



**FCC PART 15C  
TESTREPORT  
No.I17Z62134-IOT01**

**for**

**TCL Communication Ltd.**

**HSUPA/HSDPA/UMTS Tri Band/GSM Quad Band/LTE 6 Bands**

**mobile phone**

**A405DL**

**with**

**FCC ID:2ACCJN023**

**Hardware Version: 01**

**Software Version: WU15**

**Issued Date: 2017-12-22**



**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>
I17Z62134-IOT01	Rev.0	1st edition	2017-12-22
I17Z62134-IOT01	Rev.1	2nd edition	2017-12-27

## **CONTENTS**

<b>1. TEST LABORATORY .....</b>	<b>5</b>
<b>1.1. TESTING LOCATION .....</b>	<b>5</b>
<b>1.2. TESTING ENVIRONMENT .....</b>	<b>5</b>
<b>1.3. PROJECT DATA .....</b>	<b>5</b>
<b>1.4. SIGNATURE.....</b>	<b>5</b>
<b>2. CLIENT INFORMATION.....</b>	<b>6</b>
<b>2.1. APPLICANT INFORMATION.....</b>	<b>6</b>
<b>2.2. MANUFACTURER INFORMATION.....</b>	<b>6</b>
<b>3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) .....</b>	<b>7</b>
<b>3.1. ABOUT EUT .....</b>	<b>7</b>
<b>3.2. INTERNAL IDENTIFICATION OF EUT .....</b>	<b>7</b>
<b>3.3. INTERNAL IDENTIFICATION OF AE .....</b>	<b>7</b>
<b>3.4. EUT SET-UPS .....</b>	<b>8</b>
<b>3.5. GENERAL DESCRIPTION .....</b>	<b>8</b>
<b>3.6. INTERPRETATION OF THE TEST ENVIRONMENT .....</b>	<b>8</b>
<b>4. REFERENCE DOCUMENTS.....</b>	<b>8</b>
<b>4.1. DOCUMENTS SUPPLIED BY APPLICANT .....</b>	<b>8</b>
<b>4.2. REFERENCE DOCUMENTS FOR TESTING.....</b>	<b>8</b>
<b>5. TEST RESULTS .....</b>	<b>9</b>
<b>5.1. SUMMARY OF TEST RESULTS .....</b>	<b>9</b>
<b>5.2. STATEMENTS.....</b>	<b>9</b>
<b>5.3. TEST CONDITIONS.....</b>	<b>9</b>
<b>6. TEST FACILITIES UTILIZED .....</b>	<b>10</b>
<b>7. MEASUREMENT UNCERTAINTY .....</b>	<b>11</b>
<b>7.1. MAXIMUM OUTPUT POWER .....</b>	<b>11</b>
<b>7.2. PEAK POWER SPECTRAL DENSITY.....</b>	<b>11</b>
<b>7.3. DTS 6-DB SIGNAL BANDWIDTH .....</b>	<b>11</b>
<b>7.4. BAND EDGES COMPLIANCE.....</b>	<b>11</b>
<b>7.5. TRANSMITTER SPURIOUS EMISSION.....</b>	<b>11</b>
<b>7.6. 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>15</b>
<b>A.4. DTS 6-DB SIGNAL BANDWIDTH</b> .....	<b>21</b>
<b>A.5. BAND EDGES COMPLIANCE</b> .....	<b>25</b>
<b>A.6. TRANSMITTER SPURIOUS EMISSION</b> .....	<b>29</b>
A.6.1 TRANSMITTER SPURIOUS EMISSION – CONDUCTED .....	29
A.6.2 TRANSMITTER SPURIOUS EMISSION - RADIATED.....	69
<b>A.7. AC POWER-LINE CONDUCTED EMISSION</b> .....	<b>80</b>
<b>ANNEX B: ACCREDITATION CERTIFICATE</b> .....	<b>84</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: 2017-12-03

Testing End Date: 2017-12-22

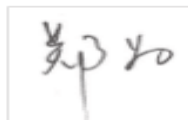
### **1.4. Signature**



---

Jiang Xue

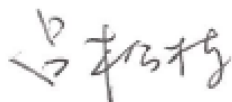
(Prepared this test report)



---

Zheng Wei

(Reviewed this test report)



---

Lv Songdong

(Approved this test report)



## **2. ClientInformation**

### **2.1. Applicant Information**

Company Name: TCL Communication Ltd.  
Address: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
City: Shanghai  
Postal Code: 201203.  
Country: China  
Telephone: 0086-21-31363544  
Fax: 0086-21-61460602

### **2.2. Manufacturer Information**

Company Name: TCL Communication Ltd.  
Address: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
City: Shanghai  
Postal Code: 201203.  
Country: China  
Telephone: 0086-21-31363544  
Fax: 0086-21-61460602

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

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

Description	HSUPA/HSDPA/UMTS Tri Band/GSM Quad Band/LTE 6 Bands mobile phone
Model name	A405DL
FCC ID	2ACCJN023
IC ID	/
With WLAN Function	Yes
Frequency Range	ISM 2400MHz~2483.5MHz
Type of Modulation	DSSS/CCK/OFDM
Number of Channels	11
Antenna	Integral Antenna
MAX Conducted Power	25.02dBm(OFDM)
Power Supply	3.7VDC by Battery

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

<b>EUT ID*</b>	<b>SN or IMEI</b>	<b>HW Version</b>	<b>SW Version</b>
EUT1	015114000001612	01	WU15
EUT2	015114000000796	01	WU15

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

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

<b>AE ID*</b>	<b>Description</b>	<b>SN</b>	<b>Remarks</b>
AE1	Battery	/	/
AE2	Charger	/	/
AE3	USB cable	/	/

##### AE1

Model	TLi013C1
Manufacturer	BYD
Capacitance	1350 mAh
Nominal voltage	3.7V

##### AE2

Model	CBA0066AGNC5
Manufacturer	PUAN
Length of cable	116 cm

##### AE3

Model	/
Manufacturer	/
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.1	EUT1+AE1+AE2	WIFI Charger

### 3.5. General Description

The Equipment under Test (EUT) is a model of HSUPA/HSDPA/UMTS Tri Band/GSM Quad Band/LTE 6 Bands mobile phonewith 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;	2016
	15.209 Radiated emission limits, general requirements;	
	15.247 Operation within the bands 902-928MHz, 2400-2483.5 MHz, and 5725-5850 MHz.	
ANSI C63.10	American National Standard ofProcedures for Compliance Testing ofUnlicensed 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)	/	<b>P</b>
Peak Power Spectral Density	15.247 (e)	/	<b>P</b>
Occupied 6dB Bandwidth	15.247 (a)	/	<b>P</b>
Band Edges Compliance	15.247 (d)	/	<b>P</b>
Transmitter Spurious Emission - Conducted	15.247 (d)	/	<b>P</b>
Transmitter Spurious Emission - Radiated	15.247, 15.205, 15.209	/	<b>P</b>
AC Powerline Conducted Emission	15.107, 15.207	/	<b>P</b>

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	3.7V(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	100344	Rohde & Schwarz	1 year	2018-08-03
3	LISN	ENV216	101200	Rohde & Schwarz	1 year	2018-03-15
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	100235	Rohde & Schwarz	1 year	2018-03-01
2	BiLog Antenna	VULB9163	9163-302	Schwarzbeck	3 years	2020-03-27
3	Bluetooth Tester	CBT	101042	Rohde & Schwarz	1 year	2018-02-19
4	EMI Antenna	3115	00167250	ETS-Lindgren	3 Years	2020-05-21
5	Dual-Ridge Waveguide Horn Antenna	3116	2661	ETS-Lindgren	3 years	2020-07-27

## 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)

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

#### Radiated(k=2)

FrequencyRange	Uncertainty(dBm)
$30\text{MHz} \leq f \leq 1\text{GHz}$	4.86
$1\text{GHz} \leq f \leq 18\text{GHz}$	5.26
$18\text{GHz} \leq f \leq 40\text{GHz}$	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

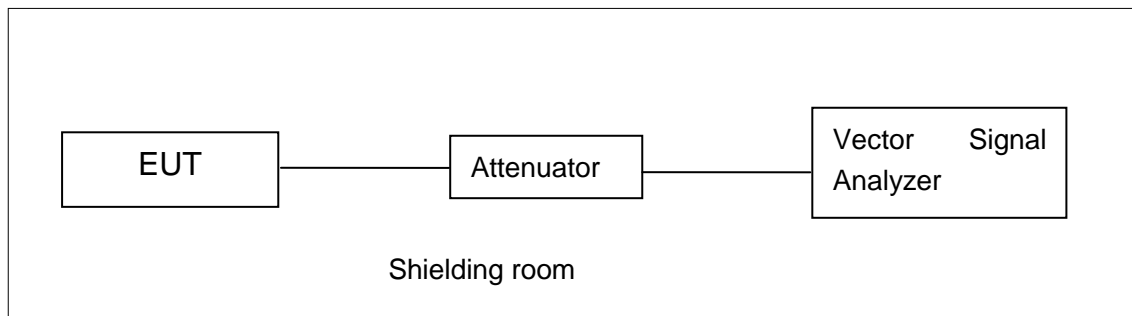


Fig.A.1.1.1: Test Setup Diagram for Conducted Measurements

#### **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;

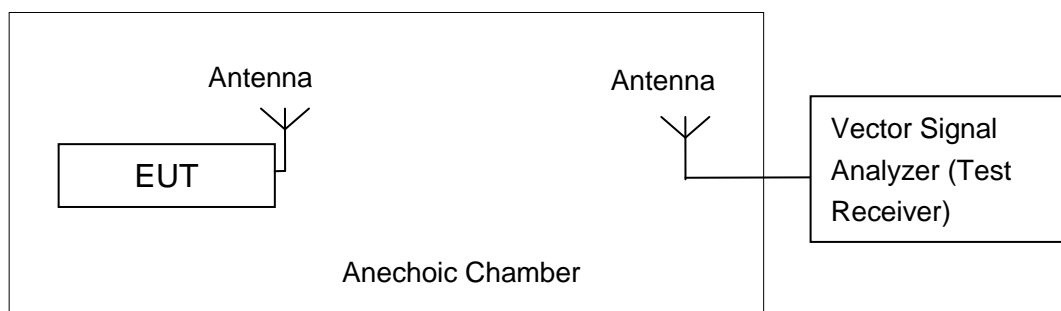


Fig.A.1.2.1: Test Setup Diagram for Radiated Measurements

## **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	21.01	/	/
	2	21.22	/	/
	5.5	22.86	/	/
	11	24.31	25.02	24.31
802.11g	6	22.58	/	/
	9	22.40	/	/
	12	22.16	/	/
	18	22.29	/	/
	24	22.79	/	/
	36	22.87	/	/
	48	22.93	/	/
	54	22.95	23.98	23.25

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	20.45	/	/
	MCS1	20.27	/	/
	MCS2	20.31	/	/
	MCS3	20.92	/	/
	MCS4	20.85	/	/
	MCS5	20.93	/	/
	MCS6	20.96	/	/
	MCS7	21.03	22.06	21.41

The data rate MCS7 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:

- a) Set span = 80MHz.
- b) Set RBW = 1MHz.
- c) Set VBW = 3MHz
- d) Number of points in sweep = 625
- e) Sweep time = auto.
- f) Detector = RMS.
- g) The trigger shall be set to "free run."
- h) Trace average 100 traces in power averaging (rms) mode.
- i) 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	17.85	18.49	17.66
802.11g	14.28	14.70	14.07

**802.11n-HT20 mode**

Mode	Test Result (dBm)		
	2412MHz(Ch1)	2437MHz(Ch6)	2462 MHz(Ch11)
802.11n(20MHz)	12.26	13.24	12.63

