



FCC PART 15C TEST REPORT No.I19Z62195-IOT06

for

Client name: Xiaomi Communications Co., Ltd.

Product name: Mobile Phone

Model name: M2001J2G/M2001J1G

With

FCC ID: 2AFZZJAG

Hardware Version: P2.2

Software Version: MIUI 11

Issued Date: 2020-03-03

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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I19Z62195-IOT06	Rev.0	1st edition	2020-02-21
I19Z62195-IOT06	Rev.1	Add power spectral density plots	2020-03-03

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1. TEST LABORATORY

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2005 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (CN0066). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

Conducted testing Location: CTTL(huayuan North Road)

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

Radiated testing Location: CTTL(huayuan North Road)

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

1.3. Testing Environment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

1.4. Project data

Testing Start Date: 2019-12-25

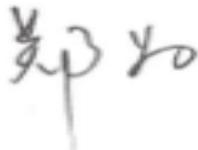
Testing End Date: 2020-02-21

1.5. Signature



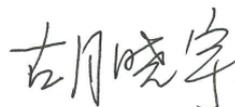
Xie Xiuzhen

(Prepared this test report)



Zheng Wei

(Reviewed this test report)



Hu Xiaoyu

(Approved this test report)



2. CLIENT INFORMATION

2.1. Applicant Information

Company Name: Xiaomi Communications Co., Ltd.
Address: #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District,
Beijing, China, 100085
City: Beijing
Postal Code: 100085
Country: China
Telephone: 010-60606666-8088
Fax: 010-60606666-1101

2.2. Manufacturer Information

Company Name: Xiaomi Communications Co., Ltd.
Address: #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District,
Beijing, China, 100085
City: Beijing
Postal Code: 100085
Country: China
Telephone: 010-60606666-8088
Fax: 010-60606666-1101

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

3.1. About EUT

Description	Mobile Phone
Model name	M2001J2G/ M2001J1G
FCC ID	2AFZZJAG
WLAN Frequency Range	ISM Band: 5725MHz~5850MHz
Type of modulation	OFDM
Voltage	3.85V(M2001J2G)/3.87V(M2001J1G)

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
EUT4	860211040054548	P2.2	MIUI 11
EUT43	860211040054480	P2.2	MIUI 11
EUT2	860211040038590/ 860211040038608	P2.2	MIUI 11

*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	SN	Remarks
AE1	battery	/	/
AE3	Travel charger	/	/
AE6	USB Cable	/	/
AE7	USB Cable	/	/
AE11	battery	/	/
AE13	Travel charger	/	/
AE16	USB Cable	/	/

AE1

Model	BM4N
Manufacturer	/
Capacitance	4680 mAh
Nominal voltage	3.85V

AE3

Model	MDY-11-EL
Manufacturer	Xiaomi Communications Co., Ltd.
Length of cable	/

AE6	
Model	L63312
Manufacturer	/
Length of cable	/
AE7	
Model	K63312
Manufacturer	SU ZHOU KELI SCIENCE&TECHNOLOGY DEVELOPMENT CO.,LTD.
Length of cable	/
AE11	
Model	BM4M
Manufacturer	/
Capacitance	4400 mAh
Nominal voltage	3.87V
AE13	
Model	MDY-11-EC
Manufacturer	Huizhou BYD Electronic Co.,Ltd.
Length of cable	/
AE16	
Model	L63512
Manufacturer	LUXSHARE Precision Industry Co., Ltd
Length of cable	/

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

3.4. General Description

Equipment Under Test (EUT) is a model of 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 and E: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.407 General technical requirements	2018
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
UNII: KDB 789033 D02	General U-NII Test Procedures New Rules v02r01	2017-12
KDB 558074 D01	Federal Communications Commission Office of Engineering and Technology Laboratory Division GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES	2019

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	15.407 (a)	/	P
Peak Power Spectral Density	15.407 (a)	/	P
Occupied 6dB Bandwidth	15.407 (e)	/	P
Band Edges Compliance - Conducted& Radiated	15.407 (b)	/	P
Transmitter Spurious Emission - Conducted	15.407	/	P
Transmitter Spurious Emission - Radiated	15.407, 15.205, 15.209	/	P
AC Powerline Conducted Emission	15.107, 15.207	/	P

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

Terms used in Verdict column

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

6.2. Statements

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

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

For WLAN SISO&MIMO mode, the whole testing has assessed only MIMO mode by referring to their higher conducted power.

6.3. Explanation of re-use of test data

The Equipment Under Test (EUT) model M2001J1G (FCC ID: 2AFZZJAG) is a variant product of M2001J2G (FCC ID: 2AFZZJAG), according to the declaration of changes provided by the applicant and FCC KDB publication 178919 D01.all the test results are derived from initial model. For detail differences between two models please refer the Declaration of Changes document 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°C
Voltage	3.85V(M2001J2G)/3.87V(M2001J1G)
Humidity	44%

7. TEST EQUIPMENTS UTILIZED

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	1 year	2020-05-15
2	Vector Signal Analyzer	FSW67	104051	Rohde & Schwarz	1 year	2020-08-04
3	LISN	ENV216	101200	Rohde & Schwarz	1 year	2020-04-27
4	Test Receiver	ESCI	100344	Rohde & Schwarz	1 year	2020-03-14
5	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100235	R&S	1 year	2020-02-27
2	BiLog Antenna	VULB9163	1222	Schwarzbeck	1 year	2020-03-14
3	Dual-Ridge Waveguide Horn Antenna	3117	00139065	ETS-Lindgren	1 year	2020-11-10
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	1 year	2020-06-18
5	Vector Signal Analyzer	FSV	101047	Rohde & Schwarz	1 year	2020-05-16

8. Measurement Uncertainty

8.1. Transmitter Output Power

Measurement Uncertainty: 0.387dB,k=1.96

8.2. Peak Power Spectral Density

Measurement Uncertainty: 0.705dB,k=1.96

8.3. Occupied 6dB Bandwidth

Measurement Uncertainty: 60.80Hz,k=1.96

8.4. Band Edges Compliance

Measurement Uncertainty : 0.62dB,k=1.96

8.5. Spurious Emissions

Conducted (k=1.96)

Frequency Range	Uncertainty(dB)
$30\text{MHz} \leq f \leq 2\text{GHz}$	1.22
$2\text{GHz} \leq f \leq 3.6\text{GHz}$	1.22
$3.6\text{GHz} \leq f \leq 8\text{GHz}$	1.22
$8\text{GHz} \leq f \leq 12.75\text{GHz}$	1.51
$12.75\text{GHz} \leq f \leq 26\text{GHz}$	1.51
$26\text{GHz} \leq f \leq 40\text{GHz}$	1.59

Radiated (k=2)

Frequency Range	Uncertainty(dB)
9kHz-30MHz	/
$30\text{MHz} \leq f \leq 1\text{GHz}$	5.40
$1\text{GHz} \leq f \leq 18\text{GHz}$	4.32
$18\text{GHz} \leq f \leq 40\text{GHz}$	5.26

8.6. AC Power-line Conducted Emission

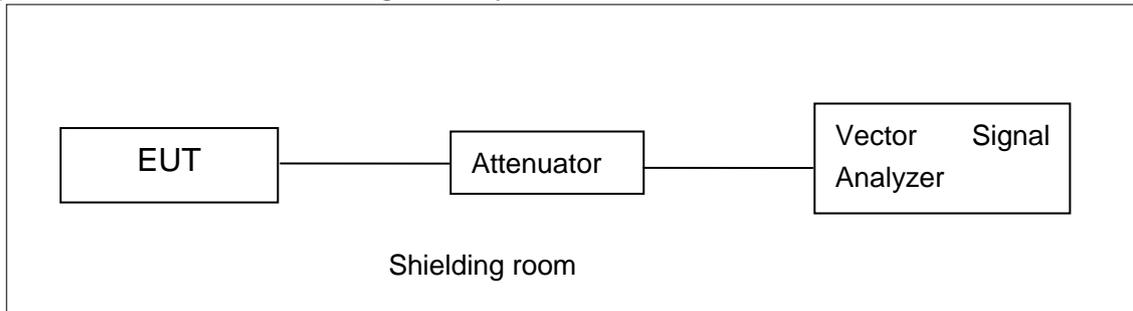
Measurement Uncertainty : 3.08dB,k=2

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

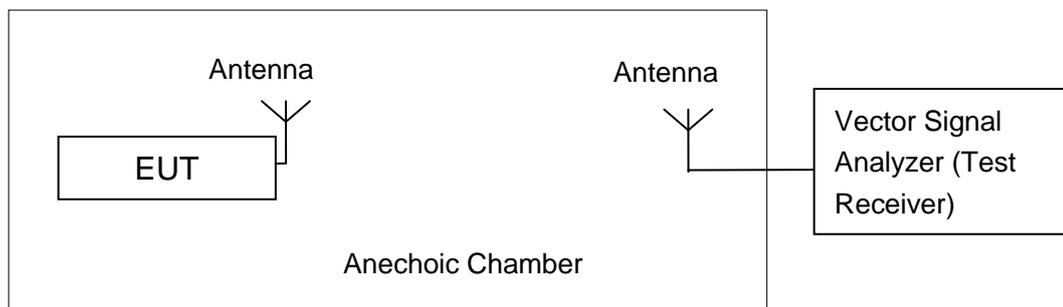


A.1.2. Radiated Emission Measurements

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.

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 Average Output Power

Measurement Limit and Method:

Standard	Limit (dBm)
FCC CRF Part 15.407(a)	< 30

A.2.1 Antenna Gain

Antenna gain is shown in the table below and the value is supplied by the applicant or manufacturer.

Frequency(MHz)	ANT3(dBi)	ANT4(dBi)
5745	-0.6	-0.6
5755	-2.9	-0.7
5775	-2.0	-2.3
5785	-2.8	-2.2
5795	-3.5	-2.2
5825	-2.5	-2.1

A.2.2. Maximum Average Output Power-Conducted

Method of Measurement: See ANSI C63.10-clause 12.3.2.2 Method SA-1

Measurement Results(Duty cycle meets the requirement of 98% and above):

ANT3

802.11a mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		5745MHz(Ch149)	5785MHz(Ch157)	5805MHz(Ch161)
802.11a	6	18.96	19.19	19.17

802.11n-HT20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5805MHz(Ch161)
802.11n(20MHz)	MCS0	17.93	18.34	18.23

802.11ac-HT20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5805MHz(Ch161)
802.11ac(20MHz)	MCS0	17.81	18.24	18.22

802.11n-HT40 mode

Mode	Data Rate (Index)	Test Result (dBm)	
		5755MHz(Ch151)	5795MHz (Ch159)
802.11n(40MHz)	MCS0	17.81	17.80

802.11ac-HT40 mode

Mode	Data Rate (Index)	Test Result (dBm)	
		5755MHz (Ch151)	5795MHz (Ch159)
802.11ac(40MHz)	MCS0	17.62	17.74

802.11ac-HT80 mode

Mode	Data Rate (Index)	Test Result (dBm)
		5775MHz (Ch155)
802.11ac(80MHz)	MCS0	16.81

802.11ax-HE20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5805MHz (Ch161)
802.11ax-HE20 (RU26-left)	MCS0	17.28	17.36	17.49
802.11ax-HE20 (RU26-middle)	MCS0	17.47	17.63	17.72
802.11ax-HE20 (RU26-right)	MCS0	17.42	17.63	17.69
802.11ax-HE20 (RU52-left)	MCS0	17.37	17.45	17.49
802.11ax-HE20 (RU52-middle)	MCS0	17.51	17.62	17.75
802.11ax-HE20 (RU52-right)	MCS0	17.38	17.56	17.69
802.11ax-HE20 (RU106-left)	MCS0	17.61	17.83	17.89
802.11ax-HE20 (RU106-right)	MCS0	17.67	17.89	17.92
802.11ax-HE20 (RU242)	MCS0	17.31	17.52	17.66

802.11ax-HE40 mode

Mode	Data Rate (Index)	Test Result (dBm)	
		5755MHz (Ch151)	5795MHz (Ch159)
802.11ax-HE40 (RU242-left)	MCS0	16.45	16.70
802.11ax-HE40 (RU242-right)	MCS0	16.65	16.89
802.11ax-HE40 (RU484)	MCS0	16.59	16.88

802.11ax-HE80 mode

Mode	Data Rate (Index)	Test Result (dBm)
		5775MHz (Ch155)
802.11ax-HE80 (RU484-left)	MCS0	15.46
802.11ax-HE80 (RU484-right)	MCS0	16.12
802.11ax-HE80 (RU996)	MCS0	15.79

Conclusion: PASS

MIMO&CDD
802.11a mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		5745MHz(Ch149)	5785MHz(Ch157)	5805MHz(Ch161)
802.11a	6	20.76	20.99	20.96

802.11n-HT20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5805MHz(Ch161)
802.11n(20MHz)	MCS0	19.34	19.81	19.86

802.11ac-HT20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5805MHz(Ch161)
802.11ac(20MHz)	MCS0	19.33	19.81	19.84

802.11n-HT40 mode

Mode	Data Rate (Index)	Test Result (dBm)	
		5755MHz(Ch151)	5795MHz (Ch159)
802.11n(40MHz)	MCS0	19.06	19.38

802.11ac-HT40 mode

Mode	Data Rate (Index)	Test Result (dBm)	
		5755MHz (Ch151)	5795MHz (Ch159)
802.11ac(40MHz)	MCS0	19.11	19.35

802.11ac-HT80 mode

Mode	Data Rate (Index)	Test Result (dBm)
		5775MHz (Ch155)
802.11ac(80MHz)	MCS0	18.23

802.11ax-HE20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5805MHz (Ch161)
802.11ax-HE20 (RU26-left)	MCS0	18.88	19.05	19.12
802.11ax-HE20 (RU26-middle)	MCS0	19.07	19.25	19.30
802.11ax-HE20 (RU26-right)	MCS0	18.99	19.22	19.26
802.11ax-HE20 (RU52-left)	MCS0	19.02	19.20	19.24
802.11ax-HE20 (RU52-middle)	MCS0	19.15	19.33	19.39
802.11ax-HE20 (RU52-right)	MCS0	19.07	19.29	19.36
802.11ax-HE20 (RU106-left)	MCS0	19.17	19.34	19.40
802.11ax-HE20 (RU106-right)	MCS0	19.21	19.43	19.47
802.11ax-HE20 (RU242)	MCS0	18.93	19.12	19.27

802.11ax-HE40 mode

Mode	Data Rate (Index)	Test Result (dBm)	
		5755MHz (Ch151)	5795MHz (Ch159)
802.11ax-HE40 (RU242-left)	MCS0	18.17	18.33
802.11ax-HE40 (RU242-right)	MCS0	18.27	18.49
802.11ax-HE40 (RU484)	MCS0	18.26	18.46

802.11ax-HE80 mode

Mode	Data Rate (Index)	Test Result (dBm)
		5775MHz (Ch155)
802.11ax-HE80 (RU484-left)	MCS0	17.30
802.11ax-HE80 (RU484-right)	MCS0	17.58
802.11ax-HE80 (RU996)	MCS0	17.28

Conclusion: PASS

A.3. Peak Power Spectral Density

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.407(a)	< 30 dBm/500 kHz

The measurement is made according to ANSI C63.10 and KDB789033 D02

Measurement Uncertainty:

Measurement Uncertainty	0.75dB
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Measurement Results:

ANT3

Mode	Channel	Power Spectral Density (dBm/500kHz)	Conclusion
802.11a	149	7.58	P
	157	7.39	P
	161	5.78	P
802.11n HT20	149	6.36	P
	157	6.52	P
	161	4.55	P
802.11ac HT20	149	6.56	P
	157	6.60	P
	161	4.79	P
802.11n HT40	151	3.06	P
	159	3.06	P
802.11ac HT40	151	2.77	P
	159	3.89	P
802.11ac HT80	155	-0.88	P
802.11ax-HE20 (RU26-left)	149	11.35	P
	157	12.19	P
	161	12.17	P
802.11ax-HE20 (RU26-middle)	149	11.11	P
	157	11.62	P
	161	11.46	P
802.11ax-HE20 (RU26-right)	149	11.31	P
	157	12.09	P
	161	11.72	P
802.11ax-HE20 (RU52-left)	149	8.53	P
	157	8.79	P
	161	9.61	P
802.11ax-HE20 (RU52-middle)	149	8.09	P
	157	8.63	P
	161	9.33	P
802.11ax-HE20	149	8.27	P

(RU52-right)	157	9.18	P
	161	8.83	P
802.11ax-HE20 (RU106-left)	149	5.91	P
	157	6.03	P
	161	6.52	P
802.11ax-HE20 (RU106-right)	149	5.71	P
	157	6.65	P
	161	6.88	P
802.11ax-HE20 (RU242)	149	4.79	P
	157	5.26	P
	161	5.37	P
802.11ax-HE40 (RU242-left)	151	2.31	P
	159	2.53	P
802.11ax-HE40 (RU242-right)	151	2.44	P
	159	2.39	P
802.11ax-HE40 (RU484)	151	0.60	P
	159	0.22	P
802.11ax-HE80 (RU484-left)	155	-2.55	P
802.11ax-HE80 (RU484-right)	155	-1.39	P
802.11ax-HE80 (RU996)	155	-3.54	P

Conclusion: PASS

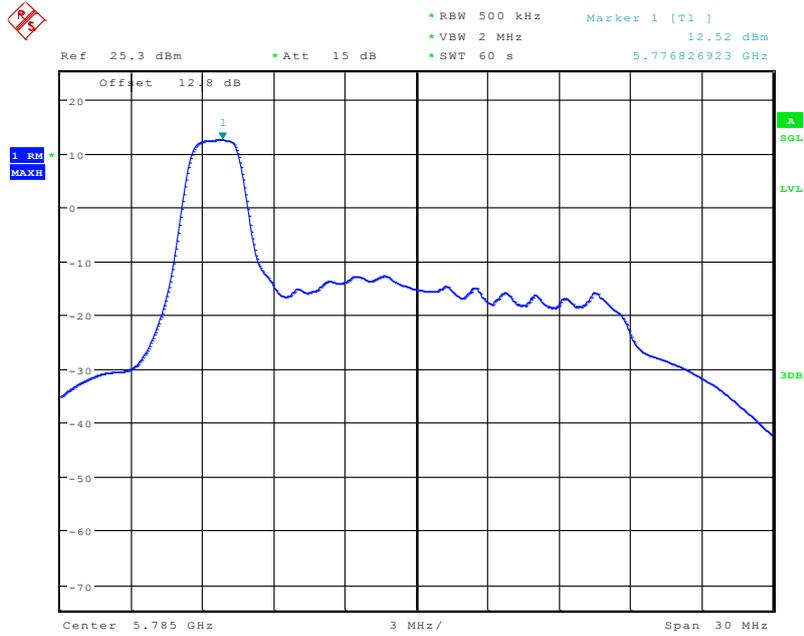
MIMO&CDD

Mode	Channel	Power Spectral Density (dBm/500kHz)	Conclusion
802.11a	149	9.53	P
	157	9.86	P
	161	8.17	P
802.11n (HT20)	149	8.61	P
	157	8.67	P
	161	6.67	P
802.11ac (HT20)	149	8.50	P
	157	8.83	P
	161	6.65	P
802.11n (HT40)	151	4.84	P
	159	4.90	P
802.11ac (HT40)	151	5.14	P
	159	5.50	P
802.11ac(HT80)	155	1.50	P
802.11ax-HE20	149	13.71	P

(RU26-left)	157	14.66	P
	161	14.28	P
802.11ax-HE20 (RU26-middle)	149	13.38	P
	157	13.94	P
	161	14.18	P
802.11ax-HE20 (RU26-right)	149	13.26	P
	157	14.30	P
	161	14.10	P
802.11ax-HE20 (RU52-left)	149	10.70	P
	157	11.11	P
	161	11.77	P
802.11ax-HE20 (RU52-middle)	149	10.30	P
	157	10.77	P
	161	11.40	P
802.11ax-HE20 (RU52-right)	149	10.54	P
	157	11.44	P
	161	11.32	P
802.11ax-HE20 (RU106-left)	149	7.77	P
	157	8.38	P
	161	8.90	P
802.11ax-HE20 (RU106-right)	149	7.85	P
	157	8.81	P
	161	9.00	P
802.11ax-HE20 (RU242)	149	6.39	P
	157	7.07	P
	161	7.54	P
802.11ax-HE40 (RU242-left)	151	4.06	P
	159	4.10	P
	151	3.97	P
	159	4.32	P
802.11ax-HE40 (RU484)	151	2.04	P
	159	2.22	P
802.11ax-HE80 (RU484-left)	155	-0.08	P
802.11ax-HE80 (RU484-right)	155	0.28	P
802.11ax-HE80 (RU996)	155	-1.51	P

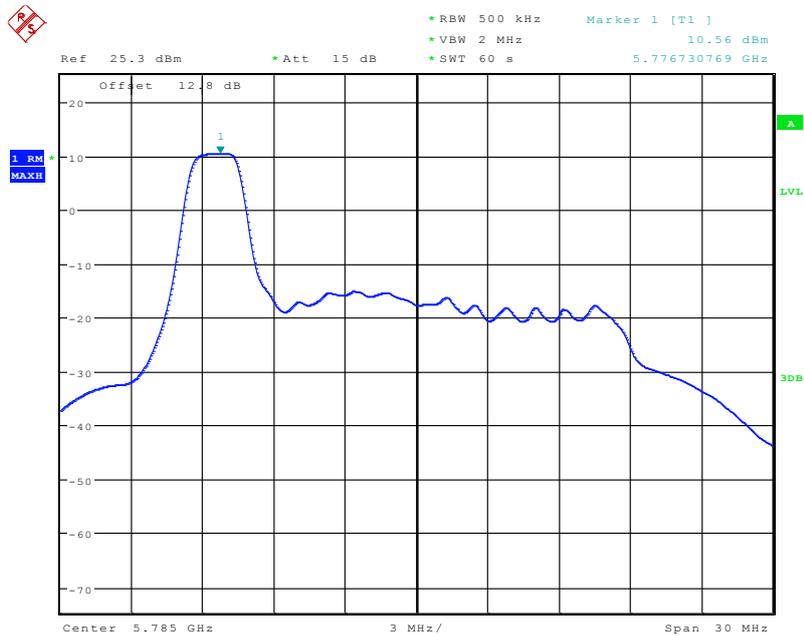
Conclusion: Pass

The maximal result of the power spectral density is as follow (802.11ax-HE20 RU26-left ch157):



Date: 3.MAR.2020 11:25:37

Fig.1 ANT3 802.11ax-HE20 RU26-left ch157



Date: 3.MAR.2020 11:53:15

Fig.2 ANT4 802.11ax-HE20 RU26-left ch157

A.4. Occupied 6dB Bandwidth

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.407 (e)	≥ 500

The measurement is made according to KDB789033 D02 .

