



# FCC PART 15C TEST REPORT

No. I16Z40225-SRD05

for

**TCL Communication Ltd**

**LTE/UMTS/GSM handheld station with**

**Bluetooth technology, WiFi and FM radio**

**5095B**

**With**

**FCC ID: 2ACCJH042**

**Hardware Version: PIO**

**Software Version: v1K14**

**Issued Date: 2016-04-19**



**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:**

CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

No.52, HuayuanNorth Road, Haidian District, Beijing, P. R. China 100191.

Tel: +86(0)10-62304633-2512, Fax: +86(0)10-62304633-2504 Email: [ctl\\_terminals@catr.cn](mailto:ctl_terminals@catr.cn). [www.chinattl.com](http://www.chinattl.com)

## **REPORT HISTORY**

<b>Report Number</b>	<b>Revision</b>	<b>Description</b>	<b>Issue Date</b>
I16Z40225-SRD05	Rev.0	1st edition	2016-03-31
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## 1. TEST LATORATORY

### 1.1. Testing Location

Location 1:CTTL(Huayuan North Road)

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

Location 2:CTTL(Shouxiang)

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

### 1.2. Project data

Testing Start Date: 2016-03-01

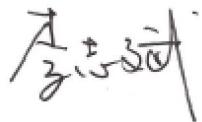
Testing End Date: 2016-03-15

### 1.3. Signature



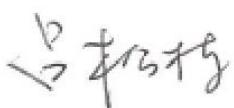
Xu Zhongfei

(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: 0086-21-51798260  
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: 0086-21-51798260  
Fax: 0086-21-61460602

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

#### **3.1. About EUT**

Description	LTE/UMTS/GSM handheld station with Bluetooth technology, WiFi and FM radio
Model name	5095B
FCC ID	2ACCJH042
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	014615000100130	PIO	v1K14
UT02a	014615000100122	PIO	v1K14

\*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	CAC2960001C1	/
AE2	Charger	CBA0061AG0C1	/

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

#### **3.4. General Description**

Equipment Under Test (EUT) is a LTE/UMTS/GSM handheld station with Bluetooth technology, WiFi and FM radio 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; Subpart E—Unlicensed National Information Infrastructure Devices Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the	2015
ANSI C63.10	Range of 9 kHz to 40 GHz	2013

## **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	15.407 (b)	/	P
Transmitter Spurious Emission - Conducted	15.407,15.205	/	P
Transmitter Spurious Emission - Radiated	15.407, 15.205, 15.209	/	P
AC Powerline Conducted Emission	15.107, 15.207	/	P
99% Occupied Bandwidth	/	/	P
Transmitter Spurious Emission - Radiated < 30MHz	15.407, 15.209	/	P

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

Terms used in Verdict column

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

### **6.2. Statements**

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

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

### **6.3. Test Conditions**

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

Temperature	26°C
Voltage	3.7V
Humidity	44%

## **7. TEST EQUIPMENTS UTILIZED**

### **8. 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	/	/

### **9. Radiated emission test system**

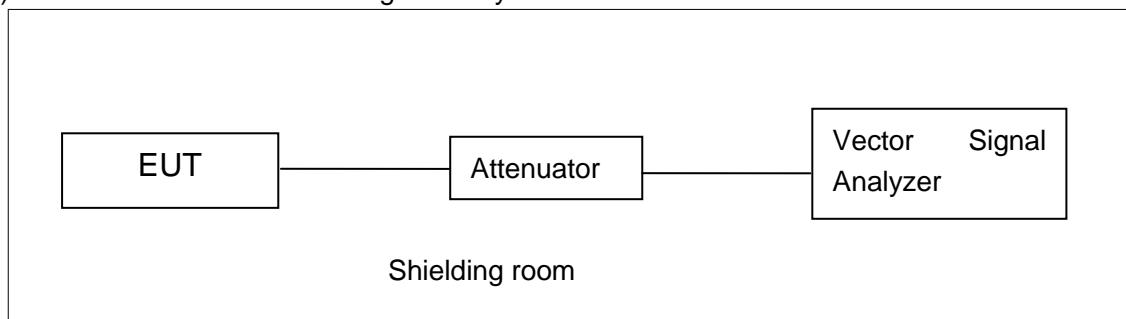
No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Calibration Due date
1	Test Receiver	ESCI 7	100948	Rohde & Schwarz	2015-07-17	2016-07-16
2	Loop antenna	HFH2-Z2	829324/007	Rohde & Schwarz	2014-12-17	2017-12-16
3	BiLog Antenna	VULB9163	234	Schwarzbeck	2013-09-16	2016-09-15
4	Dual-Ridge 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

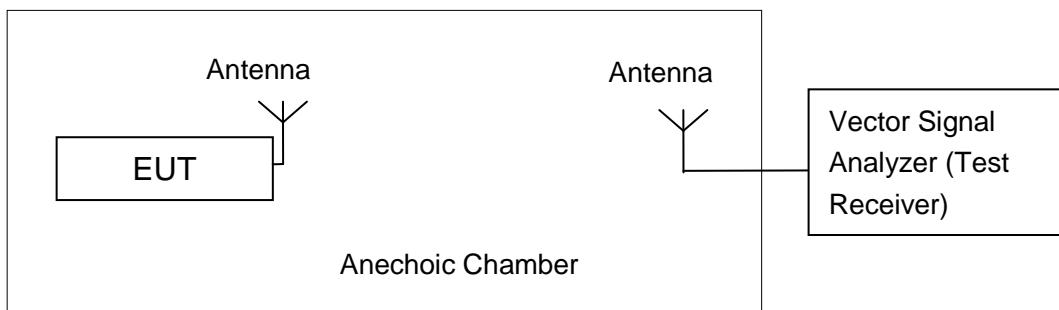


#### A.1.2. Radiated Emission Measurements

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 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 Peak Output Power

### Measurement Limit and Method:

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

### 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	14.25	/	/
	9	14.67	/	/
	12	14.87	/	/
	18	14.96	/	/
	24	15.45	/	/
	36	15.54	/	/
	48	15.82	/	/
	54	15.87	14.04	17.41

The data rate 54Mbps 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	14.31	/	/
	MCS1	14.29	/	/
	MCS2	14.28	/	/
	MCS3	15.01	/	/
	MCS4	14.97	/	/
	MCS5	14.88	/	/
	MCS6	15.18	/	/
	MCS7	15.21	13.61	16.88

The data rate MCS7 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	13.68	/
	MCS1	13.64	/
	MCS2	12.96	/
	MCS3	14.06	/
	MCS4	13.97	/
	MCS5	13.63	/
	MCS6	14.13	/
	MCS7	14.14	13.98

The data rate MCS7 is selected as worse condition, and the following cases are performed with this condition.

**Conclusion: PASS**

**A.2.2. Maximum Average Output Power-Conducted**

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

**802.11a mode**

Mode	Test Result (dBm)		
	5745MHz (Ch149)	5785MHz (Ch157)	5825MHz (Ch165)
802.11a	8.64	8.45	9.84

**802.11n-HT20 mode**

Mode	Test Result (dBm)		
	5745MHz (Ch149)	5785MHz (Ch157)	5825MHz(Ch165)
802.11n(20MHz)	8.03	7.83	9.81

**802.11n-HT40 mode**

Mode	Test Result (dBm)	
	5755MHz (Ch151)	5795MHz(Ch159)
802.11n(40MHz)	7.12	7.22

**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
-------------------------	--------

**Measurement Results:**

Mode	Channel	Power Spectral Density ( dBm/500kHz )	Conclusion
802.11a	149	6.94	P
	157	7.18	P
	165	6.83	P
802.11n HT20	149	5.88	P
	157	6.54	P
	165	6.52	P
802.11n HT40	151	4.84	P
	159	4.85	P

**Conclusion: PASS**

#### A.4. Occupied 6dB Bandwidth

##### Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.407(e)	$\geq 500$

The measurement is made according to KDB789033 D02 .

##### Measurement Uncertainty:

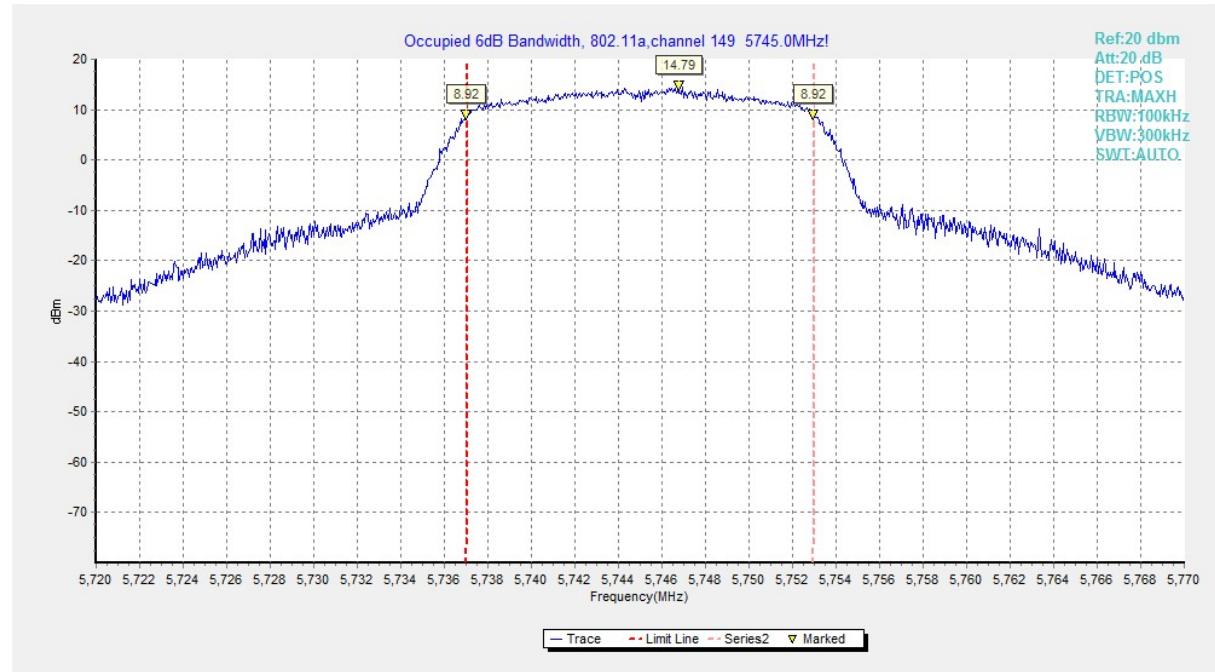
Measurement Uncertainty	60.80Hz
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##### Measurement Result:

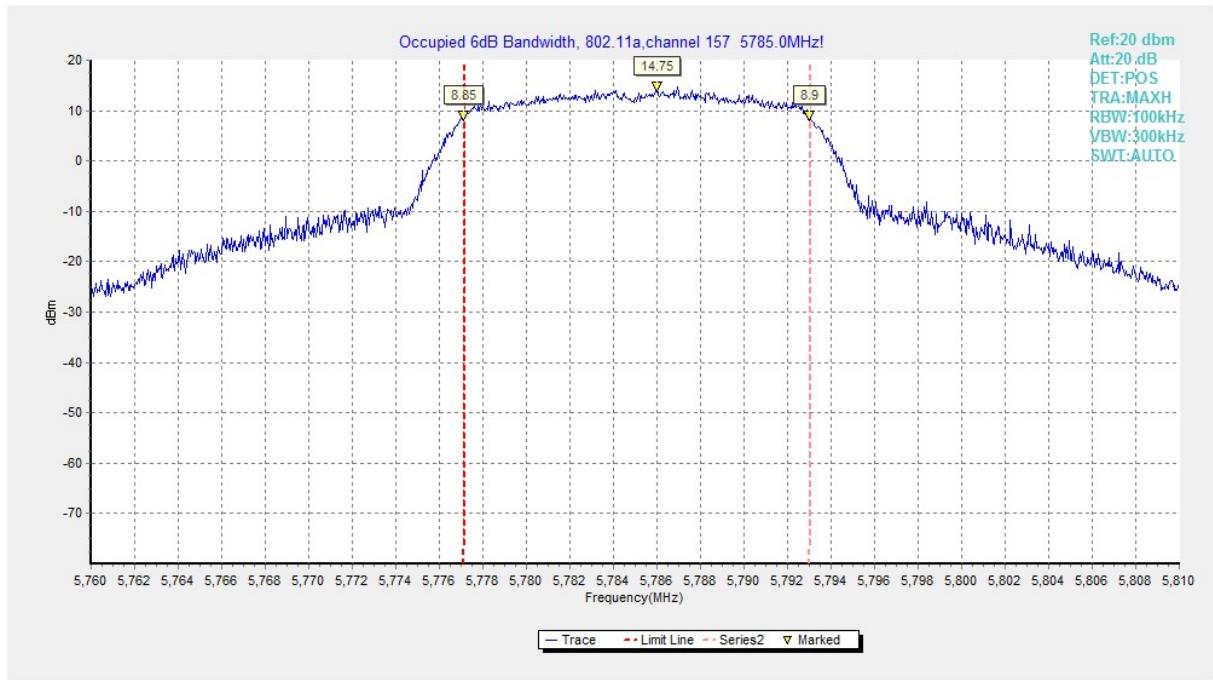
Mode	Channel	Occupied 6dB Bandwidth ( kHz)		conclusion
802.11a	149	Fig.1	15950	P
	157	Fig.2	15900	P
	165	Fig.3	16050	P
802.11n HT20	149	Fig.4	17100	P
	157	Fig.5	17400	P
	165	Fig.6	17450	P
802.11n HT40	151	Fig.7	35360	P
	159	Fig.8	35840	P