**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**

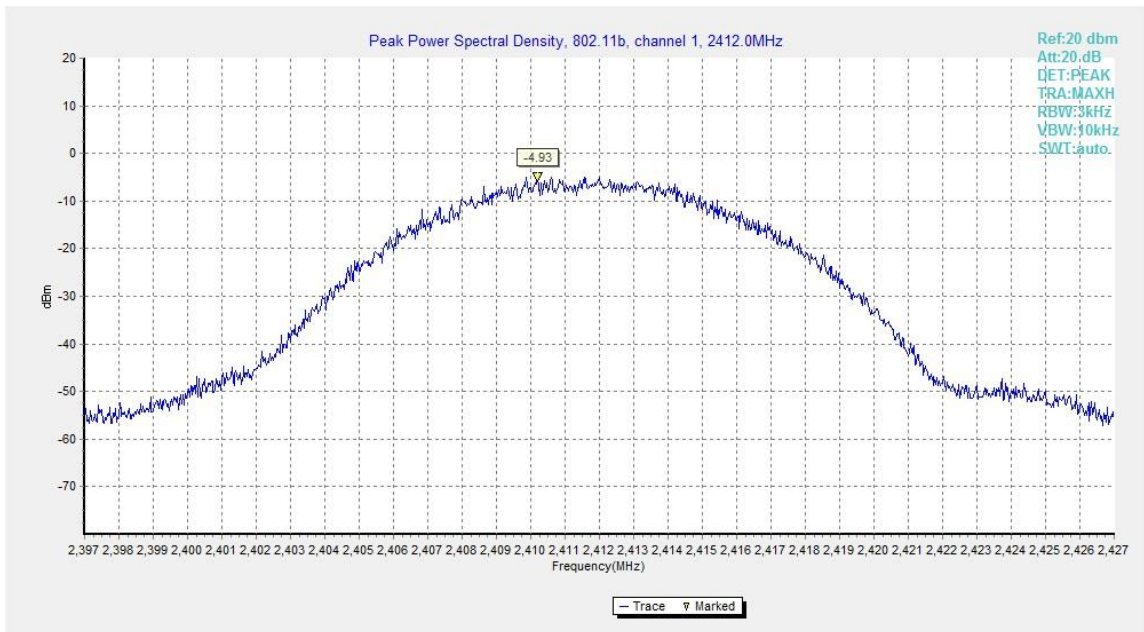
Mode	Channel	Power Spectral Density ( dBm/3 kHz )		Conclusion
802.11b	1	Fig.A.3.1	-4.93	<b>P</b>
	6	Fig.A.3.2	-4.38	<b>P</b>
	11	Fig.A.3.3	-4.33	<b>P</b>
802.11g	1	Fig.A.3.4	-10.11	<b>P</b>
	6	Fig.A.3.5	-10.09	<b>P</b>
	11	Fig.A.3.6	-9.67	<b>P</b>

#### **802.11n-HT20 mode**

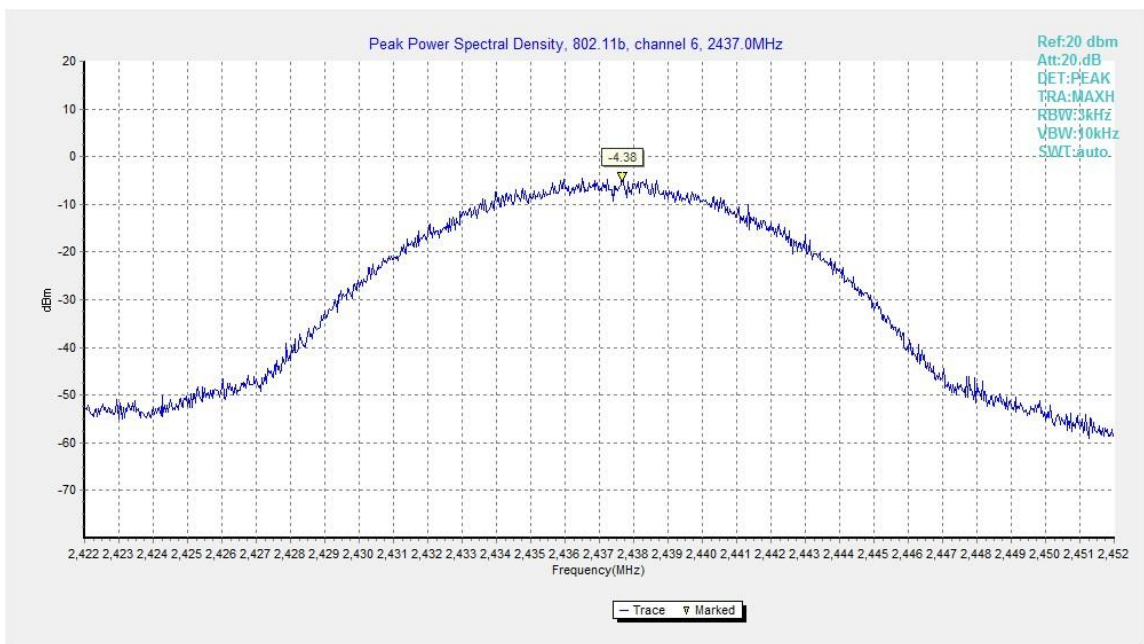
Mode	Channel	Power Spectral Density ( dBm/3 kHz )		Conclusion
802.11n (HT20)	1	Fig.A.3.7	-12.63	<b>P</b>
	6	Fig.A.3.8	-12.02	<b>P</b>
	11	Fig.A.3.9	-11.83	<b>P</b>

**Conclusion: Pass**

**Test graphs as below:**

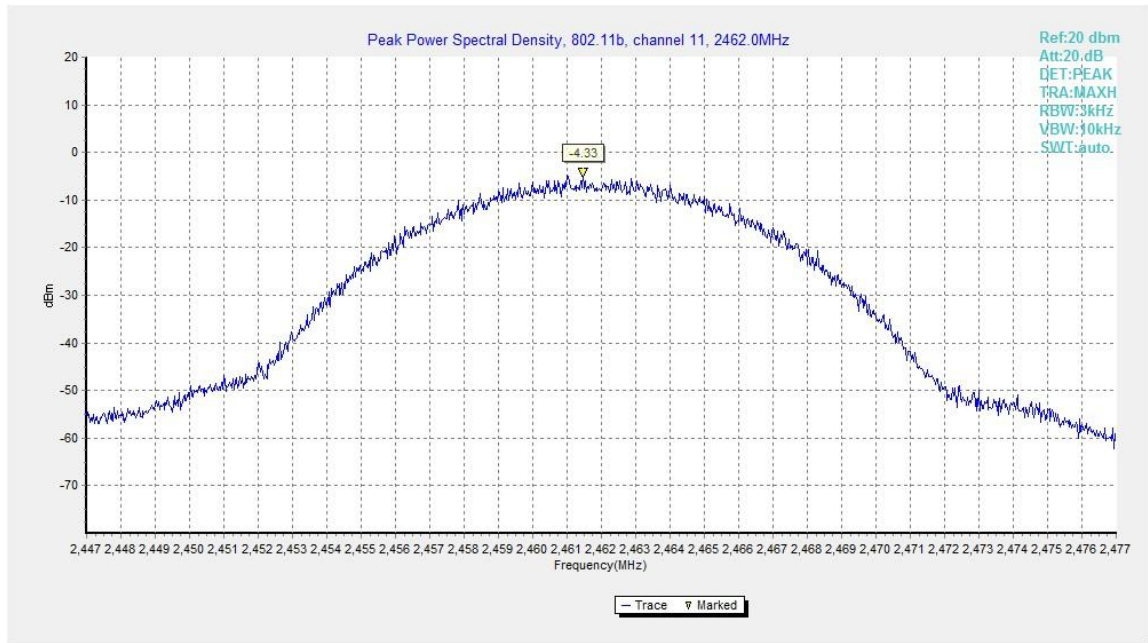


**Fig.A.3.1 Power Spectral Density(802.11b,Ch1)**

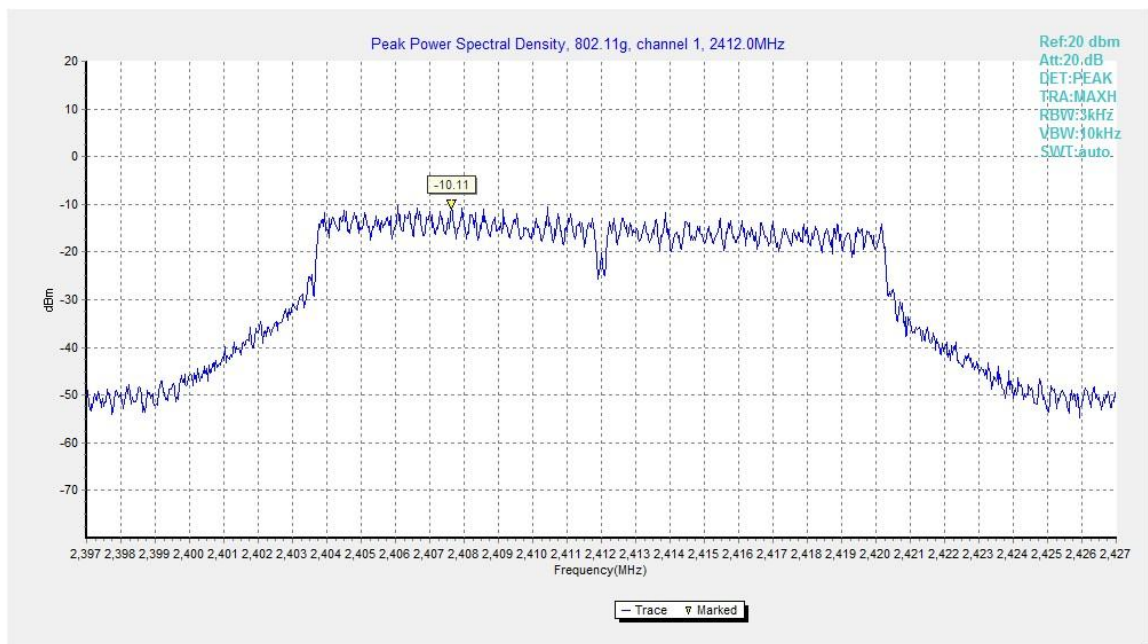


**Fig.A.3.2 Power Spectral Density (802.11b, Ch 6)**

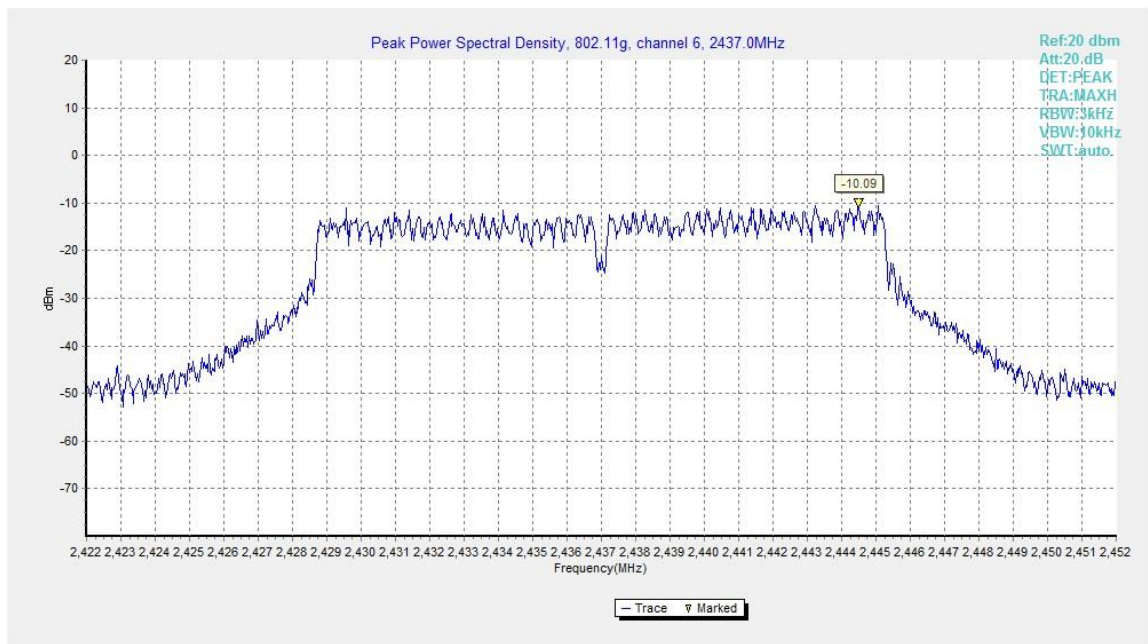




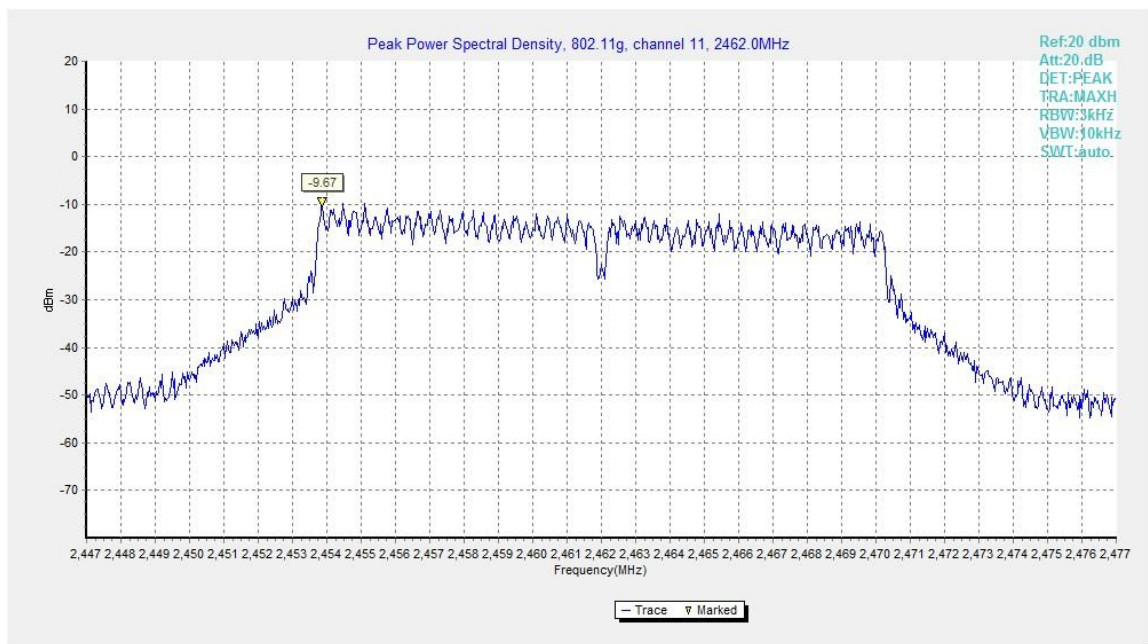
**Fig.A.3.3 Power Spectral Density (802.11b, Ch 11)**