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz
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Measurement Result:

MIMO&CDD

ANT3

Mode	Channel	Occupied 6dB Bandwidth (MHz)	conclusion
802.11a	149	15.75	P
	157	16.05	P
	161	16.05	P
802.11n (HT20)	149	16.00	P
	157	16.50	P
	161	16.80	P
802.11ac (HT20)	149	15.60	P
	157	16.30	P
	161	16.90	P
802.11n (HT40)	151	35.04	P
	159	35.12	P
802.11ac (HT40)	151	35.04	P
	159	35.12	P
802.11ac(HT80)	155	75.36	P
802.11ax-HE20 (RU242)	149	18.25	P
	157	18.60	P
	161	18.20	P
802.11ax-HE40 (RU484)	151	38.08	P
	159	38.08	P
802.11ax-HE80 (RU996)	155	77.92	P

Conclusion: PASS

ANT4

Mode	Channel	Occupied 6dB Bandwidth (MHz)	conclusion
802.11a	149	16.30	P
	157	16.30	P
	161	16.30	P
802.11n (HT20)	149	16.90	P
	157	16.80	P
	161	16.55	P
802.11ac (HT20)	149	16.90	P
	157	16.90	P
	161	16.80	P
802.11n (HT40)	151	34.96	P
	159	35.36	P
802.11ac (HT40)	151	34.64	P
	159	35.52	P
802.11ac(HT80)	155	73.44	P
802.11ax-HE20 (RU242)	149	18.55	P
	157	18.65	P
	161	18.70	P
802.11ax-HE40 (RU484)	151	38.16	P
	159	38.16	P
802.11ax-HE80 (RU996)	155	77.92	P

Conclusion: PASS

A.5. 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)
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:

MIMO&CDD

ANT3

802.11a mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11a	149	30 MHz ~ 1 GHz	Fig.3	P
		1 GHz ~ 12 GHz	Fig.4	P
		12 GHz ~ 25 GHz	Fig.5	P
		25 GHz ~ 40 GHz	Fig.6	P
	157	30 MHz ~ 1 GHz	Fig.7	P
		1 GHz ~ 12 GHz	Fig.8	P
		12 GHz ~ 25 GHz	Fig.9	P
		25 GHz ~ 40 GHz	Fig.10	P
	161	30 MHz ~ 1 GHz	Fig.11	P
		1 GHz ~ 12 GHz	Fig.12	P
		12 GHz ~ 25 GHz	Fig.13	P

		25 GHz ~ 40 GHz	Fig.14	P
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802.11n-HT20 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	149	30 MHz ~ 1 GHz	Fig.15	P
		1 GHz ~ 12 GHz	Fig.16	P
		12 GHz ~ 25 GHz	Fig.17	P
		25 GHz ~ 40 GHz	Fig.18	P
	157	30 MHz ~ 1 GHz	Fig.19	P
		1 GHz ~ 12 GHz	Fig.20	P
		12 GHz ~ 25 GHz	Fig.21	P
		25 GHz ~ 40 GHz	Fig.22	P
	161	30 MHz ~ 1 GHz	Fig.23	P
		1 GHz ~ 12 GHz	Fig.24	P
		12 GHz ~ 25 GHz	Fig.25	P
		25 GHz ~ 40 GHz	Fig.26	P

802.11ac-HT20 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11ac (HT20)	149	30 MHz ~ 1 GHz	Fig.27	P
		1 GHz ~ 12 GHz	Fig.28	P
		12 GHz ~ 25 GHz	Fig.29	P
		25 GHz ~ 40 GHz	Fig.30	P
	157	30 MHz ~ 1 GHz	Fig.31	P
		1 GHz ~ 12 GHz	Fig.32	P
		12 GHz ~ 25 GHz	Fig.33	P
		25 GHz ~ 40 GHz	Fig.34	P
	161	30 MHz ~ 1 GHz	Fig.35	P
		1 GHz ~ 12 GHz	Fig.36	P
		12 GHz ~ 25 GHz	Fig.37	P
		25 GHz ~ 40 GHz	Fig.38	P

802.11n-HT40 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT40)	151	30 MHz ~ 1 GHz	Fig.39	P
		1 GHz ~ 12 GHz	Fig.40	P
		12 GHz ~ 25 GHz	Fig.41	P
		25 GHz ~ 40 GHz	Fig.42	P
	159	30 MHz ~ 1 GHz	Fig.43	P
		1 GHz ~ 12 GHz	Fig.44	P
		12 GHz ~ 25 GHz	Fig.45	P
		25 GHz ~ 40 GHz	Fig.46	P

802.11ac-HT40 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11ac (HT40)	151	30 MHz ~ 1 GHz	Fig.47	P
		1 GHz ~ 12 GHz	Fig.48	P
		12 GHz ~ 25 GHz	Fig.49	P
		25 GHz ~ 40 GHz	Fig.50	P
	159	30 MHz ~ 1 GHz	Fig.51	P
		1 GHz ~ 12 GHz	Fig.52	P
		12 GHz ~ 25 GHz	Fig.53	P
		25 GHz ~ 40 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 ~ 12 GHz	Fig.56	P
		12 GHz ~ 25 GHz	Fig.57	P
		25 GHz ~ 40 GHz	Fig.58	P

802.11ax-HE20 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11ax-HE20 (RU106-right)	149	30 MHz ~ 1 GHz	Fig.59	P
		1 GHz ~ 40 GHz	Fig.60	P
	157	30 MHz ~ 1 GHz	Fig.61	P
		1 GHz ~ 40 GHz	Fig.62	P
	161	30 MHz ~ 1 GHz	Fig.63	P
		1 GHz ~ 40 GHz	Fig.64	P

802.11ax-HE40 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11ax-HE40 (RU242-right)	151	30 MHz ~ 1 GHz	Fig.65	P
		1 GHz ~ 40 GHz	Fig.66	P
	159	30 MHz ~ 1 GHz	Fig.67	P
		1 GHz ~ 40 GHz	Fig.68	P

802.11ax-HE40 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11ax-HE40 (RU484-right)	155	30 MHz ~ 1 GHz	Fig.69	P
		1 GHz ~ 40 GHz	Fig.70	P

The test of 11ax Transmitter Spurious Emissions need choose the configuration with the highest power for each bandwidth.

Conclusion: PASS

ANT4
802.11a mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11a	149	30 MHz ~ 1 GHz	Fig.71	P
		1 GHz ~ 12 GHz	Fig.72	P
		12 GHz ~ 25 GHz	Fig.73	P
		25 GHz ~ 40 GHz	Fig.74	P
	157	30 MHz ~ 1 GHz	Fig.75	P
		1 GHz ~ 12 GHz	Fig.76	P
		12 GHz ~ 25 GHz	Fig.77	P
		25 GHz ~ 40 GHz	Fig.78	P
	161	30 MHz ~ 1 GHz	Fig.79	P
		1 GHz ~ 12 GHz	Fig.80	P
		12 GHz ~ 25 GHz	Fig.81	P
		25 GHz ~ 40 GHz	Fig.82	P

802.11n-HT20 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	149	30 MHz ~ 1 GHz	Fig.83	P
		1 GHz ~ 12 GHz	Fig.84	P
		12 GHz ~ 25 GHz	Fig.85	P
		25 GHz ~ 40 GHz	Fig.86	P
	157	30 MHz ~ 1 GHz	Fig.87	P
		1 GHz ~ 12 GHz	Fig.88	P
		12 GHz ~ 25 GHz	Fig.89	P
		25 GHz ~ 40 GHz	Fig.90	P
	161	30 MHz ~ 1 GHz	Fig.91	P
		1 GHz ~ 12 GHz	Fig.92	P
		12 GHz ~ 25 GHz	Fig.93	P
		25 GHz ~ 40 GHz	Fig.94	P

802.11ac-HT20 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11ac (HT20)	149	30 MHz ~ 1 GHz	Fig.95	P
		1 GHz ~ 12 GHz	Fig.96	P
		12 GHz ~ 25 GHz	Fig.97	P
		25 GHz ~ 40 GHz	Fig.98	P
	157	30 MHz ~ 1 GHz	Fig.99	P
		1 GHz ~ 12 GHz	Fig.100	P
		12 GHz ~ 25 GHz	Fig.101	P
		25 GHz ~ 40 GHz	Fig.102	P
	161	30 MHz ~ 1 GHz	Fig.103	P
		1 GHz ~ 12 GHz	Fig.104	P

		12 GHz ~ 25 GHz	Fig.105	P
		25 GHz ~ 40 GHz	Fig.106	P

802.11n-HT40 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT40)	151	30 MHz ~ 1 GHz	Fig.107	P
		1 GHz ~ 12 GHz	Fig.108	P
		12 GHz ~ 25 GHz	Fig.109	P
		25 GHz ~ 40 GHz	Fig.110	P
	159	30 MHz ~ 1 GHz	Fig.111	P
		1 GHz ~ 12 GHz	Fig.112	P
		12 GHz ~ 25 GHz	Fig.113	P
		25 GHz ~ 40 GHz	Fig.114	P

802.11ac-HT40 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11ac (HT40)	151	30 MHz ~ 1 GHz	Fig.115	P
		1 GHz ~ 12 GHz	Fig.116	P
		12 GHz ~ 25 GHz	Fig.117	P
		25 GHz ~ 40 GHz	Fig.118	P
	159	30 MHz ~ 1 GHz	Fig.119	P
		1 GHz ~ 12 GHz	Fig.120	P
		12 GHz ~ 25 GHz	Fig.121	P
		25 GHz ~ 40 GHz	Fig.122	P

802.11ac-HT80 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11ac (HT80)	155	30 MHz ~ 1 GHz	Fig.123	P
		1 GHz ~ 12 GHz	Fig.124	P
		12 GHz ~ 25 GHz	Fig.125	P
		25 GHz ~ 40 GHz	Fig.126	P

802.11ax-HE20 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11ax-HE20 (RU106-right)	149	30 MHz ~ 1 GHz	Fig.127	P
		1 GHz ~ 40 GHz	Fig.128	P
	157	30 MHz ~ 1 GHz	Fig.129	P
		1 GHz ~ 40 GHz	Fig.130	P
	161	30 MHz ~ 1 GHz	Fig.131	P
		1 GHz ~ 40 GHz	Fig.132	P

802.11ax-HE40 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11ax-HE40 (RU242-right)	151	30 MHz ~ 1 GHz	Fig.133	P
		1 GHz ~ 40 GHz	Fig.134	P
	159	30 MHz ~ 1 GHz	Fig.135	P
		1 GHz ~ 40 GHz	Fig.136	P

802.11ax-HE40 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11ax-HE40 (RU484-right)	155	30 MHz ~ 1 GHz	Fig.137	P
		1 GHz ~ 40 GHz	Fig.138	P

The test of 11ax Transmitter Spurious Emissions need choose the configuration with the highest power for each bandwidth.

Conclusion: PASS

Test graphs as below:

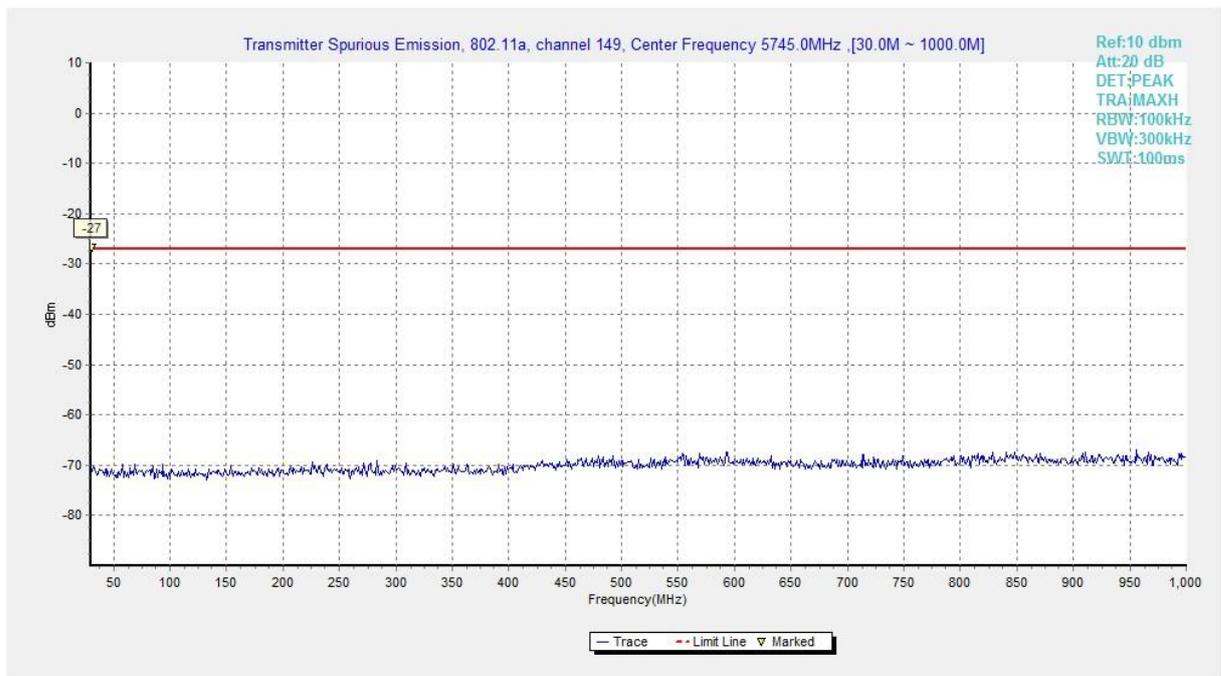


Fig. 3 Conducted Spurious Emission (802.11a, Ch149, 30 MHz-1 GHz)

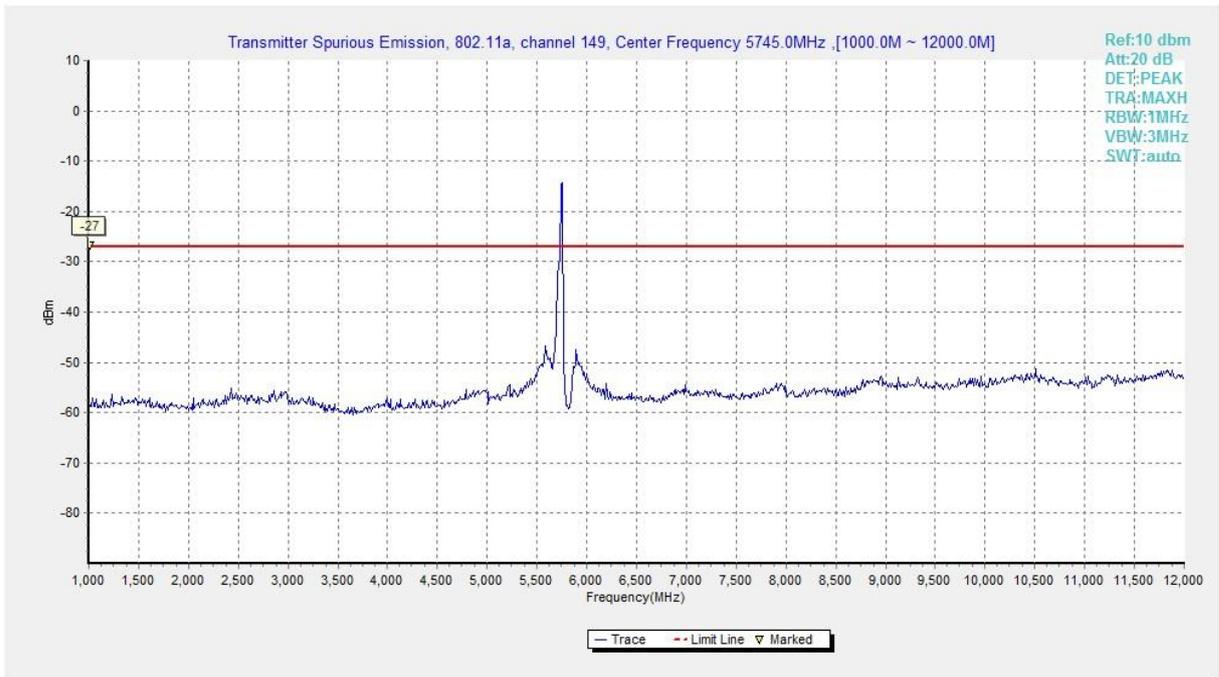


Fig. 4 Conducted Spurious Emission (802.11a, Ch149, 1 GHz -12 GHz)

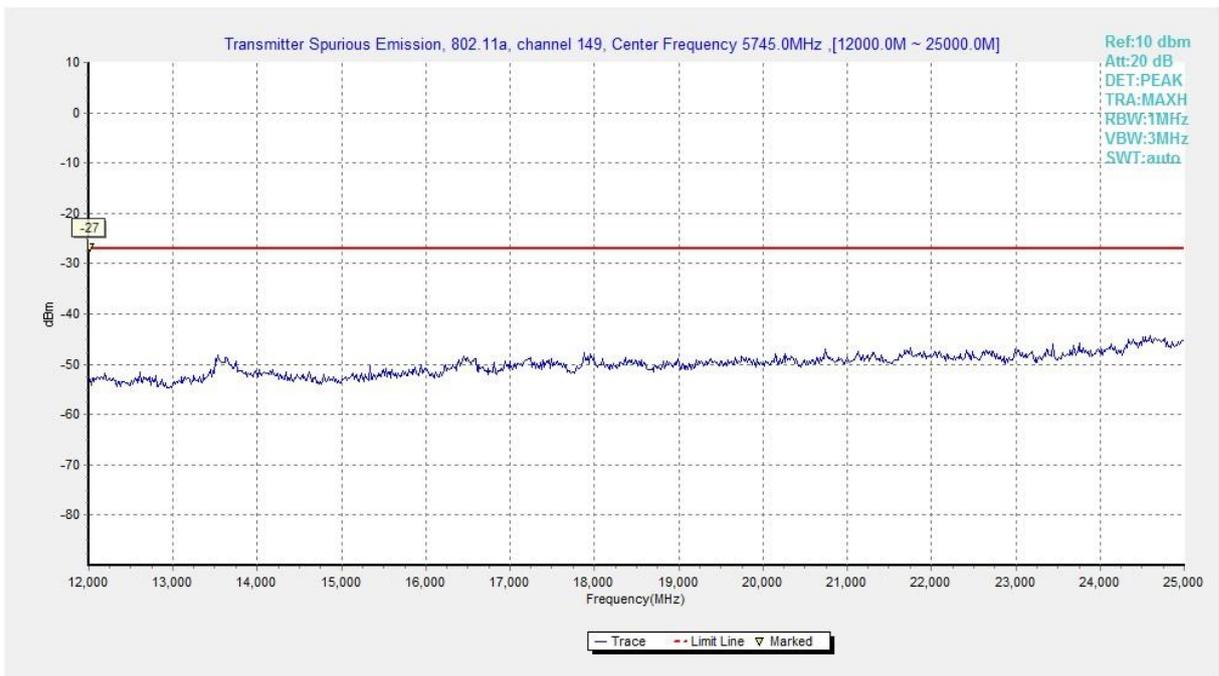


Fig. 5 Conducted Spurious Emission (802.11a, Ch149, 12 GHz-25 GHz)

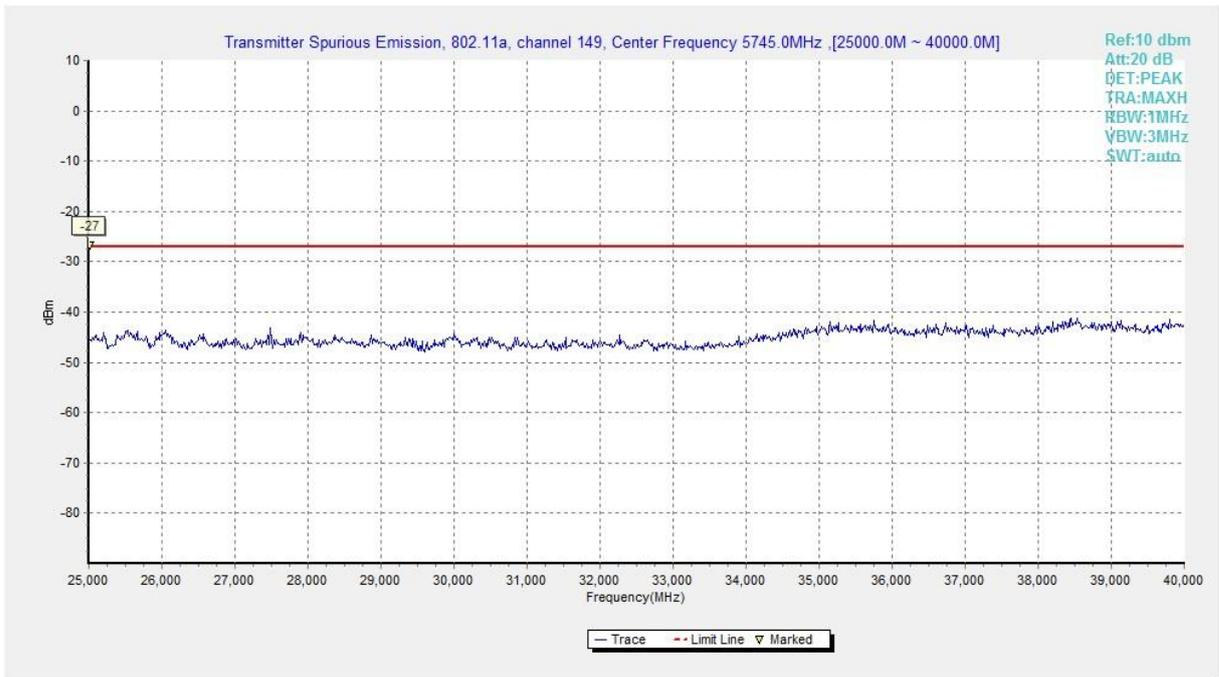


Fig. 6 Conducted Spurious Emission (802.11a, Ch149, 25 GHz-40 GHz)