**Conclusion: PASS**

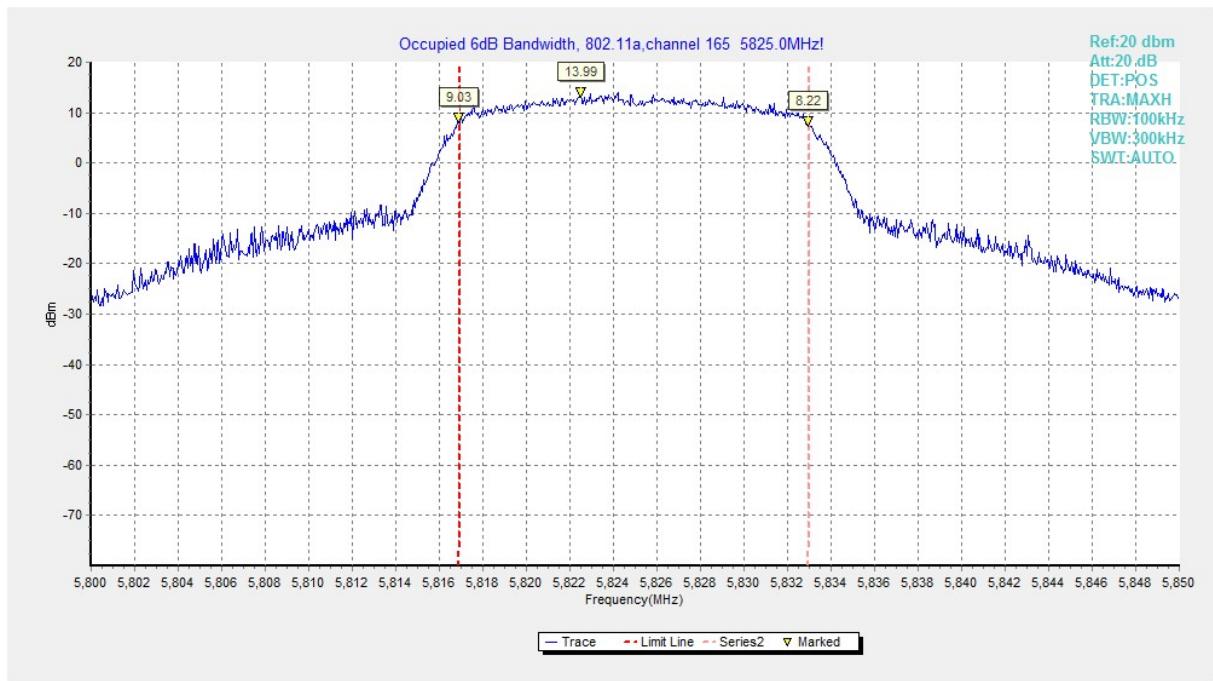
**Test graphs as below:**



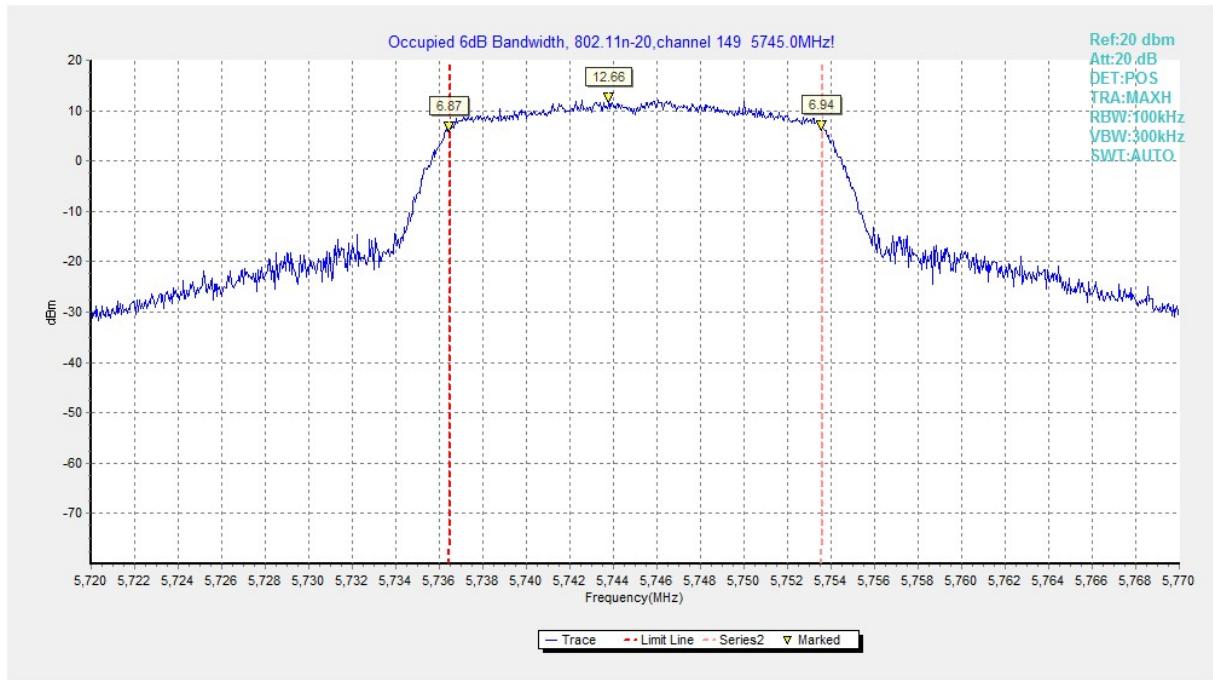
**Fig. 1 Occupied 6dB Bandwidth (802.11a, Ch 149)**



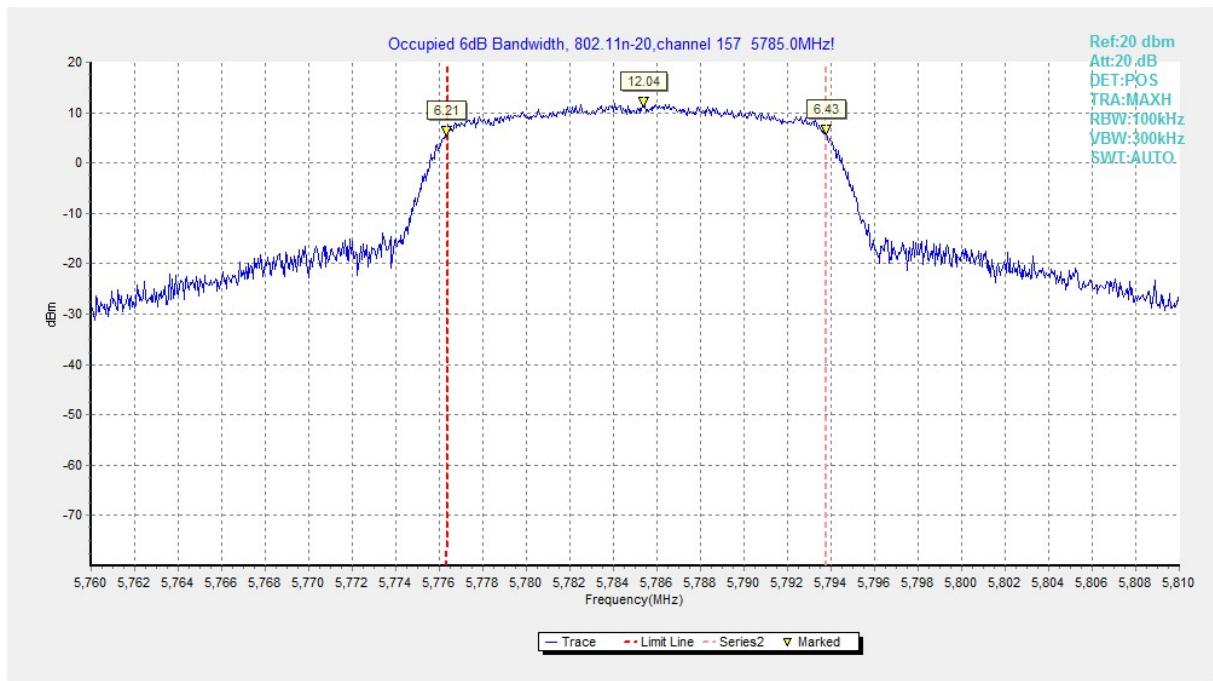
**Fig. 2 Occupied 6dB Bandwidth (802.11a, Ch 157)**



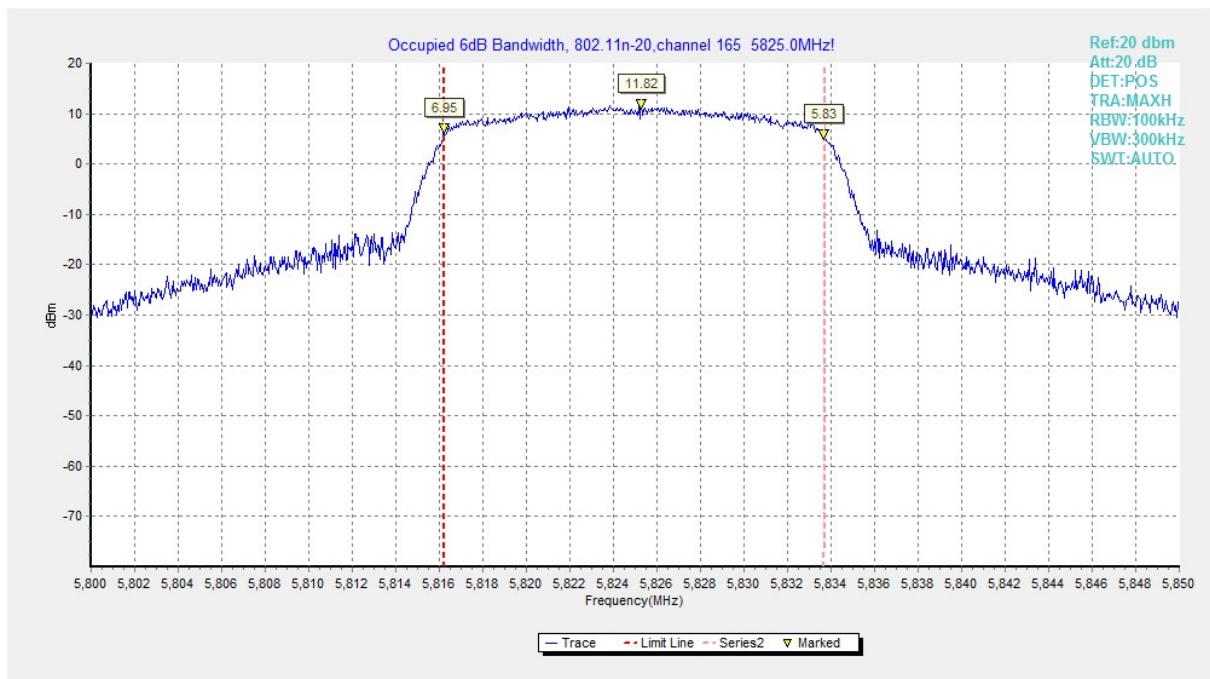
**Fig. 3 Occupied 6dB Bandwidth (802.11a, Ch 165)**



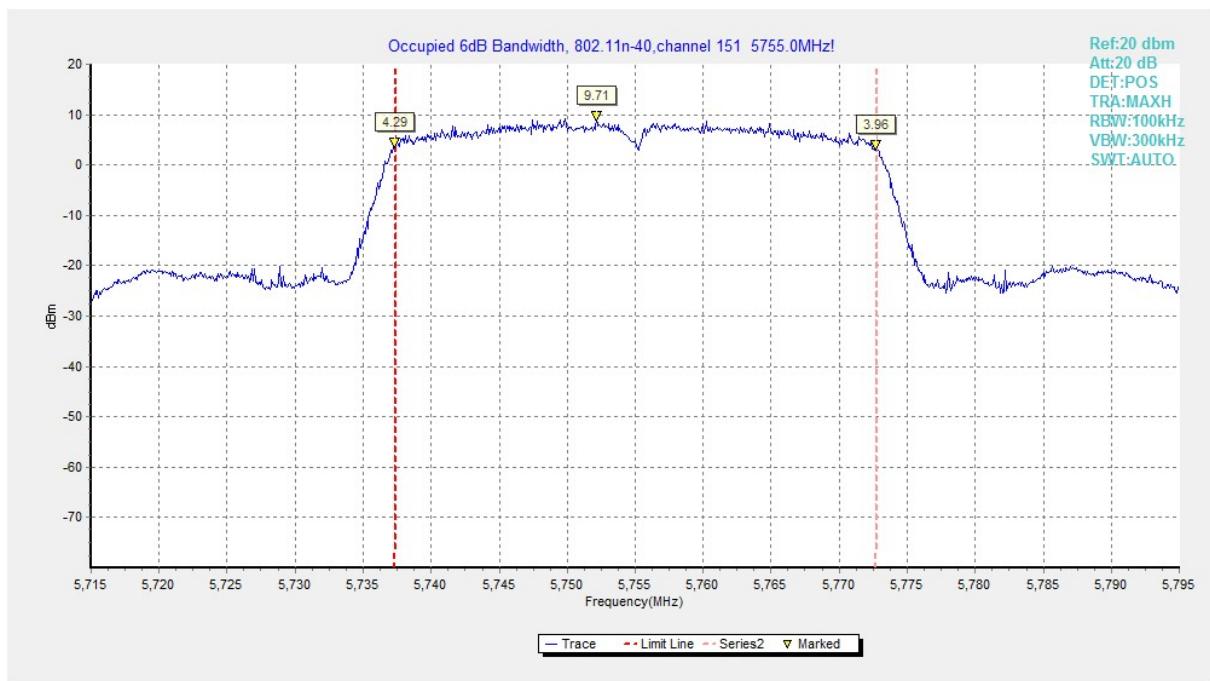
**Fig. 4 Occupied 6dB Bandwidth (802.11n-HT20, Ch 149)**



