



# FCC PART 15C TESTREPORT

No. I18Z60070-IOT13

for

**TCL Communication Ltd.**

**GSM Quad-band/HSPA-UMTS Six-band/ LTE 20-band mobile phone**

**With**

**BBF100-2**

**FCC ID: 2ACCJN025**

**Hardware Version:09**

**Software Version: 4S3L**

**Issued Date: 2018-05-08**



**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

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

**Test Laboratory:**

CTTL, Telecommunication Technology Labs, CAICT

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

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

Email: [ctl\\_terminals@caict.ac.cn](mailto:ctl_terminals@caict.ac.cn), website: [www.caict.ac.cn](http://www.caict.ac.cn)



## **REPORT HISTORY**

<b>Report Number</b>	<b>Revision</b>	<b>Description</b>	<b>Issue Date</b>
I18Z60070-IOT13	Rev.0	1st edition	2018-05-08

## **CONTENTS**

<b>1.</b>	<b>TEST LABORATORY .....</b>	<b>5</b>
<b>1.1.</b>	<b>TESTING LOCATION .....</b>	<b>5</b>
<b>1.2.</b>	<b>TESTING ENVIRONMENT.....</b>	<b>5</b>
<b>1.3.</b>	<b>PROJECT DATA .....</b>	<b>5</b>
<b>1.4.</b>	<b>SIGNATURE.....</b>	<b>5</b>
<b>2.</b>	<b>CLIENT INFORMATION.....</b>	<b>6</b>
<b>2.1.</b>	<b>APPLICANT INFORMATION.....</b>	<b>6</b>
<b>2.2.</b>	<b>MANUFACTURER INFORMATION.....</b>	<b>6</b>
<b>3.</b>	<b>EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) .....</b>	<b>7</b>
<b>3.1.</b>	<b>ABOUT EUT .....</b>	<b>7</b>
<b>3.2.</b>	<b>INTERNAL IDENTIFICATION OF EUT .....</b>	<b>7</b>
<b>3.3.</b>	<b>INTERNAL IDENTIFICATION OF AE .....</b>	<b>7</b>
<b>3.4.</b>	<b>EUT SET-UPS .....</b>	<b>8</b>
<b>3.5.</b>	<b>GENERAL DESCRIPTION .....</b>	<b>8</b>
<b>3.6.</b>	<b>INTERPRETATION OF THE TEST ENVIRONMENT .....</b>	<b>8</b>
<b>4.</b>	<b>REFERENCE DOCUMENTS .....</b>	<b>8</b>
<b>4.1.</b>	<b>DOCUMENTS SUPPLIED BY APPLICANT .....</b>	<b>8</b>
<b>4.2.</b>	<b>REFERENCE DOCUMENTS FOR TESTING .....</b>	<b>8</b>
<b>5.</b>	<b>TEST RESULTS .....</b>	<b>9</b>
<b>5.1.</b>	<b>SUMMARY OF TEST RESULTS .....</b>	<b>9</b>
<b>5.2.</b>	<b>STATEMENTS.....</b>	<b>9</b>
<b>5.3.</b>	<b>TEST CONDITIONS.....</b>	<b>9</b>
<b>6.</b>	<b>TEST FACILITIES UTILIZED .....</b>	<b>10</b>
<b>7.</b>	<b>MEASUREMENT UNCERTAINTY .....</b>	<b>11</b>
<b>7.1.</b>	<b>MAXIMUM OUTPUT POWER .....</b>	<b>11</b>
<b>7.2.</b>	<b>PEAK POWER SPECTRAL DENSITY.....</b>	<b>11</b>
<b>7.3.</b>	<b>DTS 6-DB SIGNAL BANDWIDTH .....</b>	<b>11</b>
<b>7.4.</b>	<b>BAND EDGES COMPLIANCE.....</b>	<b>11</b>
<b>7.5.</b>	<b>TRANSMITTER SPURIOUS EMISSION.....</b>	<b>11</b>
<b>7.6.</b>	<b>AC POWER-LINE CONDUCTED EMISSION.....</b>	<b>11</b>

<b>ANNEX A: DETAILED TEST RESULTS.....</b>	<b>12</b>
<b>A.1. MEASUREMENT METHOD.....</b>	<b>12</b>
<b>A.2. MAXIMUM OUTPUT POWER.....</b>	<b>13</b>
A.2.1. PEAK OUTPUT POWER-CONDUCTED .....	13
A.2.2. AVERAGE OUTPUT POWER-CONDUCTED.....	14
<b>A.3. PEAK POWER SPECTRAL DENSITY.....</b>	<b>16</b>
<b>A.4. DTS 6-DB SIGNAL BANDWIDTH .....</b>	<b>23</b>
<b>A.5. BAND EDGES COMPLIANCE .....</b>	<b>30</b>
<b>A.6. TRANSMITTER SPURIOUS EMISSION.....</b>	<b>35</b>
A.6.1 TRANSMITTER SPURIOUS EMISSION – CONDUCTED .....	35
A.6.2 TRANSMITTER SPURIOUS EMISSION - RADIATED .....	88
<b>A.7. AC POWER-LINE CONDUCTED EMISSION .....</b>	<b>103</b>
<b>ANNEX B: ACCREDITATION CERTIFICATE.....</b>	<b>107</b>



## 1. Test Laboratory

### 1.1. Testing Location

Conducted testing Location: CTTL(huayuan North Road)

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

Radiated testing Location: CTTL(BDA)

Address: No. 18 Jia Kangding Street, BDA District, Beijing, P. R.  
China 100191

### 1.2. Testing Environment

Normal Temperature: 15-35°C

Extreme Temperature: -10/+55°C

Relative Humidity: 20-75%

### 1.3. Project data

Testing Start Date: 2018-04-08

Testing End Date: 2018-05-04

### 1.4. Signature

A handwritten signature in black ink, appearing to read "江雪".

Jiang Xue

(Prepared this test report)

A handwritten signature in black ink, appearing to read "郑伟".

Zheng Wei

(Reviewed this test report)

A handwritten signature in black ink, appearing to read "吕松东".

Lv Songdong

(Approved this test report)



## **2. Client Information**

### **2.1. Applicant Information**

Company Name: TCL Communication Ltd.  
Address: 7/F, Block F4, TCL International E City, Zhong Shan Yuan Road,  
Nanshan District, Shenzhen, Guangdong, P.R. China 518052  
City: Shenzhen  
Postal Code: 518052  
Country: China  
Telephone: 0086-755-36611722  
Fax: 0086-75536612000-81722

### **2.2. Manufacturer Information**

Company Name: TCL Communication Ltd.  
Address: 7/F, Block F4, TCL International E City, Zhong Shan Yuan Road,  
Nanshan District, Shenzhen, Guangdong, P.R. China 518052  
City: Shenzhen  
Postal Code: 518052  
Country: China  
Telephone: 0086-755-36611722  
Fax: 0086-75536612000-81722

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

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

Description	GSM Quad-band/HSPA-UMTS Six-band/ LTE 20-band mobile phone
Model name	BBF100-2
FCC ID	2ACCJN025
IC ID	/
With WLAN Function	Yes
Frequency Range	ISM 2400MHz~2483.5MHz
Type of Modulation	DSSS/CCK/OFDM
Number of Channels	11
Antenna Type	Integral Antenna
MAX Conducted Power	26.71dBm(OFDM)
Power Supply	3.85V DC by Battery

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

EUT ID*	SN or IMEI	HW Version	SW Version
EUT5	015103000009816	09	4S3L
EUT2	015103000009907	09	4S3L

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

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

AE ID*	Description	SN	Remarks
AE1	Battery	/	Inbuilt
AE2	Charger	/	18TCT-CH-0157
AE3	USB Cable	/	18TCT-DC-0049
AE1			
Model		TLp035B1	
Manufacturer		BYD	
Capacitance		3360mAh	
Nominal voltage		3.85V	
AE2			
Model		CBA0064AGBC1(QC13US)	
Manufacturer		BYD	
Length of cable		/	
AE3			
Model		CDA0000105CF(DC10)	
Manufacturer		LUXSHARE	
Length of cable		/	

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

### **3.4. EUT set-ups**

EUT set-up No.	Combination of EUT and AE	Remarks
Set.11	EUT5+ AE1+ AE2+ AE3	WIFI

### **3.5. General Description**

The Equipment under Test (EUT) is a model of GSM Quad-band/HSPA-UMTS Six-band/ LTE 20-band mobile phone with integrated antenna and inbuilt battery.

It has Bluetooth (EDR) function.

It consists of normal options: travel charger, USB cable and Phone.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

### **3.6. Interpretation of the Test Environment**

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

Measurement Uncertainty

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

## **4. Reference Documents**

### **4.1. Documents supplied by applicant**

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

### **4.2. Reference Documents for testing**

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902-928MHz, 2400-2483.5 MHz, and 5725-5850 MHz.	2016
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013

## **5. Test Results**

### **5.1. Summary of Test Results**

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15C	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.247 (b)	/	P
Peak Power Spectral Density	15.247 (e)	/	P
Occupied 6dB Bandwidth	15.247 (a)	/	P
Band Edges Compliance	15.247 (d)	/	P
Transmitter Spurious Emission - Conducted	15.247 (d)	/	P
Transmitter Spurious Emission - Radiated	15.247, 15.205, 15.209	/	P
AC Powerline Conducted Emission	15.107, 15.207	/	P

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

Terms used in Verdict column

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

### **5.2. Statements**

The test cases as listed in section 5.1 of this report for the EUT specified in section 3 was performed by CTTL and according to the standards or reference documents listed in section 4.2. The EUT met all requirements of the standards or reference documents, and only the WLAN function was tested in this report.

### **5.3. Test Conditions**

T nom	Normal Temperature
T min	Low Temperature
T max	High Temperature
V nom	Normal Voltage

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

Temperature	T nom	26°C
Voltage	V nom	3.85V (By battery)
Humidity	H nom	44%

## **6. Test Facilities Utilized**

### **Conducted test system**

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	1 year	2018-06-01
2	Test Receiver	ESCI 3	100344	Rohde & Schwarz	1 year	2019-02-28
3	LISN	ENY216	101200	Rohde & Schwarz	1 year	2019-04-15
4	Shielding Room	S81	/	ETS-Lindgren	/	/

### **Radiated emission test system**

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100376	Rohde & Schwarz	1 year	2018-12-30
2	BiLog Antenna	VULB9163	514	Schwarzbeck	3 years	2021-01-03
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	3 years	2020-05-31
6	EMI Antenna	3117	00139065	ETS-Lindgren	3 Years	2020-11-15
7	Spectrum Analyzer	FSV40	101047	Rohde & Schwarz	1 year	2018-07-22

## **7. Measurement Uncertainty**

### **7.1. Maximum Output Power**

Measurement Uncertainty: 0.339dB, k=1.96

### **7.2. Peak Power Spectral Density**

Measurement Uncertainty: 0.705dBm/MHz, k=1.96

### **7.3. DTS 6-dB Signal Bandwidth**

Measurement Uncertainty: 60.80Hz, k=1.96

### **7.4. Band Edges Compliance**

Measurement Uncertainty : 0.62dBm, k=1.96

### **7.5. Transmitter Spurious Emission**

#### **Conducted (k=1.96)**

Frequency Range	Uncertainty(dBm)
30MHz ≤ f ≤ 2GHz	1.22
2GHz ≤ f ≤ 3.6GHz	1.22
3.6GHz ≤ f ≤ 8GHz	1.22
8GHz ≤ f ≤ 12.75GHz	1.51
12.75GHz ≤ f ≤ 26GHz	1.51
26GHz ≤ f ≤ 40GHz	1.59

#### **Radiated (k=2)**

Frequency Range	Uncertainty(dBm)
30MHz ≤ f ≤ 1GHz	4.86
1GHz ≤ f ≤ 18GHz	5.26
18GHz ≤ f ≤ 40GHz	5.28

### **7.6. AC Power-line Conducted Emission**

Measurement Uncertainty : 3.38dBm, k=2

## **ANNEX A: Detailed Test Results**

### **A.1. Measurement Method**

#### **A.1.1. Conducted Measurements**

Connect the EUT to the test system as Fig.A.1.1.1 shows.

Set the EUT to the required work mode.

Set the EUT to the required channel.

Set the Vector Signal Analyzer and start measurement.

Record the values. Vector Signal Analyzer

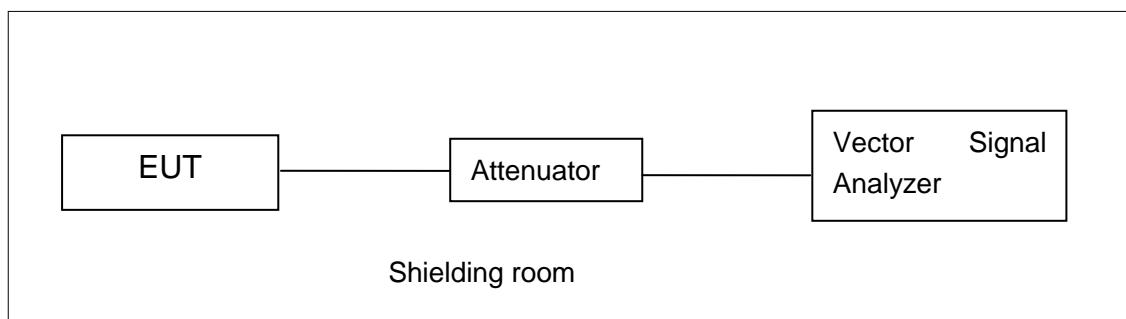


Fig.A.1.1.1: Test Setup Diagram for Conducted Measurements

#### **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;

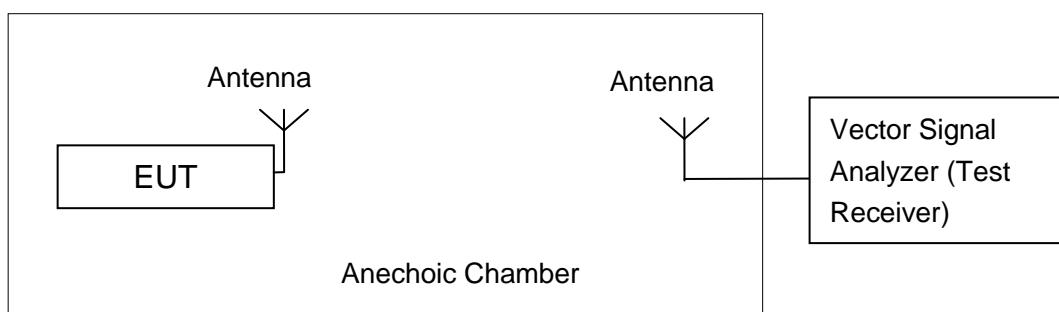


Fig.A.1.2.1: Test Setup Diagram for Radiated Measurements

## A.2. Maximum Output Power

**Method of Measurement: See ANSI C63.10-2013-clause 11.9.1.2**

- a) Set the RBW = 1 MHz.
- b) Set the VBW = 3 MHz.
- c) Set the span  $\geq [1.5 \times \text{DTS bandwidth}]$ .
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select the peak detector).

**Measurement Limit:**

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

**EUT ID: EUT2**

### **A.2.1. Peak Output Power-conducted**

**Measurement Results:**

#### **802.11b/g mode**

Mode	Data Rate (Mbps)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	1	21.65	/	/
	2	22.03	/	/
	5.5	23.46	/	/
	11	24.96	25.35	25.19
802.11g	6	24.36	/	/
	9	24.49	/	/
	12	24.24	/	/
	18	25.08	/	/
	24	25.51	/	/
	36	25.73	/	/
	48	25.88	/	/
	54	25.94	26.41	26.10

The data rate 11Mbps and 54Mbps are selected as worse condition, and the following cases are performed with this condition.

**802.11n-HT20 mode**

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11n (20MHz)	MCS0	23.32	/	/
	MCS1	23.12	/	/
	MCS2	24.04	/	/
	MCS3	24.25	/	/
	MCS4	24.62	/	/
	MCS5	24.80	/	/
	MCS6	24.82	24.13	24.98
	MCS7	24.75	/	/

The data rate MCS6 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)		
		2422MHz (Ch3)	2437MHz (Ch6)	2452 MHz (Ch9)
802.11n (40MHz)	MCS0	25.13	/	/
	MCS1	24.92	/	/
	MCS2	25.00	/	/
	MCS3	25.50	/	/
	MCS4	26.15	/	/
	MCS5	26.39	26.51	26.71
	MCS6	26.38	/	/
	MCS7	26.32	/	/

The data rate MCS5 is selected as worse condition, and the following cases are performed with this condition.

**Conclusion: Pass**
**A.2.2. Average Output Power-conducted**
**Method of Measurement: See ANSI C63.10-2013-clause 11.9.2.2.2**

The procedure for this method is as follows:

- Set span = 80MHz.
- Set RBW = 1MHz.
- Set VBW = 3MHz
- Number of points in sweep = 625
- Sweep time = auto.
- Detector = RMS.
- The trigger shall be set to "free run."
- Trace average 100 traces in power averaging (rms) mode.
- Compute power by integrating the spectrum across the OBW of the signal using the instrument's

band power measurement function, with band limits set equal to the OBW band edges.

