



# FCC PART 15C TEST REPORT No. I14Z47312-SRD03

for

**TCT Mobile Limited**

**HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone**

**Model Name: 4037A**

**FCC ID: RAD510**

**With**

**Hardware Version: PIO**

**Software Version: v9H2N**

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## 1. TEST LABORATORY

### 1.1. Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT  
Address: No. 52, Huayuan Bei Road, Haidian District, Beijing, P. R. China  
Postal Code: 100191  
Telephone: 008610623046332046  
Fax: 008610623046332063

### 1.2. Project Data

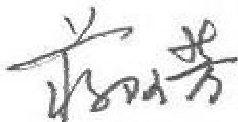
Testing Start Date: 2014-05-09  
Testing End Date: 2014-05-19

### 1.3. Signature



---

Xu Zhongfei  
(Prepared this test report)



---

Jiang Afang  
(Reviewed this test report)



---

Xiao Li  
Deputy Director of the laboratory  
(Approved this test report)

## **2. CLIENT INFORMATION**

### **2.1. Applicant Information**

Company Name: TCT Mobile Limited  
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
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Telephone: 0086-21-61460890  
Fax: 0086-21-61460602

### **2.2. Manufacturer Information**

Company Name: TCT Mobile Limited  
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
Contact: Gong Zhizhou  
Email: zhizhou.gong@jrdcom.com  
Telephone: 0086-21-61460890  
Fax: 0086-21-61460602

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

#### 3.1. About EUT

|                     |                                                    |
|---------------------|----------------------------------------------------|
| Description         | HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone |
| Model name          | 4037A                                              |
| FCC ID              | RAD510                                             |
| 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 | 24.47dBm(OFDM)                                     |
| GPRS Class          | Class 12                                           |
| GPRS operation mode | Class B                                            |
| Power Supply        | 3.8V DC by Battery                                 |

#### 3.2. Internal Identification of EUT Used During the Test

| EUT ID* | IMEI | HW Version | SW Version |
|---------|------|------------|------------|
| EUT1    | /    | PIO        | v9H2N      |
| EUT2    | /    | PIO        | v9H2N      |

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

#### 3.3. Internal Identification of AE Used During the Test

| AE ID* | Description | Type         | SN |
|--------|-------------|--------------|----|
| AE1    | Battery     | CAB60B0000C1 | /  |
| AE2    | Charger     | CBA3007AG0C1 | /  |

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

#### 3.4. General Description

Equipment Under Test (EUT) is a model of HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone with integrated antenna. It consists of normal options: Battery and Charger.

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

Samples undergoing test were selected by the Client.

#### 4. Reference Documents

##### 4.1. Documents supplied by applicant

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

##### 4.2. REFERENCE DOCUMENTS FOR TESTING

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

| Reference        | Title                                                                                                                                | Version |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------|
| FCC Part15       | FCC CFR 47, Part 15, Subpart C:                                                                                                      |         |
|                  | 15.205 Restricted bands of operation;                                                                                                | Oct,    |
|                  | 15.209 Radiated emission limits, general requirements;                                                                               | 2012    |
|                  | 15.247 Operation within the bands 902-928MHz, 2400-2483.5 MHz, and 5725-5850 MHz.                                                    |         |
| ANSI C63.4       | Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz | 2003    |
| KDB558074 v03r01 | Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247                        | 2013    |

#### 5. LABORATORY ENVIRONMENT

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

#### 6. SUMMARY OF TEST RESULTS

##### 6.1. Summary of Test Results

| SUMMARY OF MEASUREMENT RESULTS            | Sub-clause of Part15C  | Sub-clause of IC | Verdict |
|-------------------------------------------|------------------------|------------------|---------|
| Maximum Peak Output Power                 | 15.247 (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 TMC                                |
| NA | Not Applicable, The test was not applicable                                   |
| F  | Fail, The EUT does not comply with the essential requirements in the standard |

## 6.2. Statements

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

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

This model is a variant product which market name is 4035A; all the test result has been derived from test report of 4035A.