**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)**

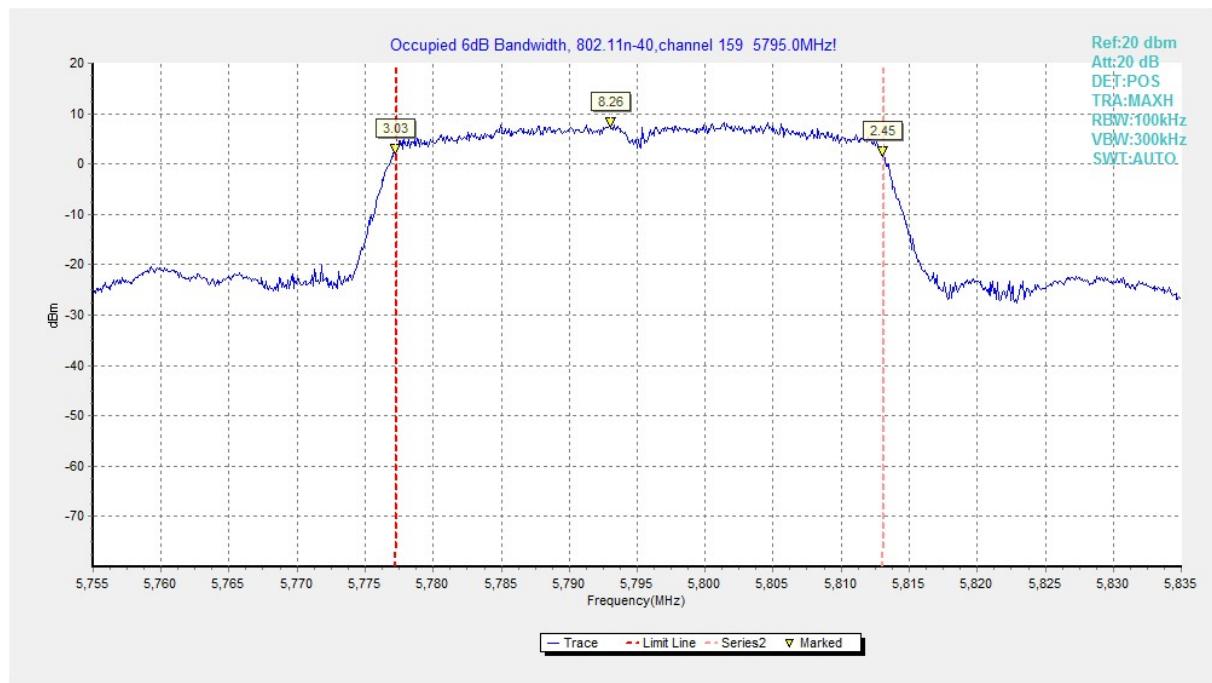


Fig. 8 Occupied 6dB Bandwidth (802.11n-HT40, Ch 159)

### A.5. Transmitter Spurious Emission

#### Measurement Limit:

Standard	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:

##### 802.11a mode

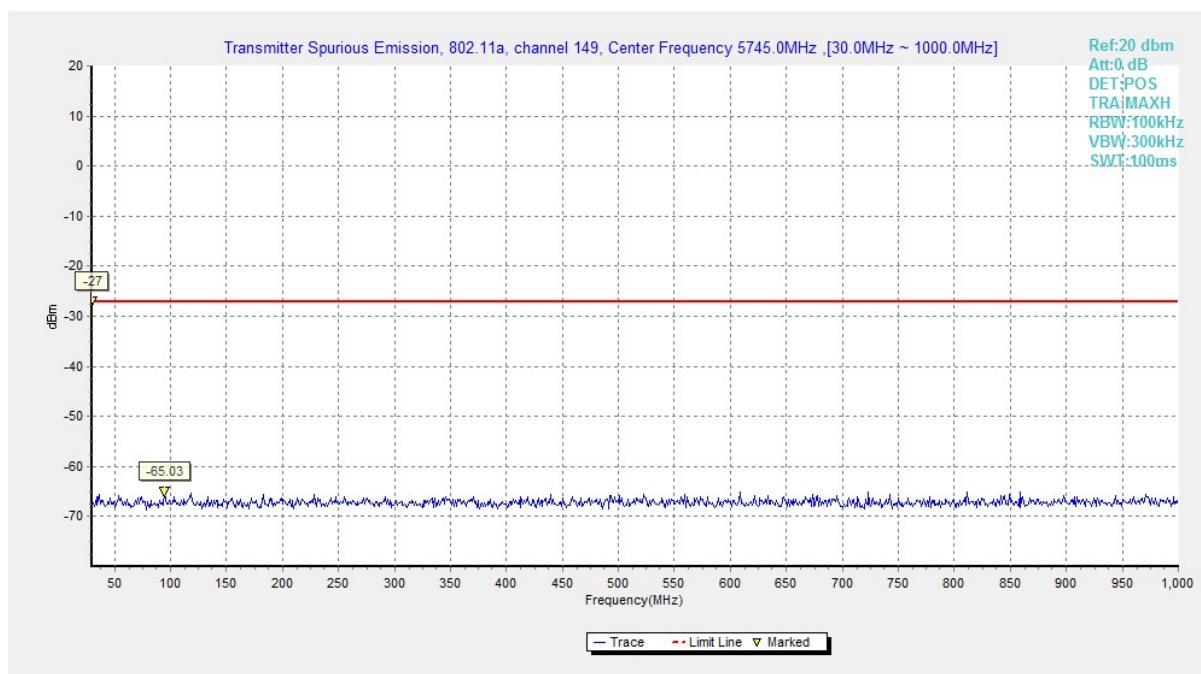
MODE	Channel	Frequency Range	Test Results	Conclusion
802.11a	149	30 MHz ~ 1 GHz	Fig.9	P
		1 GHz ~ 12 GHz	Fig.10	P
		12 GHz ~ 25 GHz	Fig.11	P
		25 GHz ~ 40 GHz	Fig.12	P
	157	30 MHz ~ 1 GHz	Fig.13	P
		1 GHz ~ 12 GHz	Fig.14	P
		12 GHz ~ 25 GHz	Fig.15	P
		25 GHz ~ 40 GHz	Fig.16	P
	165	30 MHz ~ 1 GHz	Fig.17	P
		1 GHz ~ 12 GHz	Fig.18	P
		12 GHz ~ 25 GHz	Fig.19	P
		25 GHz ~ 40 GHz	Fig.20	P

**802.11n-HT20 mode**

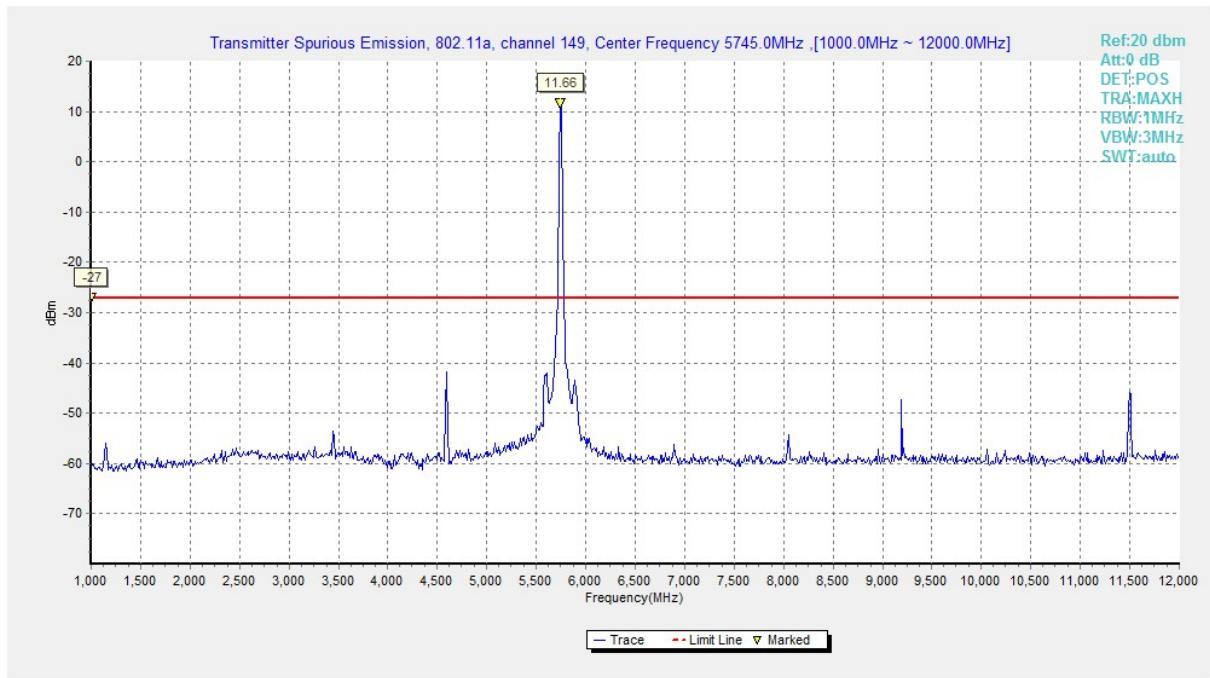
MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n HT20	149	30 MHz ~ 1 GHz	Fig.21	P
		1 GHz ~ 12 GHz	Fig.22	P
		12 GHz ~ 25 GHz	Fig.23	P
		25 GHz ~ 40 GHz	Fig.24	P
	157	30 MHz ~ 1 GHz	Fig.25	P
		1 GHz ~ 12 GHz	Fig.26	P
		12 GHz ~ 25 GHz	Fig.27	P
		25 GHz ~ 40 GHz	Fig.28	P
	165	30 MHz ~ 1 GHz	Fig.29	P
		1 GHz ~ 12 GHz	Fig.30	P
		12 GHz ~ 25 GHz	Fig.31	P
		25 GHz ~ 40 GHz	Fig.32	P

**802.11n-HT40 mode**

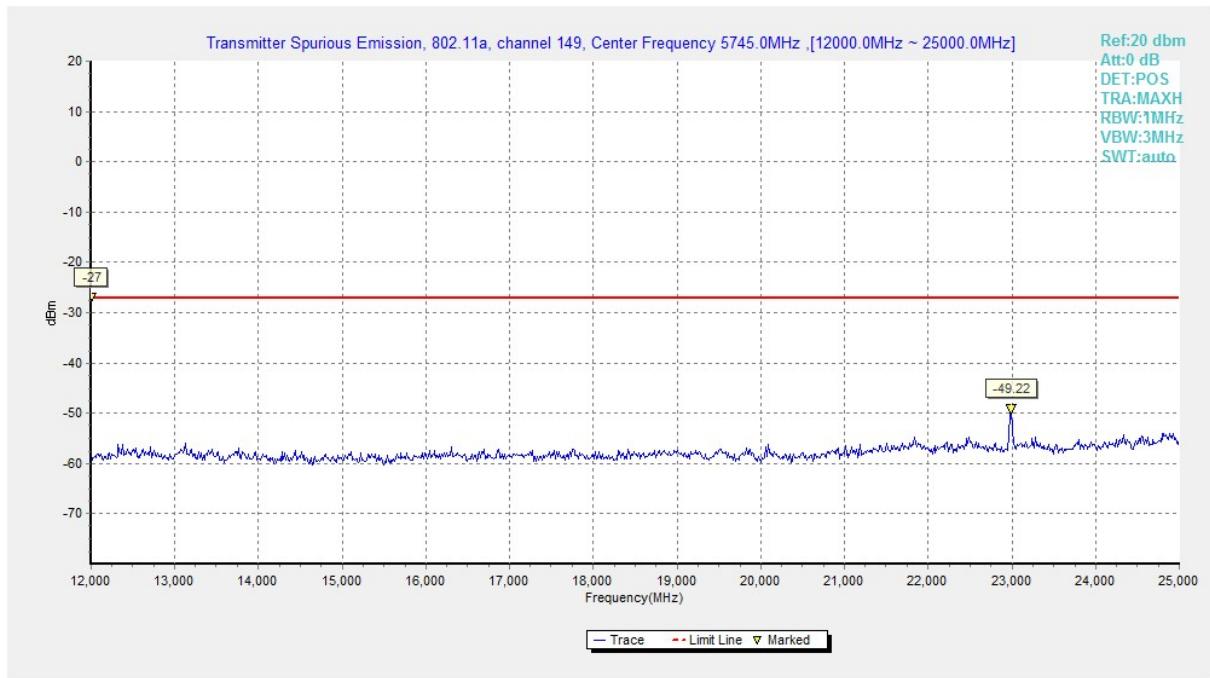
MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n HT40	151	30 MHz ~ 1 GHz	Fig.33	P
		1 GHz ~ 12 GHz	Fig.34	P
		12 GHz ~ 25 GHz	Fig.35	P
		25 GHz ~ 40 GHz	Fig.36	P
	159	30 MHz ~ 1 GHz	Fig.37	P
		1 GHz ~ 12 GHz	Fig.38	P
		12 GHz ~ 25 GHz	Fig.39	P
		25 GHz ~ 40 GHz	Fig.40	P