**802.11b/g mode**

Mode	Test Result (dBm)		
	2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	18.32	18.50	18.42
802.11g	16.48	17.11	17.09

**802.11n-HT20 mode**

Mode	Test Result (dBm)		
	2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11n (20MHz)	15.37	15.94	15.91

**802.11n-HT40 mode**

Mode	Test Result (dBm)		
	2422MHz (Ch3)	2437MHz (Ch6)	2452 MHz (Ch9)
802.11n(40MHz)	16.23	16.67	16.84

**Conclusion: Pass**

### A.3. Peak Power Spectral Density

**Method of Measurement:** See ANSI C63.10-2013-clause 11.10.2

- 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 to RBW = 3 kHz.
- d) Set the VBW = 10 kHz.
- 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 within the RBW.

**Measurement Limit:**

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

**Measurement Results:**

**802.11b/g mode**

Mode	Channel	Power Spectral Density ( dBm/3 kHz )		Conclusion
802.11b	1	Fig.A.3.1	-2.08	P
	6	Fig.A.3.2	-1.10	P
	11	Fig.A.3.3	-1.01	P
802.11g	1	Fig.A.3.4	-11.28	P
	6	Fig.A.3.5	-9.91	P
	11	Fig.A.3.6	-10.74	P

**802.11n-HT20 mode**

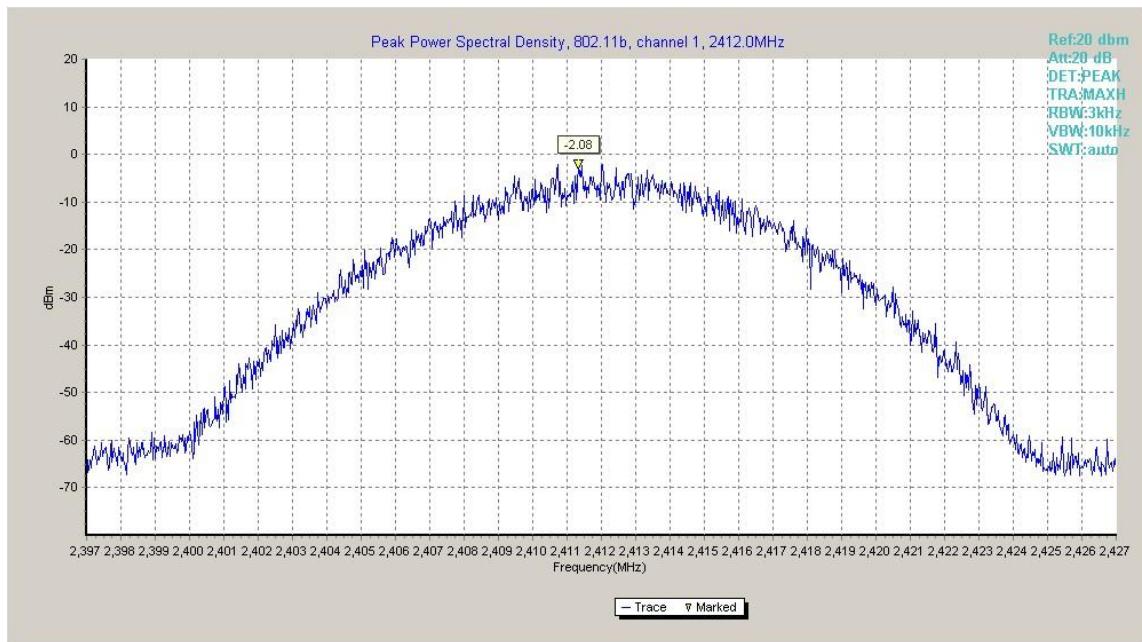
Mode	Channel	Power Spectral Density ( dBm/3 kHz )		Conclusion
802.11n (HT20)	1	Fig.A.3.7	-11.11	P
	6	Fig.A.3.8	-10.30	P
	11	Fig.A.3.9	-11.20	P

**802.11n-HT40 mode**

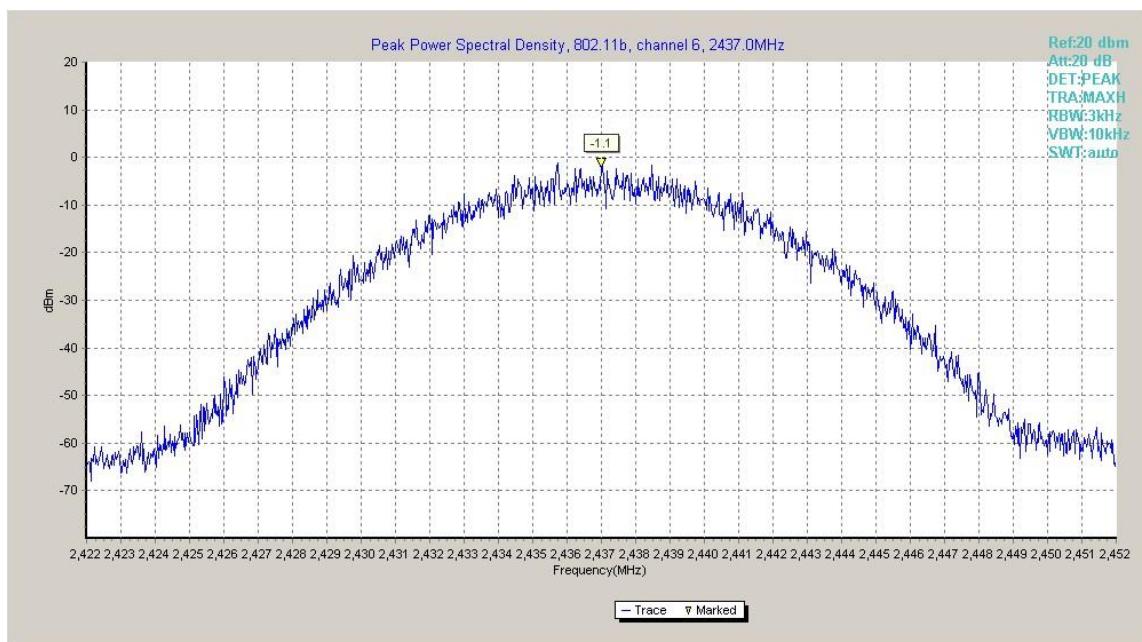
Mode	Channel	Power Spectral Density ( dBm/3 kHz )		Conclusion
802.11n (HT40)	3	Fig.A.3.10	-13.73	P
	6	Fig.A.3.11	-12.36	P
	9	Fig.A.3.12	-11.35	P

**Conclusion: Pass**

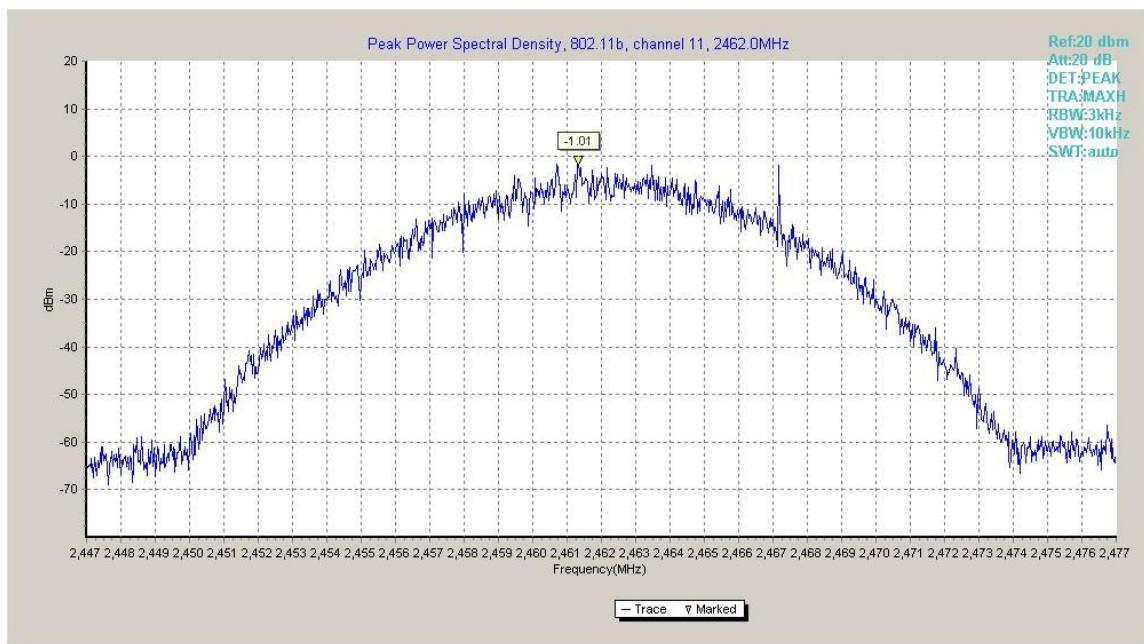
**Test graphs as below:**



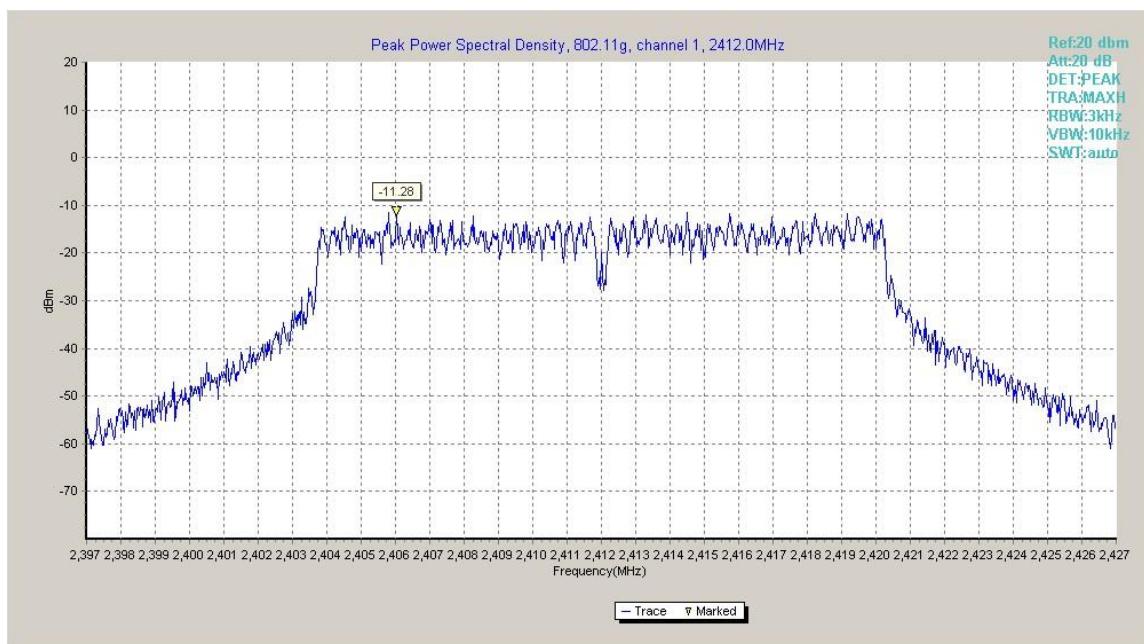
**Fig.A.3.1      Power Spectral Density(802.11b,Ch1)**



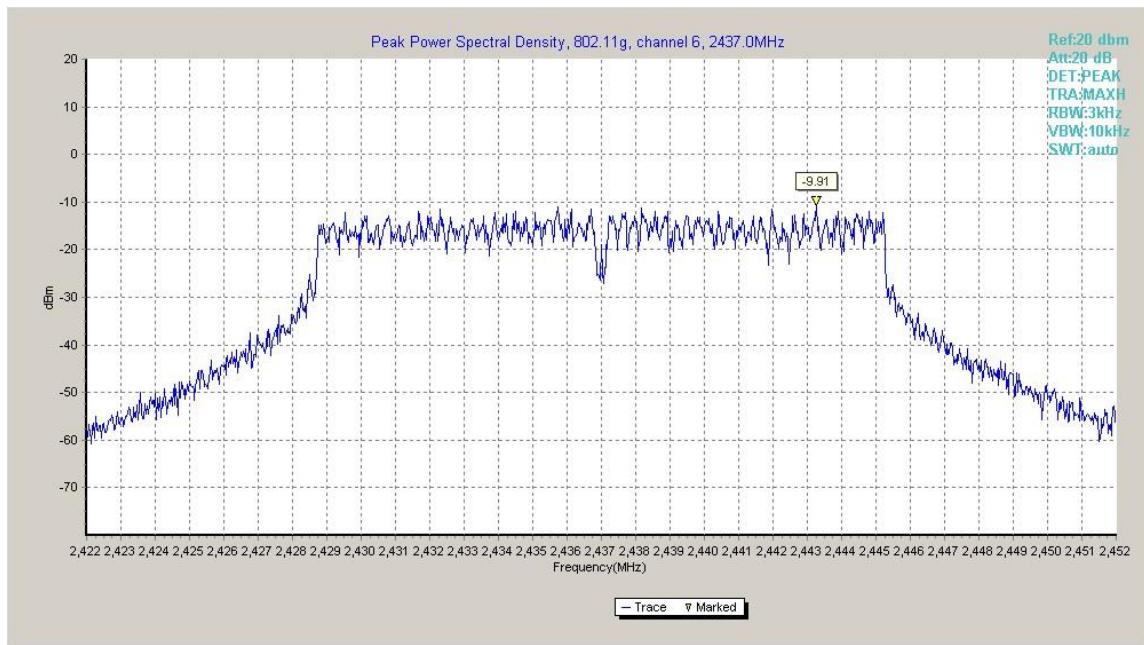
**Fig.A.3.2      Power Spectral Density (802.11b, Ch 6)**



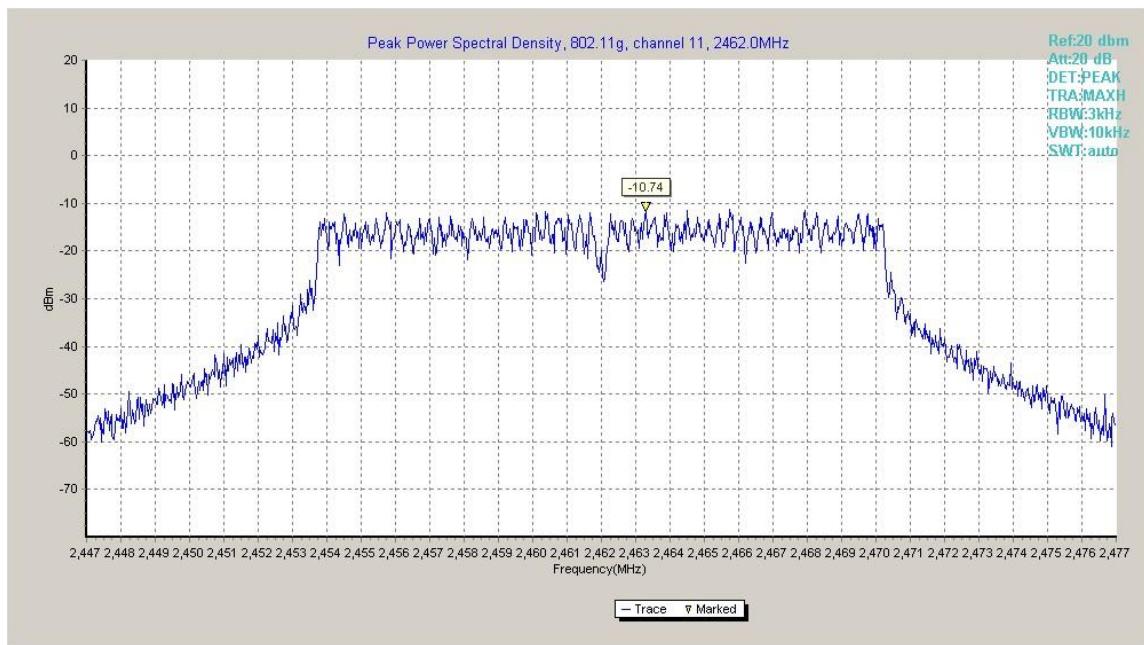
**Fig.A.3.3 Power Spectral Density (802.11b, Ch 11)**



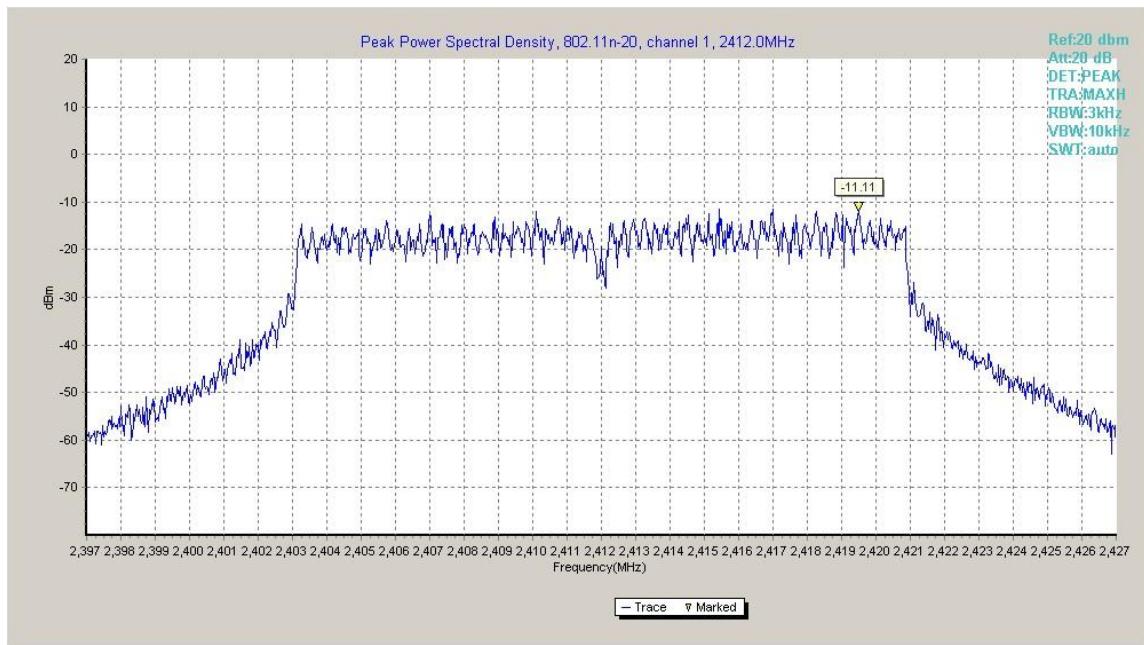
**Fig.A.3.4 Power Spectral Density (802.11g, Ch 1)**