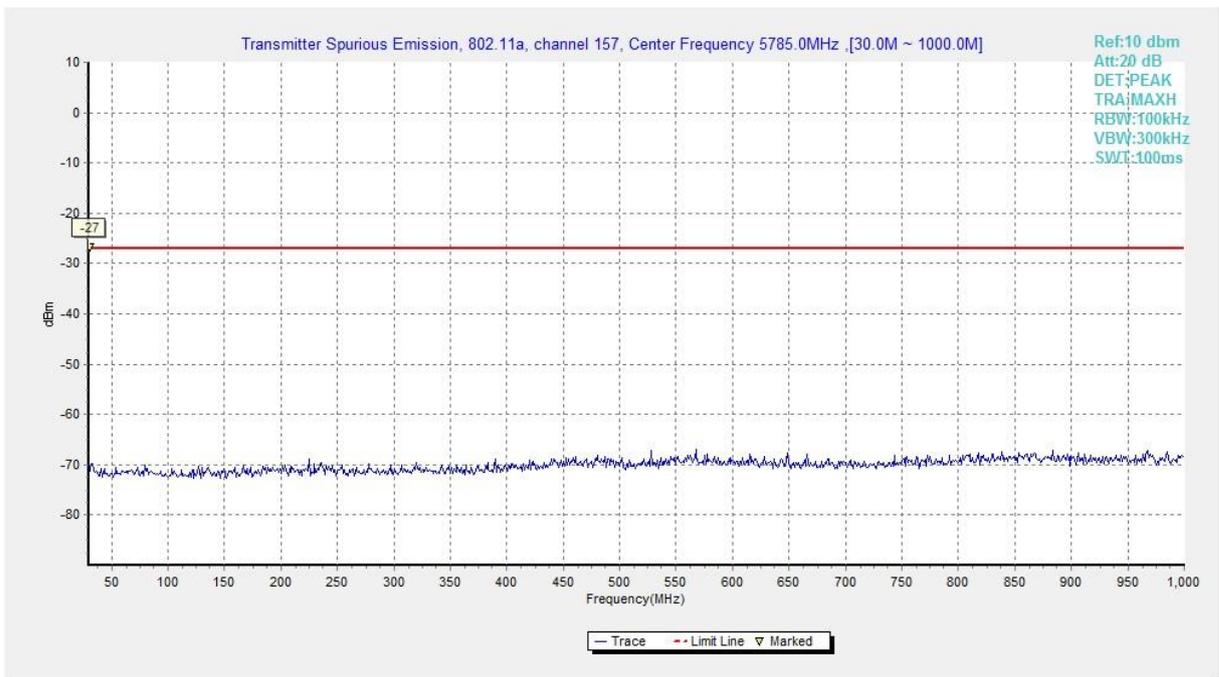


Fig. 7 Conducted Spurious Emission (802.11a, Ch157, 30 MHz-1 GHz)

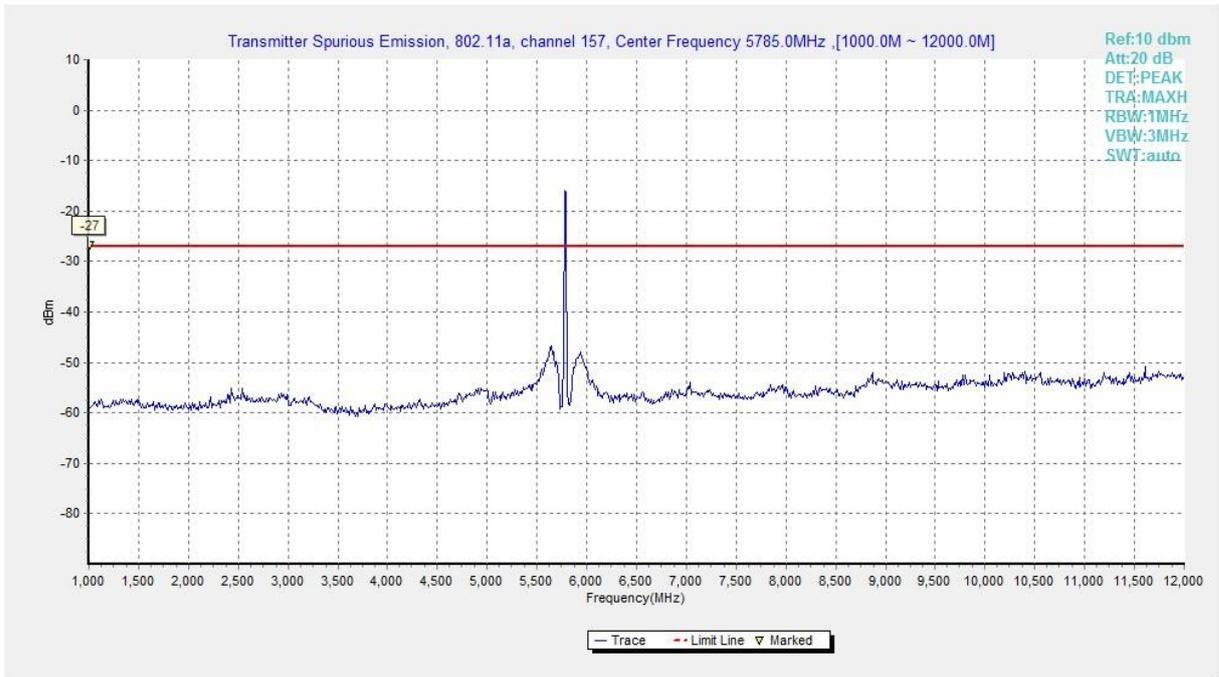


Fig. 8 Conducted Spurious Emission (802.11a, Ch157, 1 GHz -12 GHz)

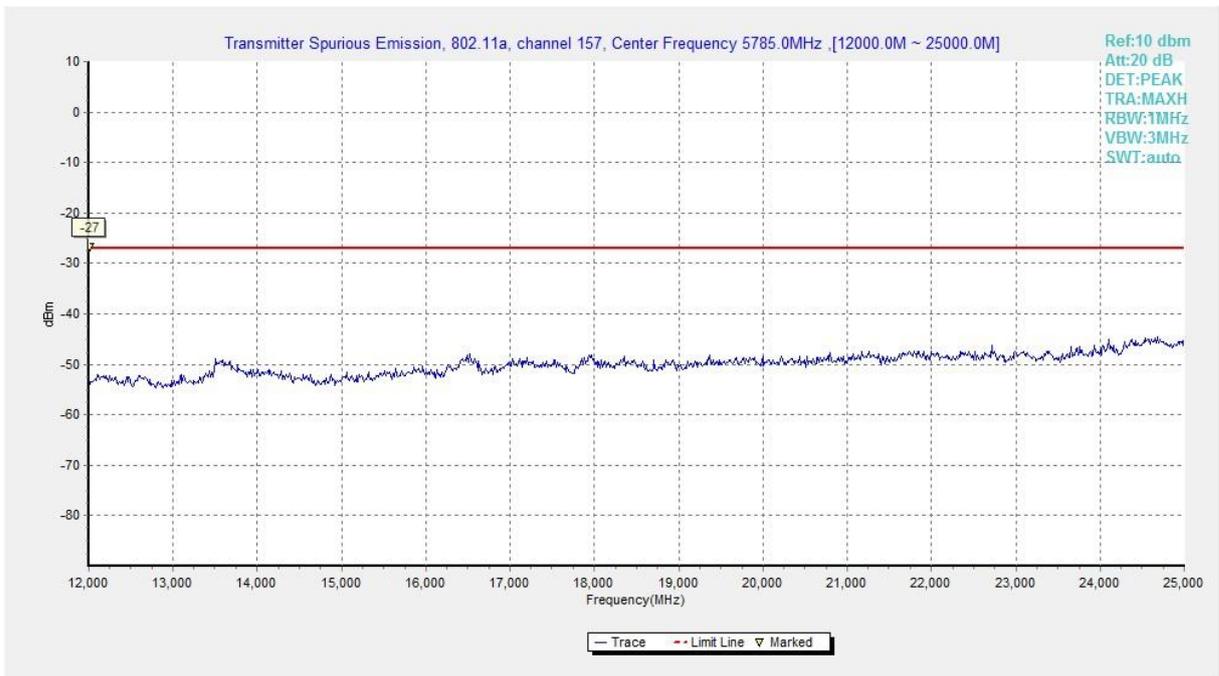


Fig. 9 Conducted Spurious Emission (802.11a, Ch157, 12 GHz-25 GHz)

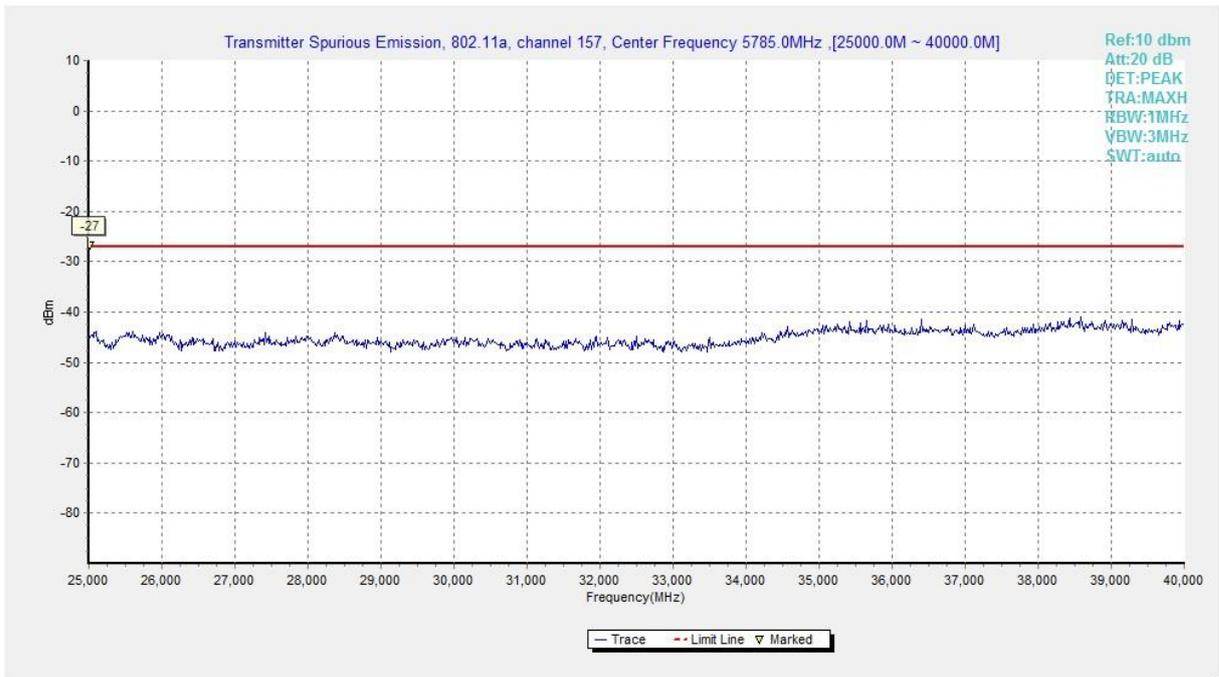


Fig. 10 Conducted Spurious Emission (802.11a, Ch157, 25 GHz-40 GHz)

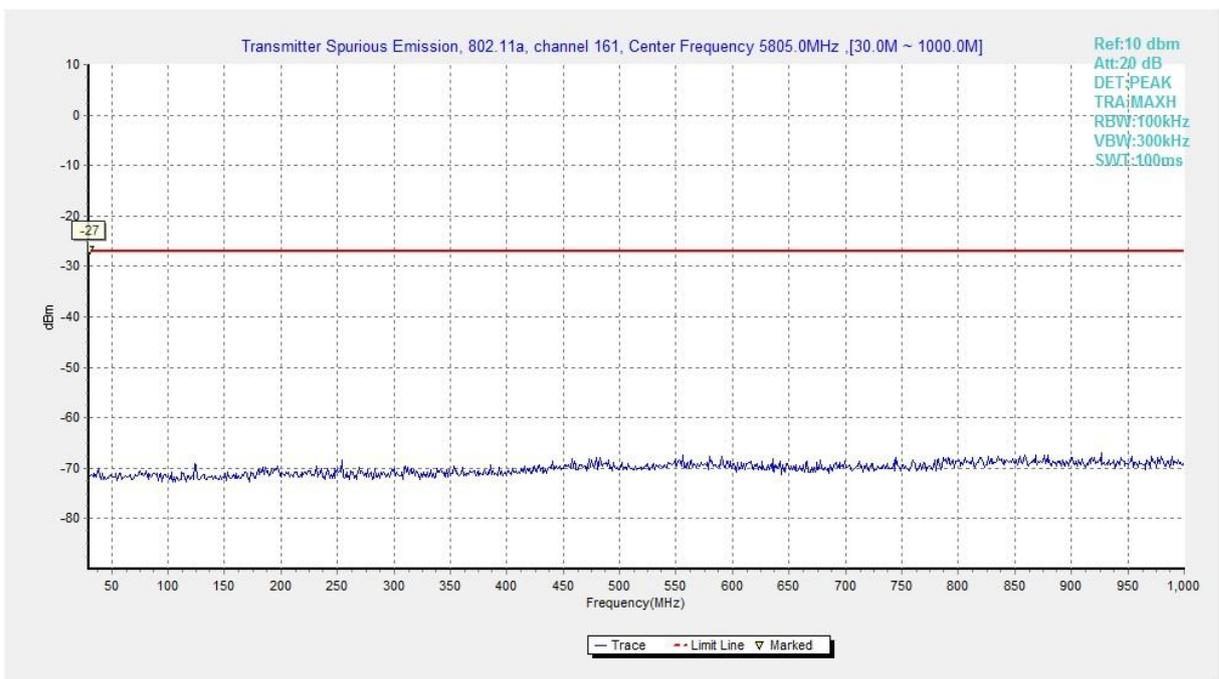


Fig. 11 Conducted Spurious Emission (802.11a, Ch161, 30 MHz-1 GHz)

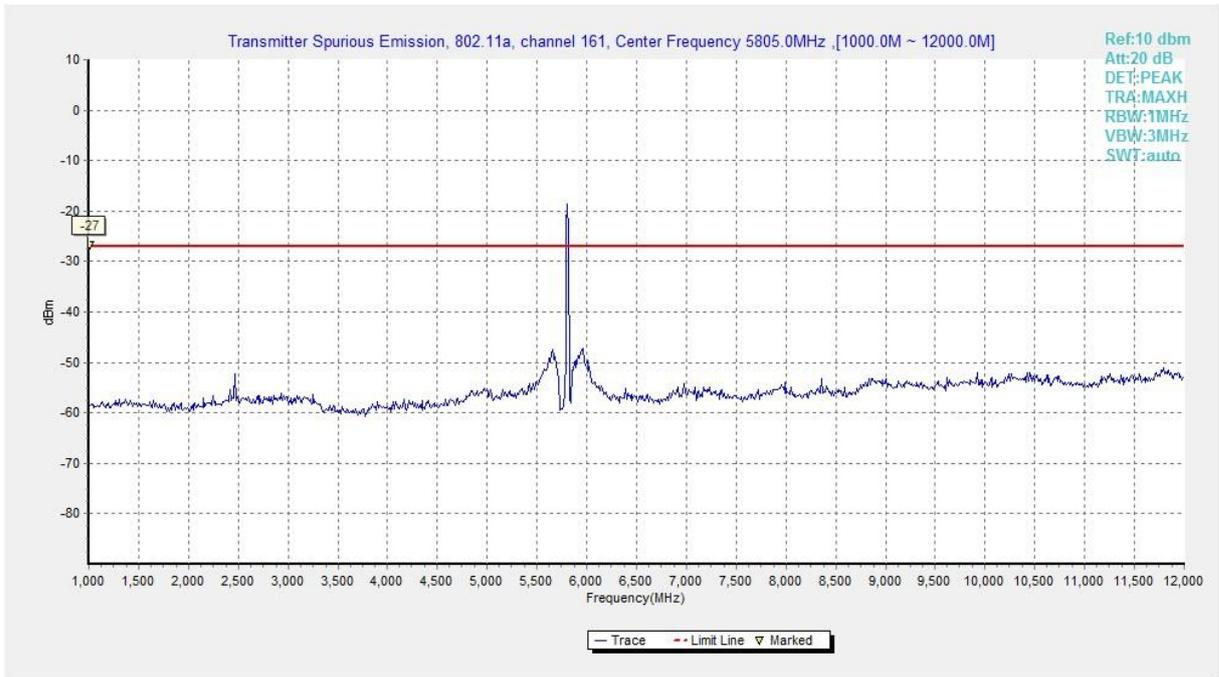


Fig. 12 Conducted Spurious Emission (802.11a, Ch161, 1 GHz -12 GHz)

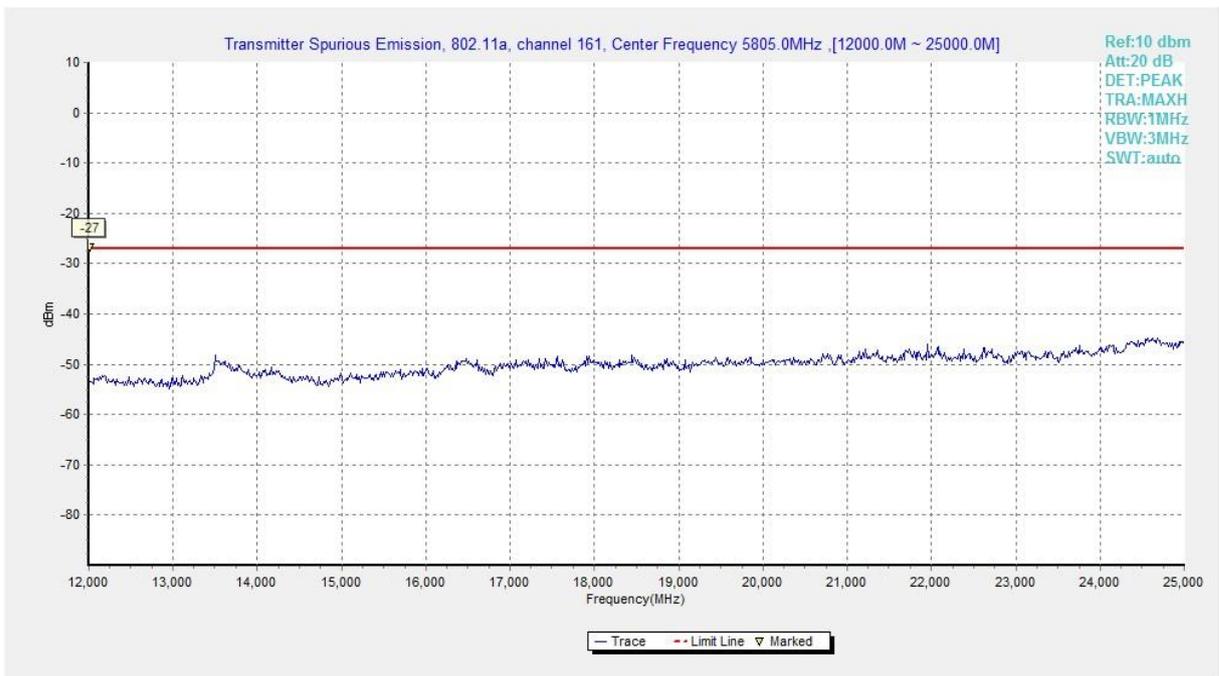


Fig. 13 Conducted Spurious Emission (802.11a, Ch161, 12 GHz-25 GHz)

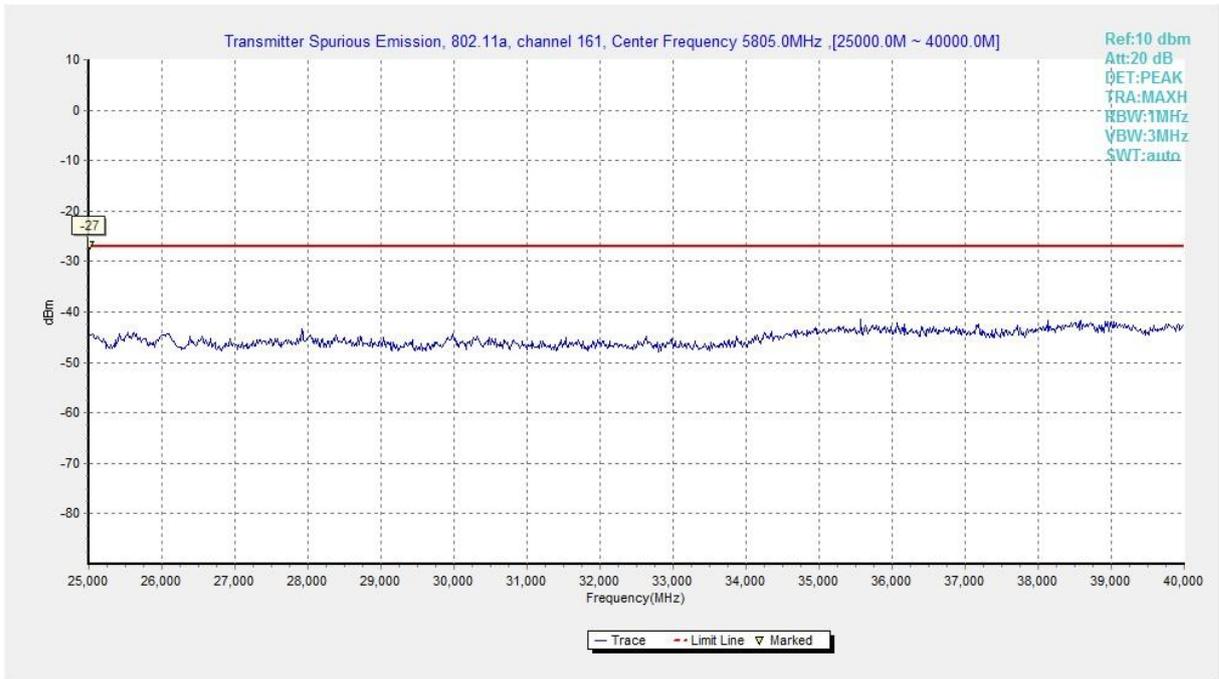


Fig. 14 Conducted Spurious Emission (802.11a, Ch161, 25 GHz-40 GHz)

