

# FCC WIFI TEST REPORT

**No. GCCT16CFR01-WIFI**

For

OBI Connect FZE

Product Name: Mobile Phone

Model Name: Obi Worldphone SF1

Trade Name: OBI

Issued Date: 2016-03-28

**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 GCCT.

To verify test report authenticity, send full test report to Email: gaoxiaoqing0310@126.com

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**GENERAL SUMMARY**

<b>Product Name</b>	Mobile Phone
<b>Model Name</b>	Obi Worldphone SF1
<b>Trade Name</b>	OBI
<b>Applicant</b>	OBI Connect FZE
<b>Manufacturer</b>	CK Telecom Limited
<b>Test Laboratory</b>	GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center
<b>Reference Standards</b>	FCC CFR 47 Part 15C:“Radio Frequency Devices Sub-Part C: intentional Radiators” ANSI C63.10-2013, “American National Standard for Testing Unlicensed Wireless Devices” KDB 558074 D01 DTS Meas Guidance v03r03
<b>Test Conclusion</b>	This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in annex B of this test report are below limits specified in the relevant standards.  General Judgment: Pass
	Date of issue: 2016.03.28
<b>Comment</b>	The test results in this report apply only to the tested sample of the stated device/equipment.

*Approved by:*Luo JianLuo Jian  
Manager*Reviewed by:*Dong XiaoboDong Xiaobo  
Deputy Manager*Tested by:*Gao XiaoqingGao Xiaoqing  
Test Engineer

## 1. Test Laboratory

### 1.1 Testing Location

<b>Company Name</b>	GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center
<b>Address</b>	Keji Road, High-tech Zone, Heyuan, Guangdong Province, PR.China
<b>CNAS Registration No.</b>	L4992
<b>FCC Registration No.</b>	303878
<b>Postal Code</b>	517001
<b>Telephone</b>	+86-762-3607221
<b>Fax</b>	+86-762-3603336

### 1.2 Testing Environment

Environment Data	Temperature(°C)	Humidity(%)
<b>Maximum Ambient</b>	22.5	57
<b>Minimum Ambient</b>	17.8	46

EUT is under testing environment.

### 1.3 Project Data

<b>Project Leader</b>	Dong Xiaobo
<b>Testing Start Date</b>	2016-03-15
<b>Testing End Date</b>	2016-03-28

## 2. Client Information

### 2.1 Applicant Information

Company Name	OBI Connect FZE
Address	B-21,Dubai Airport Free zone, PO BOX 371475, United Arab Emirates
City	Dubai
Postal Code	/
Country	United Arab Emirates

### 2.2 Manufacturer Information

Company Name	CK Telecom Limited
Address	Technology Road.High-Tech Development Zone. Heyuan, Guangdong,P.R.China.
City	Heyuan
Postal Code	/
Country	China

### 3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

#### 3.1 About EUT

<b>Model Name</b>	Obi Worldphone SF1
<b>FCC ID</b>	2AGBLSF1
<b>Tx Frequency</b>	GSM850:824 ~ 848 MHz PCS1900 : 1850 ~ 1909MHz WCDMA Band II: 1852 ~ 1908MHz WCDMA Band V: 826 ~ 846MHz Bluetooth& BLE: 2402 ~ 2480MHz WIFI(802.11b/g/n-20): 2412 ~ 2462MHz WIFI(802.11n-40): 2422 ~ 2452MHz
<b>Rx Frequency</b>	GSM850: 869 ~ 893MHz GSM1900: 1930 ~ 1989MHz WCDMA Band II: 1932 ~ 1987MHz WCDMA Band V: 871 ~ 891MHz Bluetooth& BLE: 2402 ~ 2480MHz WIFI(802.11b/g/n-20): 2412 ~ 2462MHz WIFI(802.11n-40): 2422 ~ 2452MHz GPS:1575MHz
<b>Number of Channels</b>	GSM850 :25 GSM1900 : 60 WCDMA Band II: 60 WCDMA Band V: 25 Bluetooth:79 BLE:40 WIFI(802.11b/g/n-20):11 WIFI(802.11n-40):7
<b>Modulation</b>	GSM:GMSK WCDMA:BPSK/QPSK BLE:GFSK Bluetooth: GFSK& $\pi$ /4-DQPSK&8DPSK WIFI:CCK/OFDM
<b>Antenna Type</b>	PIFA(GSM/DCS/WCDMA); MONOPOLE (Bluetooth/WIFI)
<b>Antenna Gain</b>	GSM850&1900:-0.5dBi GSM900&1800:-0.5dBi WCDMA Band II&V: -1dBi Bluetooth&BLE&WIFI: -1dBi GPS: -1dBi

<b>Normal Voltage</b>	3.8V
<b>Extreme Low Voltage</b>	3.6V
<b>Extreme High Voltage</b>	4.2V
<b>Extreme Low Temperature</b>	0°C
<b>Extreme High Temperature</b>	40°C

Note: Photographs of EUT are shown in ANNEX A of this test report.

Note: high and low voltage values in extreme condition test are given by manufacturer

### **3.2 Internal Identification of EUT**

<b>EUT ID *</b>	<b>IMEI</b>	<b>HW Version</b>	<b>SW Version</b>
GCCT16CFR01-M01	/	MIRAGE03-V1.0	/
GCCT16CFR01-M03	/	MIRAGE03-V1.0	/

\*EUT ID: is used to identify the test sample in the lab internally. GCCT16CFR01-M01 and GCCT16CFR01-M03 are the same mobile phone.

### **3.3 Internal Identification of AE**

<b>AE ID *</b>	<b>Description</b>	<b>Model</b>	<b>Manufacturer</b>
GCCT16CFR01-B01	Battery	OB3000CK	DONG GUAN DRN NEW ENERGY CO.,LTD.
GCCT16CFR01-C01	Adapter	AOD2A5V	DONGGUAN AOHAI POWER TECHNOLOGY CO,LTD.
GCCT16CFR01-B03	Battery	OB3000CK	DONG GUAN DRN NEW ENERGY CO.,LTD.
GCCT16CFR01-C03	Adapter	AOD2A5V	DONGGUAN AOHAI POWER TECHNOLOGY CO,LTD.

\*AE ID: is used to identify the test sample in the lab internally. GCCT16CFR01-B01 and GCCT16CFR01-B03 are the same accessories, GCCT16CFR01-C01 and GCCT16CFR01-C03 are the same accessories.

## 4. Test Results

### 4.1 Summary of Test Results

No	Test cases	Sample	Verdict
1	Maximum transmit power	M01	Pass
2	Maximum Power Spectral Density	M01	Pass
3	6dB Occupied Bandwidth	M01	Pass
4	Band Edge Compliance	M01	Pass
5	Conducted Transmission Spurious Emission	M01	Pass
6	AC Conducted Emission	M03	Pass
7	Radiated Emissions	M03	Pass
8	Antenna Requirements	M01	Pass

**Note:** please refer to Annex B in this test report for the detailed test results.

All measurement uncertainty is not taken into consideration for all presented test result.

### 4.2 Statements

GCCT has evaluated the test cases requested by the applicant/manufacturer as listed in section 4.1 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in general summary.

## 5. Test Equipment Utilized

**Table 1. Measurement Equipment**

<b>Hardware</b>						
<b>No.</b>	<b>Name</b>	<b>Model</b>	<b>SN</b>	<b>Manufacturer</b>	<b>Cal. Date</b>	<b>Cal. Due Date</b>
1	Spectrum Analyzer	N9020A	MY52091261	Agilent	2015.08.21	2016.08.20
2	Switch Unit	/	E0112	/		/
3	Power Sensor	U2021XA	MY50000196	Agilent	2015.08.21	2016.08.20
<b>Software</b>						
Tech WIFI		v1.0.3				

**Table 2. Radiated emission test system**

<b>No.</b>	<b>Name</b>	<b>Model</b>	<b>SN</b>	<b>Manufacturer</b>	<b>Cal. date</b>	<b>Cal. Due Date</b>
1	Spectrum Analyzer	E4440A	MY48250641	Agilent	2015.08.21	2016.08.20
2	BiCoNilog Antenna	3142E	00142015	ETS-Lindgren	2015.09.15	2017.09.14
3	Horn Antenna	3117	129169	ETS-Lindgren	2015.09.15	2017.09.14
4	Signal Generator	N5183A-532	MY49060563	Agilent	2015.08.21	2016.08.20
5	Universal Radio Communication Tester	E5515C	MY48367105	Agilent	2015.08.21	2016.08.20
6	RF Preselector	N9039A	MY48260024	Agilent	/	/
7	Loop Antenna	HFH2	860015/00	R&S	2015.08.21	2016.08.20

**Table 3.List of Accessories**

<b>No.</b>	<b>Name</b>	<b>Model</b>	<b>SN</b>	<b>Manufacturer</b>	<b>Length</b>	<b>Shielding</b>
1	PC	Pavilion dv2	CNC9112F 68	HP	/	/
2	Printer	BOISB-060 4-00	VNF3L523 98	HP	/	/
3	Mouse	M-UAV-DE L8	/	DELL	/	/
4	Power line for printer	I-SHENG	/	/	1.3m	unshielding
5	Power line for PC	A003145	/	/	2.8m	unshielding

6	USB cable	SHIELDED	E174089	/	/	unshielding
7	Adapter	Series PPP009D	HP	/	/	/

## ANNEX A: EUT Photograph

EUT Front View



EUT behind View



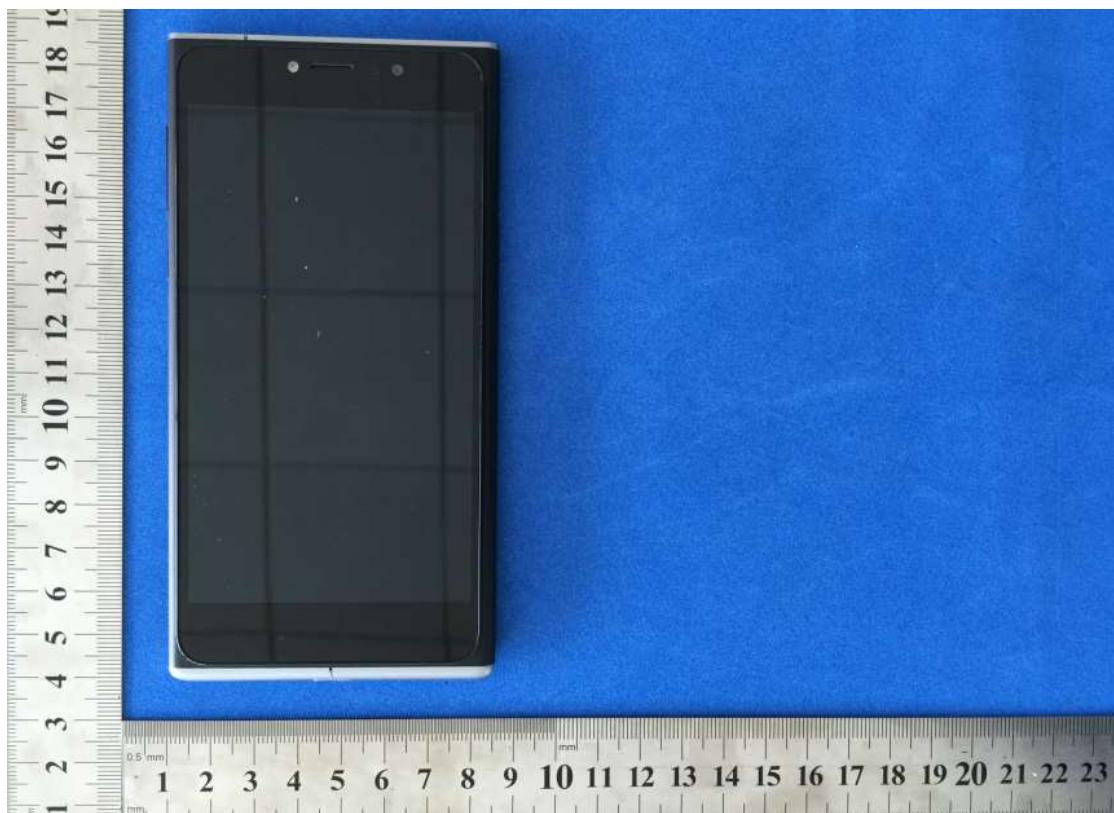
**EUT Left View**



**EUT Right View**



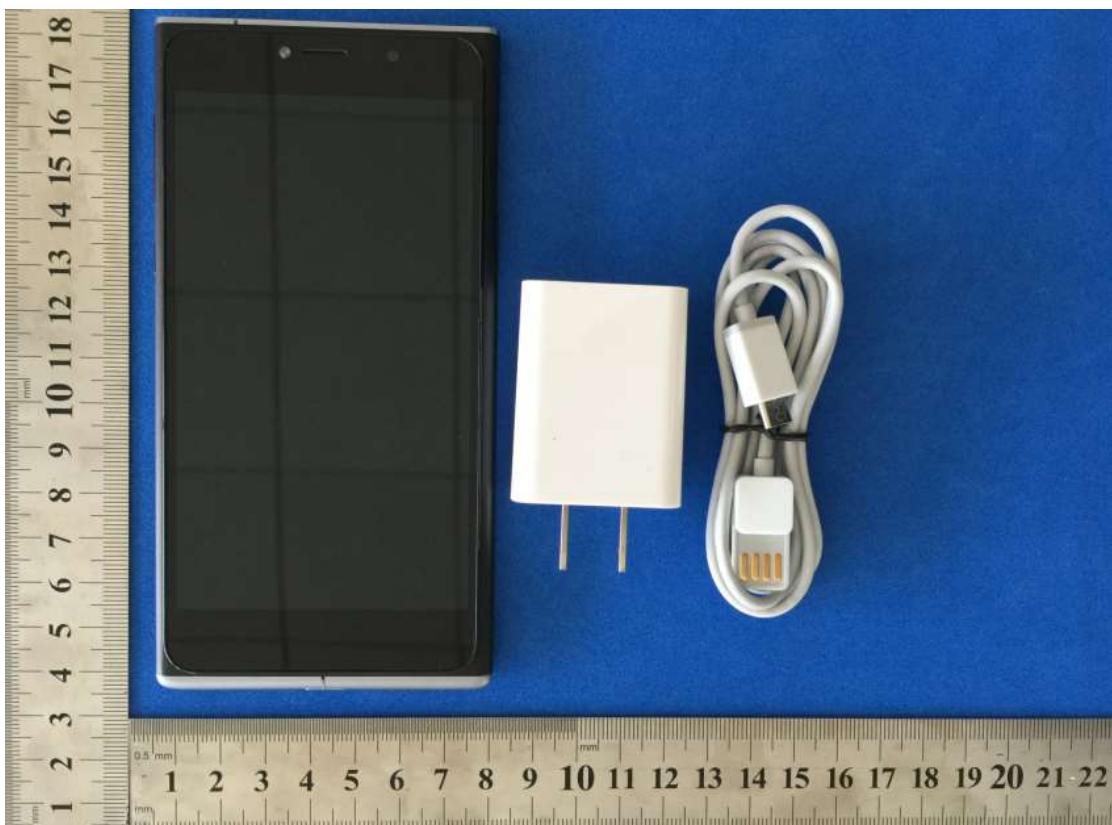
**EUT Top View**



**EUT Rear View**



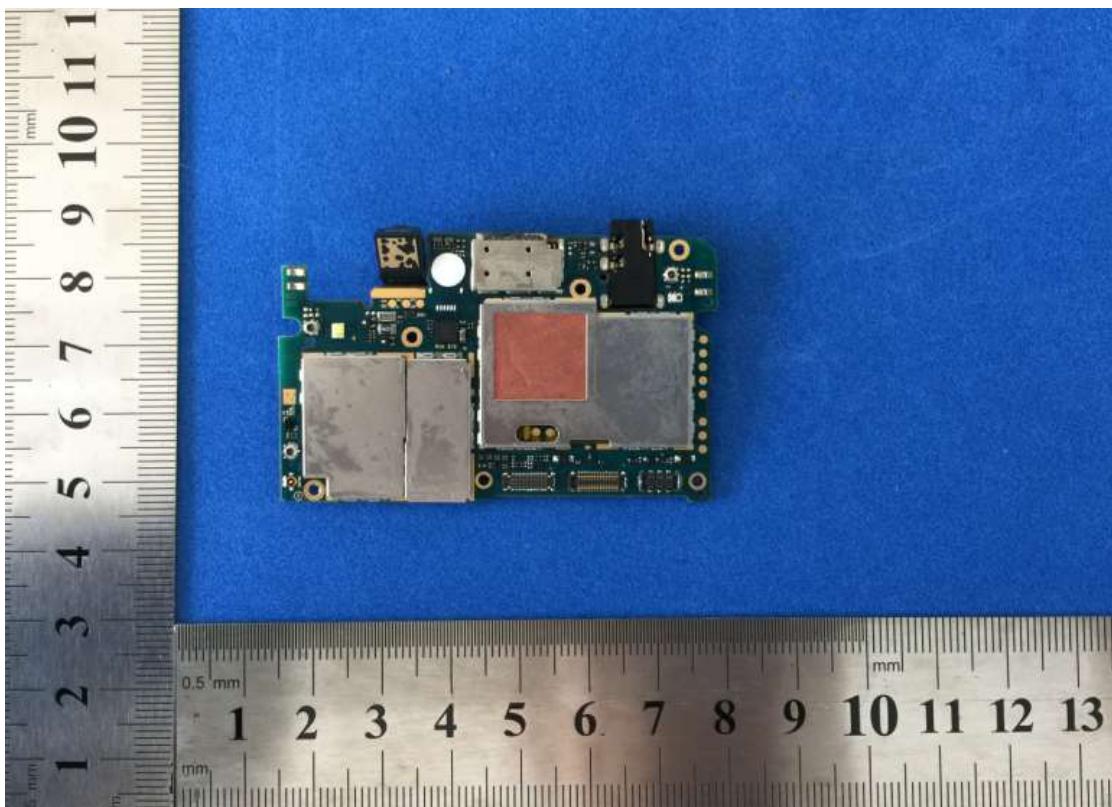
All



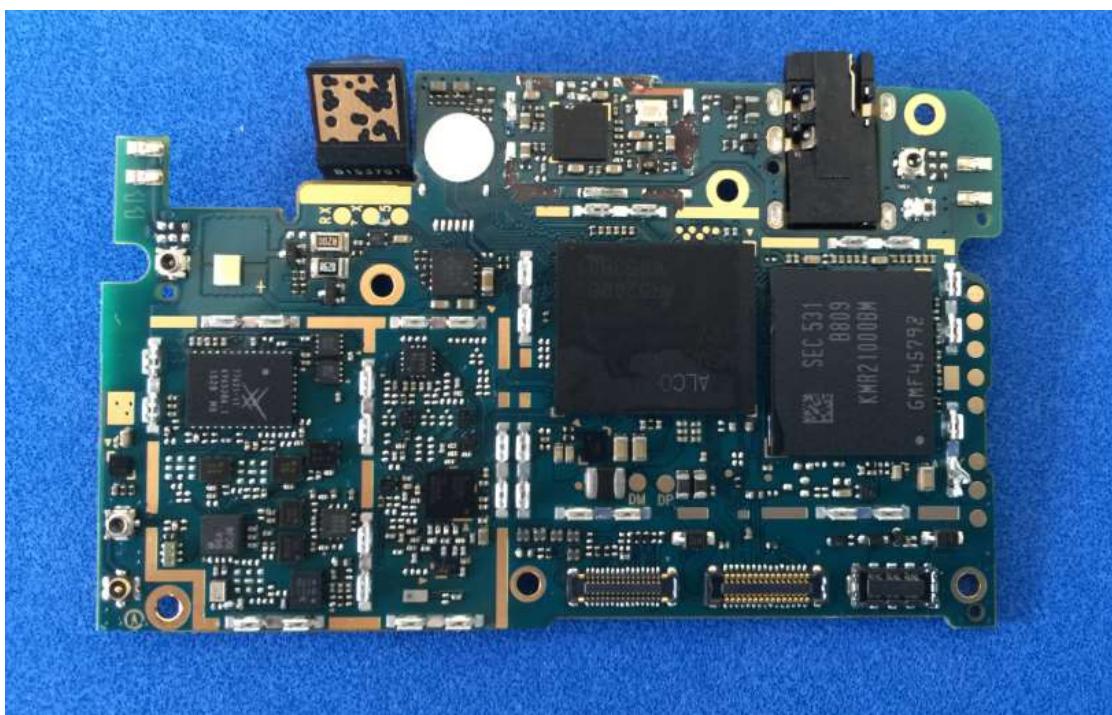
Cover off



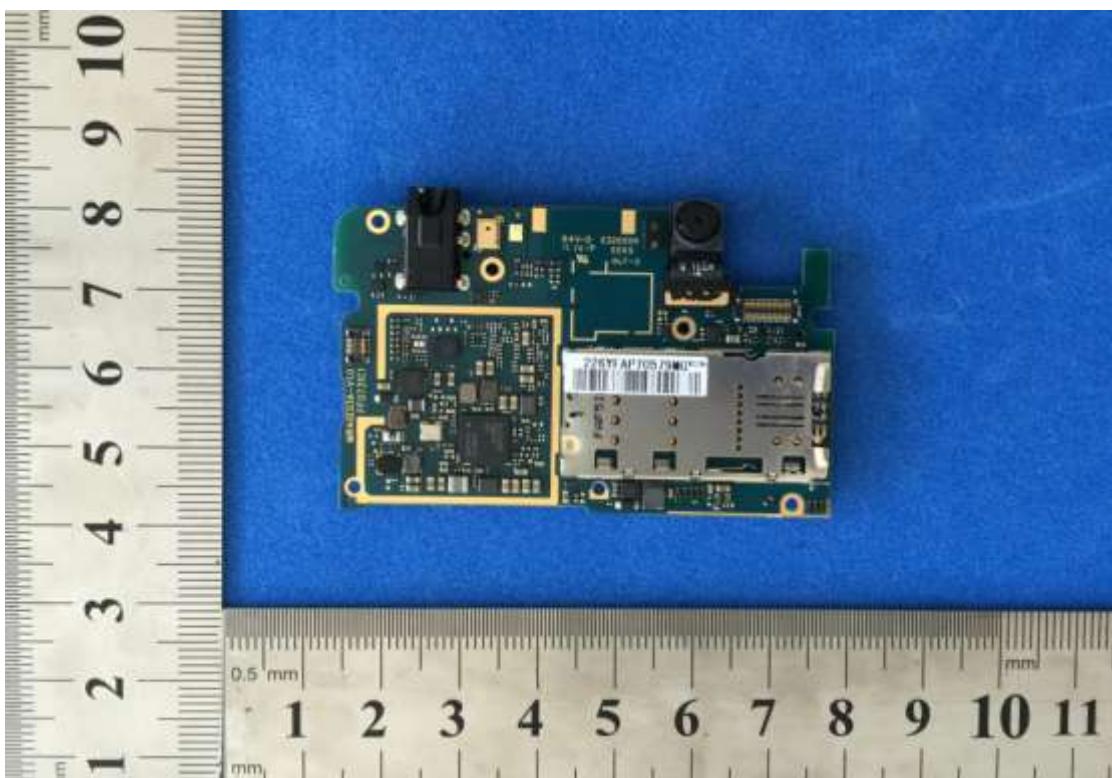
Main board with shielding Front View



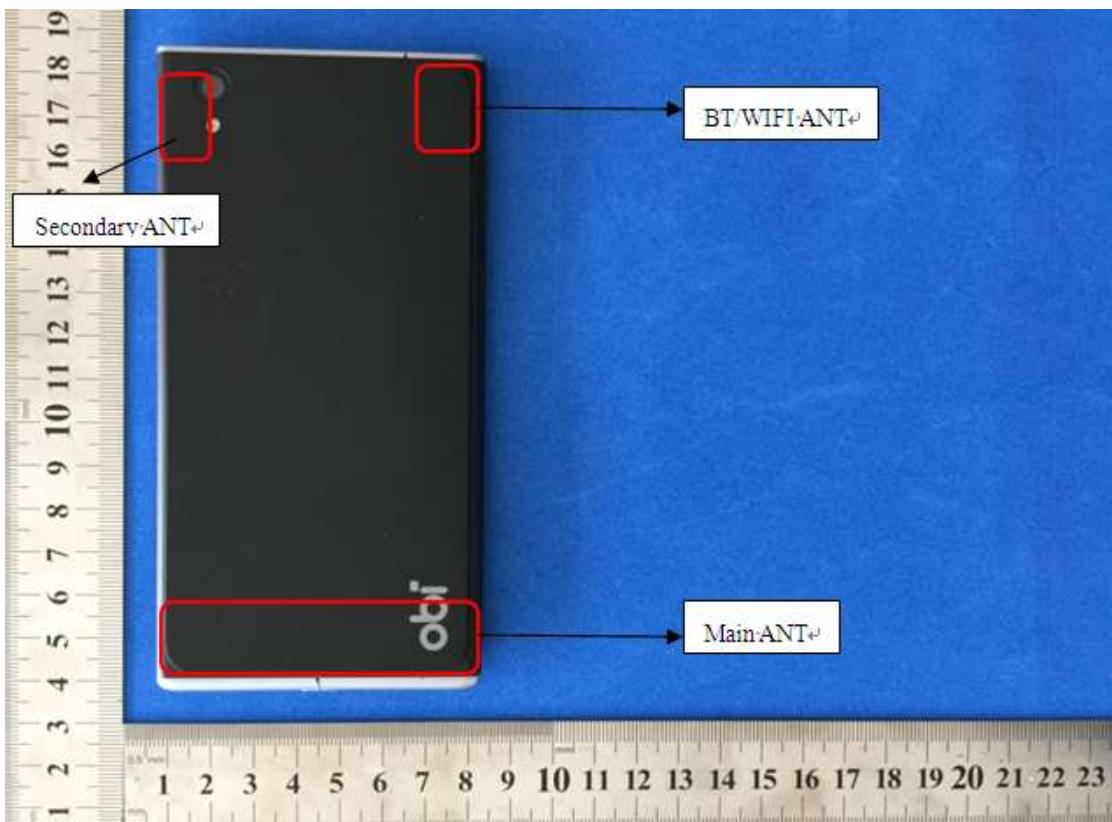
Main board without shielding Front View



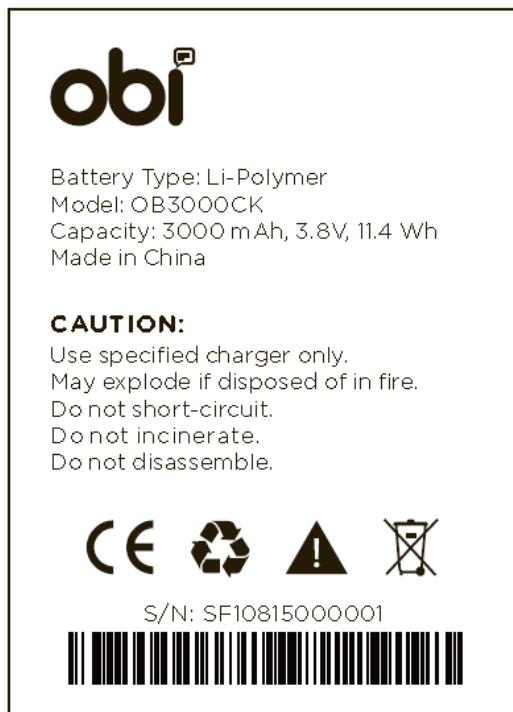
Main board Rear View



Antenna View



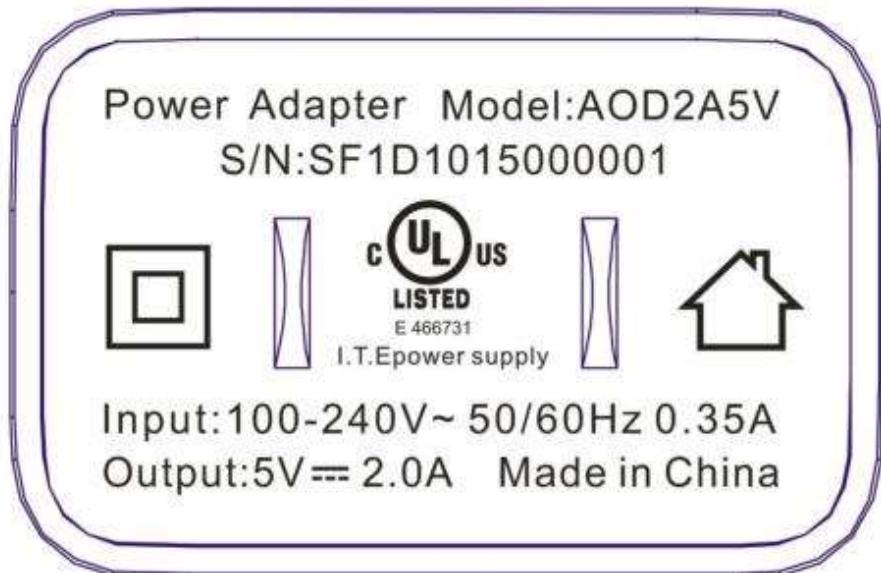
### Battery label View



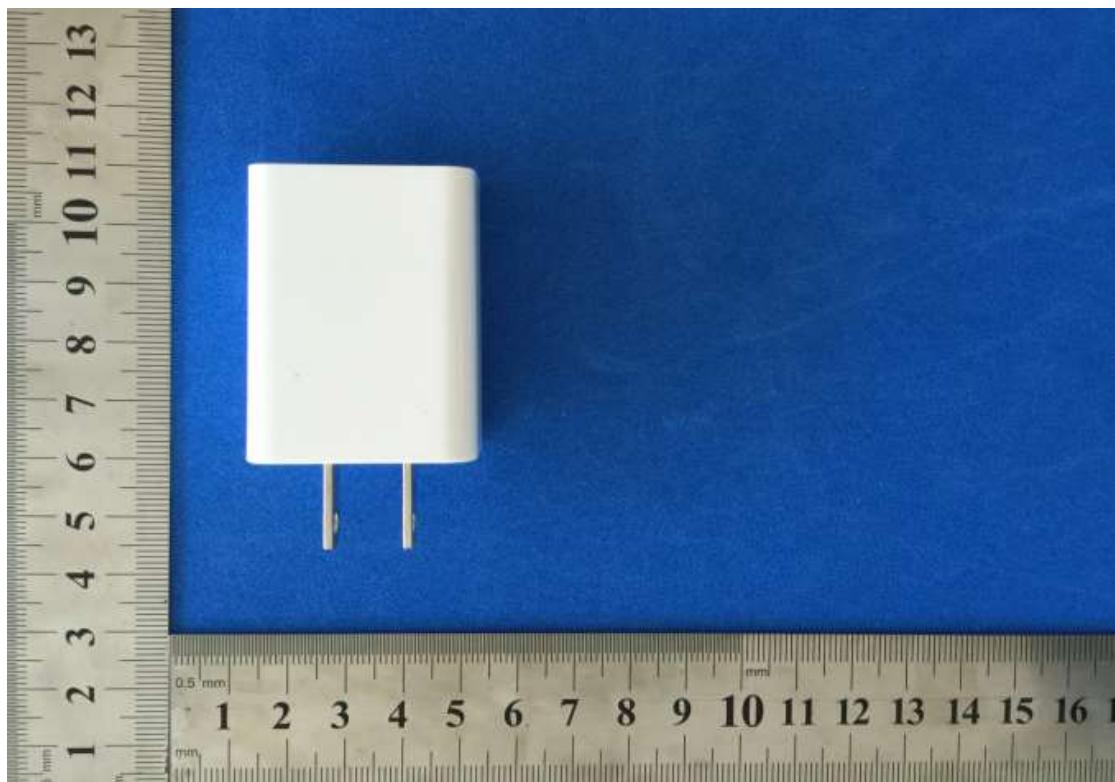
### Battery View



Adapter label view

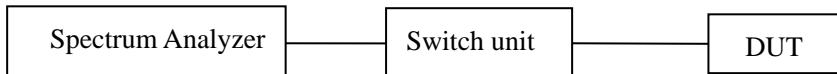


Adapter view



## ANNEX B: Detailed Test Results

The radiated test setup is shown in each radiated test case section. The conducted test setup except RF Power is shown as following:



All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.

### B.1 Maximum Peak Transmit Power

#### B.1.1 Description

The maximum Peak Output power shall be equal to or less than 30dBm.

#### B.1.2 Test procedures

##### Conducted Measurement

EUT was set for low, mid, high channel with modulated mode and highest RF output power

The power meter was connected to the antenna terminal.

##### Standard Requirement

One of the following procedures may be used to determine the maximum peak conducted output power of a DTS EUT.

##### Procedures:

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

#### B.1.3 Test Setup



#### B.1.4 Test Results

Mode	Data rate(Mbps)	Duty cycle (%)	Limit (dBm)	Maximum Peak transmit power(dBm)			Verdict
				2412MHz	2437MHz	2462MHz	
802.11b	1	100	30	15.412	15.878	15.442	Pass
	2			15.168	15.039	15.122	Pass

	5.5			15.127	15.127	15.859	Pass
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Mode	Data rate(Mbps)	Duty cycle (%)	Limit (dBm)	Maximum Peak transmit power(dBm)			Verdict
				2412MHz	2437MHz	2462MHz	
802.11g	6	100	30	12.717	13.068	12.669	Pass
	9			12.574	12.988	12.597	Pass
	12			12.369	12.865	12.486	Pass
	18			12.179	12.721	12.359	Pass
	24			11.957	12.365	12.139	Pass
	36			11.638	12.107	11.879	Pass
	48			11.385	12.686	11.538	Pass
	54			11.011	11.627	11.189	Pass

Mode	Data rate(Mbps)	Duty cycle (%)	Limit (dBm)	Maximum Peak transmit power(dBm)			Verdict
				2412MHz	2437MHz	2462MHz	
802.11n-20	MCS0	100	30	11.305	11.759	11.469	Pass
	MCS1			11.264	11.596	11.356	Pass
	MCS2			11.036	11.385	11.154	Pass
	MCS3			10.845	11.014	10.973	Pass
	MCS4			10.573	10.795	10.558	Pass
	MCS5			10.114	10.459	10.261	Pass
	MCS6			9.772	10.309	9.889	Pass
	MCS7			9.389	10.035	9.477	Pass

Mode	Data rate(Mbps)	Duty cycle (%)	Limit (dBm)	Maximum Peak transmit power(dBm)			Verdict
				2422MHz	2437MHz	2452MHz	
802.11n-40	MCS0	100	30	11.674	11.737	11.746	Pass
	MCS1			11.285	11.328	11.364	Pass
	MCS2			10.759	10.869	10.853	Pass

	MCS3		10.348	10.307	10.291	Pass
	MCS4		9.454	9.426	9.365	Pass
	MCS5		8.215	8.132	8.217	Pass
	MCS6		7.897	7.785	7.945	Pass
	MCS7		7.529	7.459	7.573	Pass

## B.2 Maximum Power Spectral Density

### B.2.1 Description

The maximum Peak power spectral density shall be equal to or less than 8 dBm.

### B.2.2 Test procedures

#### Conducted Measurement

EUT was set for low, mid, high channel with modulated mode and highest RF output power  
The spectrum analyzer was connected to the antenna terminal.

#### Procedures:

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance, and is optional if the maximum conducted (average) output power was used to demonstrate compliance.

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth
- c) Set the RBW  $\geq$  3 kHz
- d) Set the VBW  $\geq$  3 RBW.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level.
- j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### B.2.2 Test Results

#### 802.11b mode

Limit (dBm)	PSD(dBm)						Verdict
	Low Ch 2412MHz		Mid Ch 2437 MHz		High Ch 2462 MHz		
8	-4.44	Fig.1	-5.55	Fig.2	-10.89	Fig.3	Pass



**Fig.1 Peak power spectral density of 802.11b in channel 1,2412MHz**



**Fig.2 Peak power spectral density of 802.11b in channel 6,2437MHz**

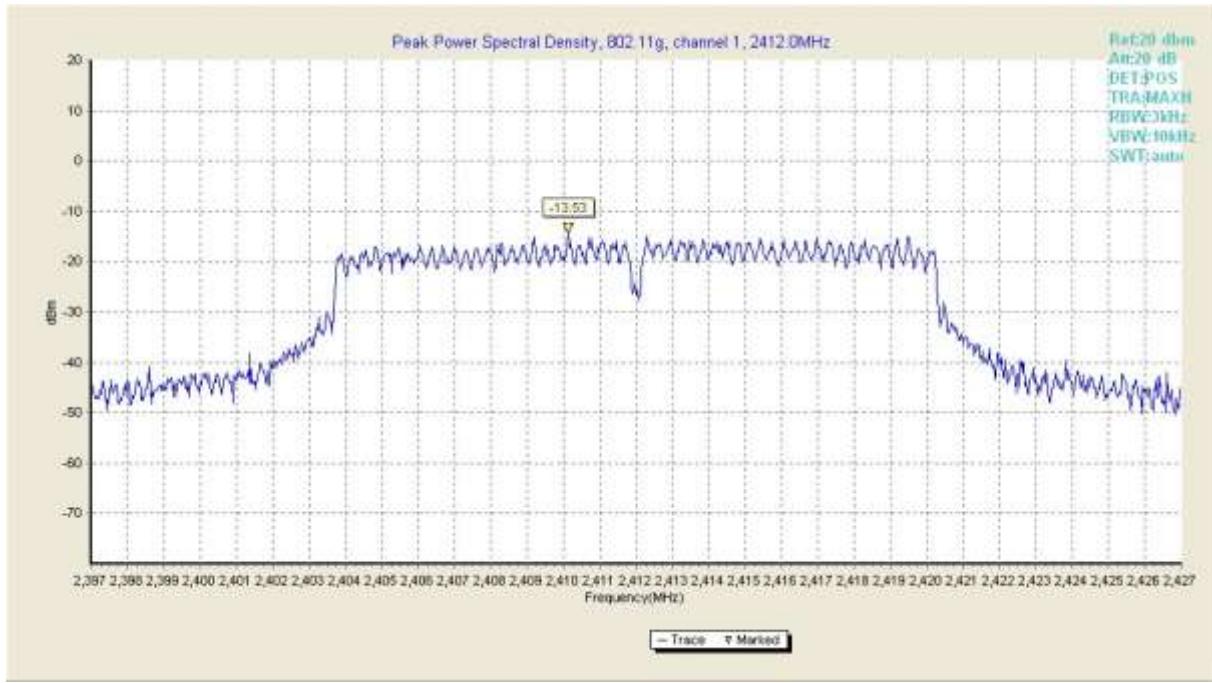


Test plot 1	2461.219971	-10.690000
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Fig.3 Peak power spectral density of 802.11b in channel 11,2462MHz

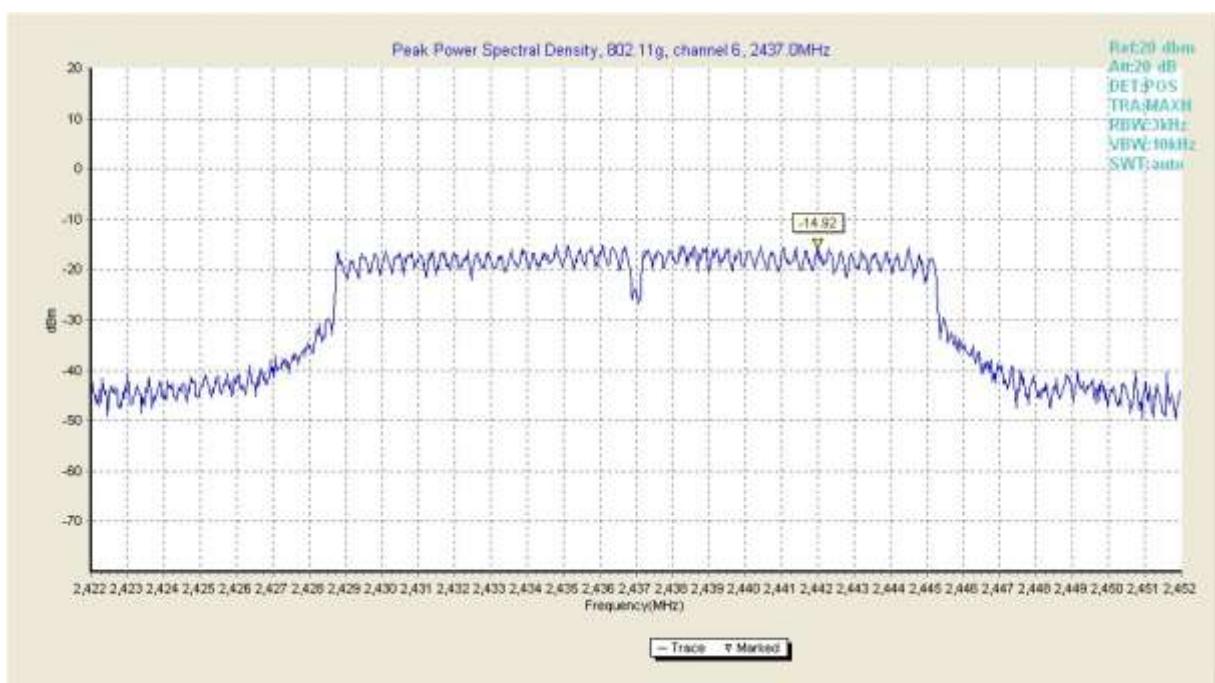
#### 802.11g mode

Limit (PSD dBm)	PSD(dBm)			Verdict			
	2412MHz	2437 MHz	2462 MHz				
8	-13.53	Fig.4	-14.92	Fig.5	-13.23	Fig.6	Pass



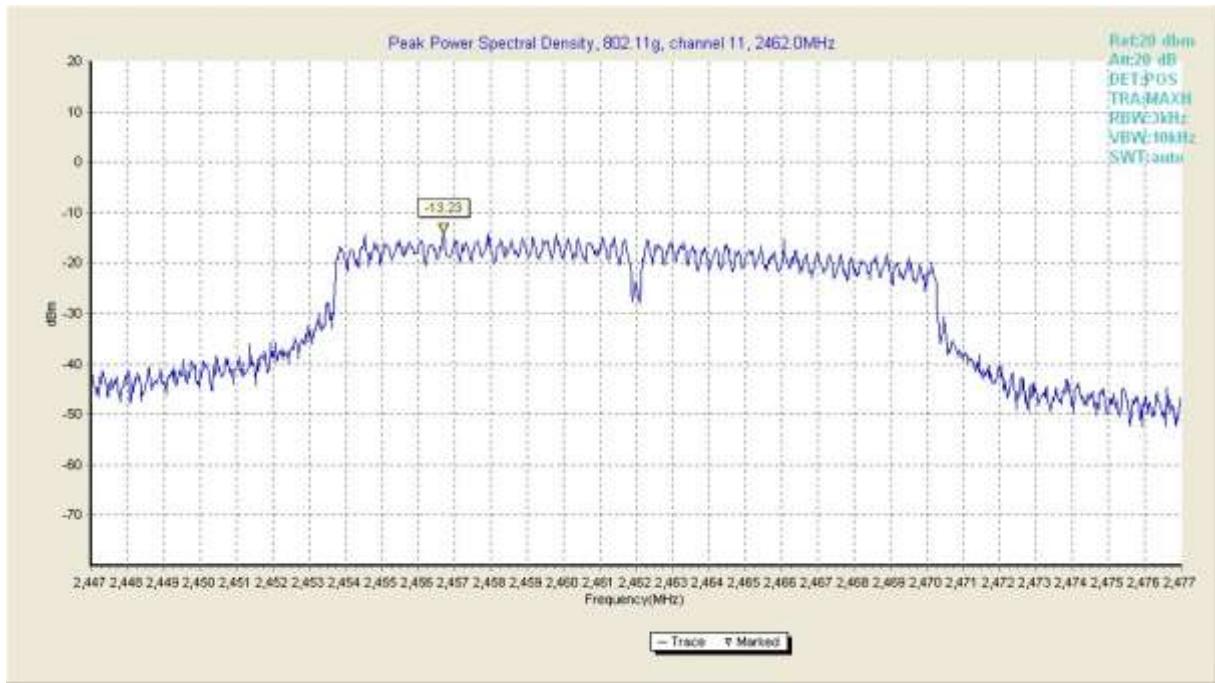
Test plot 1	2410.139893	-13.530000
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Fig.4 Peak power spectral density of 802.11g in channel 1,2412MHz



Test plot 1	2437.000000	-14.920000
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**Fig.5 Peak power spectral density of 802.11g in channel 6,2437MHz**