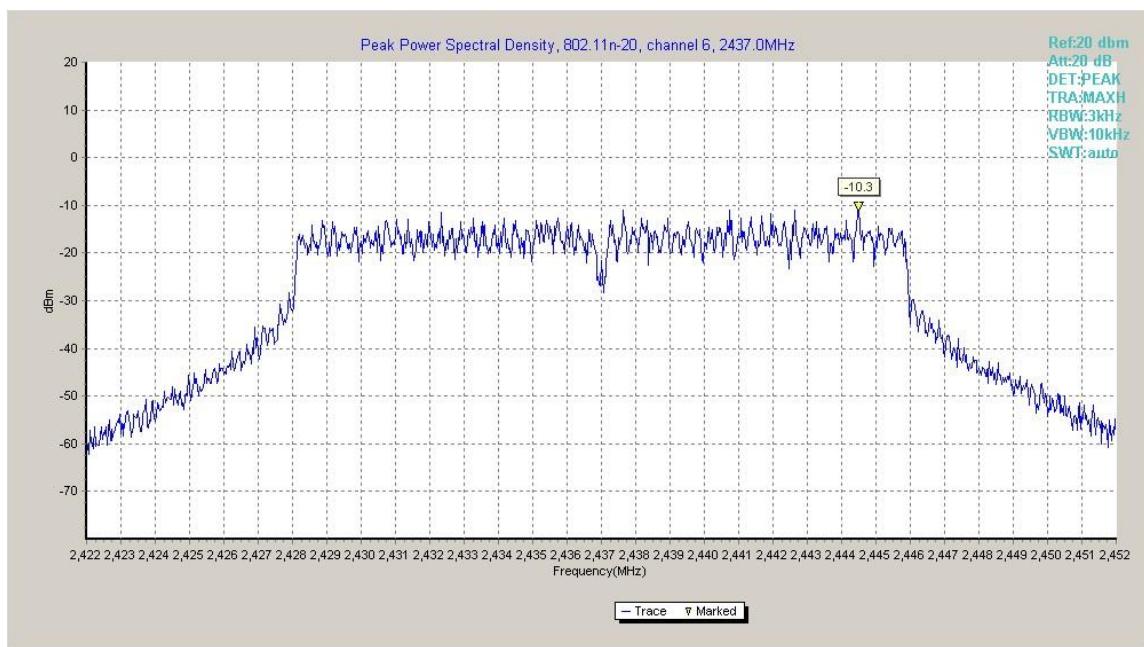
**Fig.A.3.5 Power Spectral Density (802.11g, Ch 6)**



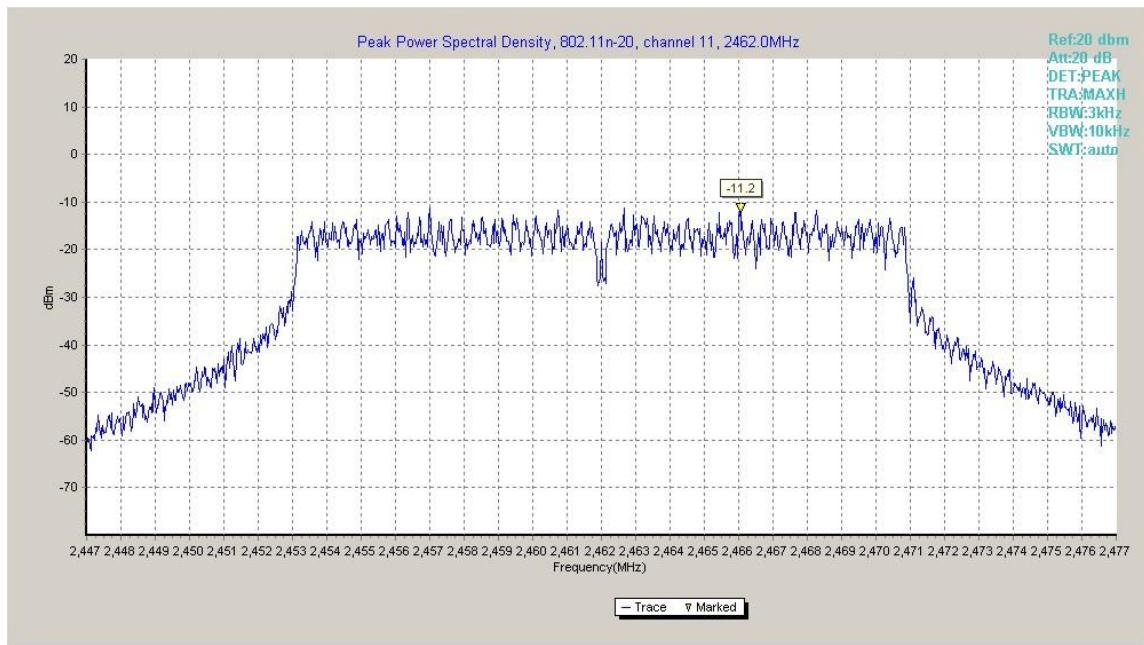
**Fig.A.3.6 Power Spectral Density (802.11g, Ch 11)**



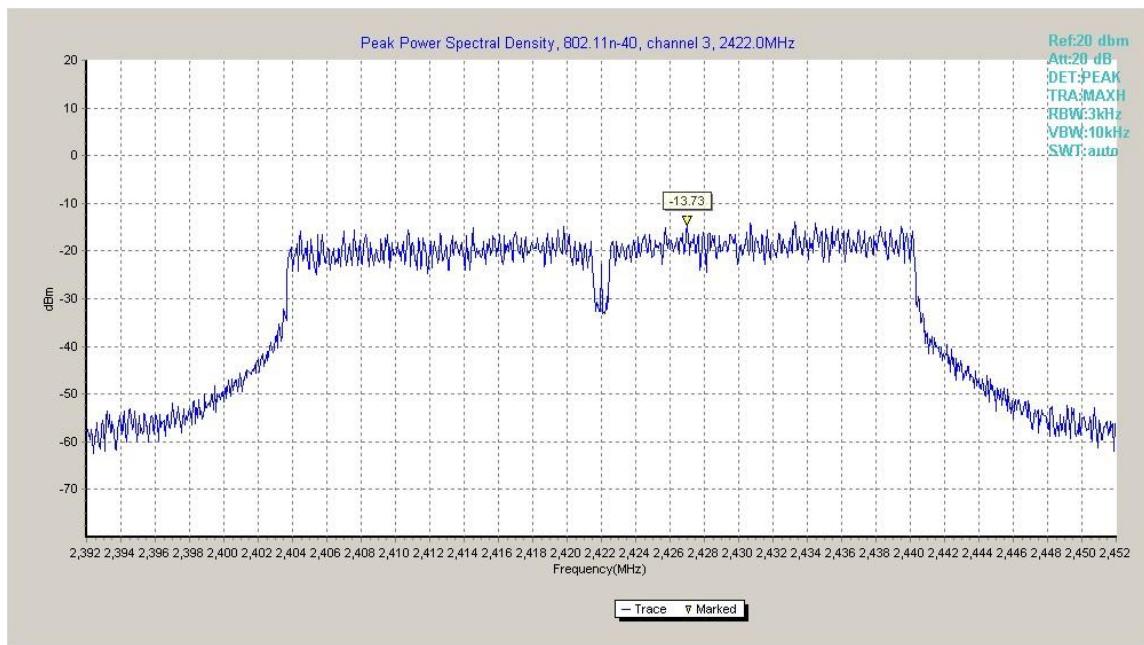
**Fig.A.3.7 Power Spectral Density (802.11n-HT20, Ch 1)**



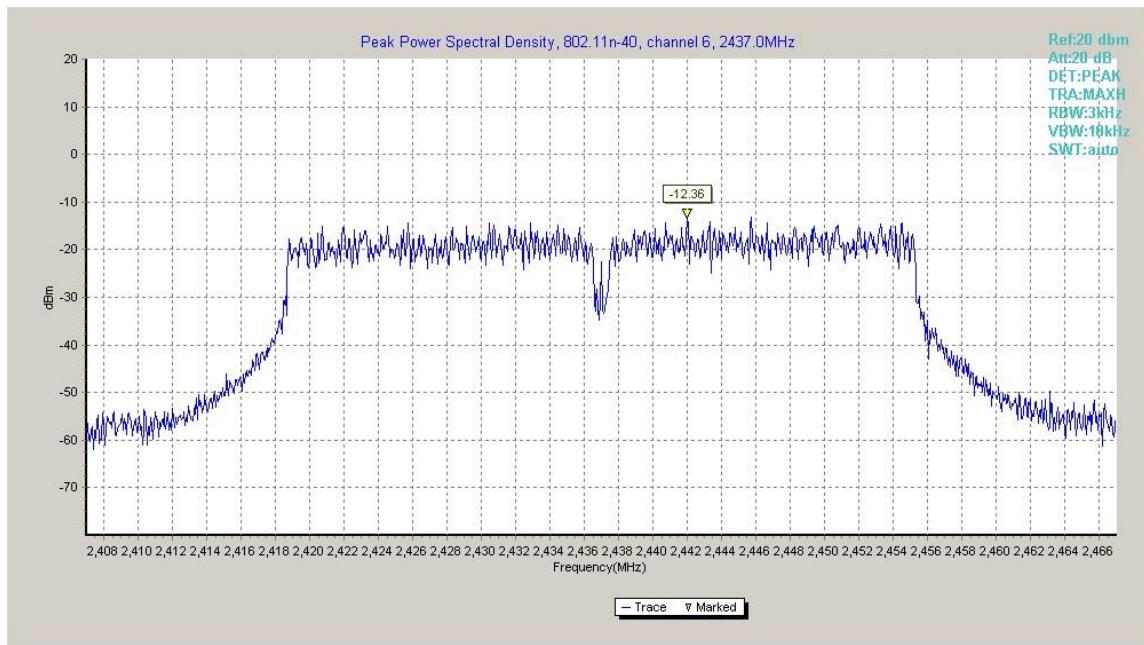
**Fig.A.3.8 Power Spectral Density (802.11n-HT20, Ch 6)**



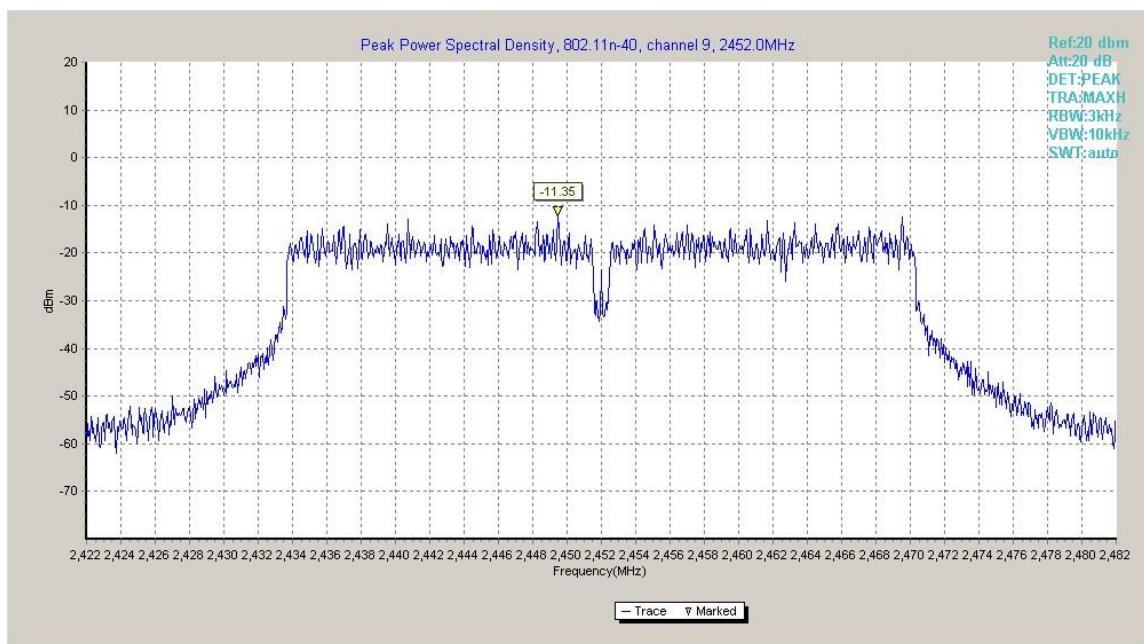
**Fig.A.3.9 Power Spectral Density (802.11n-HT20, Ch 11)**



**Fig.A.3.10 Power Spectral Density (802.11n-HT40, Ch 3)**



**Fig.A.3.11 Power Spectral Density (802.11n-HT40, Ch 6)**



**Fig.A.3.12 Power Spectral Density (802.11n-HT40, Ch 9)**

#### A.4. DTS 6-dB Signal Bandwidth

**Method of Measurement: See ANSI C63.10-2013 section 11.8.1.**

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) = 300 kHz.
- 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.

**Measurement Limit:**

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a)	$\geq 500$

**EUT ID: EUT2**

**Measurement Result:**

**802.11b/g mode**

Mode	Channel	Occupied 6dB Bandwidth ( kHz)		conclusion
802.11b	1	Fig.A.4.1	6550.00	P
	6	Fig.A.4.2	7600.00	P
	11	Fig.A.4.3	7600.00	P
802.11g	1	Fig.A.4.4	16450.00	P
	6	Fig.A.4.5	16450.00	P
	11	Fig.A.4.6	16450.00	P

**802.11n-HT20 mode**

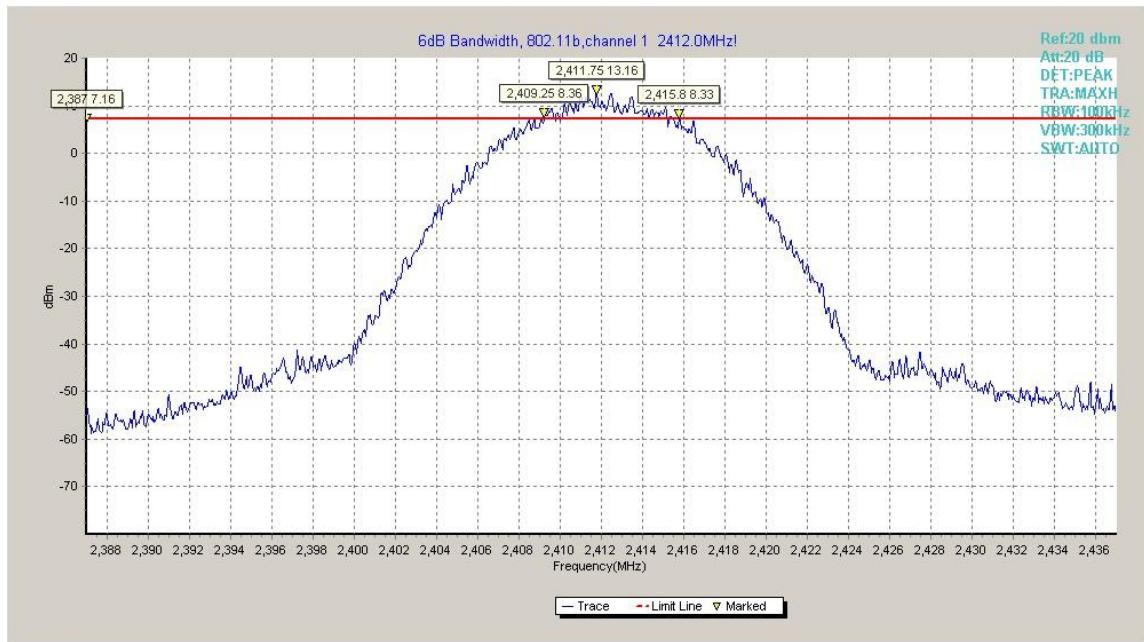
Mode	Channel	Occupied 6dB Bandwidth ( kHz)		conclusion
802.11n (HT20)	1	Fig.A.4.7	17700.00	P
	6	Fig.A.4.8	17600.00	P
	11	Fig.A.4.9	17700.00	P