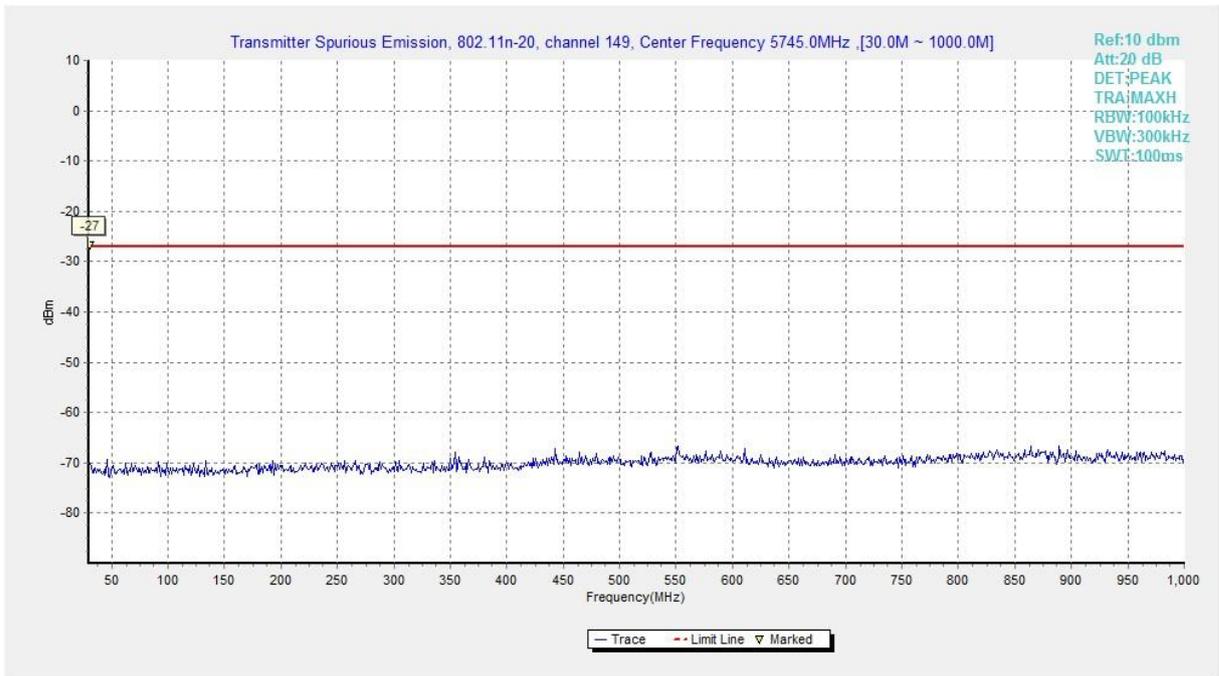


Fig. 15 Conducted Spurious Emission (802.11n-HT20, Ch149, 30 MHz-1 GHz)

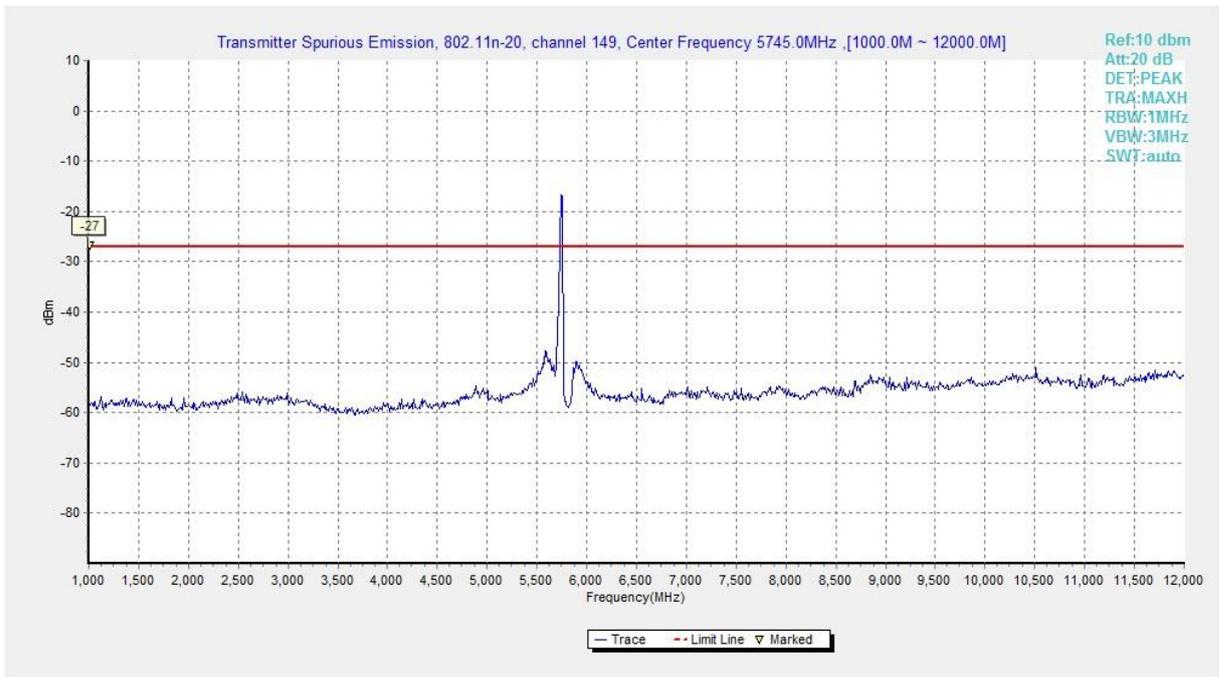


Fig. 16 Conducted Spurious Emission (802.11n-HT20, Ch149, 1 GHz -12 GHz)

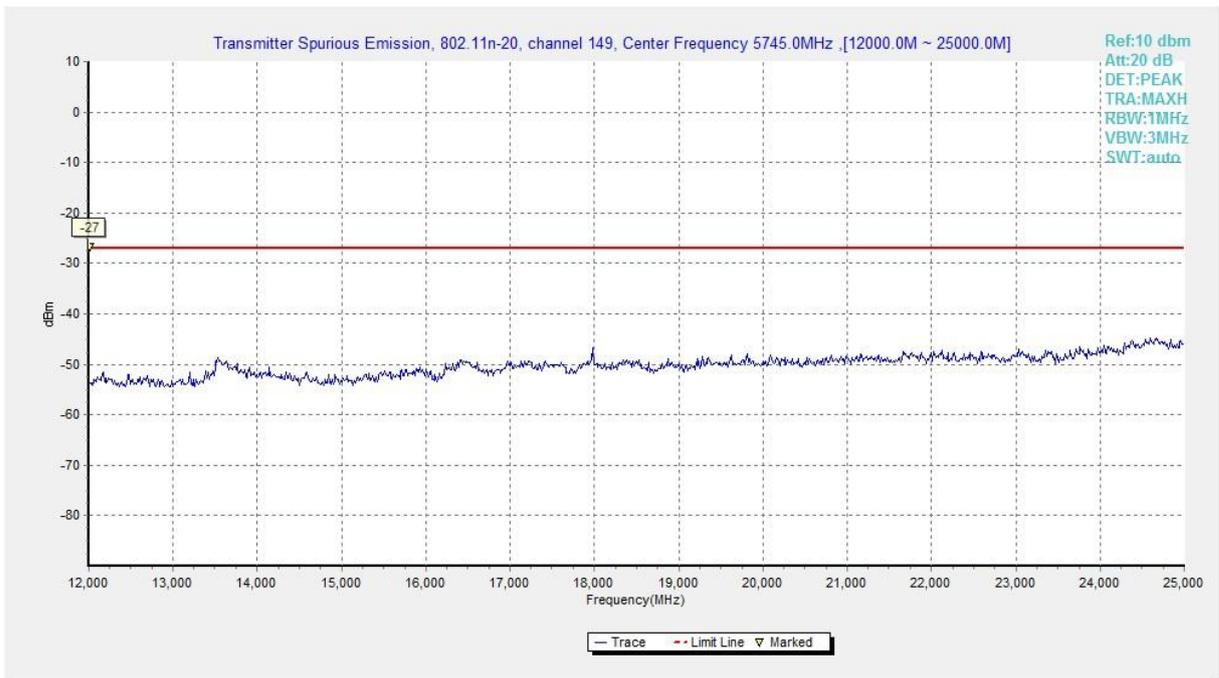


Fig. 17 Conducted Spurious Emission (802.11n-HT20, Ch149, 12 GHz-25 GHz)

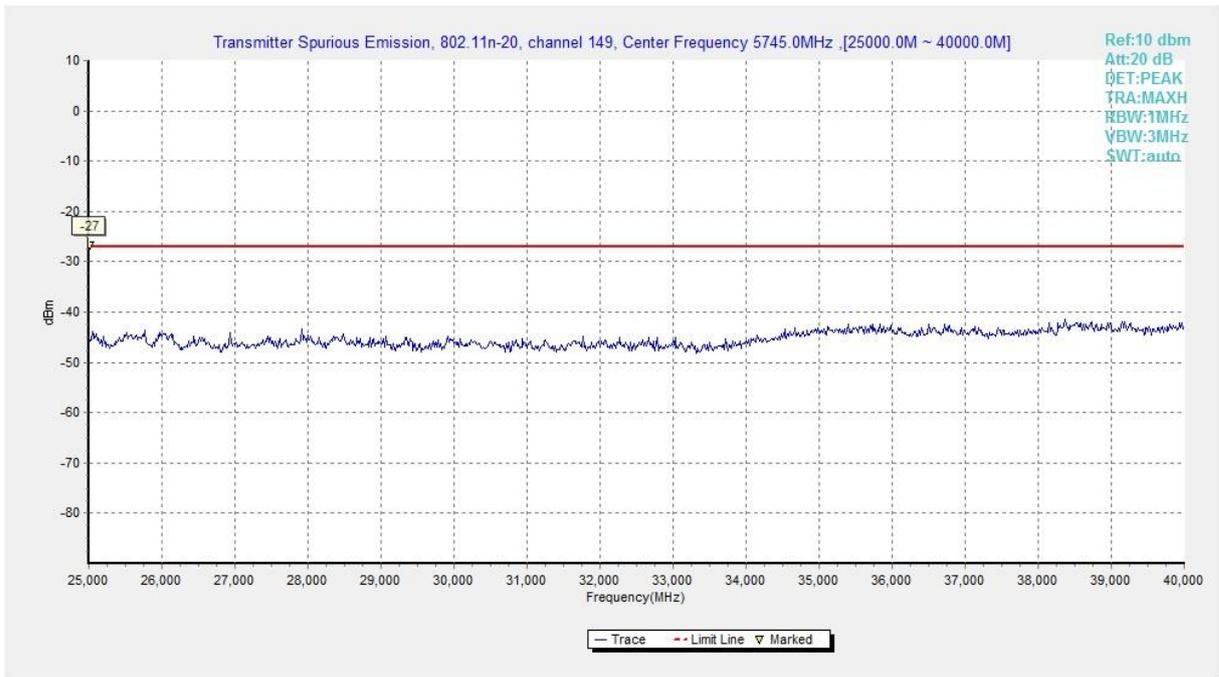


Fig. 18 Conducted Spurious Emission (802.11n-HT20, Ch149, 25 GHz-40 GHz)

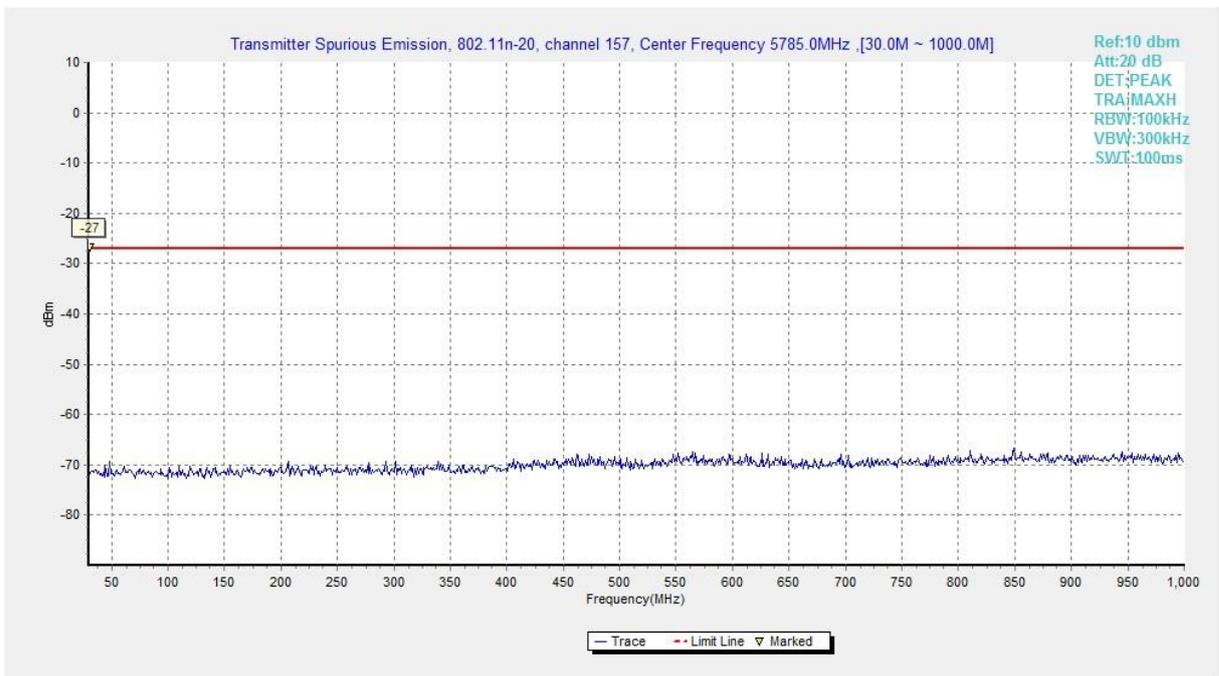


Fig. 19 Conducted Spurious Emission (802.11n-HT20, Ch157, 30 MHz-1 GHz)

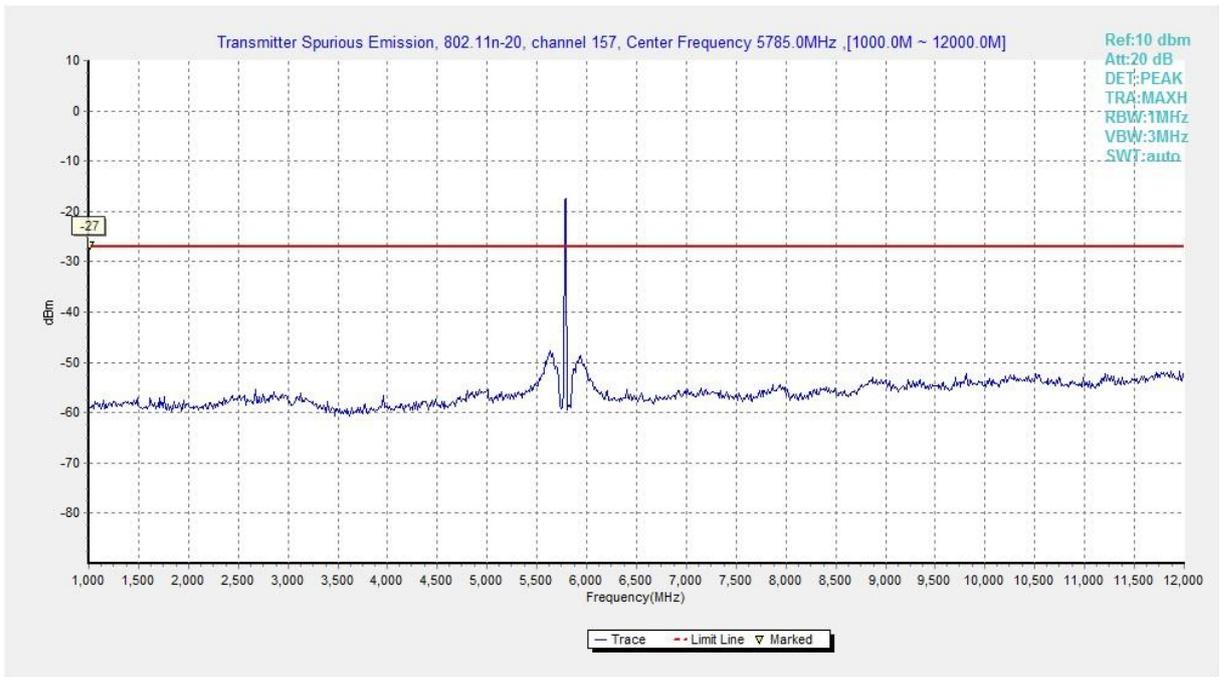


Fig. 20 Conducted Spurious Emission (802.11n-HT20, Ch157, 1 GHz -12 GHz)

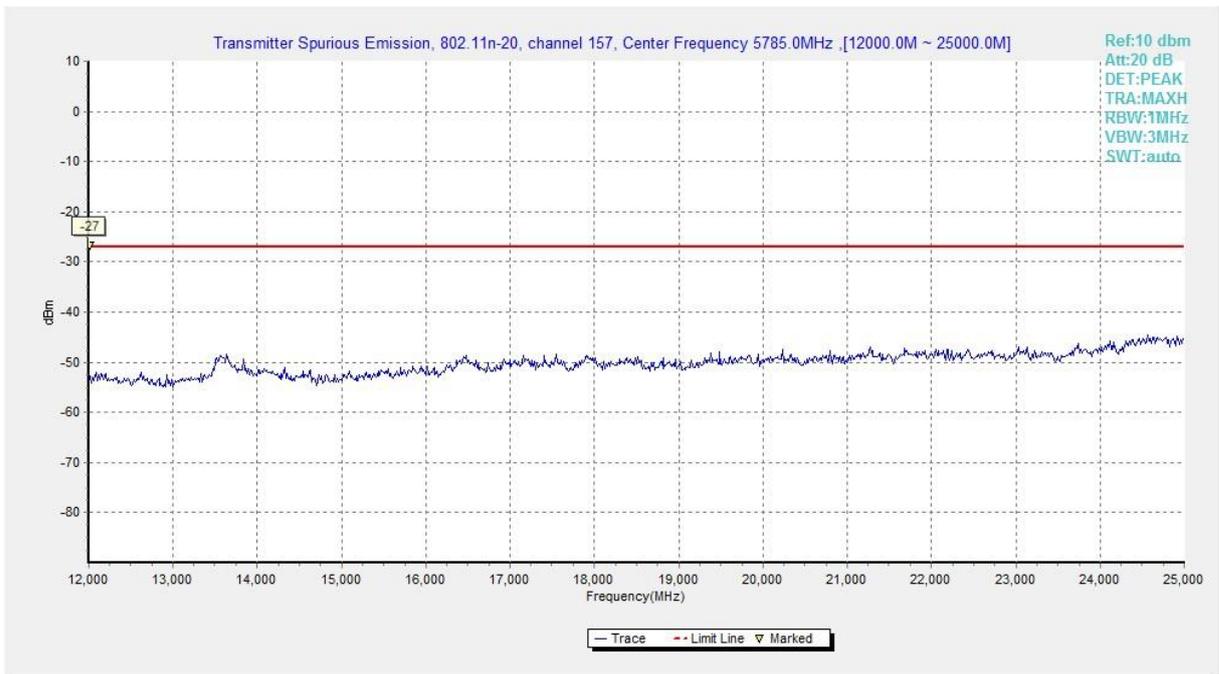


Fig. 21 Conducted Spurious Emission (802.11n-HT20, Ch157, 12 GHz-25 GHz)