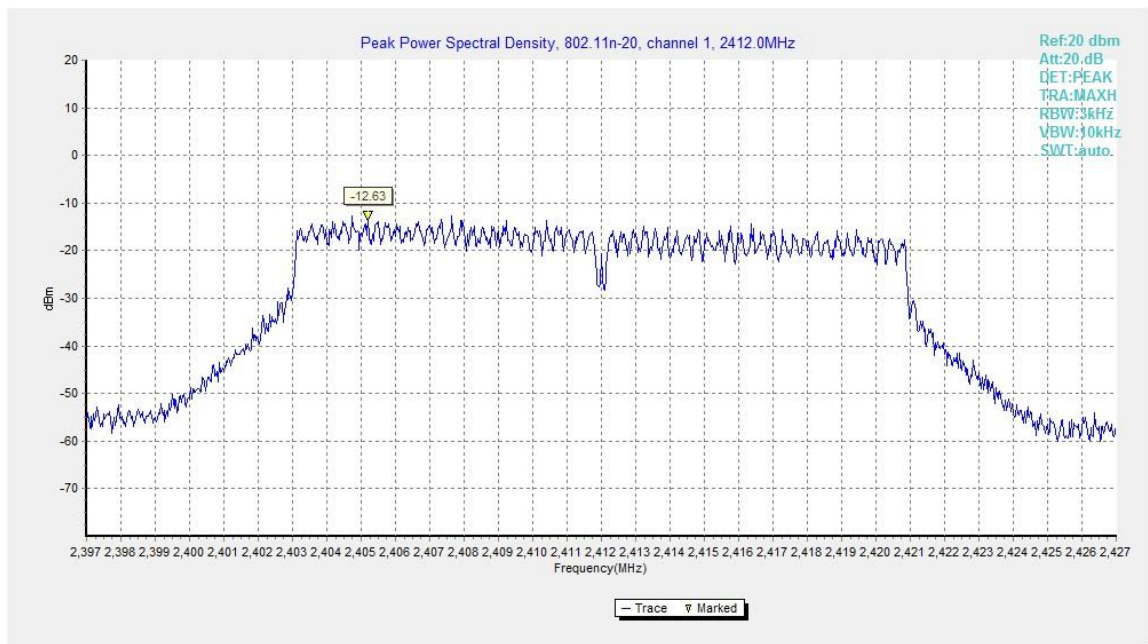
**Fig.A.3.4 Power Spectral Density (802.11g, Ch 1)**



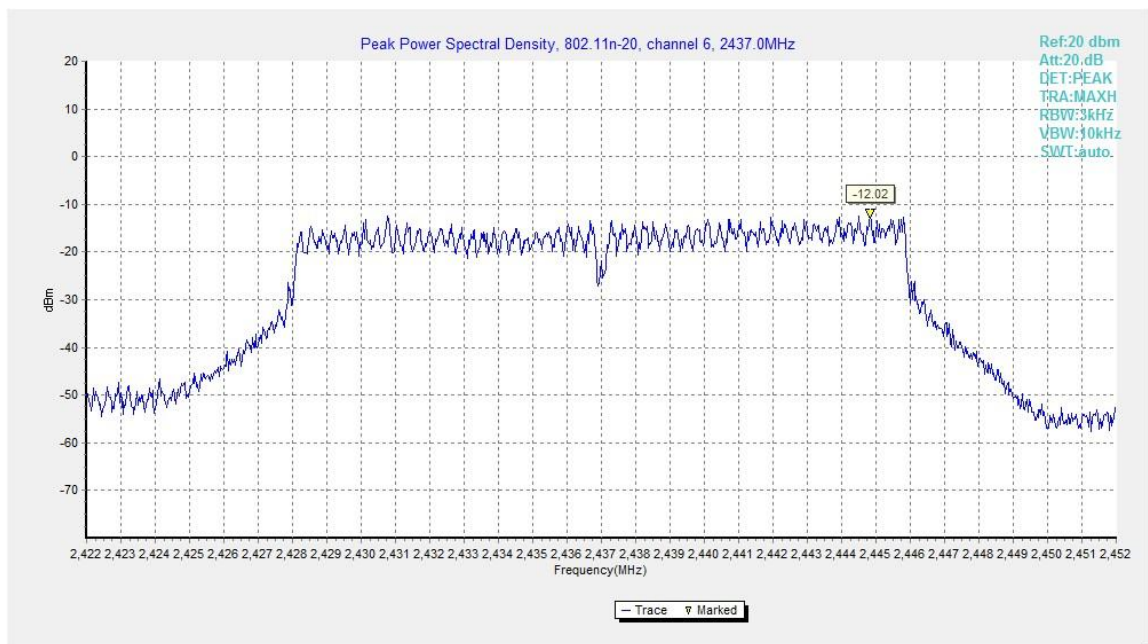
**Fig.A.3.5 Power Spectral Density (802.11g, Ch 6)**



**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)**

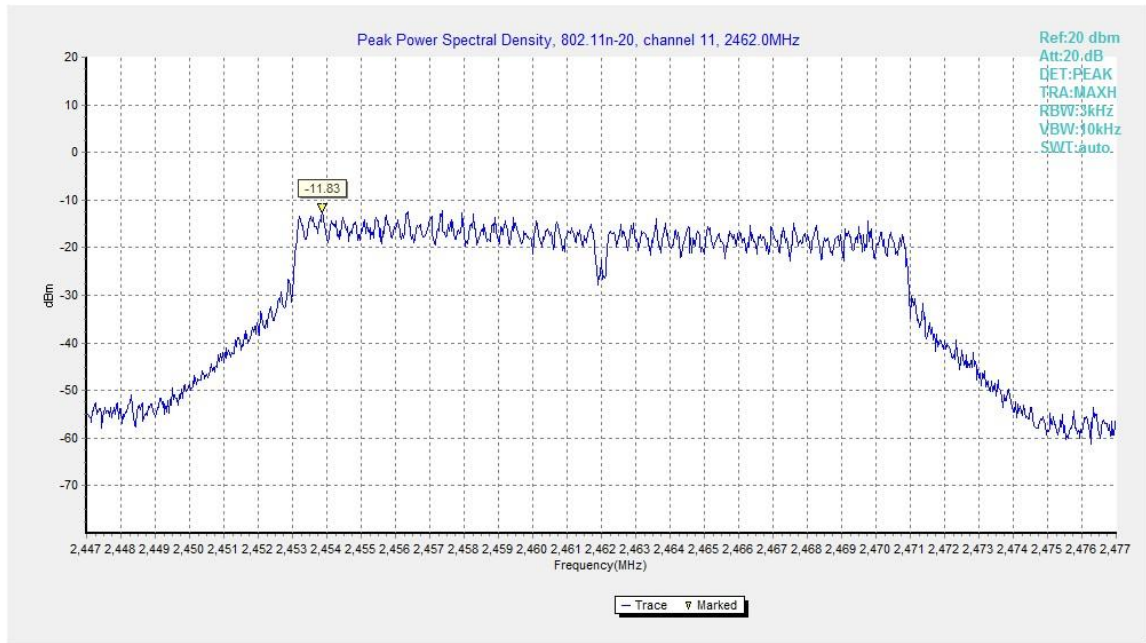


Fig.A.3.9 Power Spectral Density (802.11n-HT20, Ch 11)

#### **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)	≥ 500

**EUT ID: EUT2**

**Measurement Result:**

**802.11b/g mode**

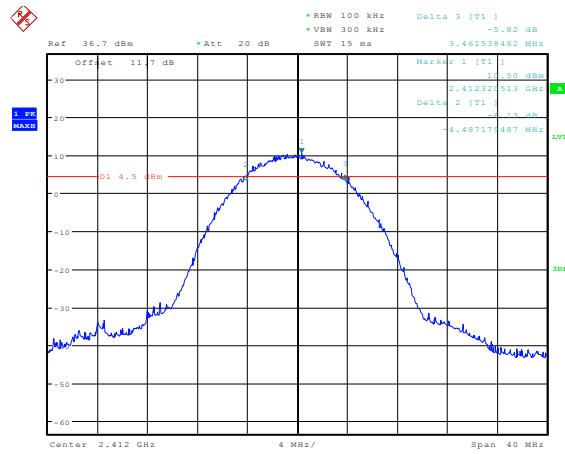
Mode	Channel	Occupied 6dB Bandwidth ( kHz)		conclusion
802.11b	1	Fig.A.4.1	7950	<b>P</b>
	6	Fig.A.4.2	7560	<b>P</b>
	11	Fig.A.4.3	7370	<b>P</b>
802.11g	1	Fig.A.4.4	16480	<b>P</b>
	6	Fig.A.4.5	16480	<b>P</b>
	11	Fig.A.4.6	16480	<b>P</b>

**802.11n-HT20 mode**

Mode	Channel	Occupied 6dB Bandwidth ( kHz)		conclusion
802.11n (HT20)	1	Fig.A.4.7	17620	<b>P</b>
	6	Fig.A.4.8	17760	<b>P</b>
	11	Fig.A.4.9	17690	<b>P</b>