**802.11n-HT40 mode**

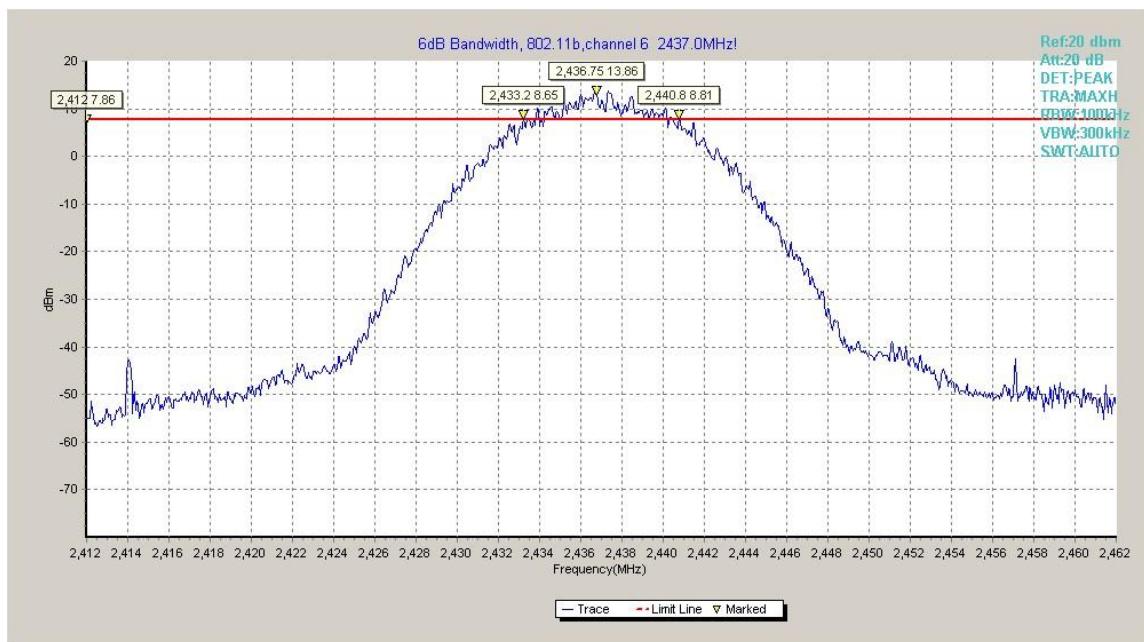
Mode	Channel	Occupied 6dB Bandwidth ( kHz)		conclusion
802.11n (HT40)	3	Fig.A.4.10	36080.00	P
	6	Fig.A.4.11	36400.00	P
	9	Fig.A.4.12	36400.00	P

**Conclusion: Pass**

**Test graphs as below:**



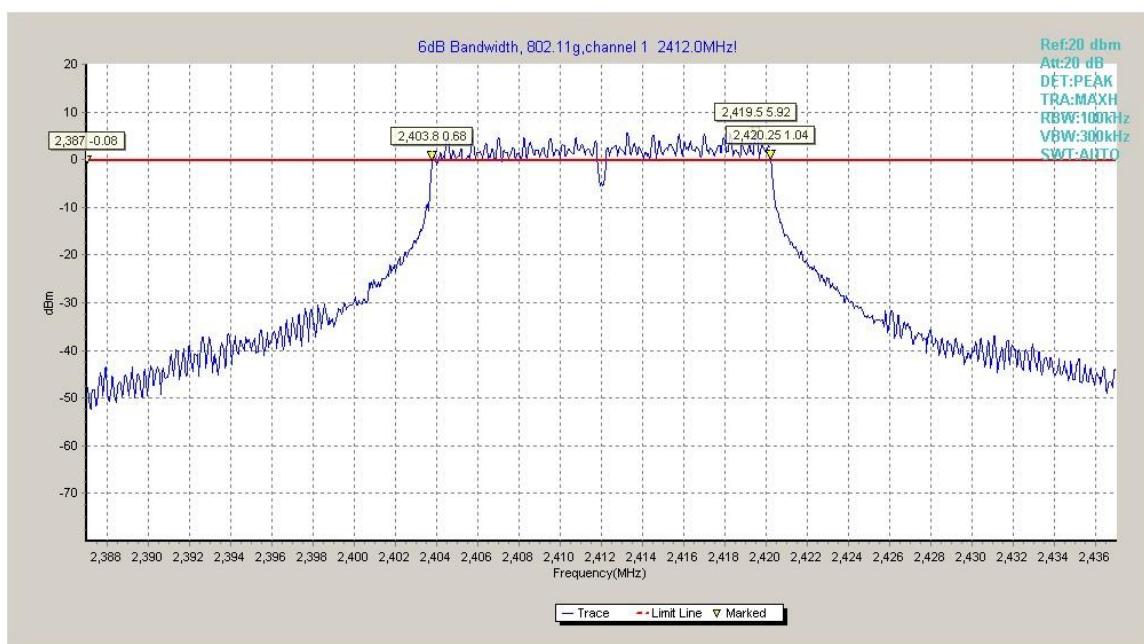
**Fig.A.4.1 Occupied 6dB Bandwidth(802.11b,Ch 1)**



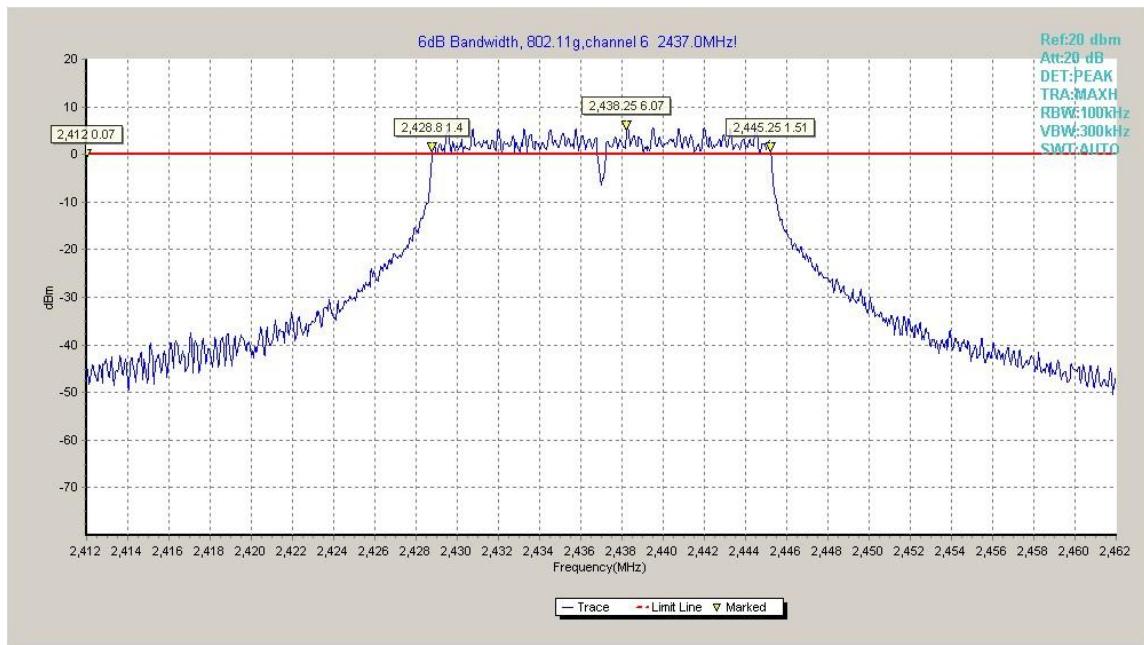
**Fig.A.4.2 Occupied 6dB Bandwidth (802.11b, Ch 6)**



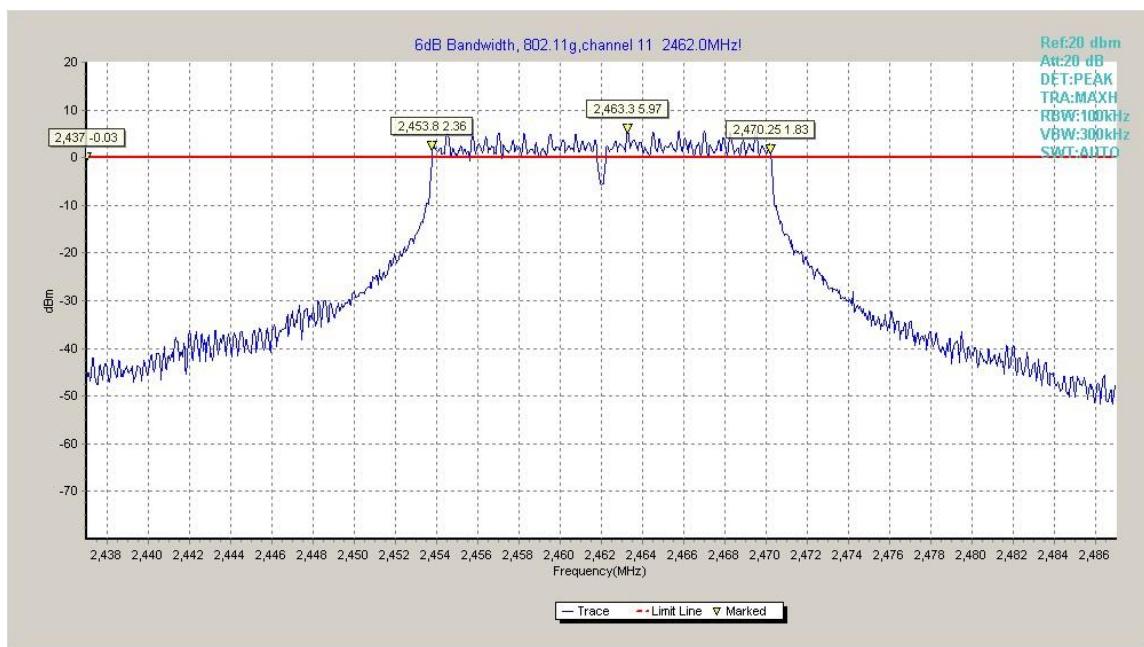
**Fig.A.4.3 Occupied 6dB Bandwidth (802.11b, Ch 11)**



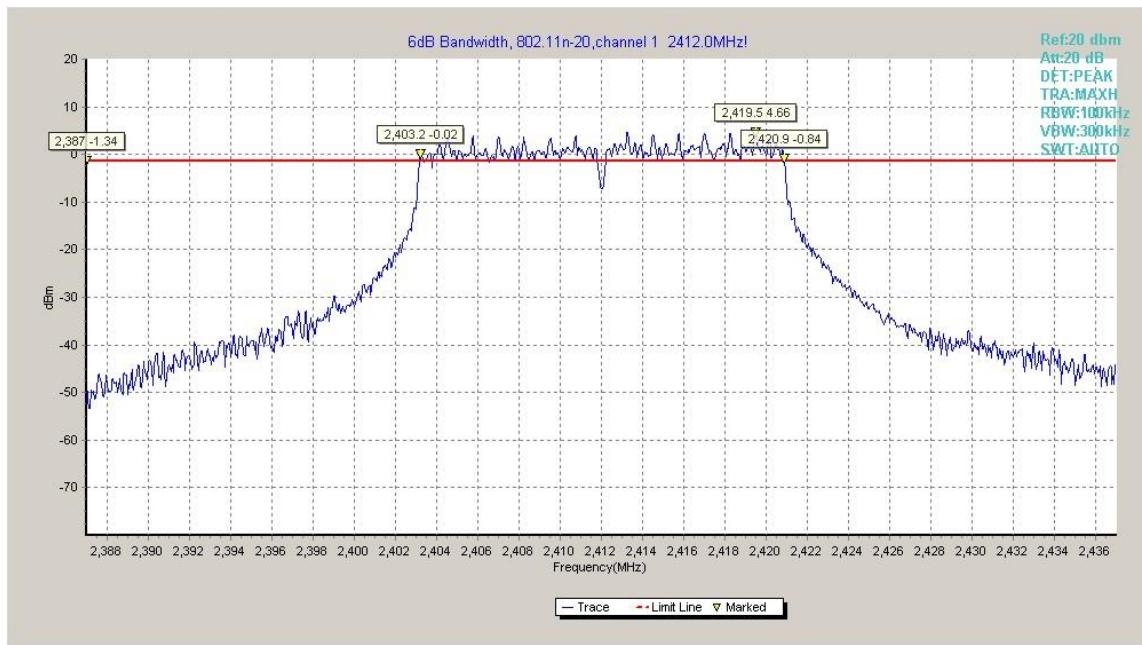
**Fig.A.4.4 Occupied 6dB Bandwidth (802.11g, Ch 1)**



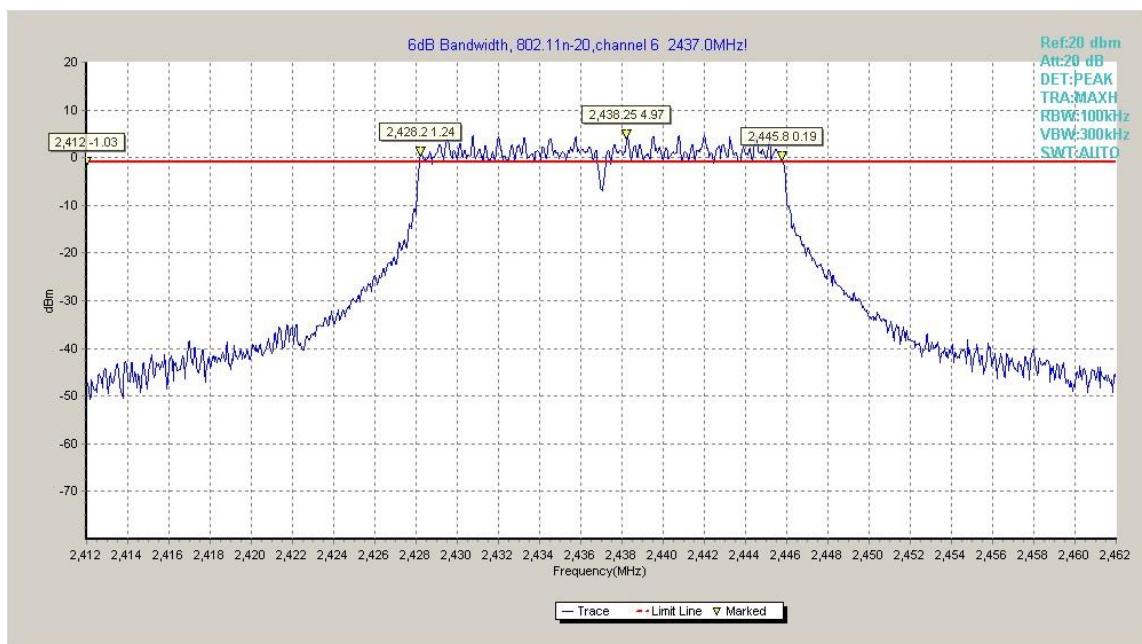
**Fig.A.4.5 Occupied 6dB Bandwidth (802.11g, Ch 6)**



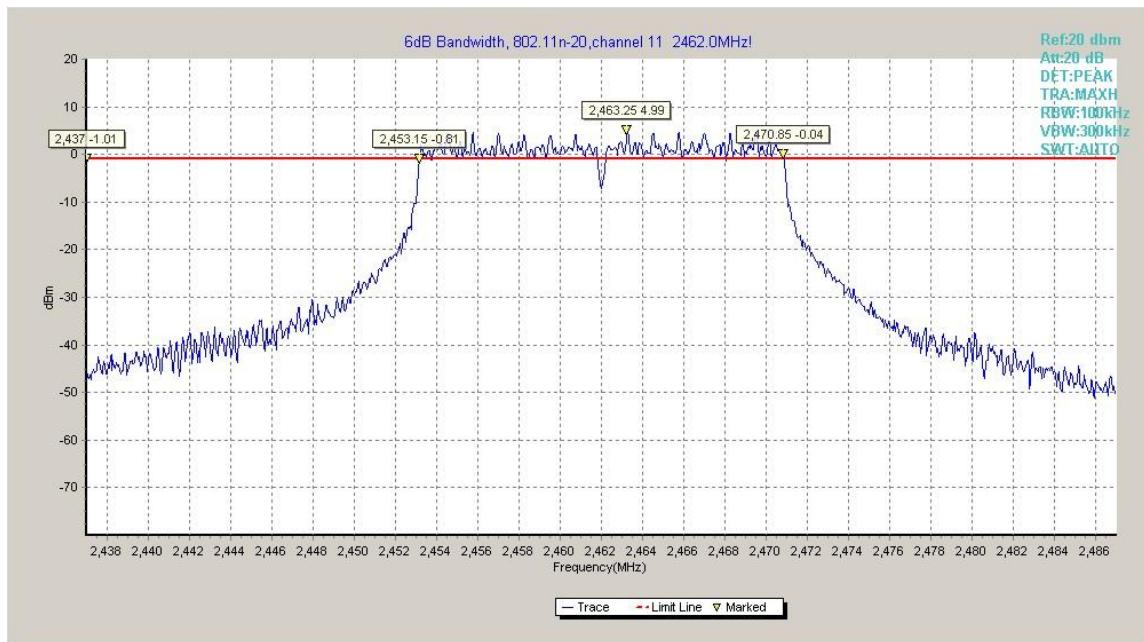
**Fig.A.4.6 Occupied 6dB Bandwidth (802.11g, Ch 11)**