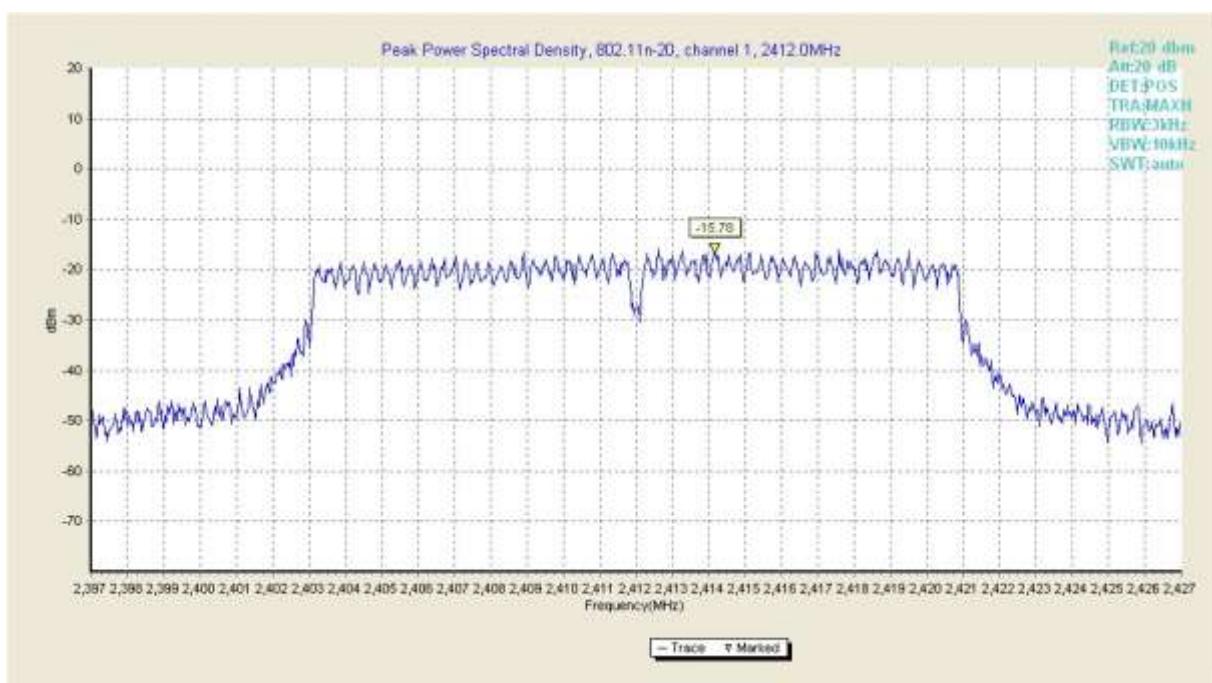


Test plot 1	2462.000000	-13.230000
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**Fig.6 Peak power spectral density of 802.11g in channel 11,2462MHz**

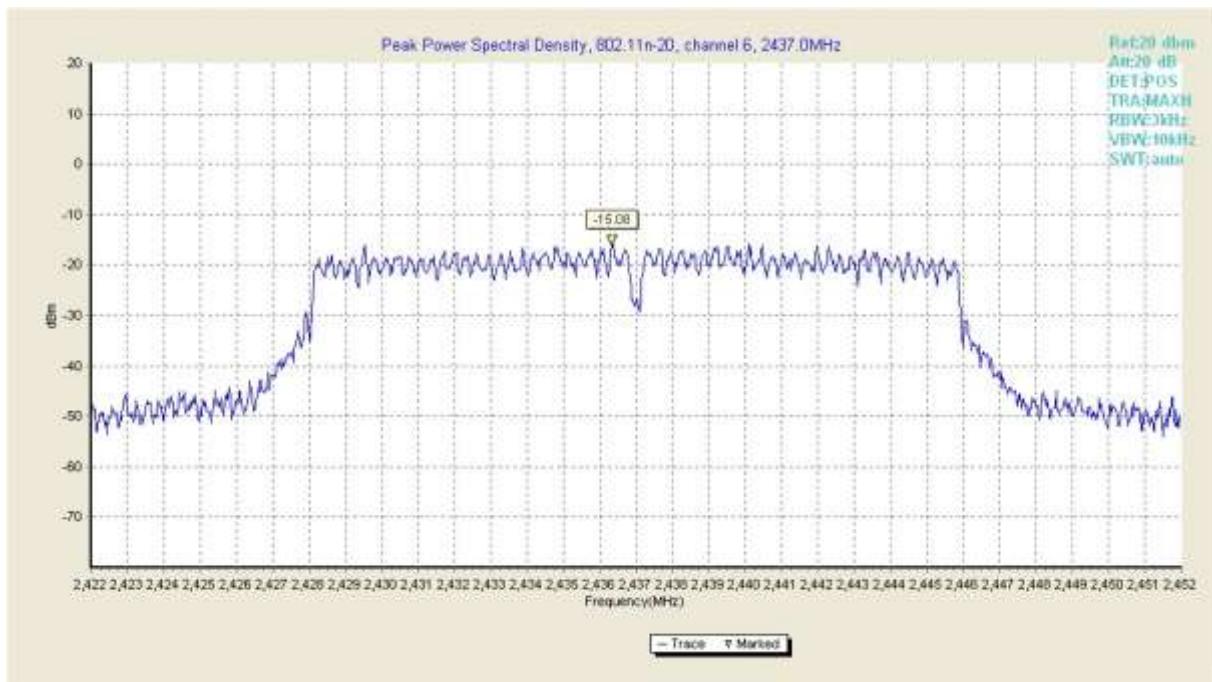
#### 802.11n-20 mode

Limit (PSD dBm)	PSD(dBm)			Verdict			
	2412MHz	2437 MHz	2462 MHz				
8	-15.78	Fig.7	-15.08	Fig.8	-13.55	Fig.9	Pass



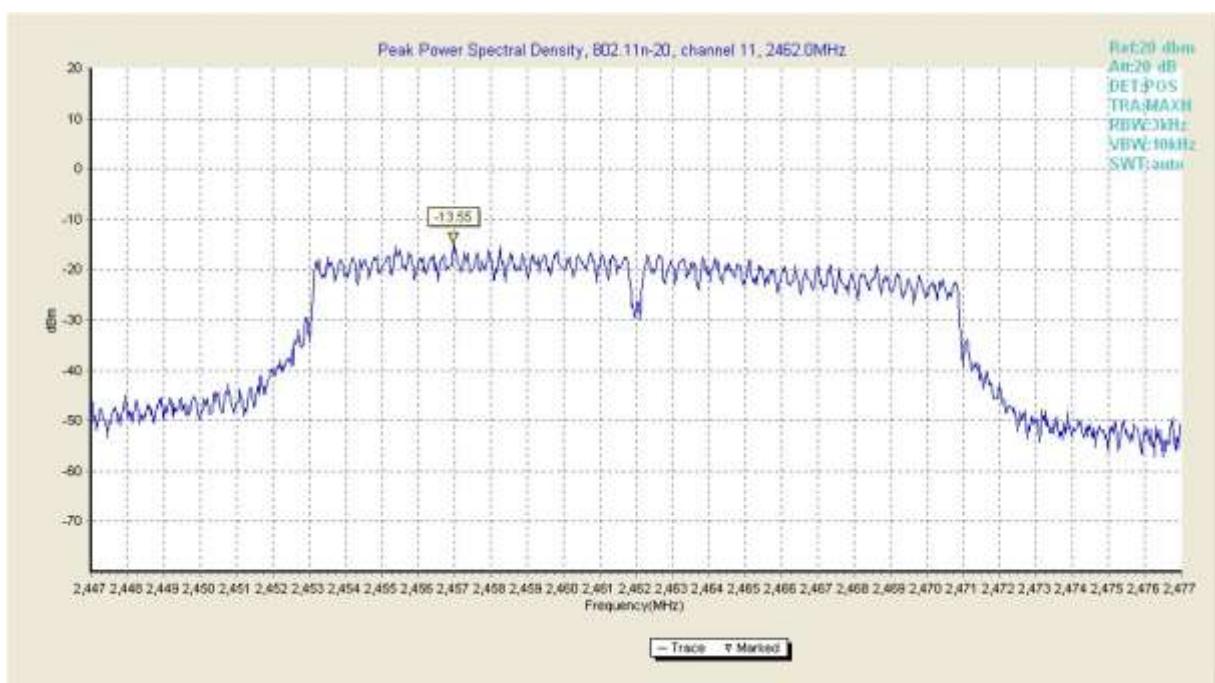
Test plot 1	2414.159912	-15.780000
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**Fig.7 Peak power spectral density of 802.11n-20 in channel 1,2412MHz**



Test plot 1	2436.340088	-15.080000
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**Fig.8 Peak power spectral density of 802.11n-20 in channel 6,2437MHz**



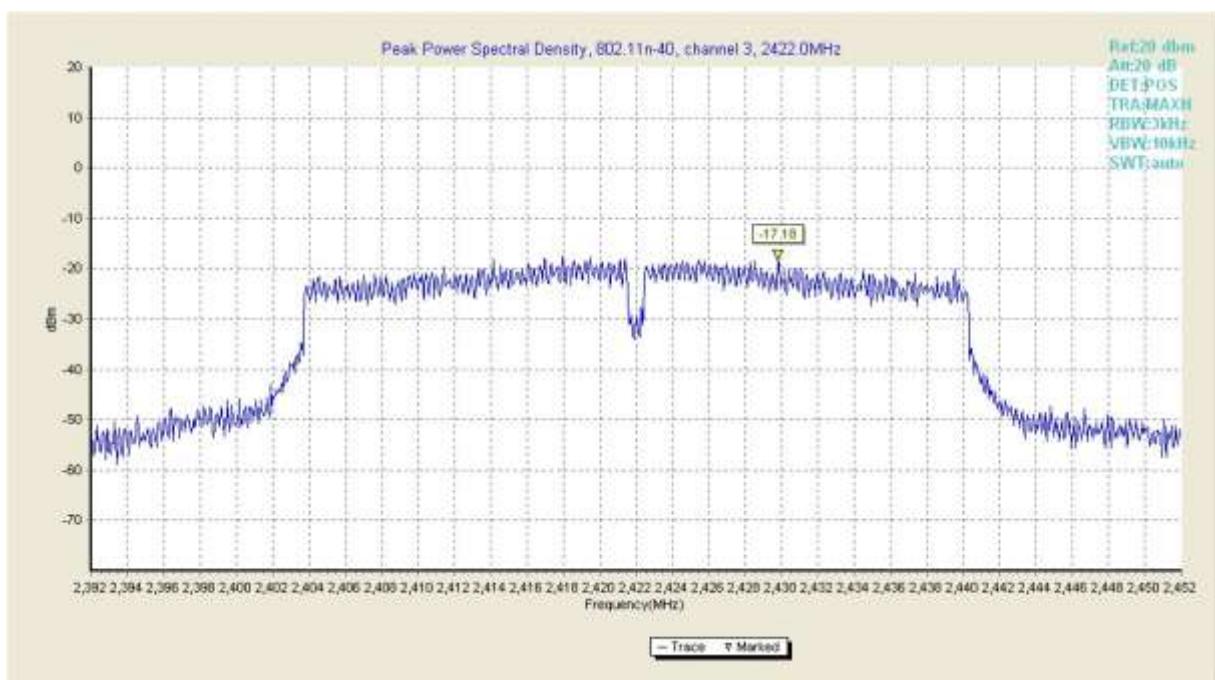
Test plot 1	2460.739990	-11.280000
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**Fig.9 Peak power spectral density of 802.11n-20 in channel 11,2462MHz**

#### 802.11n-40 mode

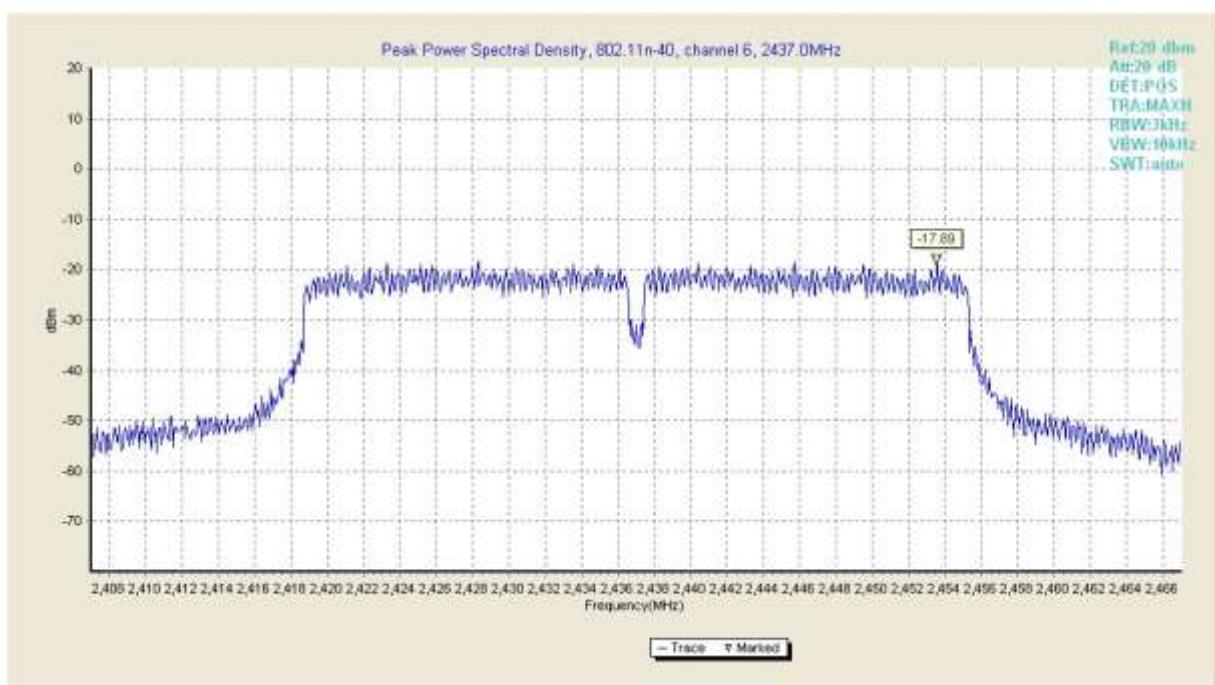
Limit (dBm)	PSD(dBm)			Verdict			
	2422MHz	2437 MHz	2452 MHz				
8	-17.18	Fig.10	-17.89	Fig.11	-17.64	Fig.12	Pass

Antenna Maximum Gain: -1dBi



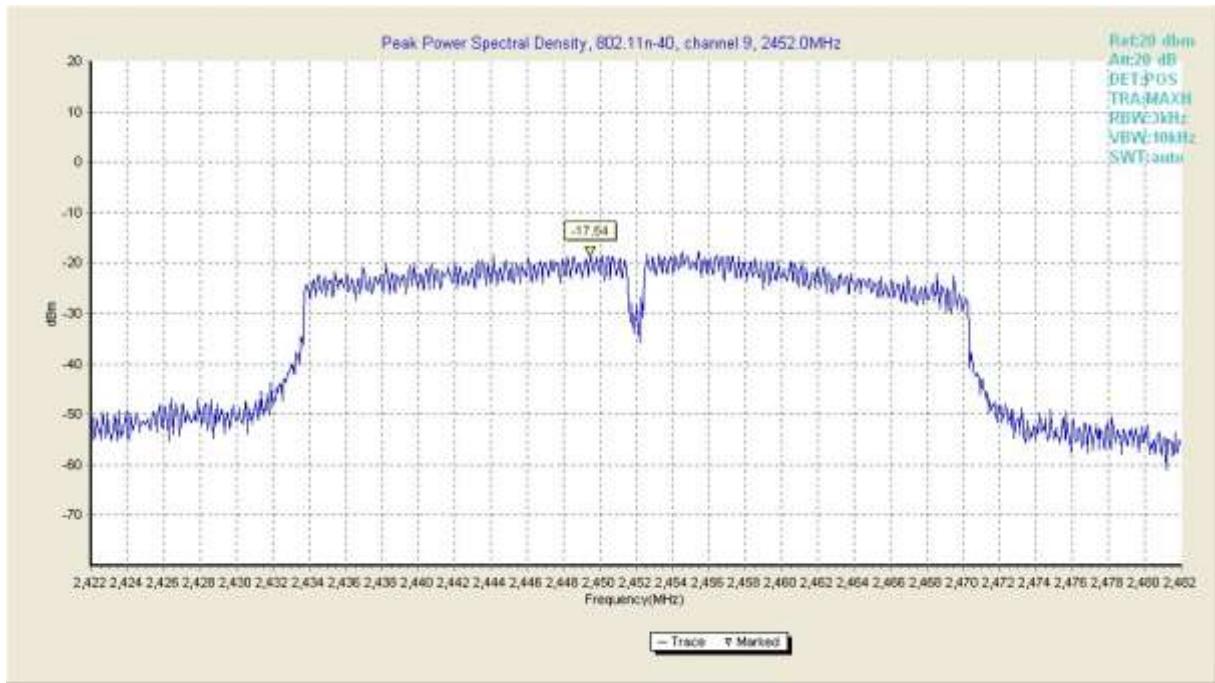
Test plot 1	2422.000000	-17.180000
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**Fig.10 Peak power spectral density of 802.11n-40 in channel 3,2422MHz**



Test plot 1	2453.560059	-17.889999
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**Fig.11 Peak power spectral density of 802.11n-40 in channel 6,2437MHz**



Test plot 1	2452.000000	-17.639999
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**Fig.12 Peak power spectral density of 802.11n-40 in channel 9,2452MHz**

**B.3 DTS(6dB&20dB)Channel Bandwidth****B.3.1 Description**

The Occupied 6dB Bandwidth shall be equal to or more than 500 kHz.

**B.3.2 Test Procedures**

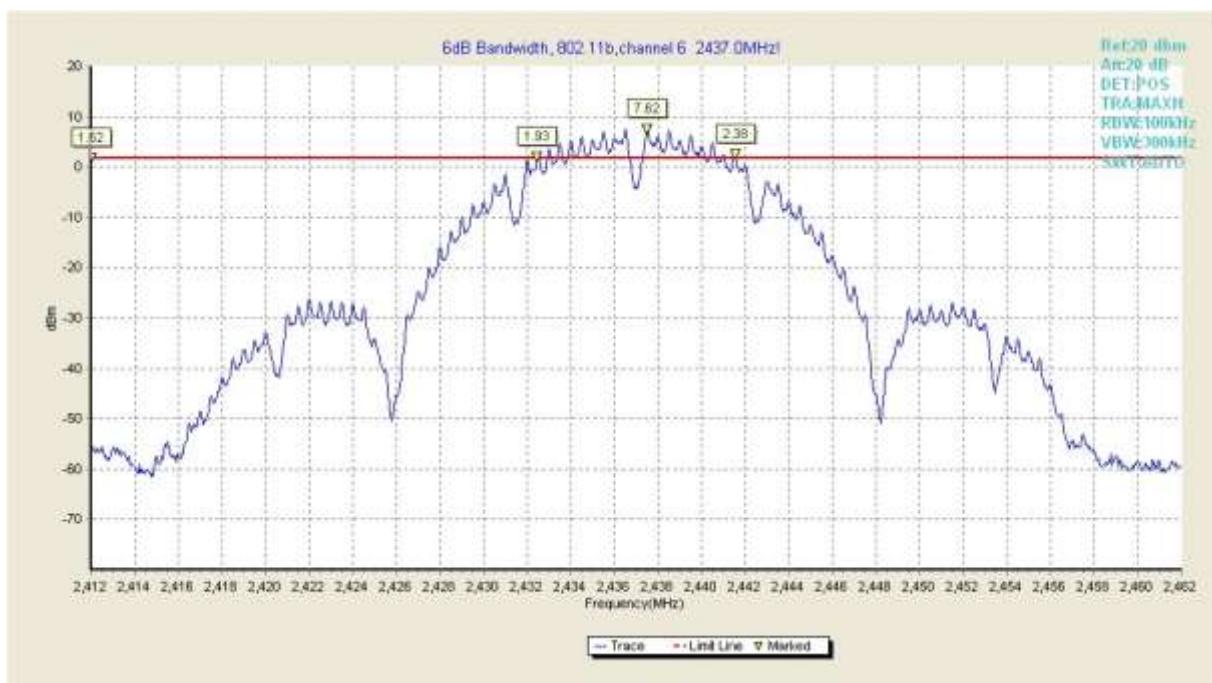
- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW)  $\geq 3$  RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

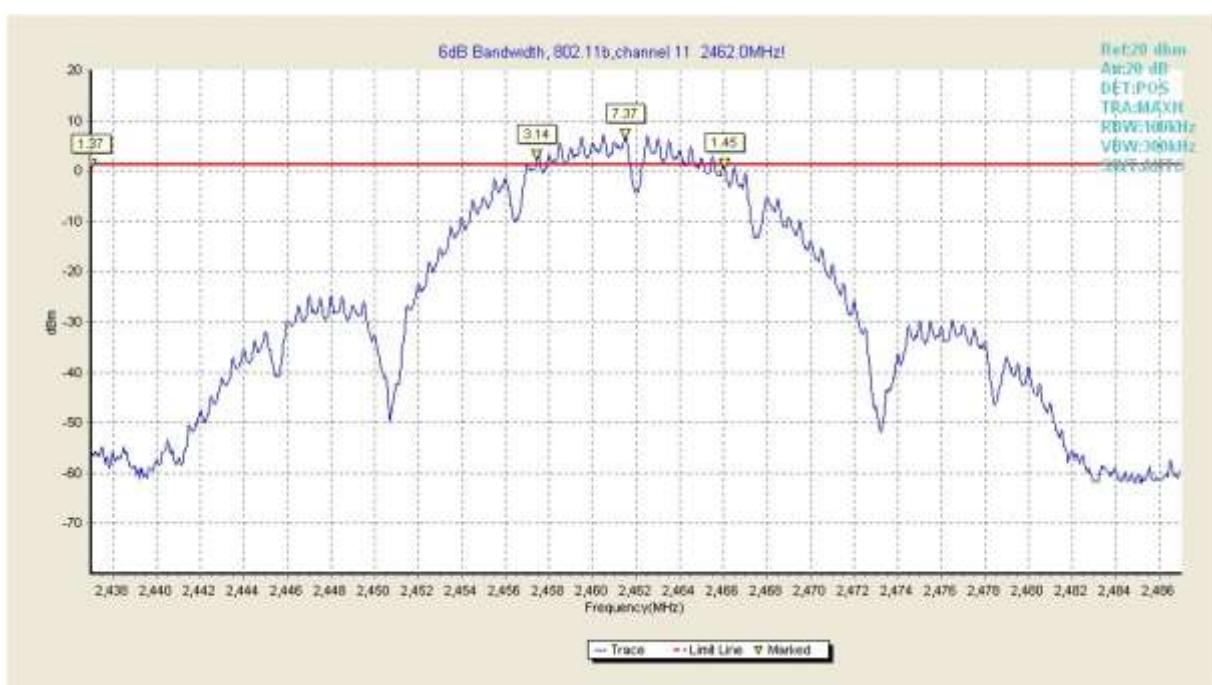
**B.3.3 Test Results****802.11 b mode**

Channel	Frequency (MHz)	Limit (MHz)	Occupied Bandwidth (MHz)	Test Results	Verdict
1	2412	0.5	9.50	Fig.13	Pass
6	2437		9.10	Fig.14	Pass
11	2462		8.60	Fig.15	Pass



Fig.13 6dB Bandwidth of 802.11b in channel 1,2412MHz





**Fig.14 6dB Bandwidth of 802.11b in channel 6,2437MHz**

Test plot 1	2457.449951	3.140000
Test plot 2	2461.500000	7.370000
Test plot 3	2466.050049	1.450000

**Fig.15 6dB Bandwidth of 802.11b in channel 11,2462MHz**

### 802.11 g mode

Channel	Frequency (MHz)	Limit (MHz)	Occupied Bandwidth (MHz)	Test Results	Verdict
1	2412	0.5	15.50	Fig.16	Pass
6	2437		15.30	Fig.17	Pass
11	2462		15.70	Fig.18	Pass



Test plot 1	2404.449951	-0.600000
Test plot 2	2413.250000	2.370000
Test plot 3	2419.949951	-3.350000

Fig.16 6dB Bandwidth of 802.11g in channel 1,2412MHz

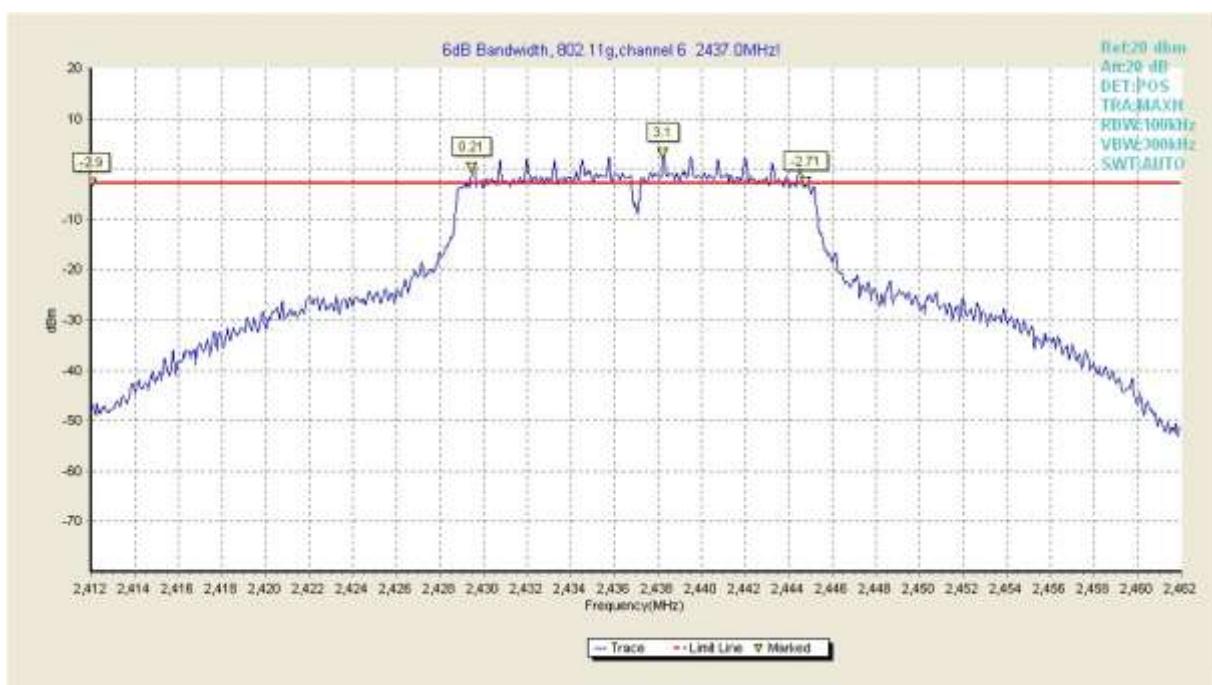


Fig.17 6dB Bandwidth of 802.11g in channel 1,2437MHz



Fig.18 6dB Bandwidth of 802.11g in channel 1,2462MHz

Test plot 1	2453.850098	-2.690000
Test plot 2	2457.000000	2.970000
Test plot 3	2469.550049	-2.110000

802.11 n-20 mode

Channel	Frequency (MHz)	Limit (MHz)	Occupied Bandwidth (MHz)	Test Results	Verdict
1	2412	0.5	16.25	Fig.19	Pass
6	2437		16.80	Fig.20	Pass
11	2462		16.30	Fig.21	Pass



Test plot 1	2404.149902	-4.250000
Test plot 2	2413.250000	1.460000
Test plot 3	2420.399902	-3.710000

Fig.19 6dB Bandwidth of 802.11n-20 in channel 1,2412MHz



Fig.20 6dB Bandwidth of 802.11 n-20 in channel 6,2437MHz



Fig.21 6dB Bandwidth of 802.11 n-20 in channel 11,2462MHz

802.11 n-40 mode

Channel	Frequency (MHz)	Limit (MHz)	Occupied Bandwidth (MHz)	Test Results	Verdict
3	2422	0.5	35.04	Fig.22	Pass
6	2437		35.92	Fig.23	Pass
9	2452		32.56	Fig.24	Pass



Test plot 1	2404.479980	-4.690000
Test plot 2	2419.520020	-0.900000
Test plot 3	2439.520020	-4.830000

Fig.22 6dB Bandwidth of 802.11 n-40 in channel 3,2422MHz



Test plot 1	2419.239990	-7.660000
Test plot 2	2441.959961	-1.910000
Test plot 3	2455.159912	-7.810000

Fig.23 6dB Bandwidth of 802.11 n-40 in channel 6,2437MHz



Test plot 1	2434.479980	-5.510000
Test plot 2	2454.560059	-0.310000
Test plot 3	2467.040039	-5.600000

Fig.24 6dB Bandwidth of 802.11 n-40 in channel 9,2452MHz

## **B.4 Band Edge Compliance**

### **B.4.1 Conducted Measurement**

#### **B.4.1.1 Description**

The Band Edges Compliance shall be equal to or less than -20 dB.

#### **B.4.1.2 Test procedures**

##### **Conducted Measurement**

EUT was set for low, mid, high channel with modulated mode and highest RF output power

The spectrum analyzer was connected to the antenna terminal.

##### **Standard Requirement**

Emissions within 2 MHz of an authorized band edge may be measured using either the marker-delta method (for peak or average emissions) or the integration method (for average emissions only), described below, provided that the OBW edge falls within 2 MHz of the band edge. Otherwise, all unwanted emissions measurements shall be performed using the standard methods.

##### **Procedures**

###### **Peak Detection**

When using a peak detector to measure unwanted emissions at or near the band edge (within 2 MHz of the authorized band), the following integration procedure can be used.

- a) Set instrument center frequency to the frequency of the emission to be measured (must be within 2 MHz of the authorized band edge).
- b) Set span to 2 MHz
- c) RBW = 100 kHz.
- d) VBW  $\geq$  3 x RBW.
- e) Detector = peak.
- f) Sweep time = auto.
- g) Trace mode = max hold.
- h) Allow sweep to continue until the trace stabilizes (required measurement time may increase for low duty cycle applications)
- i) Compute the power by integrating the spectrum over 1 MHz using the analyzer's band power measurement function with band limits set equal to the emission frequency ( $f_{\text{emission}}$ )  $\pm$  0.5 MHz. If the instrument does not have a band power function, then sum the amplitude levels (in power units) at 100 kHz intervals extending across the 1 MHz spectrum defined by  $f_{\text{emission}} \pm 0.5$  MHz.

#### **B.4.1.3 Test Results**

##### **802.11b mode**

<b>Channel</b>	<b>Frequency(MHz)</b>	<b>Limit (dB)</b>	<b>Test Result(MHz)</b>		<b>Verdict</b>
1	2400	20	37.40	Fig.25	Pass

11	2483.5		58.75	Fig.26	Pass
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Fig25. Frequency Band Edges of 802.11b in channel 1,2400MHz



Fig26. Frequency Band Edges of 802.11b in channel 11,2483.5MHz

802.11g mode

Channel	Frequency(MHz)	Limit (dB)	Test Result(MHz)		Verdict
1	2400	20	24.30	Fig.27	Pass

11	2483.5		37.54	Fig.28	Pass
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Fig27. Frequency Band Edges of 802.11g in channel 1,2400MHz



Fig28. Frequency Band Edges of 802.11g in channel 11,2483.5MHz

802.11n-20 mode

Channel	Frequency(MHz)	Limit (dB)	Test Result(MHz)		Verdict
1	2400	20	24.87	Fig.29	Pass

11	2483.5		37.10	Fig.30	Pass
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Fig29. Frequency Band Edges of 802.11n-20 in channel 1,2400MHz



Fig30. Frequency Band Edges of 802.11n-20 in channel 11,2483.5MHz

802.11n-40 mode

Channel	Frequency(MHz)	Limit (dB)	Test Result(MHz)		Verdict
3	2400	20	29.11	Fig.31	Pass

9	2483.5		57.86	Fig.32	Pass
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**Fig31. Frequency Band Edges of 802.11n-40 in channel 1,2400MHz****Fig32. Frequency Band Edges of 802.11n-40 in channel 11,2483.5MHz**

#### B.4.2 Radiated measurement

##### B.4.2.1 Procedures:

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal

from an external generator.

- b) Position the EUT on the rotated table inside the anechoic chamber without connection to measurement instrument. Turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range. Repeat above procedures until all measured frequencies were complete.
- c) Set band RBW=1MHz, VBW=3MHz with a convenient frequency span from band edge.
- d) Find the highest point in edge frequency, and then calculated results.
- e) Repeat above procedures until all measured frequencies were complete.

**B.4.2.2 Test Results**

802.11b

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Detector (PK/QP/Ave)	Turn table Angle Degree	RX Antenna		Corrected Factor	Corrected Amplitude (dB)	FCC Part 15.247/209/205	
				Height (m)	Polar (H/V)			Limit (dB $\mu$ V/m)	Margin (dB)
2400MHz									
485.79	11.52	QP	25	1.1	H	21.09	32.61	46.5	-13.89
485.79	13.42	QP	136	1.5	V	21.09	34.51	46.5	-11.99
1321.5	28.78	PK	136	1.5	V	-15.07	13.71	70	-56.29
1281.2	18.56	Ave	257	1.5	V	-15.27	3.29	50	-46.71
1753.67	31.11	PK	178	1.5	V	-14.35	16.76	70	-53.24
1770.67	20.02	Ave	233	1.5	H	-14.34	5.68	50	-44.32
1841.5	18.69	Ave	147	1.5	H	-13.38	5.31	50	-44.69
1841.5	44.57	PK	147	1.5	V	-13.38	31.19	70	-38.81
2412.08	67.85	Ave	36	1.5	V	-13.18	54.67	50	4.67
2412.08	71.12	PK	36	1.5	H	-13.16	57.96	70	-12.04
<b>2400</b>	<b>33.63</b>	<b>PK</b>	<b>307</b>	<b>1.5</b>	<b>H</b>	<b>-13.18</b>	<b>20.45</b>	<b>70</b>	<b>-49.55</b>
<b>2400</b>	<b>21.49</b>	<b>Ave</b>	<b>307</b>	<b>1.5</b>	<b>V</b>	<b>-13.18</b>	<b>8.31</b>	<b>50</b>	<b>-41.69</b>
2484.53	32.54	PK	79	1.5	V	-13.19	19.35	70	-50.65
2484.53	23.66	Ave	79	1.5	V	-13.19	10.47	50	-39.53
2483.5MHz									
387.79	11.22	QP	157	1.1	H	21.09	32.31	46.5	-14.19
3938.16	38.73	PK	245	1.5	V	-16.25	22.48	74	-51.52
4153.5	28.57	Ave	278	1.5	V	-16.45	12.12	54	-41.88

5374.67	44.27	PK	347	1.5	V	-17.41	26.86	74	-47.14
6999.53	45.73	PK	288	1.5	H	-18.62	27.11	74	-46.89
7079.33	40.73	Ave	171	1.5	H	-19.06	21.67	54	-32.33
2316.3	31.25	PK	21	1.5	V	-13.19	18.06	70	-51.94
2316.3	21.37	Ave	21	1.5	V	-13.19	8.18	50	-41.82
2362.05	73.69	PK	113	1.5	H	-13.14	60.55	70	-9.45
2362.05	71.52	Ave	113	1.5	H	-13.14	58.38	50	8.38
<b>2483.50</b>	<b>34.13</b>	<b>PK</b>	<b>196</b>	<b>1.5</b>	<b>V</b>	<b>-13.11</b>	<b>21.02</b>	<b>70</b>	<b>-48.98</b>
<b>2483.50</b>	<b>24.96</b>	<b>Ave</b>	<b>196</b>	<b>1.5</b>	<b>V</b>	<b>-13.11</b>	<b>11.85</b>	<b>50</b>	<b>-38.15</b>
2492.22	35.36	PK	277	1.5	V	-13.08	22.28	70	-47.72
2492.22	24.88	Ave	277	1.5	V	-13.08	11.8	50	-38.2

802.11g

387.79	13.47	QP	117	1.5	H	21.09	34.56	46.5	-11.94
3938.16	38.99	PK	120	1.5	V	-16.25	22.74	74	-51.26
4153.50	26.57	Ave	47	1.5	V	-16.45	10.12	54	-43.88
5374.67	44.32	PK	222	1.5	V	-17.41	26.91	74	-47.09
6999.53	45.69	PK	164	1.5	H	-18.62	27.07	74	-46.93
7079.33	39.11	Ave	172	1.5	H	-19.06	20.05	54	-33.95
2316.30	33.75	PK	344	1.5	V	-13.19	20.56	70	-49.44
2316.30	20.06	Ave	344	1.5	V	-13.19	6.87	50	-43.13
2362.05	73.33	PK	287	1.5	H	-13.14	60.19	70	-9.81
2362.05	71.44	Ave	287	1.5	H	-13.14	58.3	50	8.3
<b>2483.50</b>	<b>32.55</b>	<b>PK</b>	<b>253</b>	<b>1.5</b>	<b>V</b>	<b>-13.11</b>	<b>19.44</b>	<b>70</b>	<b>-50.56</b>
<b>2483.50</b>	<b>24.77</b>	<b>Ave</b>	<b>253</b>	<b>1.5</b>	<b>V</b>	<b>-13.11</b>	<b>11.66</b>	<b>50</b>	<b>-38.34</b>
2492.22	34.69	PK	146	1.5	V	-13.08	21.61	70	-48.39
2492.22	22.71	Ave	146	1.5	V	-13.08	9.63	50	-40.37

802.11n-20

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Detector (PK/QP/Ave)	Turn table Angle Degree	RX Antenna		Corrected Factor	Corrected Amplitude Limit	FCC Part 15.247/209/205	
				Height (m)	Polar (H/V)			(dB $\mu$ V/m)	(dB $\mu$ V/m)
2400MHz									
485.79	13.22	QP	113	1.1	H	21.09	34.31	46.50	-12.19
1321.5	28.67	PK	178	1.5	V	-15.07	13.6	70.00	-56.4
1281.2	18.88	Ave	254	1.5	V	-15.27	3.61	50.00	-46.39
1753.67	30.39	PK	36	1.5	H	-14.35	16.04	70.00	-53.96
1770.67	19.96	AV	77	1.5	H	-14.34	5.62	50.00	-44.38
1841.50	18.65	Ave	244	1.5	H	-13.38	5.27	50.00	-44.73
1841.50	44.32	PK	244	1.5	V	-13.38	30.94	70.00	-39.06
2412.08	67.89	Ave	172	1.5	V	-13.18	54.71	50.00	4.71
2412.08	70.91	PK	172	1.5	H	-13.16	57.75	70.00	-12.25
<b>2400.00</b>	<b>33.21</b>	<b>PK</b>	<b>298</b>	<b>1.5</b>	<b>V</b>	<b>-13.18</b>	<b>20.03</b>	<b>70.00</b>	<b>-49.97</b>
<b>2400.00</b>	<b>22.78</b>	<b>Ave</b>	<b>298</b>	<b>1.5</b>	<b>V</b>	<b>-13.18</b>	<b>9.6</b>	<b>50.00</b>	<b>-40.4</b>

2484.53	32.37	PK	236	1.5	V	-13.19	19.18	70.00	-50.82
2484.53	23.24	Ave	236	1.5	V	-13.19	10.05	50.00	-39.95
2483.5MHz									
387.79	13.33	QP	177	1.5	H	21.09	34.42	46.5	-12.08
3938.16	39.01	PK	152	1.5	V	-16.25	22.76	74	-51.24
4153.50	28.33	Ave	277	1.5	V	-16.45	11.88	54	-42.12
5374.67	44.25	PK	282	1.5	V	-17.41	26.84	74	-47.16
6999.53	46.93	PK	99	1.5	H	-18.62	28.31	74	-45.69
7079.33	40.06	Ave	168	1.5	H	-19.06	21	54	-33
2316.30	31.72	PK	57	1.5	V	-13.19	18.53	70	-51.47
2316.30	21.26	Ave	57	1.5	V	-13.19	8.07	50	-41.93
2362.05	71.55	PK	31	1.5	H	-13.14	58.41	70	-11.59
2362.05	70.21	Ave	31	1.5	H	-13.14	57.07	50	7.07
<b>2483.5</b>	<b>34.33</b>	<b>PK</b>	<b>164</b>	<b>1.5</b>	<b>V</b>	<b>-13.11</b>	<b>21.22</b>	<b>70</b>	<b>-48.78</b>
<b>2483.5</b>	<b>24.01</b>	<b>Ave</b>	<b>164</b>	<b>1.5</b>	<b>V</b>	<b>-13.11</b>	<b>10.9</b>	<b>50</b>	<b>-39.1</b>
2492.22	34.37	PK	299	1.5	V	-13.08	21.29	70	-48.71
2492.22	24.57	Ave	299	1.5	V	-13.08	11.49	50	-38.51

802.11n-40

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Detector (PK/QP/Ave)	Turn table Angle Degree	RX Antenna		Corrected Factor (dB)	Corrected Amplitude (dB $\mu$ V/m)	FCC Part 15.247/209/205	
				Height (m)	Polar (H/V)			Limit (dB $\mu$ V/m)	Margin (dB)
2400MHz									
485.79	12.65	QP	157	1.1	H	21.09	33.74	46.5	-12.76
1321.5	28.88	PK	221	1.5	V	-15.07	13.81	70	-56.19
1281.2	16.99	Ave	124	1.5	V	-15.27	1.72	50	-48.28
1753.67	32.36	PK	198	1.5	H	-14.35	18.01	70	-51.99
1770.67	20.07	Ave	47	1.5	H	-14.34	5.73	50	-44.27
1841.50	19.74	Ave	277	1.5	H	-13.38	6.36	50	-43.64
1841.50	43.87	PK	277	1.5	V	-13.38	30.49	70	-39.51
2422.08	68.60	Ave	287	1.5	V	-13.28	55.32	50	5.32

2422.08	73.67	PK	287	1.5	H	-13.26	60.41	70	-9.59
<b>2400</b>	<b>33.75</b>	<b>PK</b>	<b>93</b>	<b>1.5</b>	<b>V</b>	<b>-13.18</b>	<b>20.57</b>	<b>70</b>	<b>-49.43</b>
<b>2400</b>	<b>22.70</b>	<b>Ave</b>	<b>93</b>	<b>1.5</b>	<b>V</b>	<b>-13.18</b>	<b>9.52</b>	<b>50</b>	<b>-40.48</b>
2484.53	34.78	PK	134	1.5	V	-13.19	21.59	70	-48.41
2484.53	22.36	Ave	134	1.5	V	-13.19	9.17	50	-40.83
2483.5MHz									
387.79	13.66	QP	68	1.5	H	21.09	34.75	46.5	-11.75
3938.16	40.89	PK	179	1.5	V	-16.25	24.64	74	-49.36
4153.50	28.24	Ave	112	1.5	V	-16.45	11.79	54	-42.21
5374.67	44.45	PK	271	1.5	V	-17.41	27.04	74	-46.96
6999.53	46.37	PK	57	1.5	H	-18.62	27.75	74	-46.25
7079.33	40.87	Ave	177	1.5	H	-19.06	21.81	54	-32.19
2316.30	33.96	PK	221	1.5	V	-13.19	20.77	70	-49.23
2316.30	20.47	Ave	221	1.5	V	-13.19	7.28	50	-42.72
2352.05	73.32	PK	163	1.5	H	-13.15	60.17	70	-9.83
2352.05	71.87	Ave	163	1.5	H	-13.15	58.72	50	8.72
<b>2483.5</b>	<b>34.58</b>	<b>PK</b>	<b>244</b>	<b>1.5</b>	<b>V</b>	<b>-13.11</b>	<b>21.47</b>	<b>70</b>	<b>-48.53</b>
<b>2483.5</b>	<b>22.78</b>	<b>Ave</b>	<b>244</b>	<b>1.5</b>	<b>V</b>	<b>-13.11</b>	<b>9.67</b>	<b>50</b>	<b>-40.33</b>
2492.22	35.69	PK	188	1.5	V	-13.08	22.61	70	-47.39
2492.22	25.02	Ave	188	1.5	V	-13.08	11.94	50	-38.06

## **B.5 Conducted Transmission Spurious Emission**

### **B.5.1 Description**

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

### **B.5.2 Test Procedures**

#### **Conducted Measurement**

EUT was set for low, mid, high channel with modulated mode and highest RF output power

The spectrum analyzer was connected to the antenna terminal.