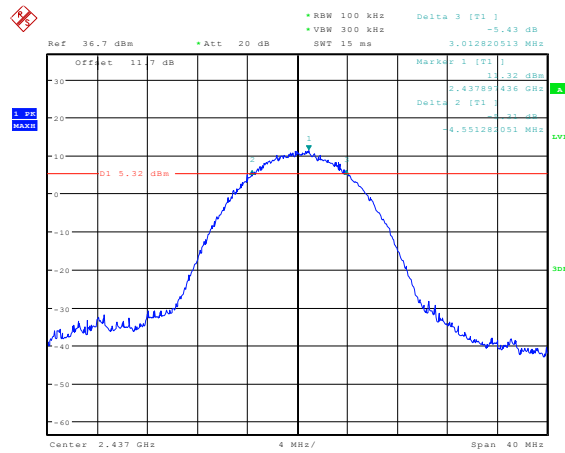
**Conclusion: Pass**

**Test graphs as below:**



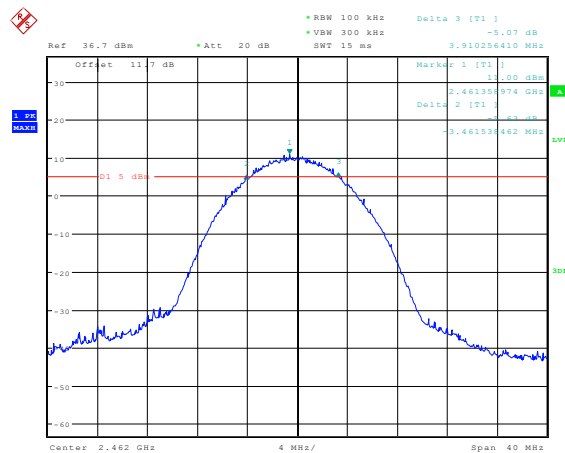
Date: 22.DEC.2017 14:18:23

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



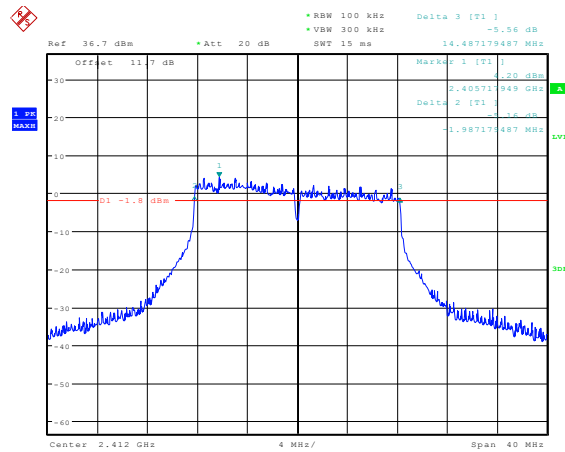
Date: 22.DEC.2017 14:20:30

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



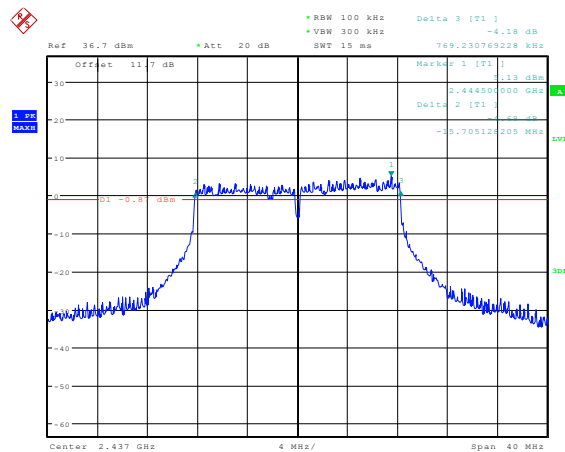
Date: 22.DEC.2017 14:24:51

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



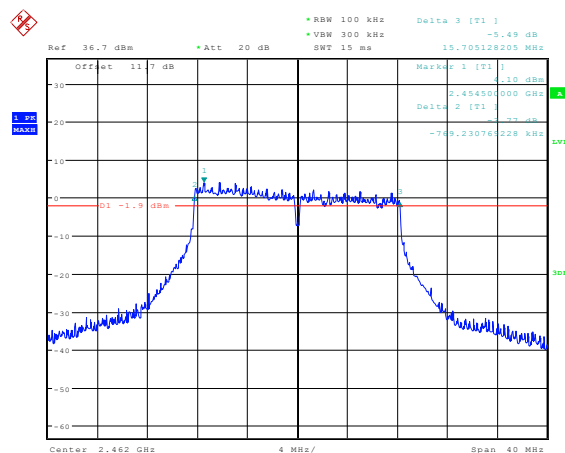
Date: 22.DEC.2017 14:33:57

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



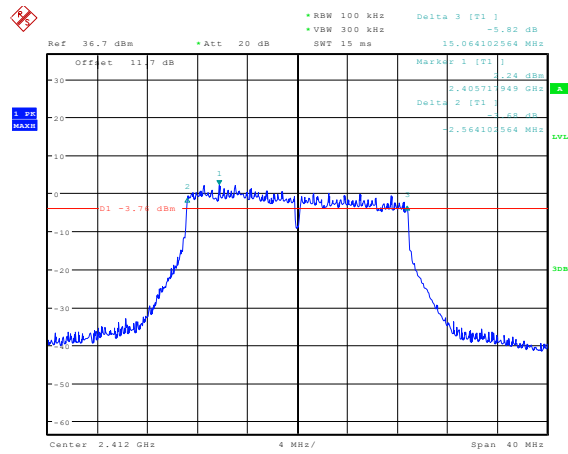
Date: 22.DEC.2017 14:30:22

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



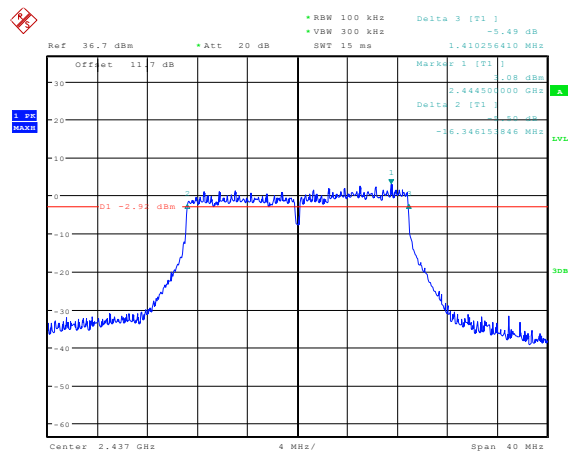
Date: 22.DEC.2017 14:27:45

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



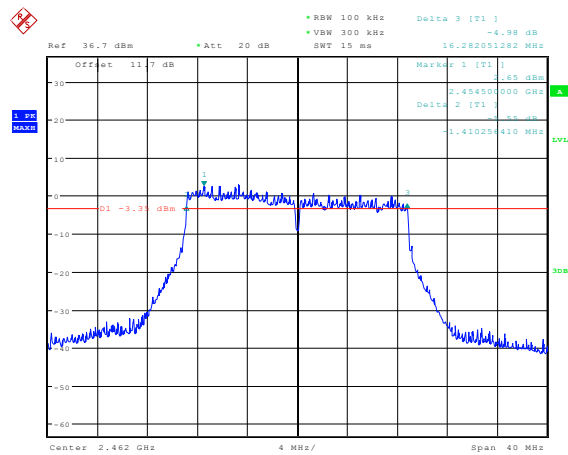
Date: 22.DEC.2017 14:39:36

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



Date: 22.DEC.2017 14:41:30

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



Date: 22.DEC.2017 14:43:39

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



### **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	<b>P</b>
	11	Fig.A.5.2	<b>P</b>
802.11g	1	Fig.A.5.3	<b>P</b>
	11	Fig.A.5.4	<b>P</b>

**802.11n-HT20 mode**

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

**Conclusion: Pass**

**Test graphs as below:**

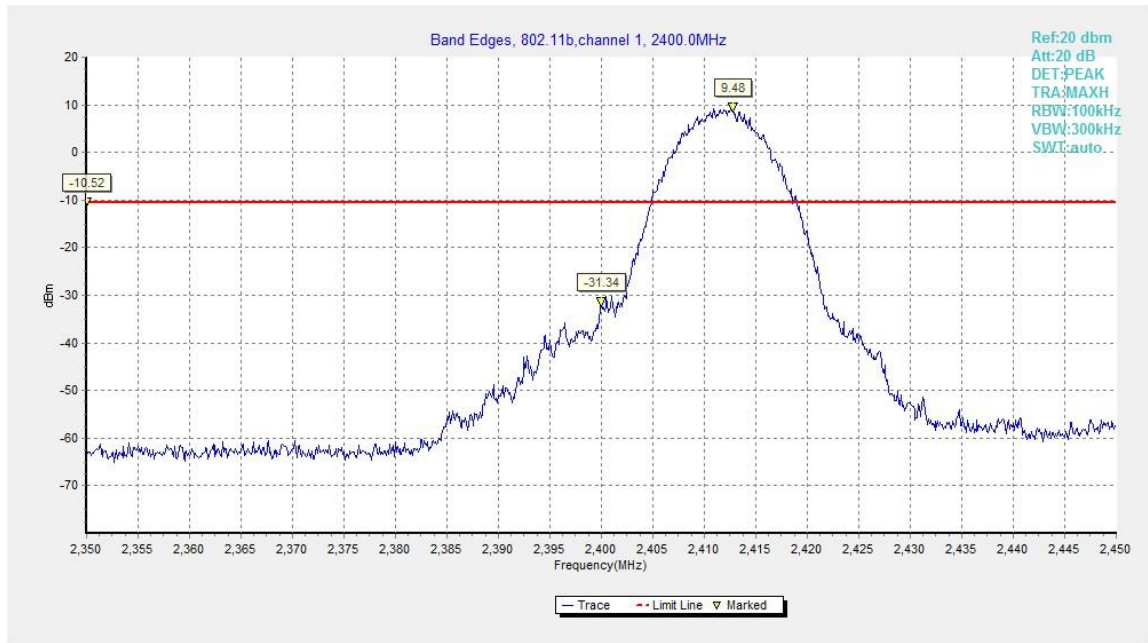


Fig.A.5.1 Band Edges (802.11b, Ch 1)

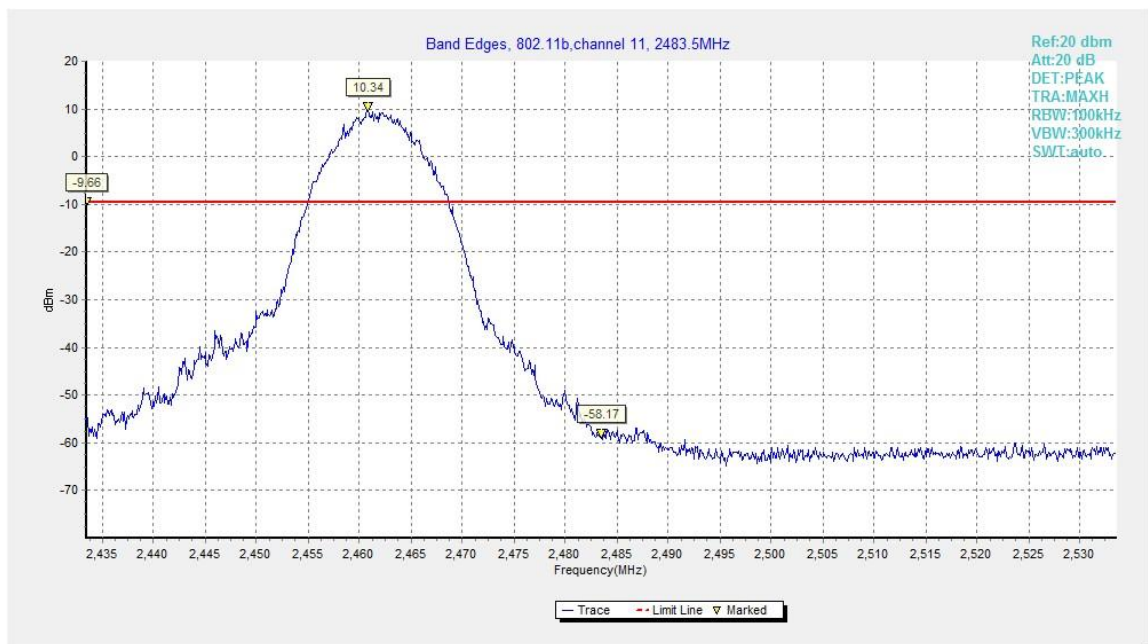


Fig.A.5.2 Band Edges (802.11b, Ch 11)

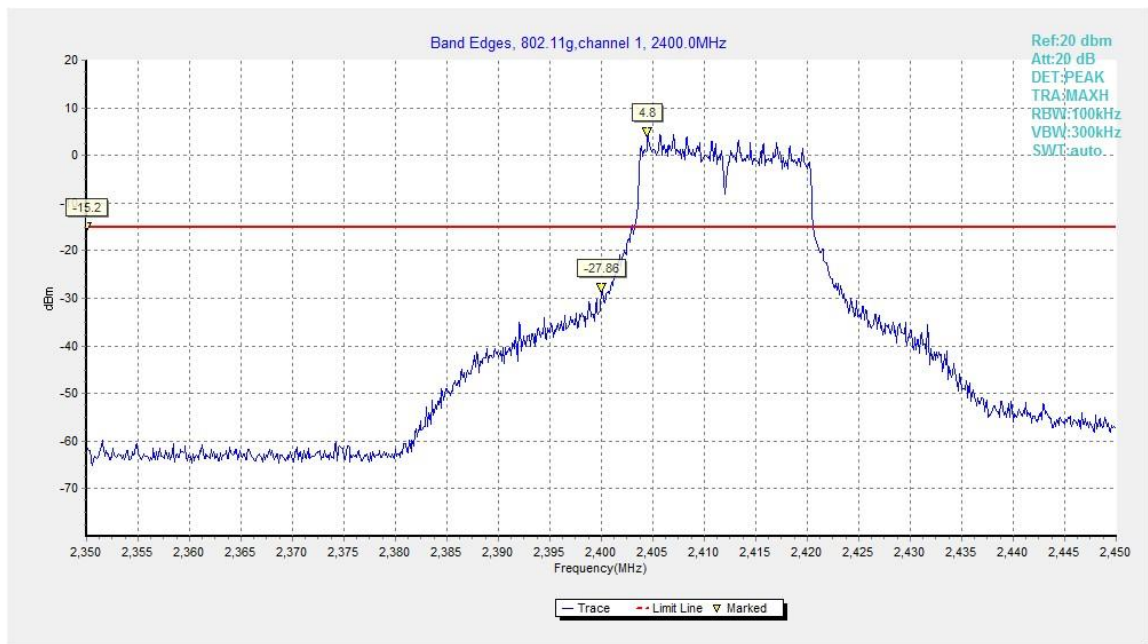


Fig.A.5.3 Band Edges (802.11g, Ch 1)