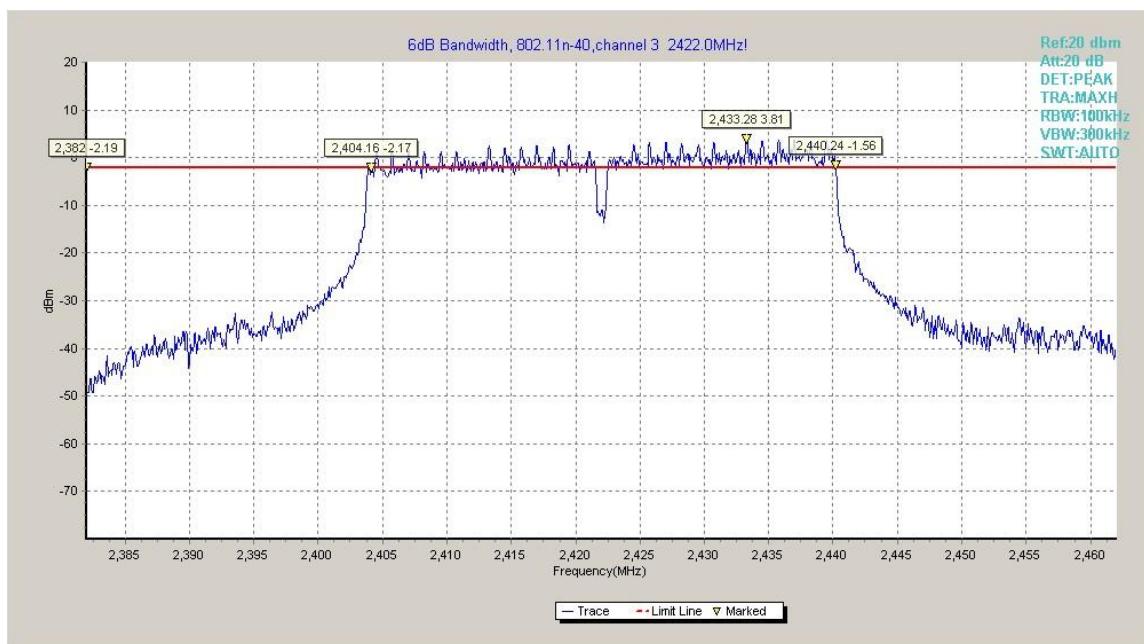
**Fig.A.4.7 Occupied 6dB Bandwidth (802.11n-20MHz, Ch 1)**



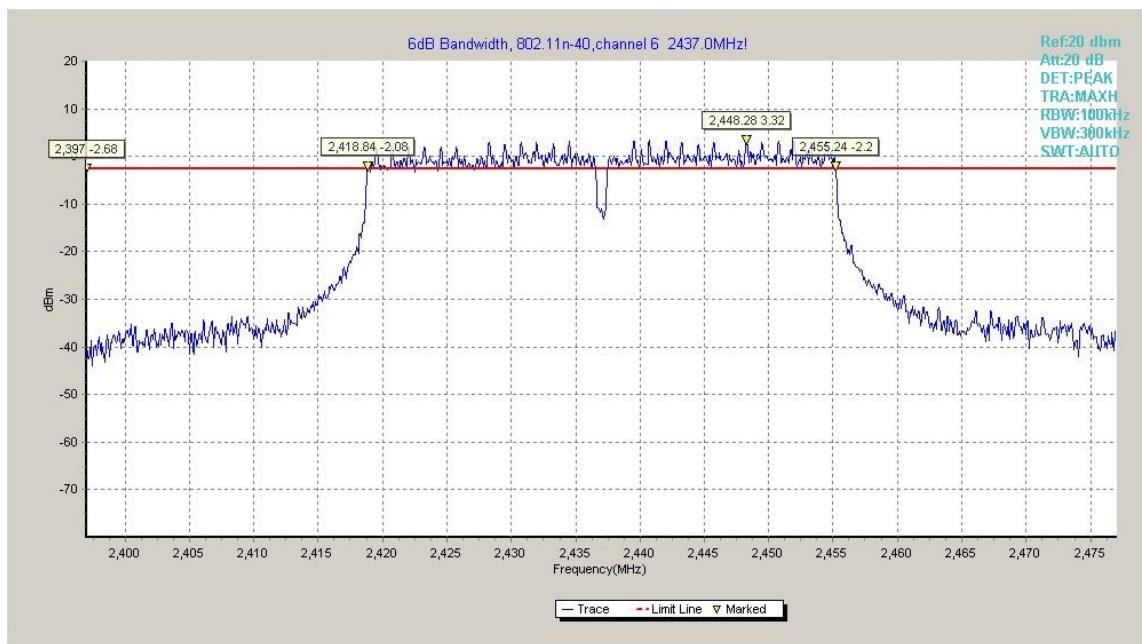
**Fig.A.4.8 Occupied 6dB Bandwidth (802.11n-HT20, Ch 6)**



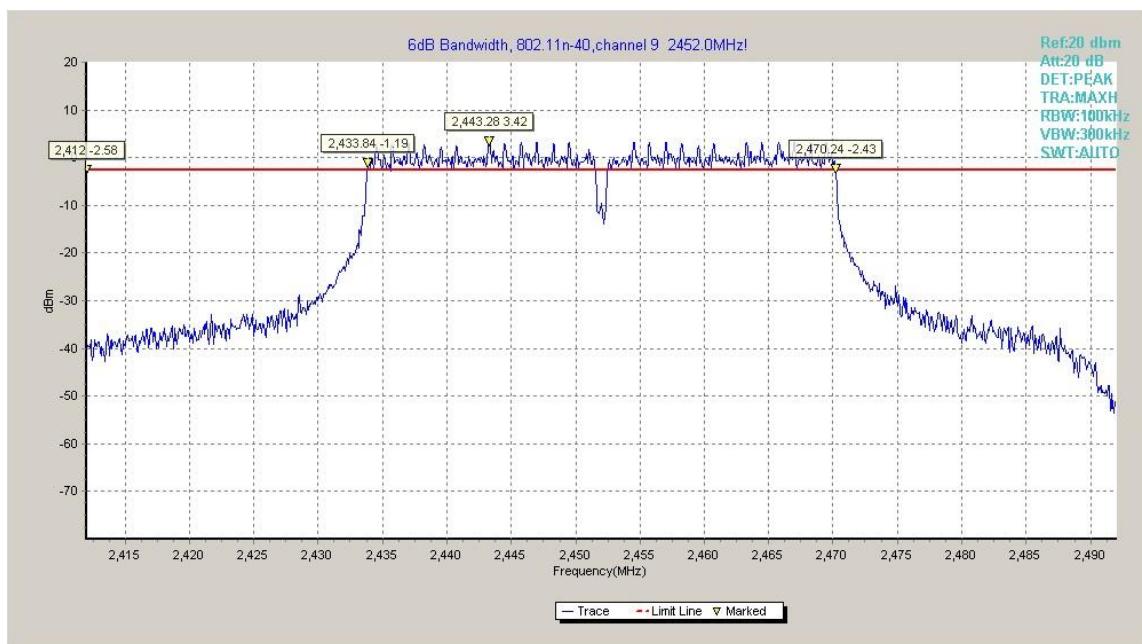
**Fig.A.4.9 Occupied 6dB Bandwidth (802.11n-HT20, Ch 11)**



**Fig.A.4.10 Occupied 6dB Bandwidth (802.11n-40MHz, Ch 3)**



**Fig.A.4.11 Occupied 6dB Bandwidth (802.11n-HT40, Ch 6)**



**Fig.A.4.12 Occupied 6dB Bandwidth (802.11n-HT40, Ch 9)**

## A.5. Band Edges Compliance

**Method of Measurement: See ANSI C63.10-2013-clause 6.10.4**

Connect the spectrum analyzer to the EUT using an appropriate RF cable connected to the EUT output. Configure the spectrum analyzer settings as described below.

- a) Set Span = 100MHz
- b) Sweep Time: coupled
- c) Set the RBW= 100 kHz
- c) Set the VBW= 300 kHz
- d) Detector: Peak
- e) Trace: Max hold

**Measurement Limit:**

Standard	Limit (dBc)
FCC 47 CFR Part 15.247 (d)	> 20

**EUT ID: EUT2**

**Measurement Result:**

### 802.11b/g mode

Mode	Channel	Test Results	Conclusion
802.11b	1	Fig.A.5.1	P
	11	Fig.A.5.2	P
802.11g	1	Fig.A.5.3	P
	11	Fig.A.5.4	P

### 802.11n-HT20 mode

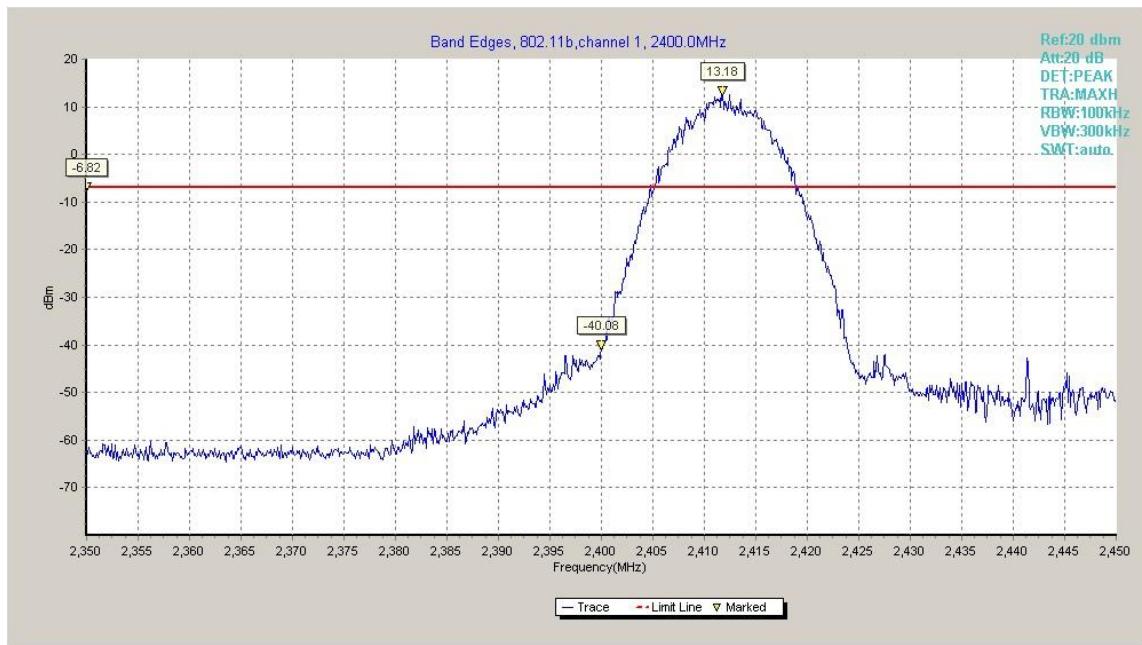
Mode	Channel	Test Results	Conclusion
802.11n (HT20)	1	Fig.A.5.5	P
	11	Fig.A.5.6	P

### 802.11n-HT40 mode

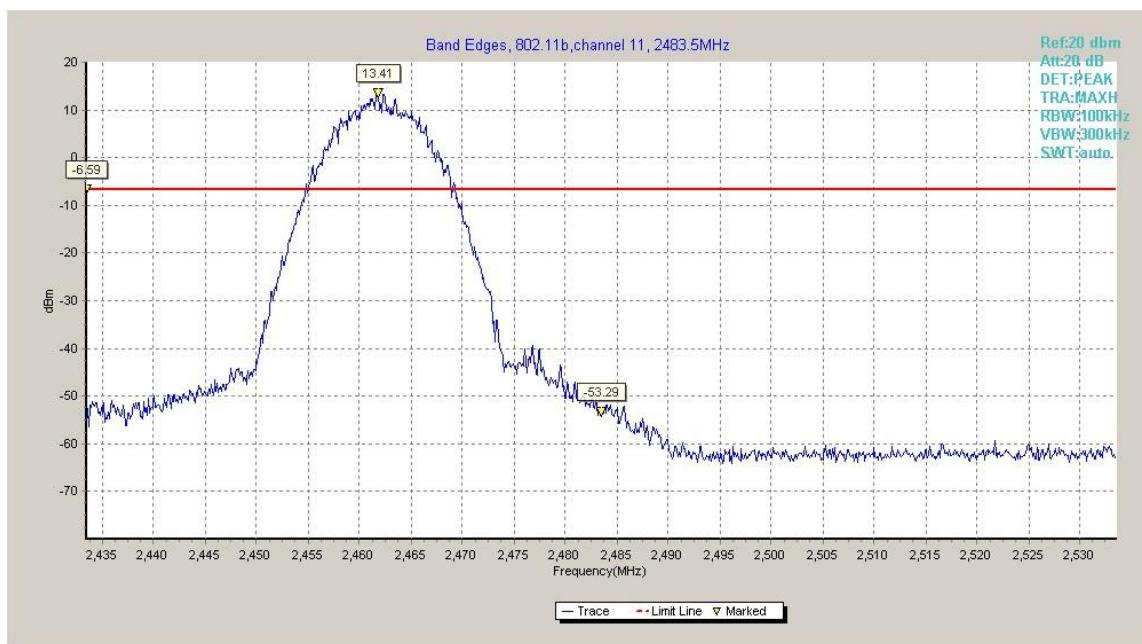
Mode	Channel	Test Results	Conclusion
802.11n (HT40)	3	Fig.A.5.7	P
	9	Fig.A.5.8	P

**Conclusion: Pass**

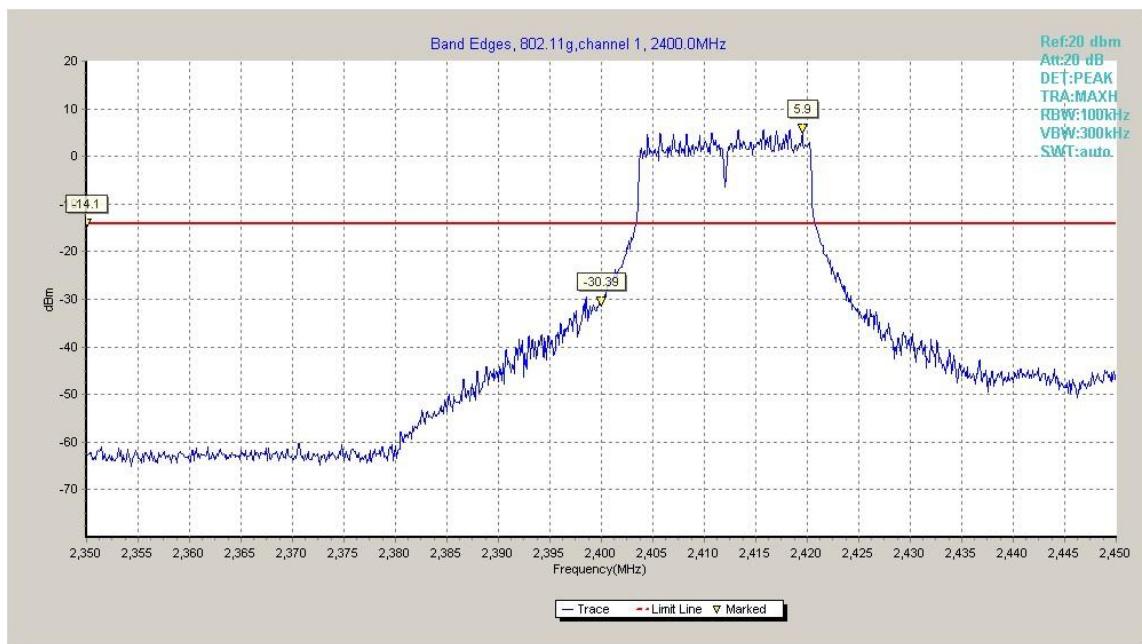
**Test graphs as below:**



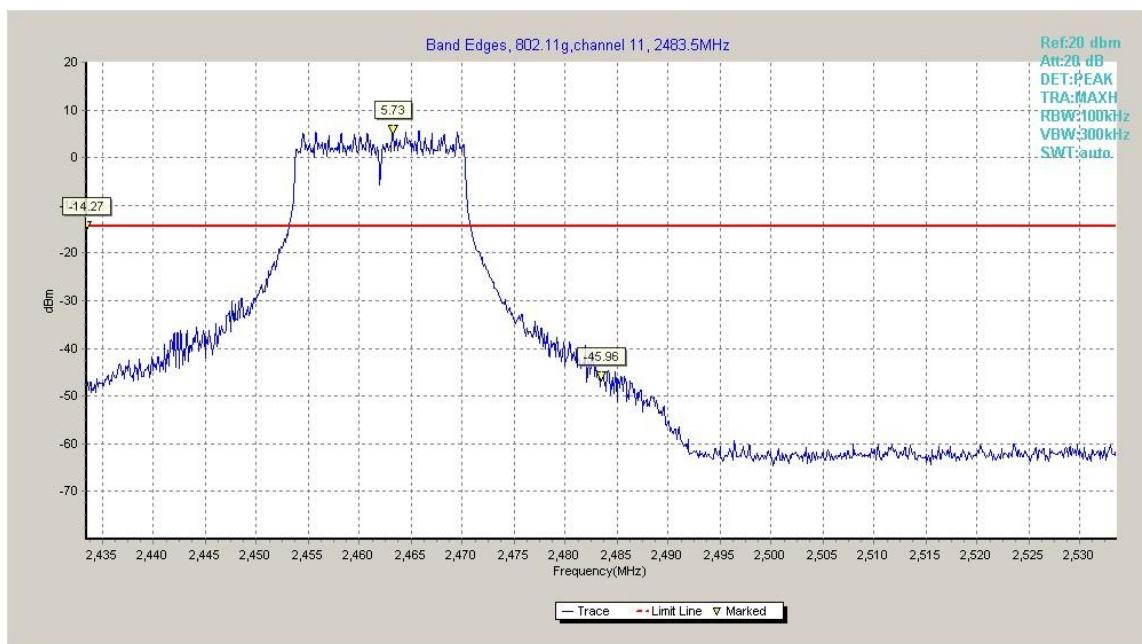
**Fig.A.5.1 Band Edges (802.11b, Ch 1)**