## 6.3. Test Conditions

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

|             |                   |
|-------------|-------------------|
| Temperature | 26°C              |
| Voltage     | 3.8V (By battery) |
| Humidity    | 44%               |

## 7. TEST EQUIPMENTS UTILIZED

### Conducted test system

| No. | Equipment              | Model   | Serial Number | Manufacturer    | Calibration date | Calibration Due date |
|-----|------------------------|---------|---------------|-----------------|------------------|----------------------|
| 1   | Vector Signal Analyzer | FSQ40   | 200089        | Rohde & Schwarz | 2013-07-08       | 2014-07-07           |
| 2   | Test Receiver          | ESS     | 847151/015    | Rohde & Schwarz | 2013-11-29       | 2014-11-28           |
| 3   | LISN                   | ESH2-Z5 | 829991/012    | Rohde & Schwarz | 2013-4-15        | 2015-4-14            |
| 4   | Shielding Room         | S81     | /             | ETS-Lindgren    | /                | /                    |

### Radiated emission test system

| No. | Equipment                         | Model    | Serial Number | Manufacturer     | Calibration date | Calibration Due date |
|-----|-----------------------------------|----------|---------------|------------------|------------------|----------------------|
| 1   | Test Receiver                     | ESU26    | 100376        | Rohde & Schwarz  | 2013-11-6        | 2014-11-5            |
| 2   | BiLog Antenna                     | VULB9163 | 9163-514      | Schwarzbeck      | 2011-11-11       | 2014-11-10           |
| 3   | Dual-Ridge Waveguide Horn Antenna | 3117     | 00119024      | ETS-Lindgren     | 2011-4-20        | 2015-4-19            |
| 4   | Dual-Ridge Waveguide Horn Antenna | 3116     | 2661          | EMCO             | 2011-7-1         | 2014-06-30           |
| 5   | Loop antenna                      | HFH2-Z2  | 829324/007    | Rohde & Schwarz  | 2011-12-21       | 2014-12-20           |
| 6   | Semi-anechoic chamber             | /        | CT000332-1074 | Frankonia German | /                | /                    |

## ANNEX A: MEASUREMENT 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

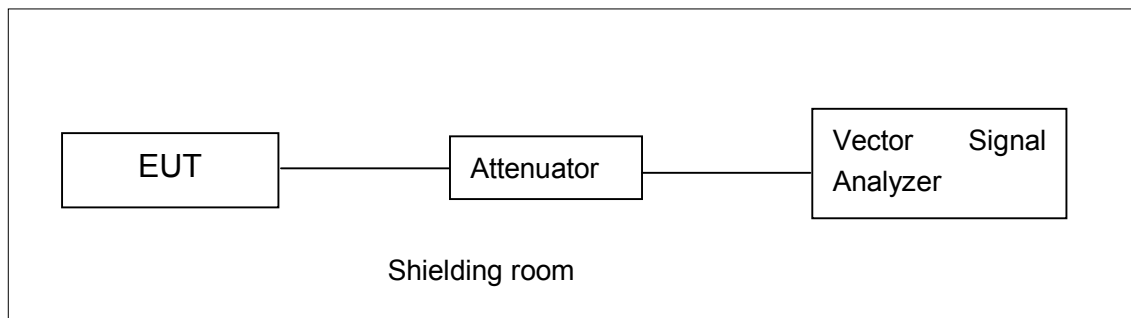


Fig.A.1.1.1: Test Setup Diagram for Conducted Measurements

#### 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;

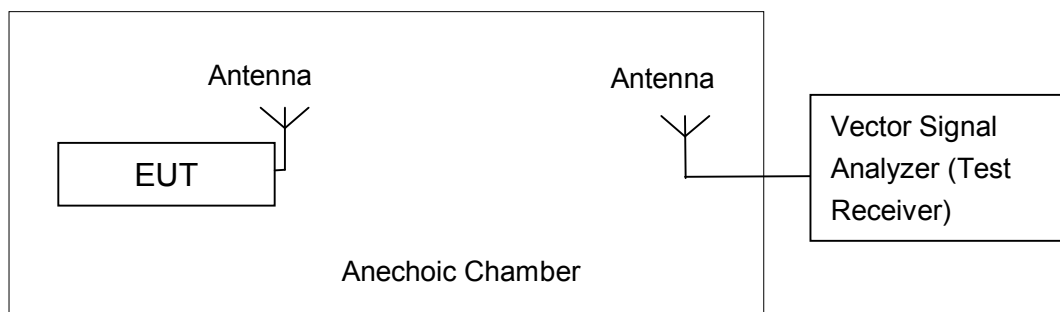


Fig.A.1.2.1: Test Setup Diagram for Radiated Measurements

## A.2. Maximum Output Power

### Measurement Limit and Method:

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

Note: The Duty cycle of EUT is 98.1%, so all measurements of maximum conducted output power will be performed with the EUT transmitting continuously.

