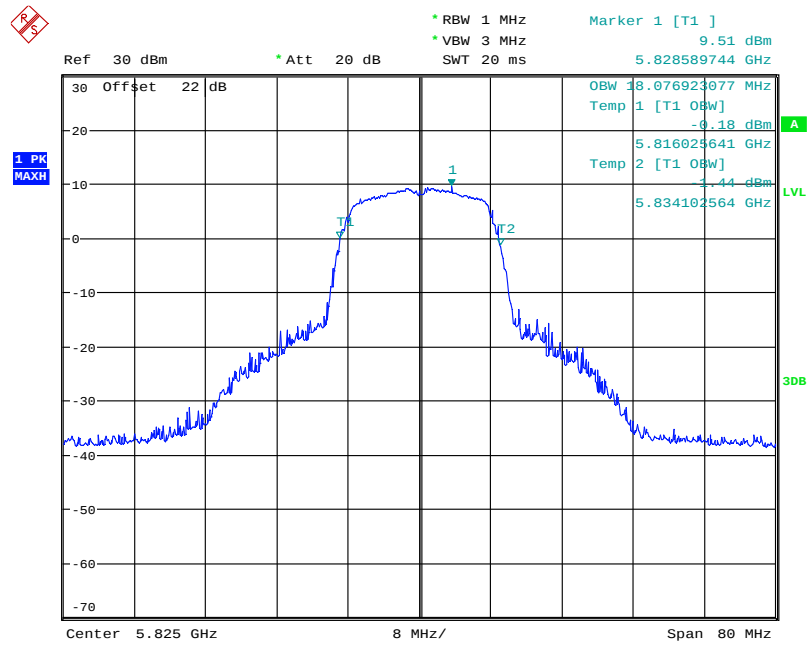
Date: 12.JUN.2014 10:24:09

Fig. 65 99% Occupied Bandwidth: Channel 149, 802.11a



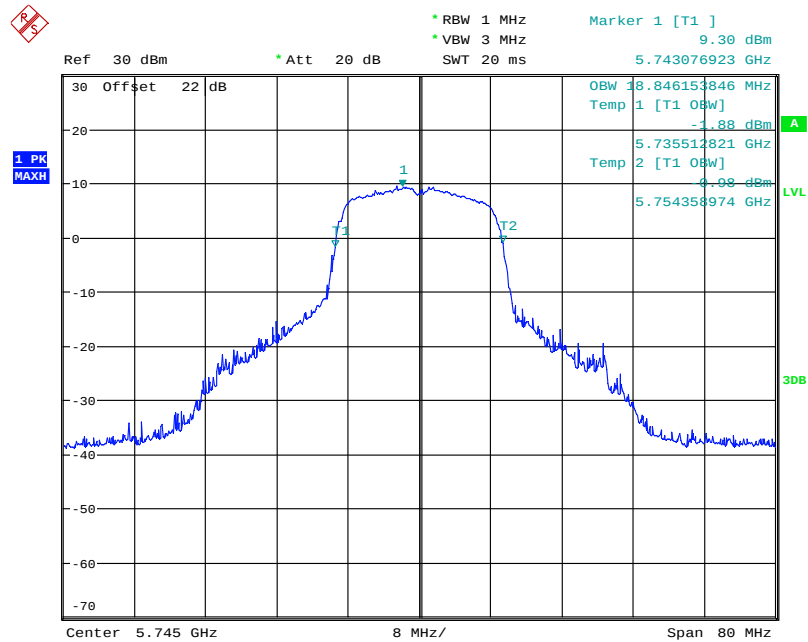
Date: 12.JUN.2014 10:24:44

Fig. 66 99% Occupied Bandwidth: Channel 157, 802.11a



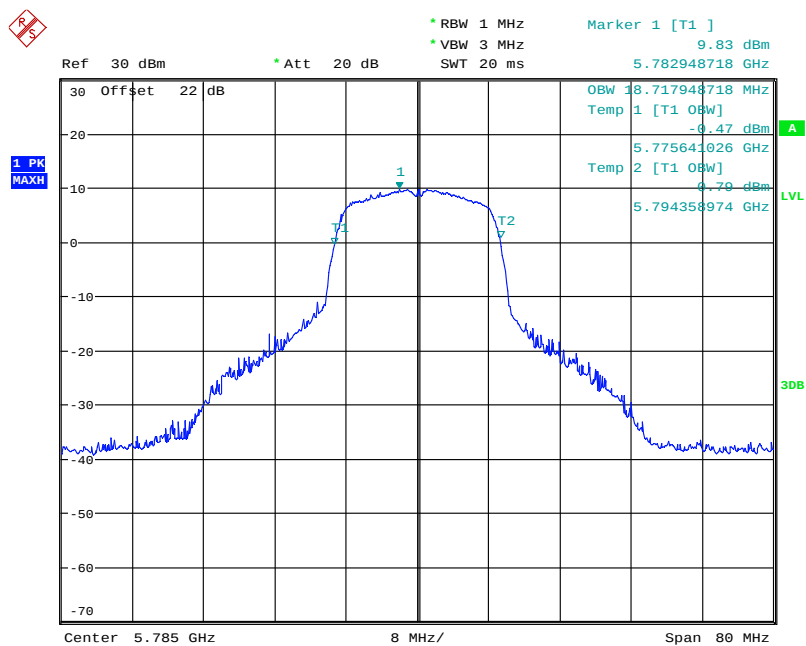
Date: 12.JUN.2014 10:25:12

Fig. 67 99% Occupied Bandwidth: Channel 161, 802.11a



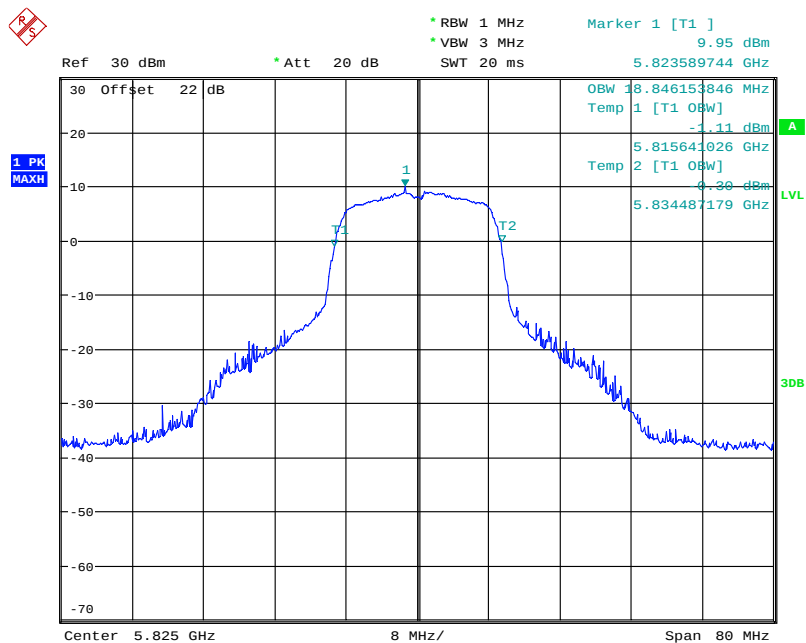
Date: 12.JUN.2014 10:26:32