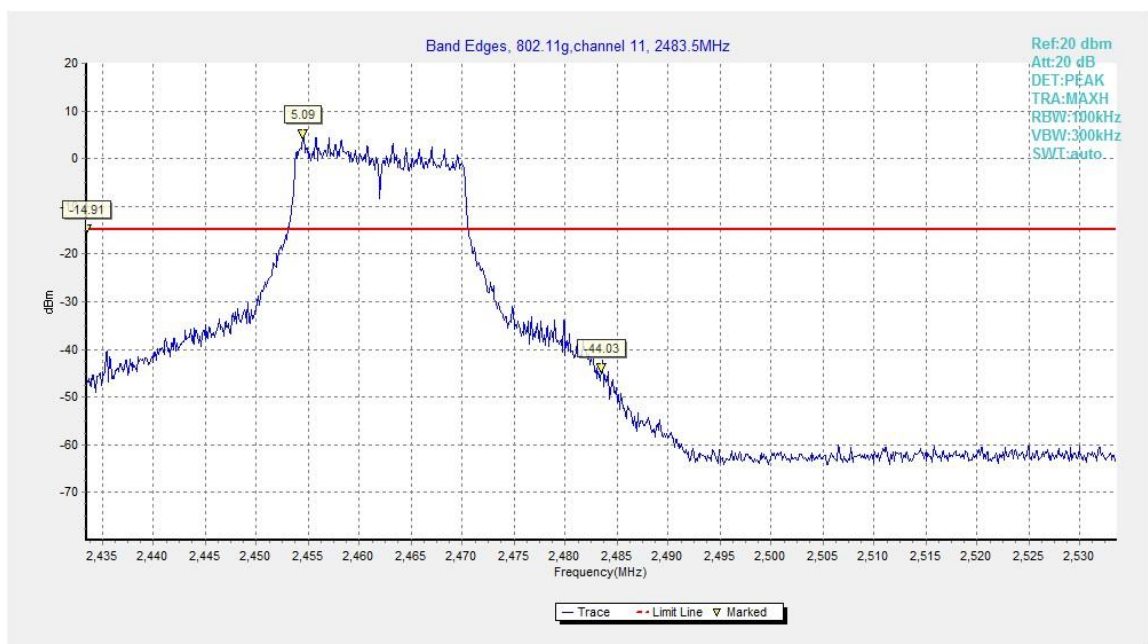


Fig.A.5.4 Band Edges (802.11g, Ch 11)



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



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



**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:**

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

**EUT ID: EUT2**

**Measurement Results:**

**802.11b mode**

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

**802.11g mode**

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

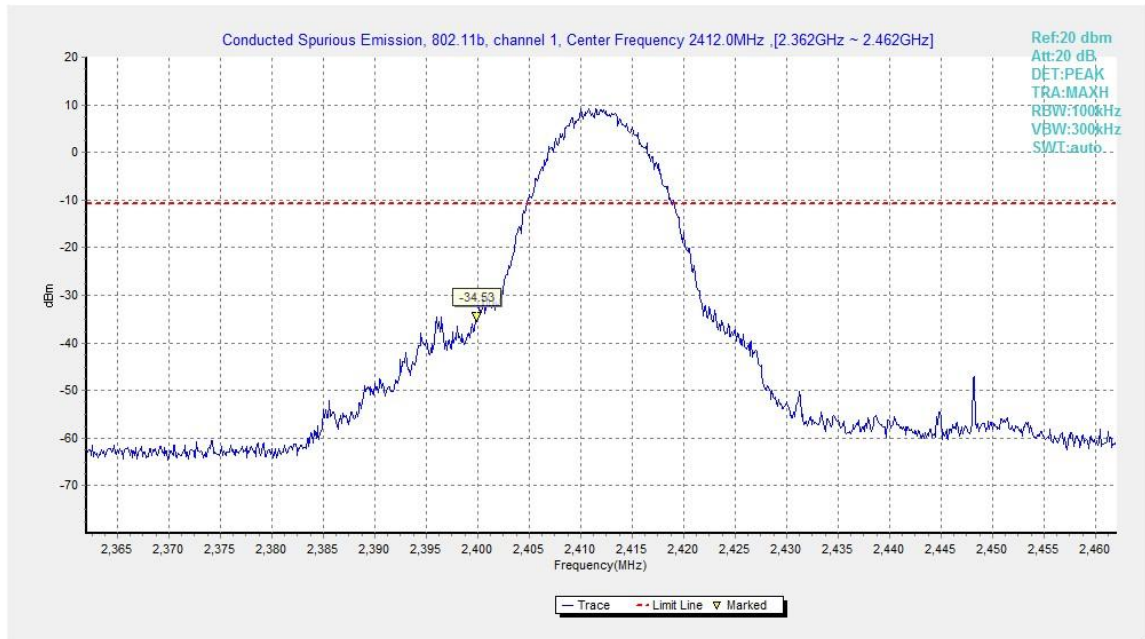
**802.11n-HT20 mode**

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

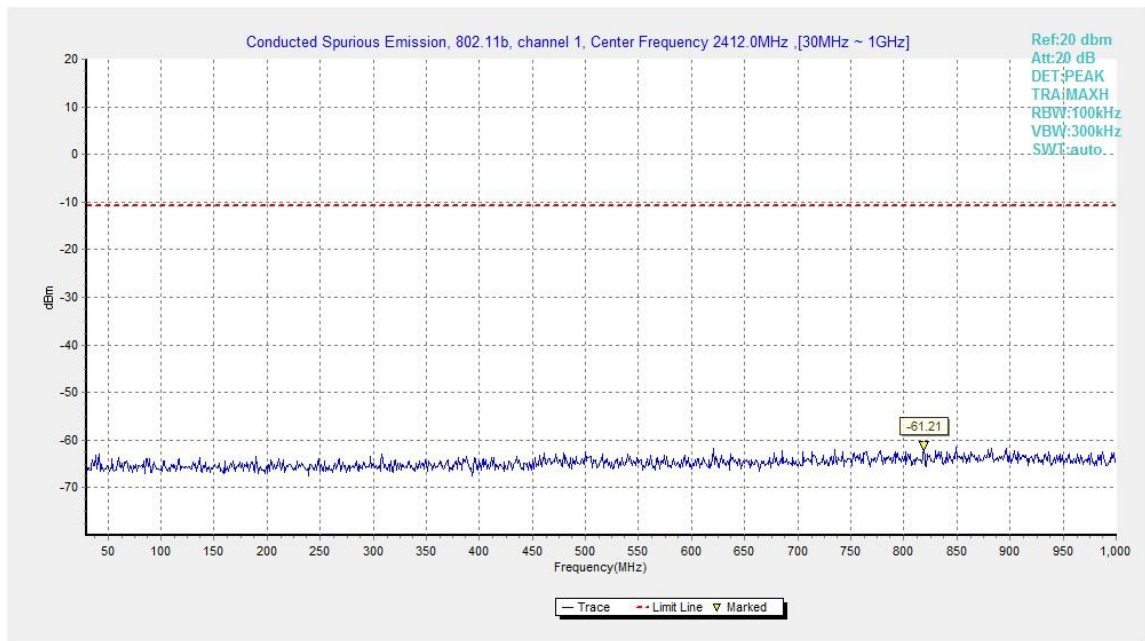
**Conclusion: Pass**

**Test graphs as below:**

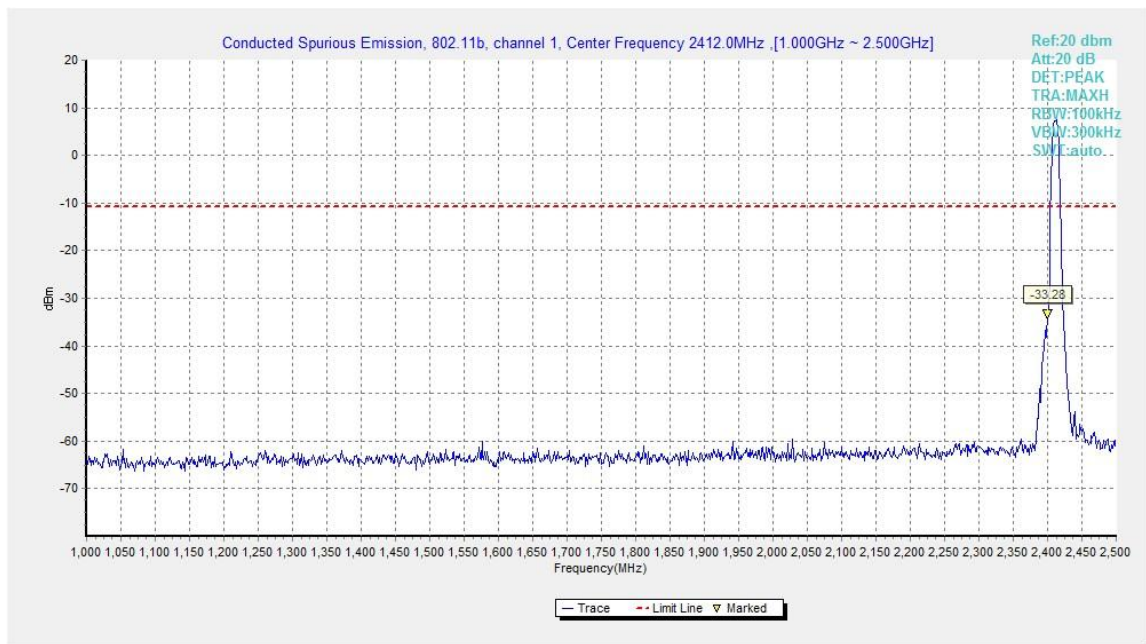




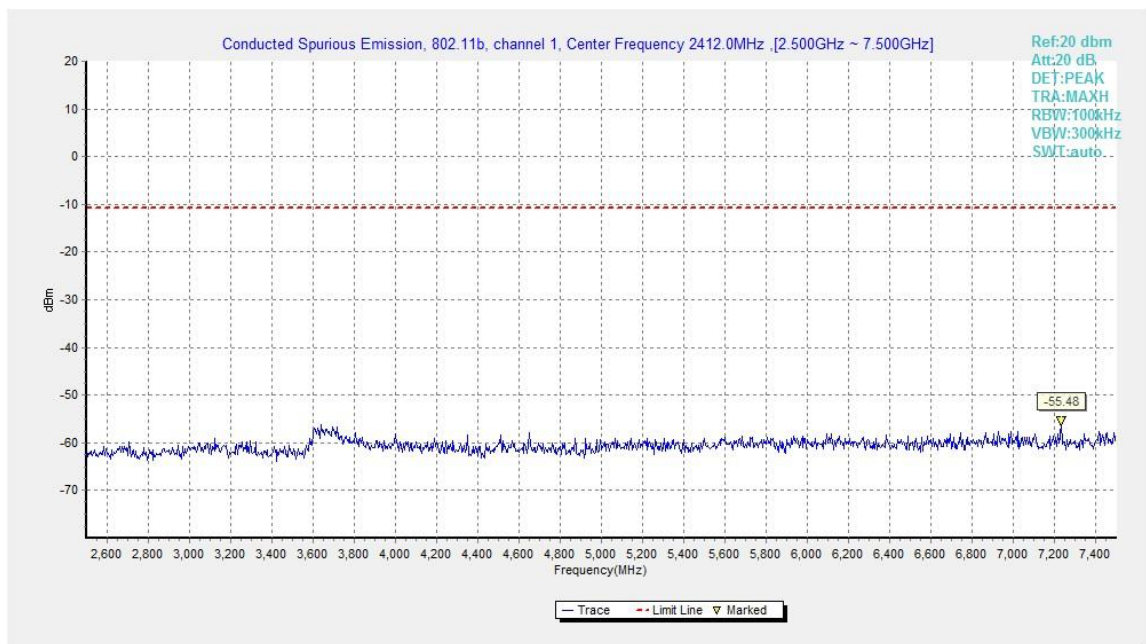
**Fig.A.6.1.1 Transmitter Spurious Emission - Conducted (802.11b, Ch1, Center Frequency)**