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

Method of Measurement: See KDB558074 section 9.1.2.

### Measurement Results:

#### 802.11b/g mode

| Mode    | Data Rate (Mbps) | Test Result (dBm) |               |                 |                 |                 |
|---------|------------------|-------------------|---------------|-----------------|-----------------|-----------------|
|         |                  | 2412MHz (Ch1)     | 2437MHz (Ch6) | 2462 MHz (Ch11) | 2467 MHz (Ch12) | 2472 MHz (Ch13) |
| 802.11b | 1                | 21.02             | /             | /               | /               | /               |
|         | 2                | 21.30             | /             | /               | /               | /               |
|         | 5.5              | 22.83             | /             | /               | /               | /               |
|         | 11               | 24.07             | 24.47         | 20.61           | 14.93           | 14.78           |
| 802.11g | 6                | 23.95             | /             | /               | /               | /               |
|         | 9                | 23.99             | /             | /               | /               | /               |
|         | 12               | 23.70             | /             | /               | /               | /               |
|         | 18               | 23.71             | /             | /               | /               | /               |
|         | 24               | 24.18             | 24.35         | 16.68           | 17.13           | 16.94           |
|         | 36               | 23.94             | /             | /               | /               | /               |
|         | 48               | 24.00             | /             | /               | /               | /               |
|         | 54               | 24.01             | /             | /               | /               | /               |

The data rate 11Mbps and 24Mbps 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) | 2467 MHz (Ch12) | 2472 MHz (Ch13) |
| 802.11n (20MHz) | MCS0              | 22.12             | /             | /               | /               | /               |
|                 | MCS1              | 21.78             | /             | /               | /               | /               |
|                 | MCS2              | 21.71             | /             | /               | /               | /               |
|                 | MCS3              | 22.09             | /             | /               | /               | /               |
|                 | MCS4              | 22.12             | 22.33         | 14.76           | 14.76           | 14.83           |
|                 | MCS5              | 22.11             | /             | /               | /               | /               |
|                 | MCS6              | 22.09             | /             | /               | /               | /               |
|                 | MCS7              | 22.05             | /             | /               | /               | /               |

The data rate MCS4 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) | 2457 MHz (Ch10) | 2462 MHz (Ch11) |
| 802.11n (40MHz) | MCS0              | 20.20             | 20.45         | 20.36          | 15.16           | 15.36           |
|                 | MCS1              | 19.63             | /             | /              | /               | /               |
|                 | MCS2              | 19.68             | /             | /              | /               | /               |
|                 | MCS3              | 20.04             | /             | /              | /               | /               |
|                 | MCS4              | 20.05             | /             | /              | /               | /               |
|                 | MCS5              | 20.01             | /             | /              | /               | /               |
|                 | MCS6              | 19.77             | /             | /              | /               | /               |
|                 | MCS7              | 19.75             | /             | /              | /               | /               |

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

**Conclusion: Pass**

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

**Method of Measurement: See KDB558074 section 9.2.1.2.**

**802.11b/g mode**

| Mode    | Test Result (dBm) |               |                 |                 |                 |
|---------|-------------------|---------------|-----------------|-----------------|-----------------|
|         | 2412MHz (Ch1)     | 2437MHz (Ch6) | 2462 MHz (Ch11) | 2467 MHz (Ch12) | 2472 MHz (Ch13) |
| 802.11b | 17.52             | 17.72         | 13.95           | 8.33            | 8.52            |
| 802.11g | 15.32             | 15.67         | 8.00            | 8.04            | 8.08            |

**802.11n-HT20 mode**

| Mode            | Test Result (dBm) |               |                 |                 |                 |
|-----------------|-------------------|---------------|-----------------|-----------------|-----------------|
|                 | 2412MHz (Ch1)     | 2437MHz (Ch6) | 2462 MHz (Ch11) | 2467 MHz (Ch12) | 2472 MHz (Ch13) |
| 802.11n (20MHz) | 13.39             | 13.50         | 5.95            | 5.95            | 5.96            |

**802.11n-HT40 mode**

| Mode            | Test Result (dBm) |               |                |                 |                 |
|-----------------|-------------------|---------------|----------------|-----------------|-----------------|
|                 | 2422MHz (Ch3)     | 2437MHz (Ch6) | 2452 MHz (Ch9) | 2457 MHz (Ch10) | 2462 MHz (Ch11) |
| 802.11n (40MHz) | 10.82             | 11.05         | 11.21          | 5.79            | 5.92            |

**Conclusion: Pass**

**Measurement Uncertainty:**

|                         |        |
|-------------------------|--------|
| Measurement Uncertainty | 0.75dB |
|-------------------------|--------|

### A.3. Peak Power Spectral Density

Method of Measurement: See KDB558074 section 10.2.