**Conclusion: PASS**
**Test graphs as below:**


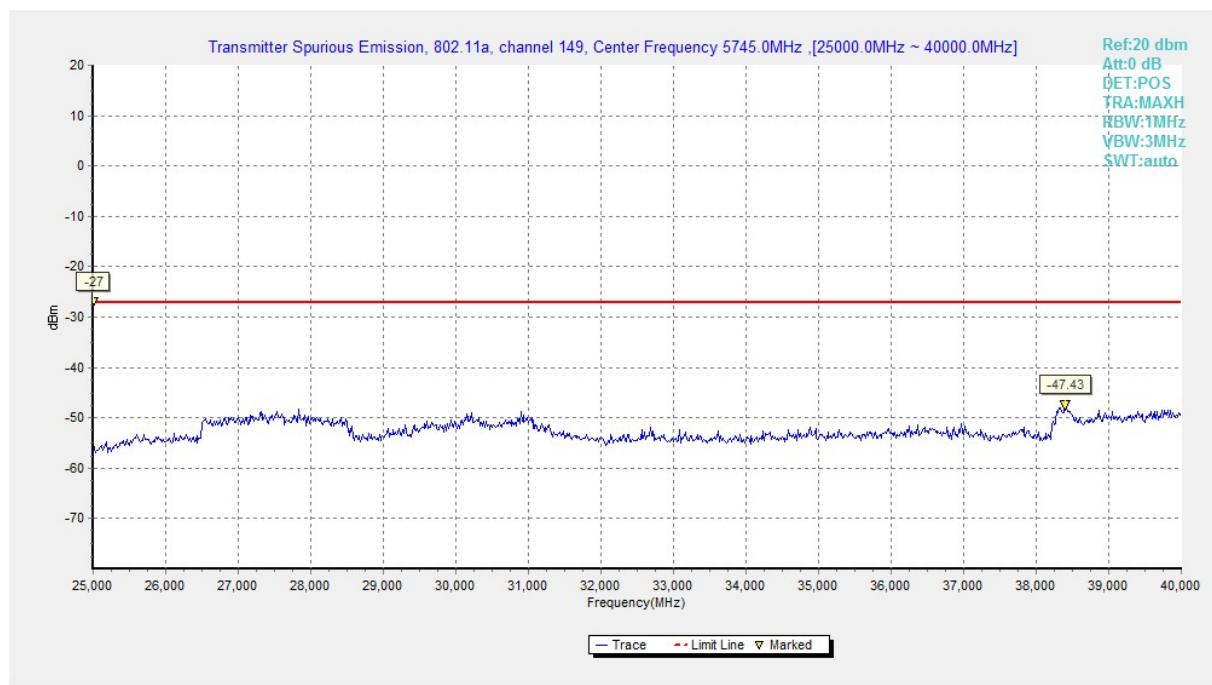
**Fig. 9 Conducted Spurious Emission (802.11a, Ch149, 30 MHz-1 GHz)**



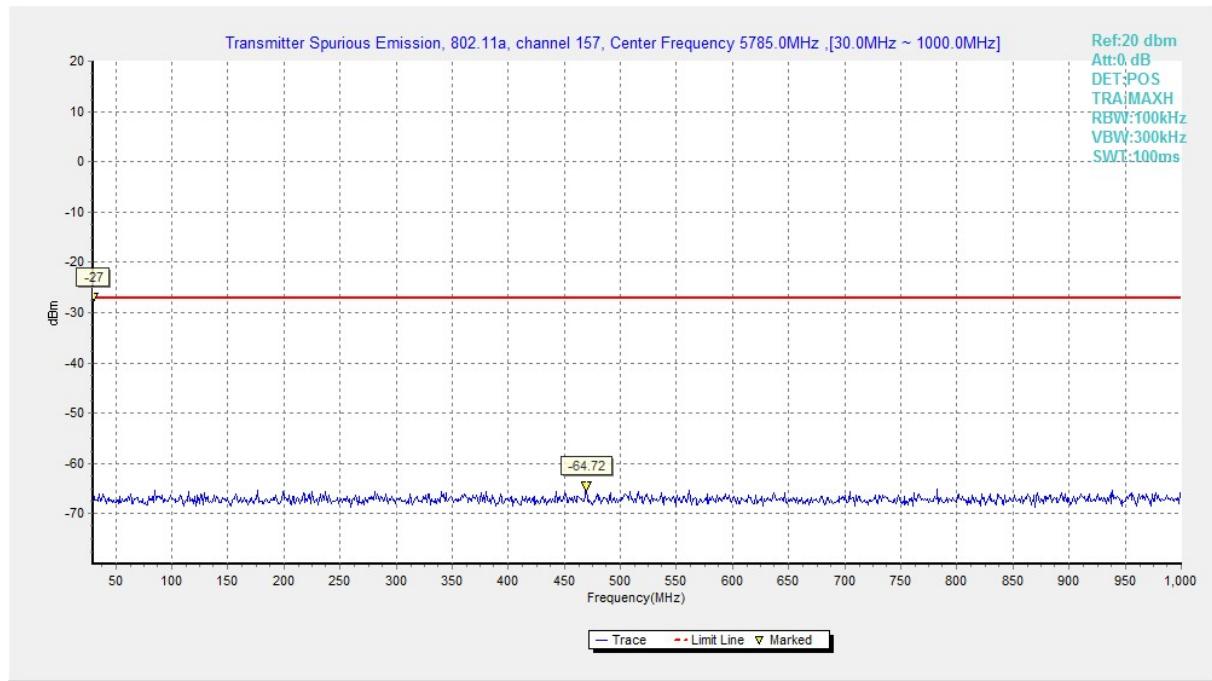
**Fig. 10 Conducted Spurious Emission (802.11a, Ch149, 1 GHz -12 GHz)**



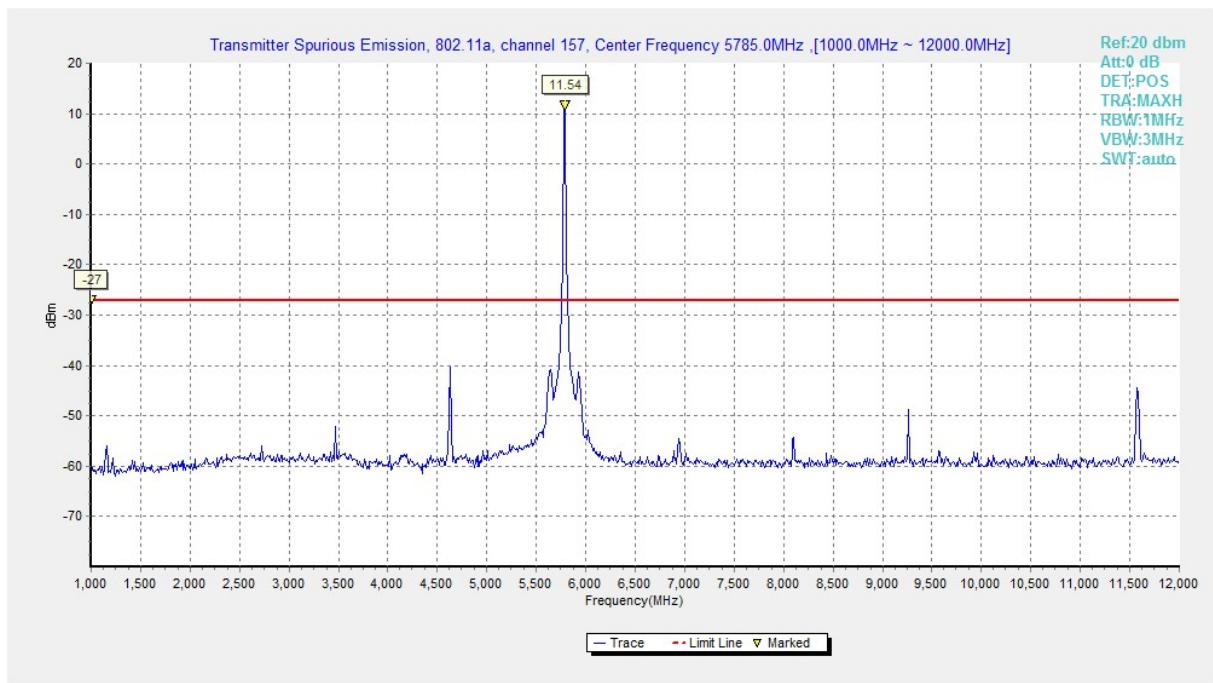
**Fig. 11 Conducted Spurious Emission (802.11a, Ch149, 12 GHz-25 GHz)**



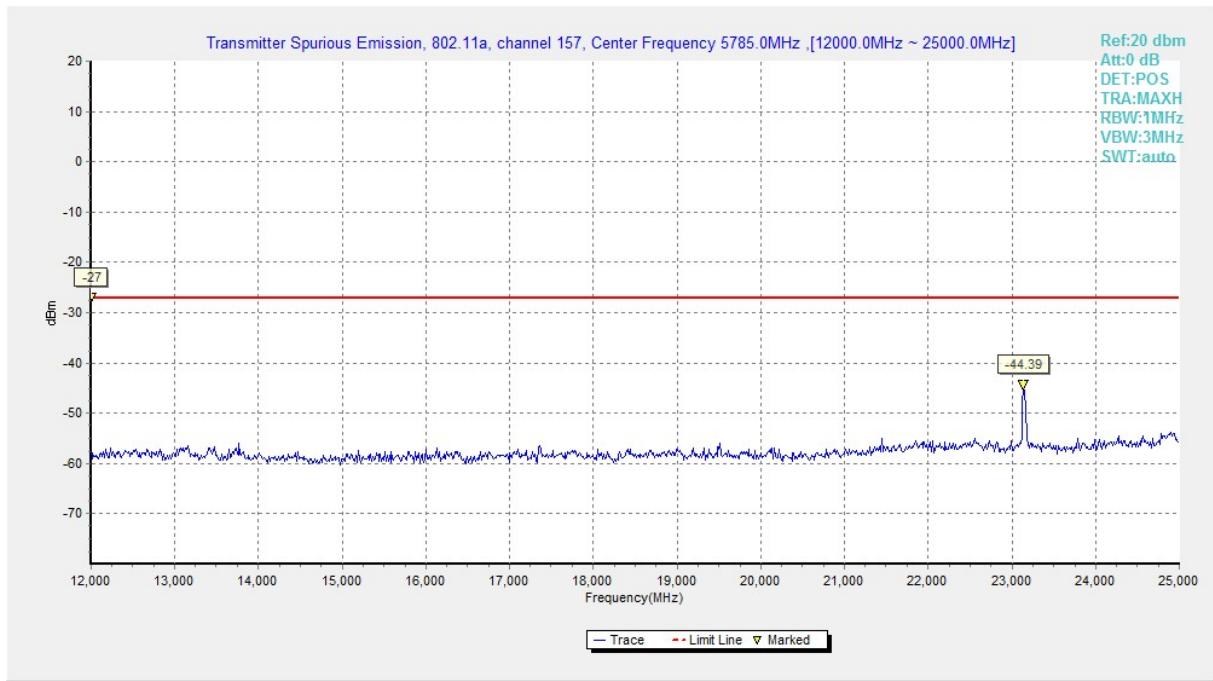
**Fig. 12 Conducted Spurious Emission (802.11a, Ch149, 25 GHz-40 GHz)**



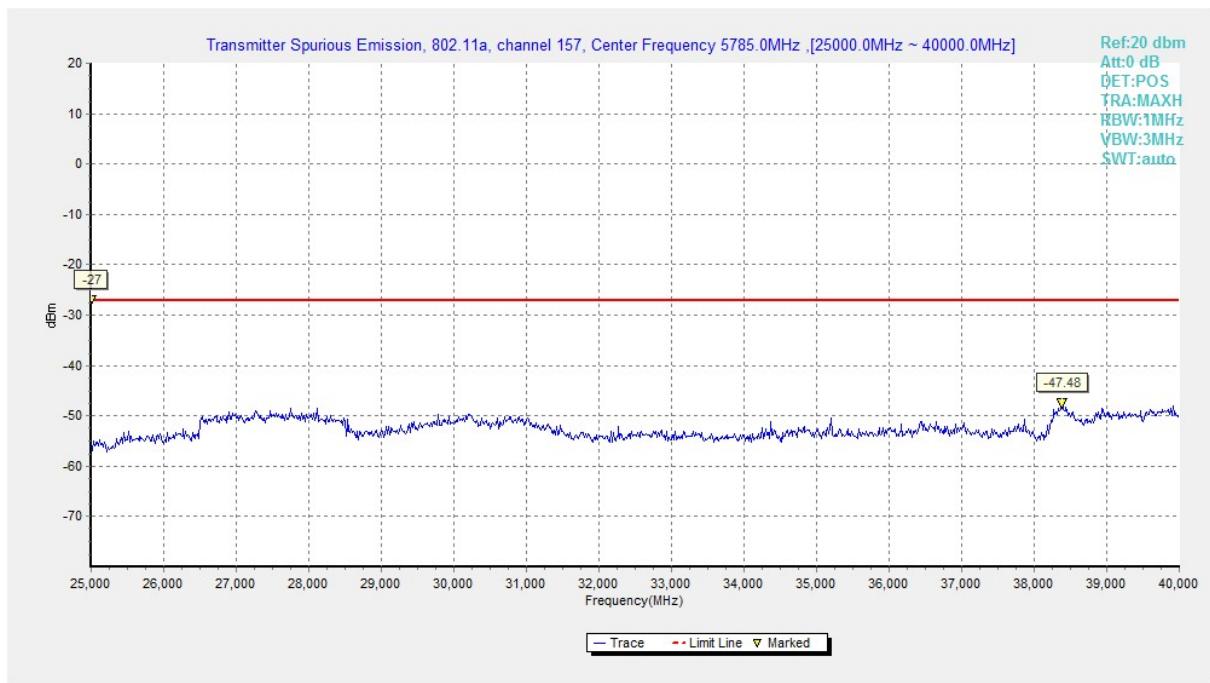
**Fig. 13 Conducted Spurious Emission (802.11a, Ch157, 30 MHz-1 GHz)**