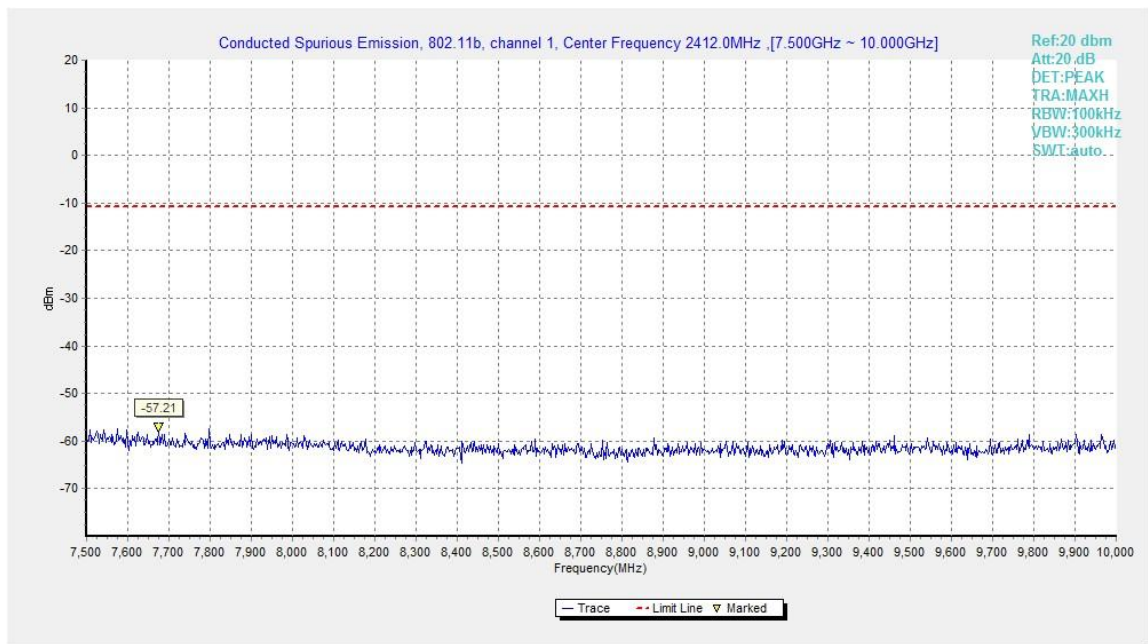
**Fig.A.6.1.2 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 30 MHz-1 GHz)**



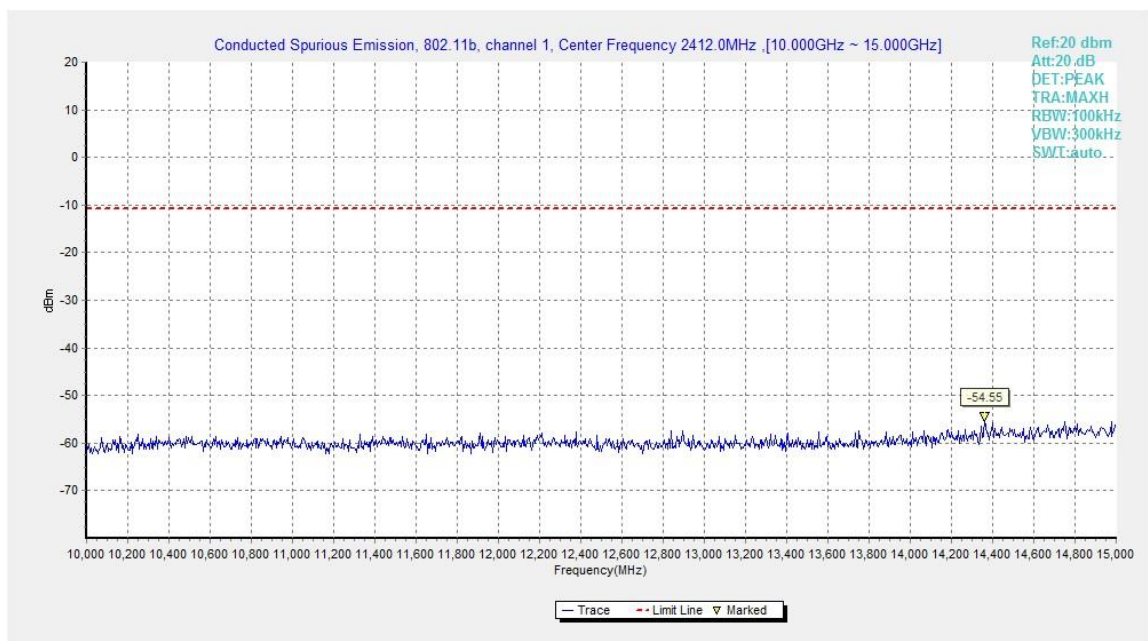
**Fig.A.6.1.3 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 1 GHz-2.5 GHz)**



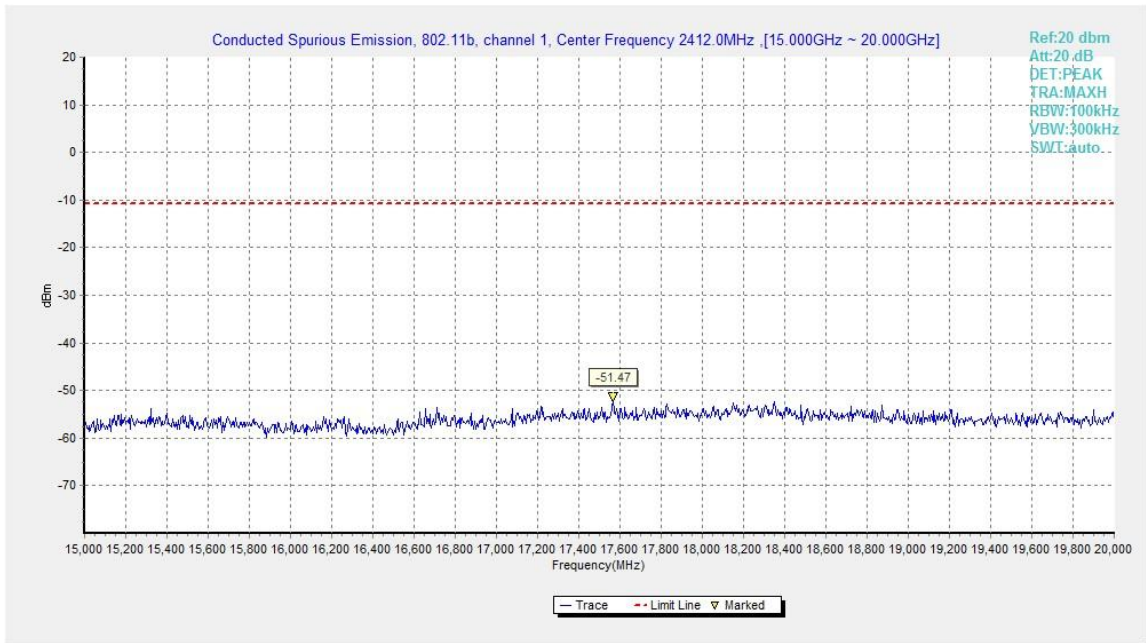
**Fig.A.6.1.4 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 2.5 GHz-7.5 GHz)**



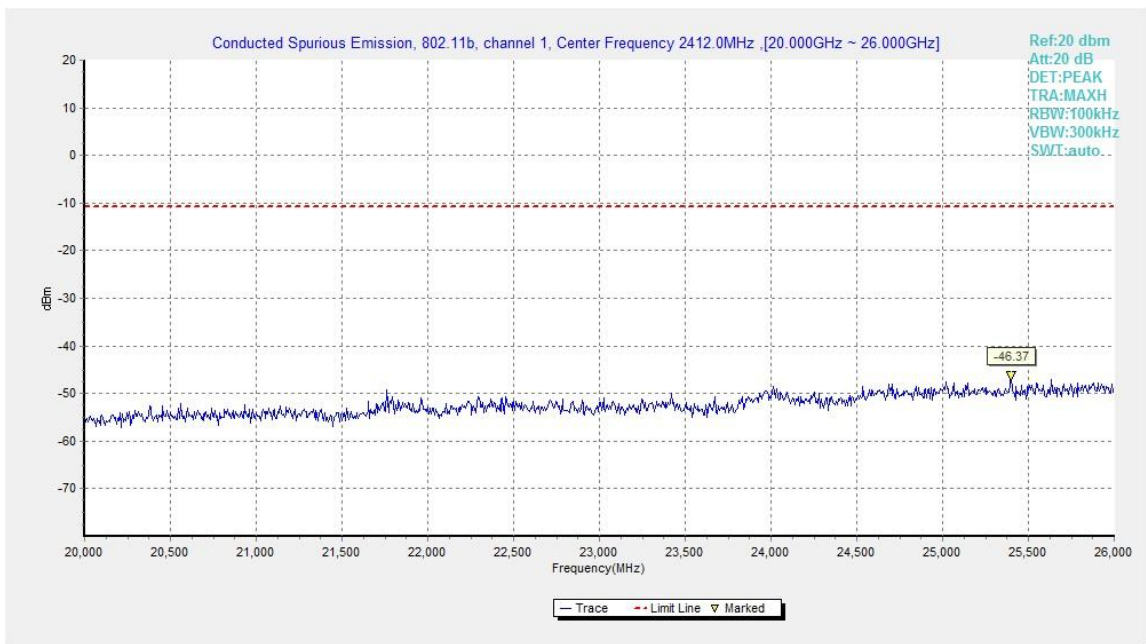
**Fig.A.6.1.5 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 7.5 GHz-10 GHz)**



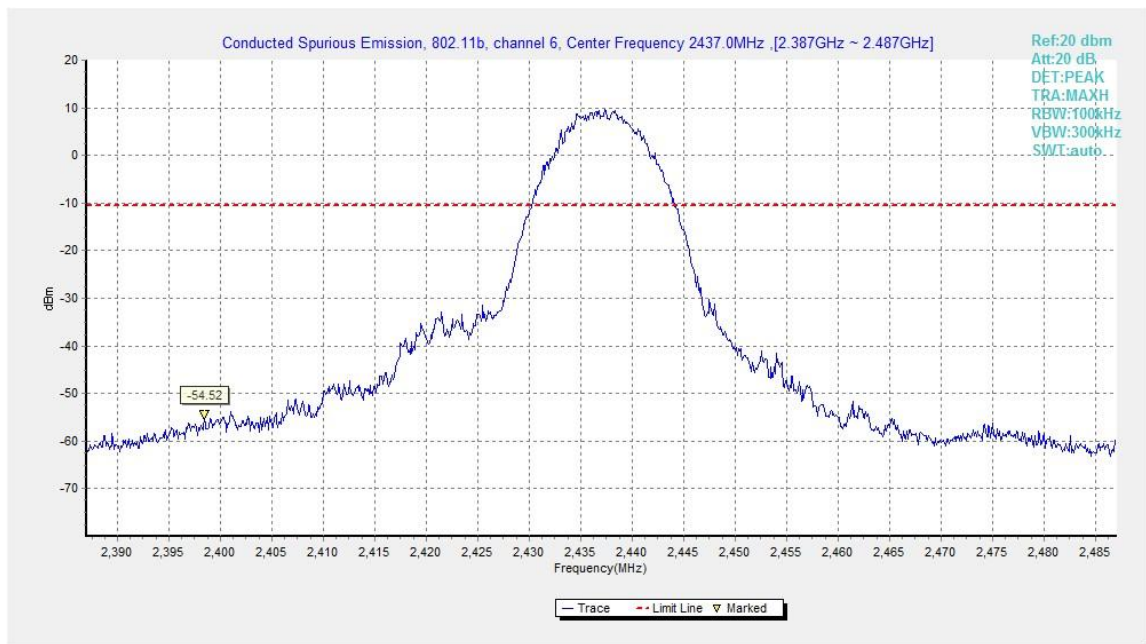
**Fig.A.6.1.6 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 10 GHz-15 GHz)**



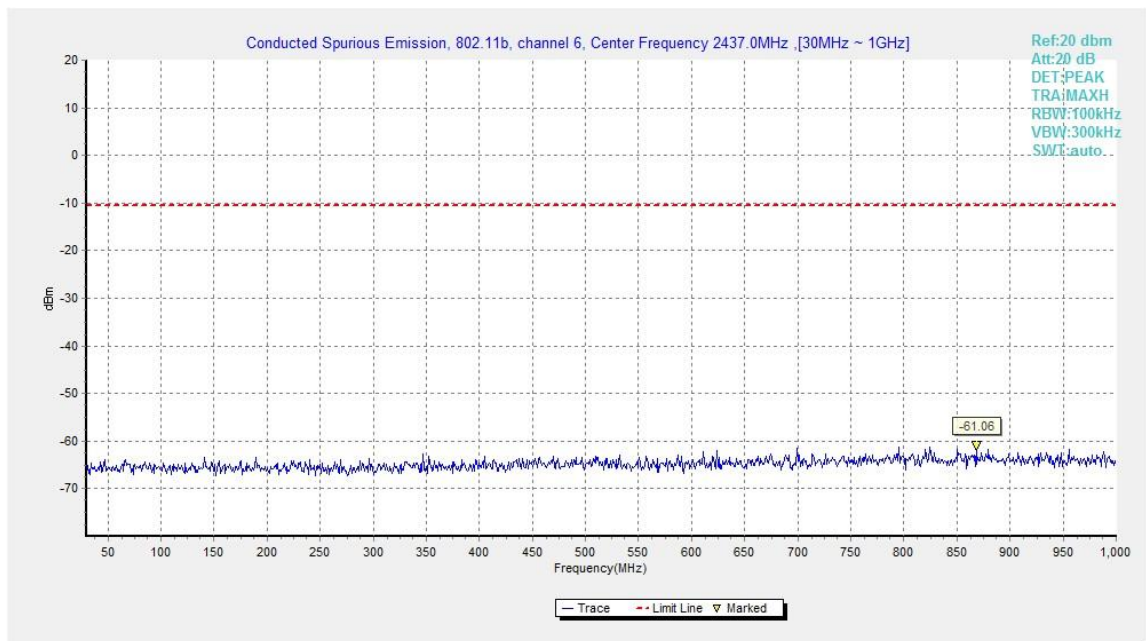
**Fig.A.6.1.7 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 15 GHz-20 GHz)**