Measurement Limit:

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

Modulation type and data rate tested:

|             |              |              |              |
|-------------|--------------|--------------|--------------|
| 802.11b     | 802.11g      | 802.11n-HT20 | 802.11n-HT40 |
| 11Mbps(CCK) | 24Mbps(OFDM) | MCS4(OFDM)   | MCS0(OFDM)   |

Measurement Results:

#### 802.11b/g mode

| Mode    | Channel | Power Spectral Density<br>( dBm/3 kHz ) |        | Conclusion |
|---------|---------|-----------------------------------------|--------|------------|
| 802.11b | 1       | Fig.A.3.1                               | -5.70  | P          |
|         | 6       | Fig.A.3.2                               | -6.19  | P          |
|         | 11      | Fig.A.3.3                               | -10.14 | P          |
|         | 12      | Fig.A.3.4                               | -15.89 | P          |
|         | 13      | Fig.A.3.5                               | -14.26 | P          |
| 802.11g | 1       | Fig.A.3.6                               | -8.93  | P          |
|         | 6       | Fig.A.3.7                               | -9.13  | P          |
|         | 11      | Fig.A.3.8                               | -18.38 | P          |
|         | 12      | Fig.A.3.9                               | -17.26 | P          |
|         | 13      | Fig.A.3.10                              | -17.09 | P          |

#### 802.11n-HT20 mode

| Mode              | Channel | Power Spectral Density<br>( dBm/3 kHz ) |        | Conclusion |
|-------------------|---------|-----------------------------------------|--------|------------|
| 802.11n<br>(HT20) | 1       | Fig.A.3.11                              | -11.27 | P          |
|                   | 6       | Fig.A.3.12                              | -11.33 | P          |
|                   | 11      | Fig.A.3.13                              | -19.84 | P          |
|                   | 12      | Fig.A.3.14                              | -20.00 | P          |
|                   | 13      | Fig.A.3.15                              | -20.52 | P          |

#### 802.11n-HT40 mode

| Mode              | Channel | Power Spectral Density<br>( dBm/3 kHz ) |        | Conclusion |
|-------------------|---------|-----------------------------------------|--------|------------|
| 802.11n<br>(HT40) | 3       | Fig.A.3.16                              | -16.16 | P          |
|                   | 6       | Fig.A.3.17                              | -17.91 | P          |
|                   | 9       | Fig.A.3.18                              | -17.23 | P          |
|                   | 10      | Fig.A.3.19                              | -19.66 | P          |
|                   | 11      | Fig.A.3.20                              | -18.64 | P          |

Conclusion: Pass

### Measurement Uncertainty:

|                         |        |
|-------------------------|--------|
| Measurement Uncertainty | 0.75dB |
|-------------------------|--------|

Test graphs as below:

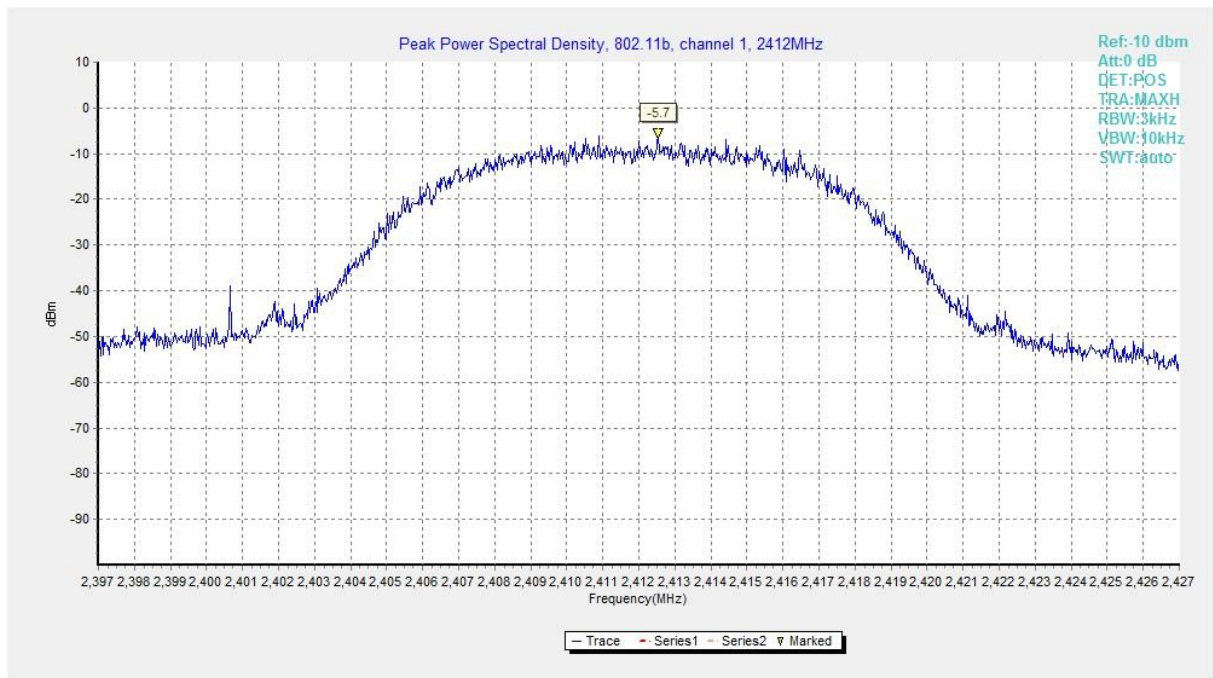


Fig.A.3.1 Power Spectral Density (802.11b, Ch 1)