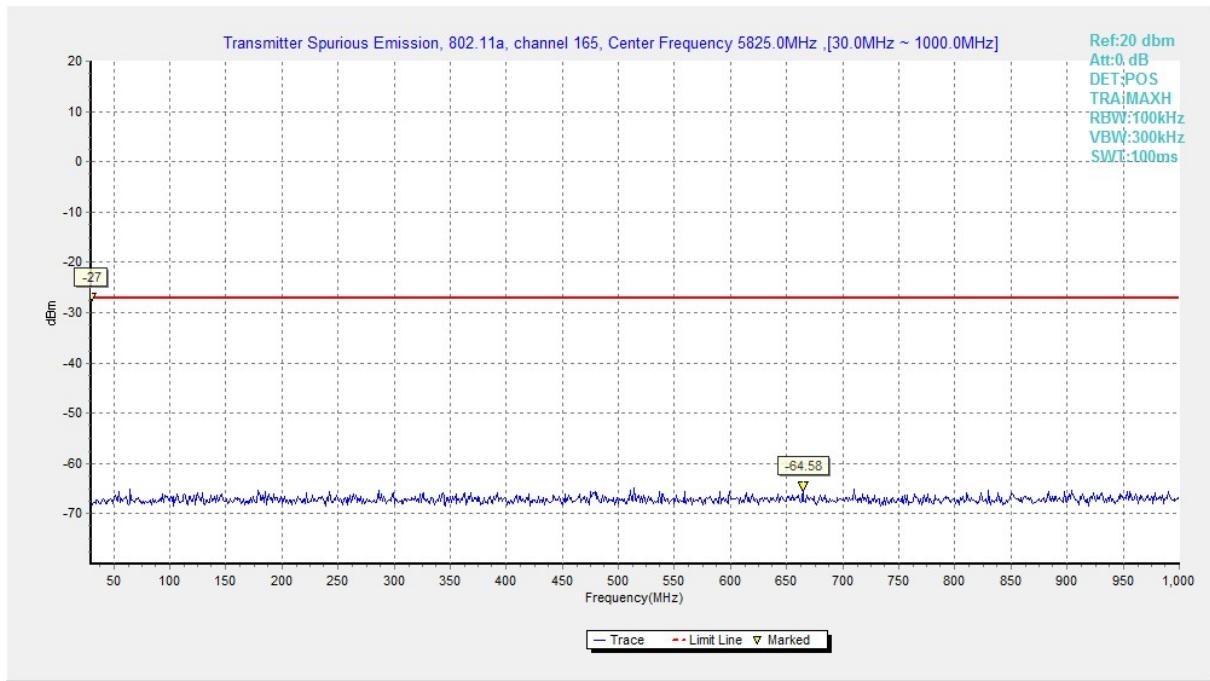
**Fig. 14 Conducted Spurious Emission (802.11a, Ch157, 1 GHz -12 GHz)**



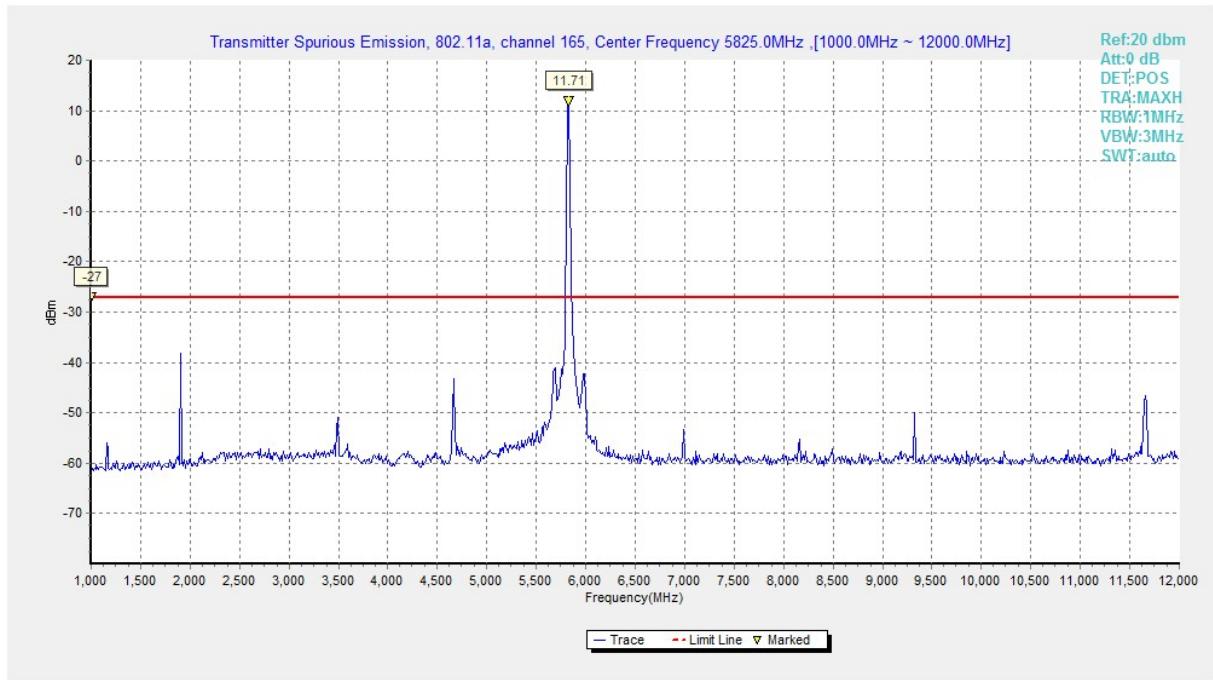
**Fig. 15 Conducted Spurious Emission (802.11a, Ch157, 12 GHz-25 GHz)**



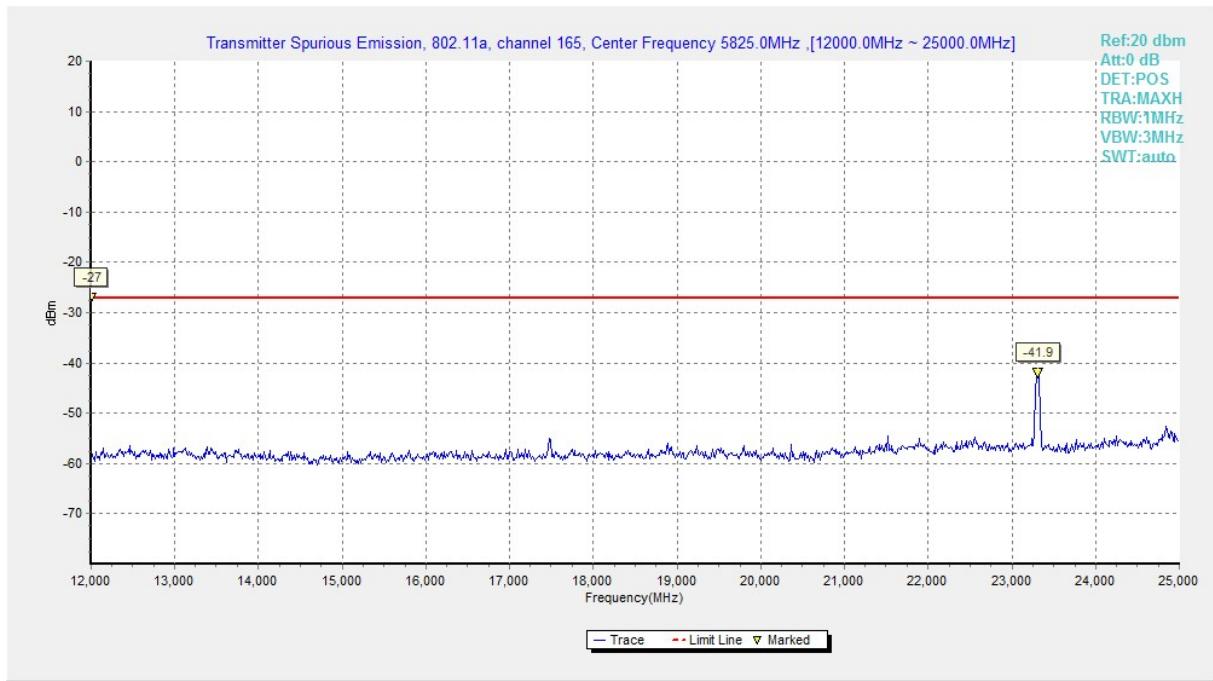
**Fig. 16 Conducted Spurious Emission (802.11a, Ch157, 25 GHz-40 GHz)**



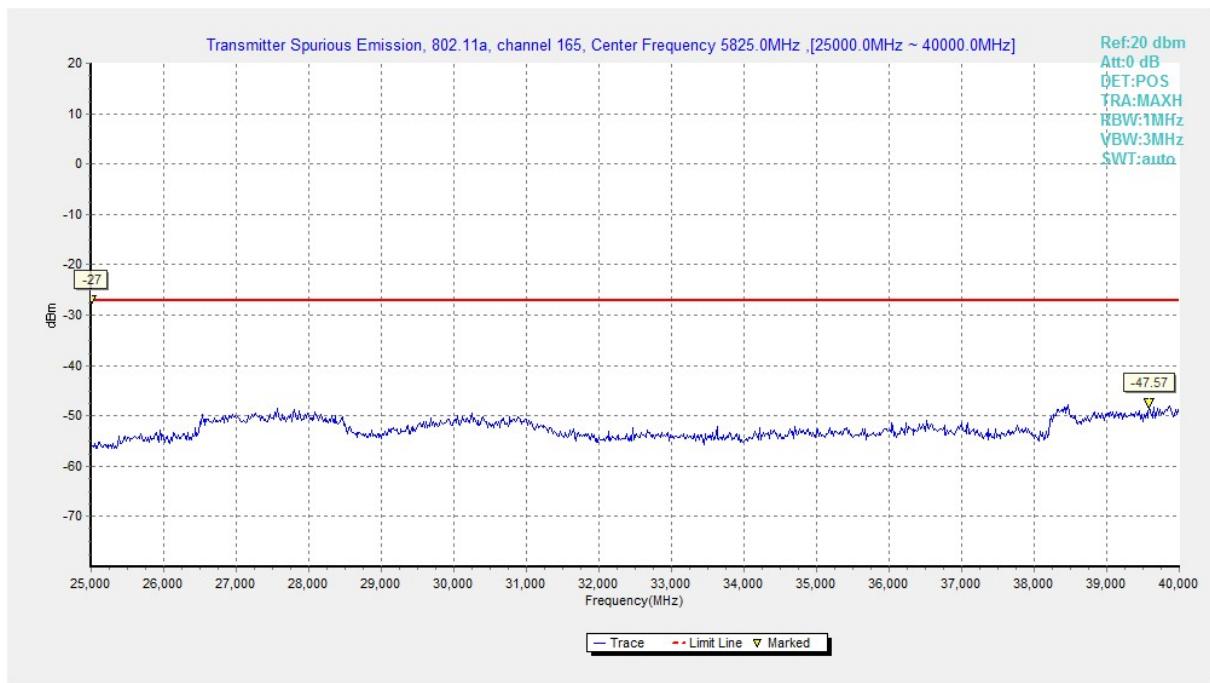
**Fig. 17 Conducted Spurious Emission (802.11a, Ch165, 30 MHz-1 GHz)**



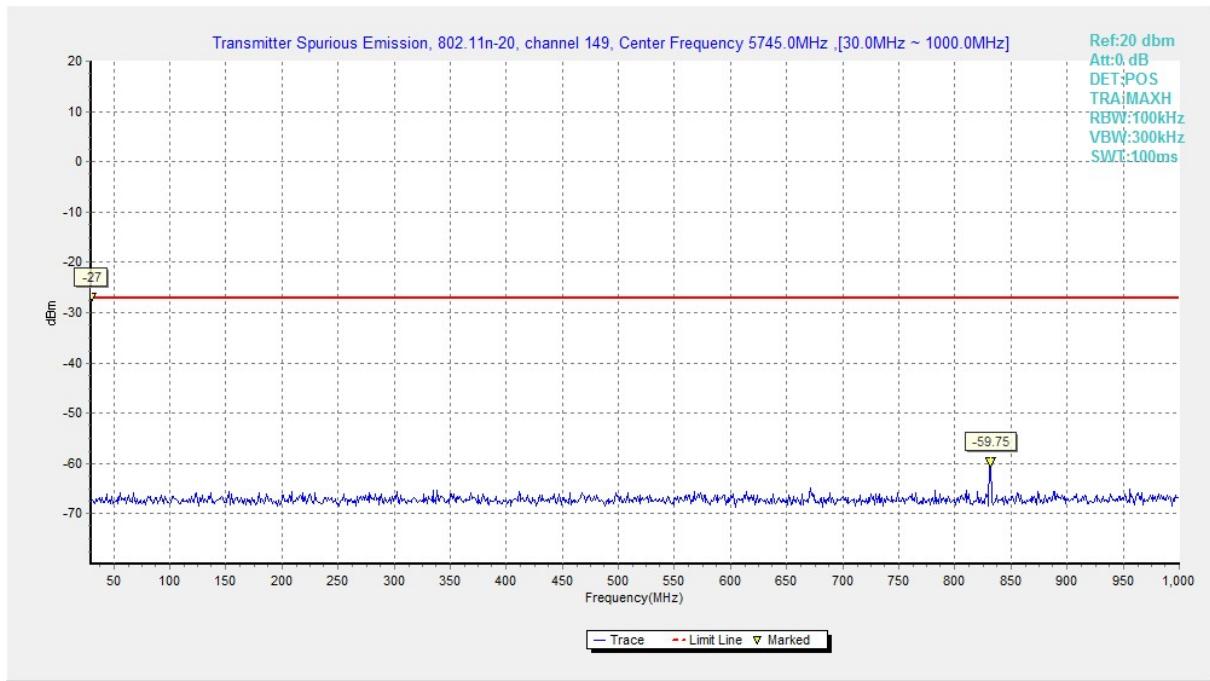
**Fig. 18 Conducted Spurious Emission (802.11a, Ch165, 1 GHz -12 GHz)**