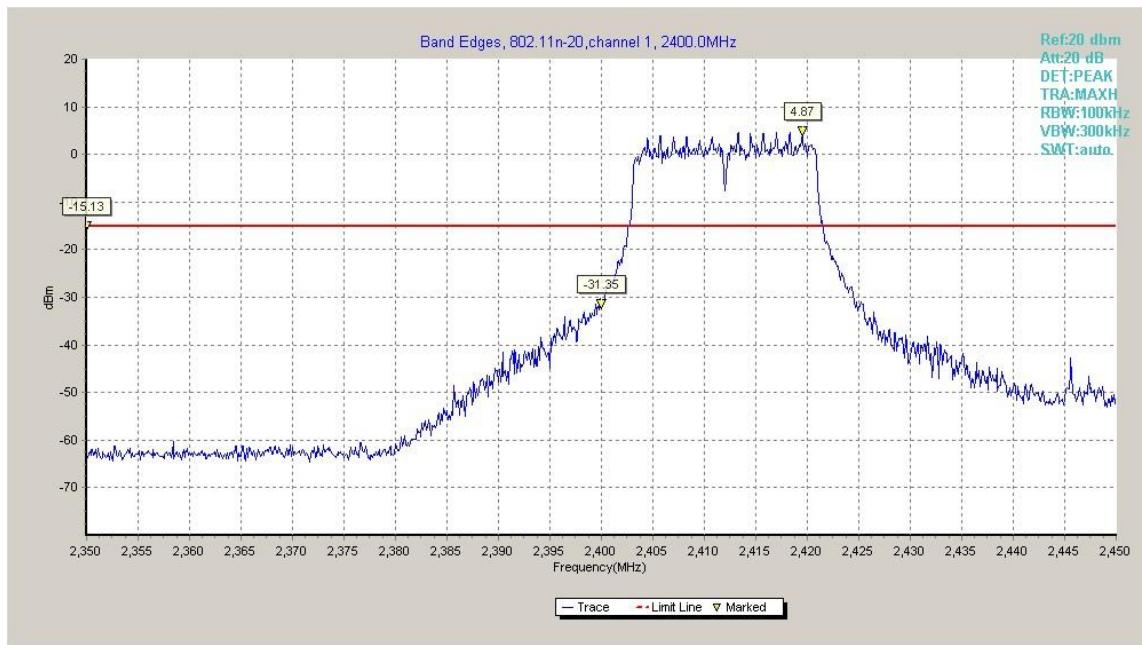
**Fig.A.5.2 Band Edges (802.11b, Ch 11)**



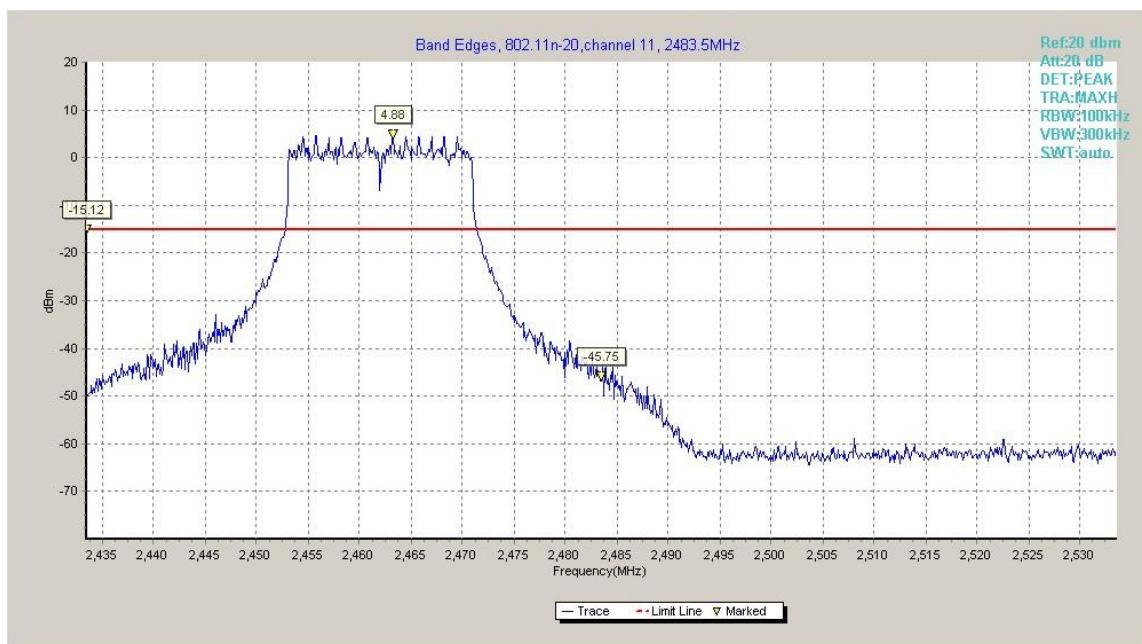
**Fig.A.5.3 Band Edges (802.11g, Ch 1)**



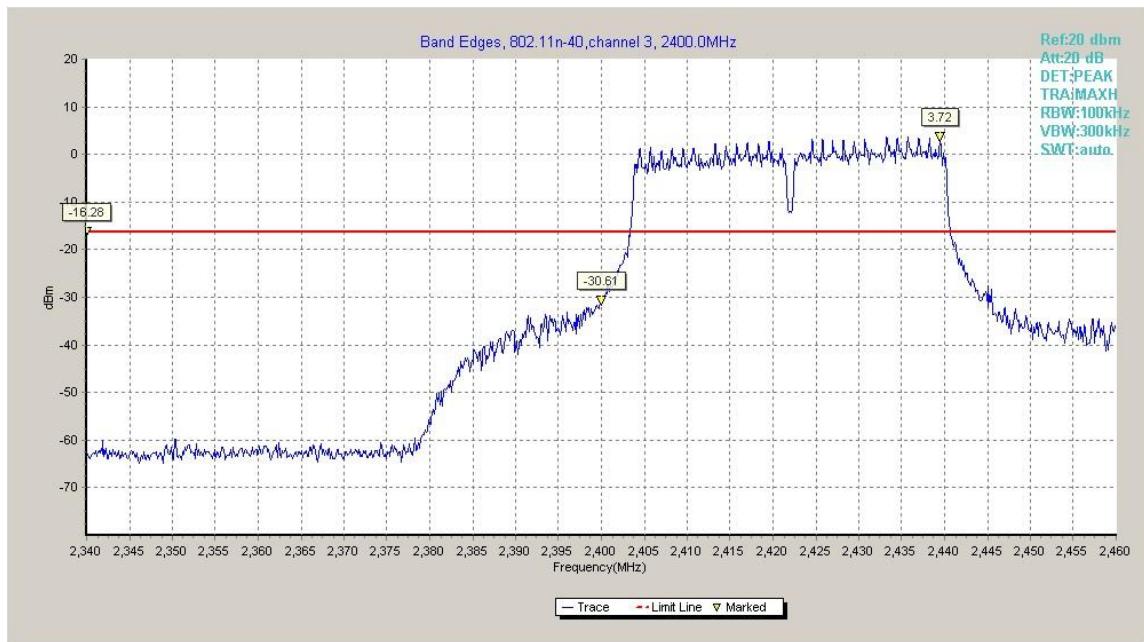
**Fig.A.5.4 Band Edges (802.11g, Ch 11)**



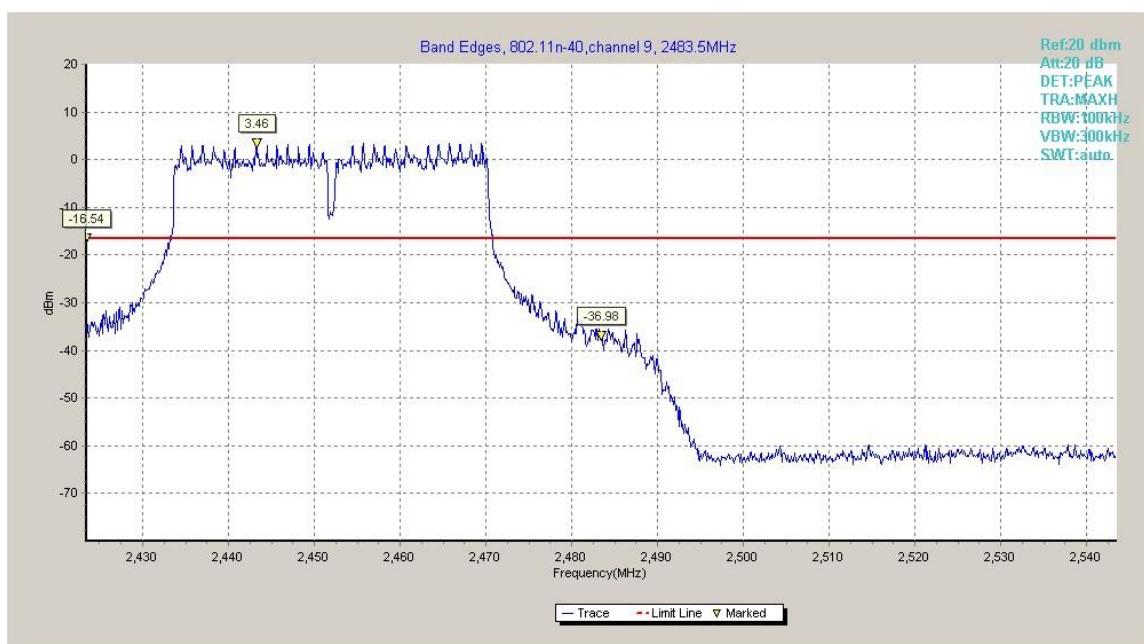
**Fig.A.5.5 Band Edges (802.11n-HT20, Ch 1)**



**Fig.A.5.6 Band Edges (802.11n-HT20, Ch 11)**



**Fig.A.5.7 Band Edges (802.11n-HT40, Ch 3)**



**Fig.A.5.8 Band Edges (802.11n-HT40, Ch 9)**

## **A.6. Transmitter Spurious Emission**

### **A.6.1 Transmitter Spurious Emission – Conducted**

**Method of Measurement: See ANSI C63.10-2013-clause 11.11.2**

Establish a reference level by using the following procedure:

- a) Set instrument center frequency to DTS channel center frequency
- b) Set the span to  $\geq 1.5$  times the DTS bandwidth
- c) Set the RBW= 100 kHz
- d) Set the VBW= 300 kHz
- 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 PSD level

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Establish an emission level by using the following procedure:

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100 kHz.
- c) Set the VBW = 300 kHz.
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

#### **Measurement Limit:**

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

**EUT ID: EUT2**

#### **Measurement Results:**

**802.11b mode**

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11b	1	2.412 GHz	Fig.A.6.1.1	P
		30 MHz ~ 1 GHz	Fig.A.6.1.2	P
		1 GHz ~ 2.5 GHz	Fig.A.6.1.3	P
		2.5 GHz ~ 7.5 GHz	Fig.A.6.1.4	P
		7.5 GHz ~ 10 GHz	Fig.A.6.1.5	P
		10 GHz ~ 15 GHz	Fig.A.6.1.6	P
		15 GHz ~ 20 GHz	Fig.A.6.1.7	P
		20 GHz ~ 26 GHz	Fig.A.6.1.8	P
	6	2.437 GHz	Fig.A.6.1.9	P
		30 MHz ~ 1 GHz	Fig.A.6.1.10	P
		1 GHz ~ 2.5 GHz	Fig.A.6.1.11	P
		2.5 GHz ~ 7.5 GHz	Fig.A.6.1.12	P
		7.5 GHz ~ 10 GHz	Fig.A.6.1.13	P
		10 GHz ~ 15 GHz	Fig.A.6.1.14	P
		15 GHz ~ 20 GHz	Fig.A.6.1.15	P
		20 GHz ~ 26 GHz	Fig.A.6.1.16	P
	11	2.462 GHz	Fig.A.6.1.17	P
		30 MHz ~ 1 GHz	Fig.A.6.1.18	P
		1 GHz ~ 2.5 GHz	Fig.A.6.1.19	P
		2.5 GHz ~ 7.5 GHz	Fig.A.6.1.20	P
		7.5 GHz ~ 10 GHz	Fig.A.6.1.21	P
		10 GHz ~ 15 GHz	Fig.A.6.1.22	P
		15 GHz ~ 20 GHz	Fig.A.6.1.23	P
		20 GHz ~ 26 GHz	Fig.A.6.1.24	P

**802.11g mode**

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11g	1	2.412 GHz	Fig.A.6.1.25	P
		30 MHz ~ 1 GHz	Fig.A.6.1.26	P
		1 GHz ~ 2.5 GHz	Fig.A.6.1.27	P
		2.5 GHz ~ 7.5 GHz	Fig.A.6.1.28	P
		7.5 GHz ~ 10 GHz	Fig.A.6.1.29	P
		10 GHz ~ 15 GHz	Fig.A.6.1.30	P
		15 GHz ~ 20 GHz	Fig.A.6.1.31	P
		20 GHz ~ 26 GHz	Fig.A.6.1.32	P
	6	2.437 GHz	Fig.A.6.1.33	P
		30 MHz ~ 1 GHz	Fig.A.6.1.34	P
		1 GHz ~ 2.5 GHz	Fig.A.6.1.35	P
		2.5 GHz ~ 7.5 GHz	Fig.A.6.1.36	P
		7.5 GHz ~ 10 GHz	Fig.A.6.1.37	P
		10 GHz ~ 15 GHz	Fig.A.6.1.38	P
		15 GHz ~ 20 GHz	Fig.A.6.1.39	P
		20 GHz ~ 26 GHz	Fig.A.6.1.40	P
	11	2.462 GHz	Fig.A.6.1.41	P
		30 MHz ~ 1 GHz	Fig.A.6.1.42	P
		1 GHz ~ 2.5 GHz	Fig.A.6.1.43	P
		2.5 GHz ~ 7.5 GHz	Fig.A.6.1.44	P
		7.5 GHz ~ 10 GHz	Fig.A.6.1.45	P
		10 GHz ~ 15 GHz	Fig.A.6.1.46	P
		15 GHz ~ 20 GHz	Fig.A.6.1.47	P
		20 GHz ~ 26 GHz	Fig.A.6.1.48	P

**802.11n-HT20 mode**

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	1	2.412 GHz	Fig.A.6.1.49	P
		30 MHz ~ 1 GHz	Fig.A.6.1.50	P
		1 GHz ~ 2.5 GHz	Fig.A.6.1.51	P
		2.5 GHz ~ 7.5 GHz	Fig.A.6.1.52	P
		7.5 GHz ~ 10 GHz	Fig.A.6.1.53	P
		10 GHz ~ 15 GHz	Fig.A.6.1.54	P
		15 GHz ~ 20 GHz	Fig.A.6.1.55	P
		20 GHz ~ 26 GHz	Fig.A.6.1.56	P
	6	2.437 GHz	Fig.A.6.1.57	P
		30 MHz ~ 1 GHz	Fig.A.6.1.58	P
		1 GHz ~ 2.5 GHz	Fig.A.6.1.59	P
		2.5 GHz ~ 7.5 GHz	Fig.A.6.1.60	P
		7.5 GHz ~ 10 GHz	Fig.A.6.1.61	P
		10 GHz ~ 15 GHz	Fig.A.6.1.62	P
		15 GHz ~ 20 GHz	Fig.A.6.1.63	P
		20 GHz ~ 26 GHz	Fig.A.6.1.64	P
	11	2.462 GHz	Fig.A.6.1.65	P
		30 MHz ~ 1 GHz	Fig.A.6.1.66	P
		1 GHz ~ 2.5 GHz	Fig.A.6.1.67	P
		2.5 GHz ~ 7.5 GHz	Fig.A.6.1.68	P
		7.5 GHz ~ 10 GHz	Fig.A.6.1.69	P
		10 GHz ~ 15 GHz	Fig.A.6.1.70	P
		15 GHz ~ 20 GHz	Fig.A.6.1.71	P
		20 GHz ~ 26 GHz	Fig.A.6.1.72	P