#### **Procedures**

- a) The EUT was connected to SA by a low loss cable.
- b) Set RBW=100 kHz, VBW $\geq$  RBW, scan up to 10th harmonics. All harmonics/Spurs emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

### **B.5.3 Test Result**

#### **802.11b mode**

<b>Channel</b>	<b>Frequency Range</b>	<b>Test Results</b>	<b>Verdict</b>
1	30MHz ~ 1GHz	Fig.33	Pass
	1GHz ~ 2.5GHz	Fig.34	Pass
	2.5GHz ~ 7.5GHz	Fig.35	Pass
	7.5GHz ~ 10GHz	Fig.36	Pass
	10GHz ~ 15GHz	Fig.37	Pass
	15GHz ~ 20GHz	Fig.38	Pass
	20GHz ~ 26GHz	Fig.39	Pass
6	30MHz ~ 1GHz	Fig.40	Pass
	1GHz ~ 2.5GHz	Fig.41	Pass
	2.5GHz ~ 7.5GHz	Fig.42	Pass
	7.5GHz ~ 10GHz	Fig.43	Pass
	10GHz ~ 15GHz	Fig.44	Pass
	15GHz ~ 20GHz	Fig.45	Pass
	20GHz ~ 26GHz	Fig.46	Pass
11	30MHz ~ 1GHz	Fig.47	Pass
	1GHz ~ 2.5GHz	Fig.48	Pass
	2.5GHz ~ 7.5GHz	Fig.49	Pass
	7.5GHz ~ 10GHz	Fig.50	Pass
	10GHz ~ 15GHz	Fig.51	Pass
	15GHz ~ 20GHz	Fig.52	Pass

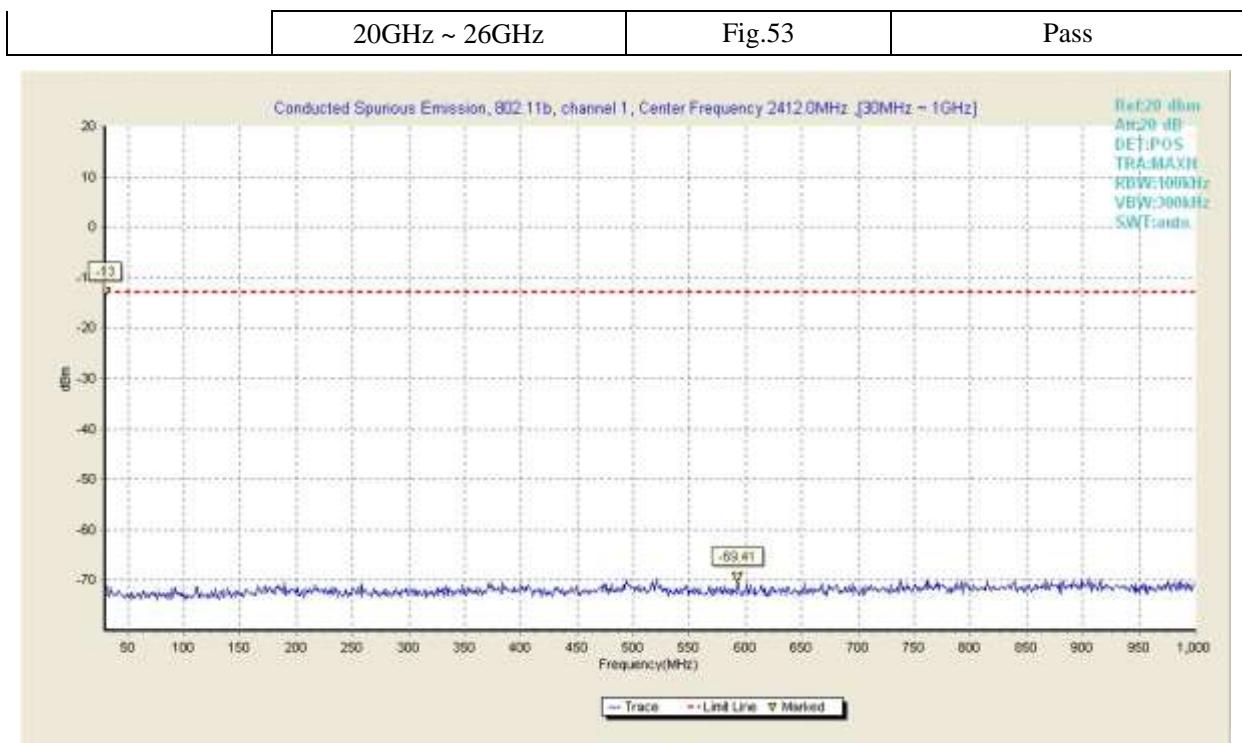


Fig33. Conducted Transmission Spurious Emission of 802.11b in channel 1,30MHz~1GHz

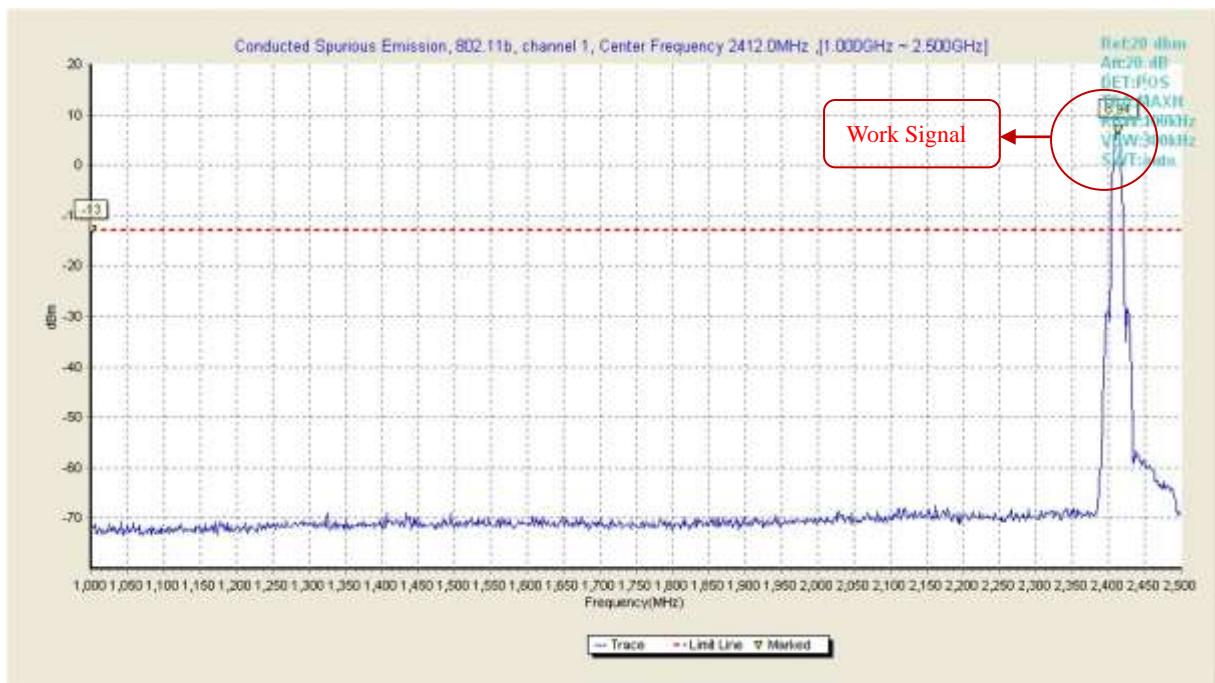


Fig34. Conducted Transmission Spurious Emission of 802.11b in channel 1,1GHz~2.5GHz

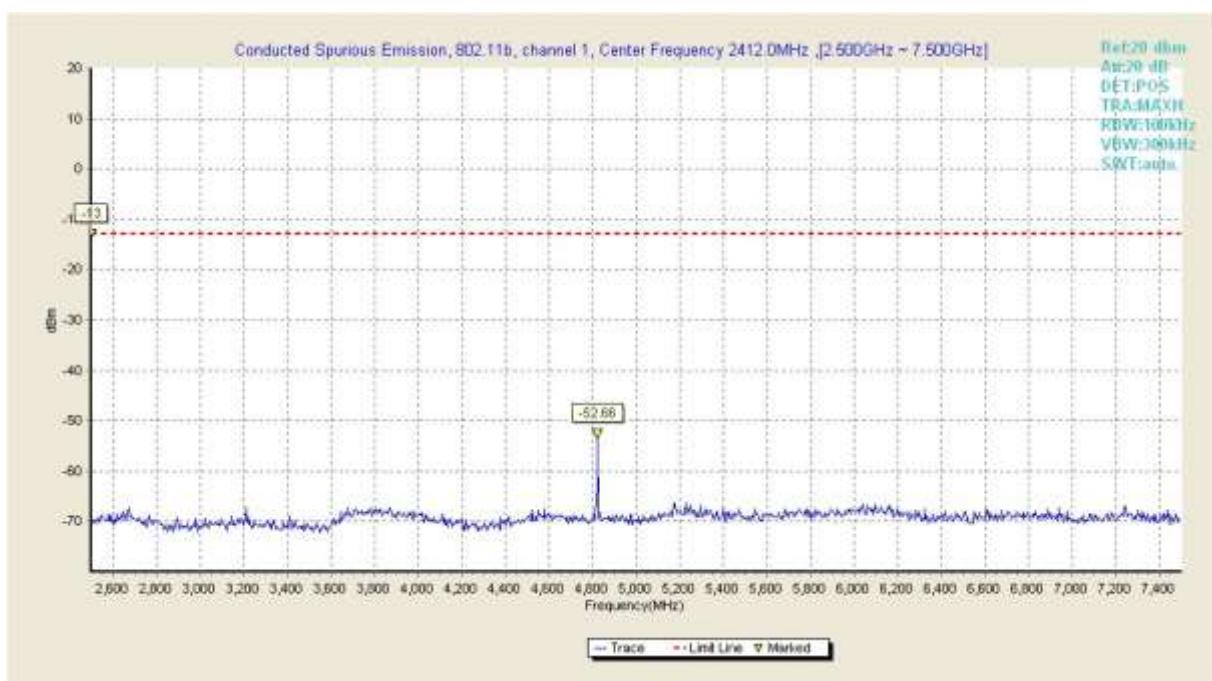


Fig35. Conducted Transmission Spurious Emission of 802.11b in channel 1, 2.5GHz~7.5GHz

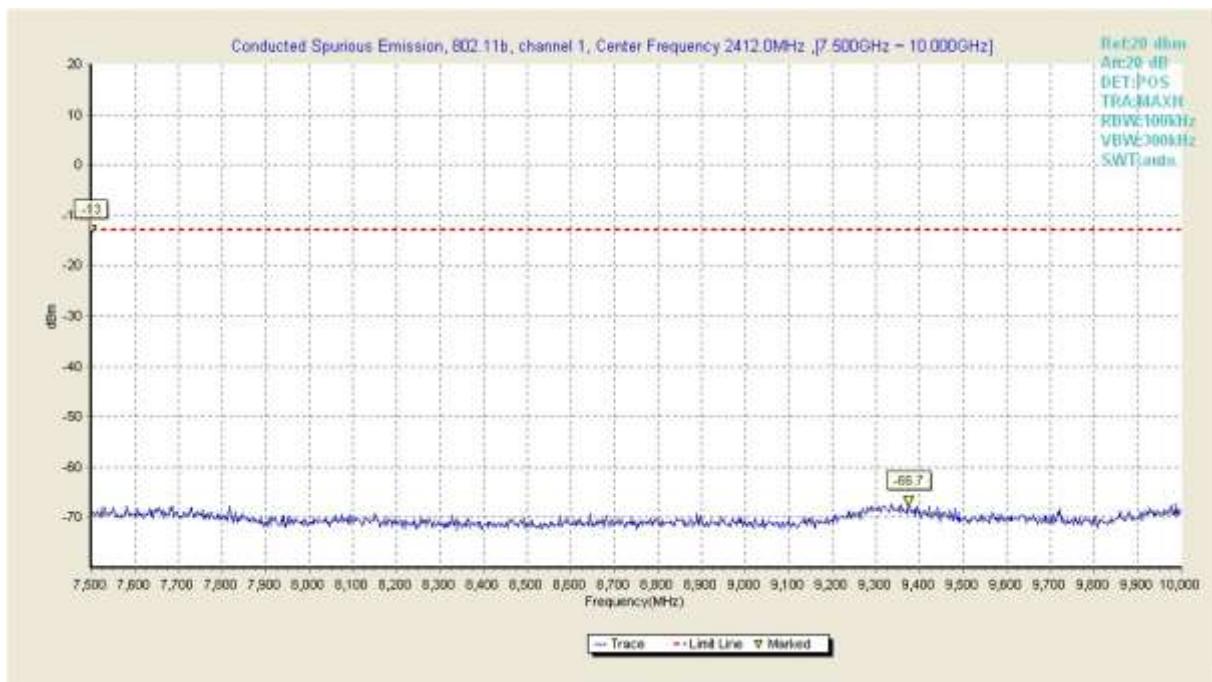


Fig36. Conducted Transmission Spurious Emission of 802.11b in channel 1, 7.5GHz~10.5GHz

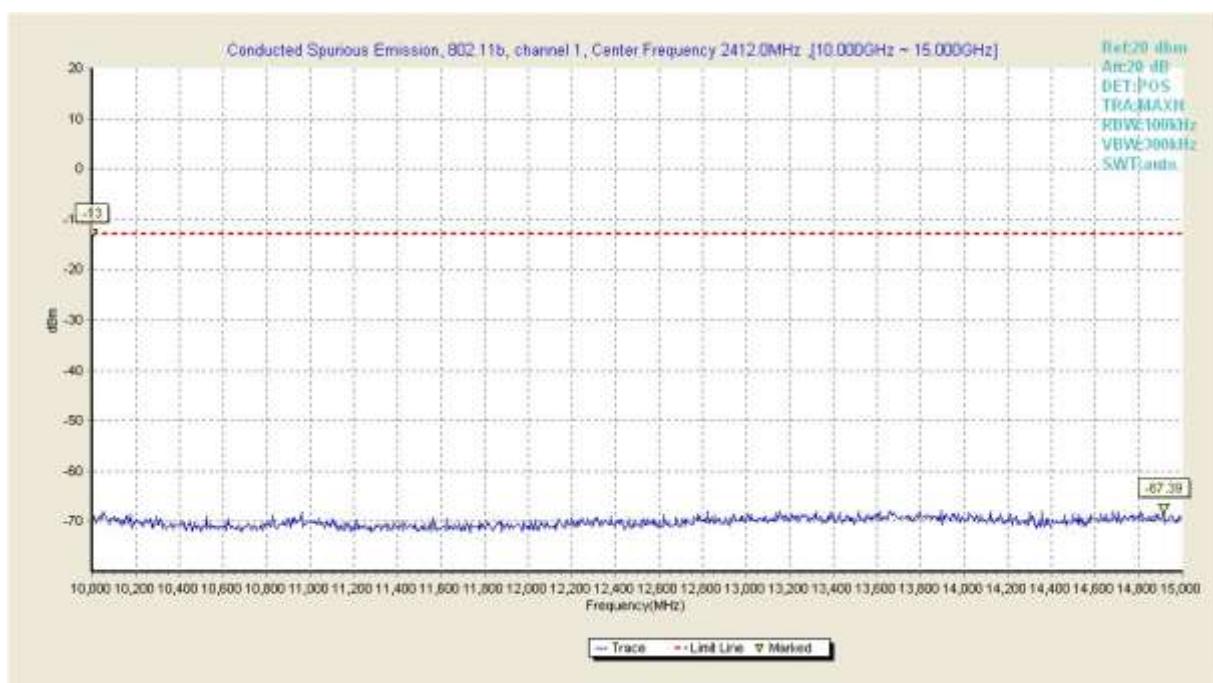


Fig37. Conducted Transmission Spurious Emission of 802.11b in channel 1, 10GHz~15GHz

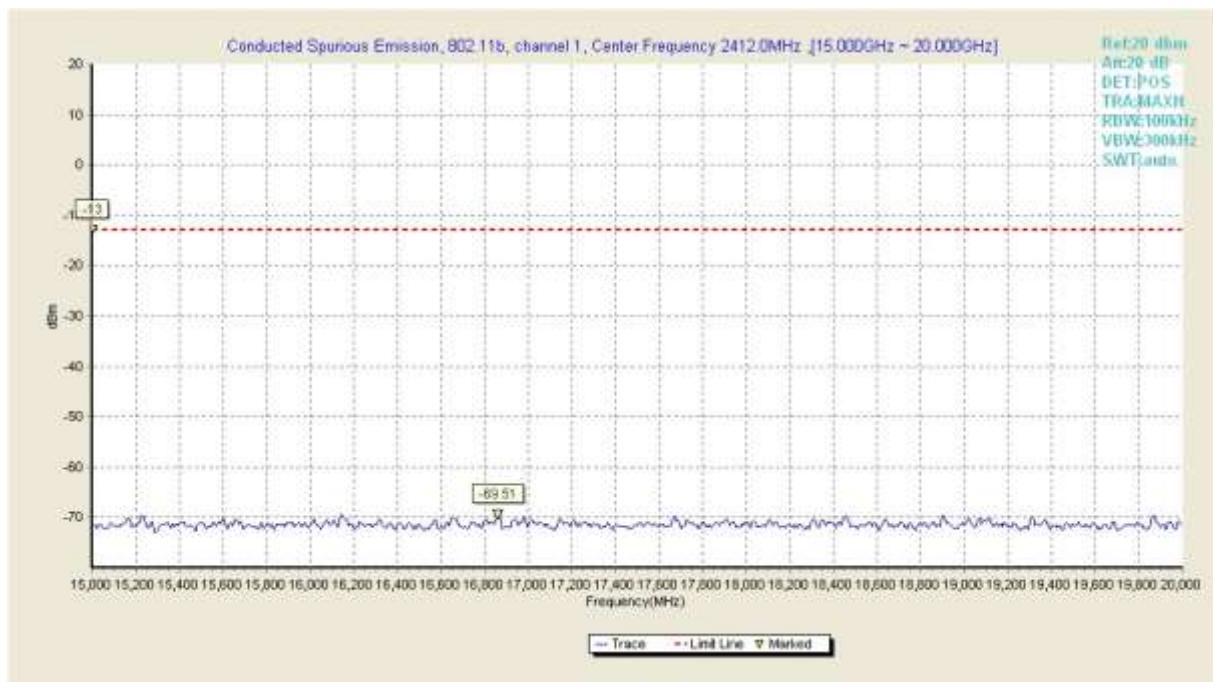


Fig38. Conducted Transmission Spurious Emission of 802.11b in channel 1, 15GHz~20GHz

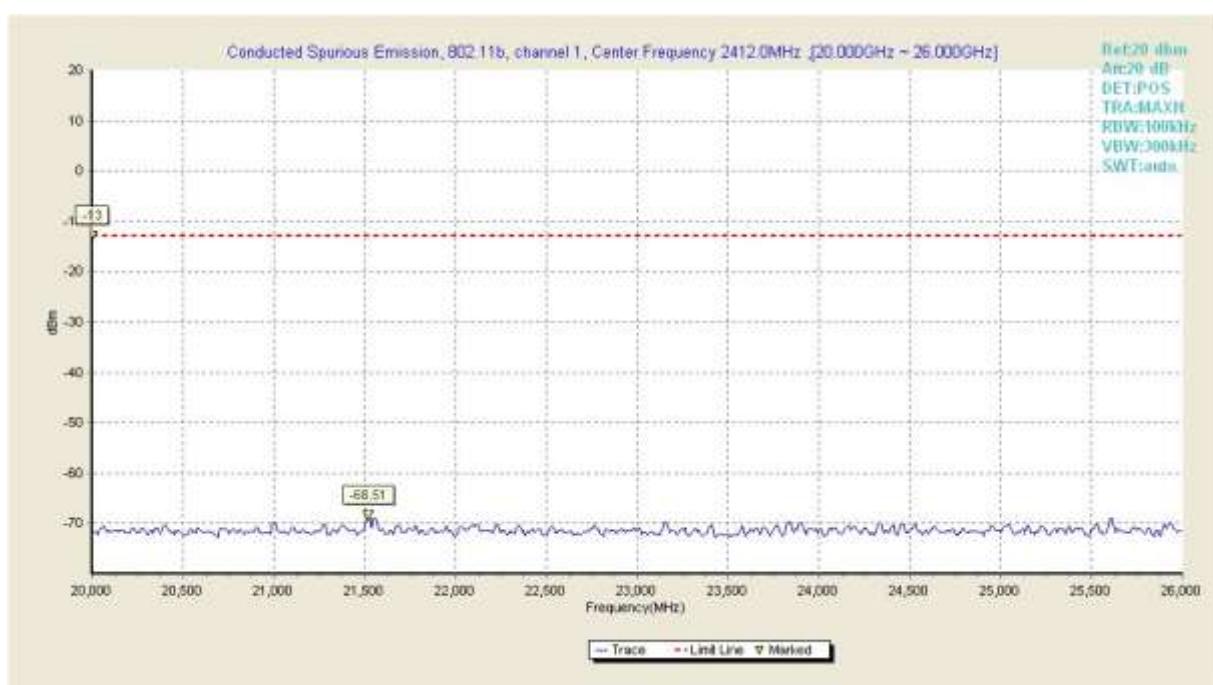


Fig39. Conducted Transmission Spurious Emission of 802.11b in channel 1, 20GHz~26GHz

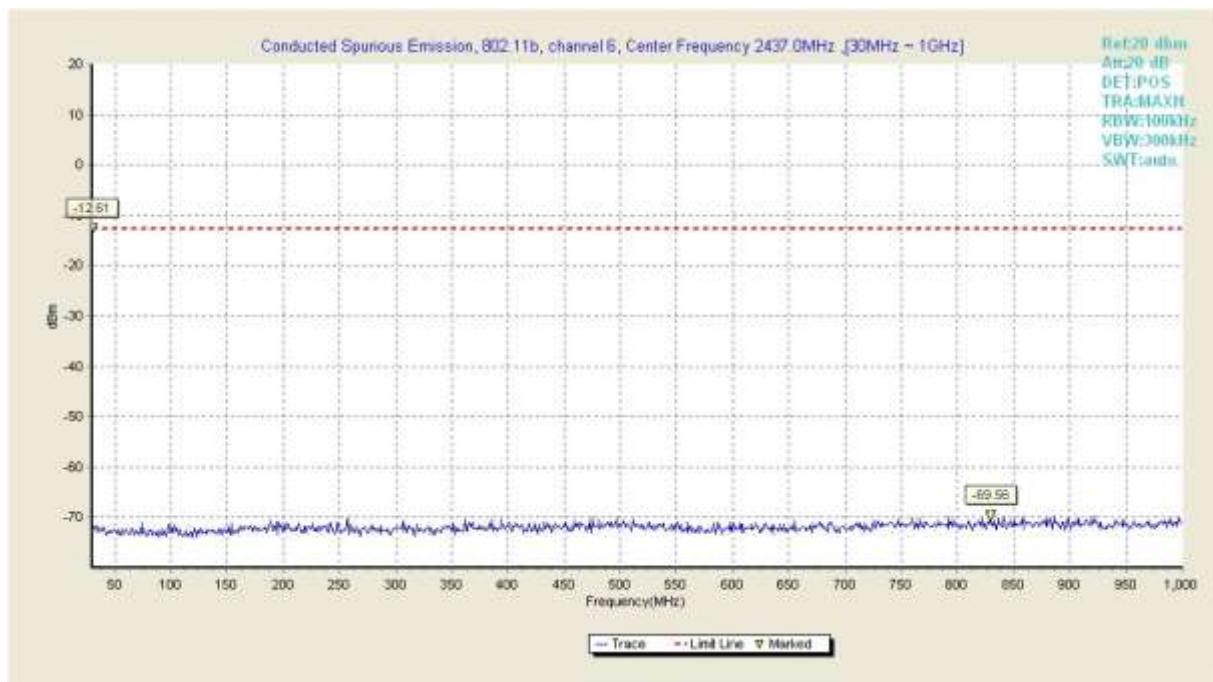


Fig40. Conducted Transmission Spurious Emission of 802.11b in channel 6, 30MHz~1GHz

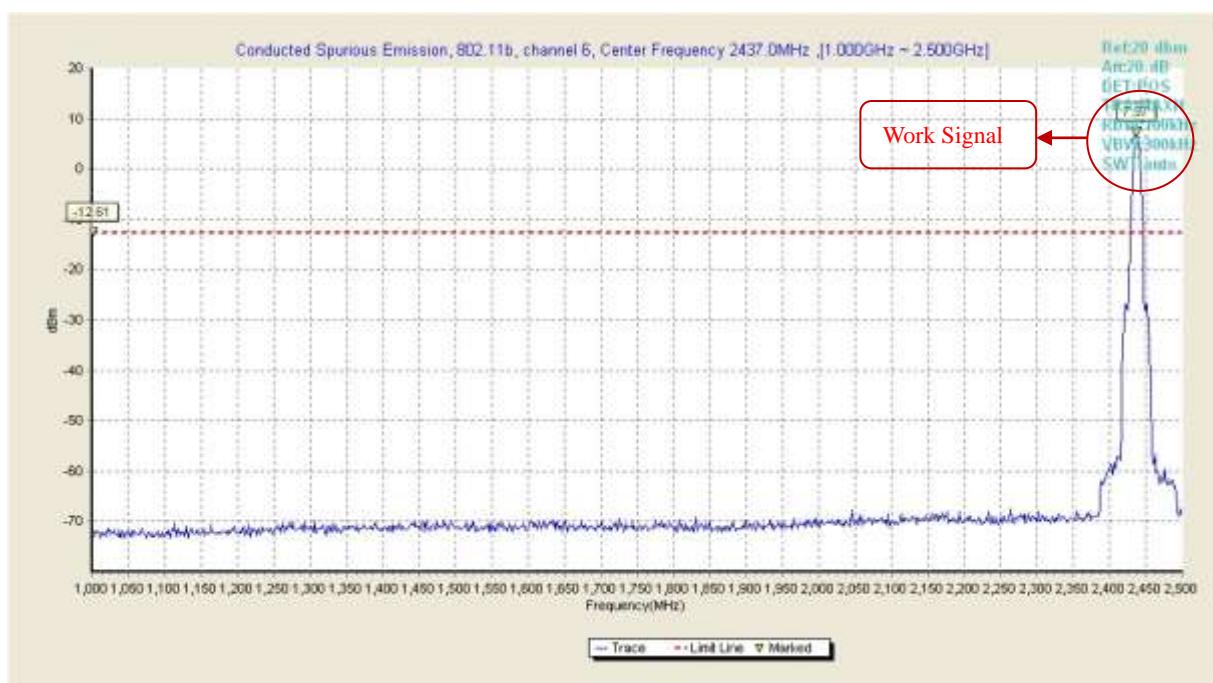


Fig41. Conducted Transmission Spurious Emission of 802.11b in channel 6, 1GHz~2.5GHz

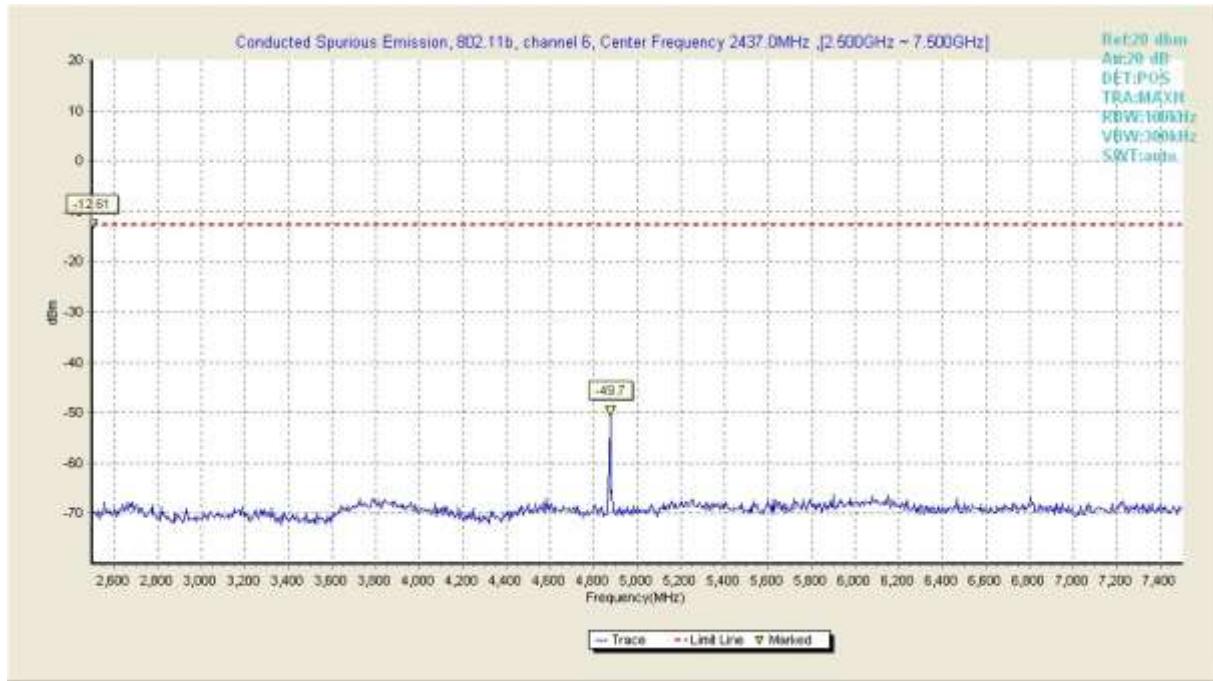


Fig42. Conducted Transmission Spurious Emission of 802.11b in channel 6, 2.5GHz~7.5GHz

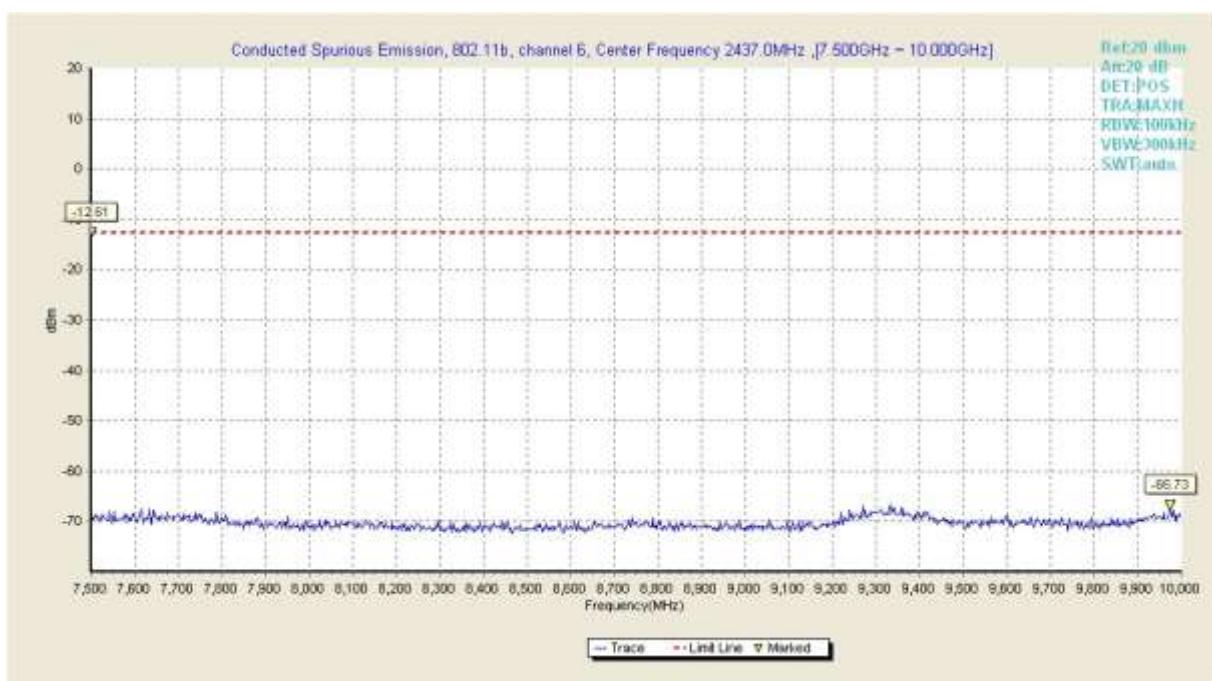


Fig43.Conducted Transmission Spurious Emission of 802.11b in channel 6, 7.5GHz~10GHz

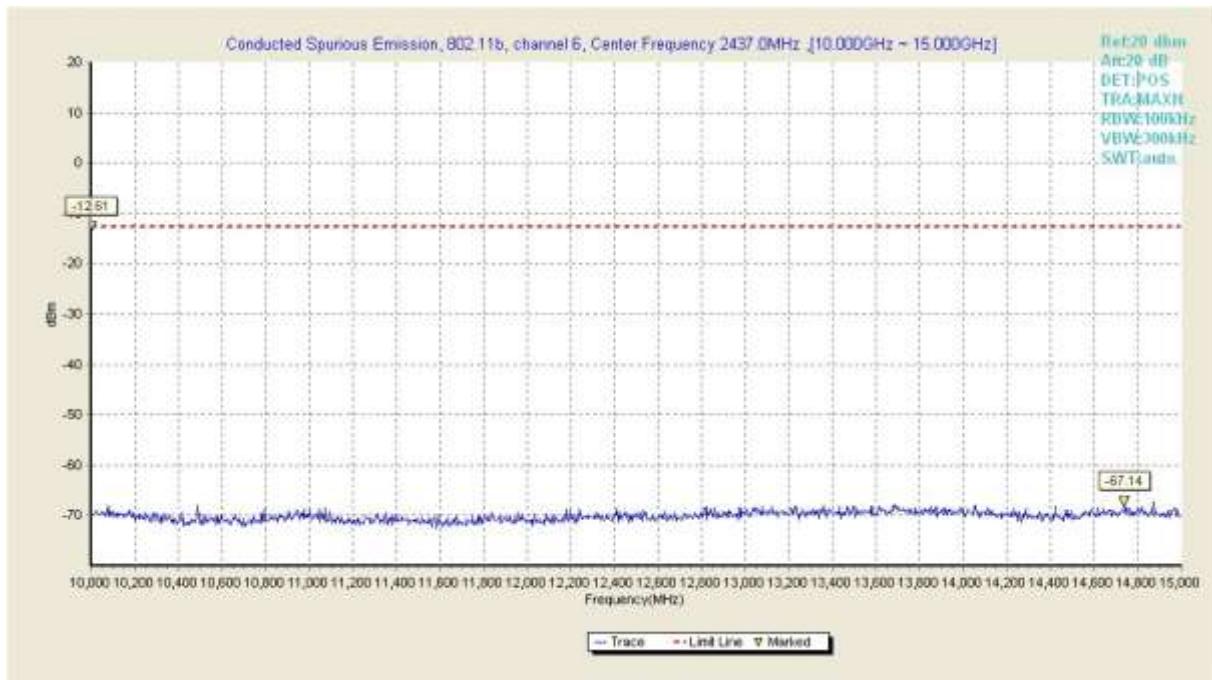


Fig44.Conducted Transmission Spurious Emission of 802.11b in channel 6, 10GHz~15GHz

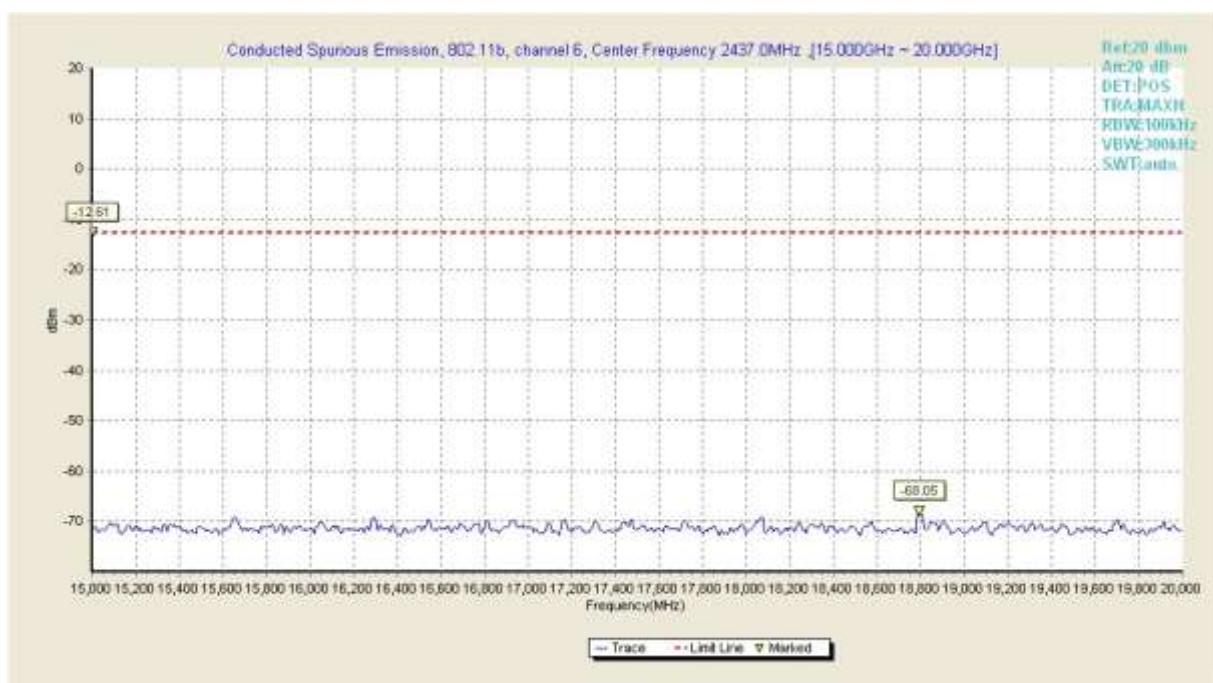


Fig45.Conducted Transmission Spurious Emission of 802.11b in channel 6, 15GHz~20GHz

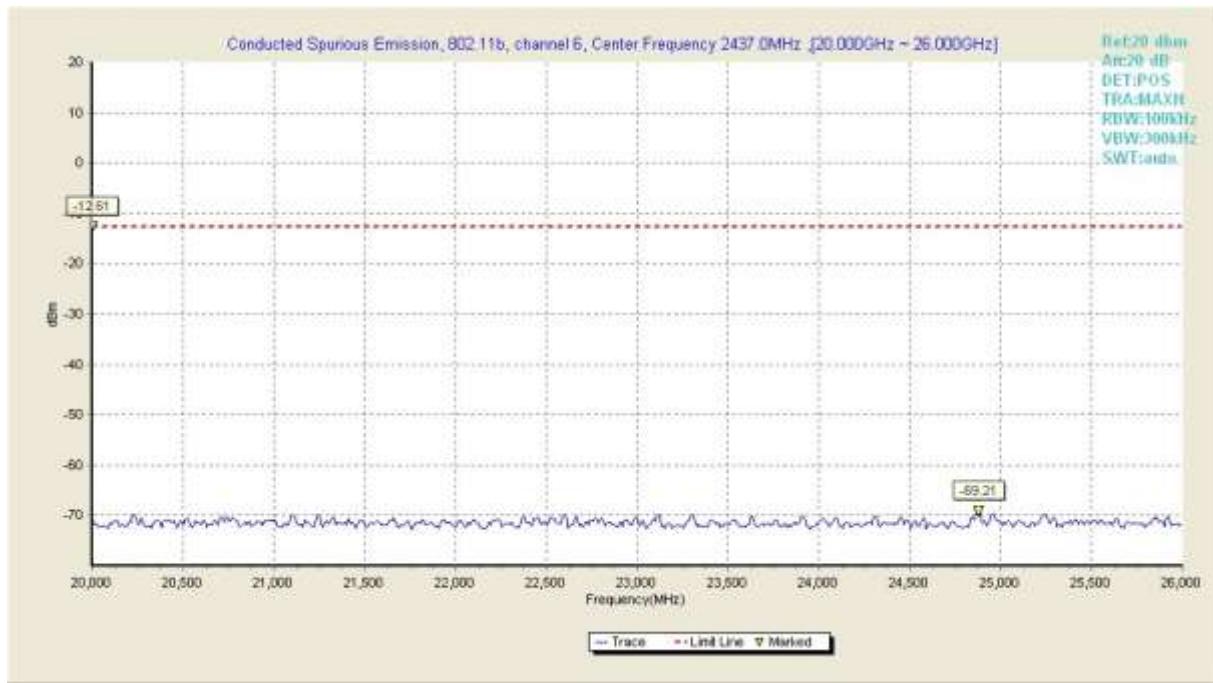


Fig46.Conducted Transmission Spurious Emission of 802.11b in channel 6, 20GHz~26GHz

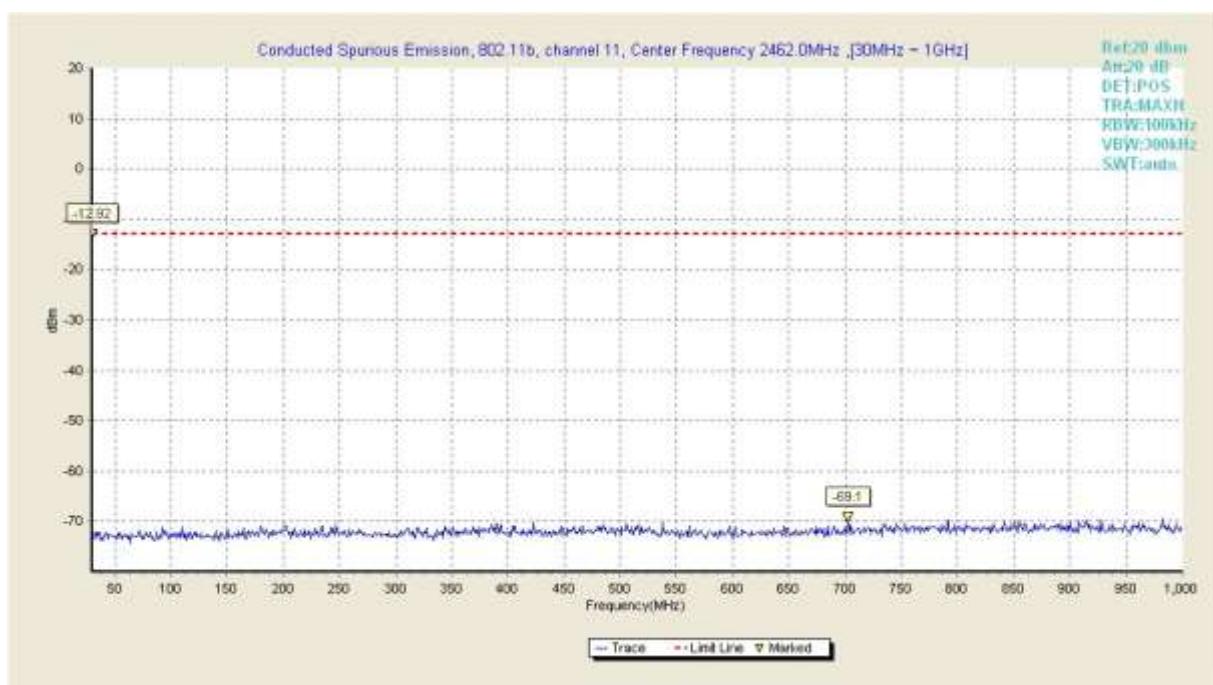


Fig47.Conducted Transmission Spurious Emission of 802.11b in channel 11, 30MHz~1GHz