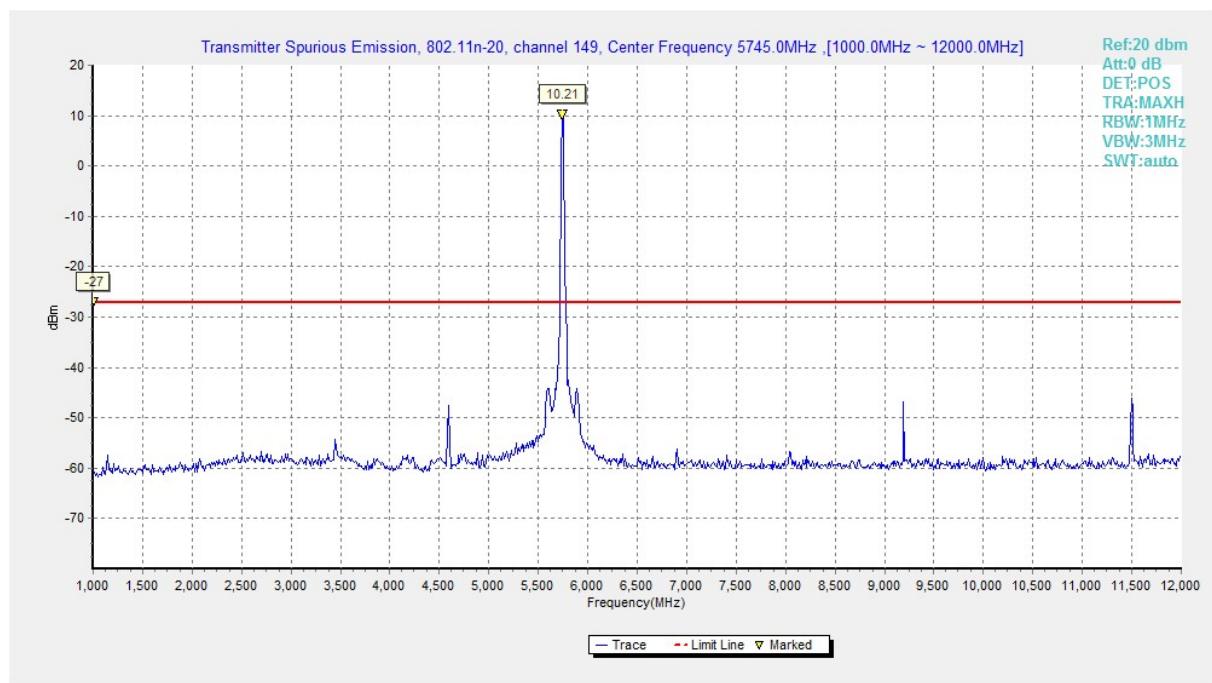
**Fig. 19 Conducted Spurious Emission (802.11a, Ch165, 12 GHz-25 GHz)**



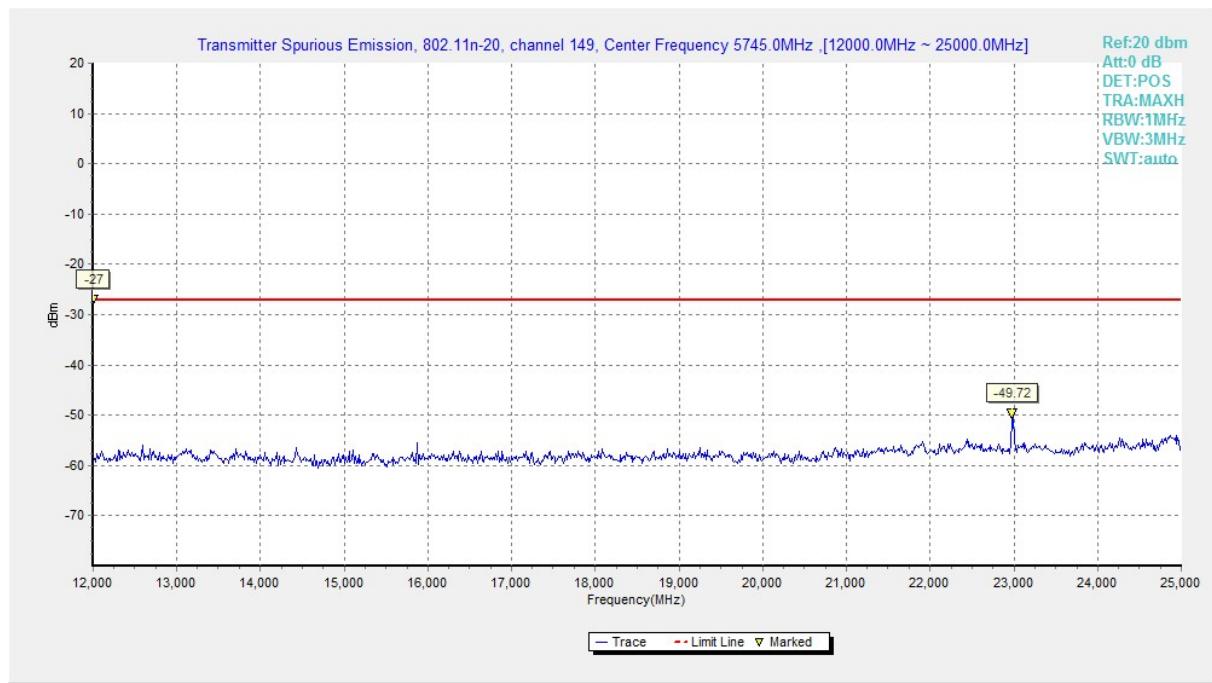
**Fig. 20 Conducted Spurious Emission (802.11a, Ch165, 25 GHz-40 GHz)**



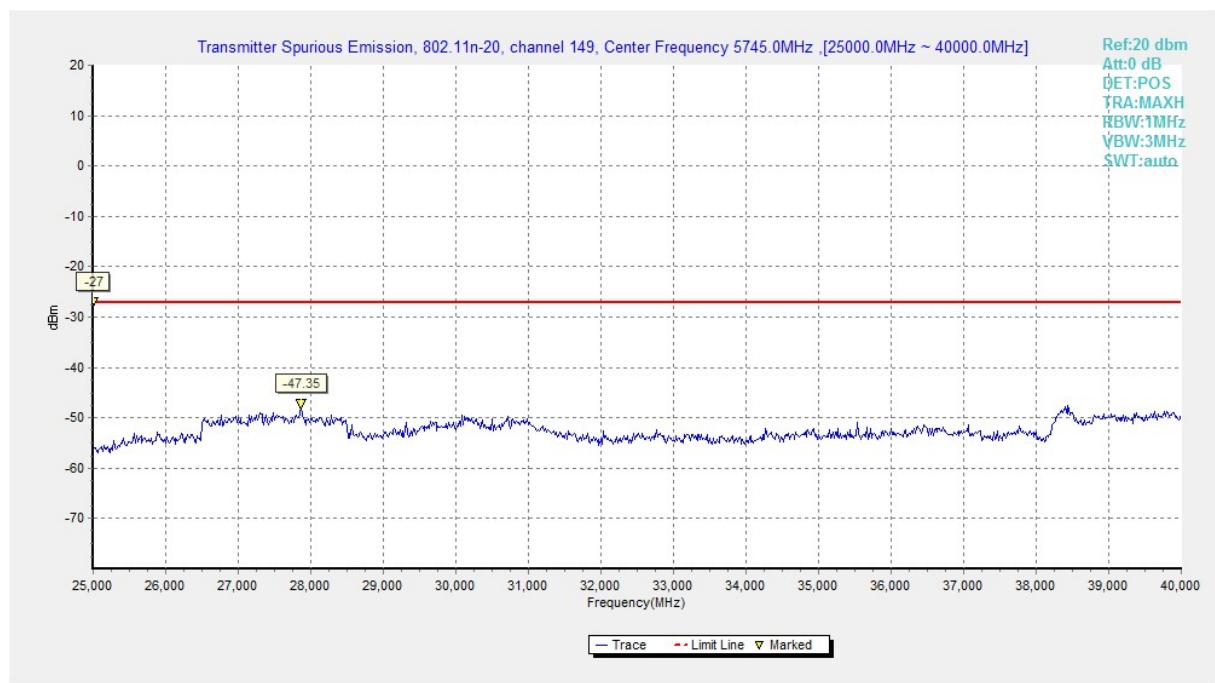
**Fig. 21 Conducted Spurious Emission (802.11n-HT20, Ch149, 30 MHz-1 GHz)**



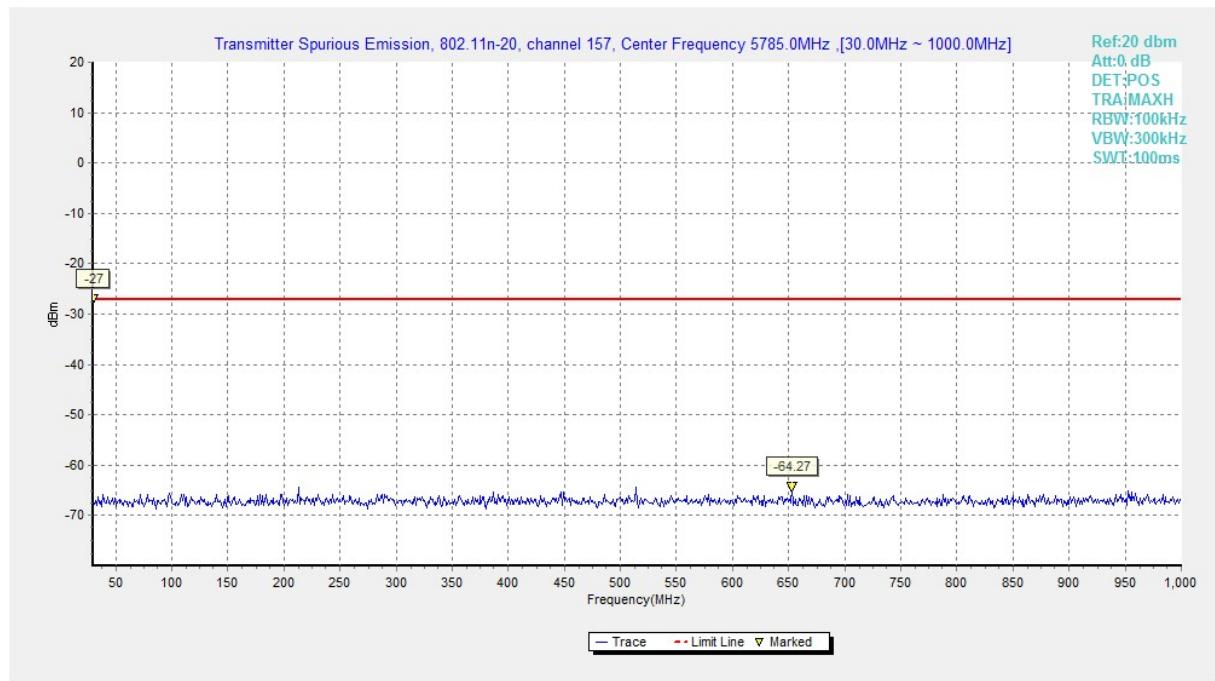
**Fig. 22 Conducted Spurious Emission (802.11n-HT20, Ch149, 1 GHz -12 GHz)**



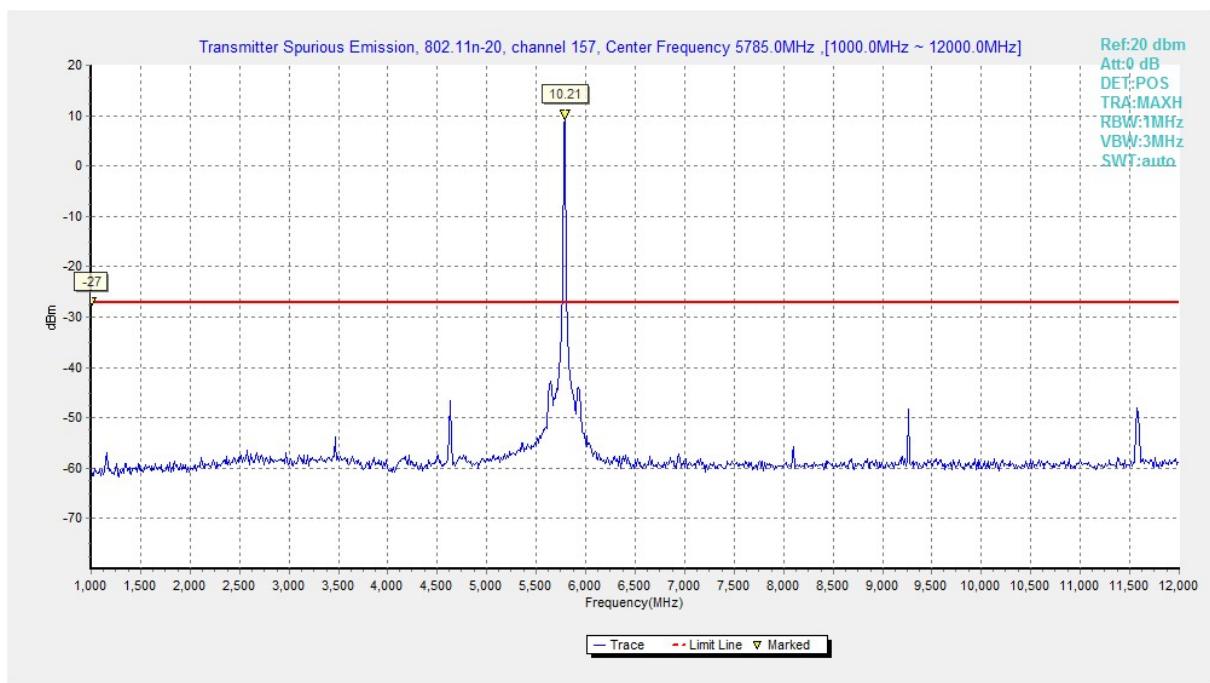
**Fig. 23 Conducted Spurious Emission (802.11n-HT20, Ch149, 12 GHz-25 GHz)**