Fig. 68 99% Occupied Bandwidth: Channel 149, 802.11n-HT20



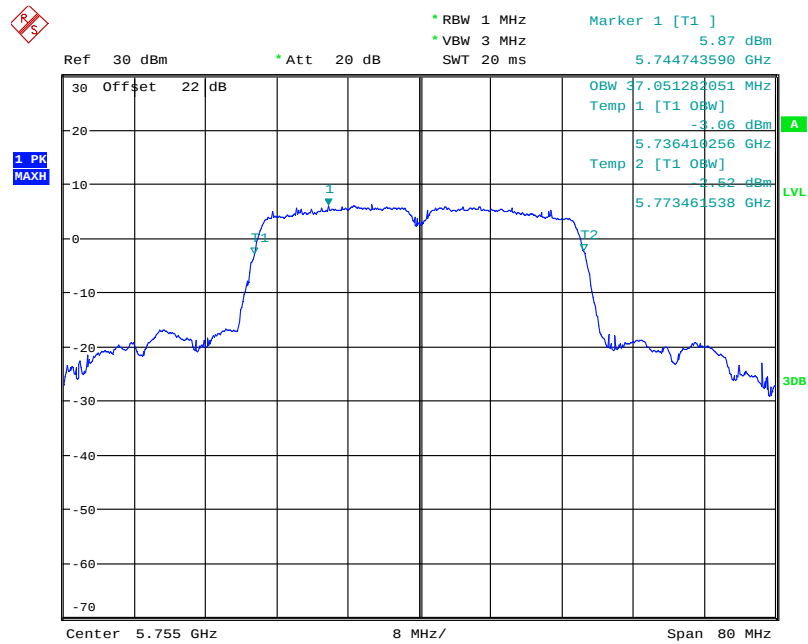
Date: 12.JUN.2014 10:26:05

Fig. 69 99% Occupied Bandwidth: Channel 157, 802.11n-HT20



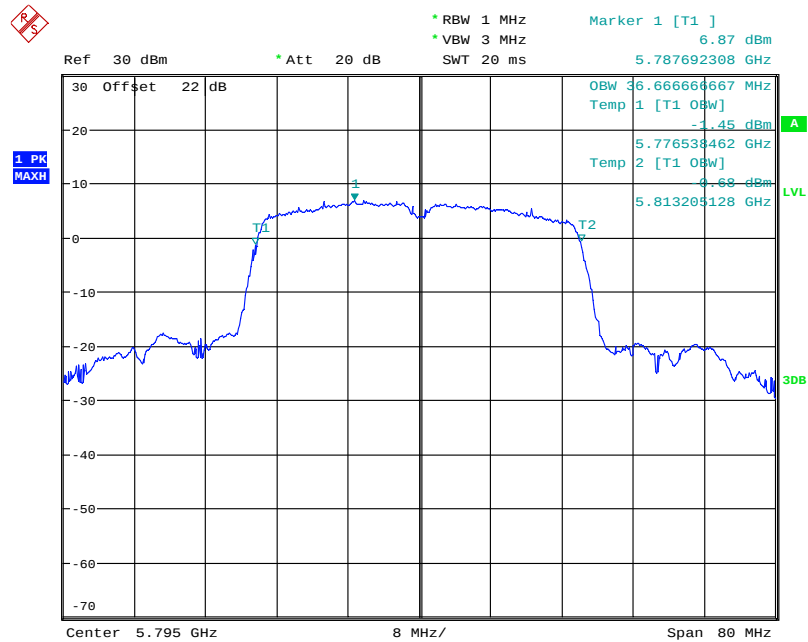
Date: 12.JUN.2014 10:25:38

Fig. 70 99% Occupied Bandwidth: Channel 161, 802.11n-HT20



Date: 12.JUN.2014 10:27:02

Fig. 71 99% Occupied Bandwidth: Channel 151, 802.11n-HT40



Date: 12.JUN.2014 10:27:25

Fig. 72 99% Occupied Bandwidth: Channel 159, 802.11n-HT40