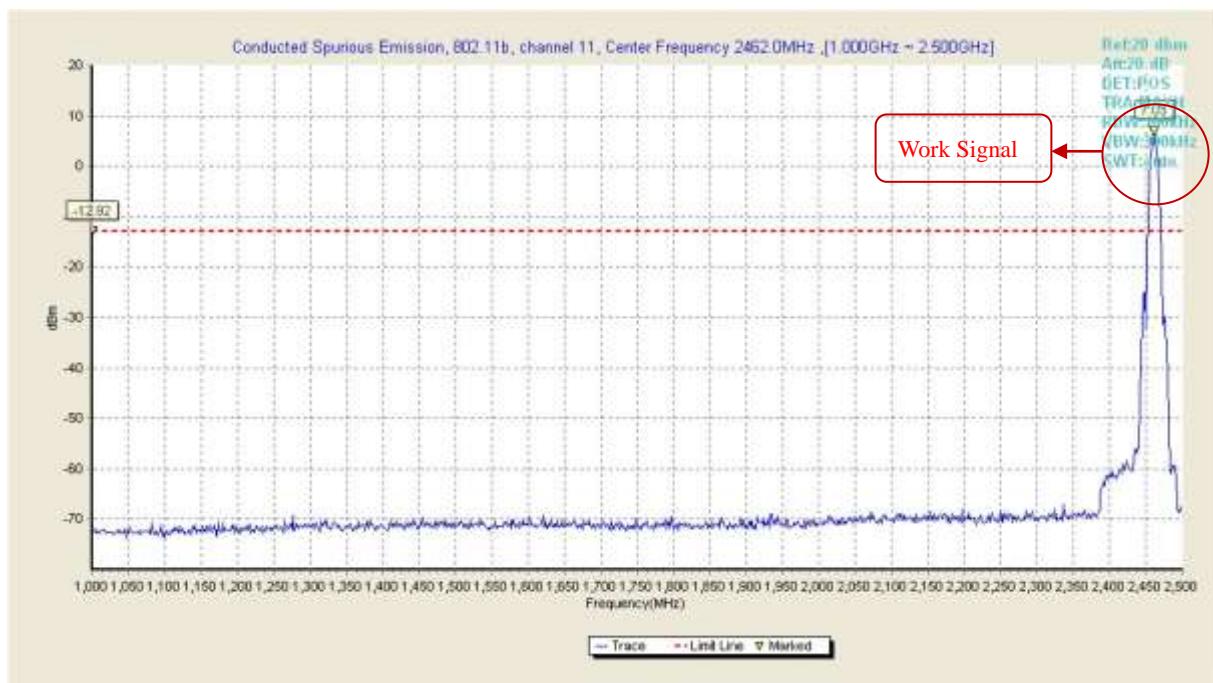


Fig48.Conducted Transmission Spurious Emission of 802.11b in channel 11, 1GHz~2.5GHz

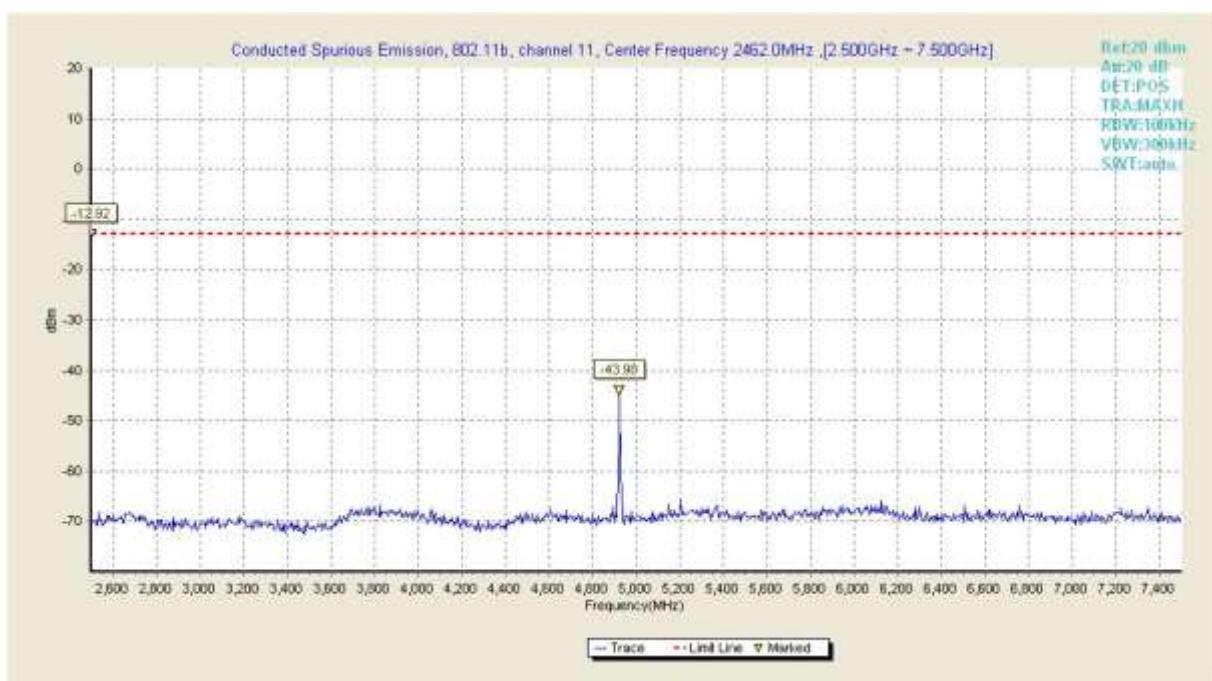


Fig49.Conducted Transmission Spurious Emission of 802.11b in channel 11, 2.5GHz~7.5GHz

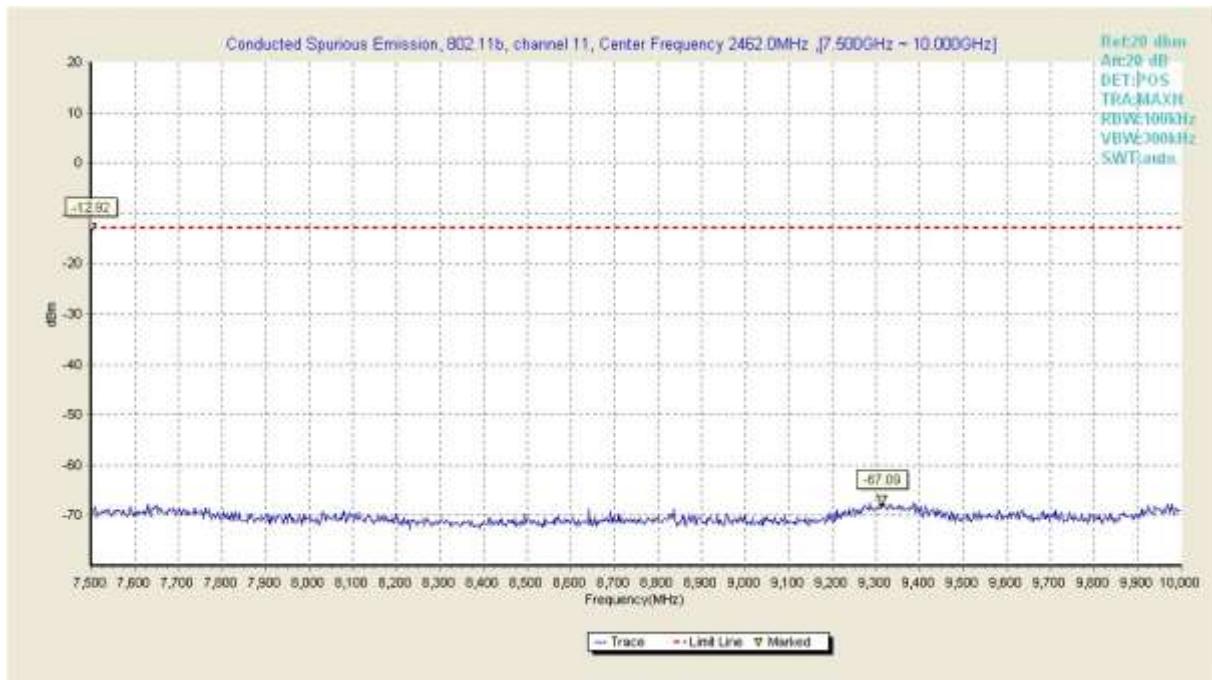


Fig50.Conducted Transmission Spurious Emission of 802.11b in channel 11, 7.5GHz~10GHz

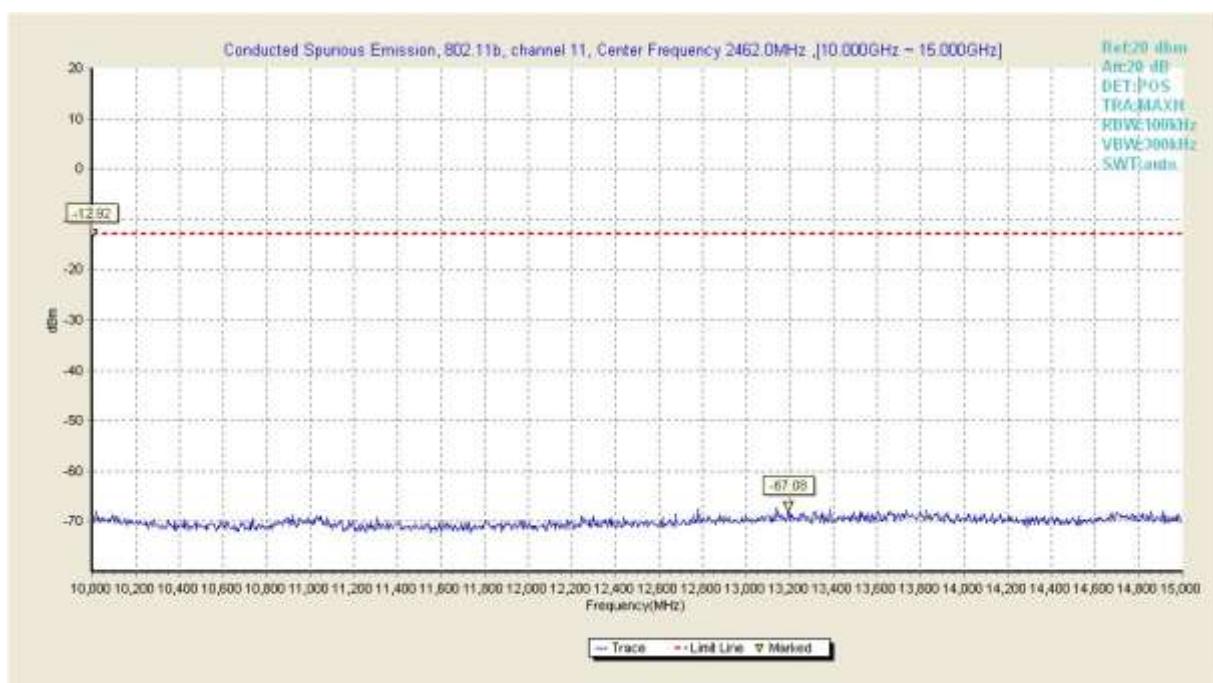


Fig51. Conducted Transmission Spurious Emission of 802.11b in channel 11, 10GHz~15GHz

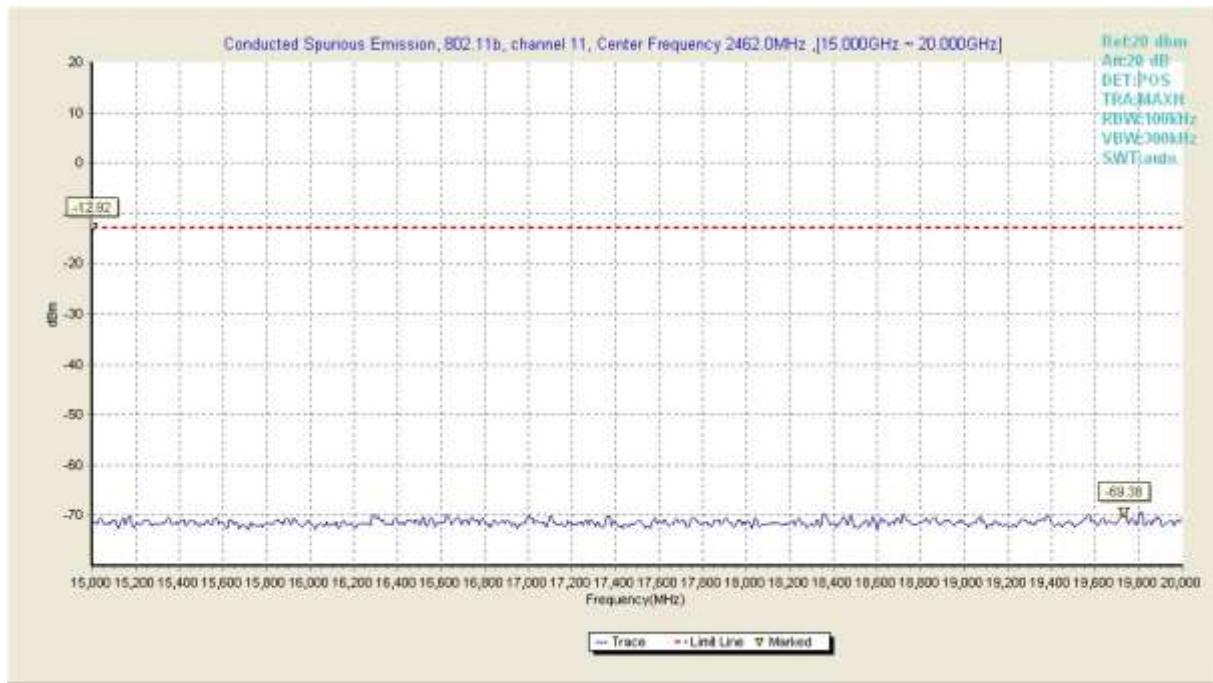


Fig52. Conducted Transmission Spurious Emission of 802.11b in channel 11, 15GHz~20GHz

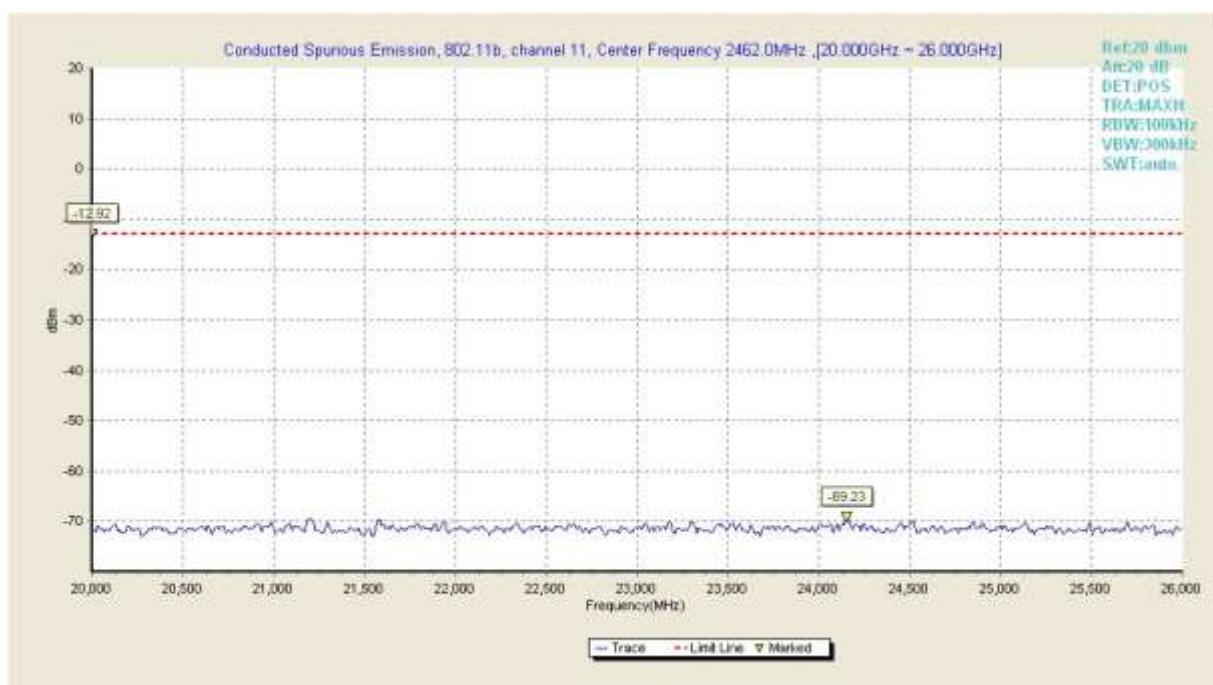


Fig53. Conducted Transmission Spurious Emission of 802.11b in channel 11, 20GHz~26GHz

## 802.11g mode

Channel	Frequency Range	Test Results	Verdict
1	30MHz ~ 1GHz	Fig.54	Pass
	1GHz ~ 2.5GHz	Fig.55	Pass
	2.5GHz ~ 7.5GHz	Fig.56	Pass
	7.5GHz ~ 10GHz	Fig.57	Pass
	10GHz ~ 15GHz	Fig.58	Pass
	15GHz ~ 20GHz	Fig.59	Pass
	20GHz ~ 26GHz	Fig.60	Pass
6	30MHz ~ 1GHz	Fig.61	Pass
	1GHz ~ 2.5GHz	Fig.62	Pass
	2.5GHz ~ 7.5GHz	Fig.63	Pass
	7.5GHz ~ 10GHz	Fig.64	Pass
	10GHz ~ 15GHz	Fig.65	Pass
	15GHz ~ 20GHz	Fig.66	Pass
	20GHz ~ 26GHz	Fig.67	Pass
11	30MHz ~ 1GHz	Fig.68	Pass
	1GHz ~ 2.5GHz	Fig.69	Pass
	2.5GHz ~ 7.5GHz	Fig.70	Pass
	7.5GHz ~ 10GHz	Fig.71	Pass
	10GHz ~ 15GHz	Fig.72	Pass
	15GHz ~ 20GHz	Fig.73	Pass
	20GHz ~ 26GHz	Fig.74	Pass

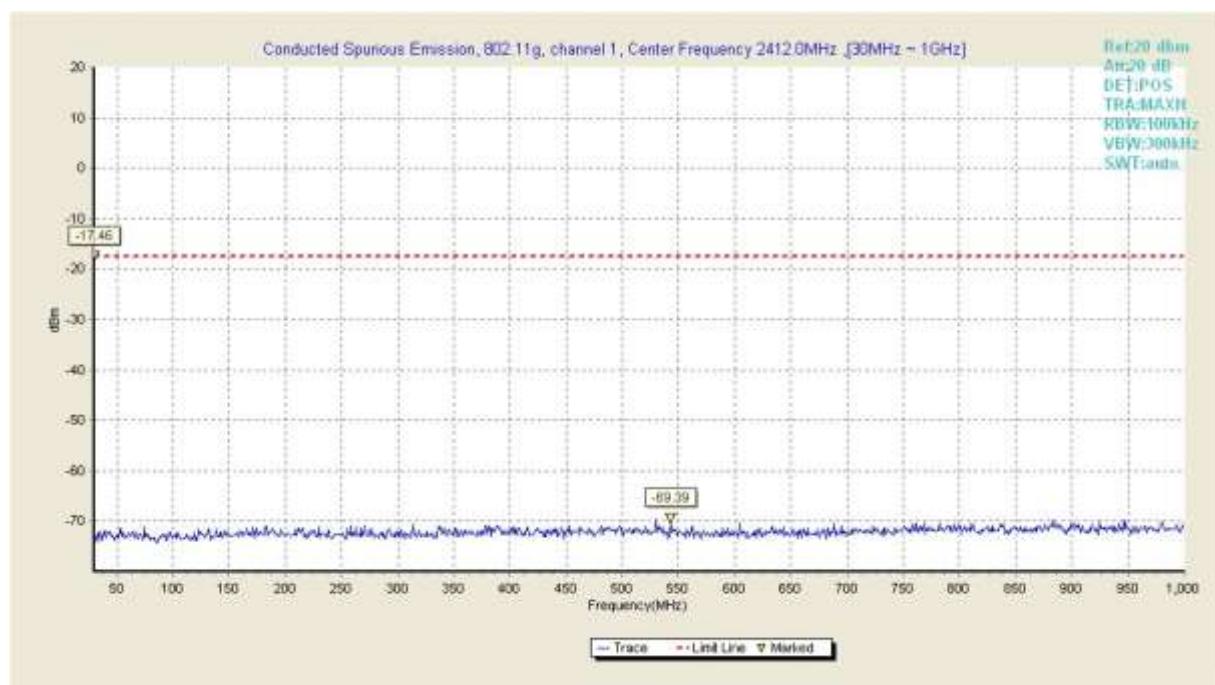


Fig54.Conducted Transmission Spurious Emission of 802.11g in channel 1, 30MHz~1GHz

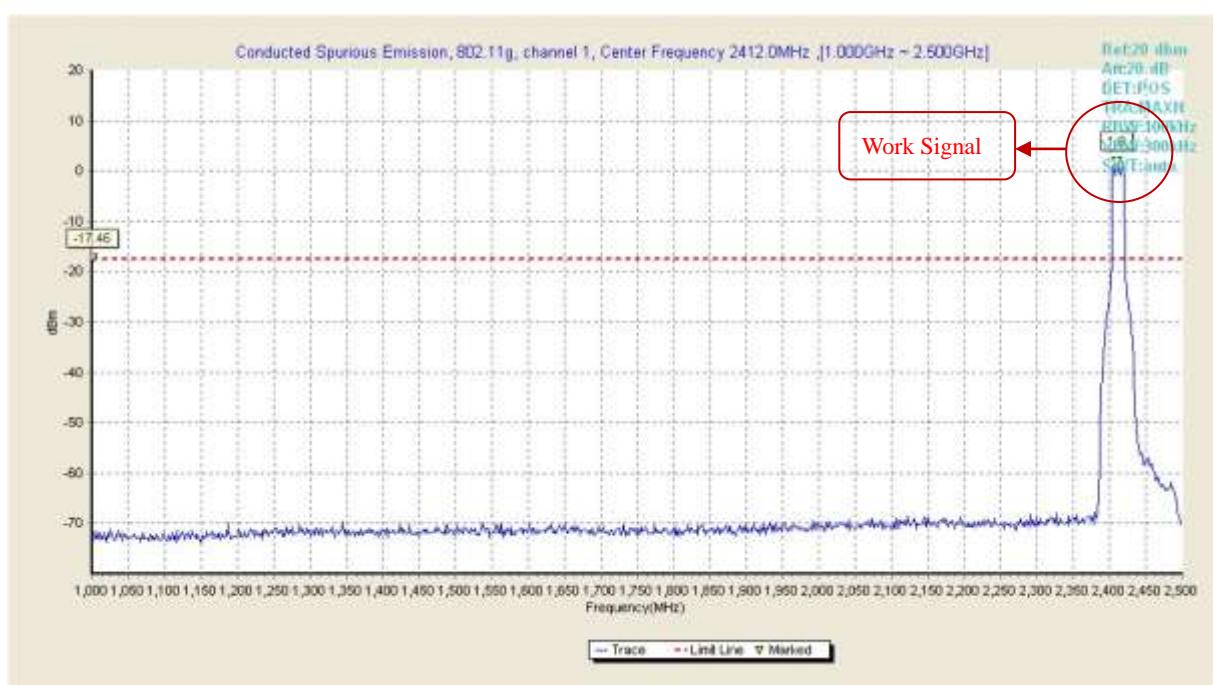


Fig55. Conducted Transmission Spurious Emission of 802.11g in channel 1, 1GHz ~ 2.5GHz

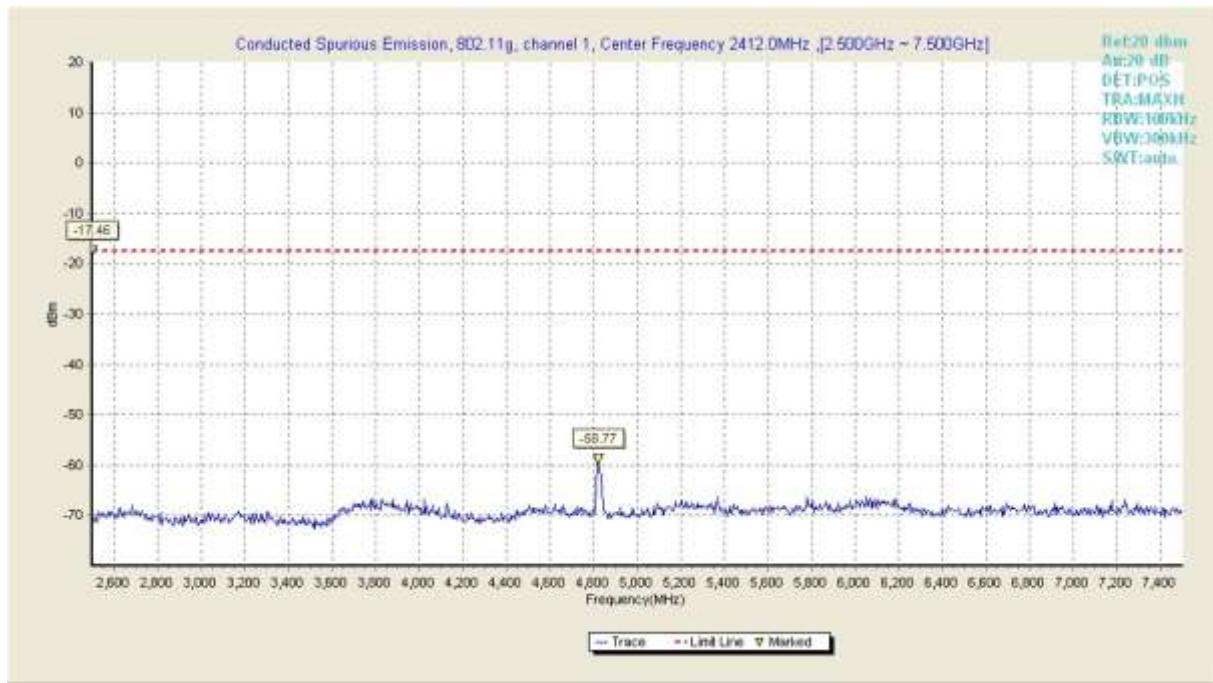


Fig56. Conducted Transmission Spurious Emission of 802.11g in channel 1, 2.5GHz ~ 7.5GHz

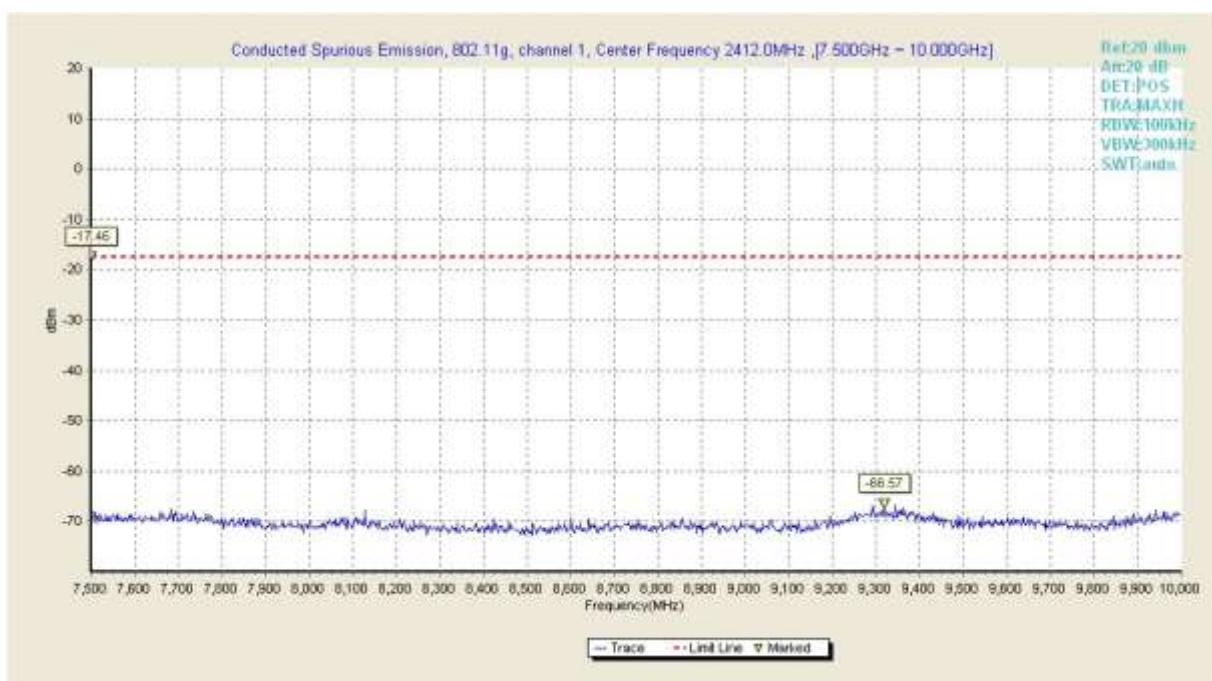


Fig57. Conducted Transmission Spurious Emission of 802.11g in channel 1, 7.5GHz ~ 10GHz

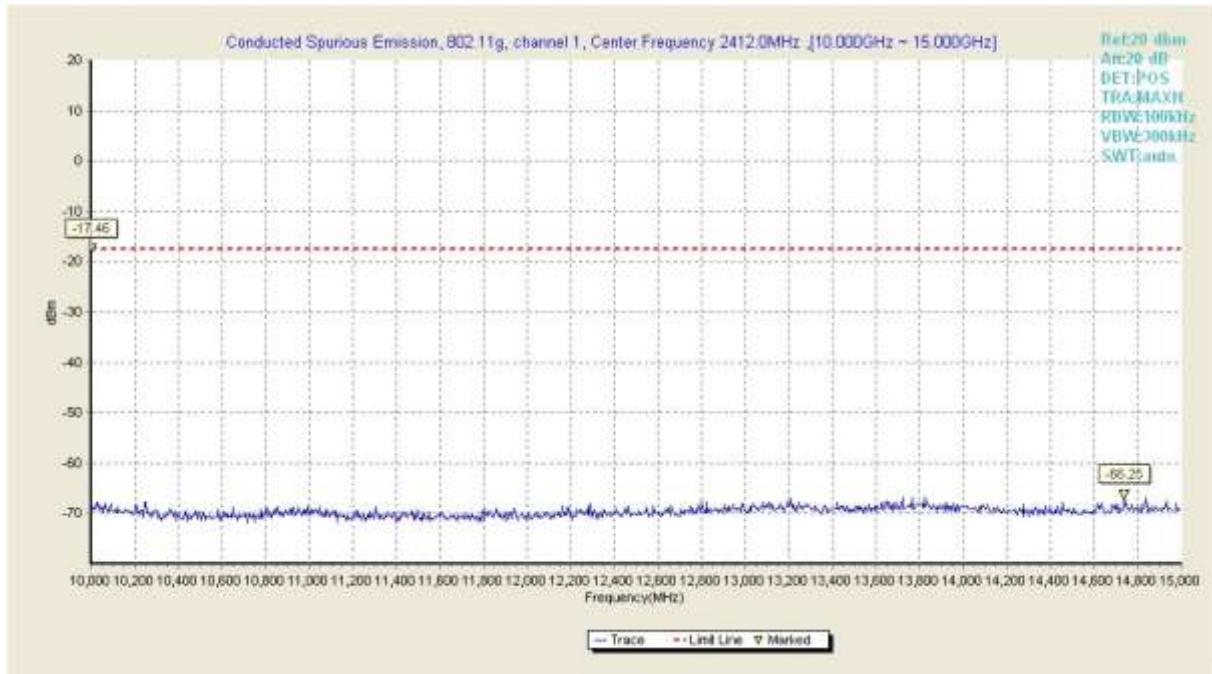


Fig58. Conducted Transmission Spurious Emission of 802.11g in channel 1, 10GHz ~ 15GHz

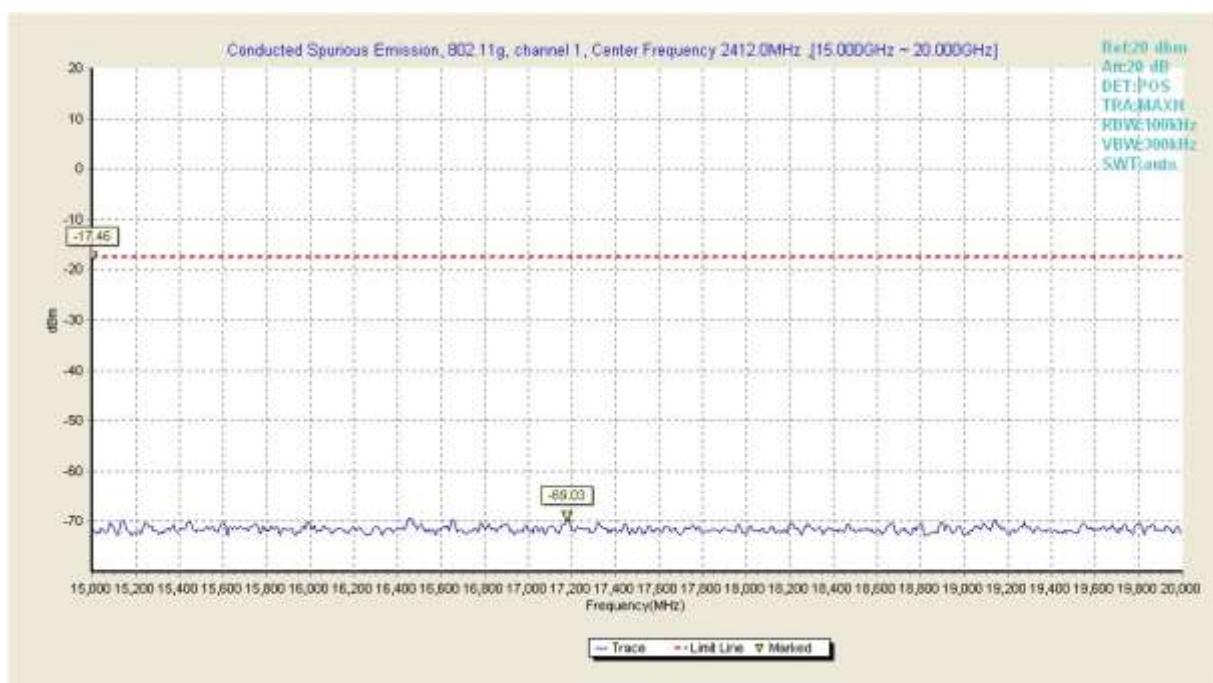


Fig59. Conducted Transmission Spurious Emission of 802.11g in channel 1, 15GHz ~ 20GHz

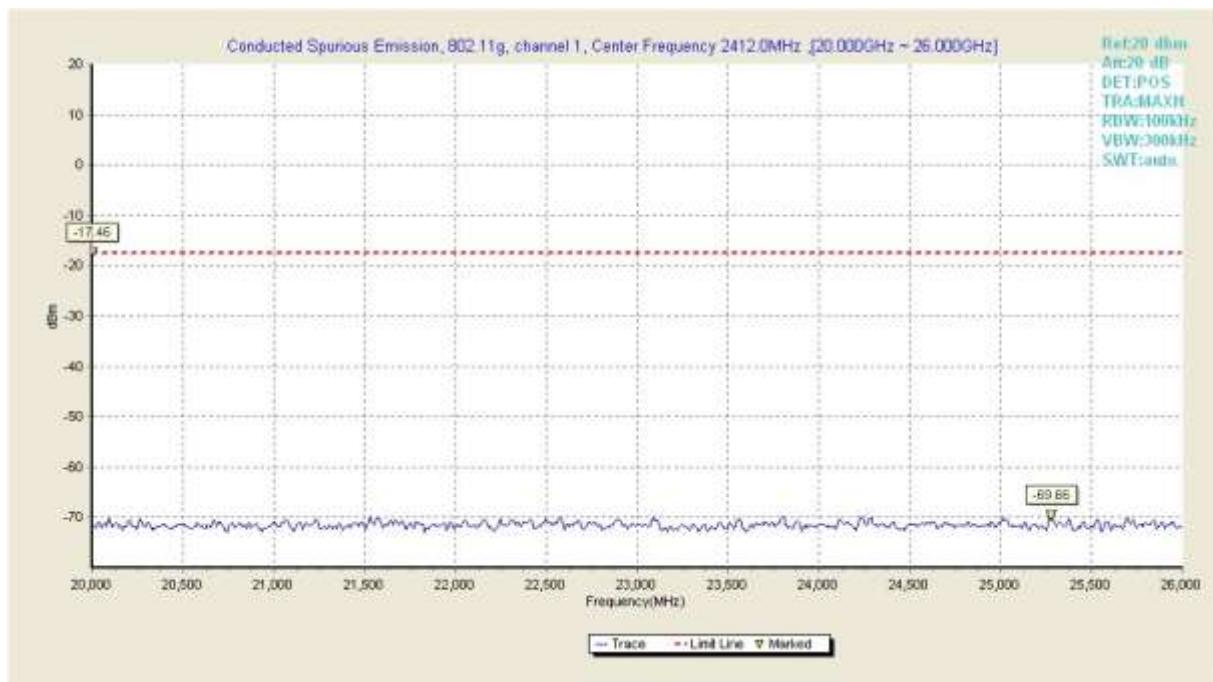


Fig60. Conducted Transmission Spurious Emission of 802.11g in channel 1, 20GHz ~ 26GHz

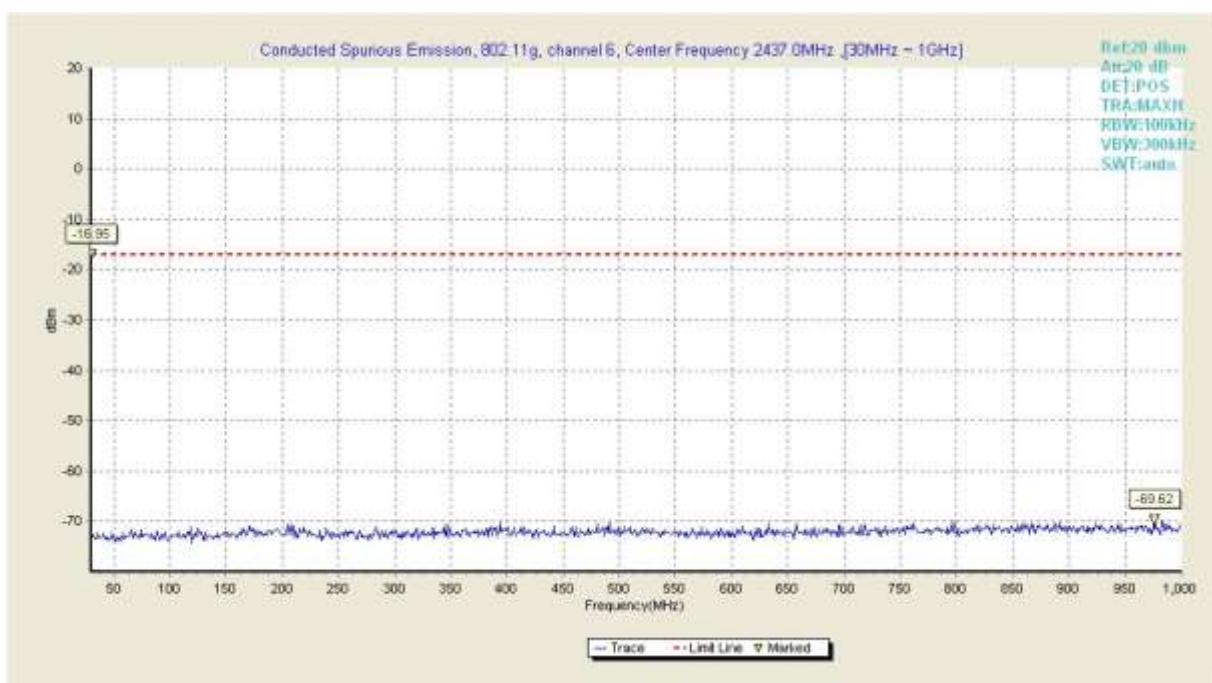


Fig61. Conducted Transmission Spurious Emission of 802.11g in channel 6, 30MHz~1GHz

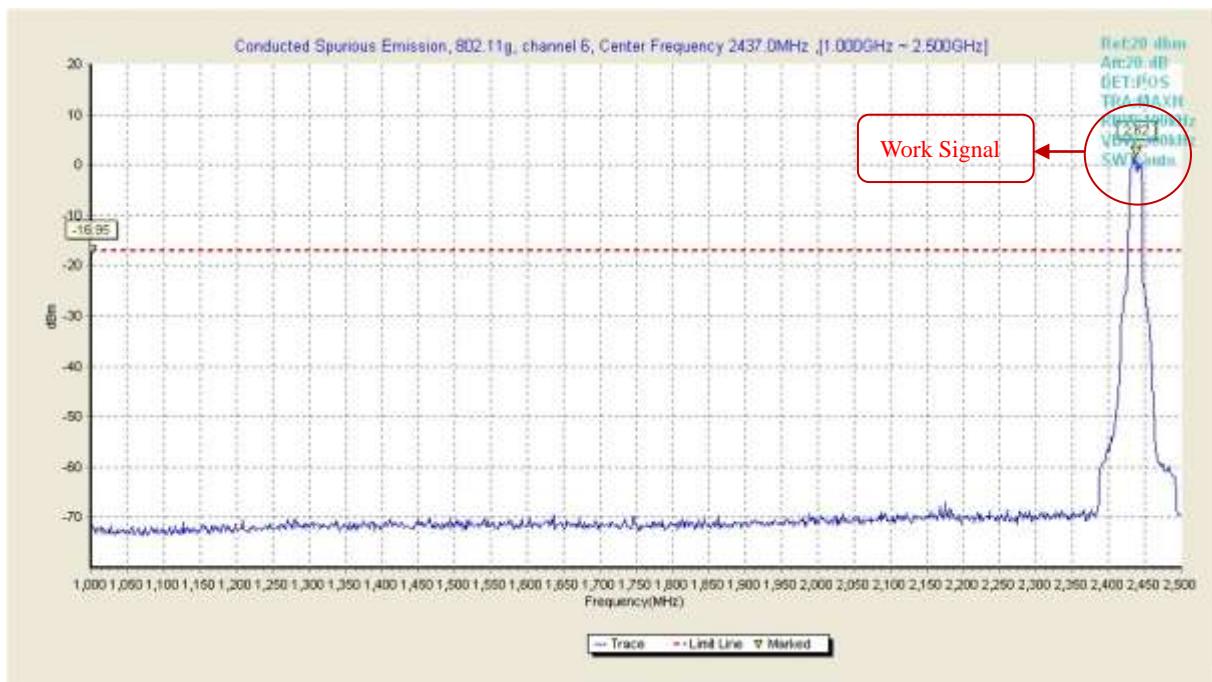


Fig62. Conducted Transmission Spurious Emission of 802.11g in channel 6, 1GHz ~ 2.5GHz

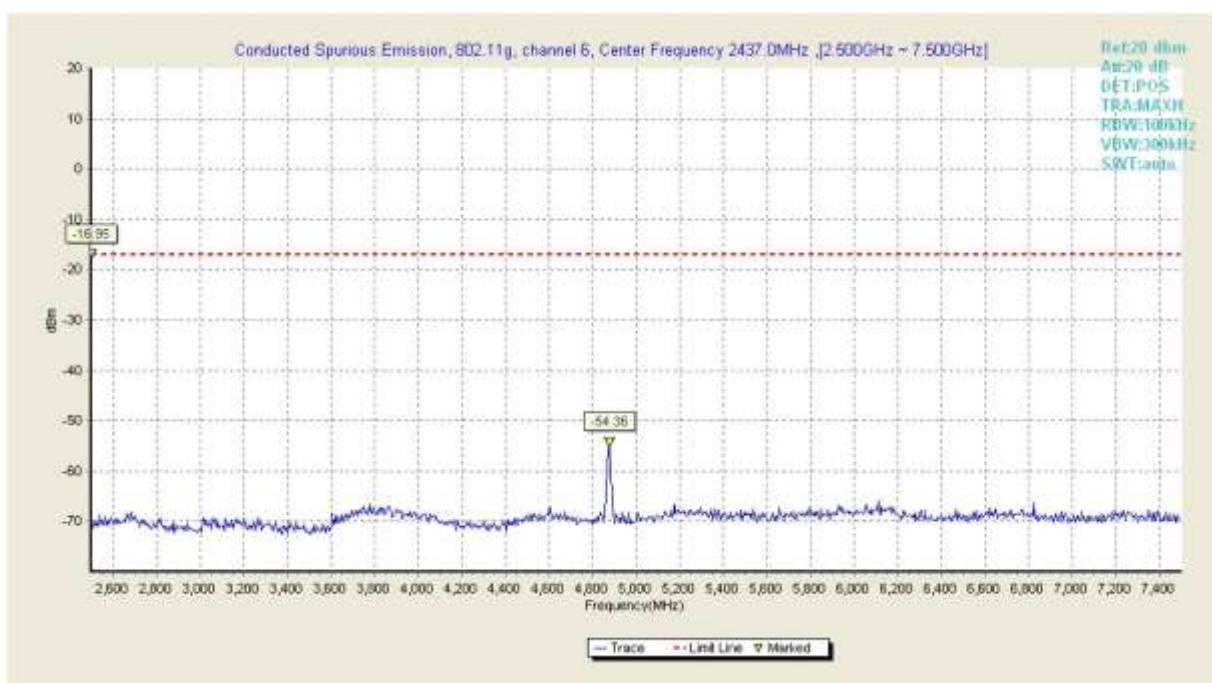


Fig63.Conducted Transmission Spurious Emission of 802.11g in channel 6, 2.5GHz ~ 7.5GHz