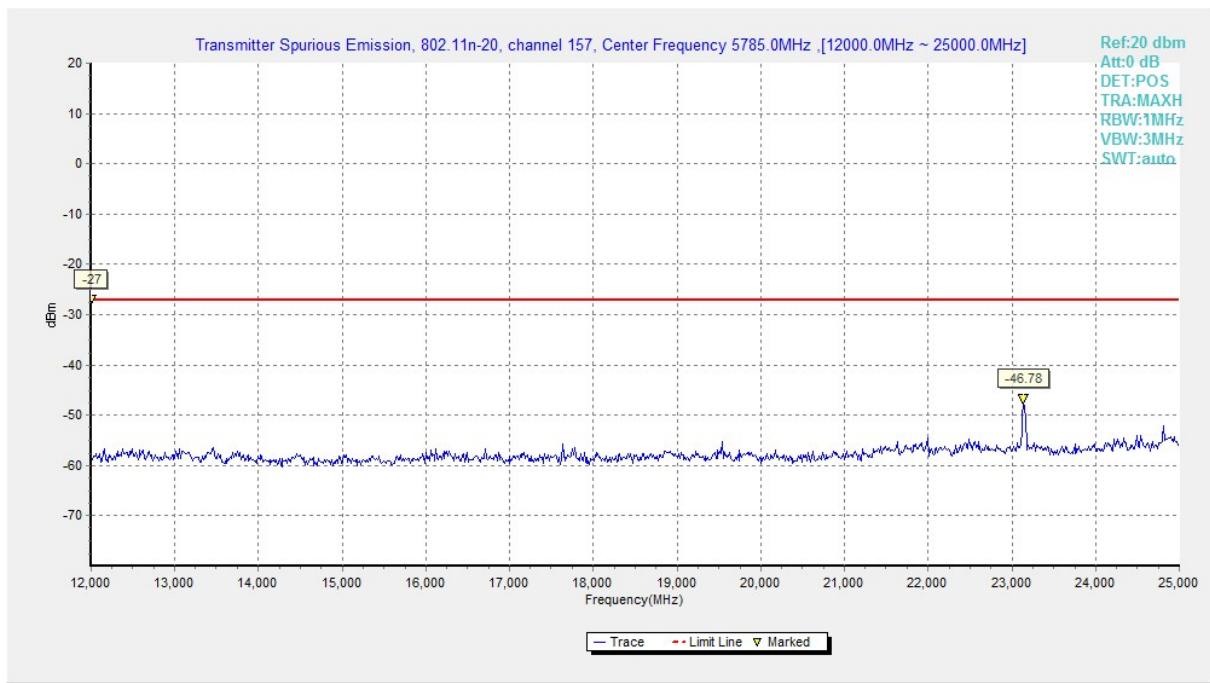
**Fig. 24 Conducted Spurious Emission (802.11n-HT20, Ch149, 25 GHz-40 GHz)**



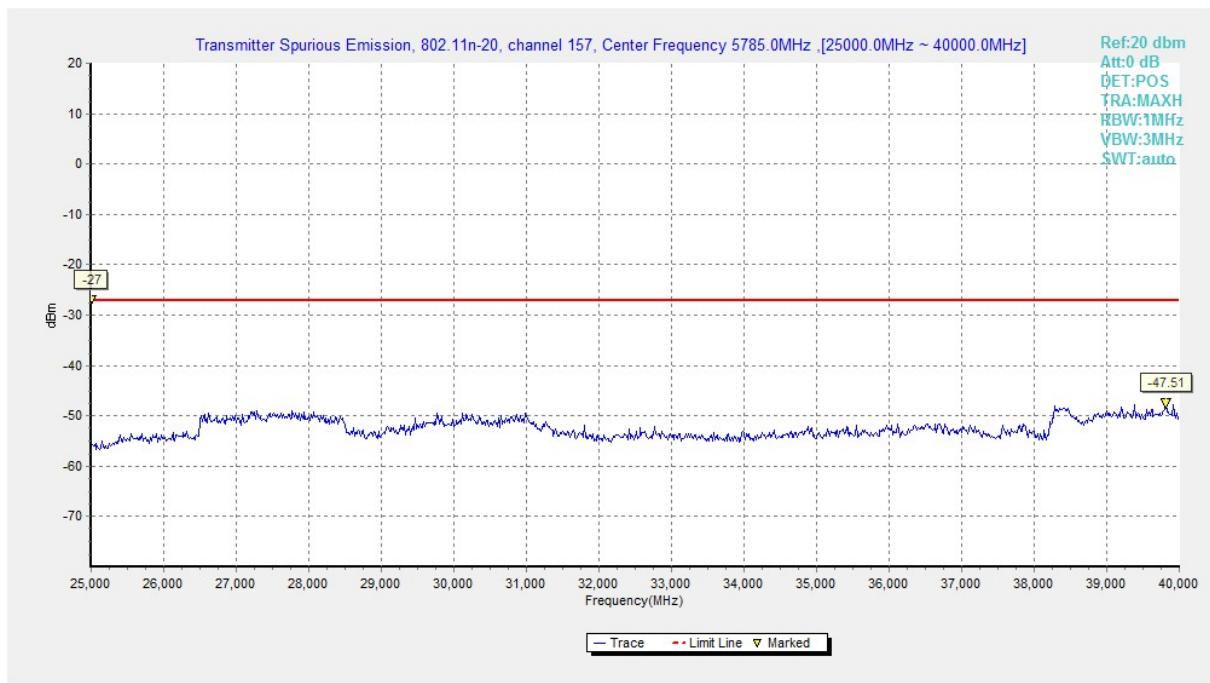
**Fig. 25 Conducted Spurious Emission (802.11n-HT20, Ch157, 30 MHz-1 GHz)**



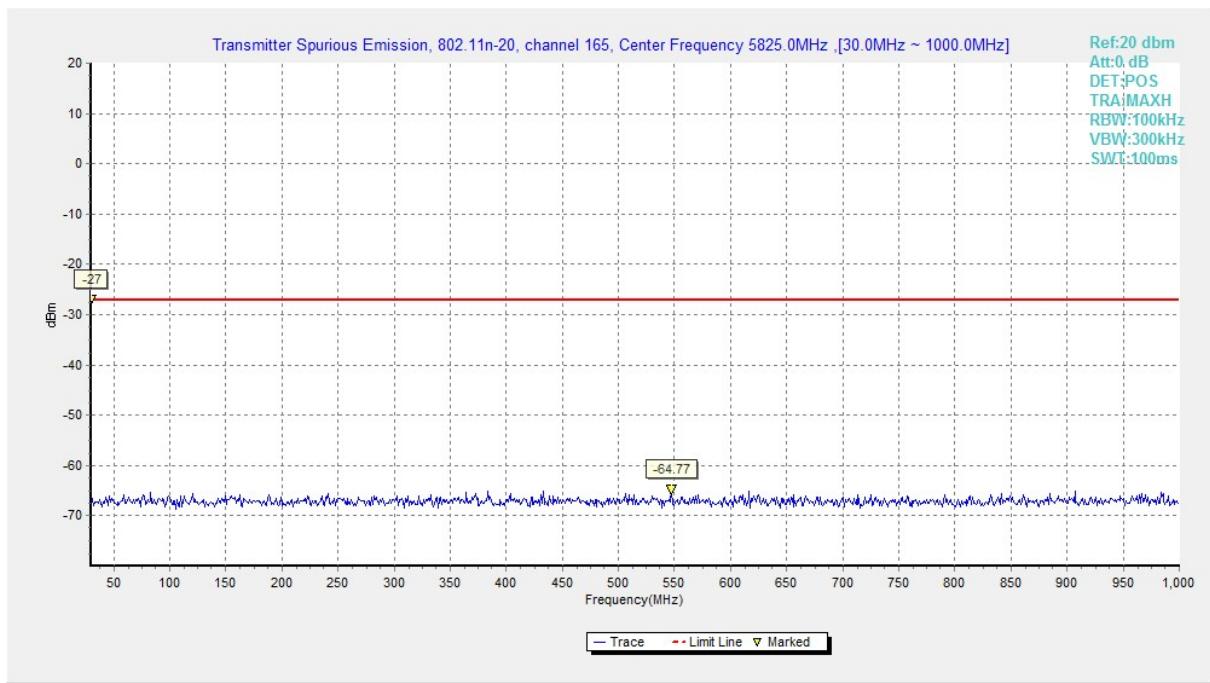
**Fig. 26 Conducted Spurious Emission (802.11n-HT20, Ch157, 1 GHz -12 GHz)**



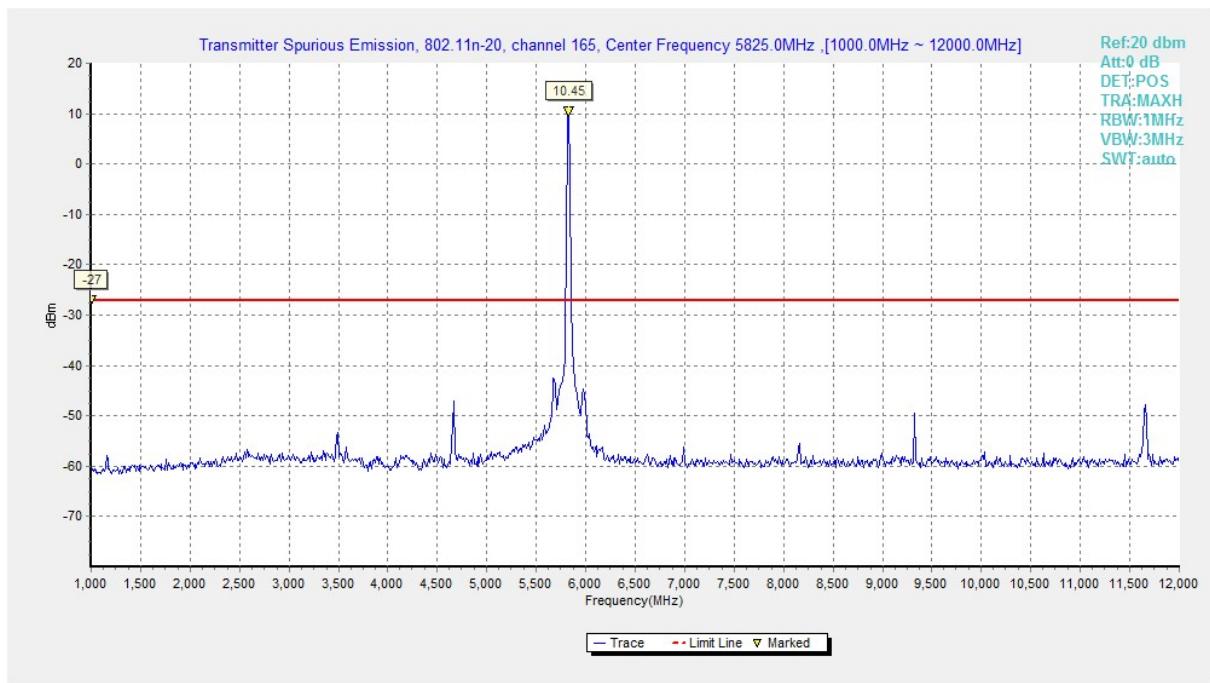
**Fig. 27 Conducted Spurious Emission (802.11n-HT20, Ch157, 12 GHz-25 GHz)**