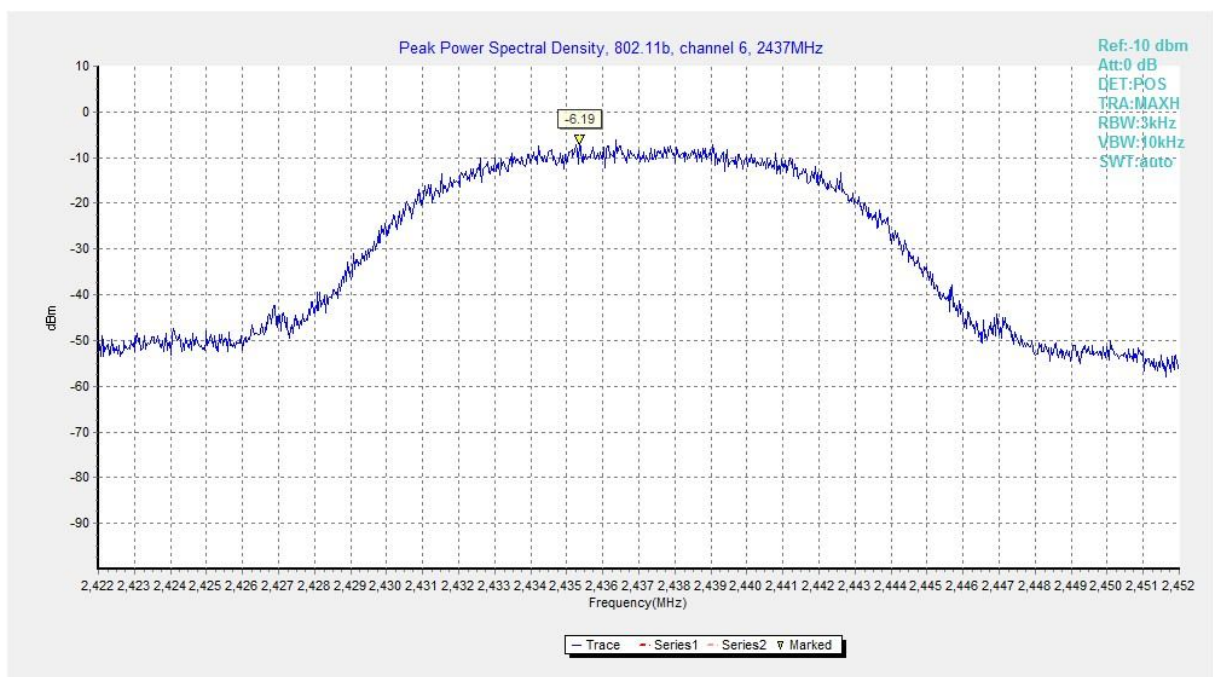
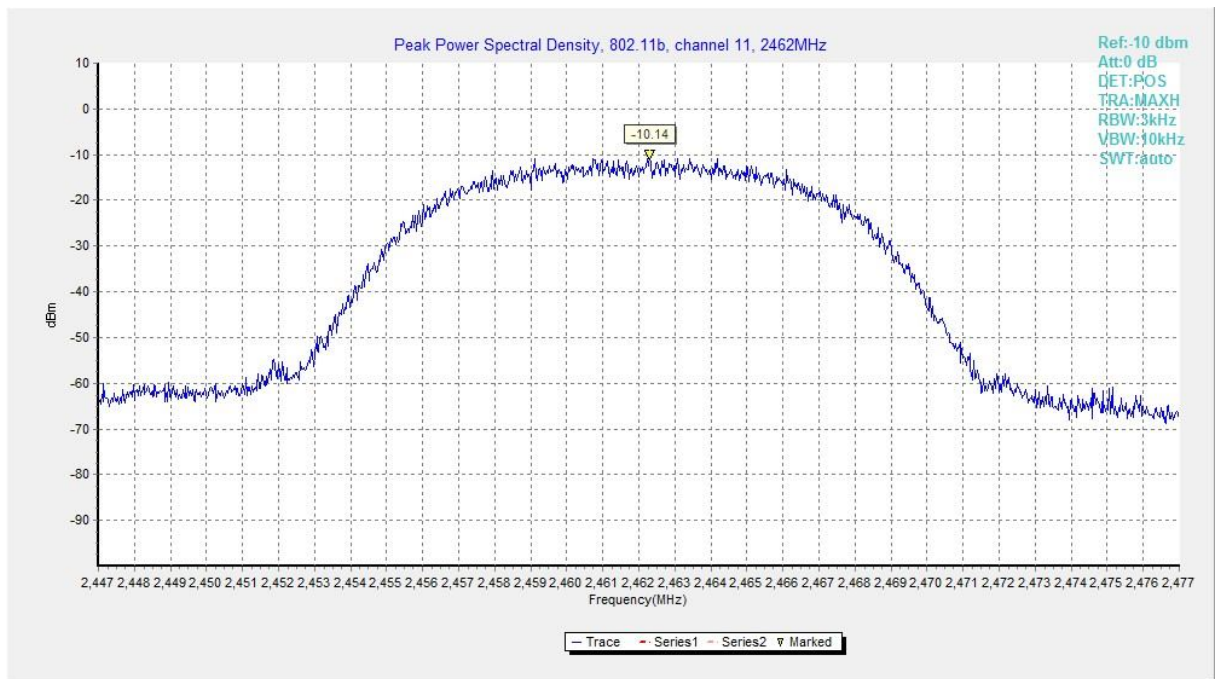
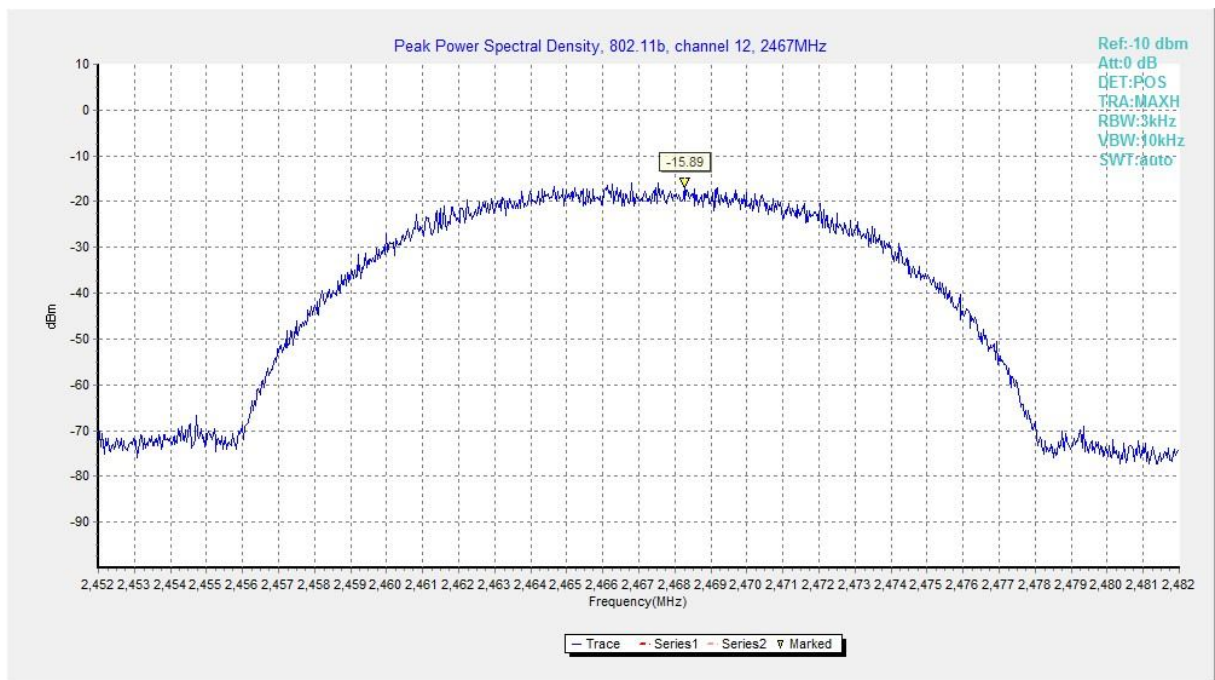