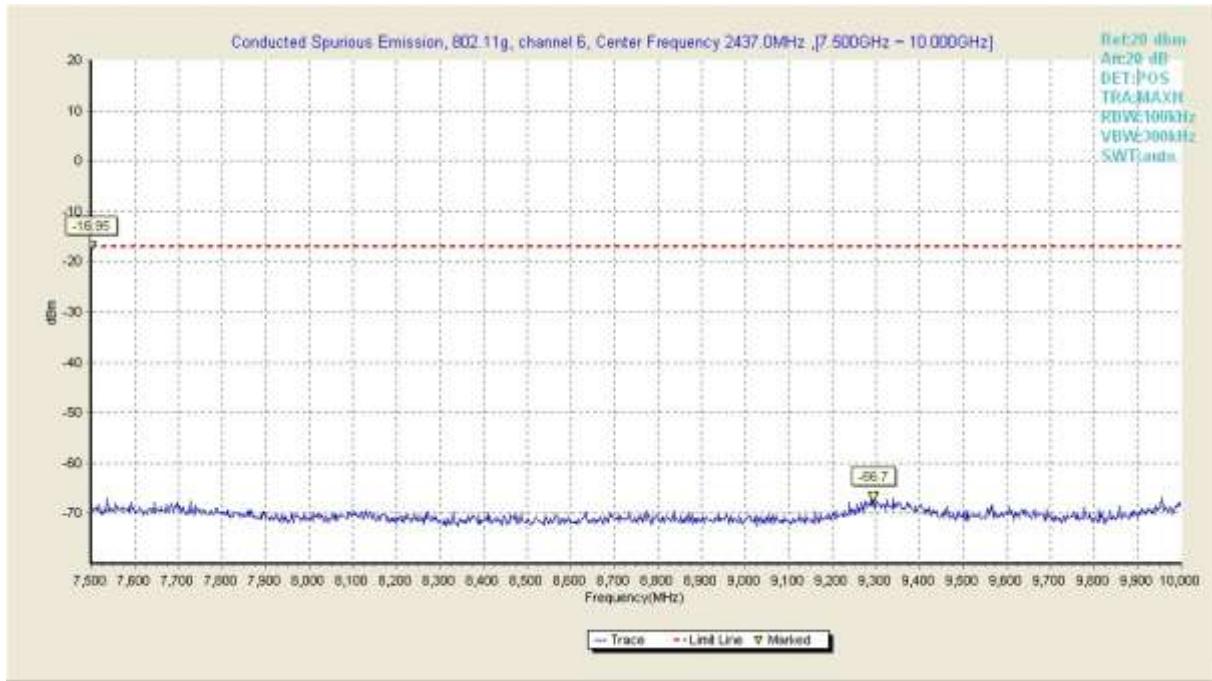
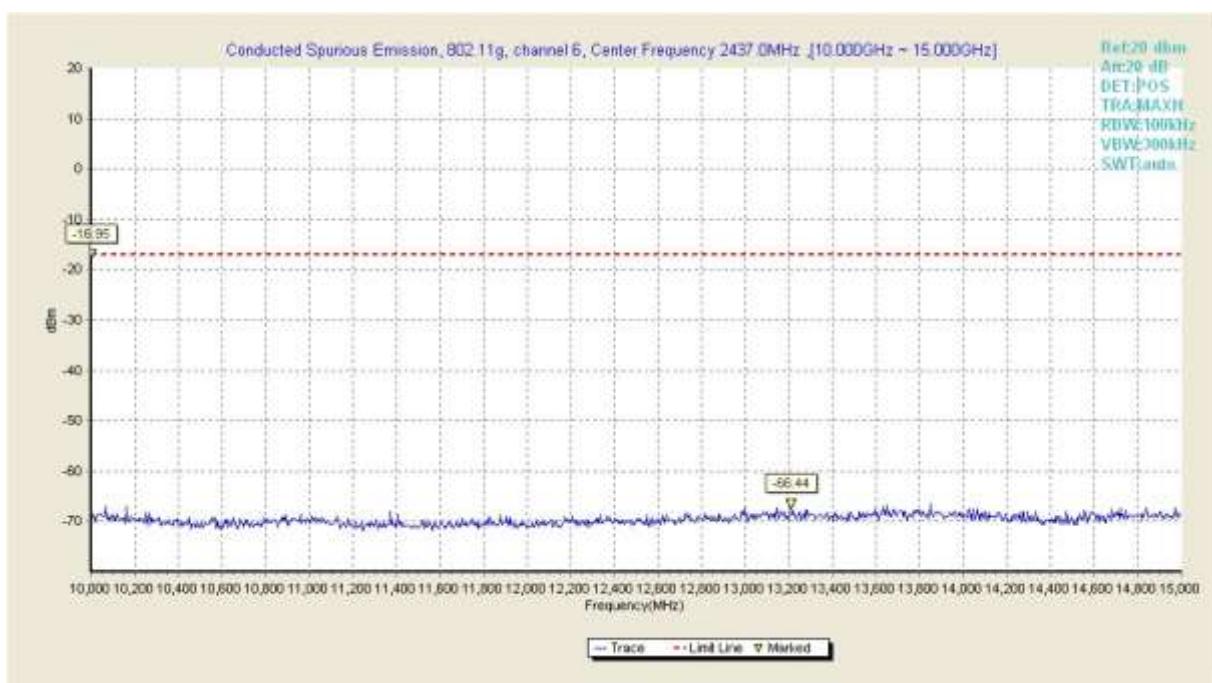
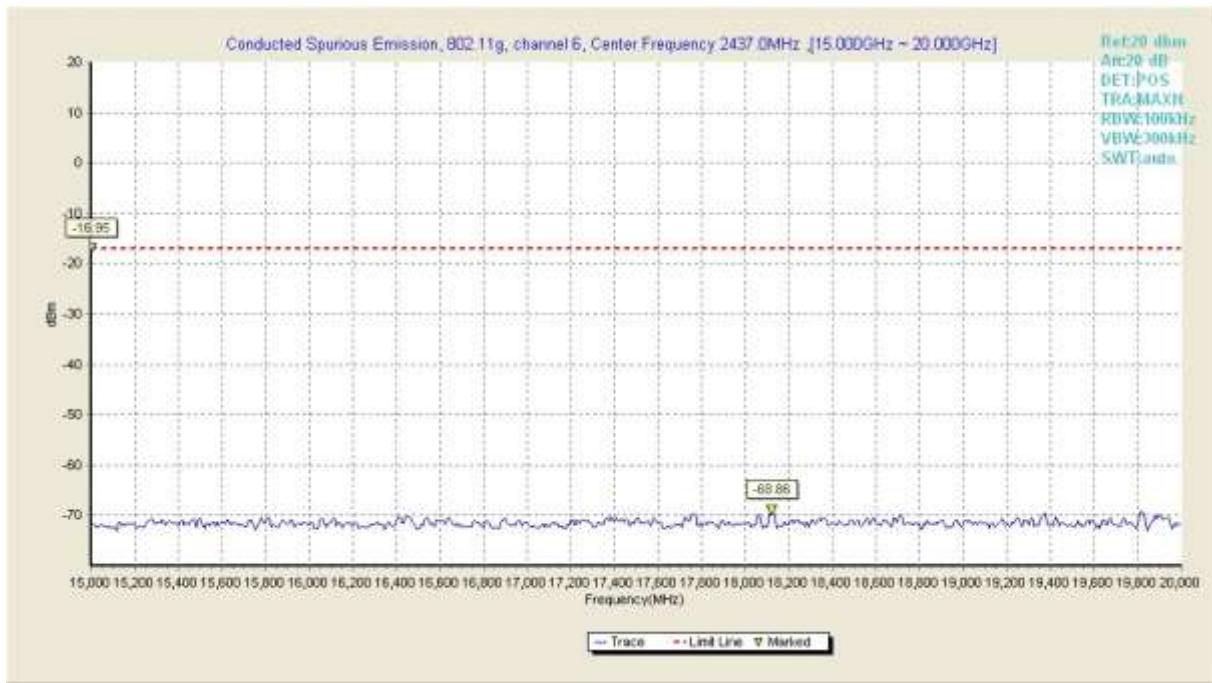


Fig64.Conducted Transmission Spurious Emission of 802.11g in channel 6, 7.5GHz ~ 10GHz



**Fig65.**Conducted Transmission Spurious Emission of 802.11g in channel 6, 10GHz ~ 15GHz



**Fig66.**Conducted Transmission Spurious Emission of 802.11g in channel 6, 15GHz ~ 20GHz

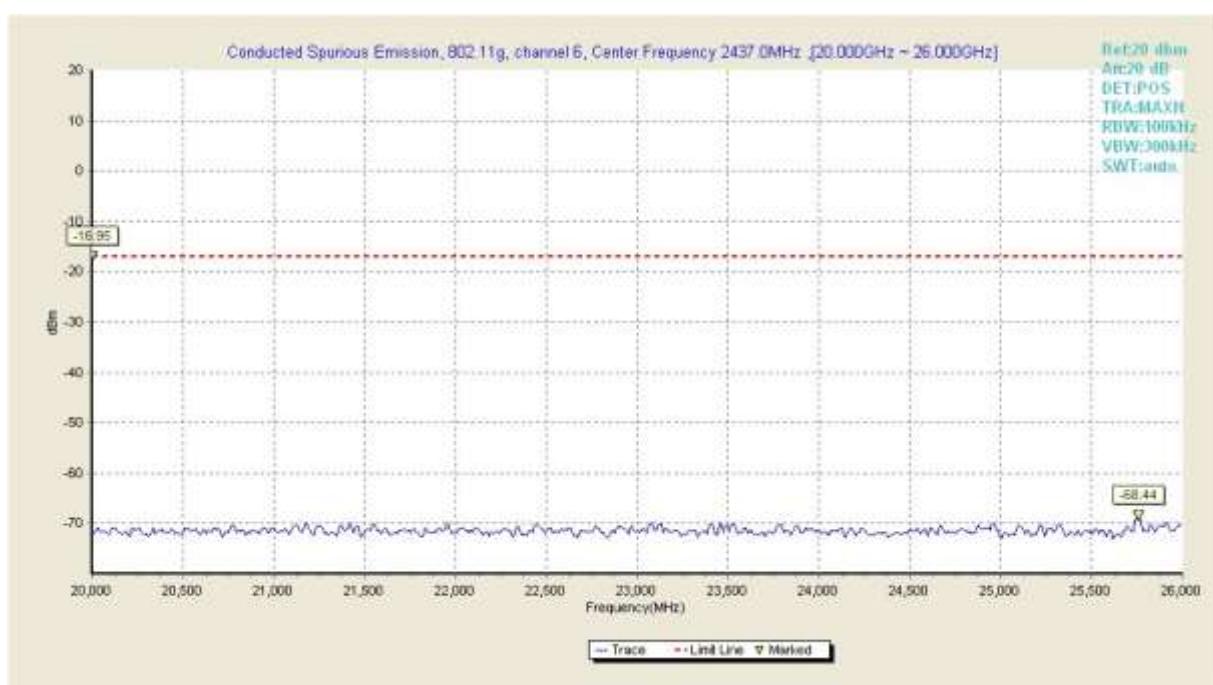


Fig67.Conducted Transmission Spurious Emission of 802.11g in channel 6, 20GHz ~ 26GHz

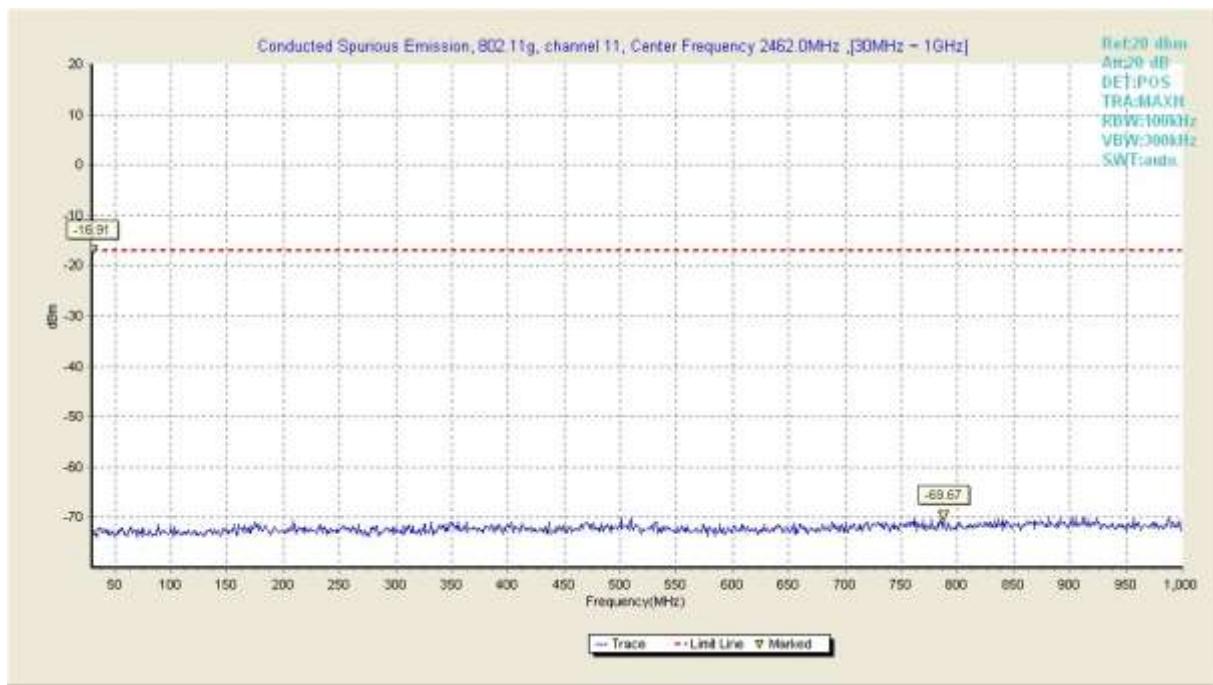
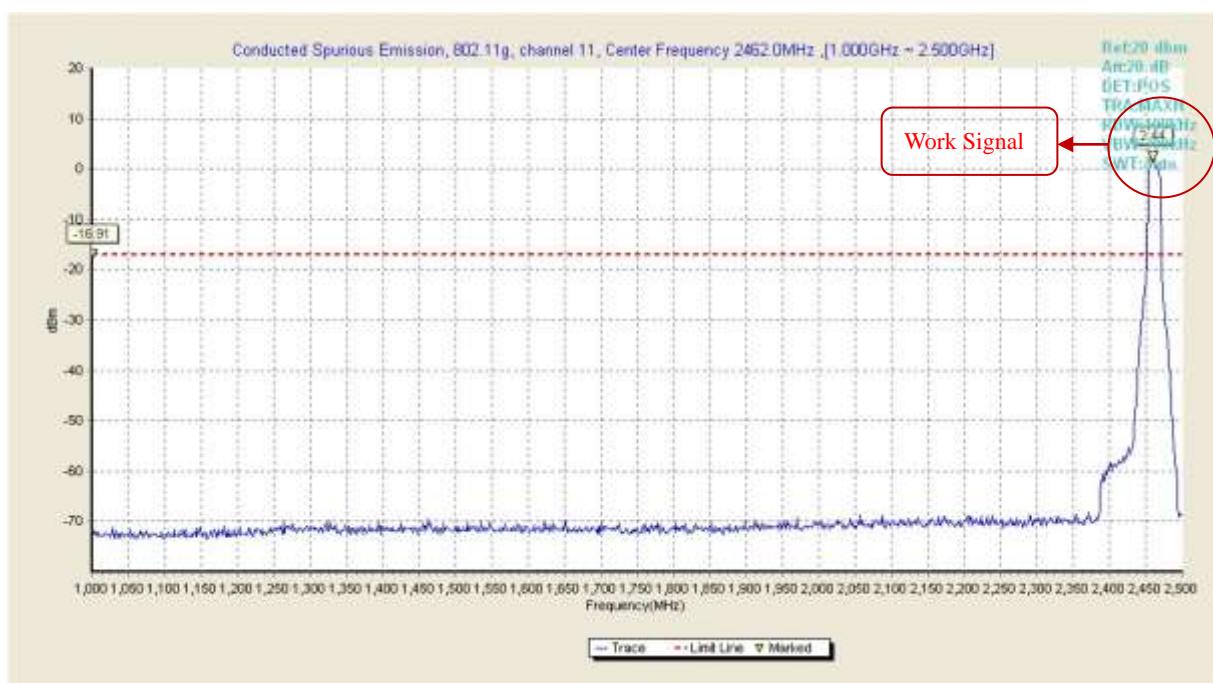
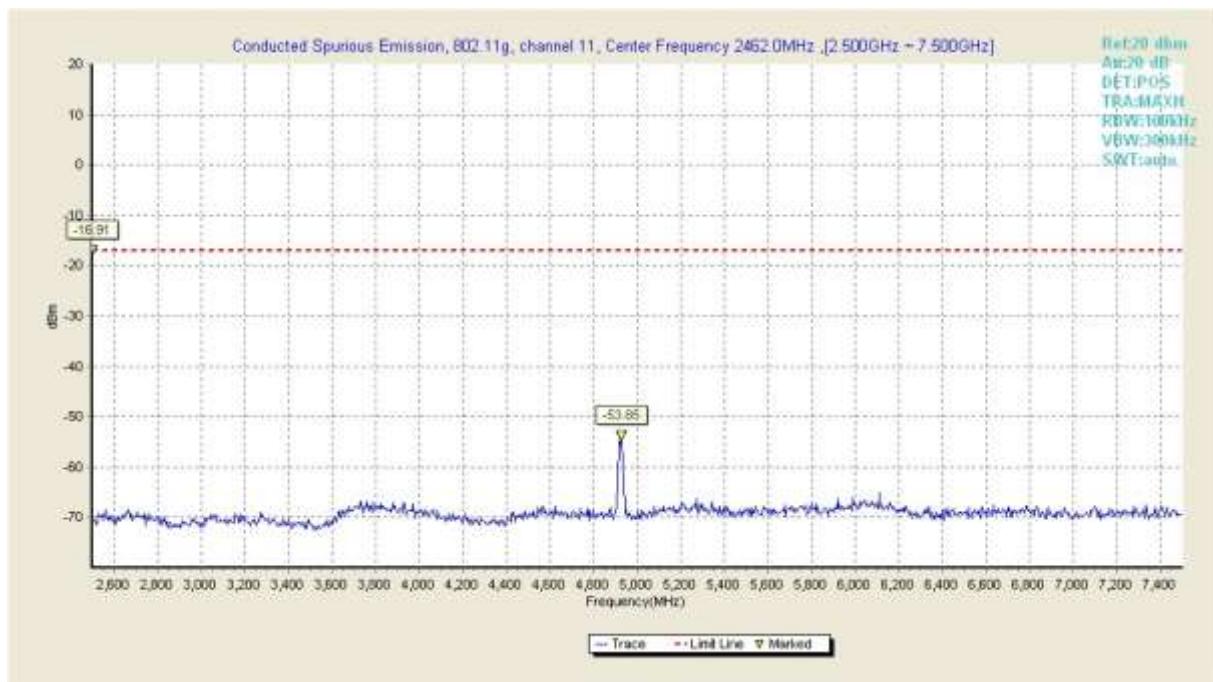


Fig68.Conducted Transmission Spurious Emission of 802.11g in channel 11, 30MHz~1GHz



**Fig69.**Conducted Transmission Spurious Emission of 802.11g in channel 11, 1GHz ~ 2.5GHz



**Fig70.**Conducted Transmission Spurious Emission of 802.11g in channel 11, 2.5GHz ~ 7.5GHz

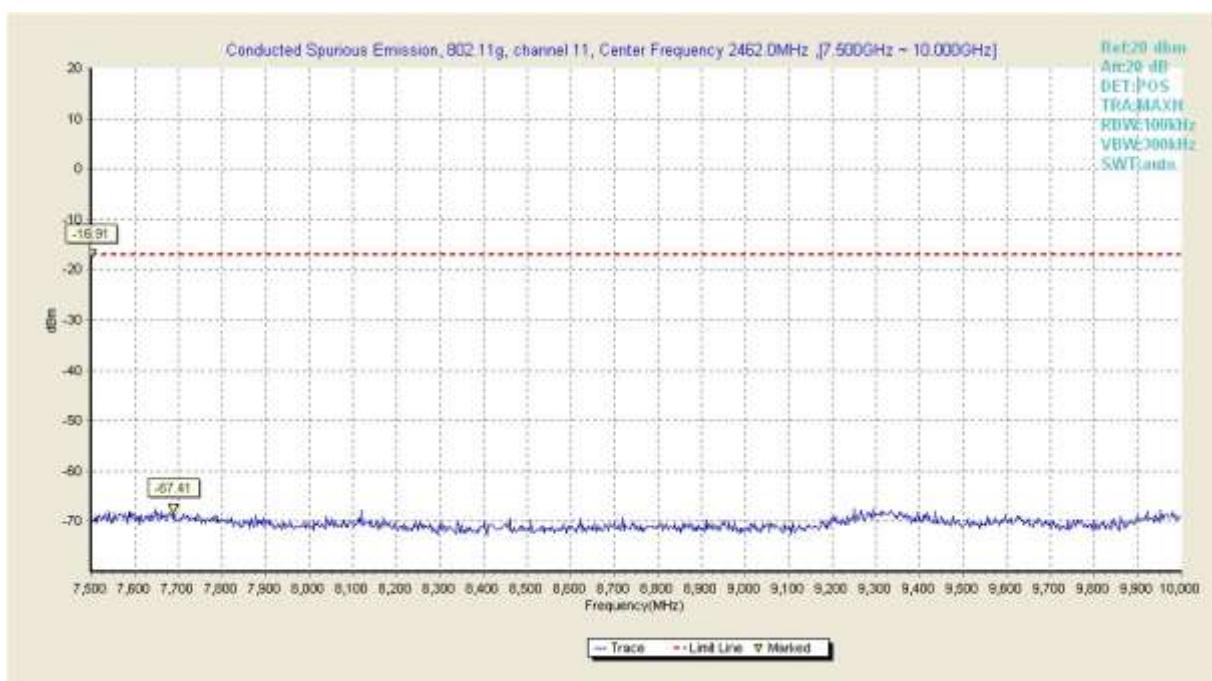


Fig71. Conducted Transmission Spurious Emission of 802.11g in channel 11, 7.5GHz ~ 10GHz

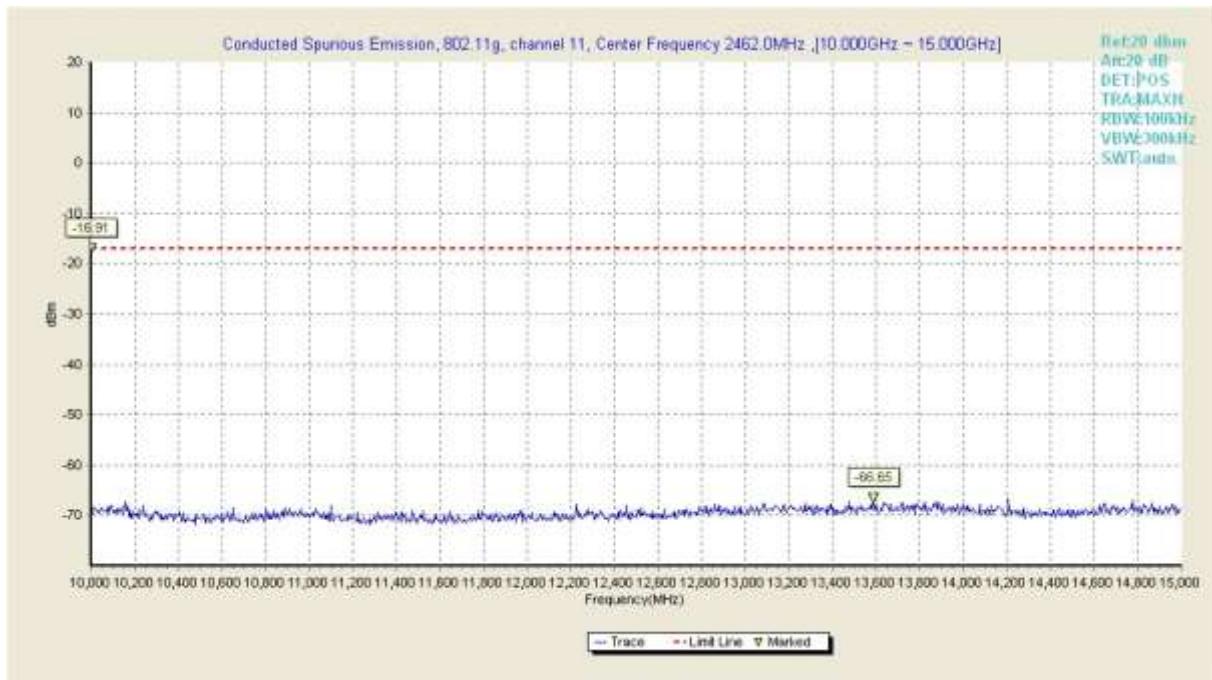


Fig72. Conducted Transmission Spurious Emission of 802.11g in channel 11, 10GHz ~ 15GHz

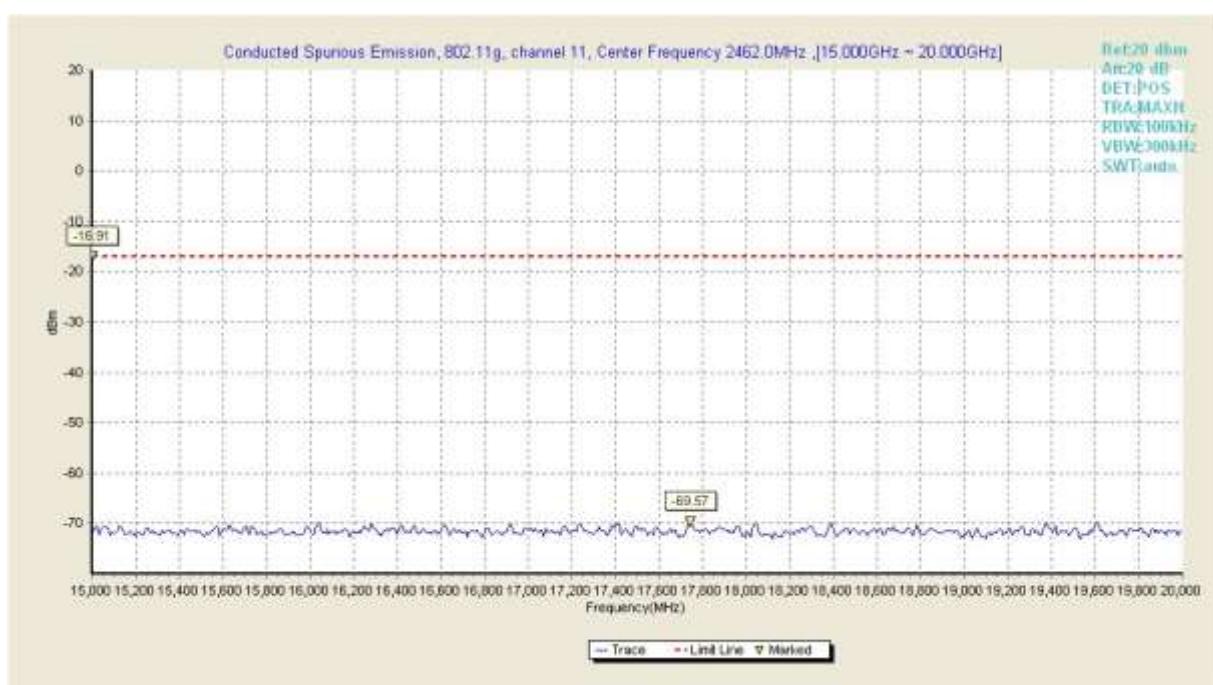


Fig73. Conducted Transmission Spurious Emission of 802.11g in channel 11, 15GHz ~ 20GHz

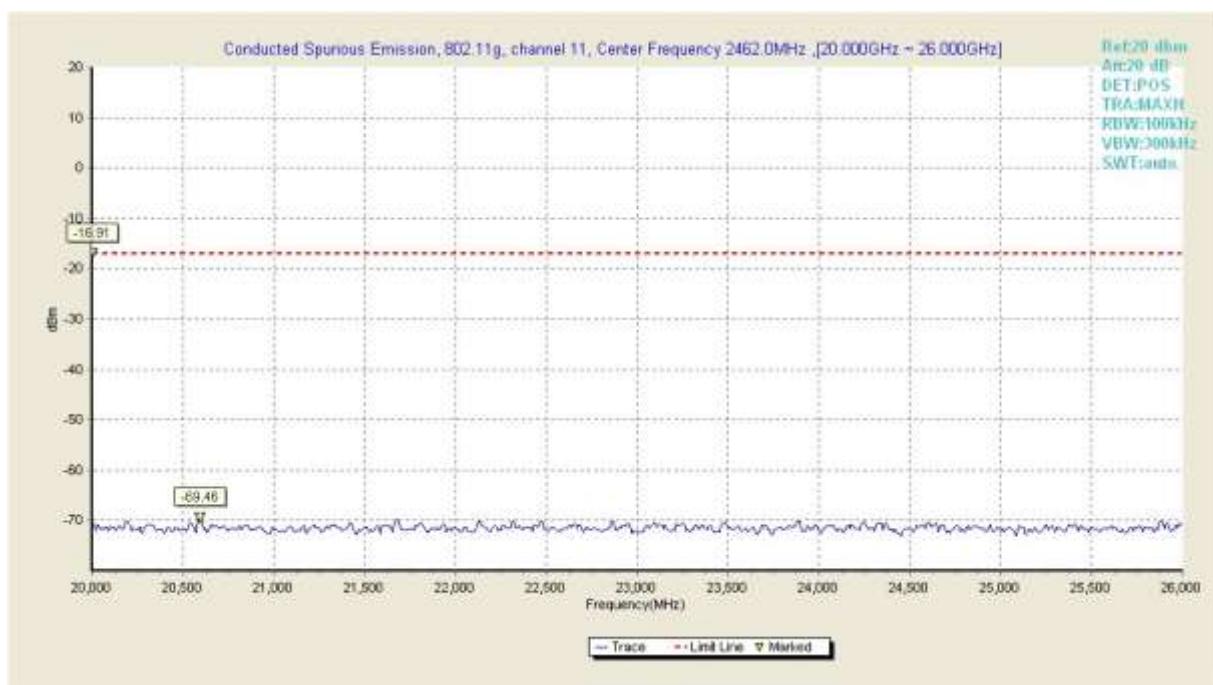


Fig74. Conducted Transmission Spurious Emission of 802.11g in channel 11, 20GHz ~ 26GHz

## 802.11n-20 mode

Channel	Frequency Range	Test Results	Verdict
1	30MHz ~ 1GHz	Fig.75	Pass
	1GHz ~ 2.5GHz	Fig.76	Pass
	2.5GHz ~ 7.5GHz	Fig.77	Pass
	7.5GHz ~ 10GHz	Fig.78	Pass
	10GHz ~ 15GHz	Fig.79	Pass
	15GHz ~ 20GHz	Fig.80	Pass
	20GHz ~ 26GHz	Fig.81	Pass
6	30MHz ~ 1GHz	Fig.82	Pass
	1GHz ~ 2.5GHz	Fig.83	Pass
	2.5GHz ~ 7.5GHz	Fig.84	Pass
	7.5GHz ~ 10GHz	Fig.85	Pass
	10GHz ~ 15GHz	Fig.86	Pass
	15GHz ~ 20GHz	Fig.87	Pass
	20GHz ~ 26GHz	Fig.88	Pass
11	30MHz ~ 1GHz	Fig.89	Pass
	1GHz ~ 2.5GHz	Fig.90	Pass
	2.5GHz ~ 7.5GHz	Fig.91	Pass
	7.5GHz ~ 10GHz	Fig.92	Pass
	10GHz ~ 15GHz	Fig.93	Pass
	15GHz ~ 20GHz	Fig.94	Pass
	20GHz ~ 26GHz	Fig.9	Pass

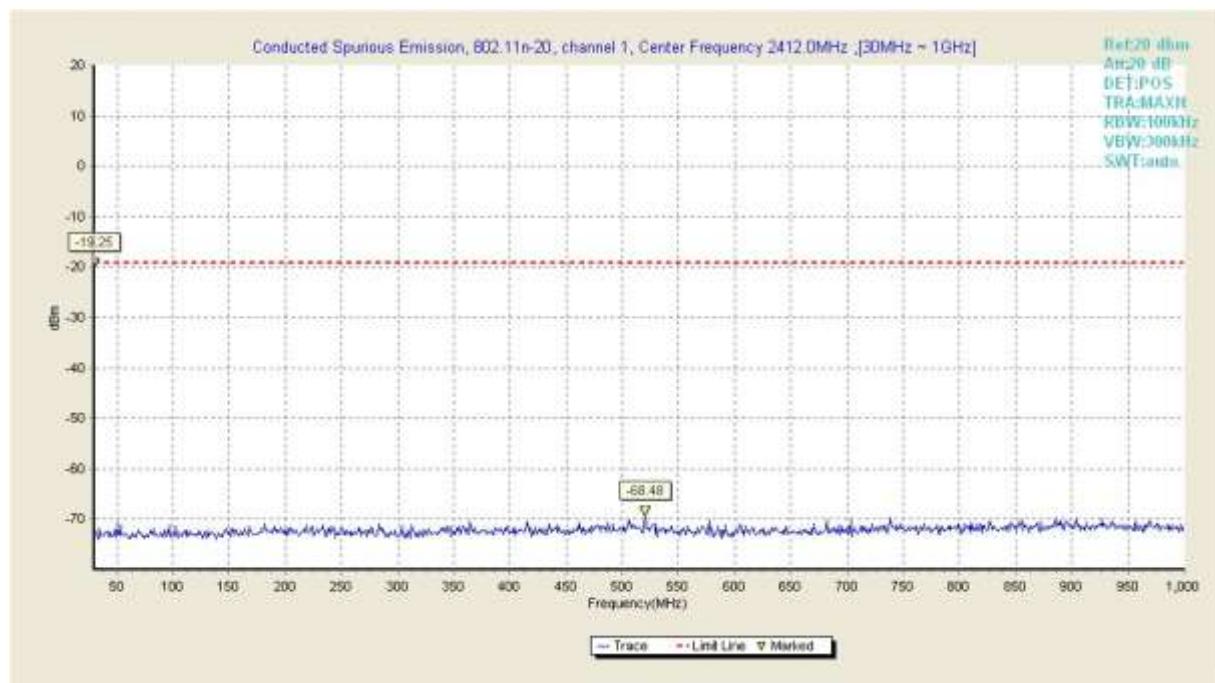


Fig75.Conducted Transmission Spurious Emission of 802.11n-20 in channel 1, 30MHz~1GHz

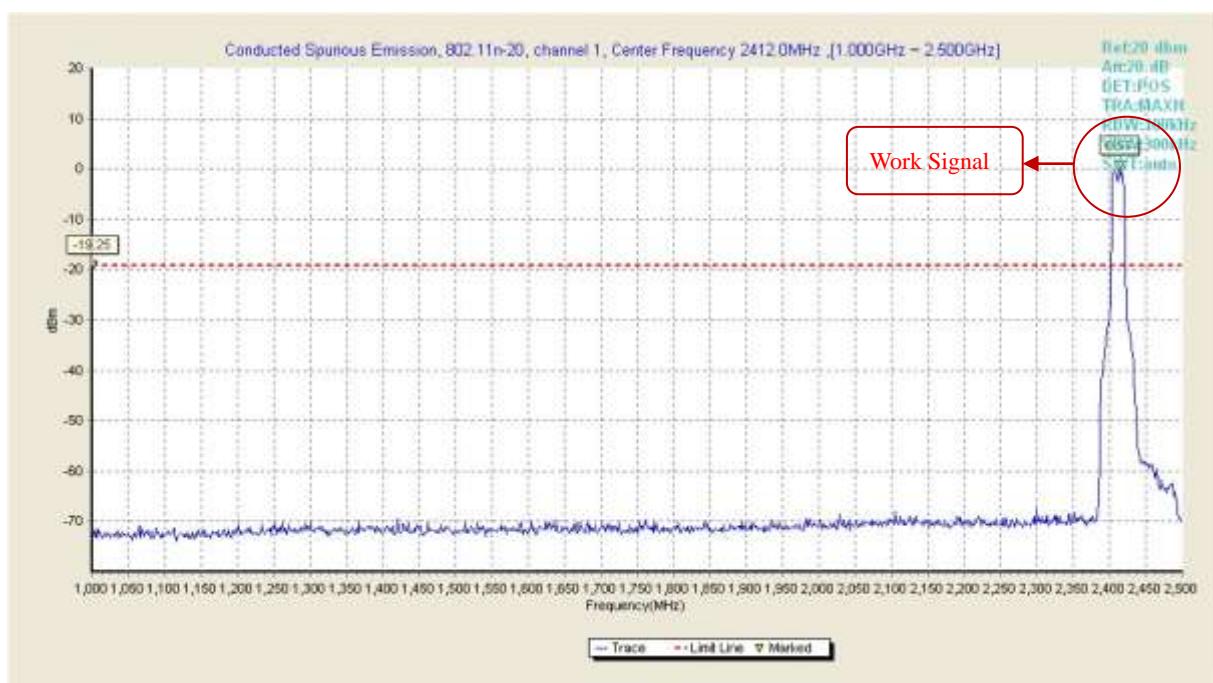


Fig76.Conducted Transmission Spurious Emission of 802.11n-20 in channel 1, 1GHz ~ 2.5GHz

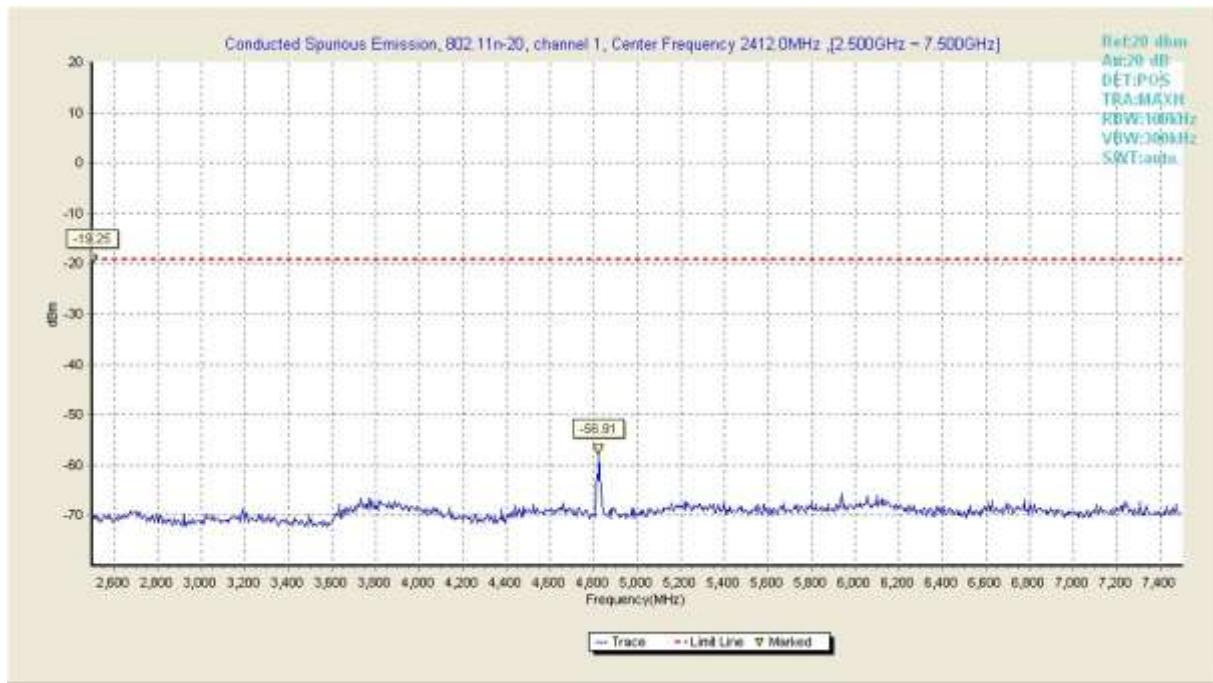


Fig77.Conducted Transmission Spurious Emission of 802.11n-20in channel 1, 2.5GHz ~ 7.5GHz

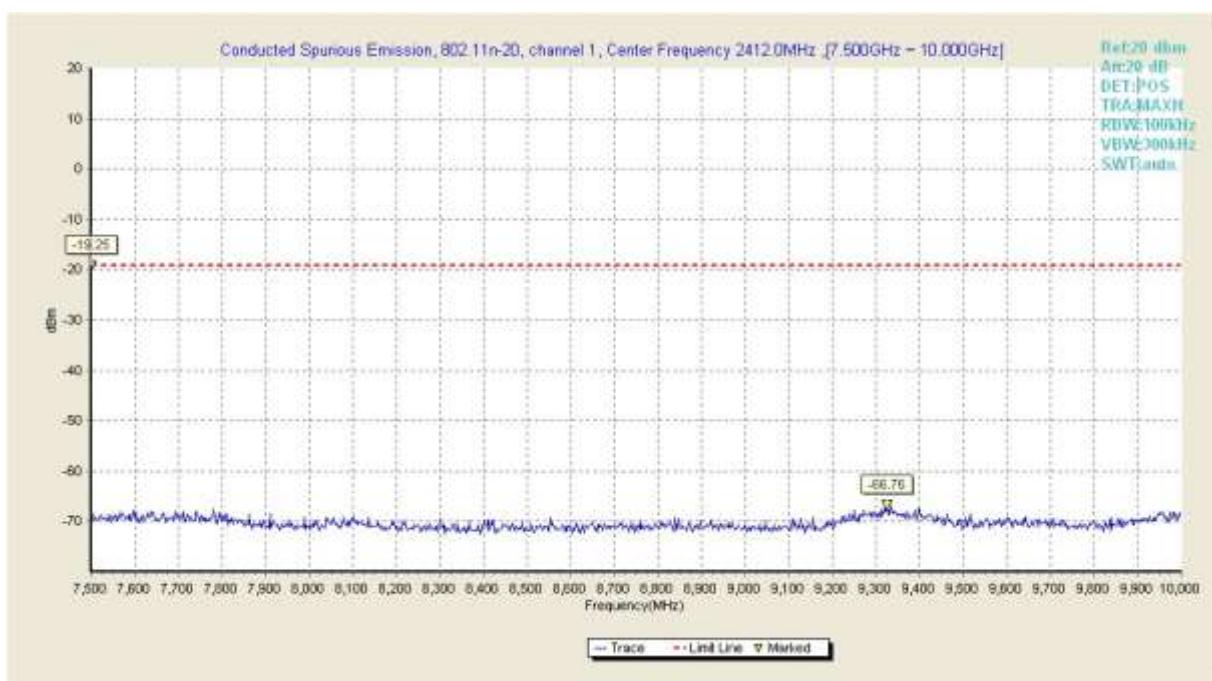


Fig78.Conducted Transmission Spurious Emission of 802.11n-20 in channel 1, 7.5GHz ~ 10GHz