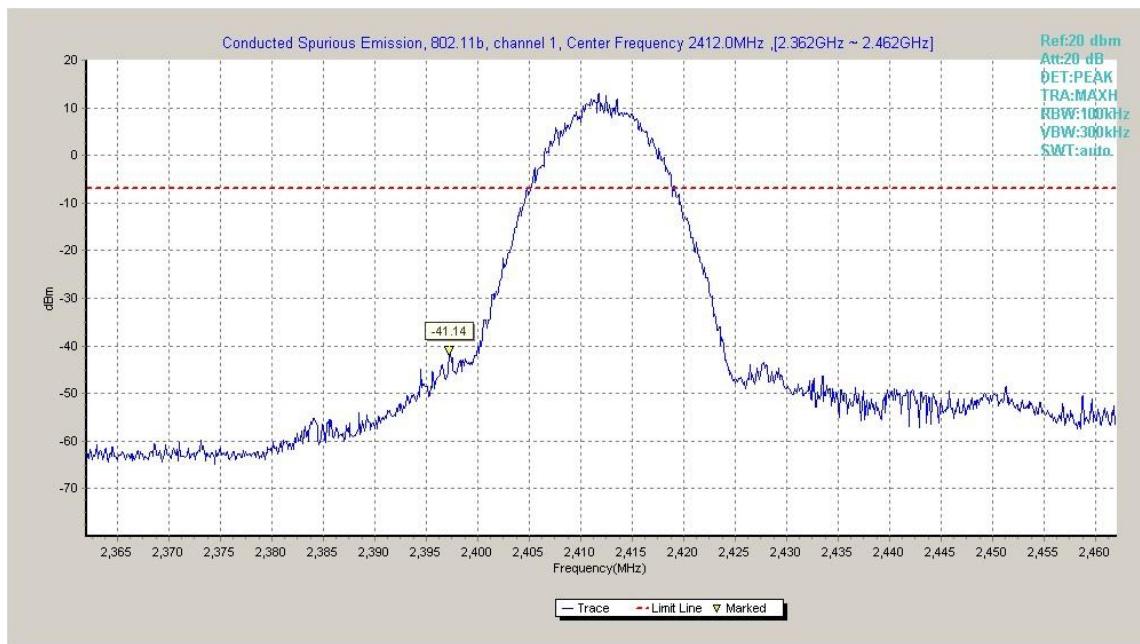
**802.11n-HT40 mode**

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT40)	3	2.422 GHz	Fig.A.6.1.73	P
		30 MHz ~ 1 GHz	Fig.A.6.1.74	P
		1 GHz ~ 2.5 GHz	Fig.A.6.1.75	P
		2.5 GHz ~ 7.5 GHz	Fig.A.6.1.76	P
		7.5 GHz ~ 10 GHz	Fig.A.6.1.77	P
		10 GHz ~ 15 GHz	Fig.A.6.1.78	P
		15 GHz ~ 20 GHz	Fig.A.6.1.79	P
		20 GHz ~ 26 GHz	Fig.A.6.1.80	P
	6	2.437 GHz	Fig.A.6.1.81	P
		30 MHz ~ 1 GHz	Fig.A.6.1.82	P
		1 GHz ~ 2.5 GHz	Fig.A.6.1.83	P
		2.5 GHz ~ 7.5 GHz	Fig.A.6.1.84	P
		7.5 GHz ~ 10 GHz	Fig.A.6.1.85	P
		10 GHz ~ 15 GHz	Fig.A.6.1.86	P

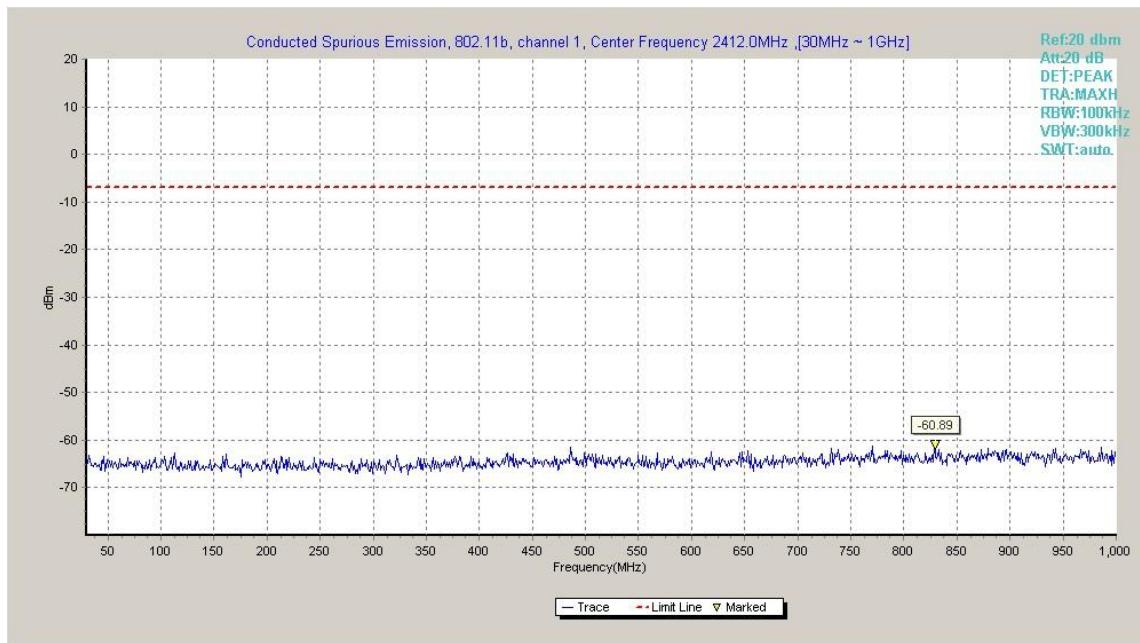
9		15 GHz ~ 20 GHz	Fig.A.6.1.87	P
		20 GHz ~ 26 GHz	Fig.A.6.1.88	P
		2.452 GHz	Fig.A.6.1.89	P
		30 MHz ~ 1 GHz	Fig.A.6.1.90	P
		1 GHz ~ 2.5 GHz	Fig.A.6.1.91	P
		2.5 GHz ~ 7.5 GHz	Fig.A.6.1.92	P
		7.5 GHz ~ 10 GHz	Fig.A.6.1.93	P
		10 GHz ~ 15 GHz	Fig.A.6.1.94	P
		15 GHz ~ 20 GHz	Fig.A.6.1.95	P
		20 GHz ~ 26 GHz	Fig.A.6.1.96	P

**Conclusion: Pass**

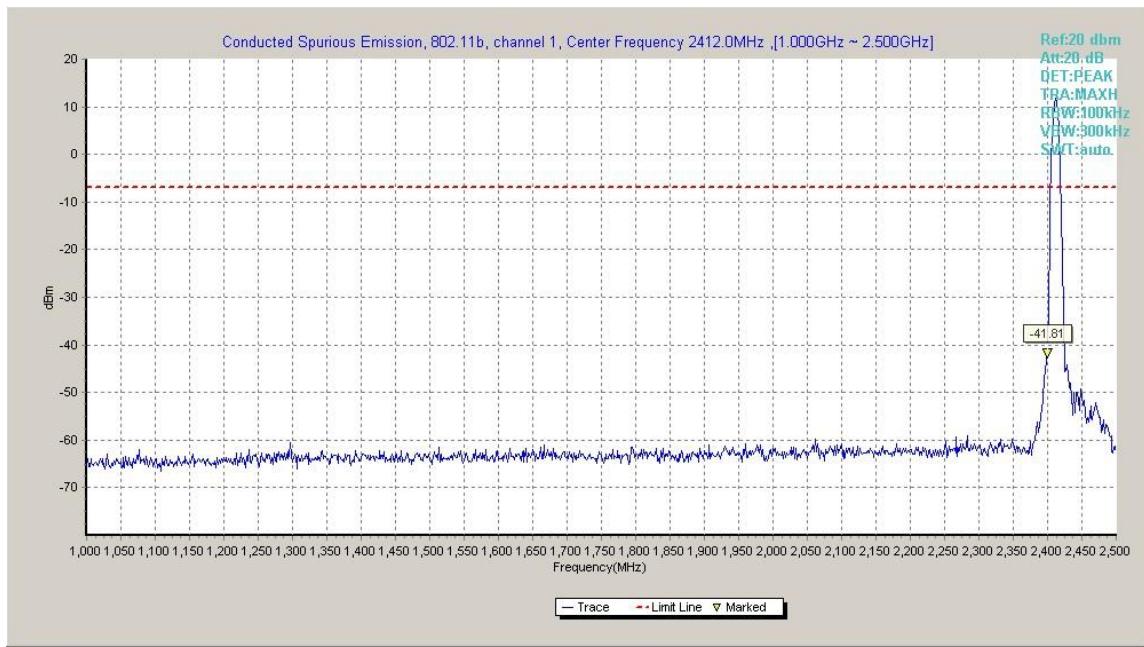
**Test graphs as below:**



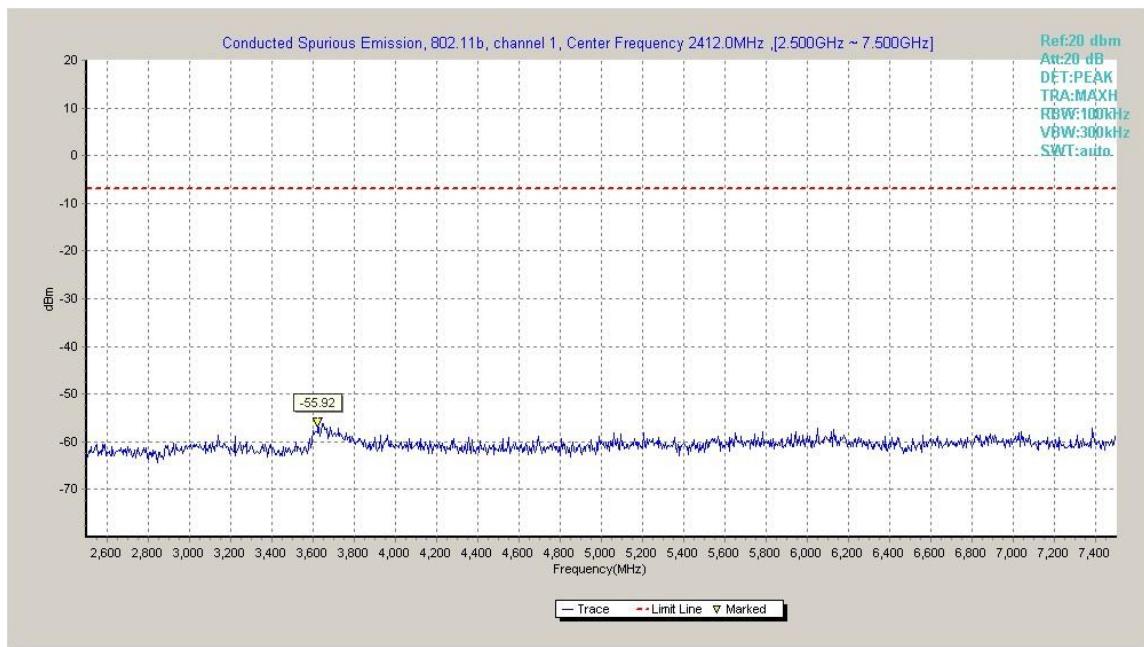
**Fig.A.6.1.1 Transmitter Spurious Emission - Conducted (802.11b, Ch1, Center Frequency)**



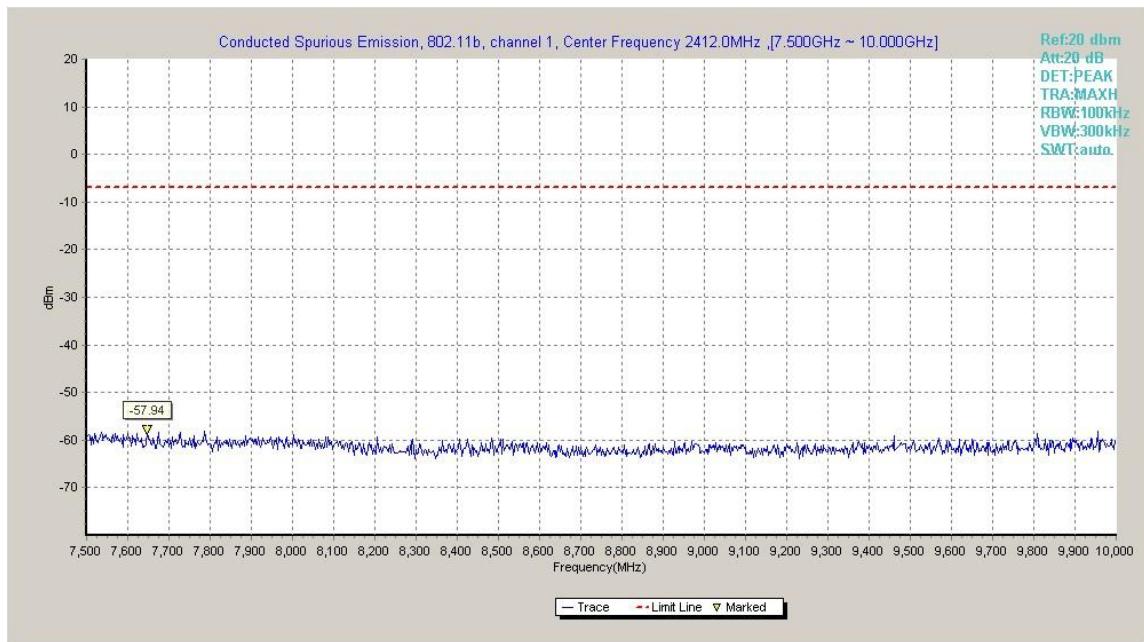
**Fig.A.6.1.2 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 30 MHz-1 GHz)**



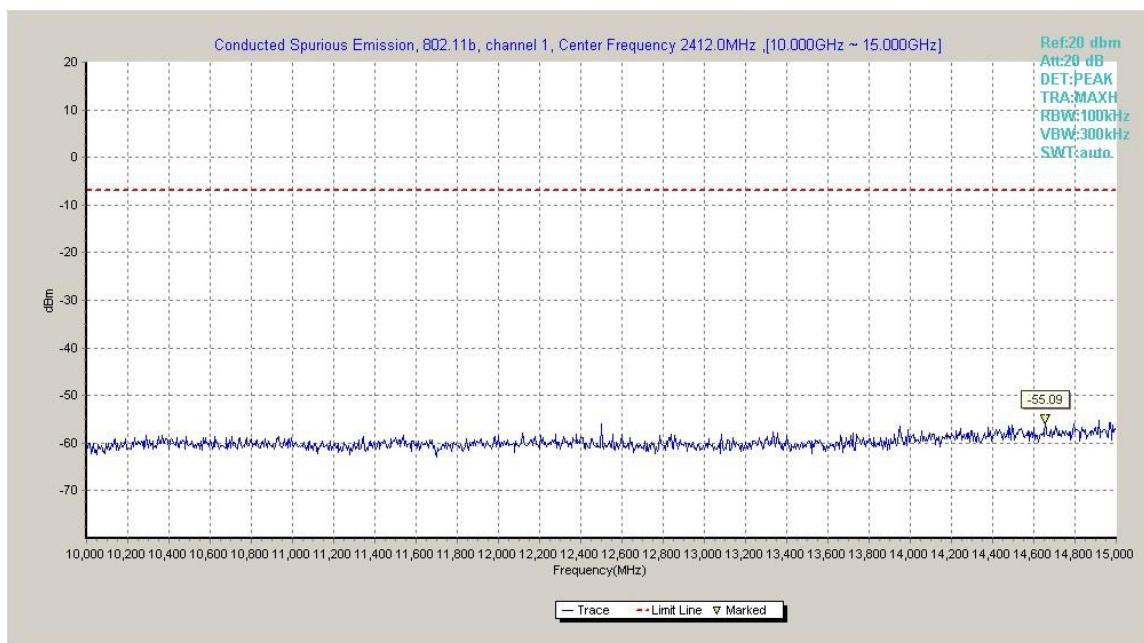
**Fig.A.6.1.3 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 1 GHz-2.5 GHz)**



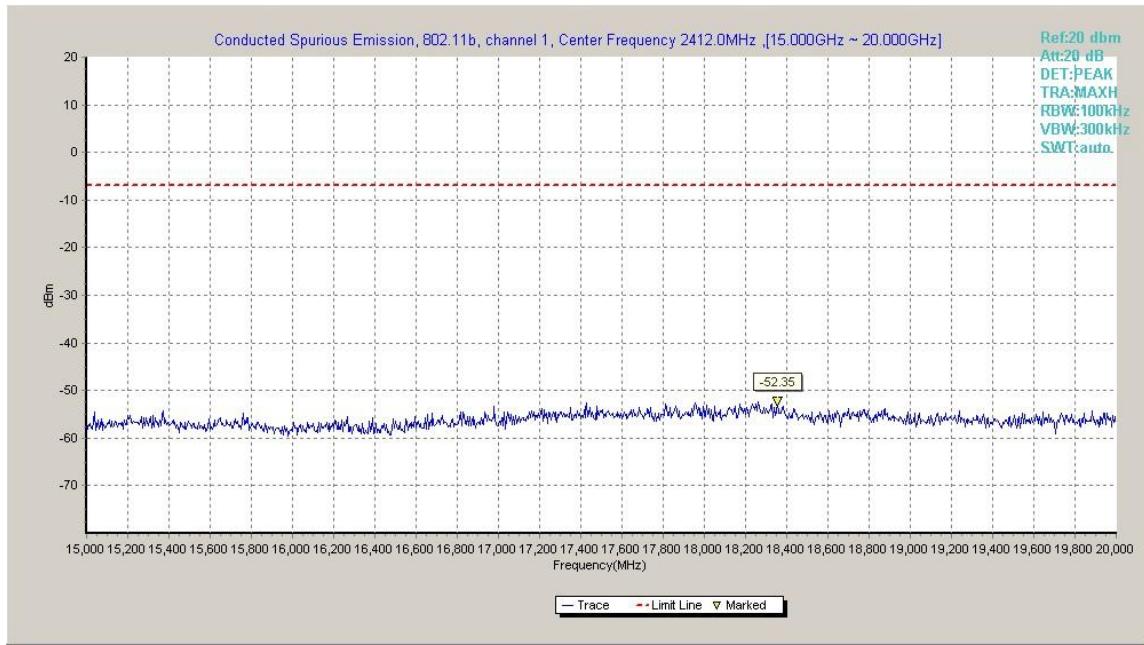
**Fig.A.6.1.4 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 2.5 GHz-7.5 GHz)**