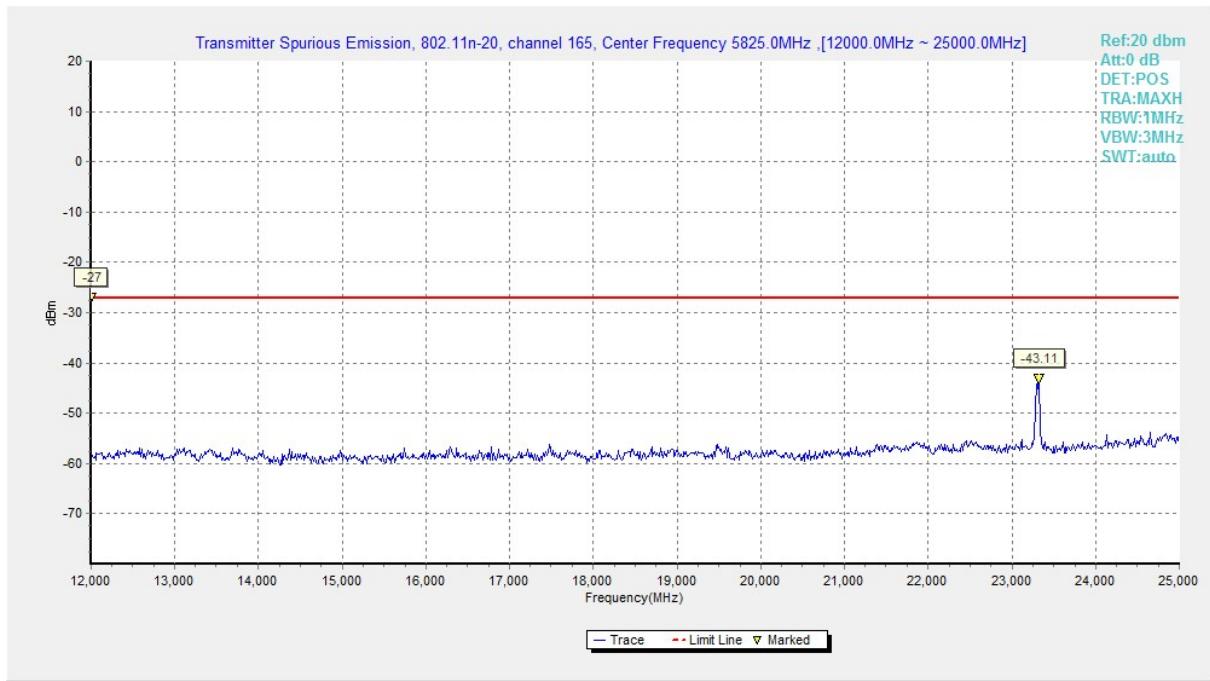
**Fig. 28 Conducted Spurious Emission (802.11n-HT20, Ch157, 25 GHz-40 GHz)**



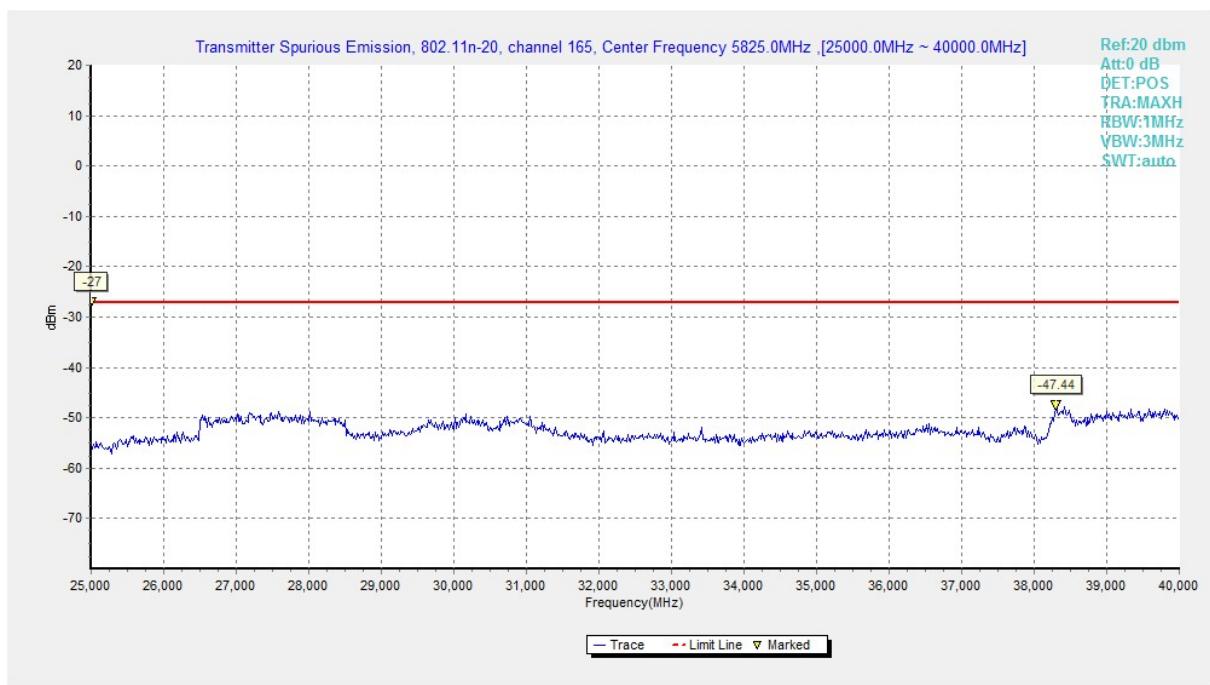
**Fig. 29 Conducted Spurious Emission (802.11n-HT20, Ch165, 30 MHz-1 GHz)**



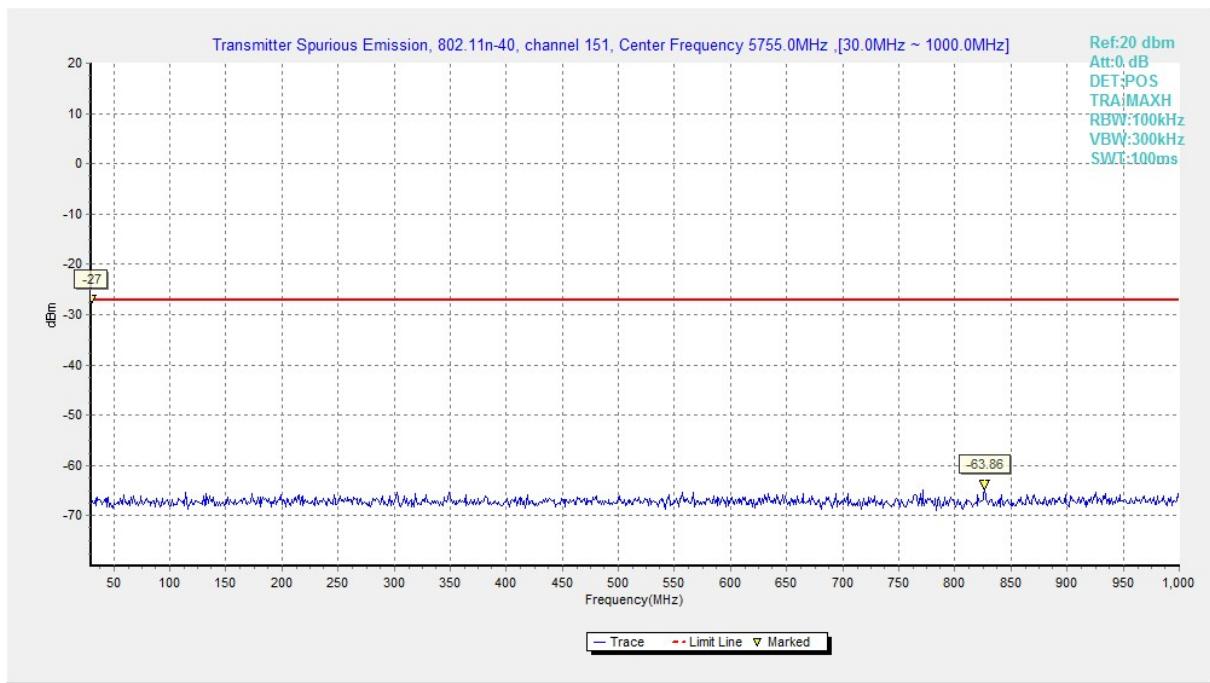
**Fig. 30 Conducted Spurious Emission (802.11n-HT20, Ch165, 1 GHz -12 GHz)**



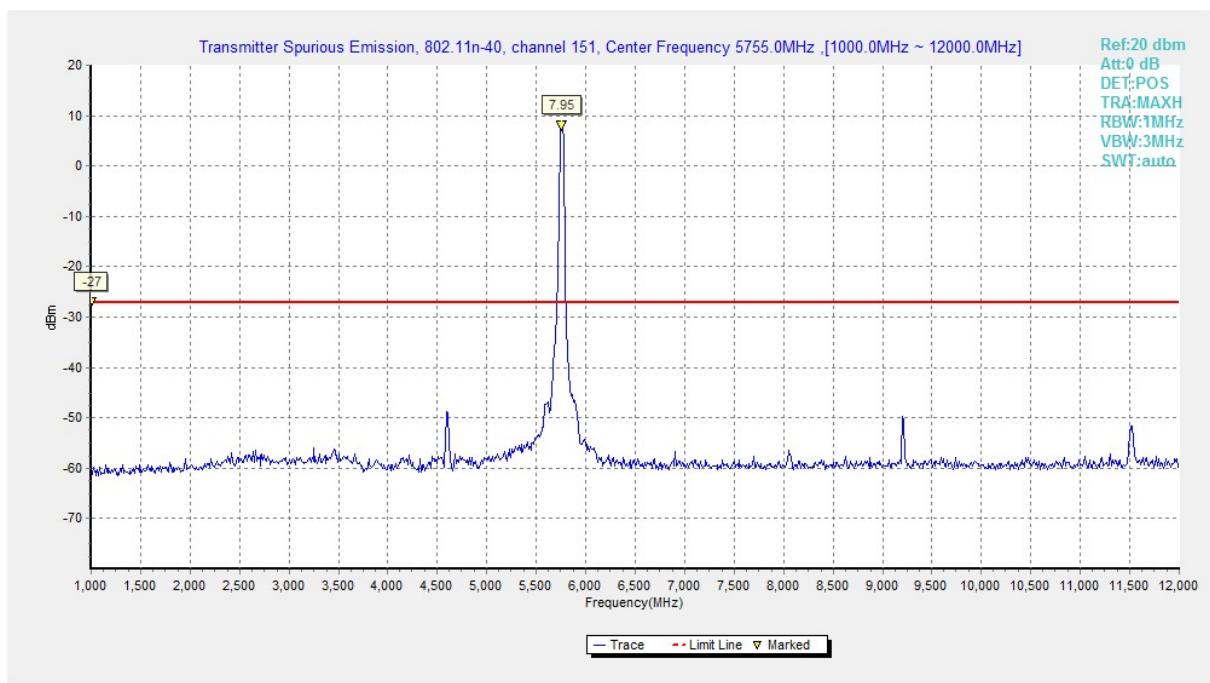
**Fig. 31 Conducted Spurious Emission (802.11n-HT20, Ch165, 12 GHz-25 GHz)**



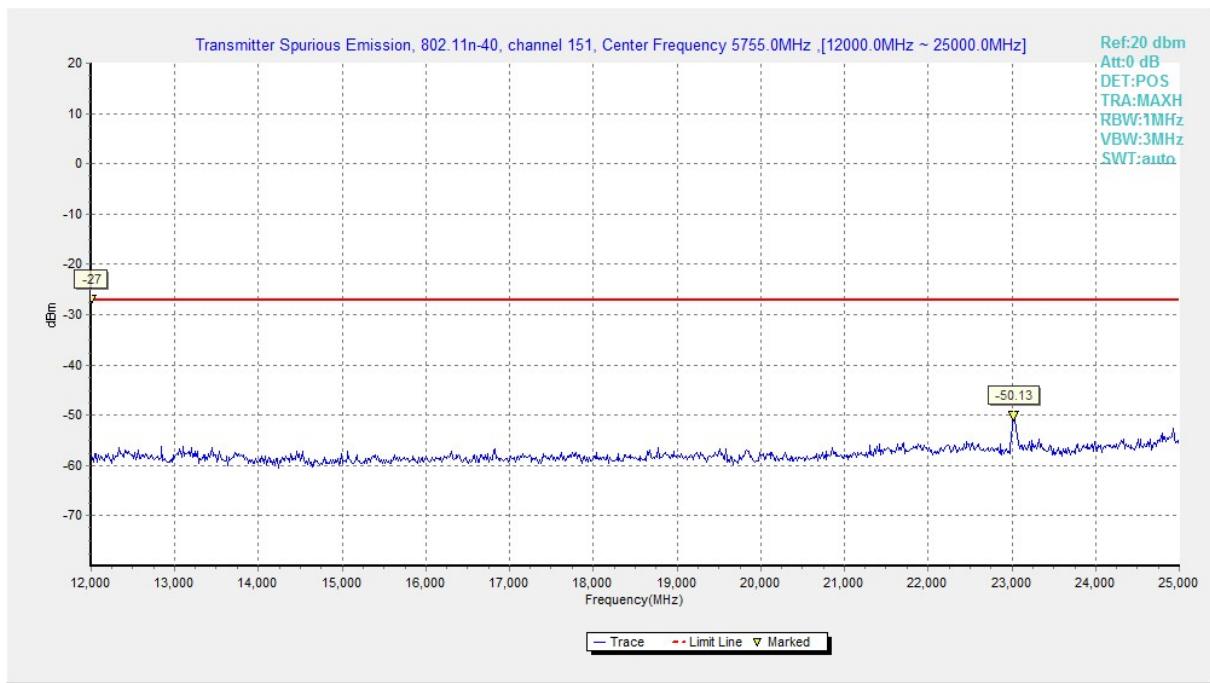
**Fig. 32 Conducted Spurious Emission (802.11n-HT20, Ch165, 25 GHz-40 GHz)**



**Fig. 33 Conducted Spurious Emission (802.11n-HT40, Ch151, 30 MHz-1 GHz)**



**Fig. 34 Conducted Spurious Emission (802.11n-HT40, Ch151, 1 GHz -12 GHz)**



**Fig. 35 Conducted Spurious Emission (802.11n-HT40, Ch151, 12 GHz-25 GHz)**