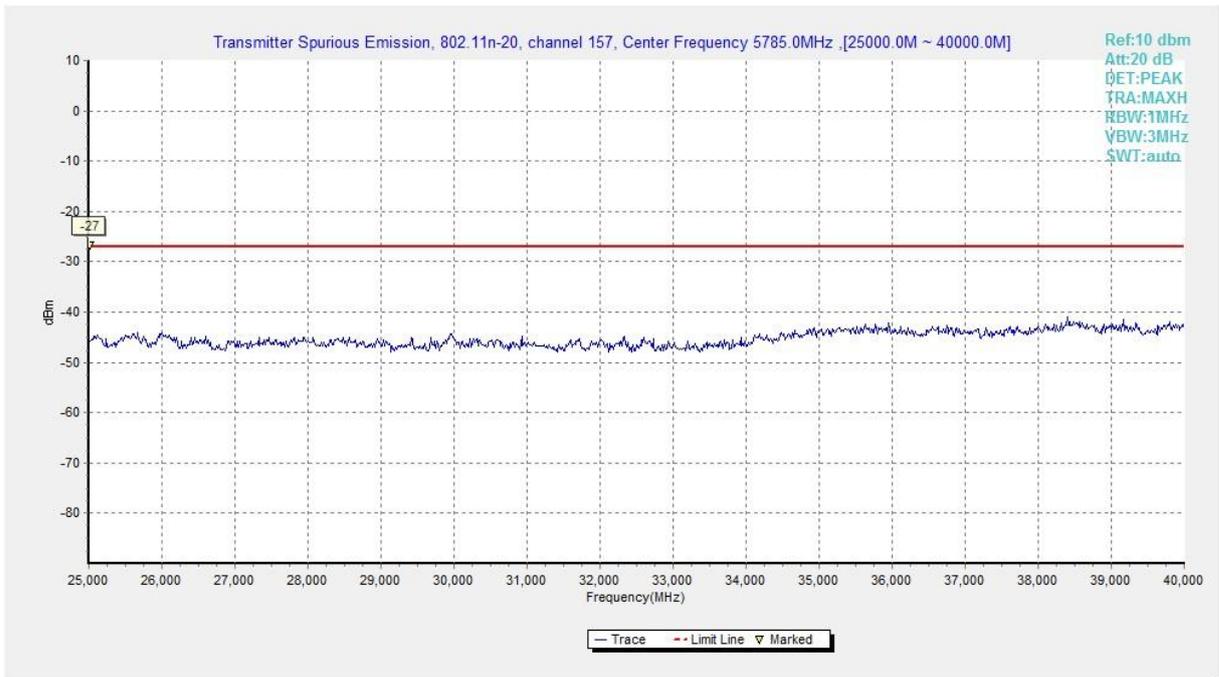


Fig. 22 Conducted Spurious Emission (802.11n-HT20, Ch157, 25 GHz-40 GHz)

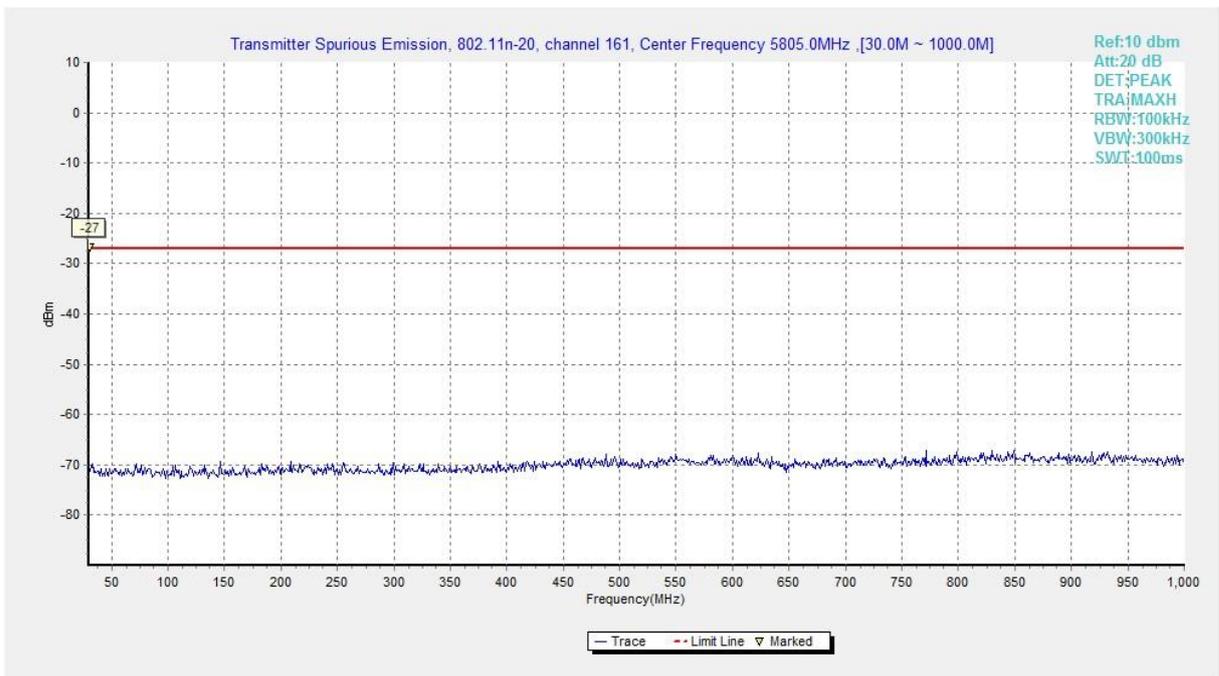


Fig. 23 Conducted Spurious Emission (802.11n-HT20, Ch161, 30 MHz-1 GHz)

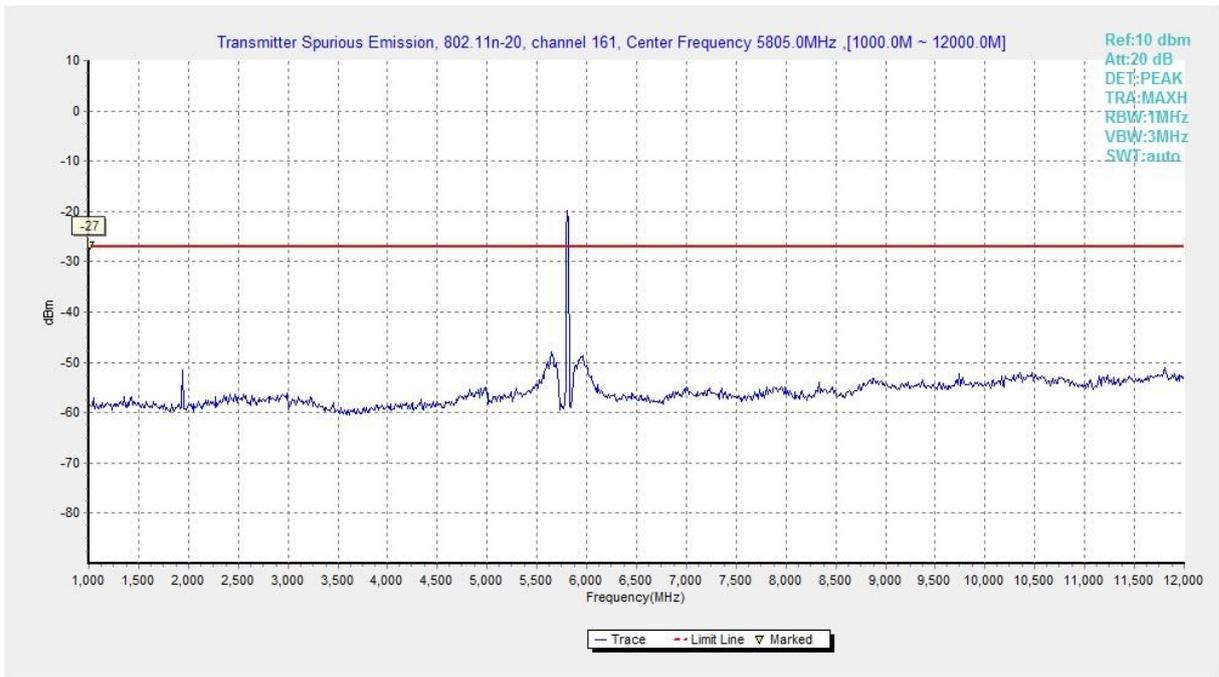


Fig. 24 Conducted Spurious Emission (802.11n-HT20, Ch161, 1 GHz -12 GHz)

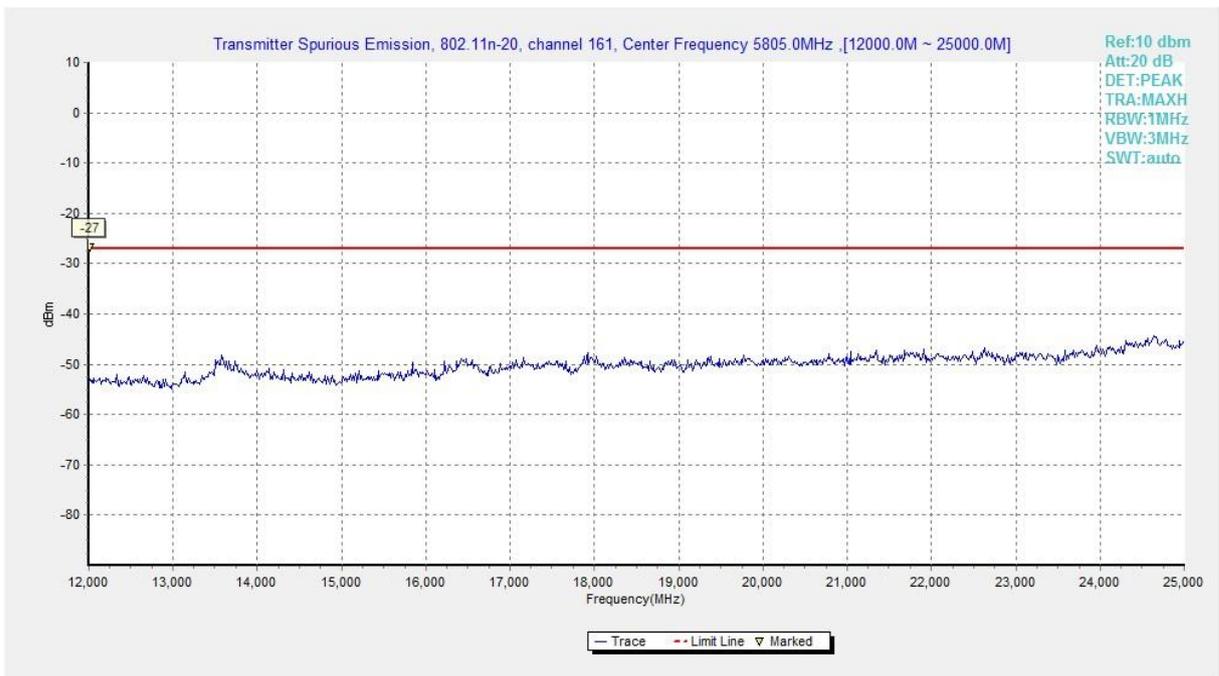


Fig. 25 Conducted Spurious Emission (802.11n-HT20, Ch161, 12 GHz-25 GHz)

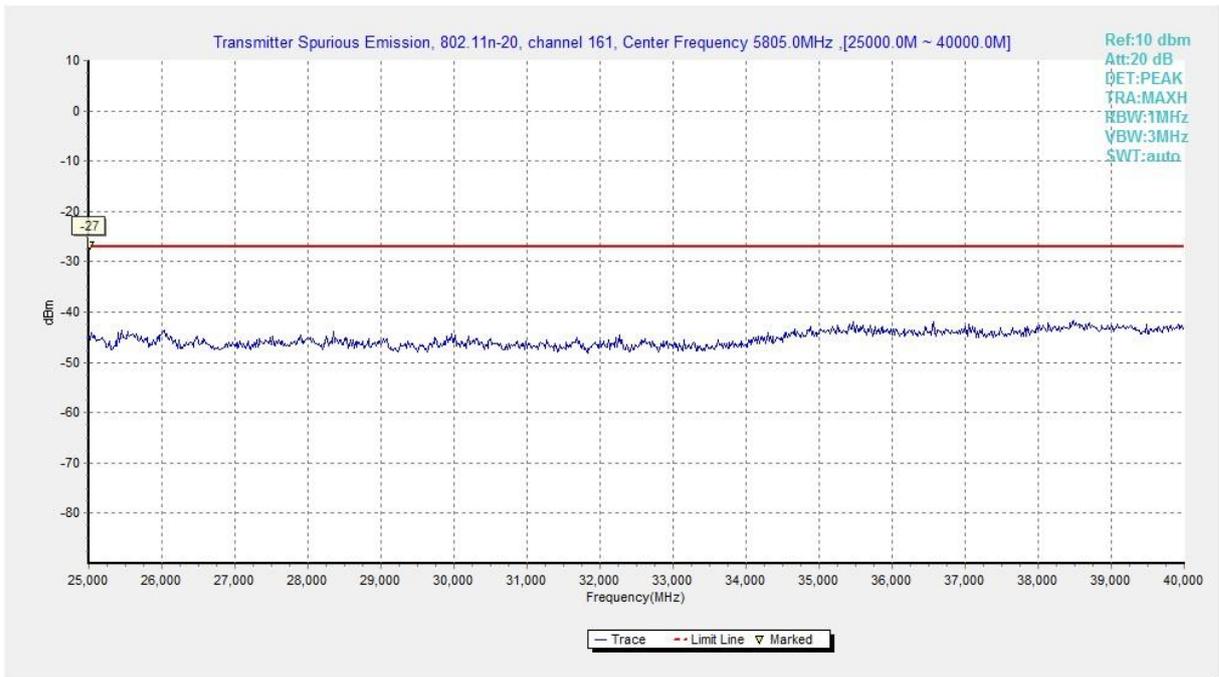


Fig. 26 Conducted Spurious Emission (802.11n-HT20, Ch161, 25 GHz-40 GHz)

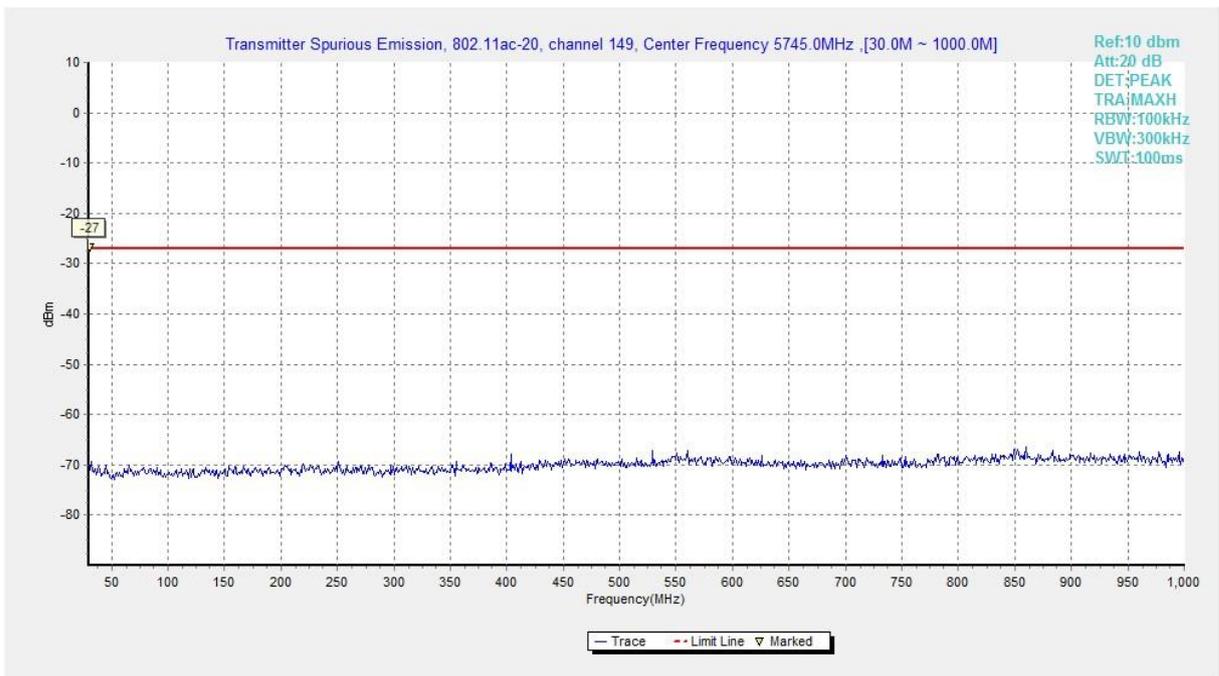


Fig. 27 Conducted Spurious Emission (802.11ac-HT20, Ch149, 30 MHz-1 GHz)

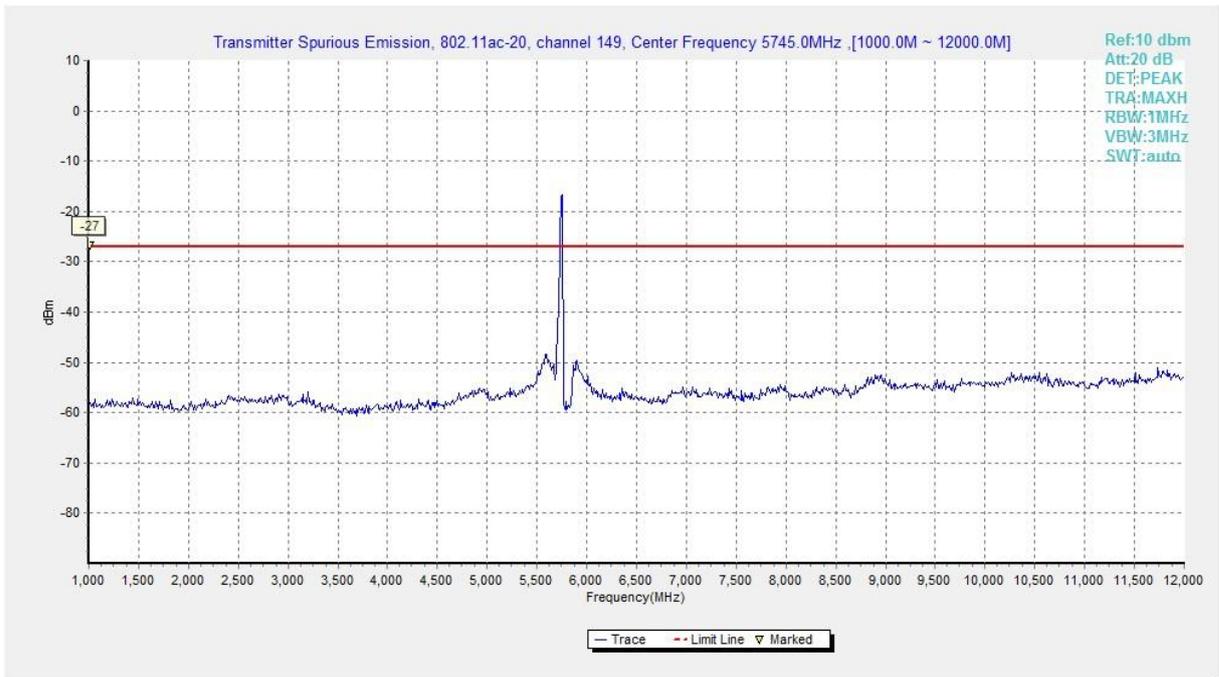


Fig. 28 Conducted Spurious Emission (802.11ac-HT20, Ch149, 1 GHz -12 GHz)

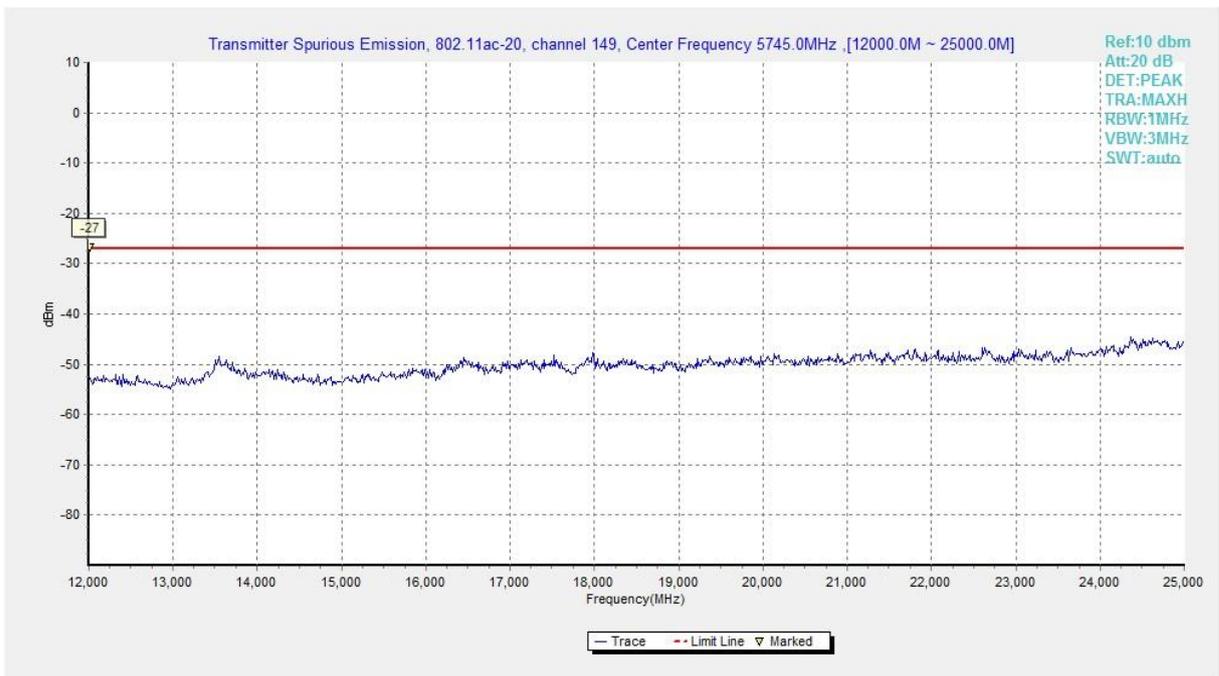


Fig. 29 Conducted Spurious Emission (802.11ac-HT20, Ch149, 12 GHz-25 GHz)