A.8. Spurious Emissions Radiated < 30MHz**Measurement Limit:**

Frequency (MHz)	Field strength(dB μ V/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.73	P

Conclusion: PASS

Test graphs as below:

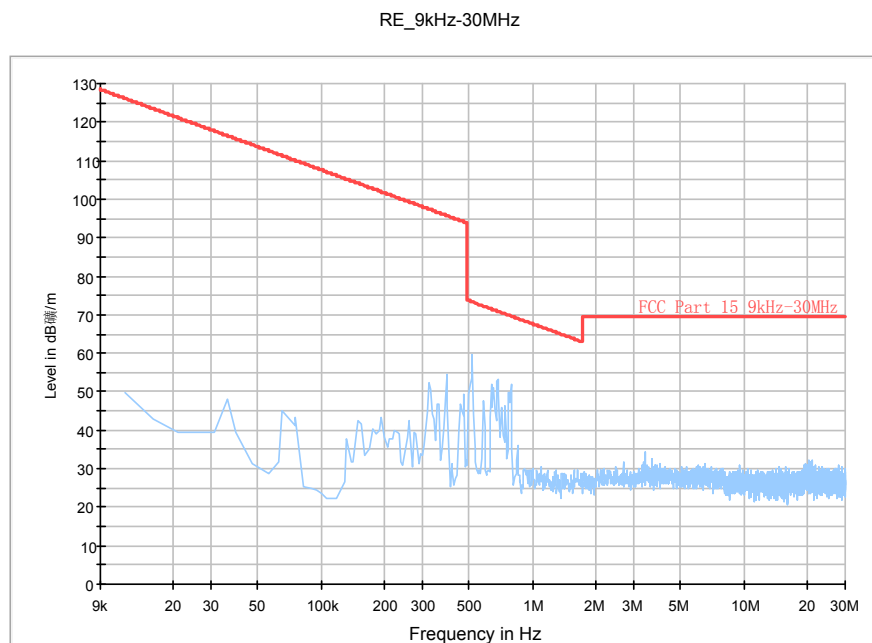


Fig. 73 Radiated Spurious Emission (802.11a, ch157, 9 kHz ~30 MHz)

ANNEX B: PHOTOGRAPHS OF THE TEST SET-UP

Layout of Radiated Spurious Emission Test



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