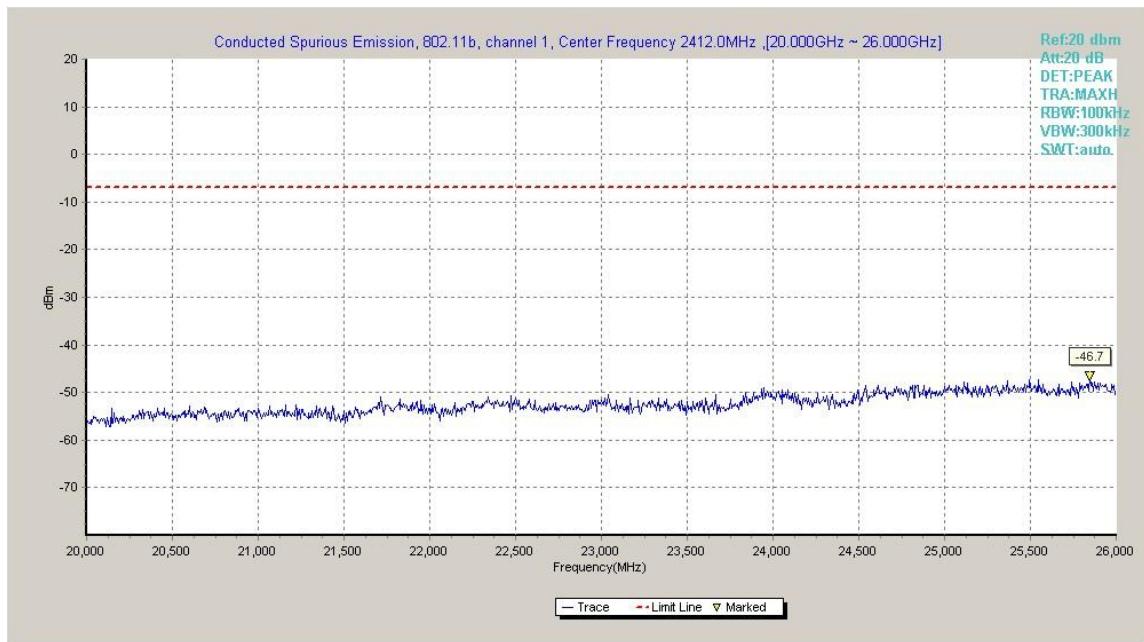
**Fig.A.6.1.5 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 7.5 GHz-10 GHz)**



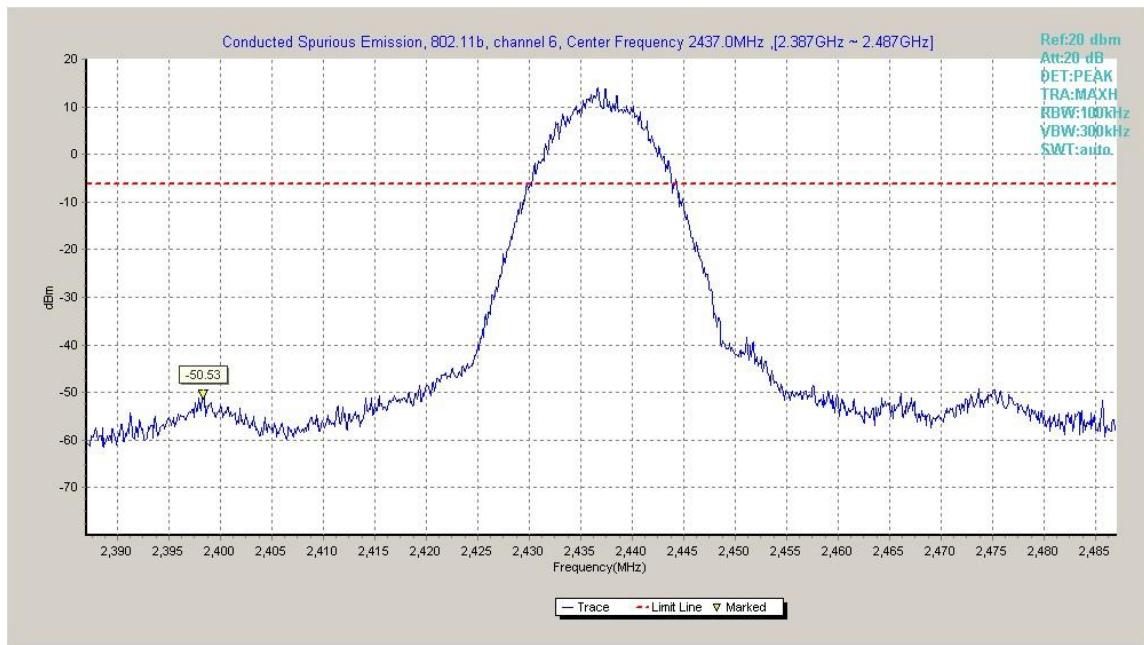
**Fig.A.6.1.6 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 10 GHz-15 GHz)**



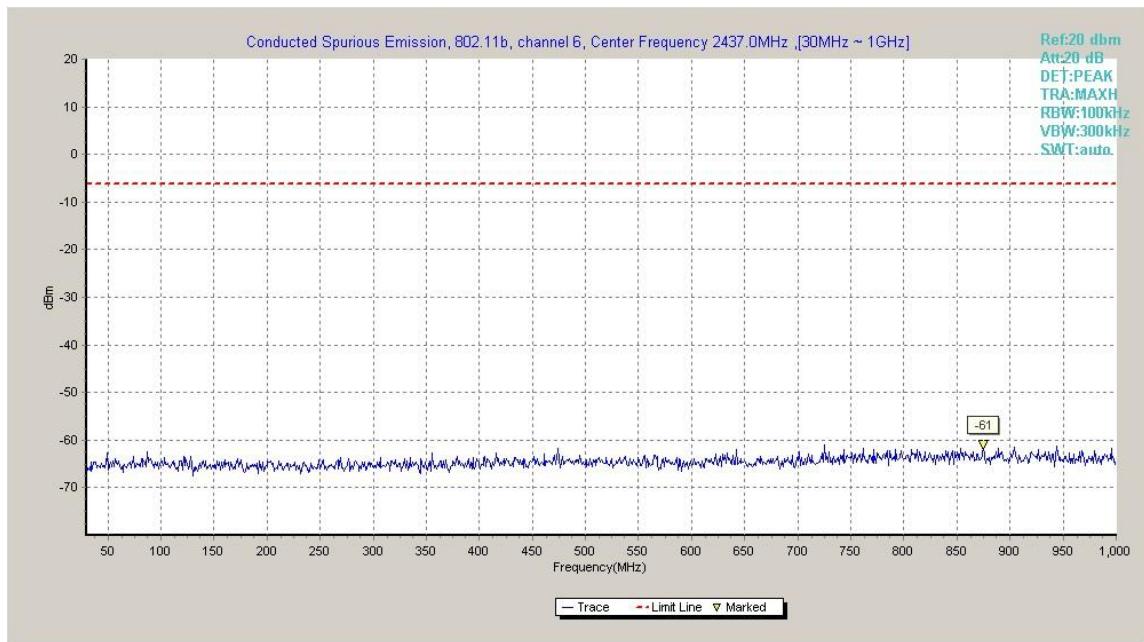
**Fig.A.6.1.7 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 15 GHz-20 GHz)**



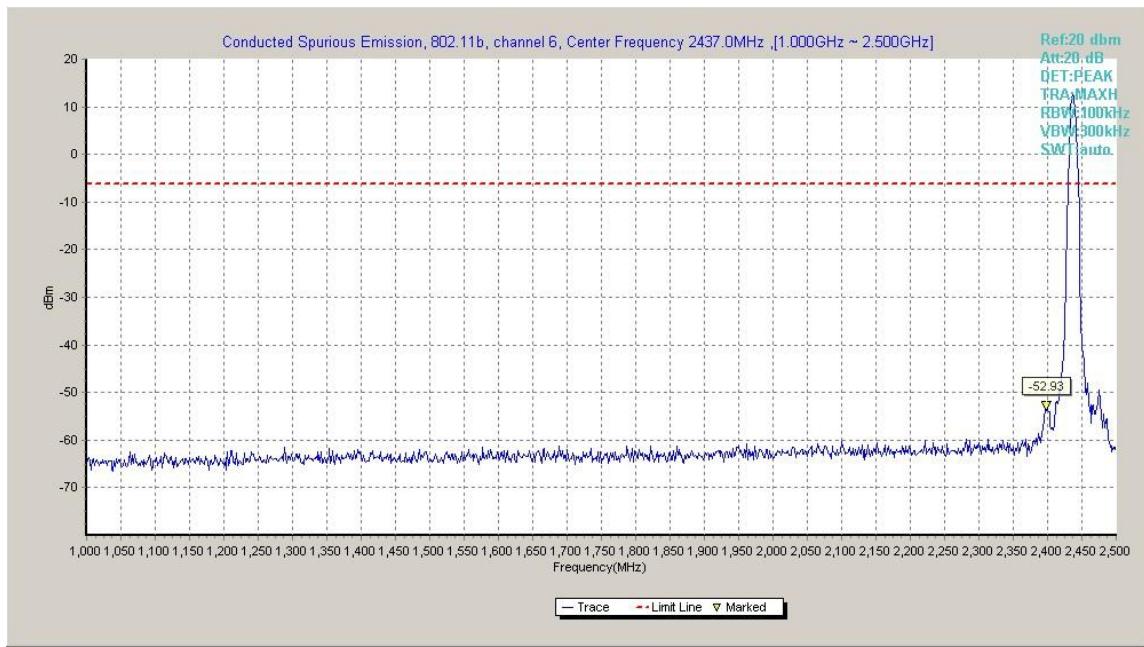
**Fig.A.6.1.8 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 20 GHz-26 GHz)**



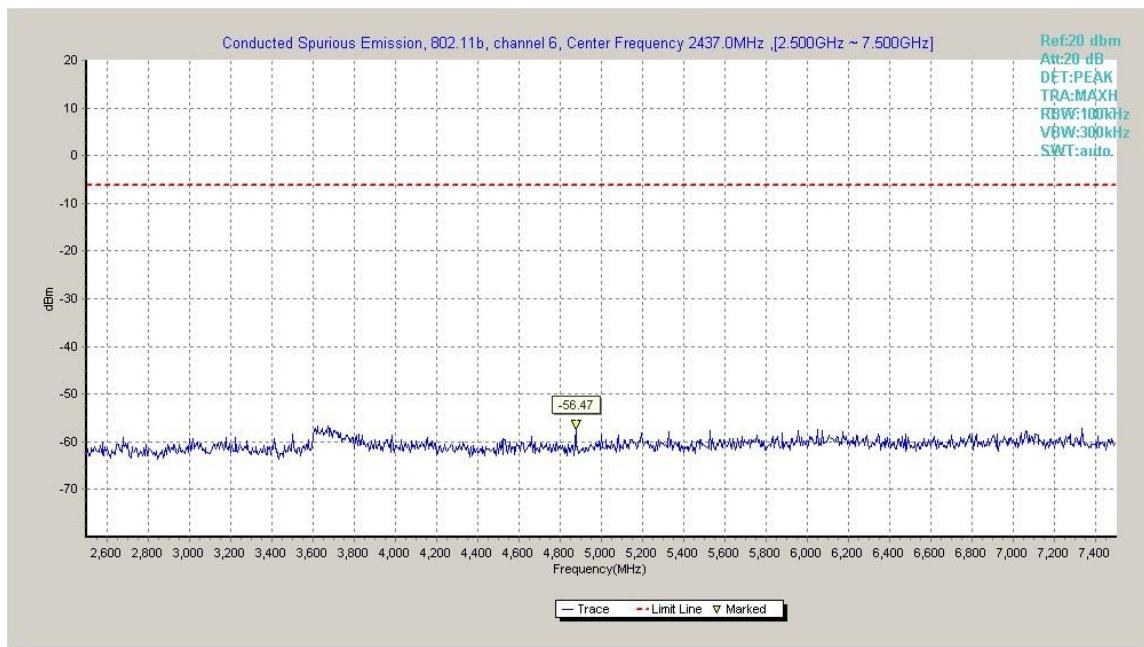
**Fig.A.6.1.9 Transmitter Spurious Emission - Conducted (802.11b, Ch6, Center Frequency)**



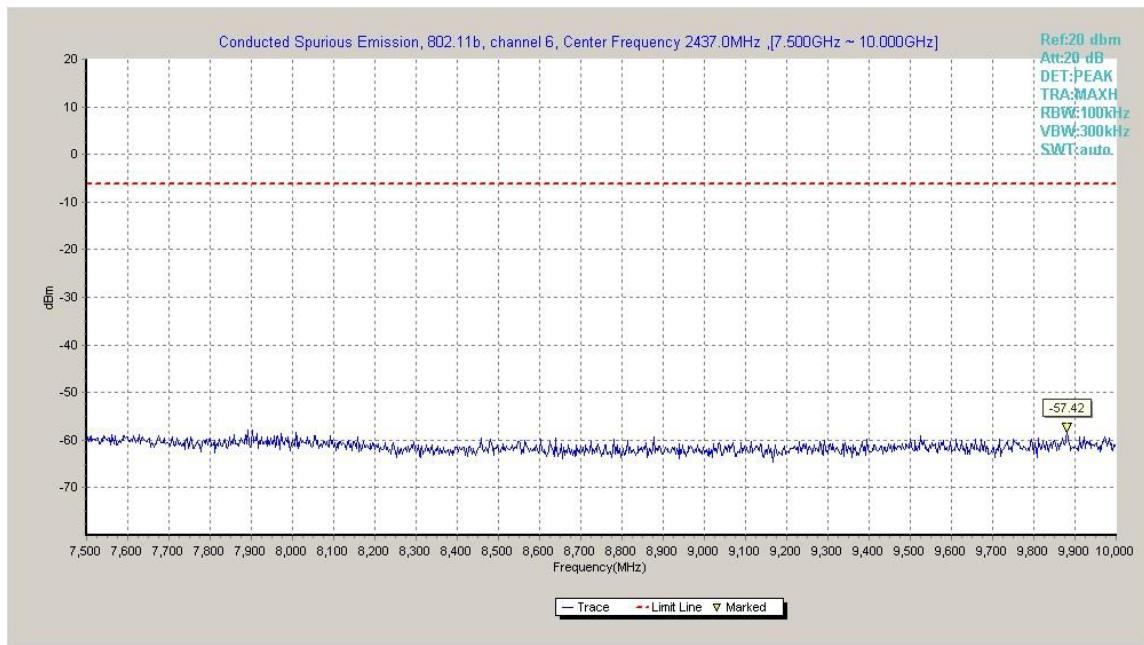
**Fig.A.6.1.10 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 30 MHz-1 GHz)**



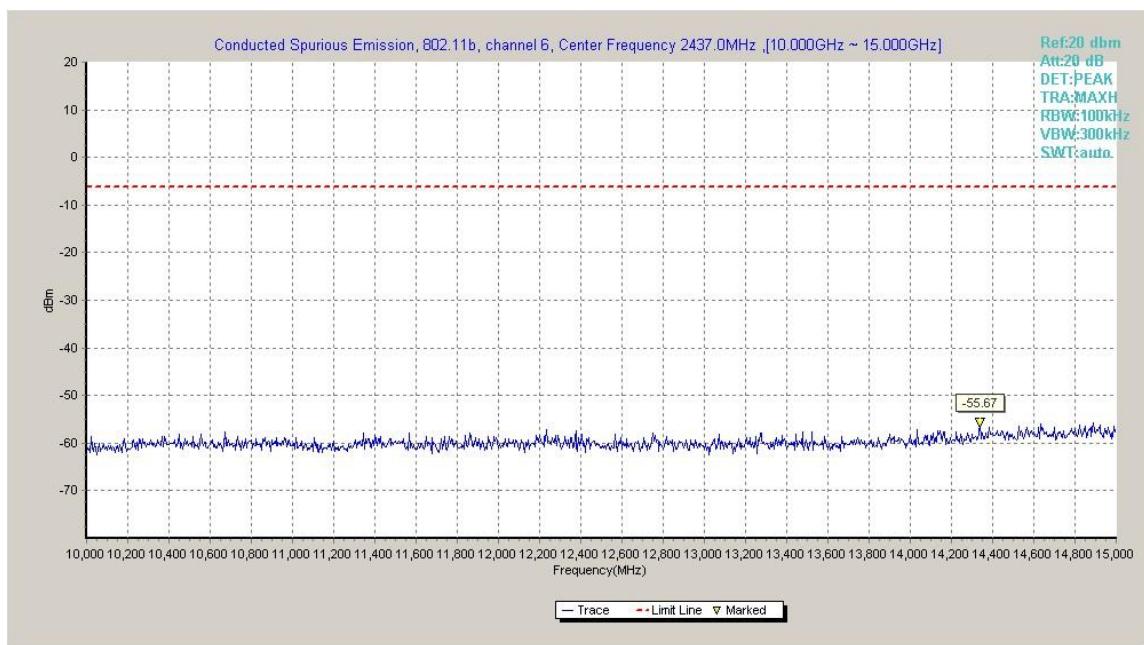
**Fig.A.6.1.11 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 1 GHz-2.5 GHz)**



**Fig.A.6.1.12 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 2.5 GHz-7.5 GHz)**



**Fig.A.6.1.13 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 7.5 GHz-10 GHz)**



**Fig.A.6.1.14 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 10 GHz-15 GHz)**