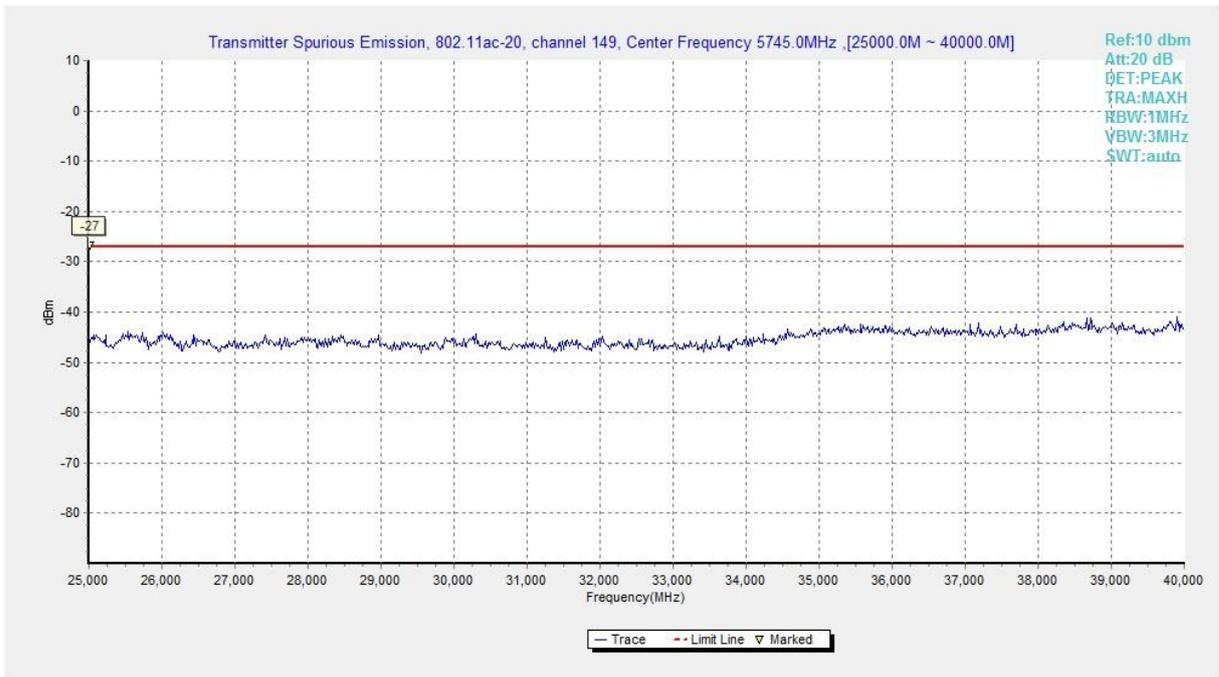


Fig. 30 Conducted Spurious Emission (802.11ac-HT20, Ch149, 25 GHz-40 GHz)

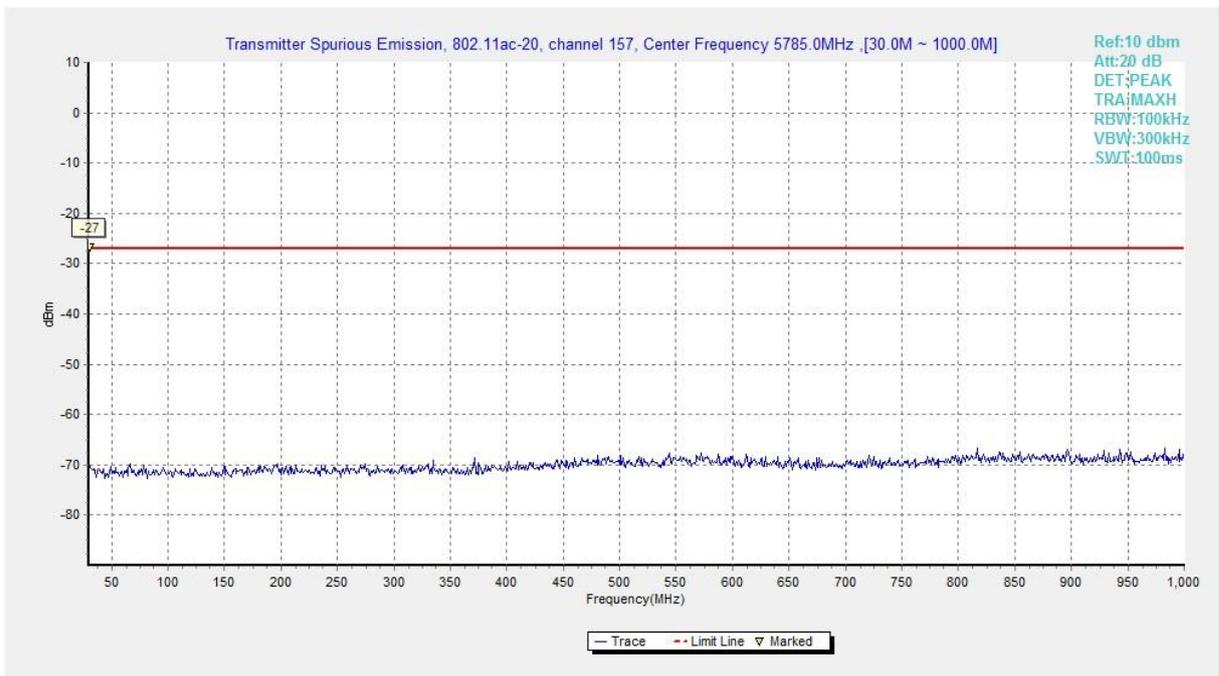


Fig. 31 Conducted Spurious Emission (802.11ac-HT20, Ch157, 30 MHz-1 GHz)

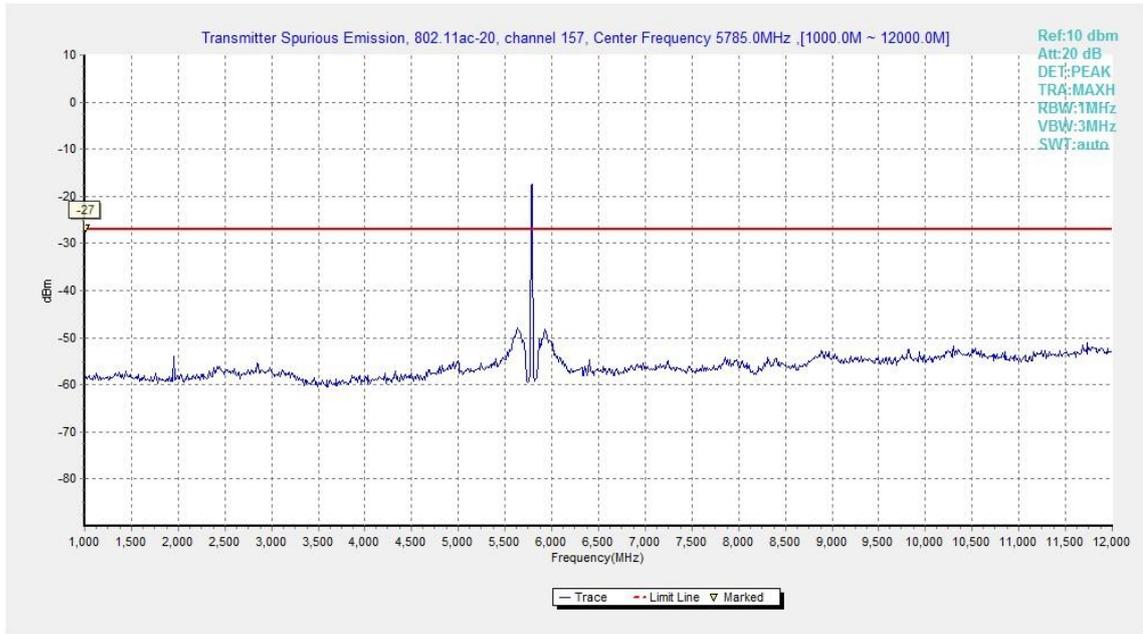


Fig. 32 Conducted Spurious Emission (802.11ac-HT20, Ch157, 1 GHz -12 GHz)

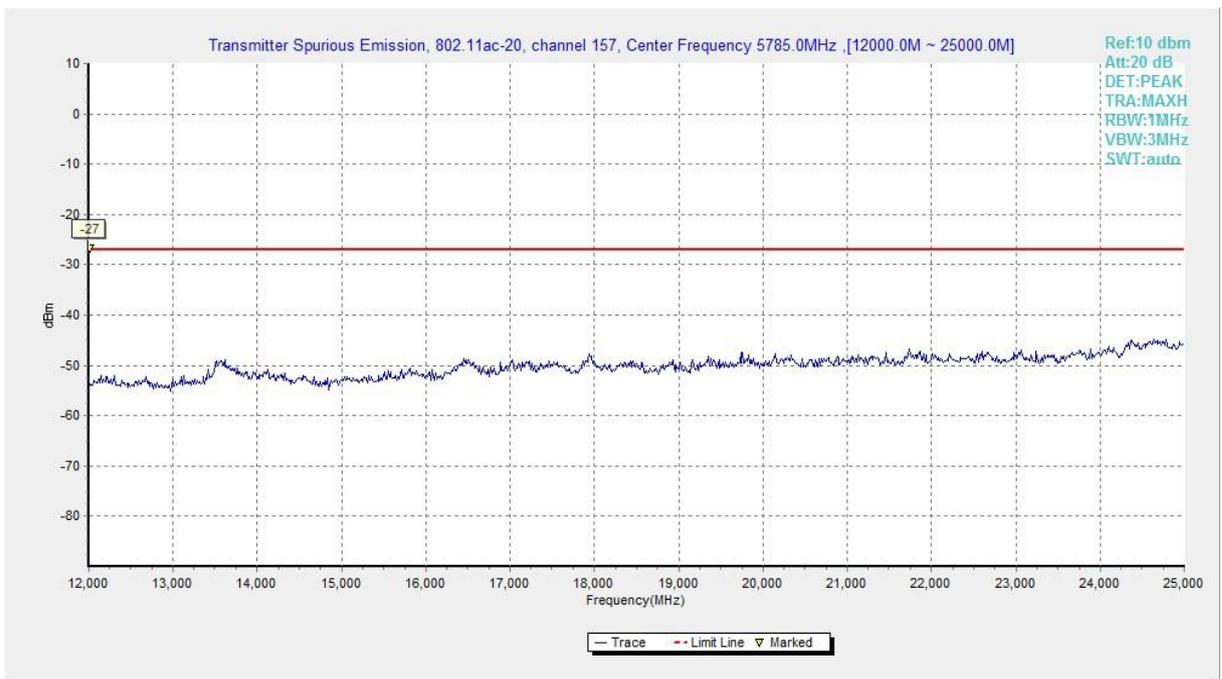


Fig. 33 Conducted Spurious Emission (802.11ac-HT20, Ch157, 12 GHz-25 GHz)

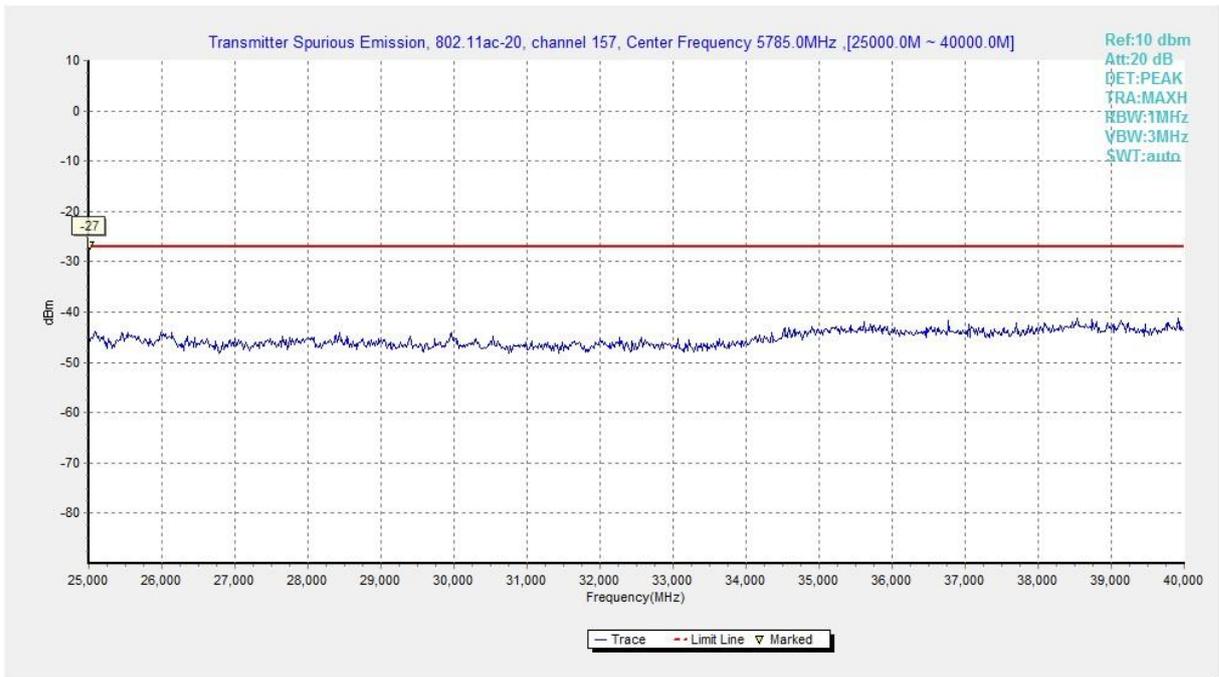


Fig. 34 Conducted Spurious Emission (802.11ac-HT20, Ch157, 25 GHz-40 GHz)

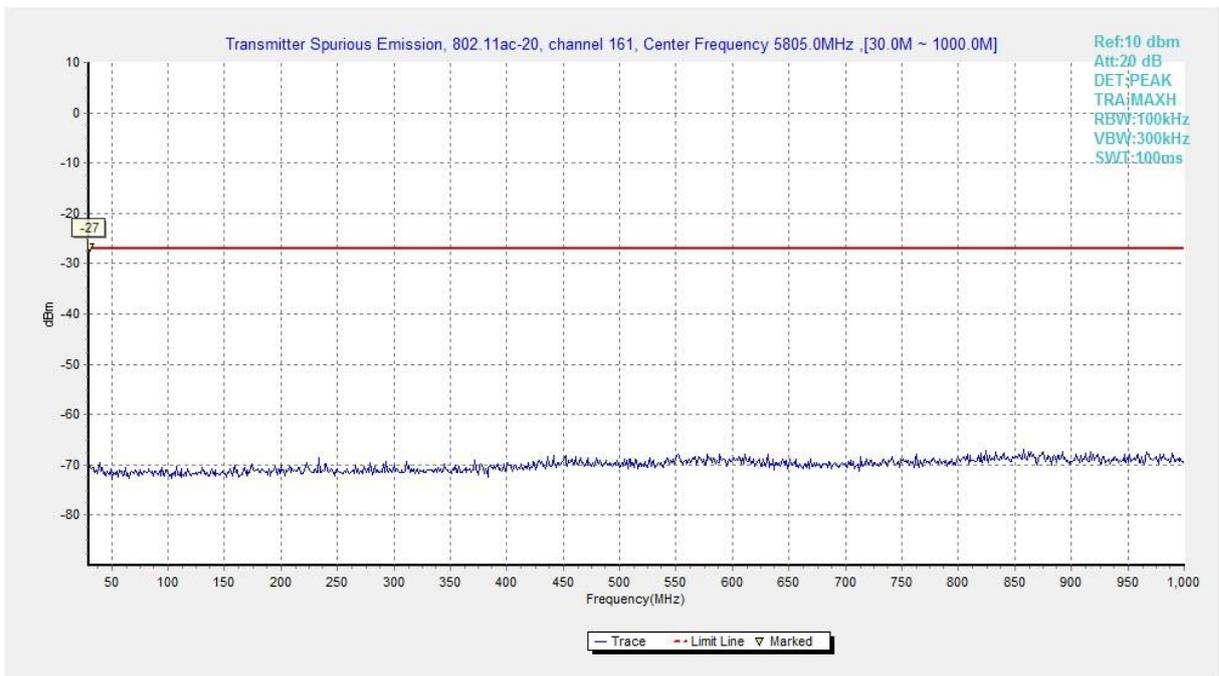


Fig. 35 Conducted Spurious Emission (802.11ac-HT20, Ch161, 30 MHz-1 GHz)

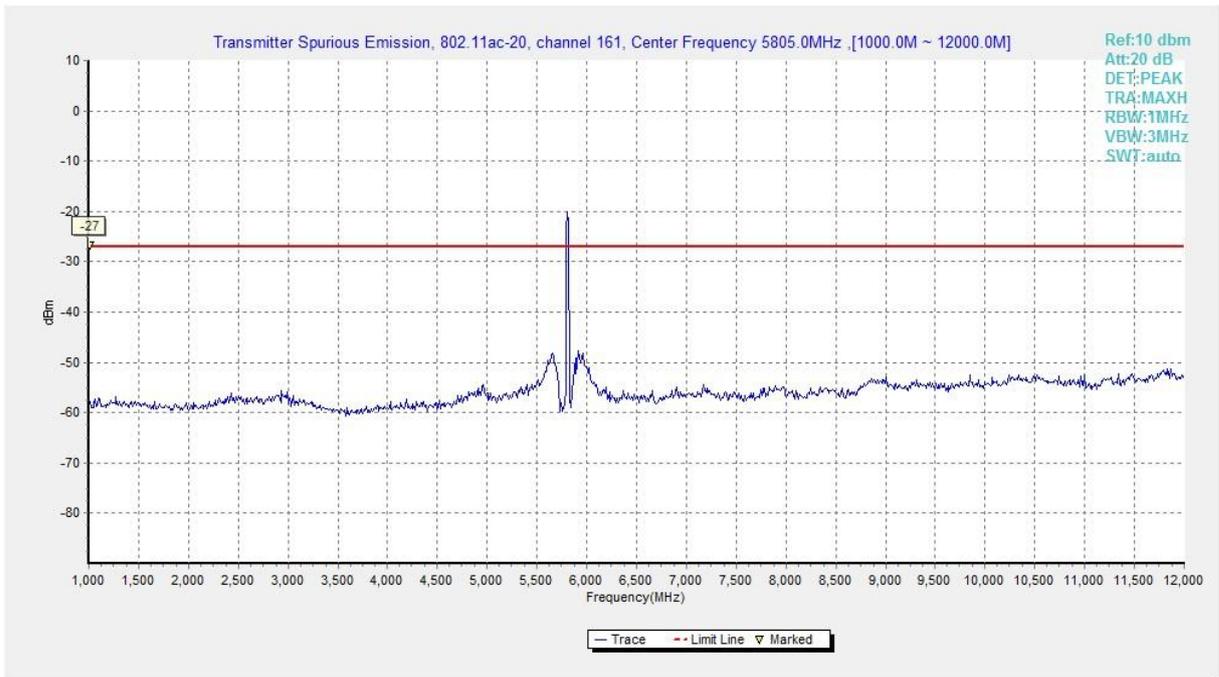


Fig. 36 Conducted Spurious Emission (802.11ac-HT20, Ch161, 1 GHz -12 GHz)

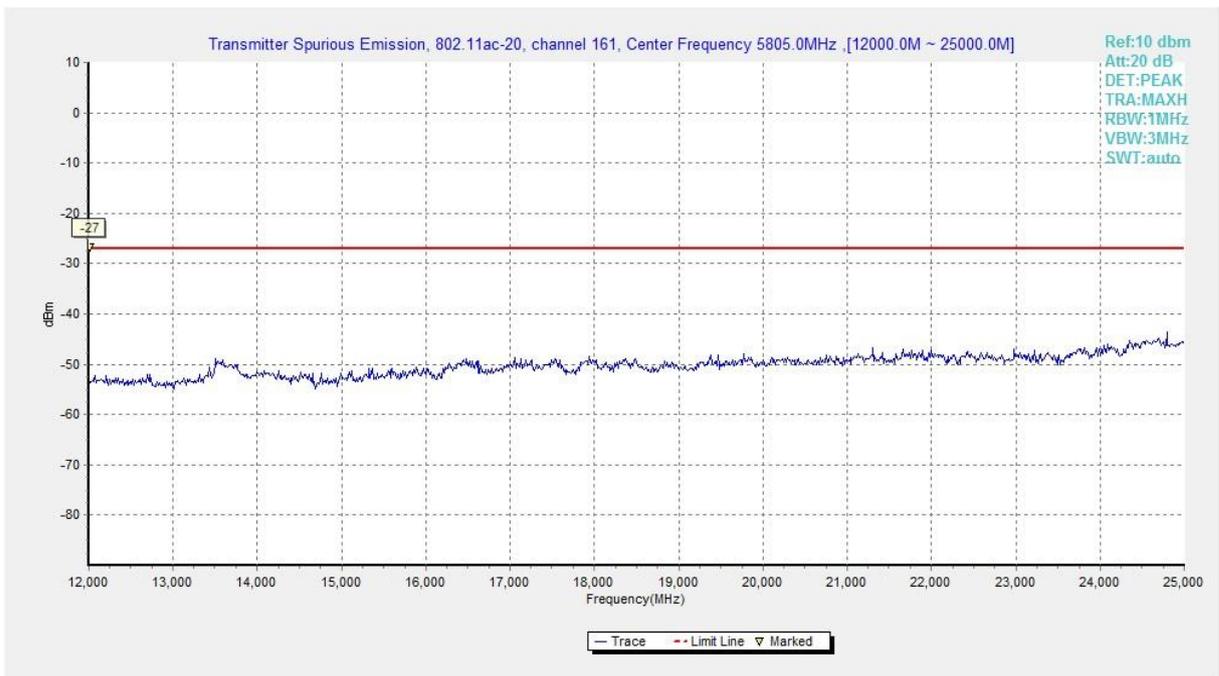


Fig. 37 Conducted Spurious Emission (802.11ac-HT20, Ch161, 12 GHz-25 GHz)