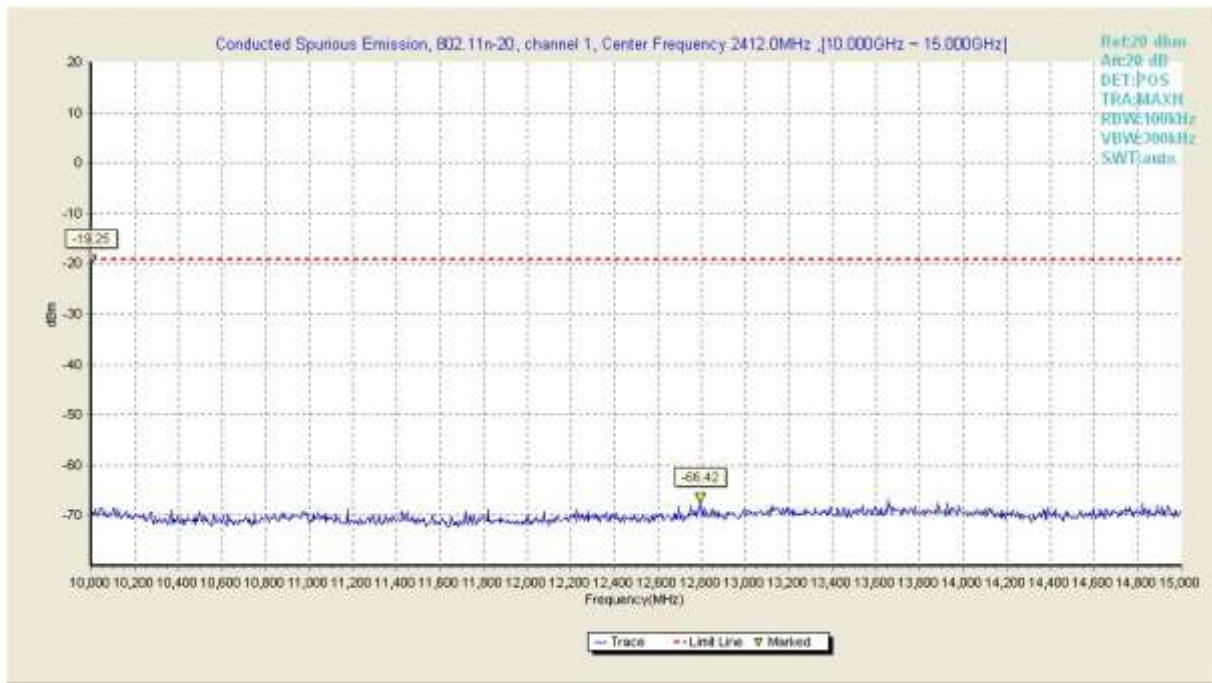


Fig79.Conducted Transmission Spurious Emission of 802.11n-20 in channel 1, 10GHz ~ 15GHz

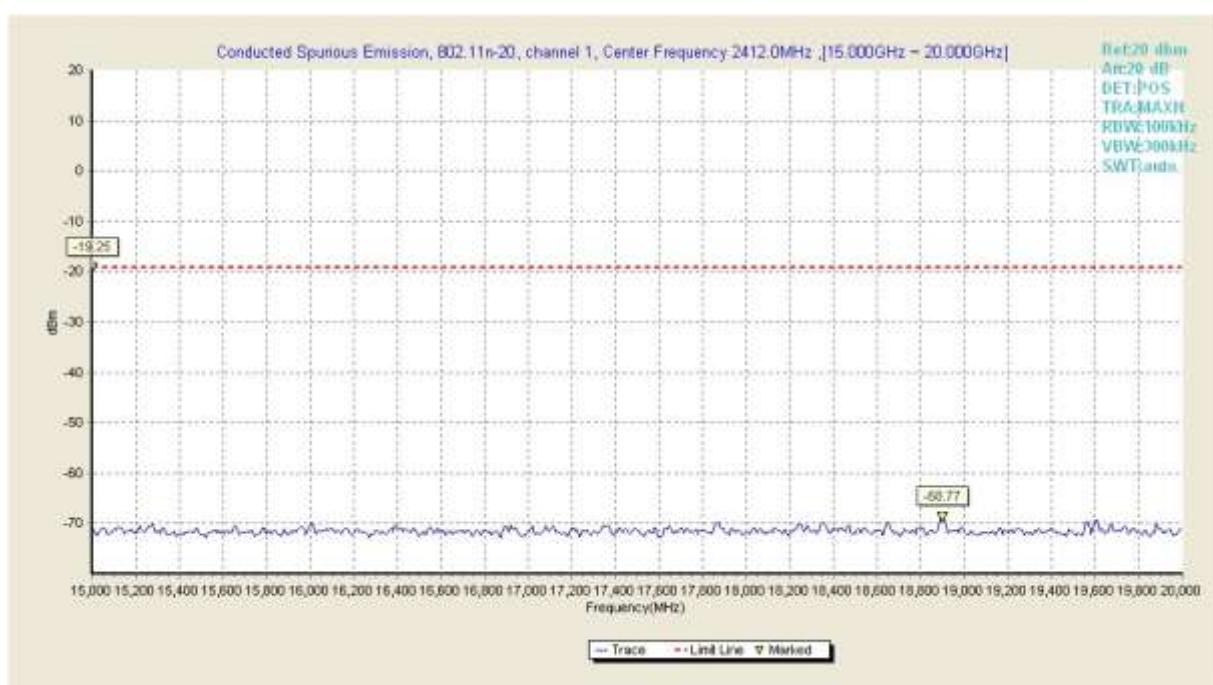


Fig80. Conducted Transmission Spurious Emission of 802.11n-20 in channel 1, 15GHz ~ 20GHz

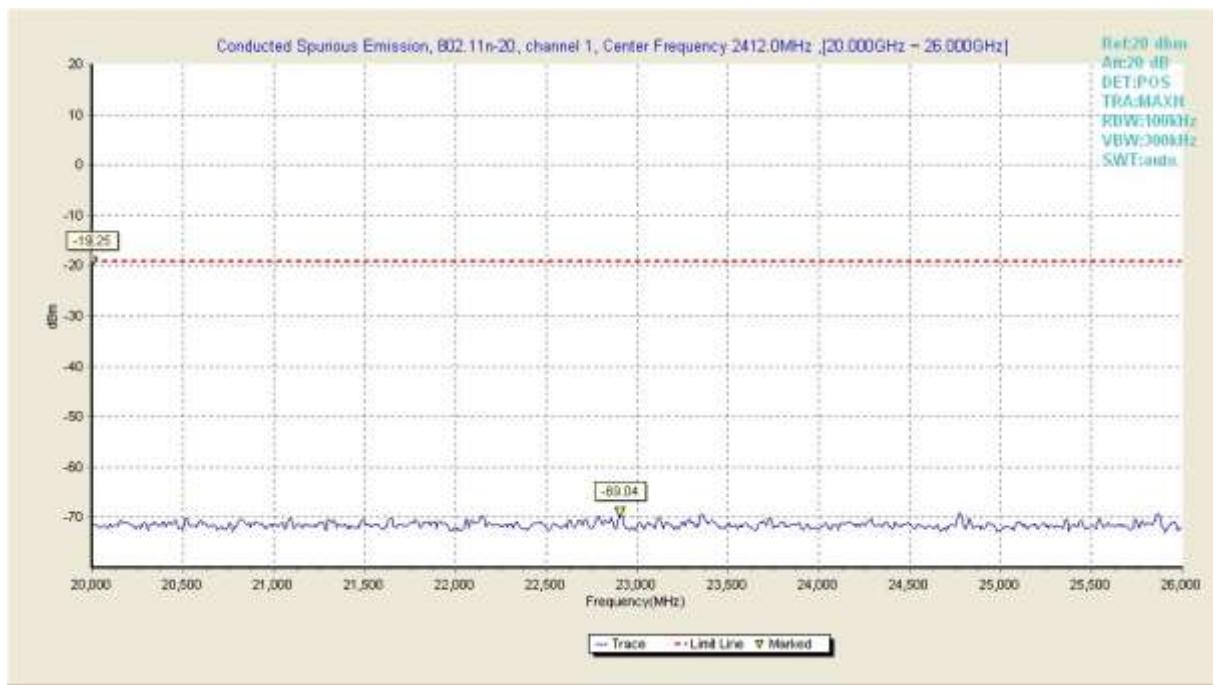


Fig81. Conducted Transmission Spurious Emission of 802.11n-20 in channel 1, 20GHz ~ 26GHz

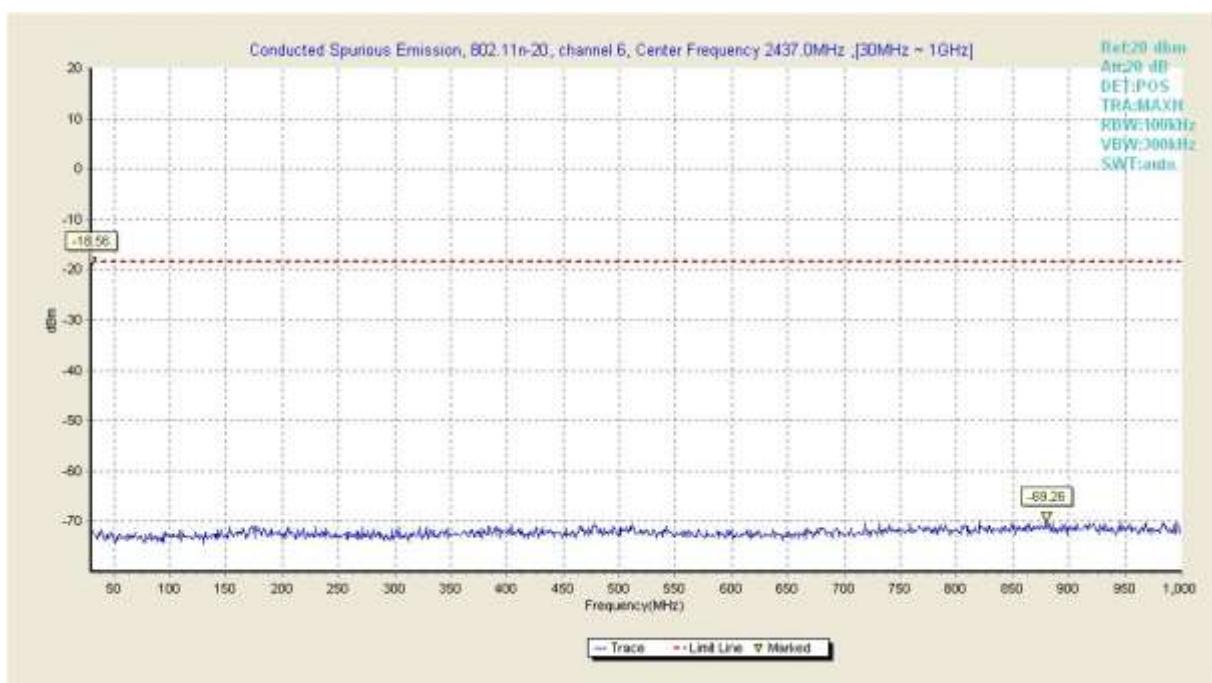


Fig82. Conducted Transmission Spurious Emission of 802.11n-20 in channel 6, 30MHz~1GHz

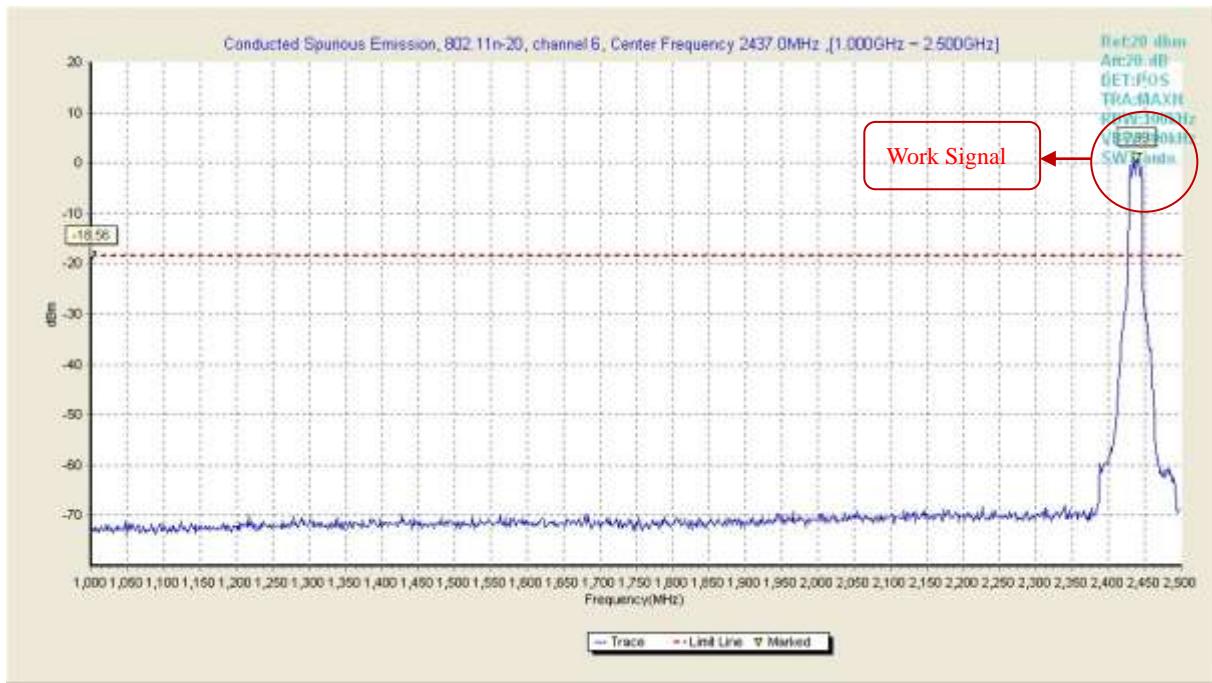


Fig83. Conducted Transmission Spurious Emission of 802.11n-20 in channel 6, 1GHz ~ 2.5GHz

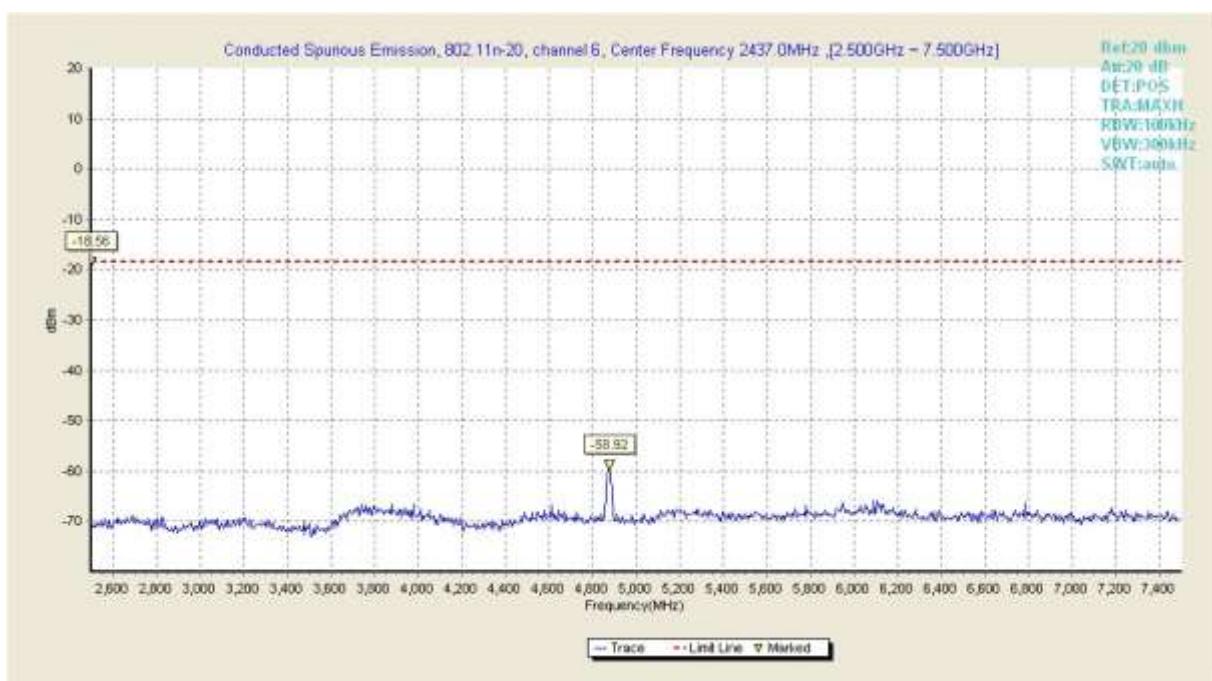


Fig84.Conducted Transmission Spurious Emission of 802.11n-20 in channel 6, 2.5GHz ~ 7.5GHz

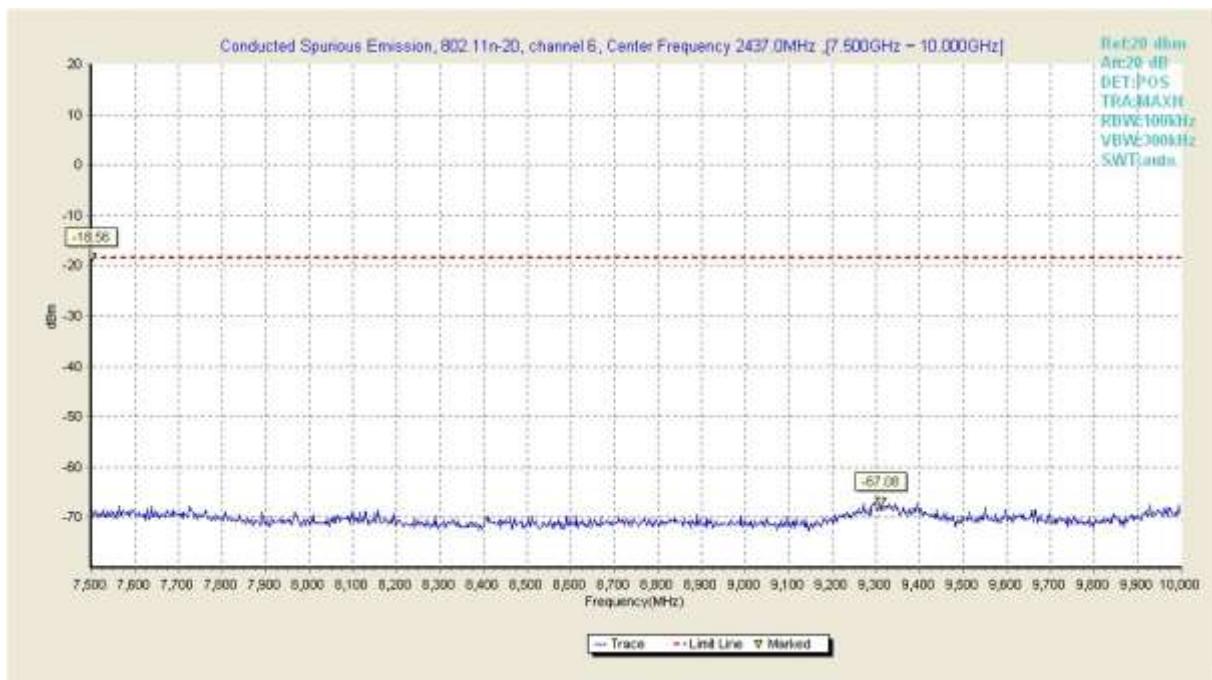


Fig85.Conducted Transmission Spurious Emission of 802.11n-20 in channel 6, 7.5GHz ~ 10GHz

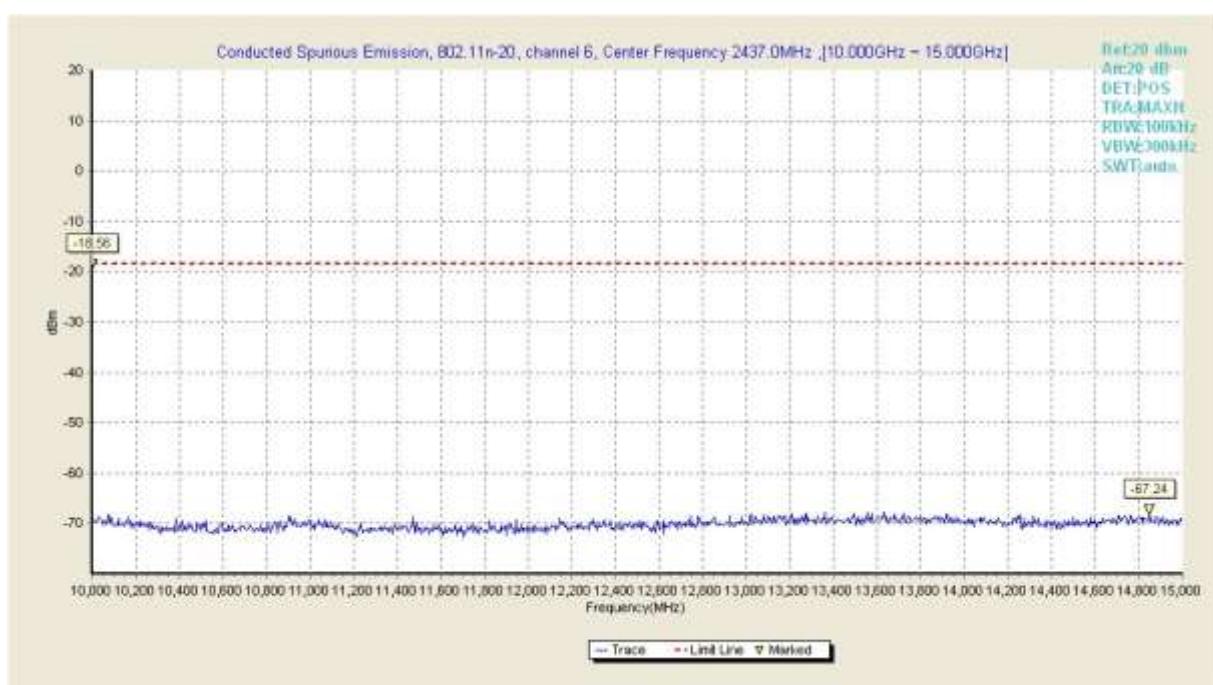


Fig86.Conducted Transmission Spurious Emission of 802.11n-20 in channel 6, 10GHz ~ 15GHz

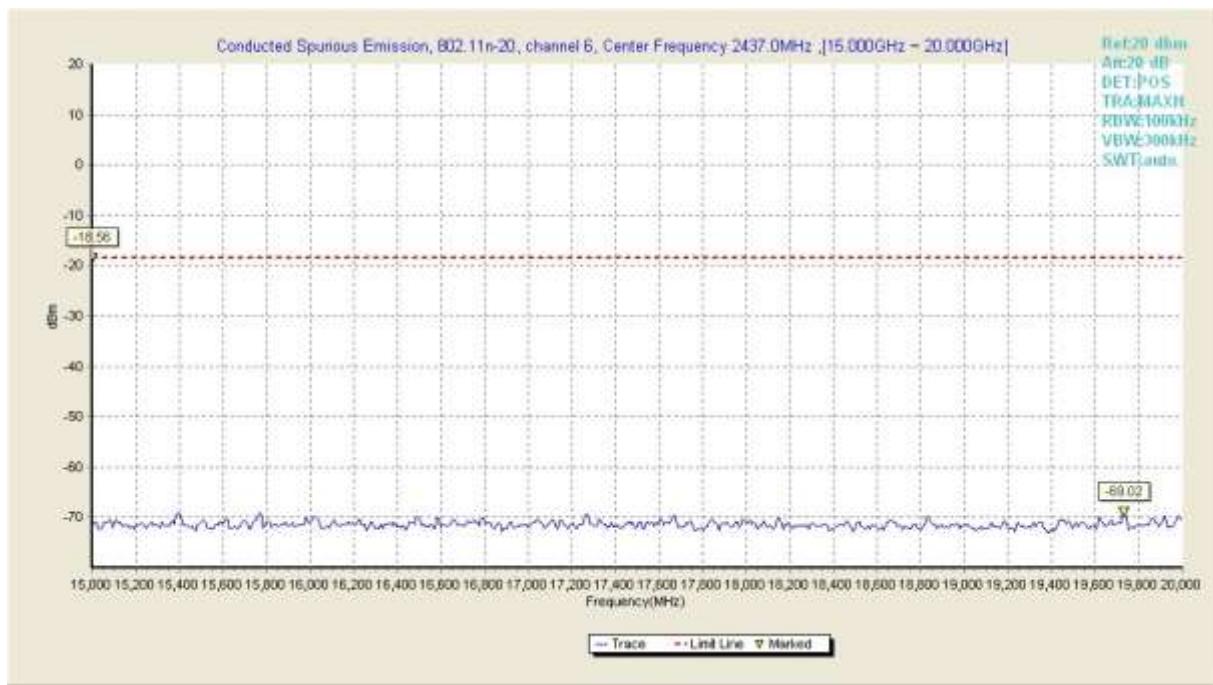


Fig87.Conducted Transmission Spurious Emission of 802.11n-20 in channel 6, 15GHz ~ 20GHz

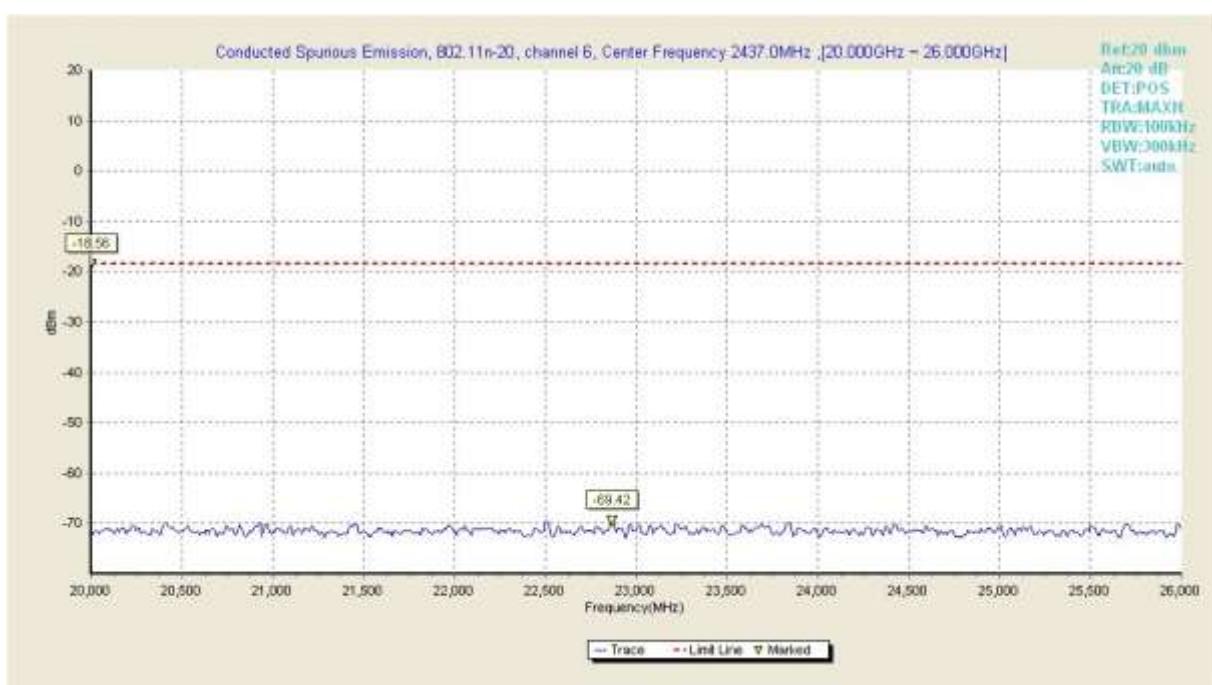


Fig88.Conducted Transmission Spurious Emission of 802.11n-20 in channel 6, 20GHz ~ 26GHz

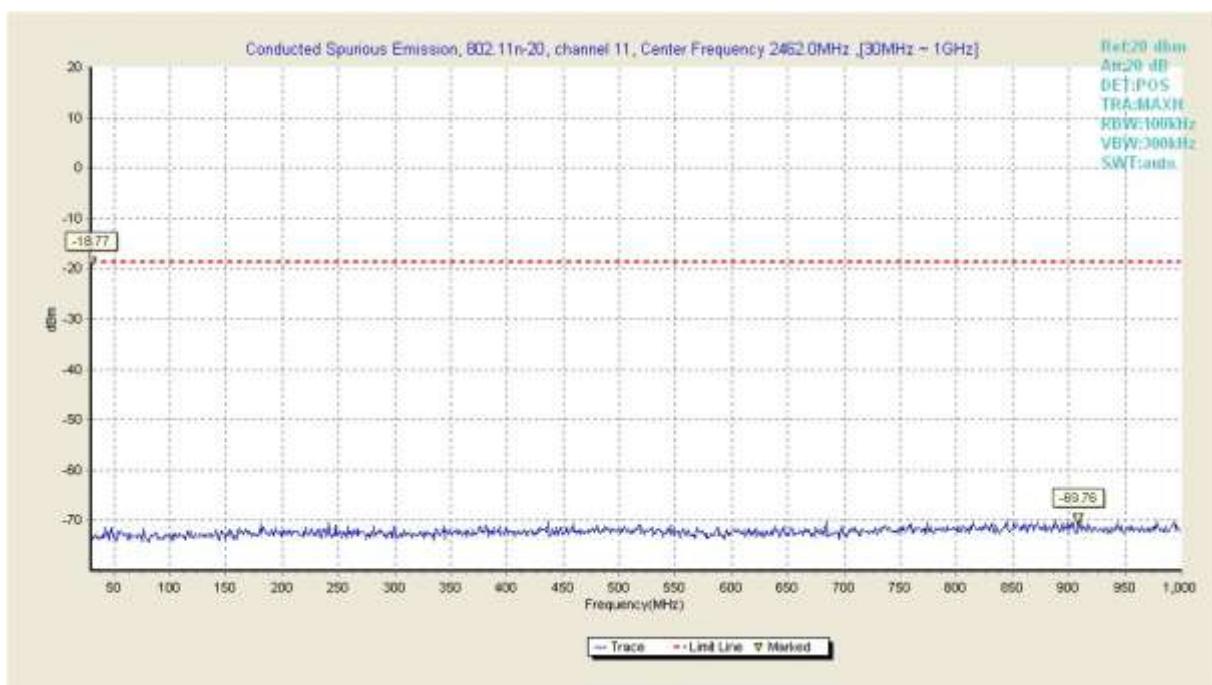


Fig89.Conducted Transmission Spurious Emission of 802.11n-20 in channel 11, 30MHz~1GHz

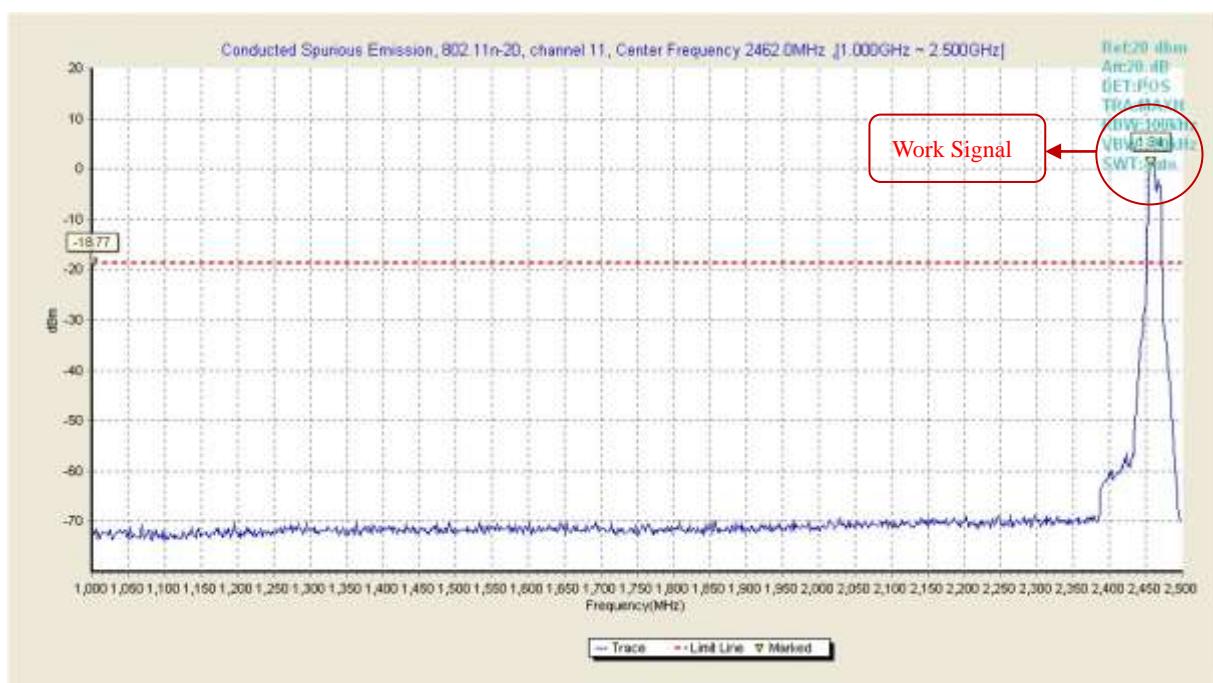


Fig90.Conducted Transmission Spurious Emission of 802.11n-20 in channel 11, 1GHz ~ 2.5GHz

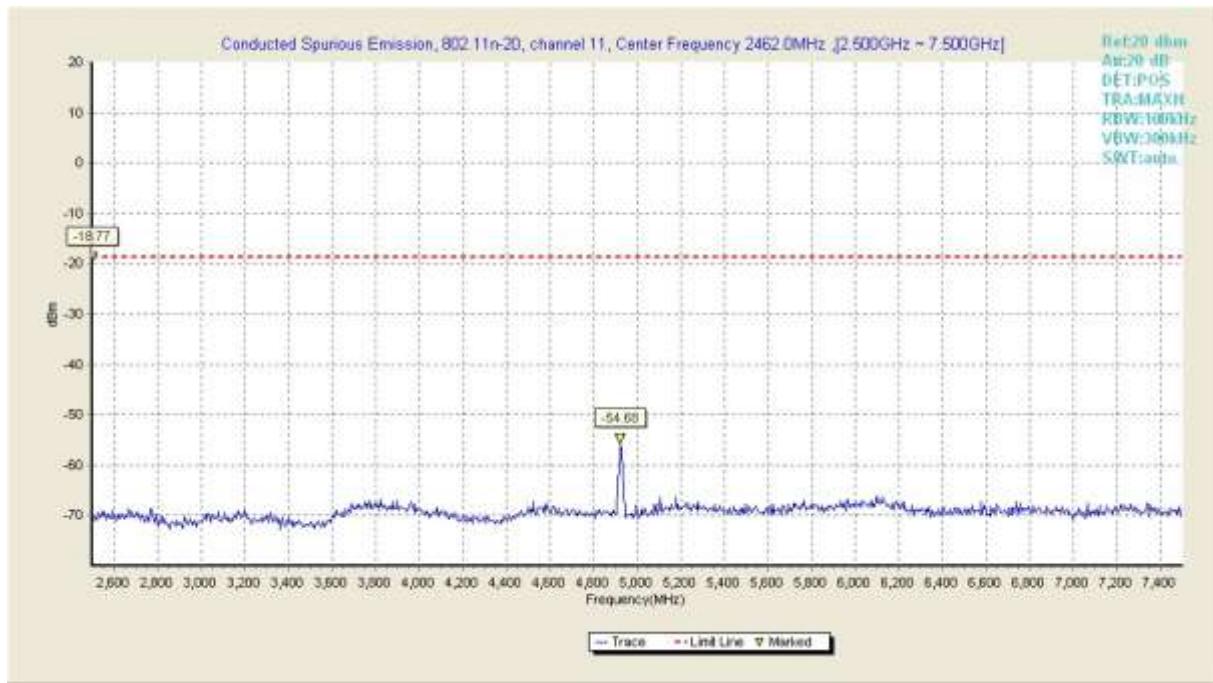


Fig91.Conducted Transmission Spurious Emission of 802.11n-20 in channel 11, 2.5GHz ~ 7.5GHz

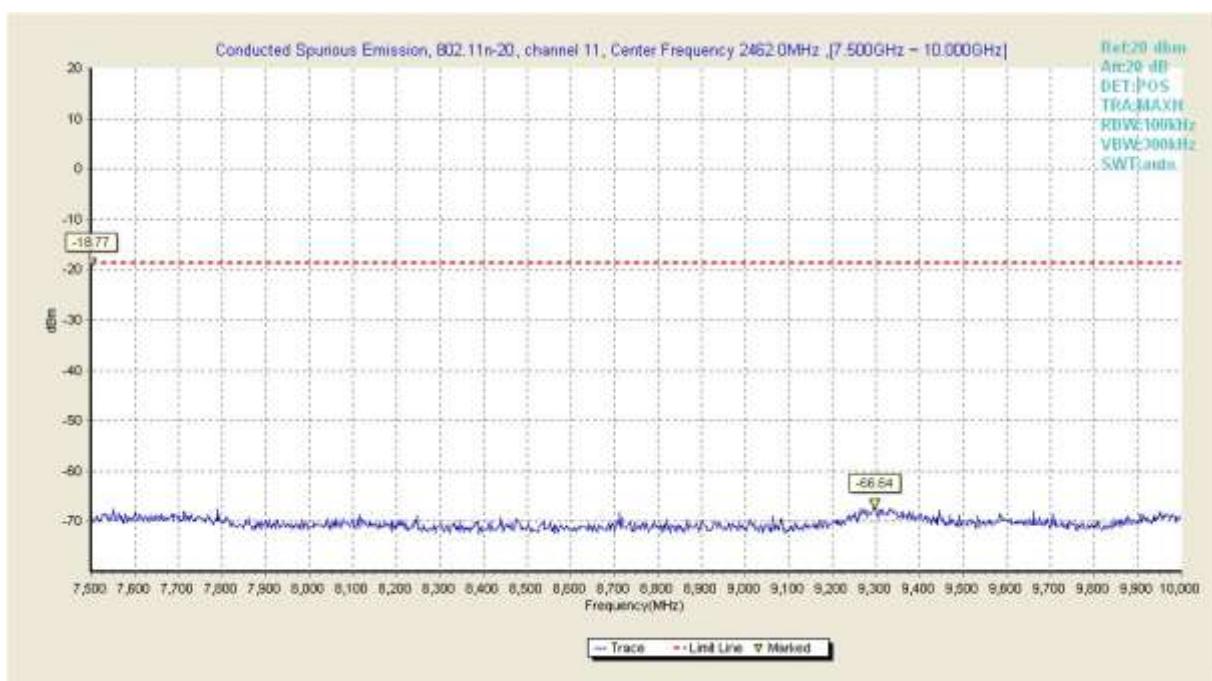


Fig92.Conducted Transmission Spurious Emission of 802.11n-20 in channel 11, 7.5GHz ~ 10GHz

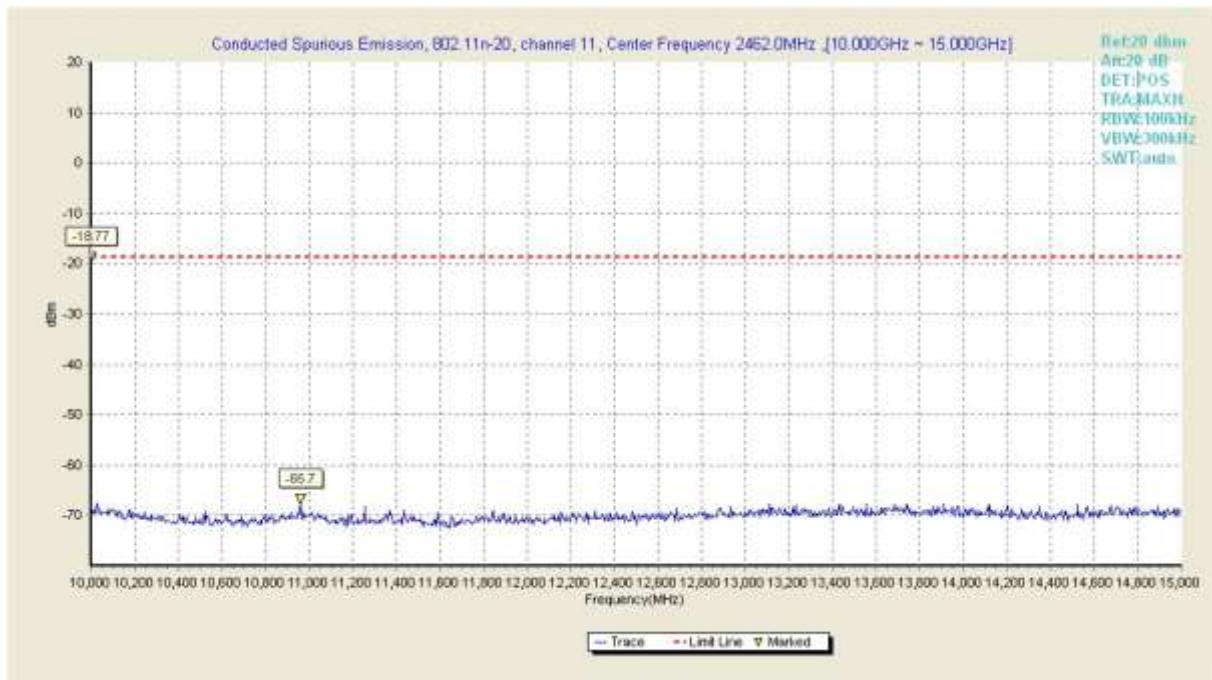


Fig93.Conducted Transmission Spurious Emission of 802.11n-20 in channel 11, 10GHz ~ 15GHz

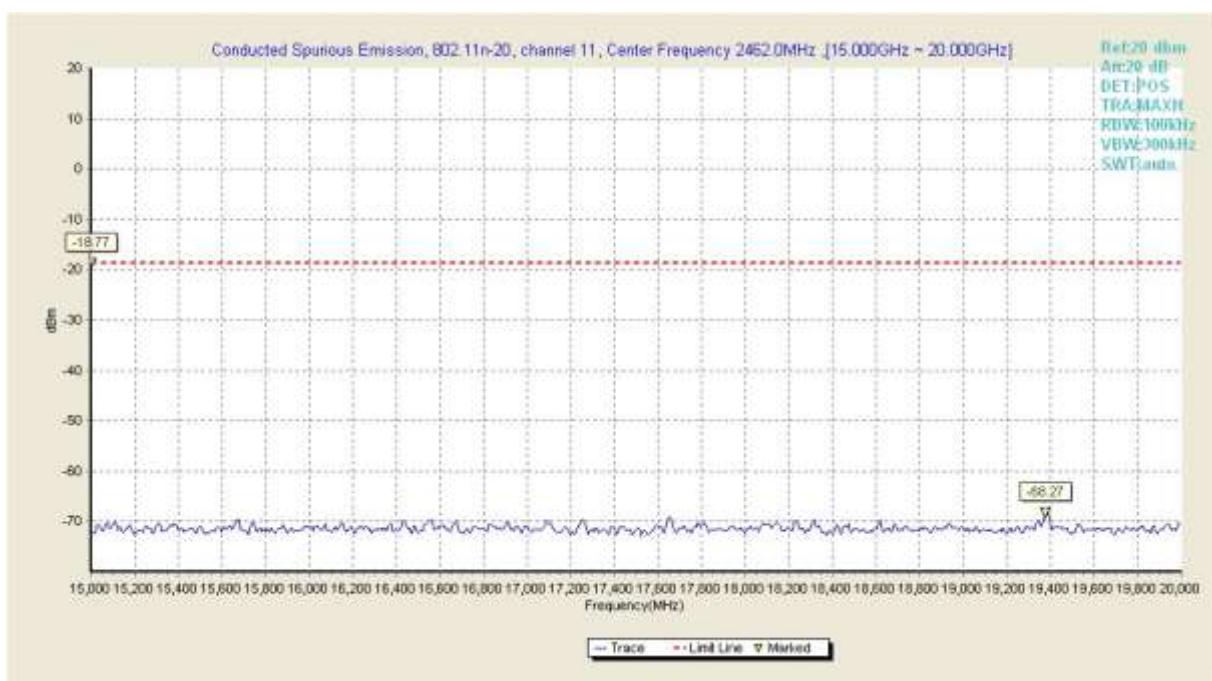


Fig94. Conducted Transmission Spurious Emission of 802.11n-20 in channel 11, 15GHz ~ 20GHz