**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)**

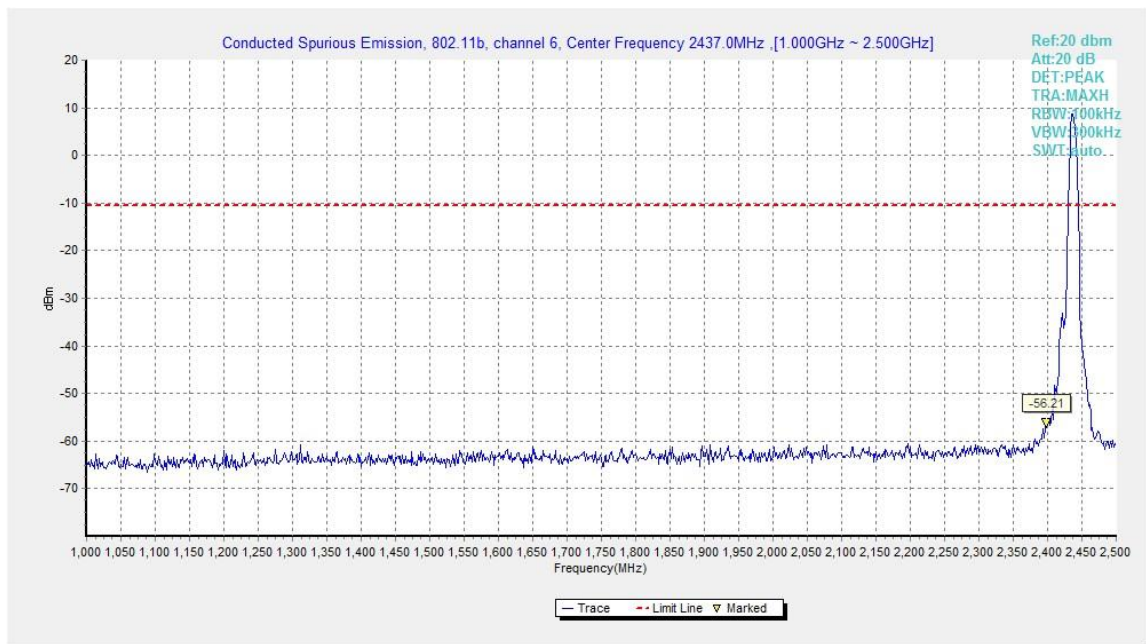


Fig.A.6.1.11 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 1 GHz-2.5 GHz)

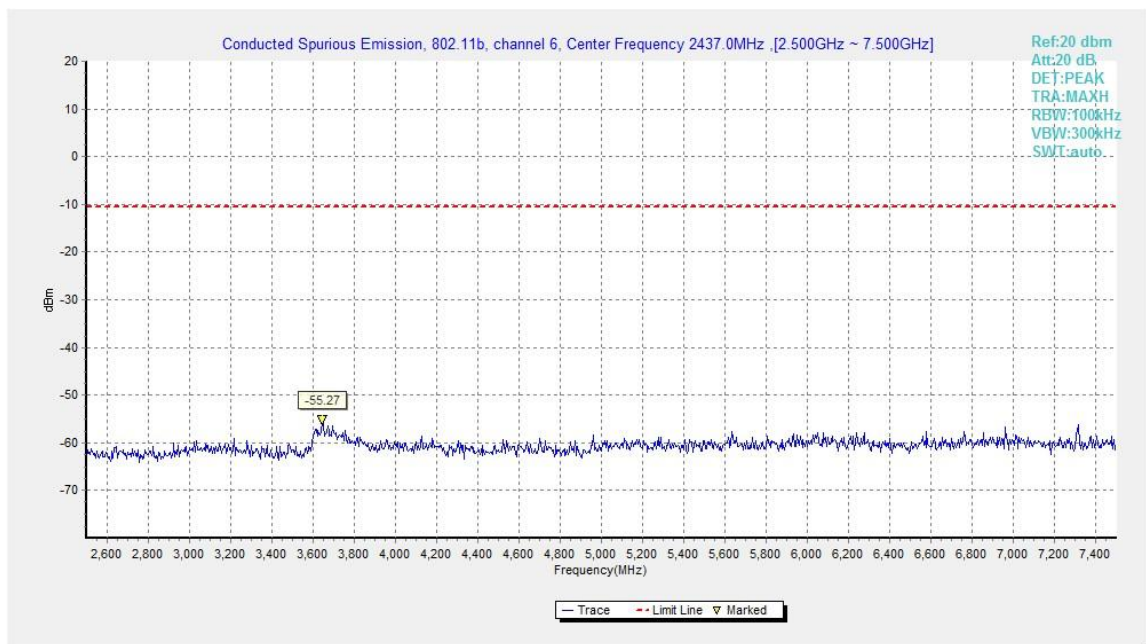
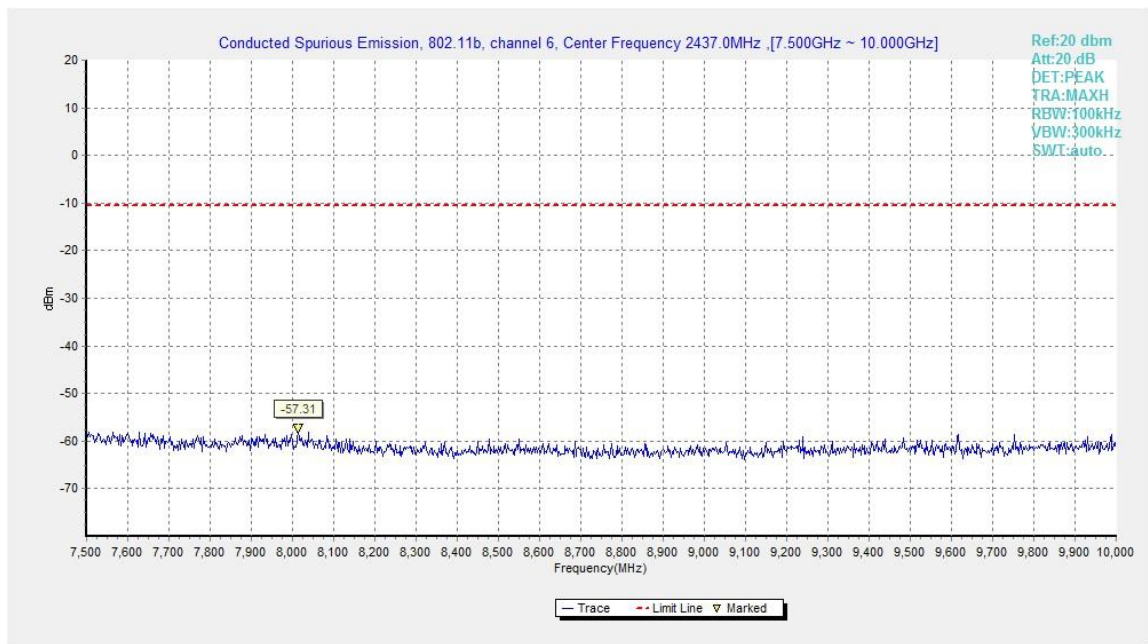
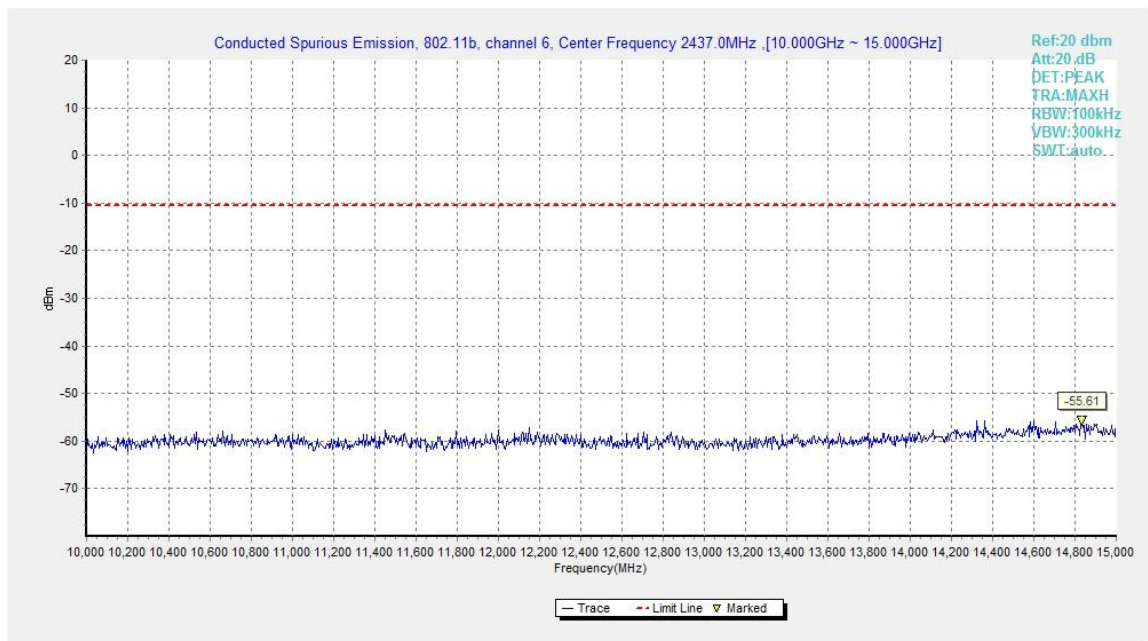


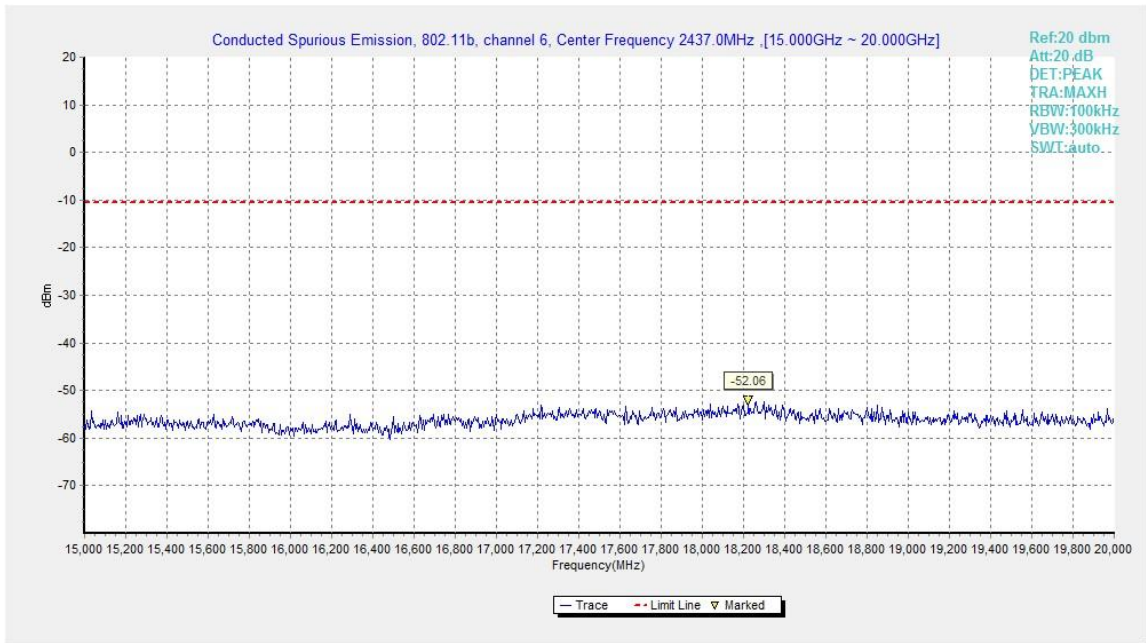
Fig.A.6.1.12 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 2.5 GHz-7.5 GHz)