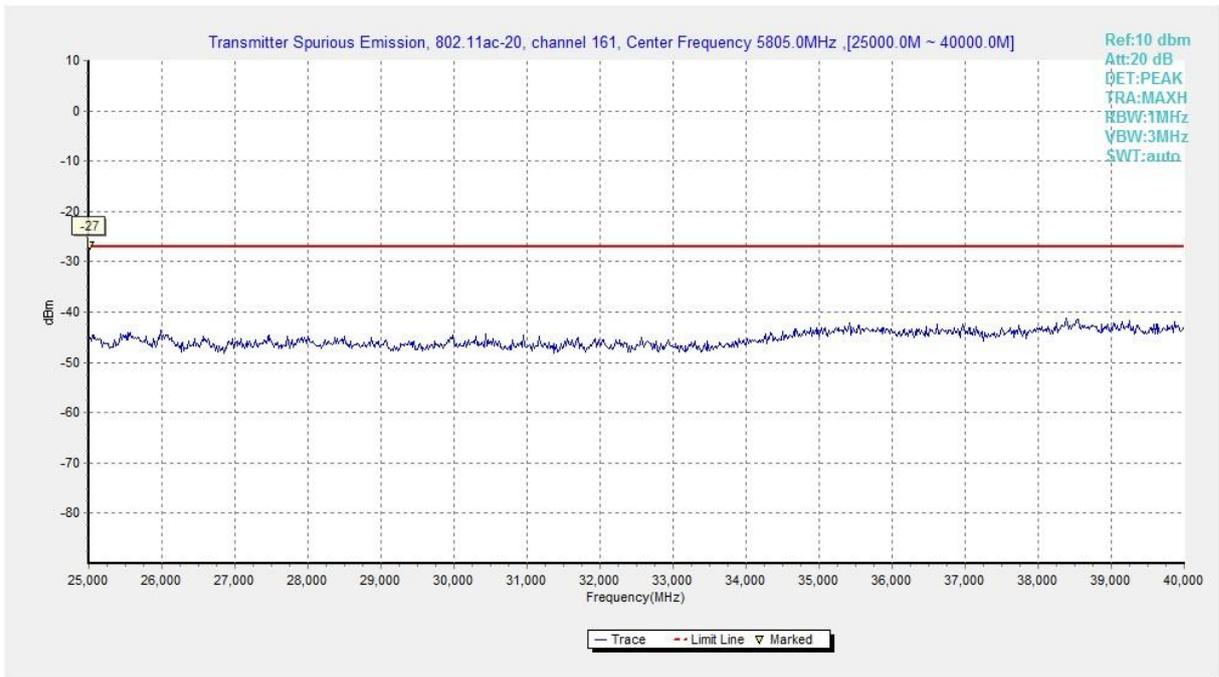


Fig. 38 Conducted Spurious Emission (802.11ac-HT20, Ch161, 25 GHz-40 GHz)

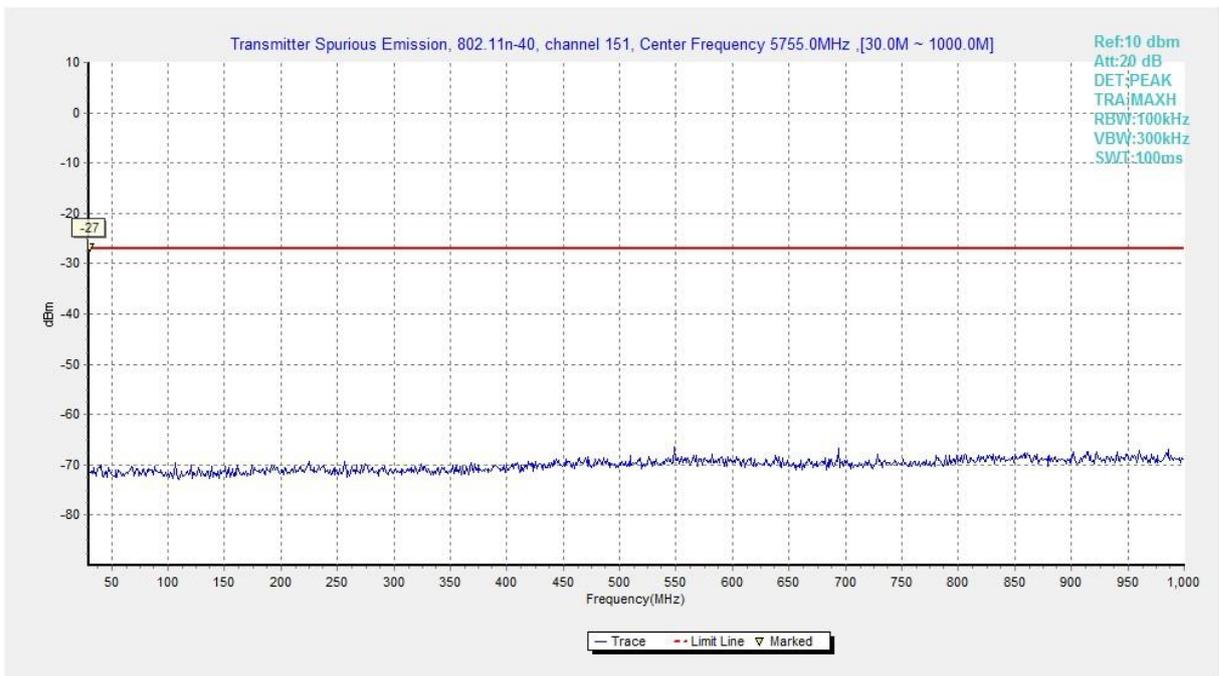


Fig. 39 Conducted Spurious Emission (802.11n-HT40, Ch151, 30 MHz-1 GHz)

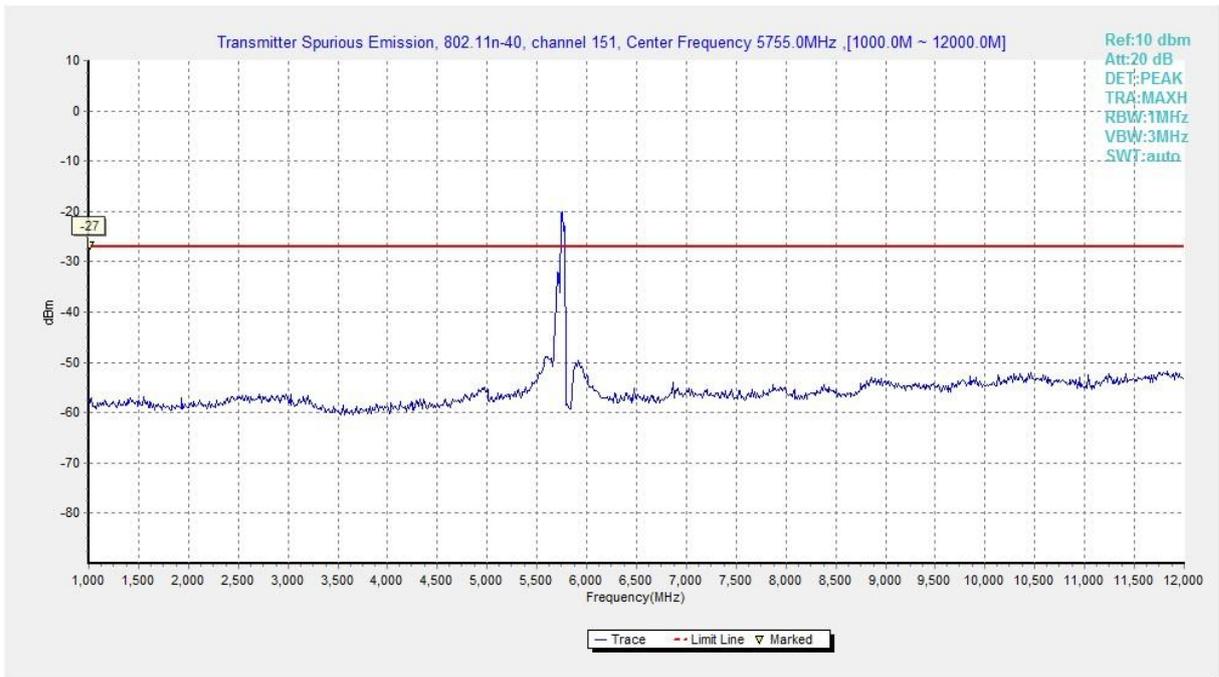


Fig. 40 Conducted Spurious Emission (802.11n-HT40, Ch151, 1 GHz -12 GHz)

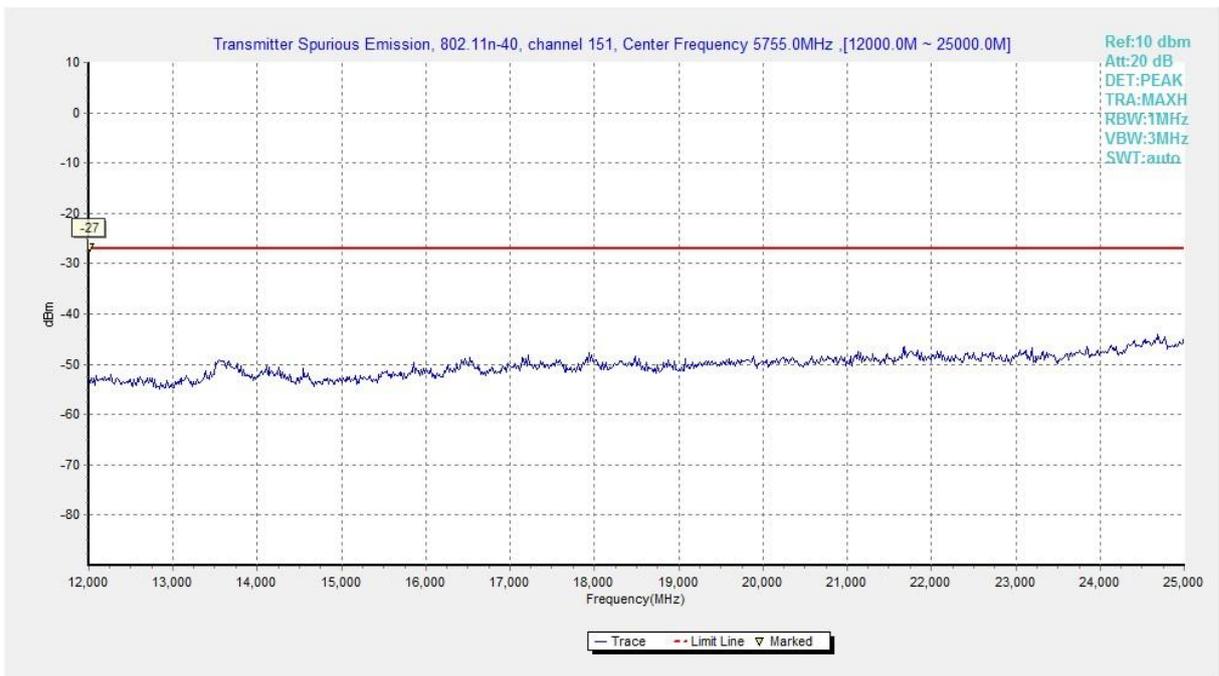


Fig. 41 Conducted Spurious Emission (802.11n-HT40, Ch151, 12 GHz-25 GHz)

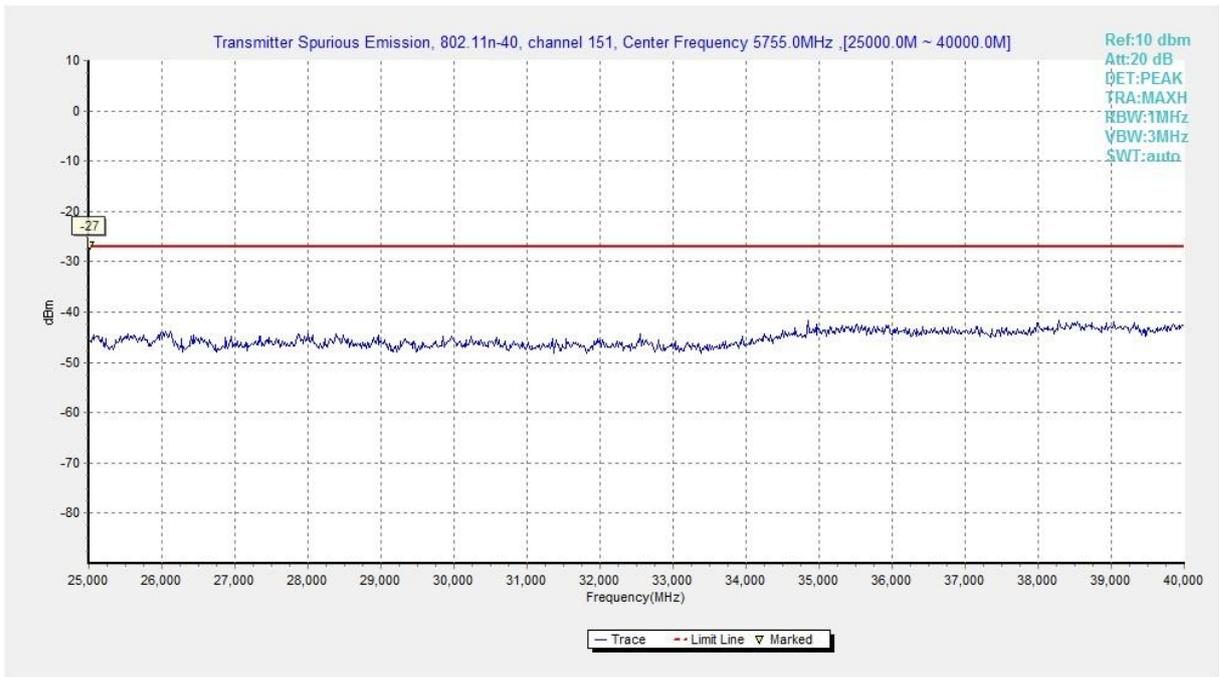


Fig. 42 Conducted Spurious Emission (802.11n-HT40, Ch151, 25 GHz-40 GHz)

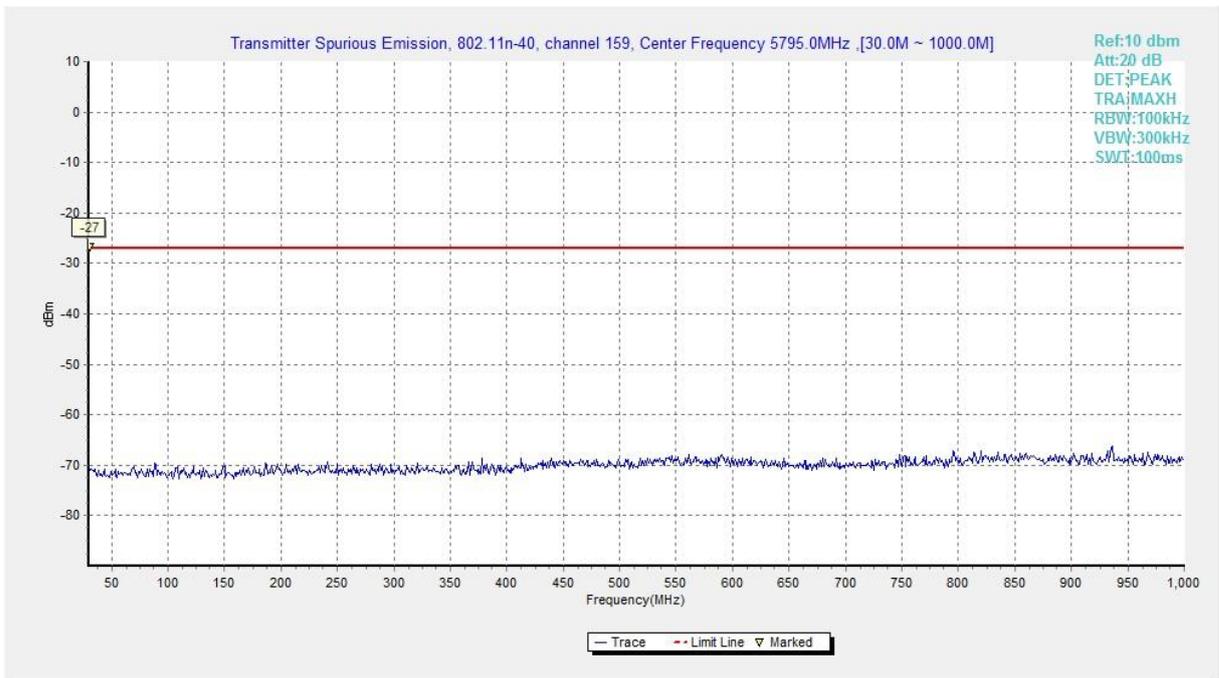


Fig. 43 Conducted Spurious Emission (802.11n-HT40, Ch159, 30 MHz-1 GHz)

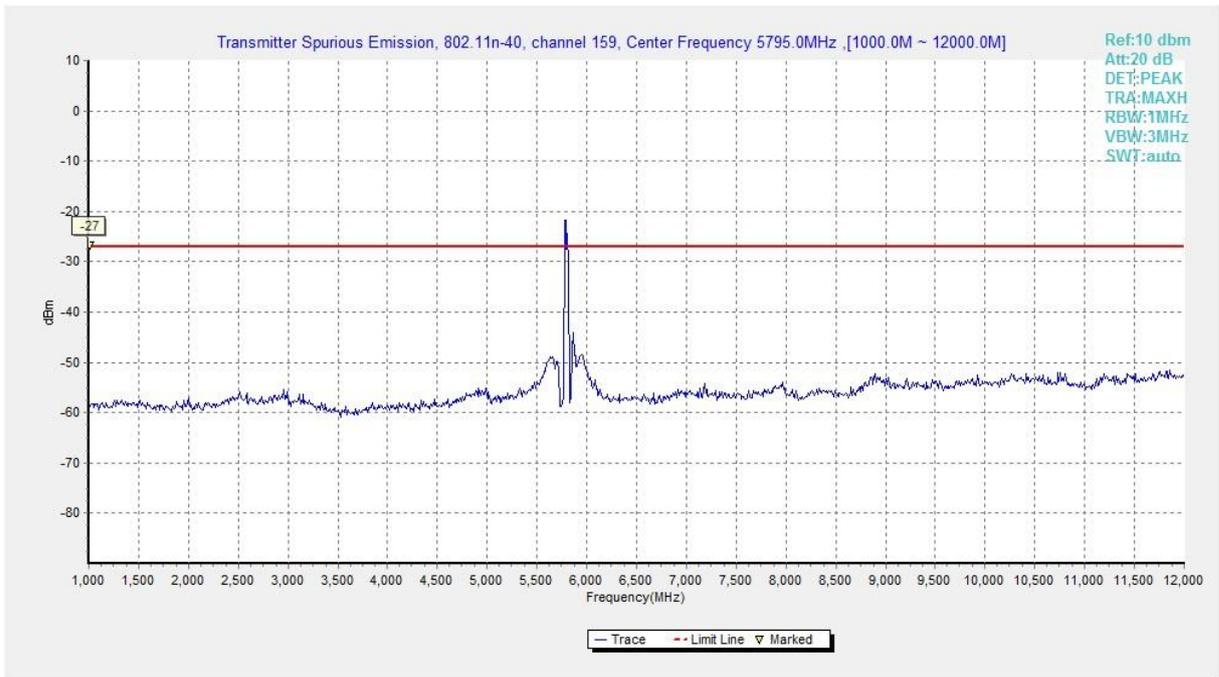


Fig. 44 Conducted Spurious Emission (802.11n-HT40, Ch159, 1 GHz -12 GHz)

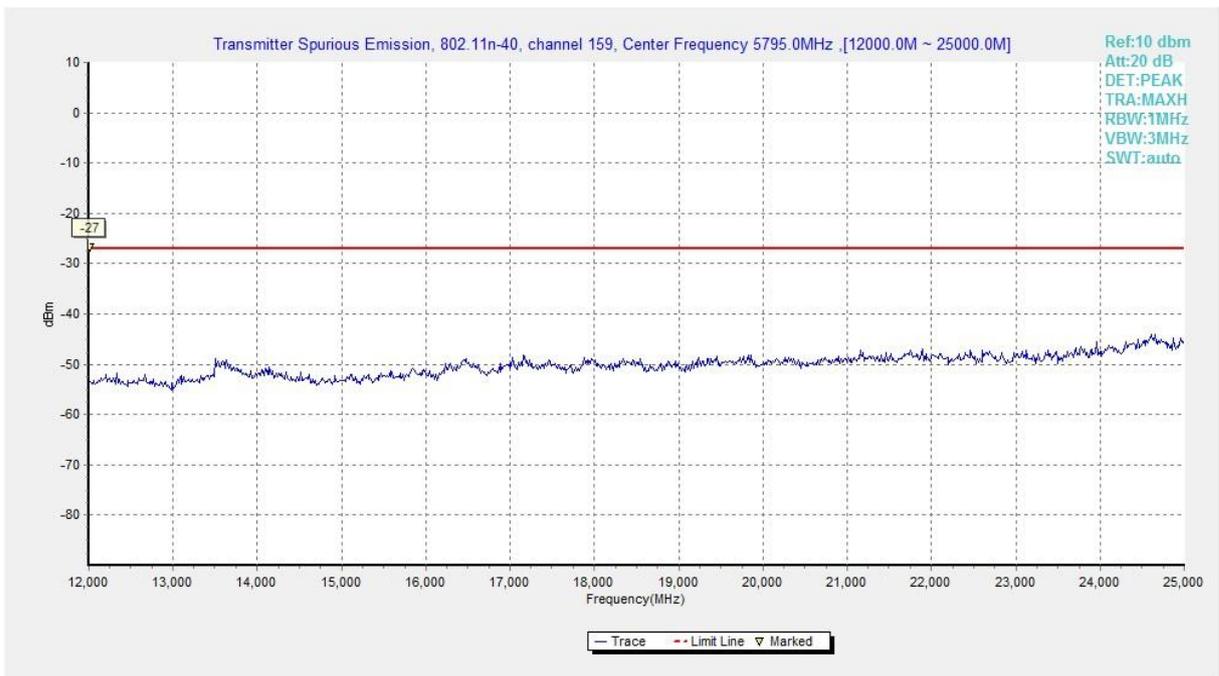


Fig. 45 Conducted Spurious Emission (802.11n-HT40, Ch159, 12 GHz-25 GHz)