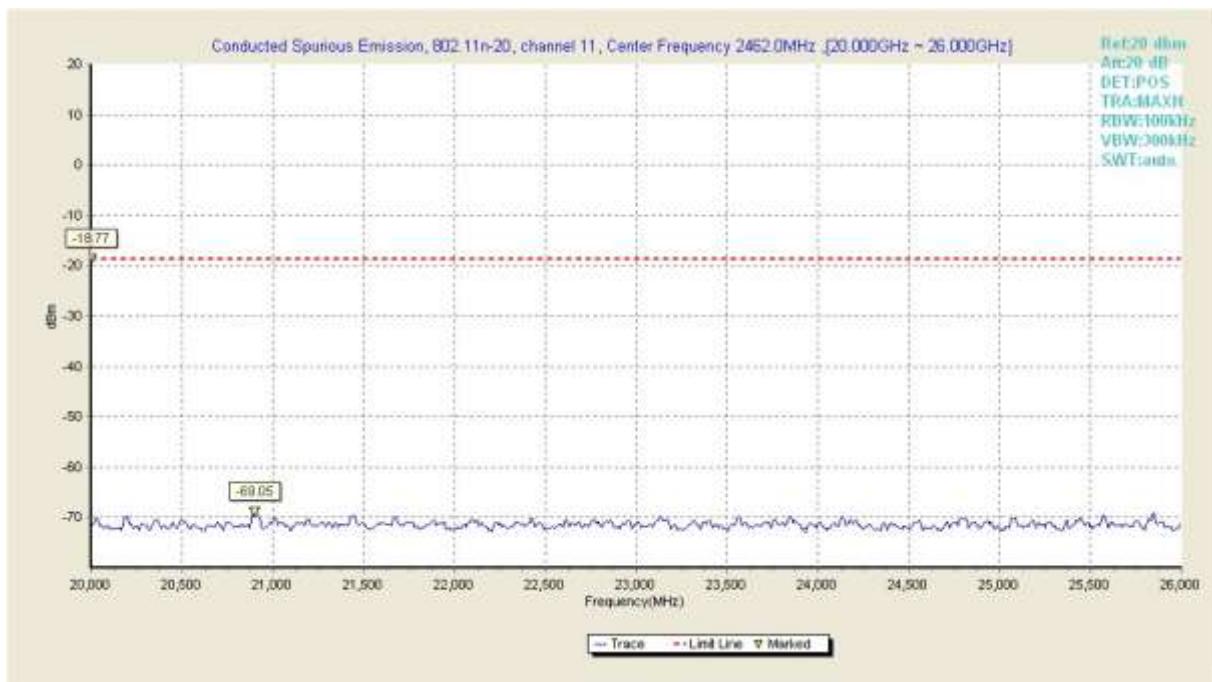
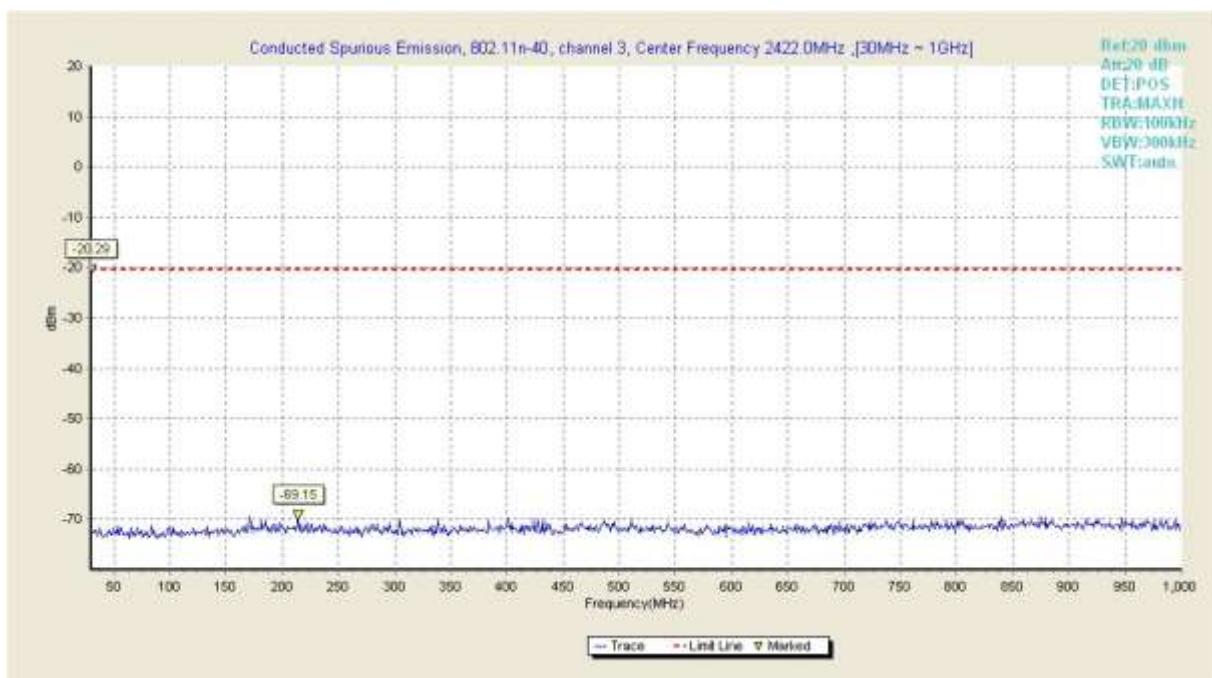


Fig95. Conducted Transmission Spurious Emission of 802.11n-20 in channel 11, 20GHz ~ 26GHz

**802.11n-40 mode**

Channel	Frequency Range	Test Results	Verdict
3	30MHz ~ 1GHz	Fig.96	Pass
	1GHz ~ 2.5GHz	Fig.97	Pass
	2.5GHz ~ 7.5GHz	Fig.98	Pass
	7.5GHz ~ 10GHz	Fig.99	Pass
	10GHz ~ 15GHz	Fig.100	Pass
	15GHz ~ 20GHz	Fig.101	Pass
	20GHz ~ 26GHz	Fig.102	Pass
6	30MHz ~ 1GHz	Fig.103	Pass
	1GHz ~ 2.5GHz	Fig.104	Pass
	2.5GHz ~ 7.5GHz	Fig.105	Pass
	7.5GHz ~ 10GHz	Fig.106	Pass
	10GHz ~ 15GHz	Fig.107	Pass
	15GHz ~ 20GHz	Fig.108	Pass
	20GHz ~ 26GHz	Fig.109	Pass
9	30MHz ~ 1GHz	Fig.110	Pass
	1GHz ~ 2.5GHz	Fig.111	Pass
	2.5GHz ~ 7.5GHz	Fig.112	Pass
	7.5GHz ~ 10GHz	Fig.113	Pass
	10GHz ~ 15GHz	Fig.114	Pass
	15GHz ~ 20GHz	Fig.115	Pass
	20GHz ~ 26GHz	Fig.116	Pass

**Fig96.Conducted Transmission Spurious Emission of 802.11n-40 in channel 1, 30MHz~1GHz**

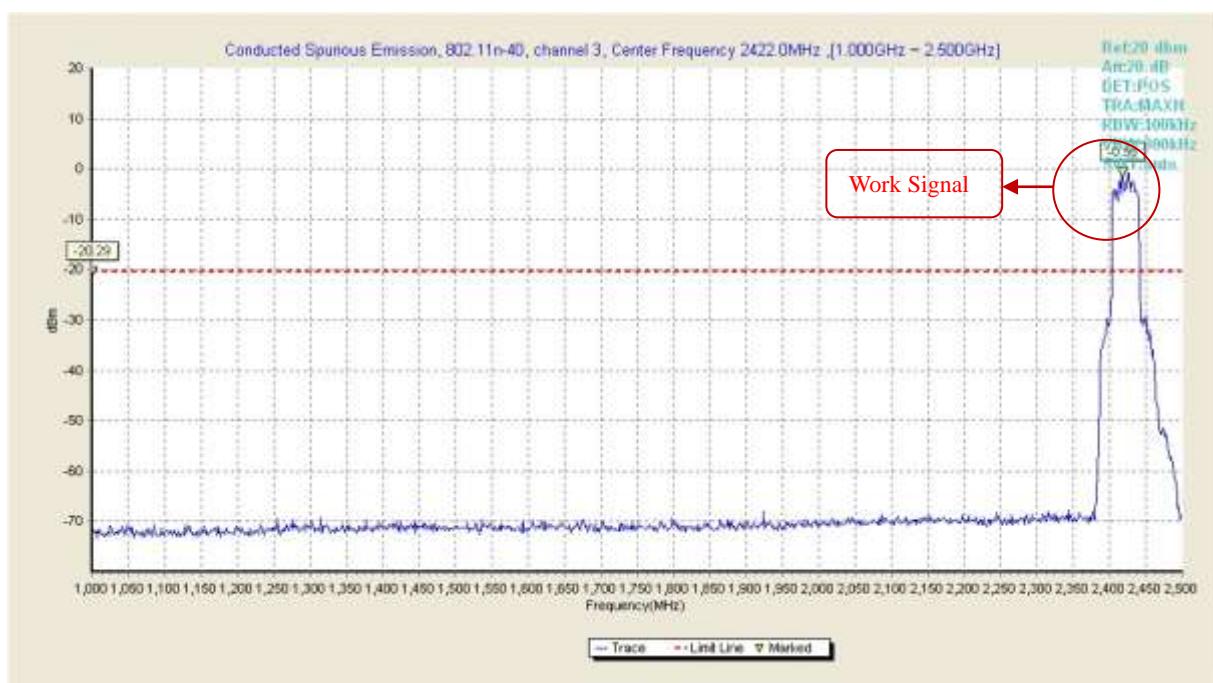


Fig97.Conducted Transmission Spurious Emission of 802.11n-40 in channel 1, 1GHz ~ 2.5GHz

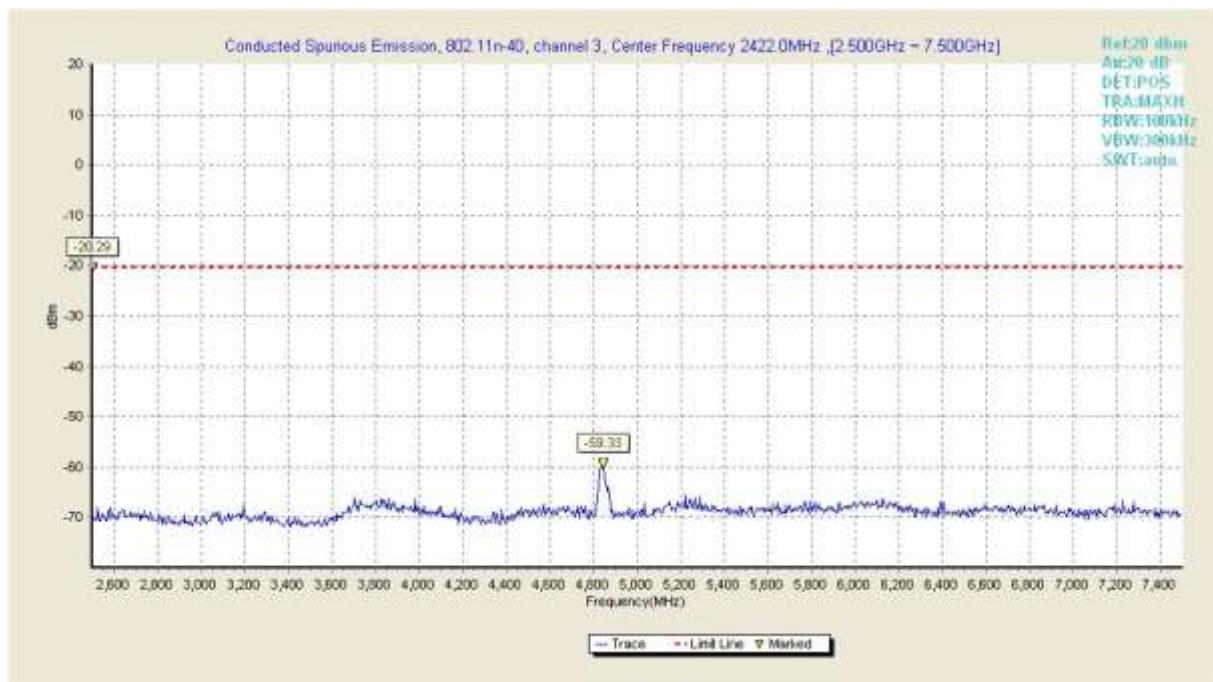


Fig98.Conducted Transmission Spurious Emission of 802.11n-40 in channel 1, 2.5GHz ~ 7.5GHz

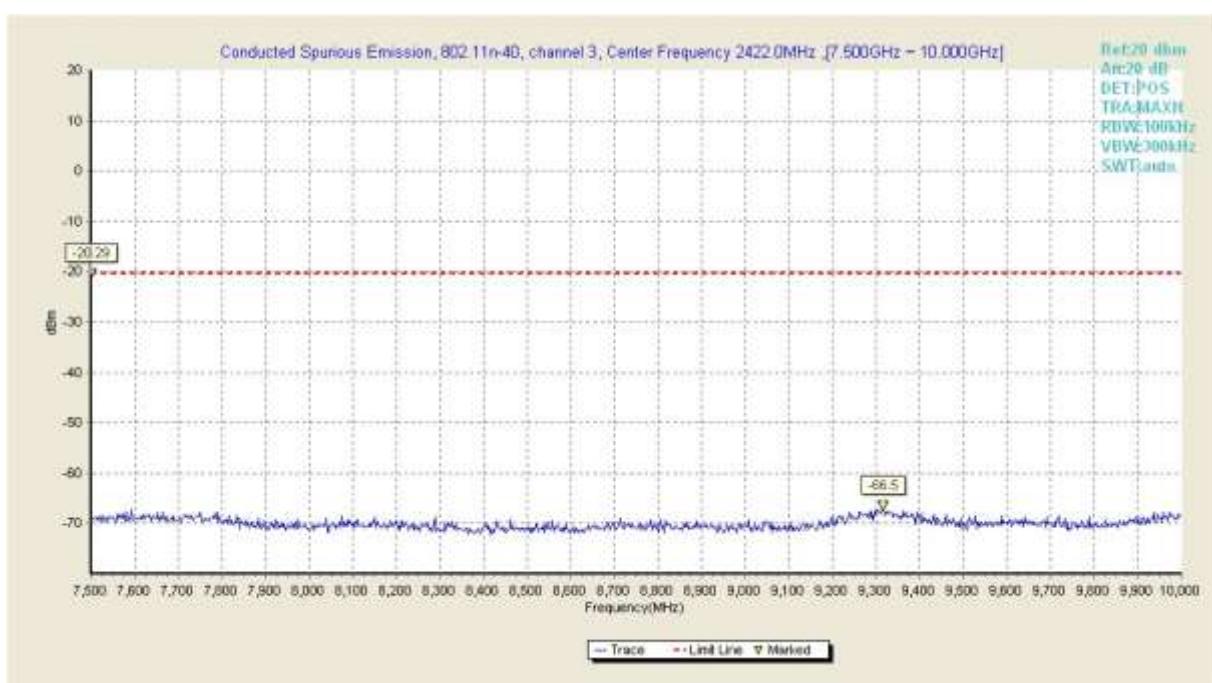


Fig99.Conducted Transmission Spurious Emission of 802.11n-40 in channel 1, 7.5GHz ~ 10GHz

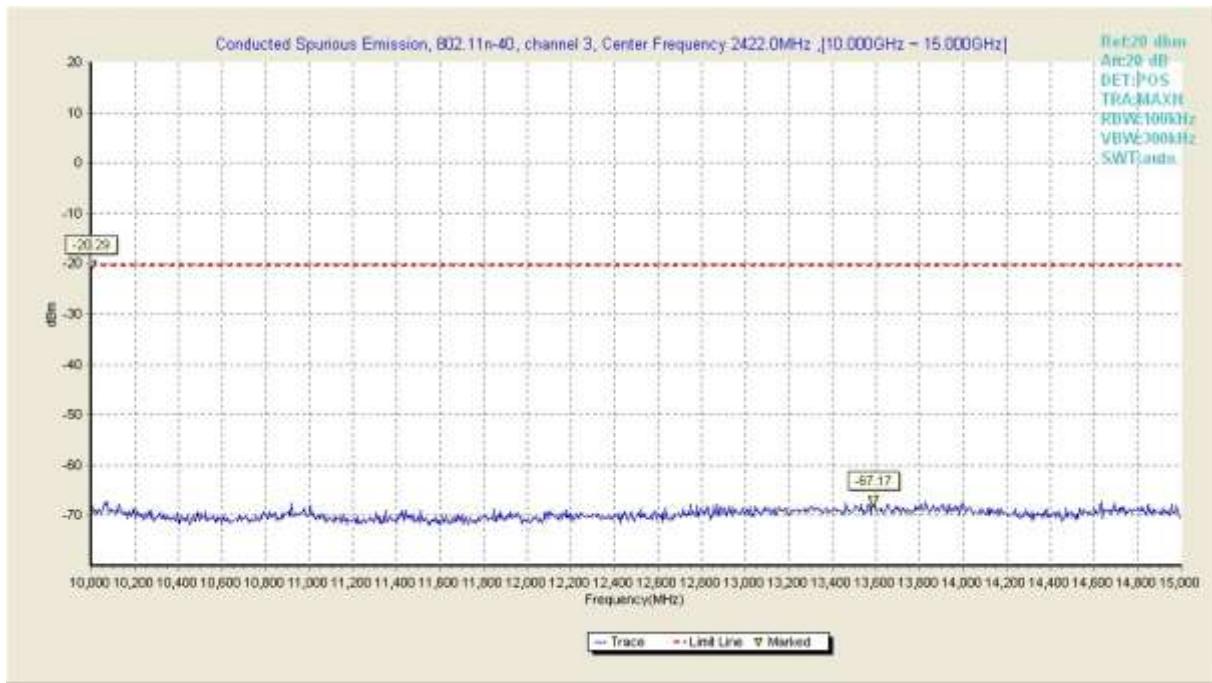
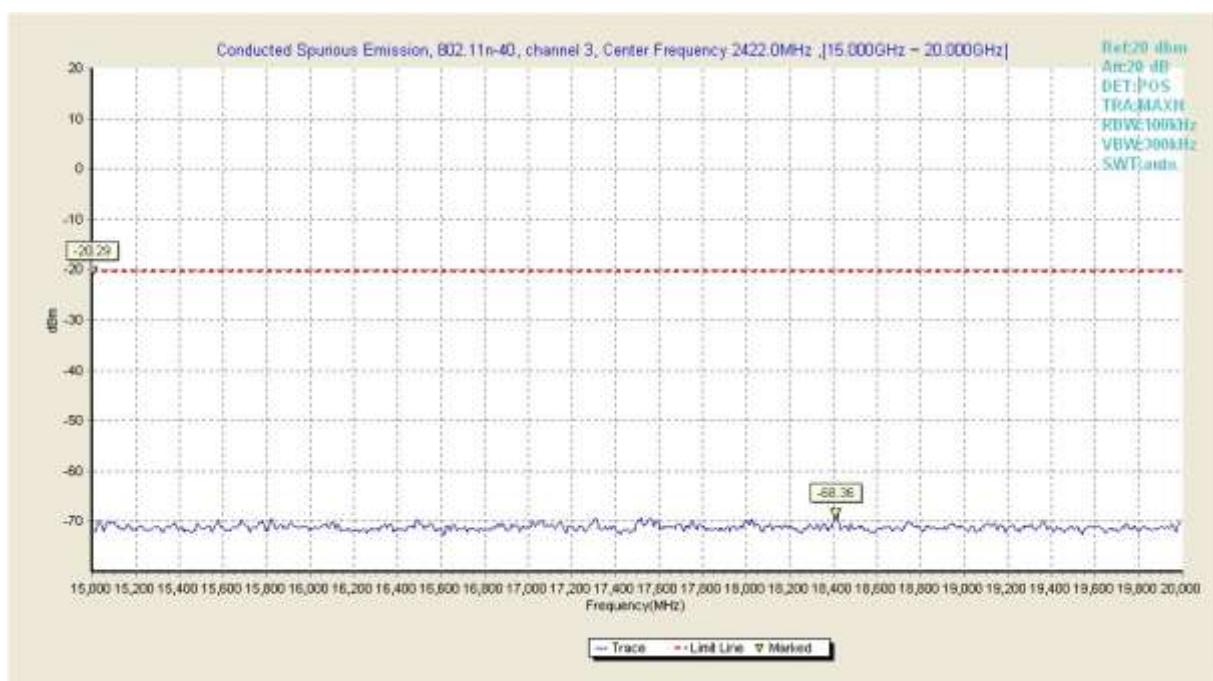
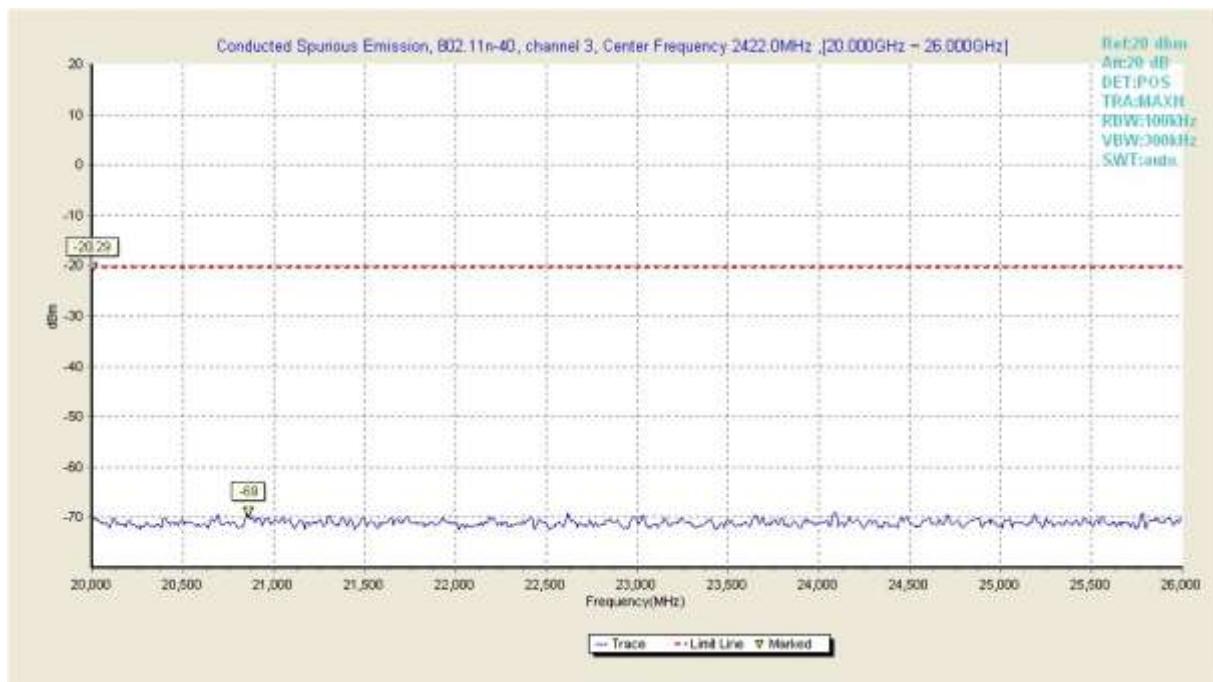


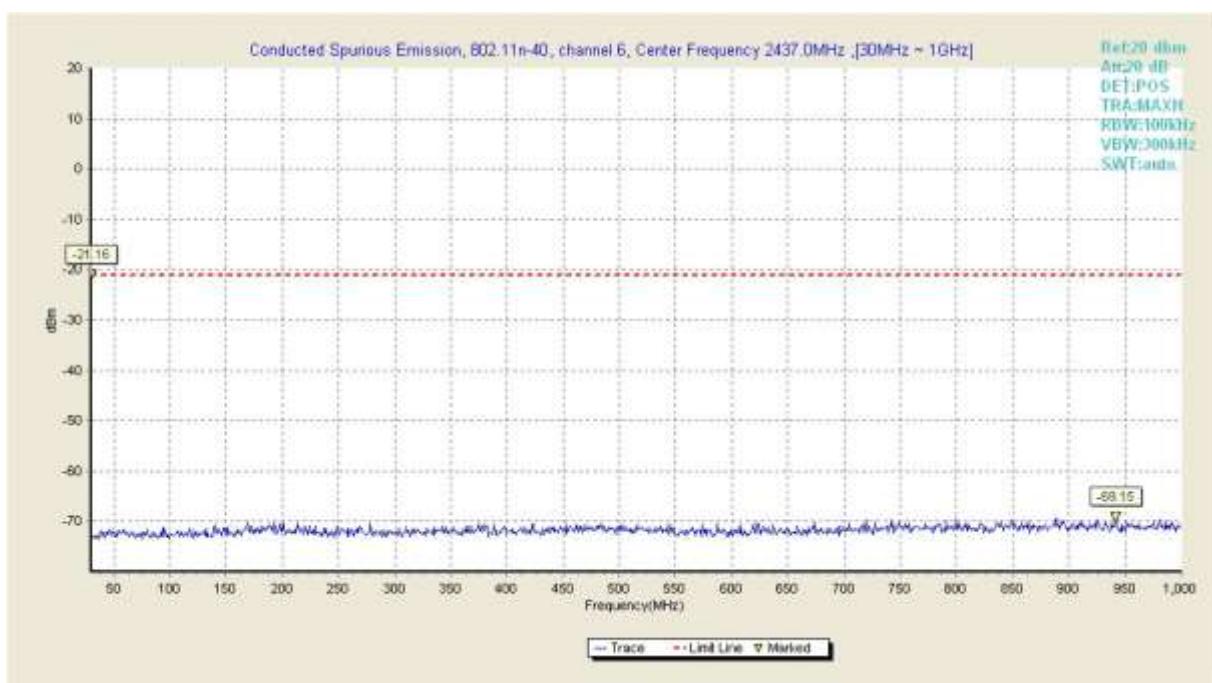
Fig100.Conducted Transmission Spurious Emission of 802.11n-40 in channel 1, 10GHz ~ 15GHz



**Fig101.**Conducted Transmission Spurious Emission of 802.11n-40 n channel 1, 15GHz ~ 20GHz



**Fig102.**Conducted Transmission Spurious Emission of 802.11n-40 in channel 1, 20GHz ~ 26GHz



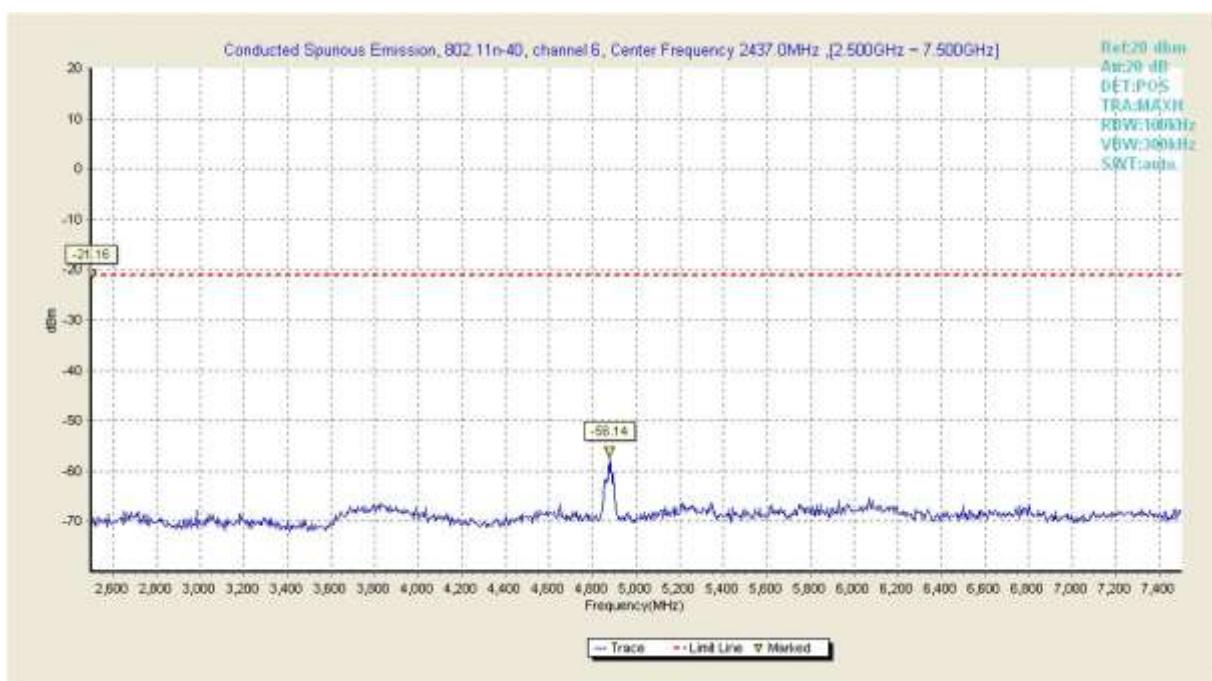


Fig105. Conducted Transmission Spurious Emission of 802.11n-40 in channel 6, 2.5GHz ~ 7.5GHz

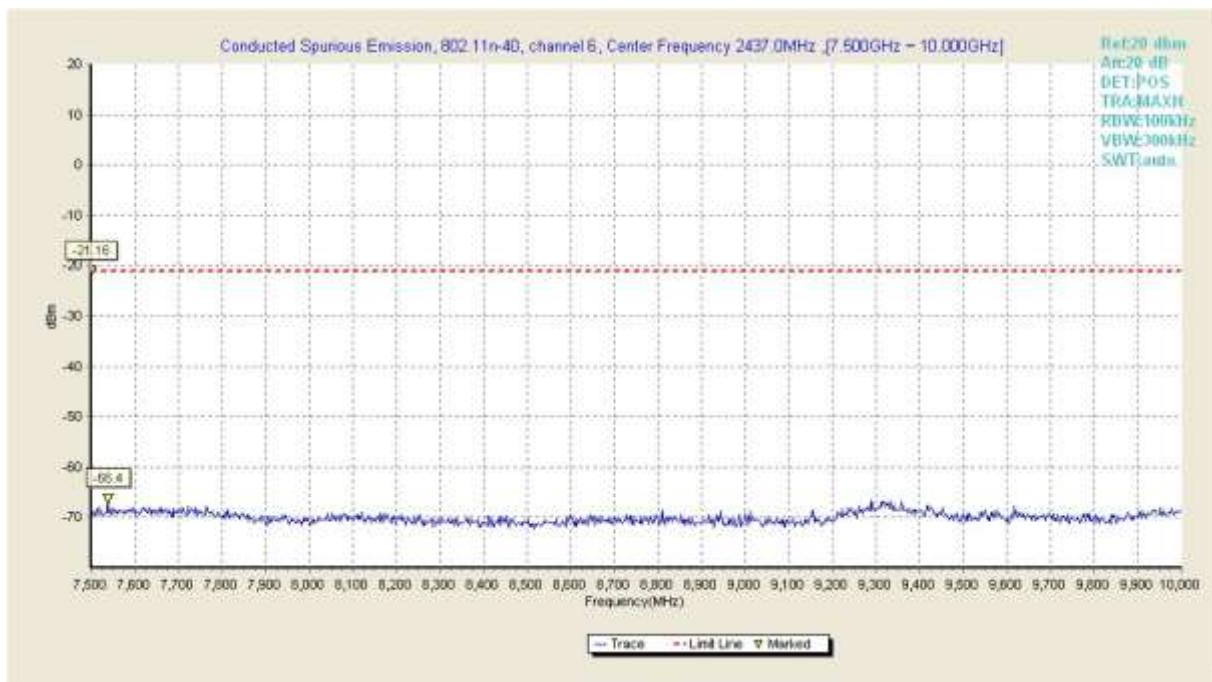
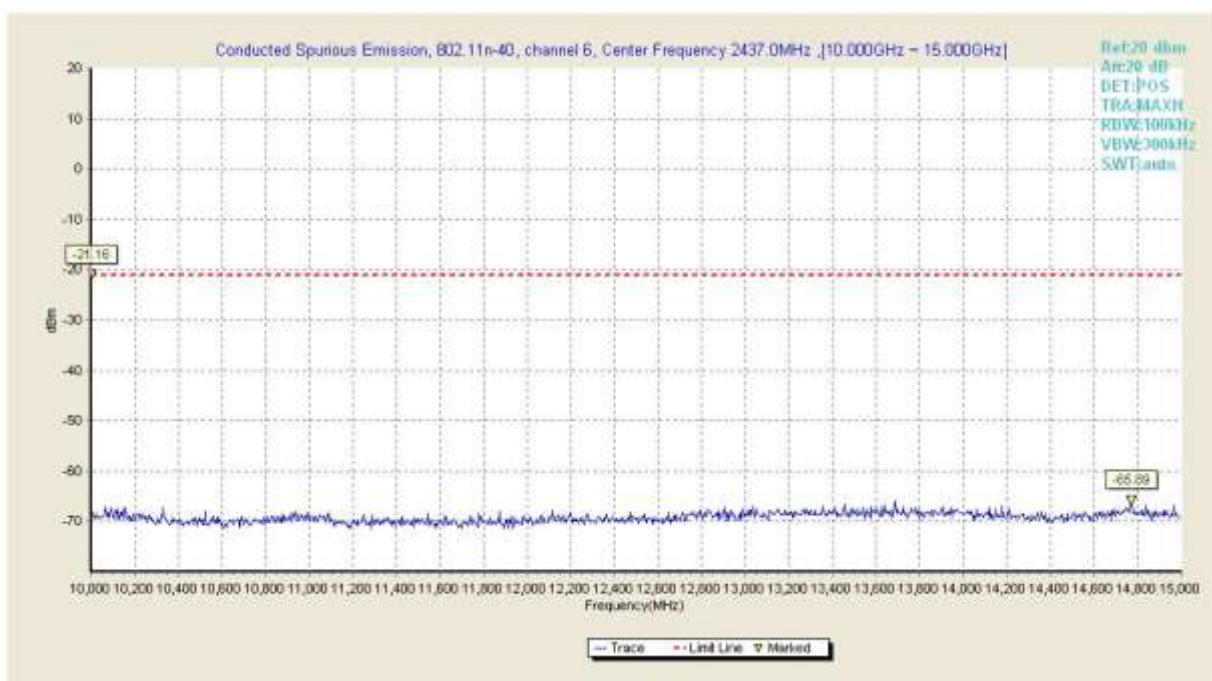
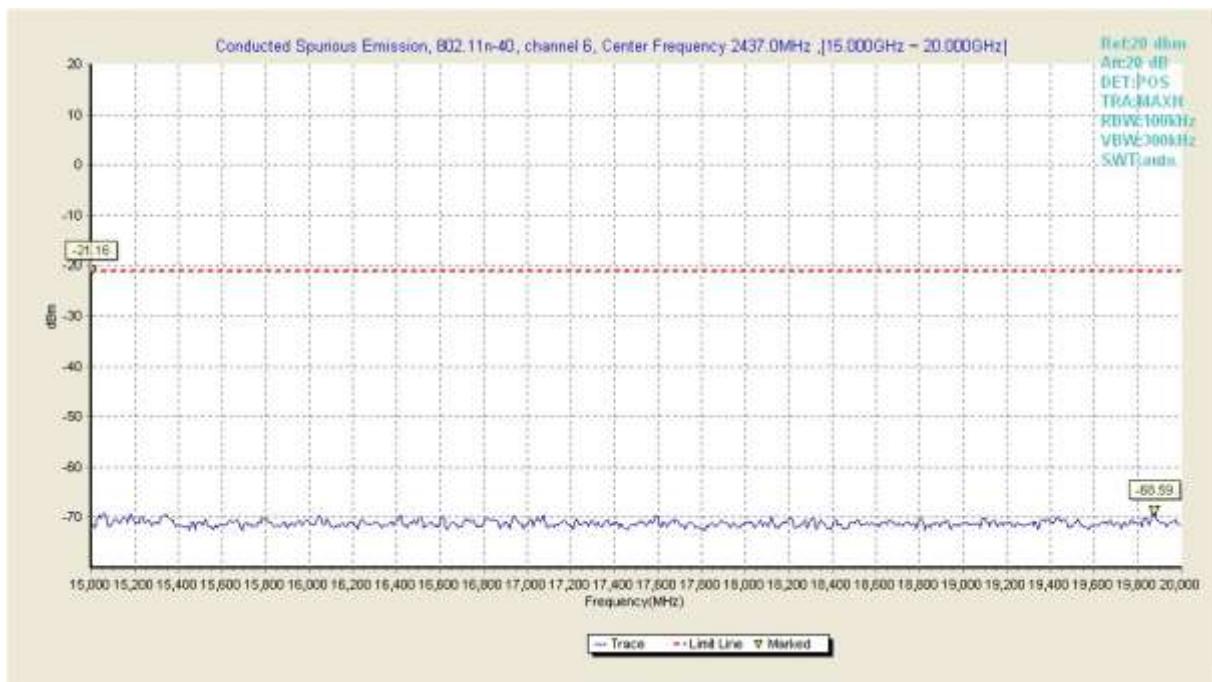


Fig106. Conducted Transmission Spurious Emission of 802.11n-40 in channel 6, 7.5GHz ~ 10GHz



**Fig107.**Conducted Transmission Spurious Emission of 802.11n-40 in channel 6, 10GHz ~ 15GHz



**Fig108.**Conducted Transmission Spurious Emission of 802.11n-40 in channel 6, 15GHz ~ 20GHz

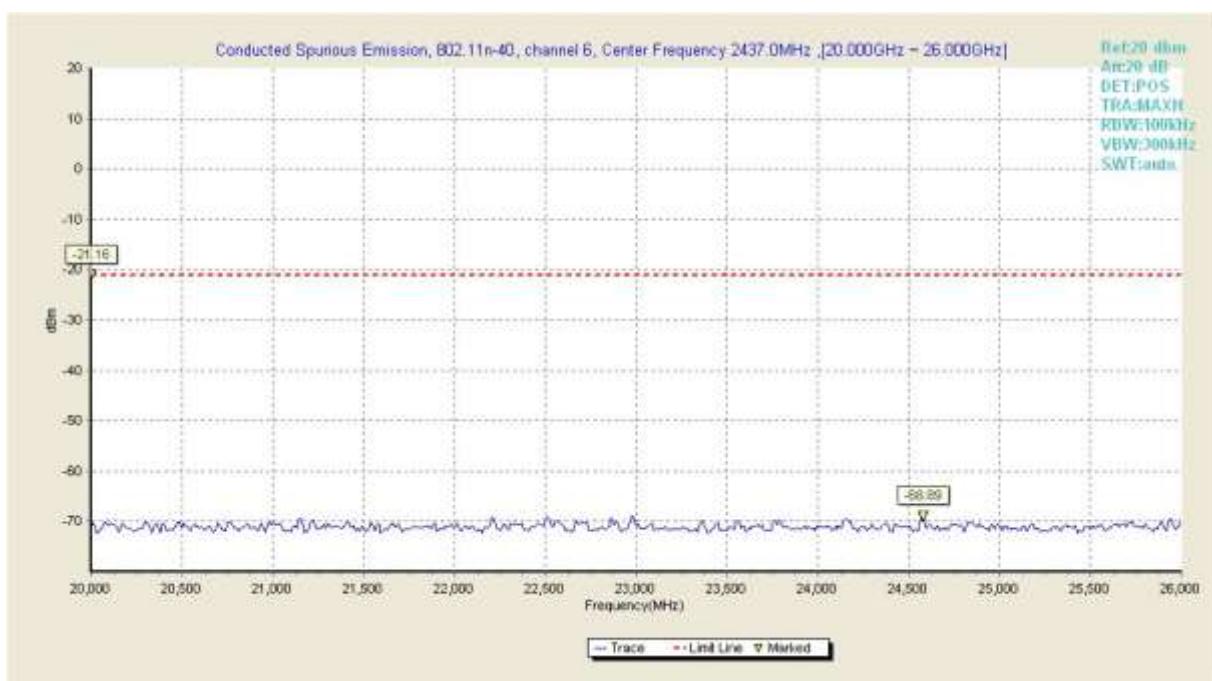


Fig109.Conducted Transmission Spurious Emission of 802.11n-40 in channel 6, 20GHz ~ 26GHz

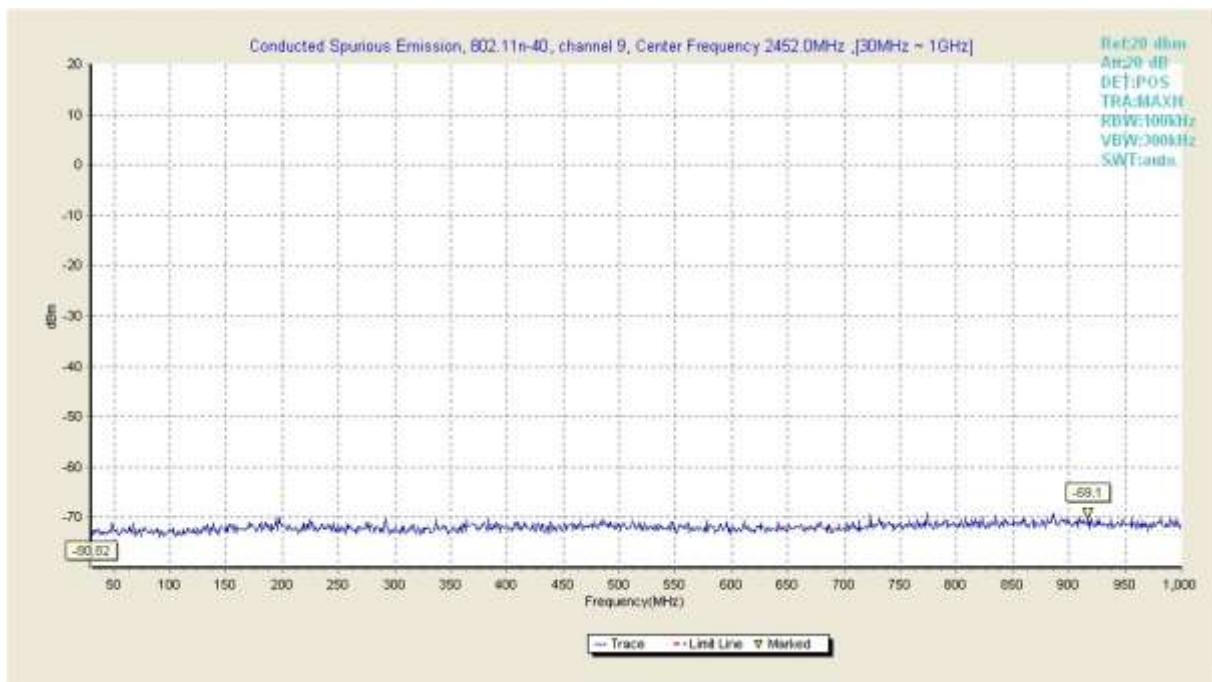


Fig110.Conducted Transmission Spurious Emission of 802.11n-40 in channel 11, 30MHz~1GHz

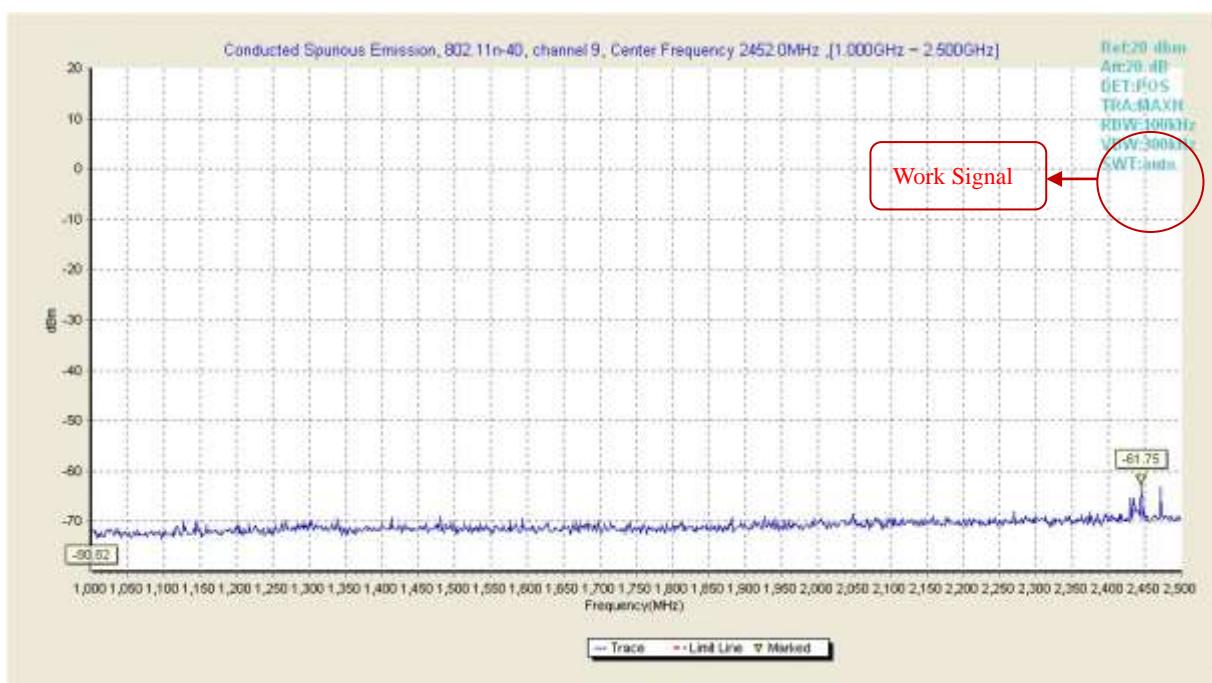


Fig111.Conducted Transmission Spurious Emission of 802.11n-40 in channel 11, 1GHz ~ 2.5GHz