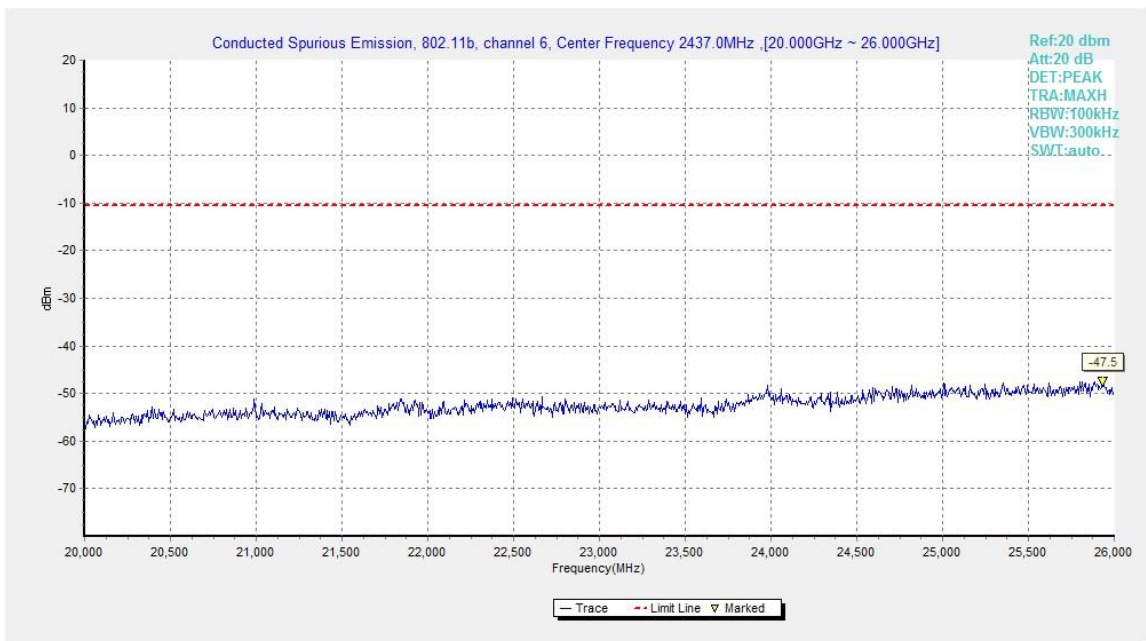
**Fig.A.6.1.13 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 7.5 GHz-10 GHz)**



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

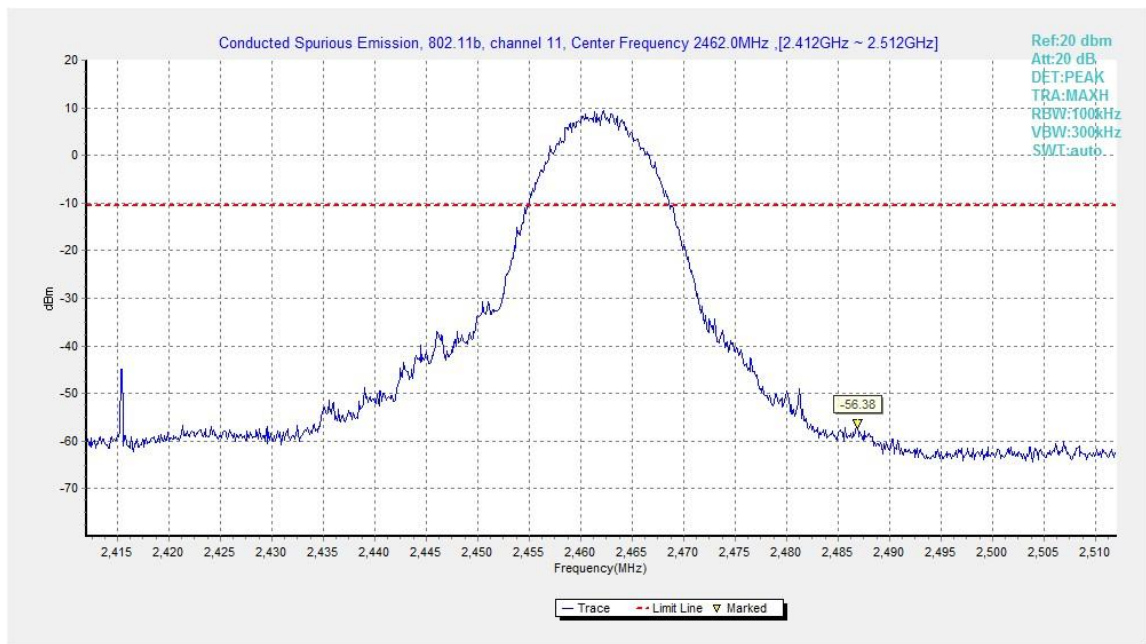


**Fig.A.6.1.15 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 15 GHz-20 GHz)**

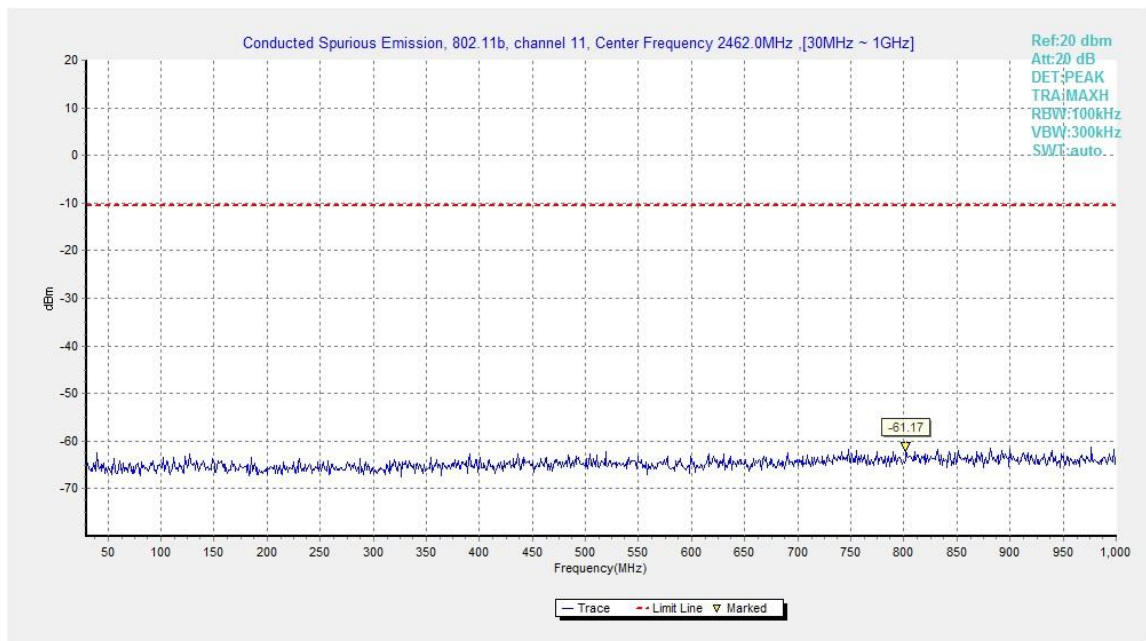


**Fig.A.6.1.16 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 20 GHz-26 GHz)**

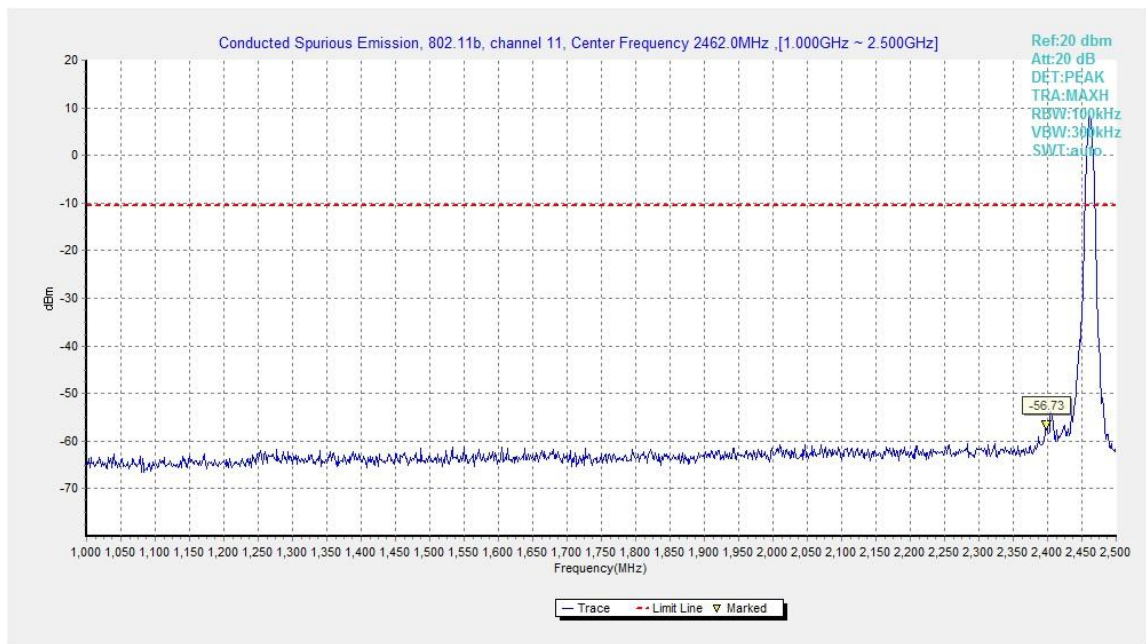




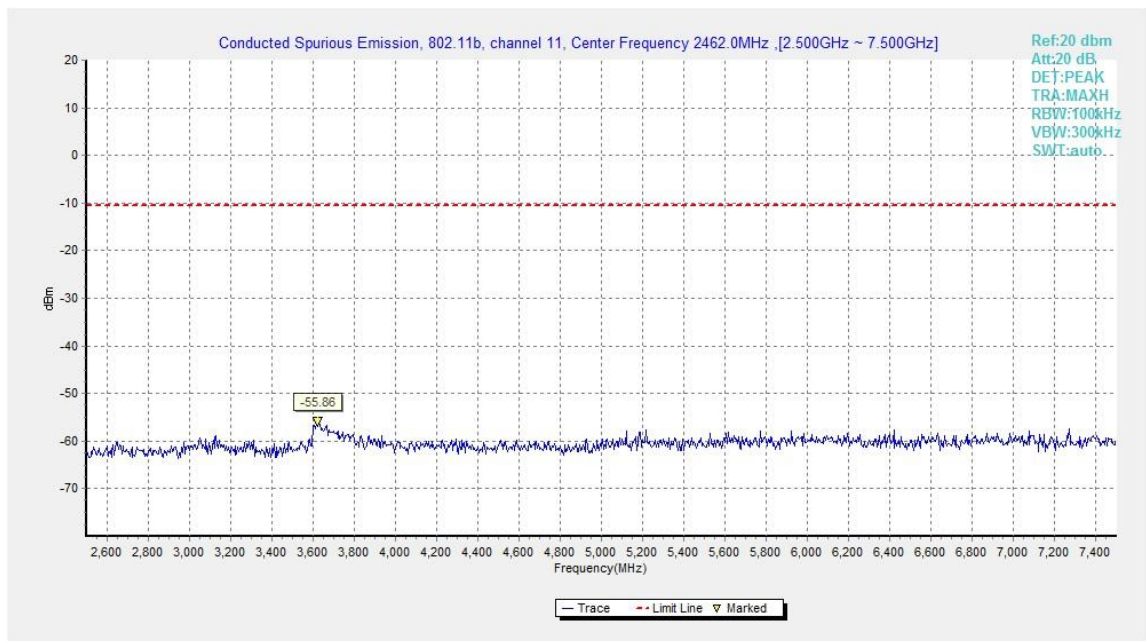
**Fig.A.6.1.17 Transmitter Spurious Emission - Conducted (802.11b, Ch11, Center Frequency)**



**Fig.A.6.1.18 Transmitter Spurious Emission - Conducted (802.11b, Ch11, 30 MHz-1 GHz)**



**Fig.A.6.1.19 Transmitter Spurious Emission - Conducted (802.11b, Ch11, 1 GHz-2.5 GHz)**



**Fig.A.6.1.20 Transmitter Spurious Emission - Conducted (802.11b, Ch11, 2.5 GHz-7.5 GHz)**