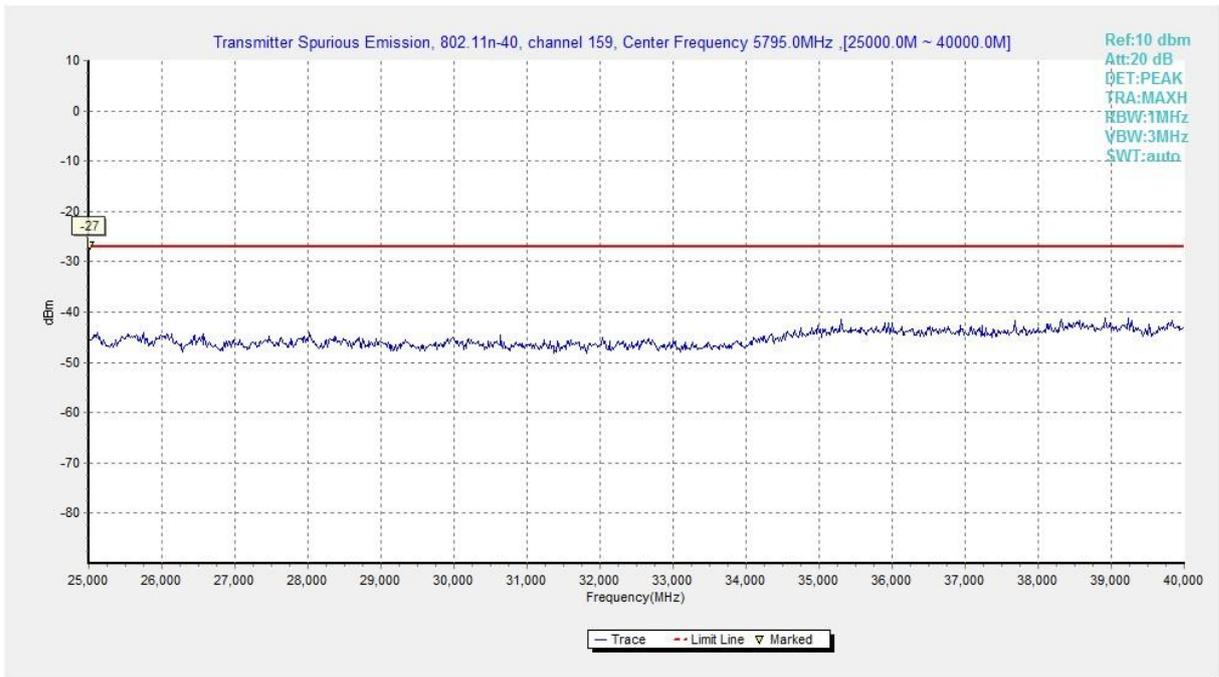


Fig. 46 Conducted Spurious Emission (802.11n-HT40, Ch159, 25 GHz-40 GHz)

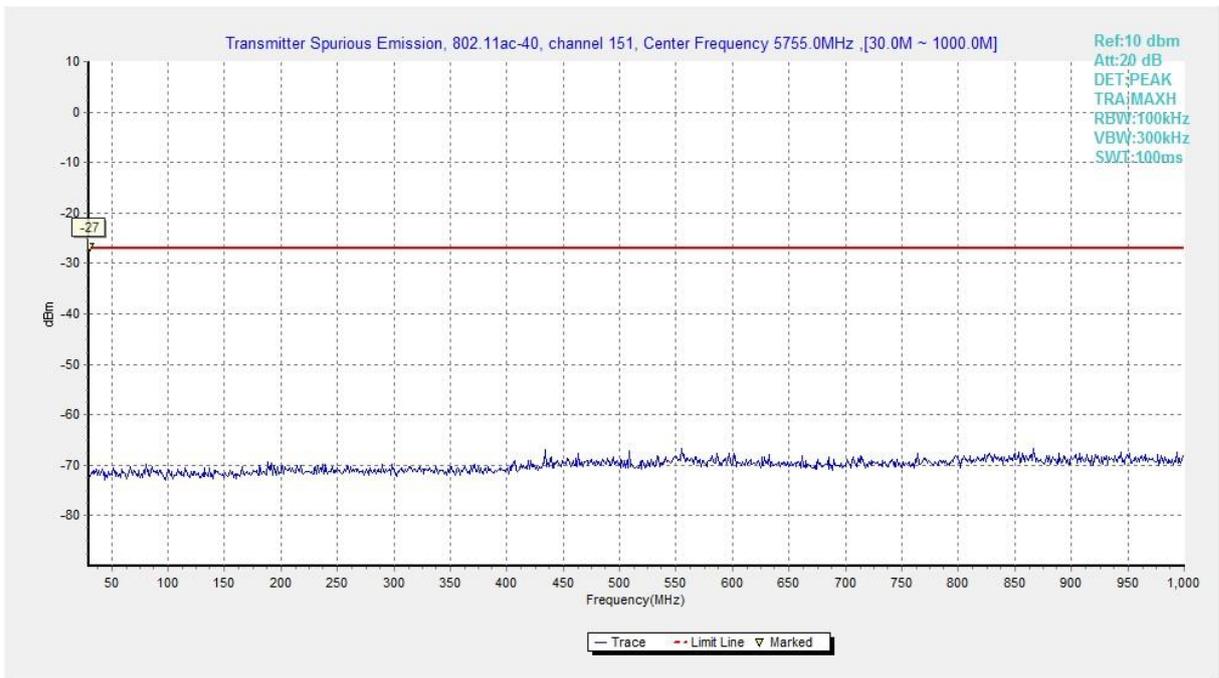


Fig. 47 Conducted Spurious Emission (802.11ac-HT40, Ch151, 30 MHz-1 GHz)

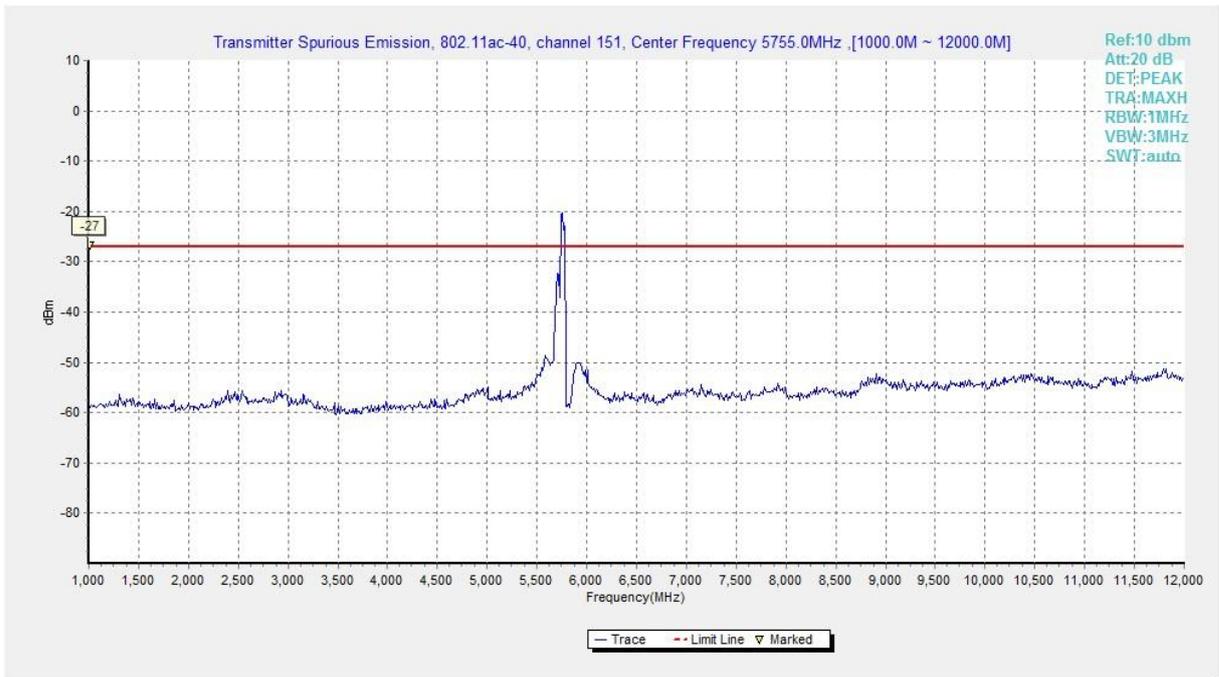


Fig. 48 Conducted Spurious Emission (802.11ac-HT40, Ch151, 1 GHz -12 GHz)

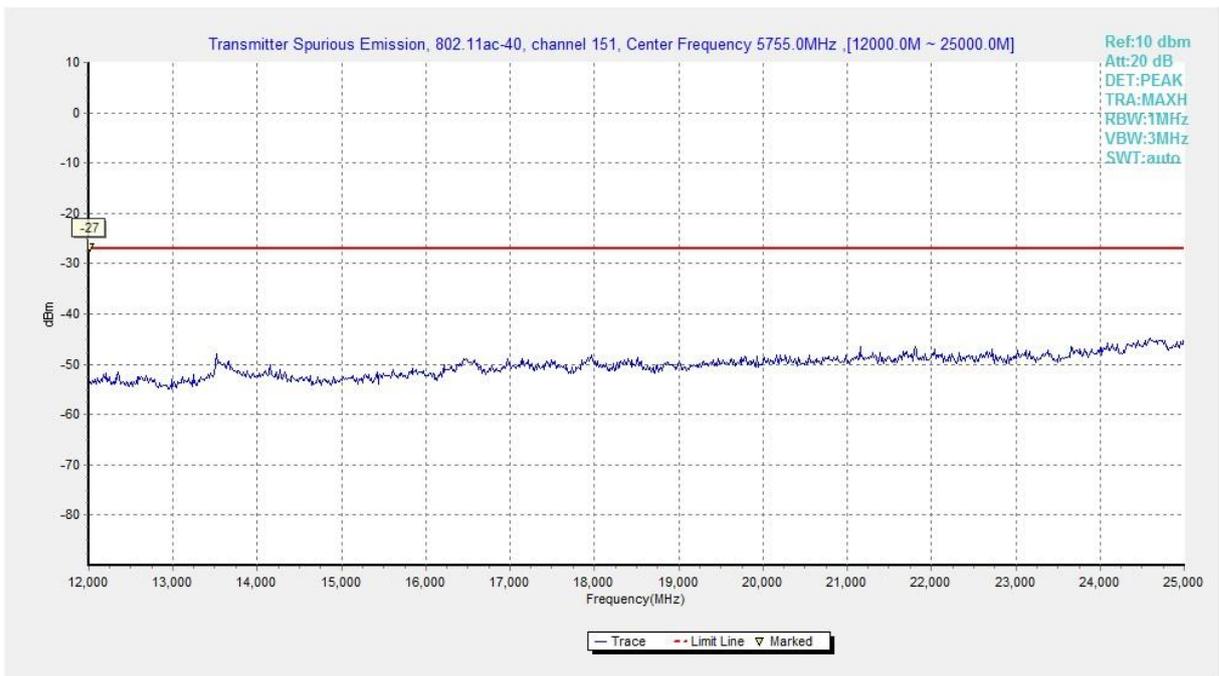


Fig. 49 Conducted Spurious Emission (802.11ac-HT40, Ch151, 12 GHz-25 GHz)

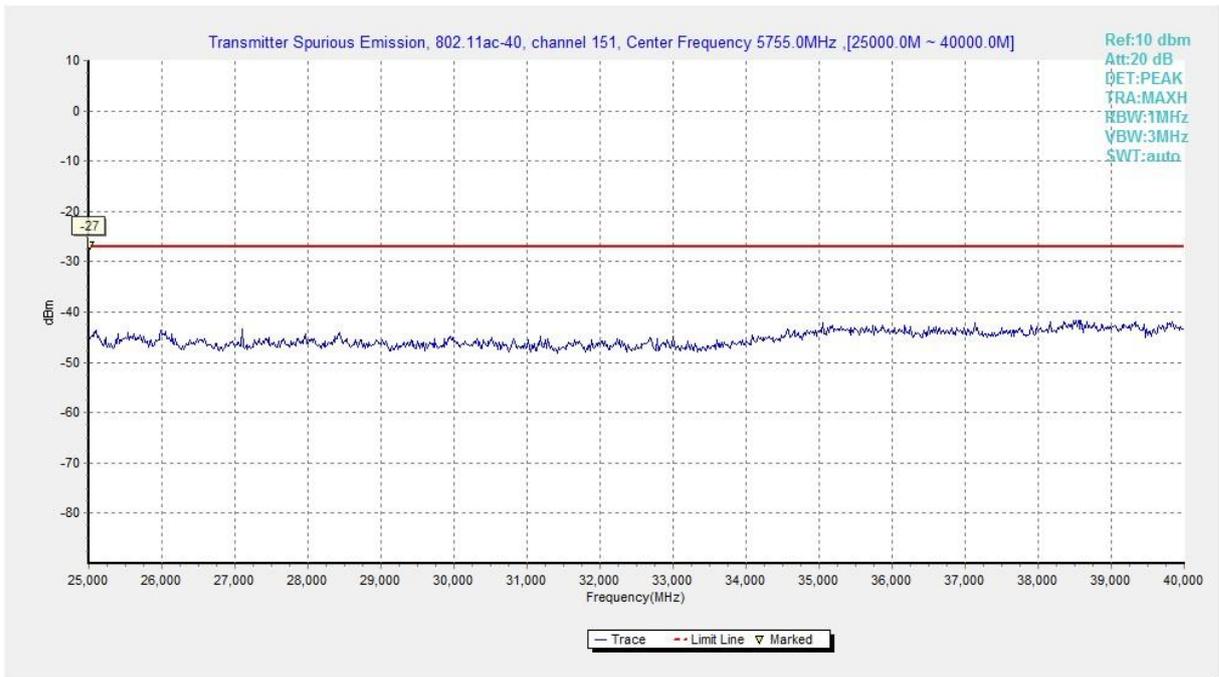


Fig. 50 Conducted Spurious Emission (802.11ac-HT40, Ch151, 25 GHz-40 GHz)

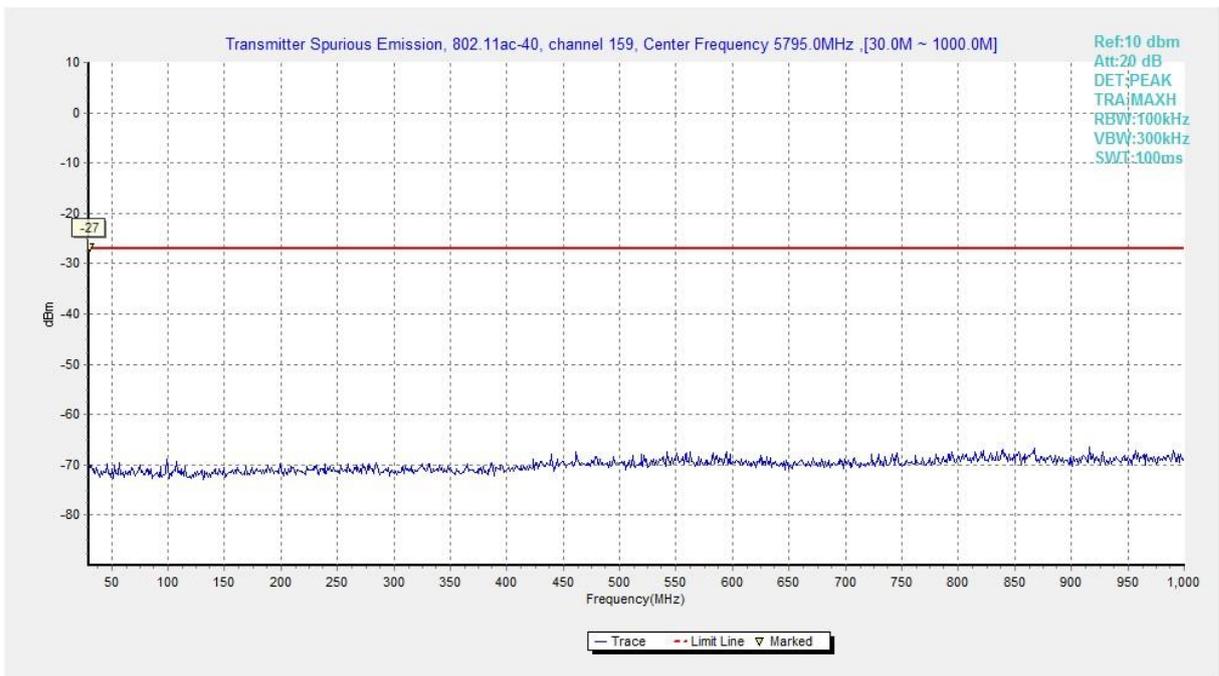


Fig. 51 Conducted Spurious Emission (802.11ac-HT40, Ch159, 30 MHz-1 GHz)

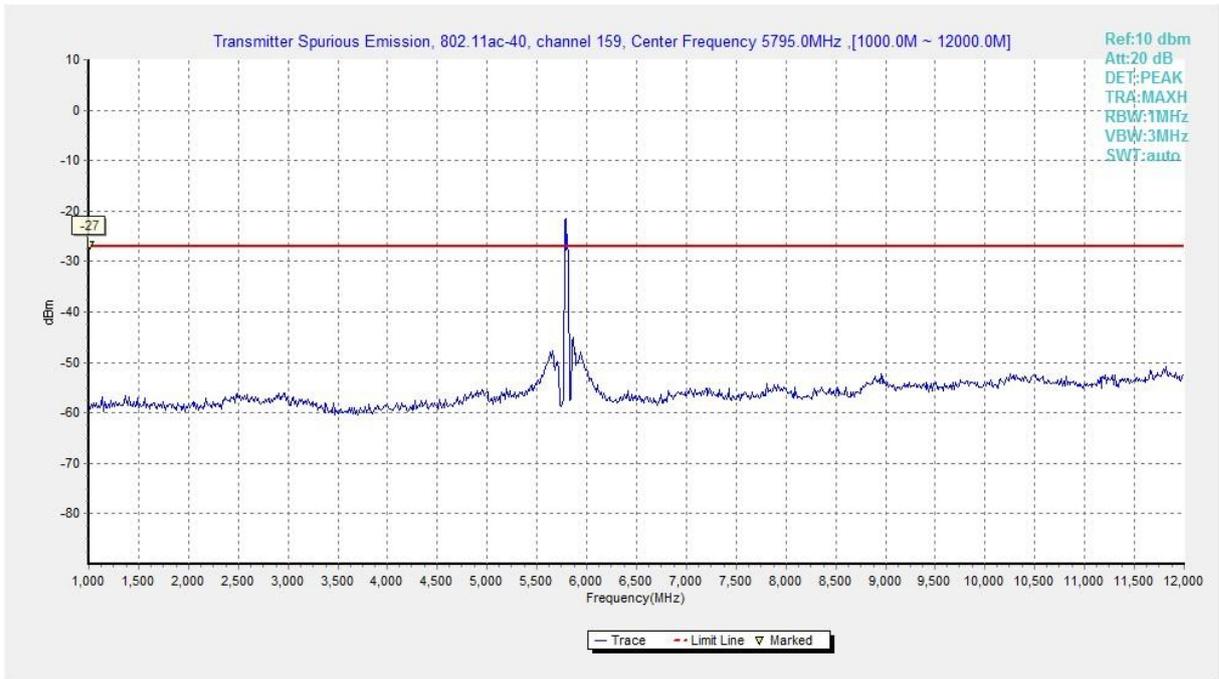


Fig. 52 Conducted Spurious Emission (802.11ac-HT40, Ch159, 1 GHz -12 GHz)

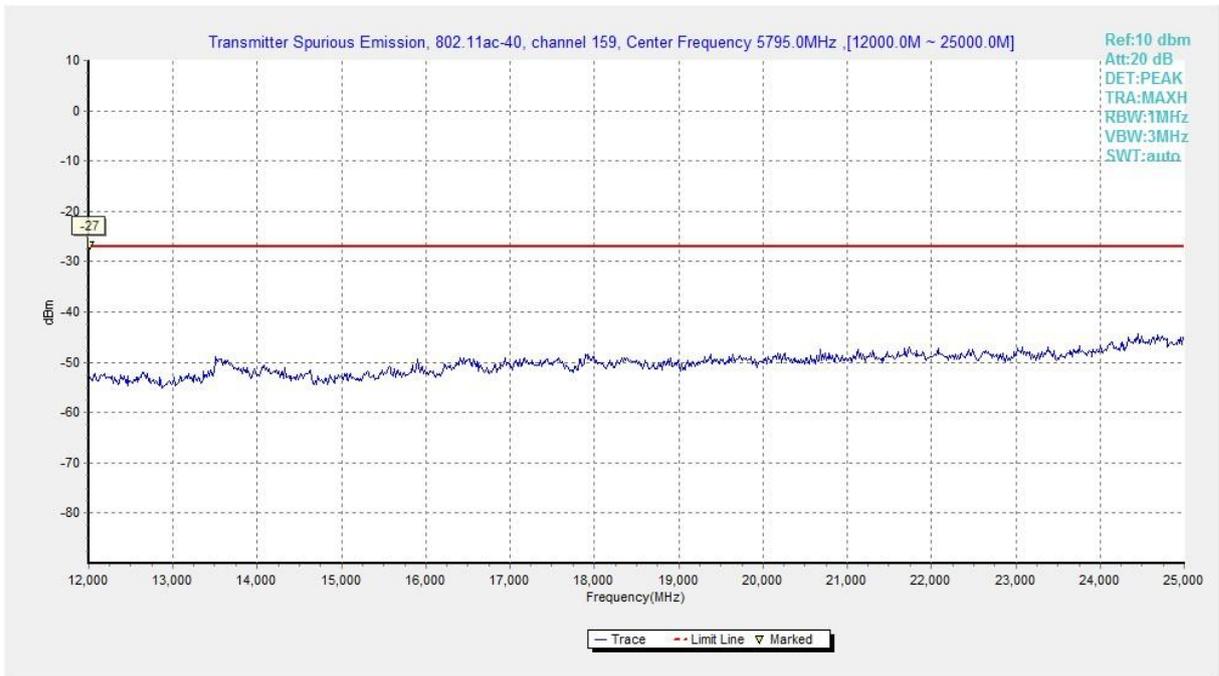


Fig. 53 Conducted Spurious Emission (802.11ac-HT40, Ch159, 12 GHz-25 GHz)