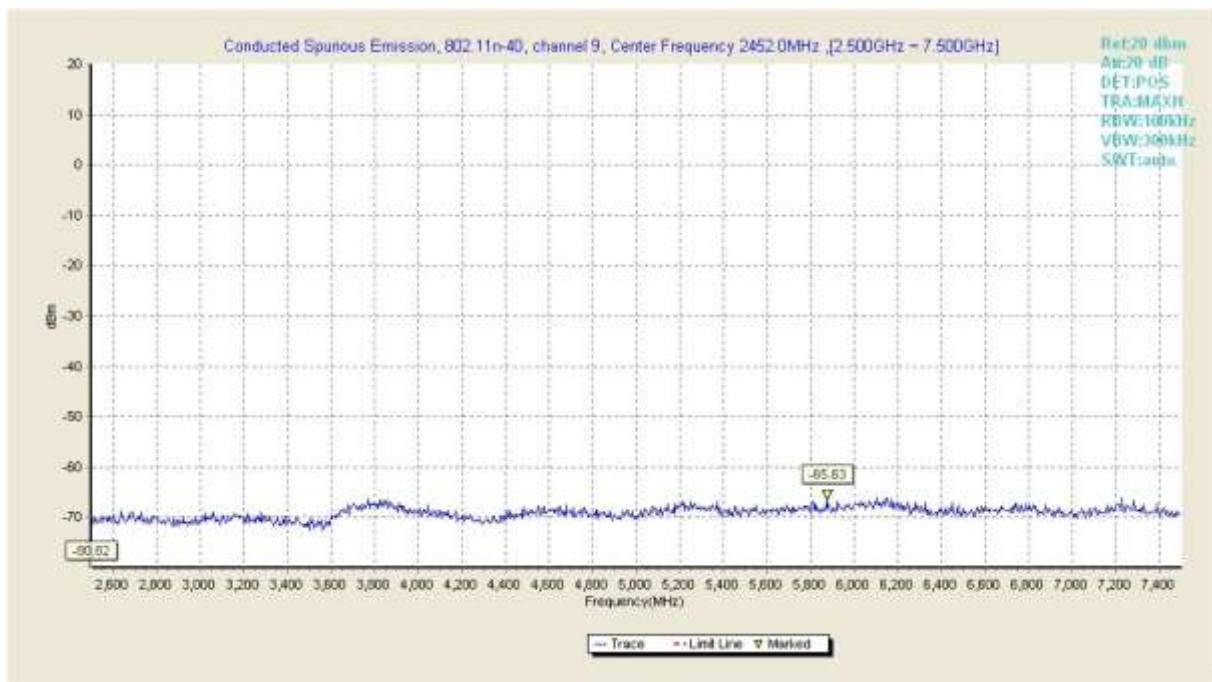


Fig112.Conducted Transmission Spurious Emission of 802.11n-40 in channel 11, 2.5GHz ~ 7.5GHz

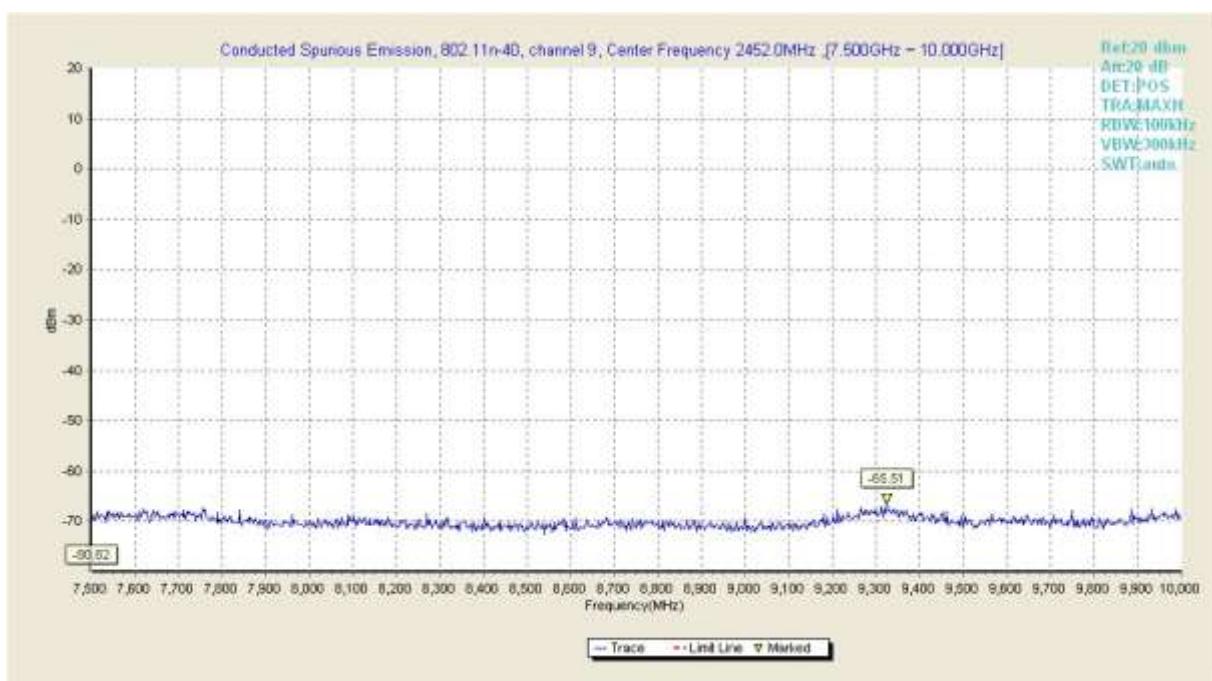


Fig113.Conducted Transmission Spurious Emission of 802.11n-40 in channel 11, 7.5GHz ~ 10GHz

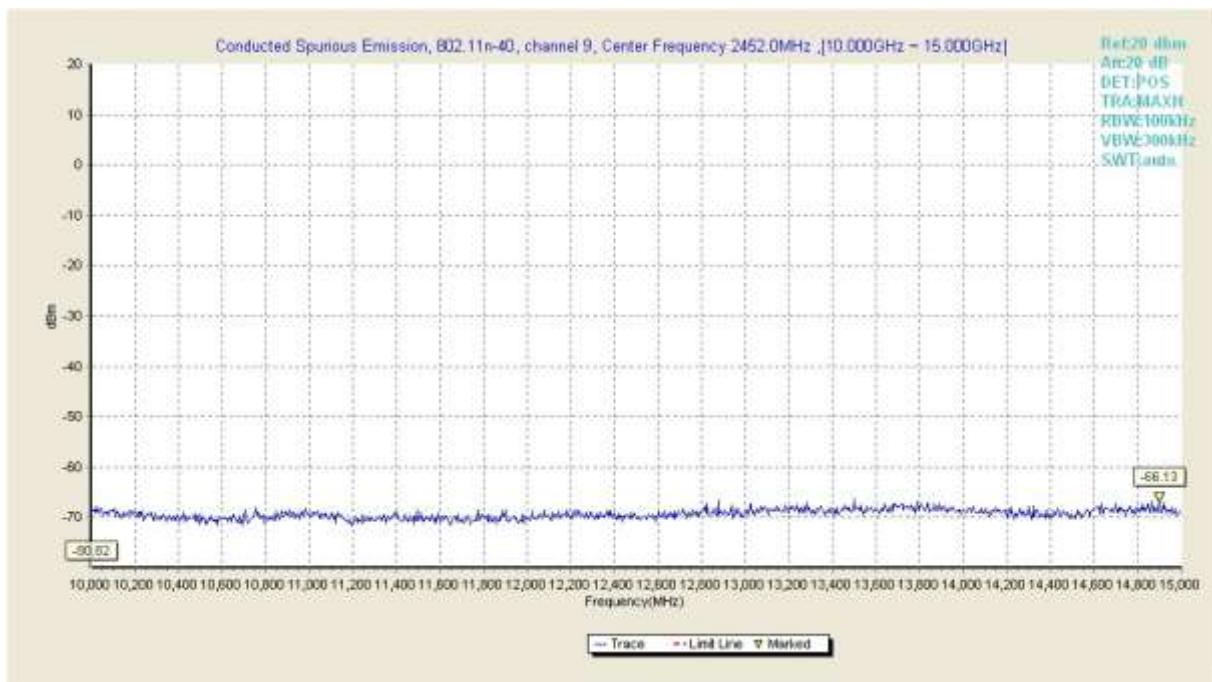


Fig114.Conducted Transmission Spurious Emission of 802.11n-40 in channel 11, 10GHz ~ 15GHz

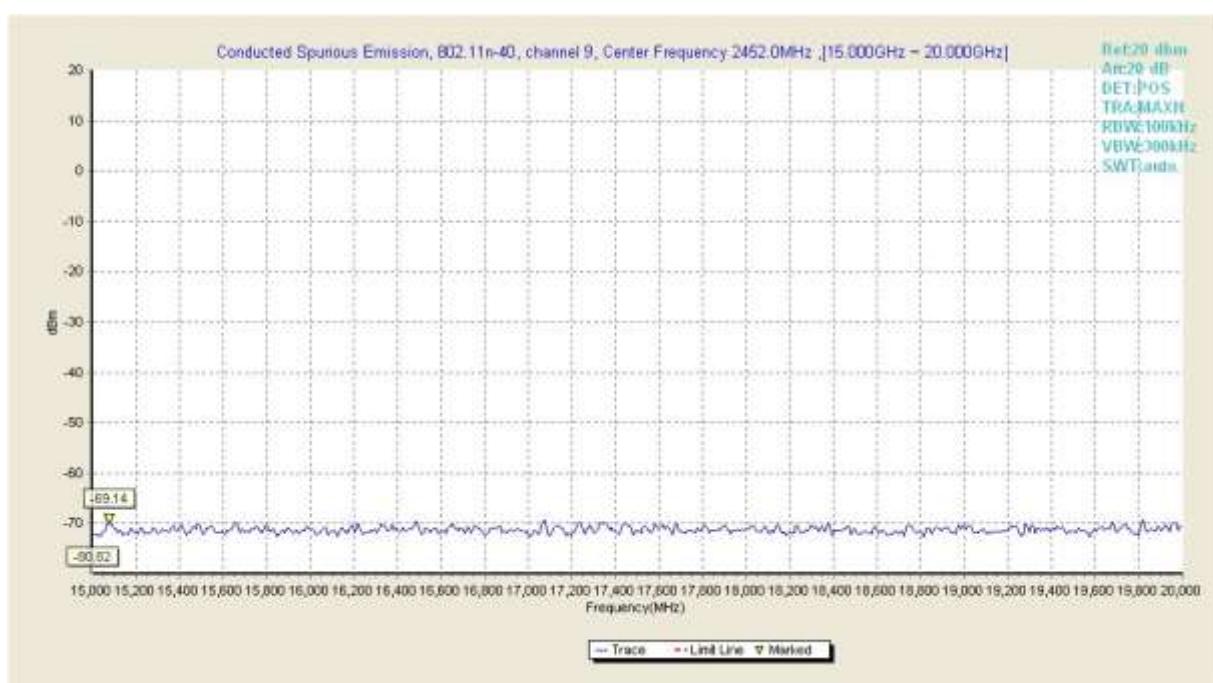


Fig115.Conducted Transmission Spurious Emission of 802.11n-40 in channel 11, 15GHz ~ 20GHz

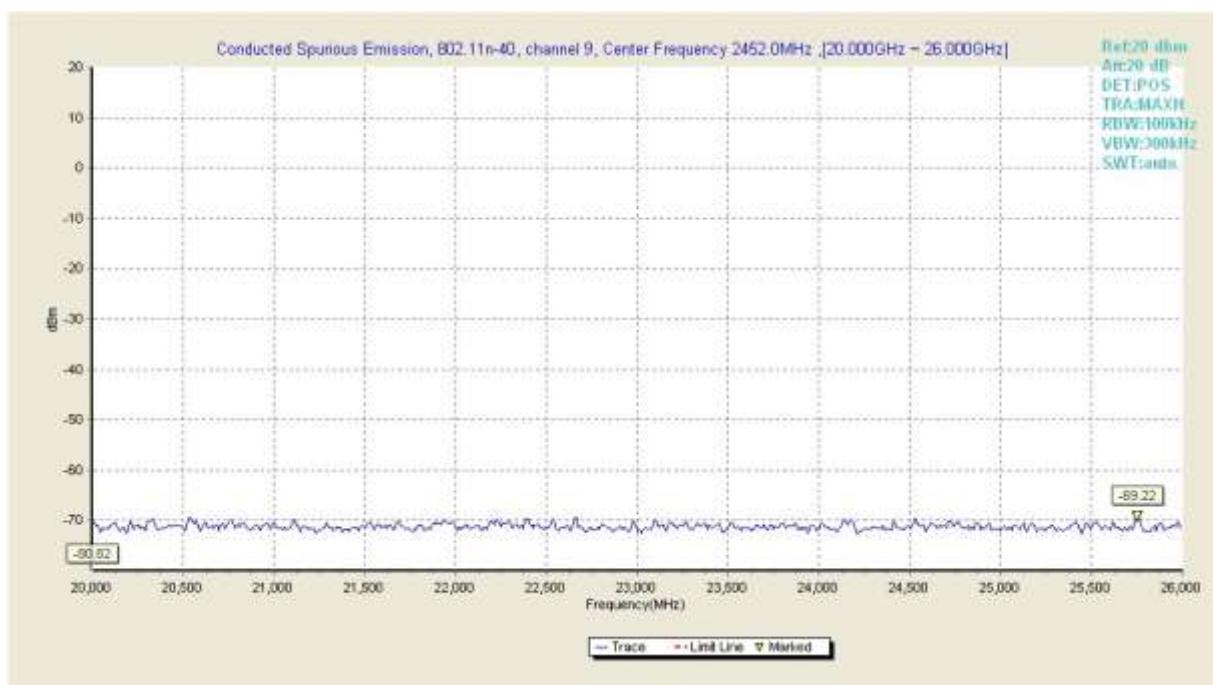


Fig116.Conducted Transmission Spurious Emission of 802.11n-40 in channel 11, 20GHz ~ 26GHz

## **B.6 AC Conducted Emission**

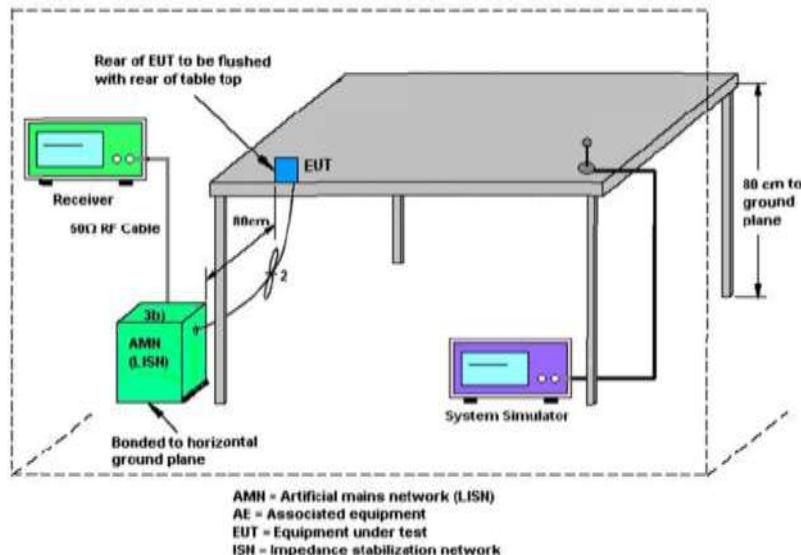
### **B.6.1 Description**

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits

### **B.6.2 Test Procedure**

- a) The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b) Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c) All the support units are connecting to the other LISN.
- d) The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e) The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- f) Both sides of AC line were checked for maximum conducted interference.
- g) The frequency range from 150 kHz to 30 MHz was searched.
- h) Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

### **B.6.3 Test Setup**





#### B.6.4 Test Results

##### Limit

Frequency of Emission(MHz)	Conducted Limit(dB $\mu$ V)	
	Quasi -Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with logarithm of the frequency

##### Line L

###### Scan Settings (1 Range)

Frequencies			Receiver Settings			
Start	Stop	Step	Res BW	M-Time	Atten	Preamp
150 kHz	30 MHz	4 kHz	9 kHz (6dB)	5 ms	Auto	Off

###### Previous Measurement

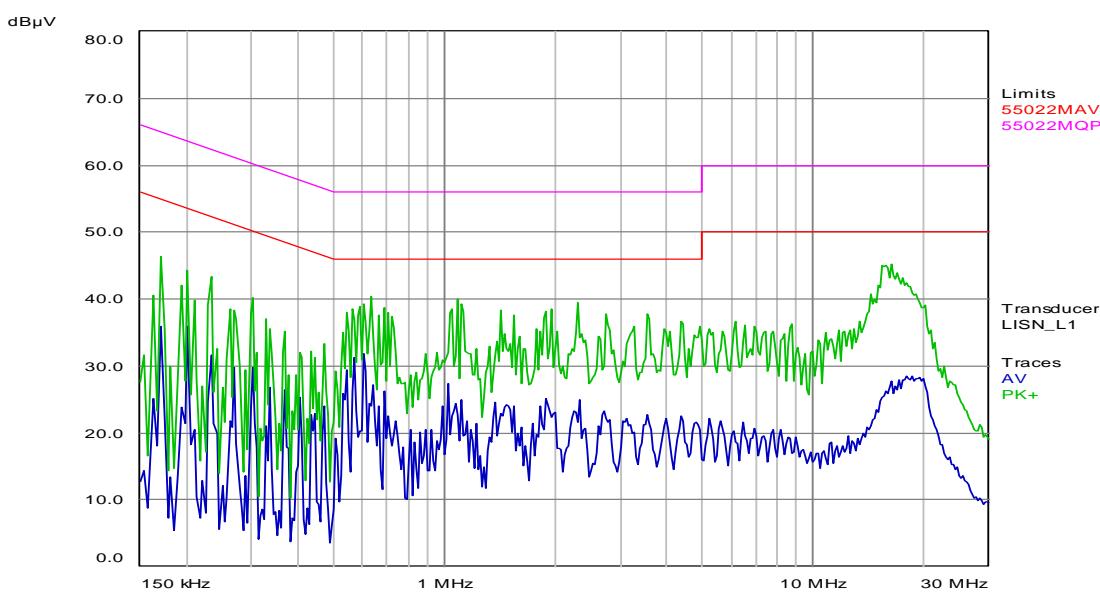
Detectors: AV, PK+

Meas Time: see scan settings

Peaks: 6

Acc. Margin: 10 dB

###### Pre-measurement Graph



### Peak Search Results

Trace	Frequency (MHz)	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Delta Limit (dB)	Delta Ref (dB)	Comment
/	/	/	/	/	/	/

\* = limit exceeded

### Line N

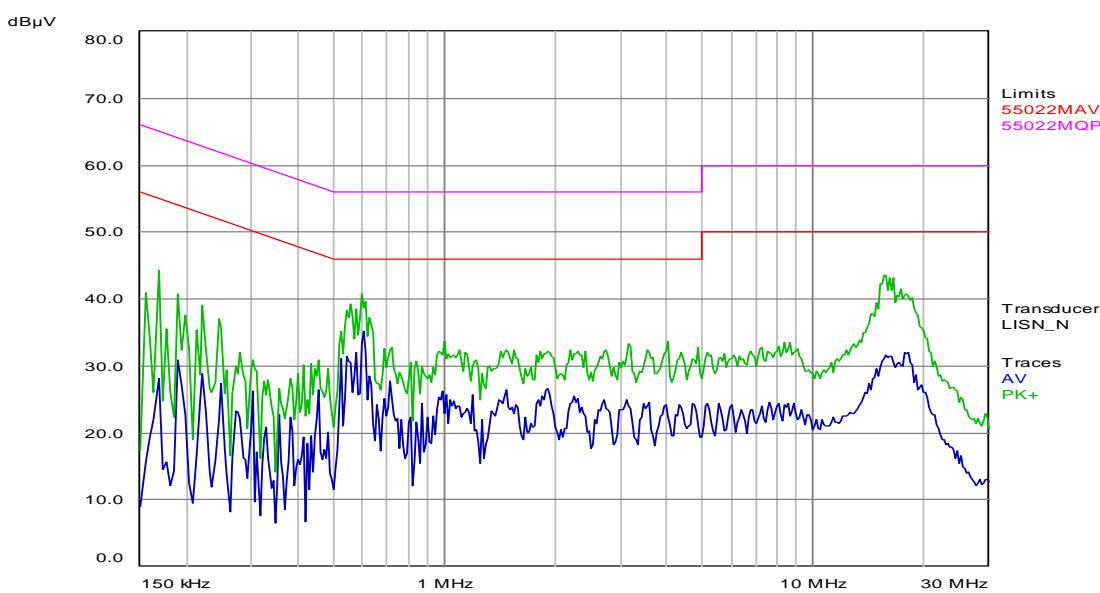
#### Scan Settings (1 Range)

Frequencies			Receiver Settings			
Start	Stop	Step	Res BW	M-Time	Atten	Preamp
150 kHz	30 MHz	4.5 kHz	9 kHz (6dB)	15 ms	Auto	Off

#### Final Measurement

Detectors: AV, QP      Meas Time: 1 s  
Peaks: 6      Acc. Margin: 10 dB

#### Pre-measurement Graph



## Final Measurement Results

Trace	Frequency (MHz)	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Delta Limit (dB)	Delta Ref (dB)	Comment
1 AV	0.5955	34.01	46.00	-11.99		N / on
1 AV	0.6045	33.66	46.00	-12.34		N / on

\* = limit exceeded

## **B.7 Radiated Emission**

### **B.7.1 Limit of Radiated Emission**

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below

<b>Frequency(MHz)</b>	<b>Field Strength(microvolts/meters)</b>	<b>Measurement Distance(Meters)</b>
0.009-0.490	2400/F(kHz)	3000
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
above 960	500	3

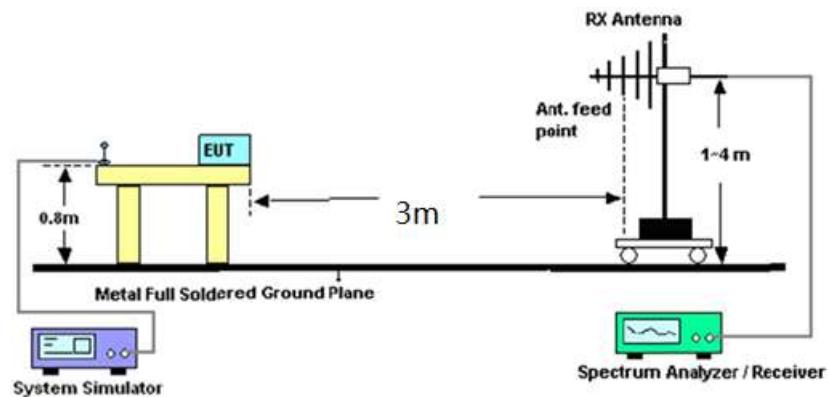
### **B.7.2 Test Procedure**

- a. The EUT was placed on a turntable with 1.5 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The height of the antenna is varied between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
- e. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower(from 1 m to 4 m)and turntable(from 0 degree to 360 degrees)to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode. SA setting: Span= wide enough to fully capture the emission being measured; RBW=1MHz (f > 1GHz), RBW=100kHz (f < 1GHz), VBW ≥ RBW, Sweep time=auto, Trace= Max hold. Above 18GHz shall be extrapolated to specified distance using an extrapolation factor 20dB/decade from 3m to 1m.
- g. If the emission level of the EUT in peak mode was 20dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported.
- h. Emission level (dB $\mu$ V/m) = 20 log Emission level ( $\mu$ V/m).

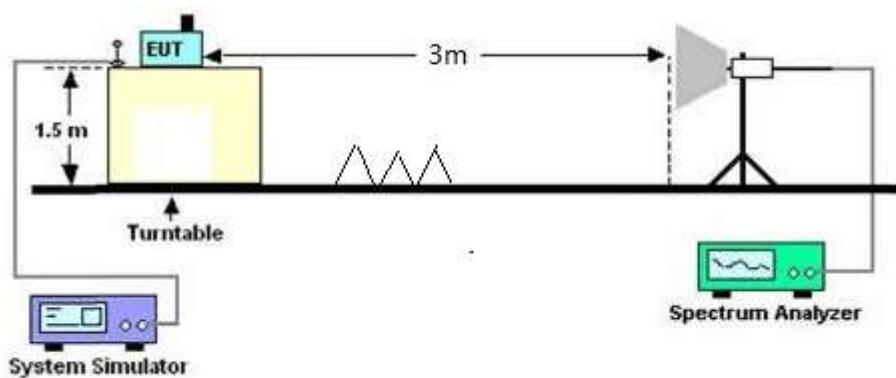
### **B.7.3 Test Setup**

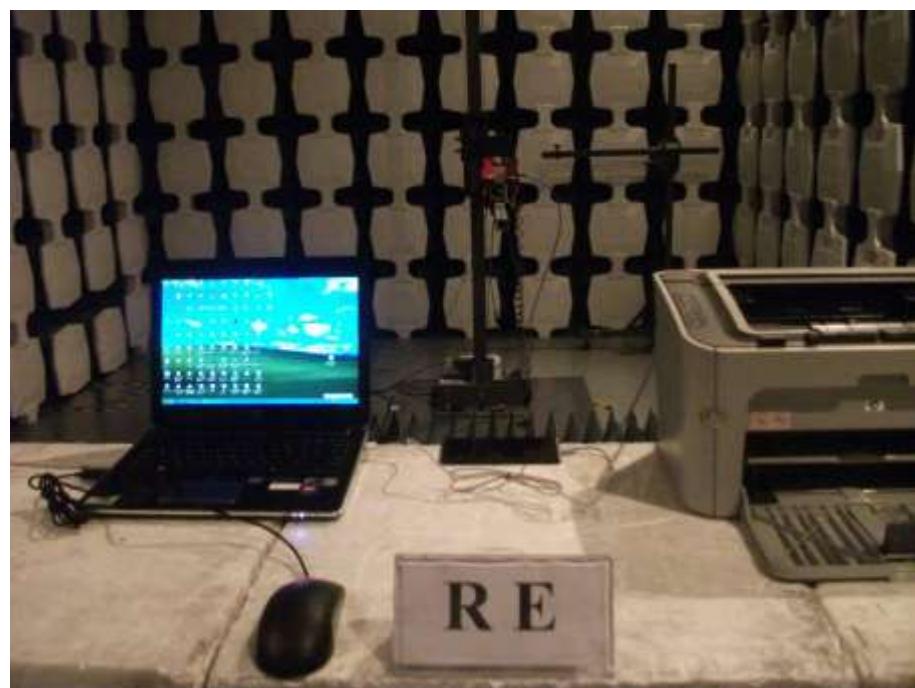
Frequency Band(MHz)	Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	QP	100kHz	100kHz
Above 1000	Peak	1MHz	1MHz
	Average	1MHz	10Hz

### Radiated Emissions Frequency: Below 1GHz



### Radiated Emissions Frequency: above 1GHz





#### B.7.4 Test Results

Above 6GHz, EUT was pre-scanned and which was 20dB lower than limit line per 15.31(0) not reported.

**Worst case data rate mode: 802.11b**

**Test Mode: Traffic**

Verdict: Pass

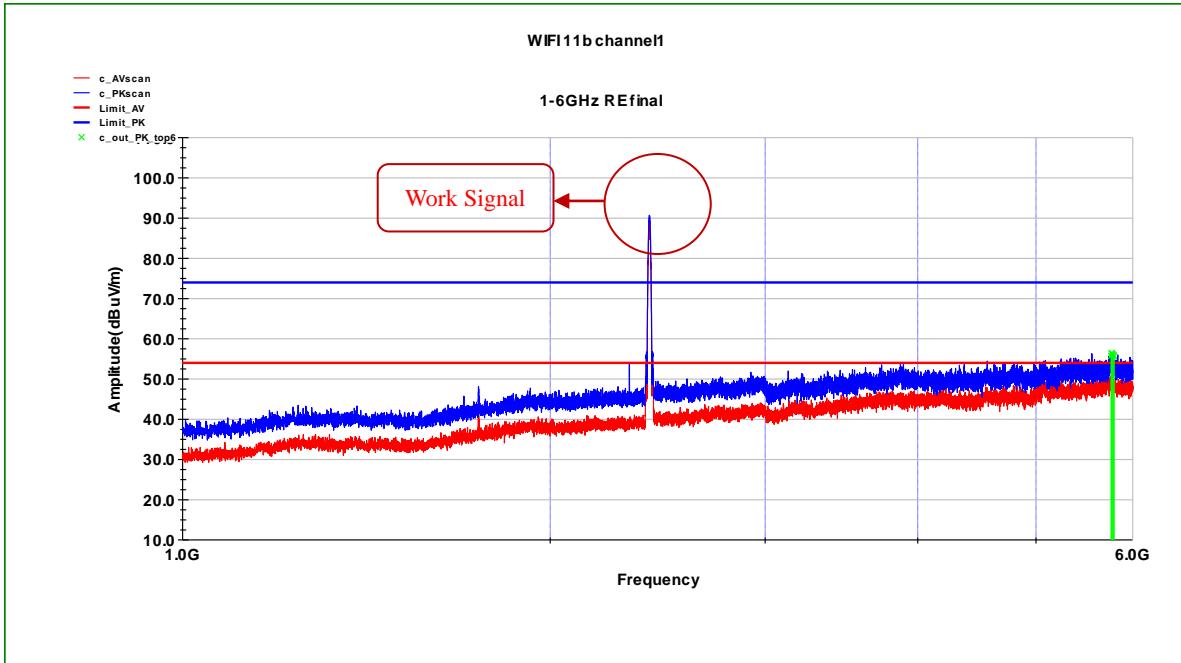


Fig.118 Radiated Emission of channel 1 in 30MHz-1GHz

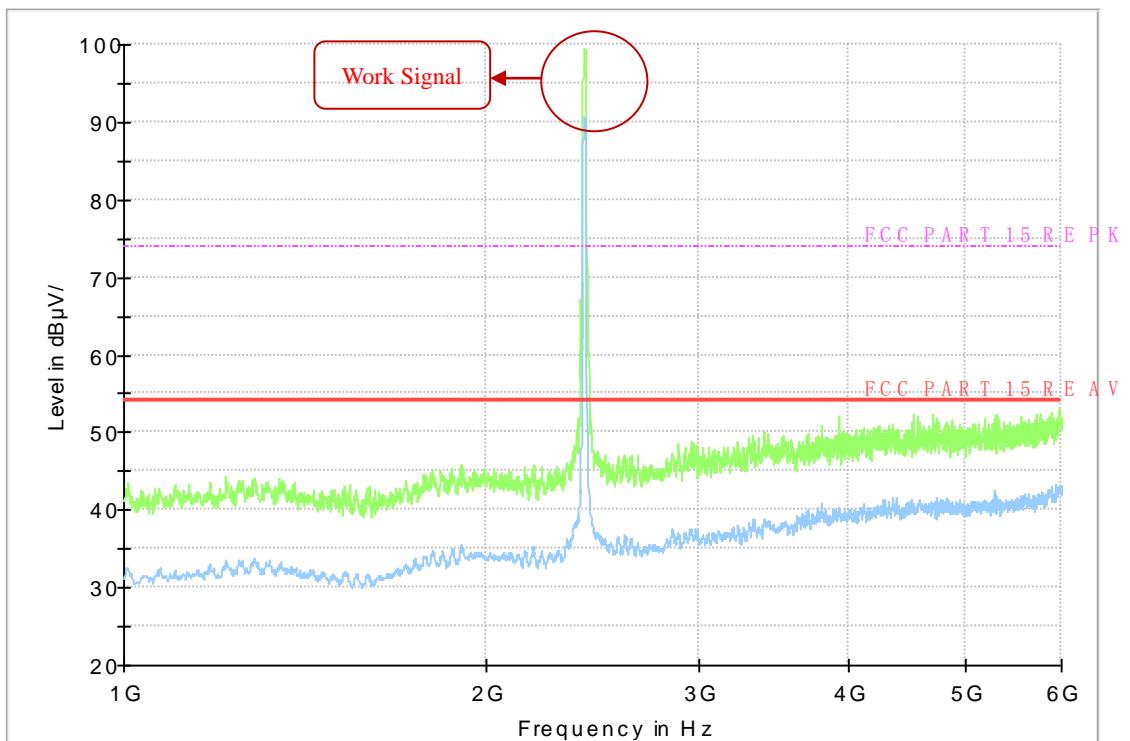


Fig.119 Radiated Emission of channel 1 in 1GHz-6GHz

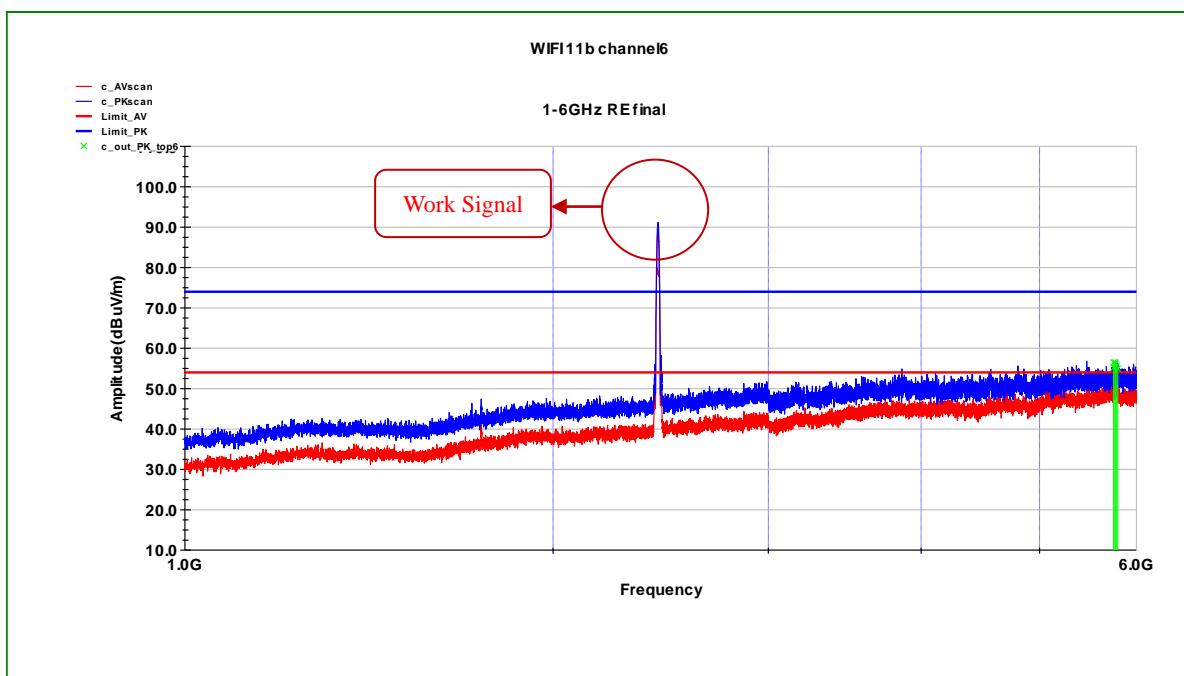


Fig.120 Radiated Emission of channel 6 in 30MHz-1GHz

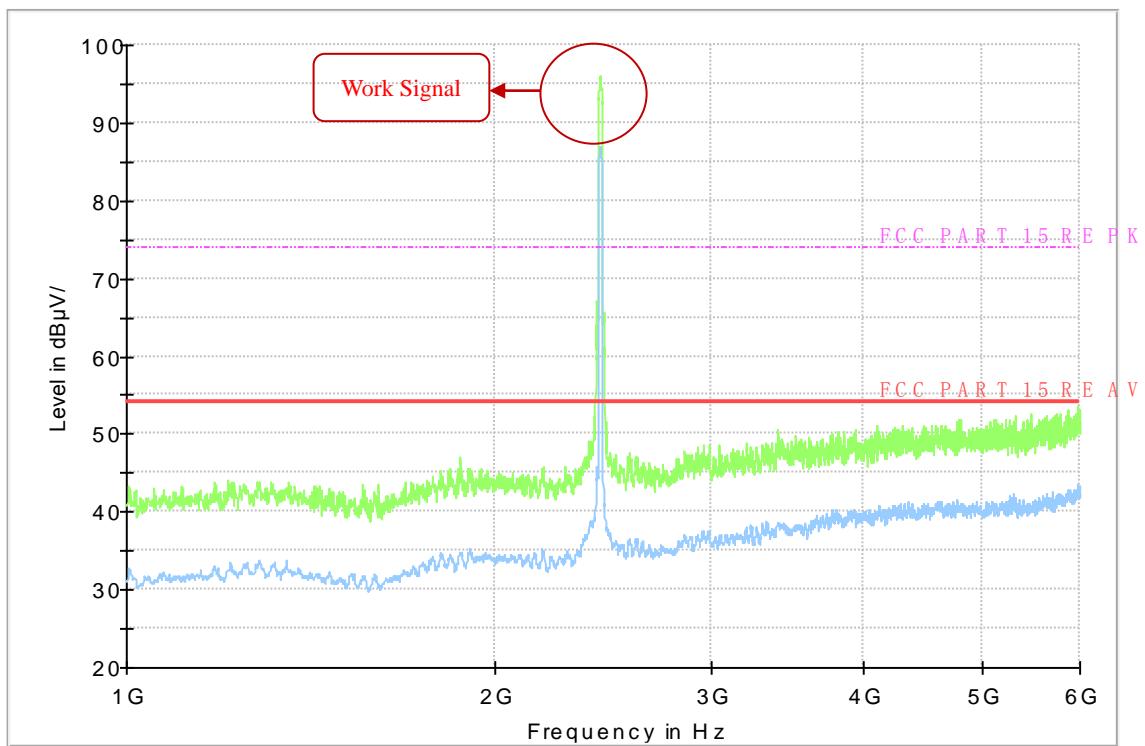


Fig.121 Radiated Emission of channel 6 in 1GHz-6GHz

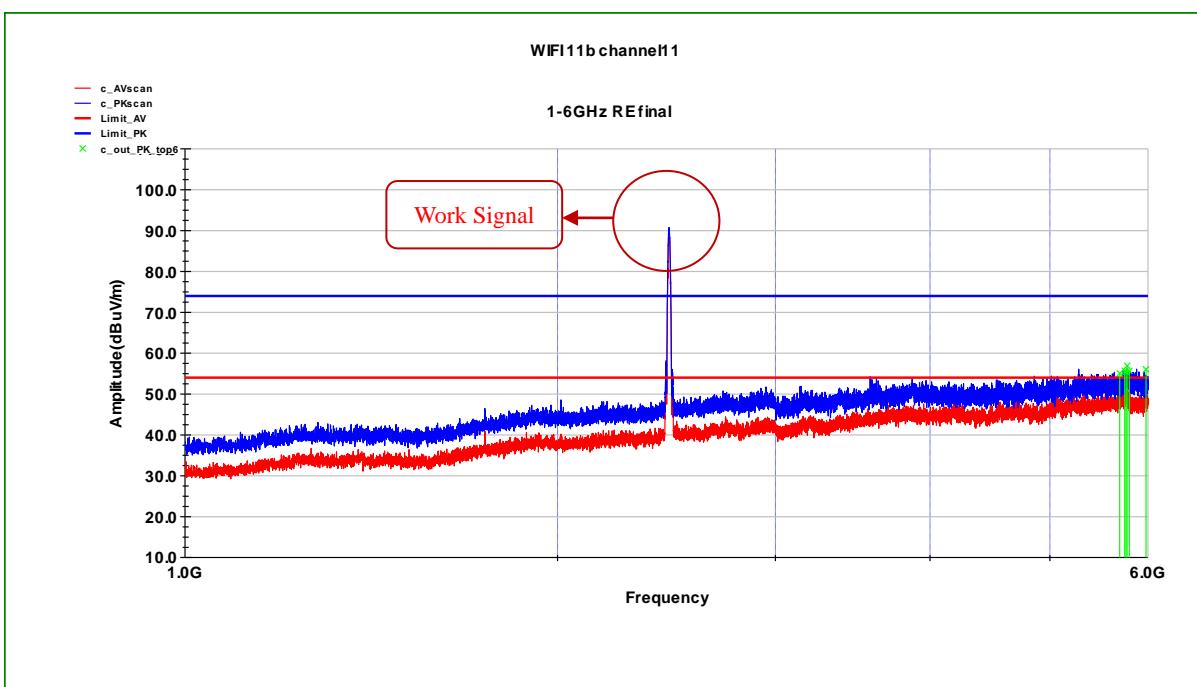


Fig.122 Radiated Emission of channel 11 in 30MHz-1GHz

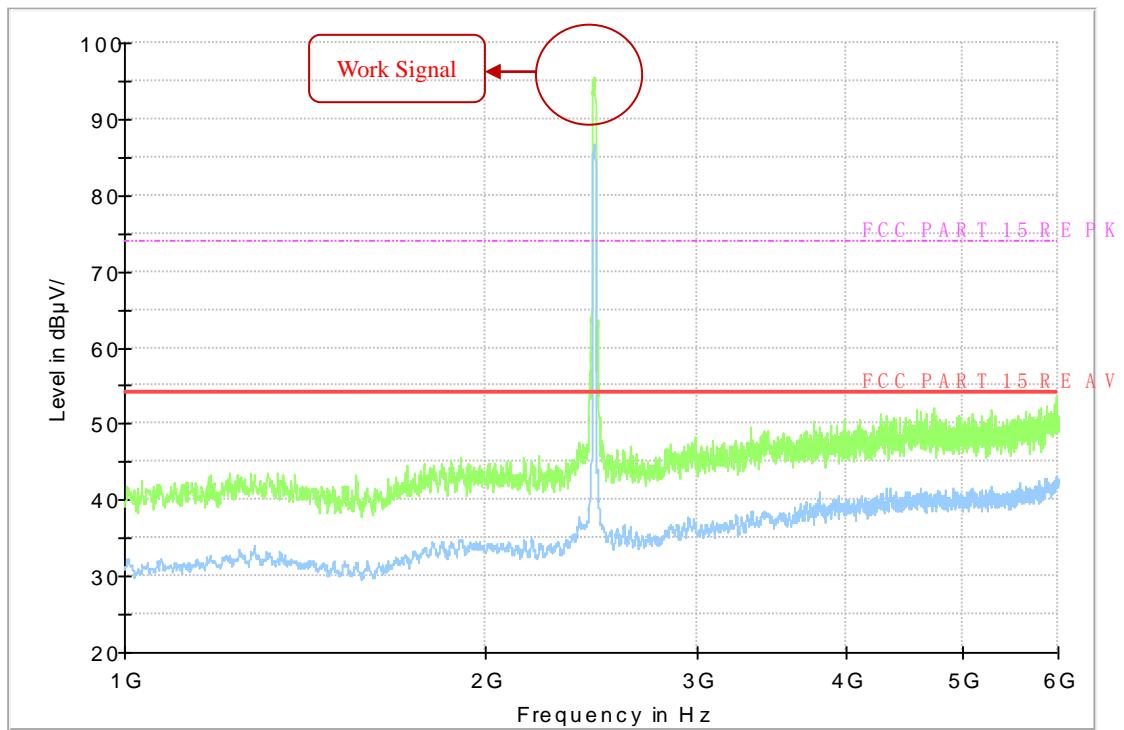


Fig.123 Radiated Emission of channel 11 in 1GHz-6GHz

## B.8 Antenna Requirements

### B.8.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the

same level in dB comparing to gain minus 6dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

**B.8.2 Antenna Connected construction**

The Antenna type used in this product is PIFA Antenna without connector and it is considered to meet antenna requirement.

**B.8.3 Antenna Gain**

The antenna peak gain of EUT is less than 6dBi, Therefore, it is not necessary to reduced maximum peak output power limit.

**ANNEX C: Report Revision History**

<b>Report NO.</b>	<b>Report version</b>	<b>Description</b>	<b>Issue Date</b>
<b>GCCT16CFR01-WIFI</b>	<b>NONE</b>	<b>Original</b>	<b>2015.03.28</b>

**\*\*\*END OF REPORT\*\*\***