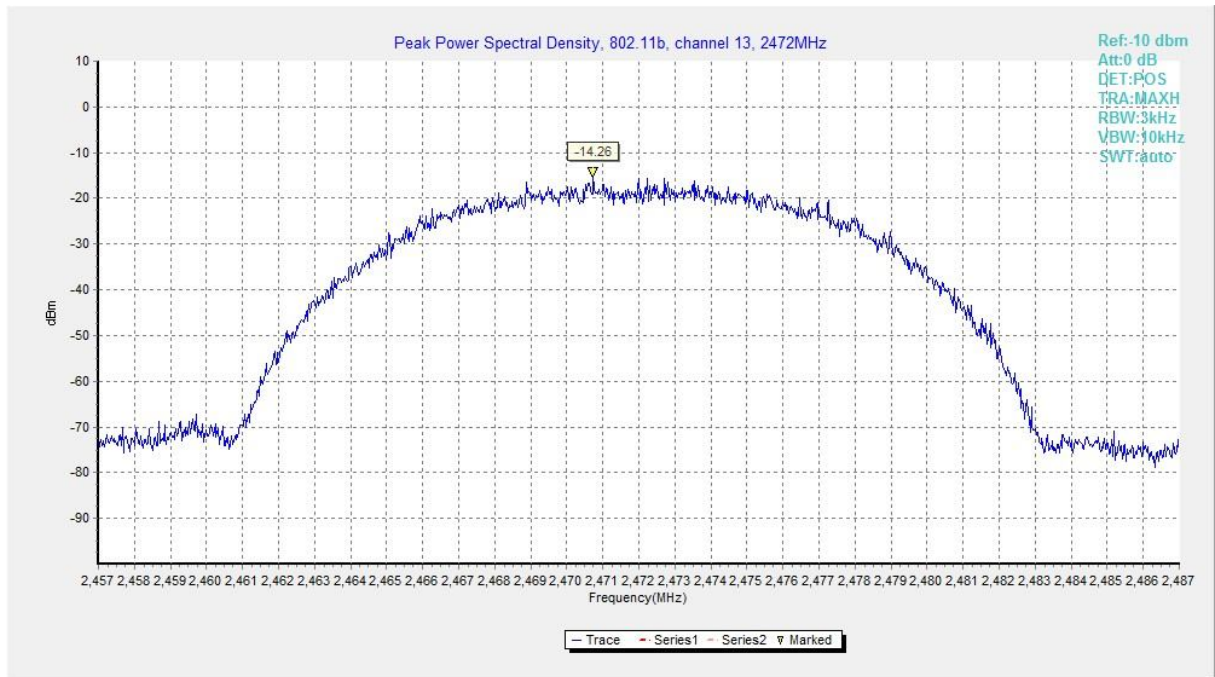
Fig.A.3.2 Power Spectral Density (802.11b, Ch 6)



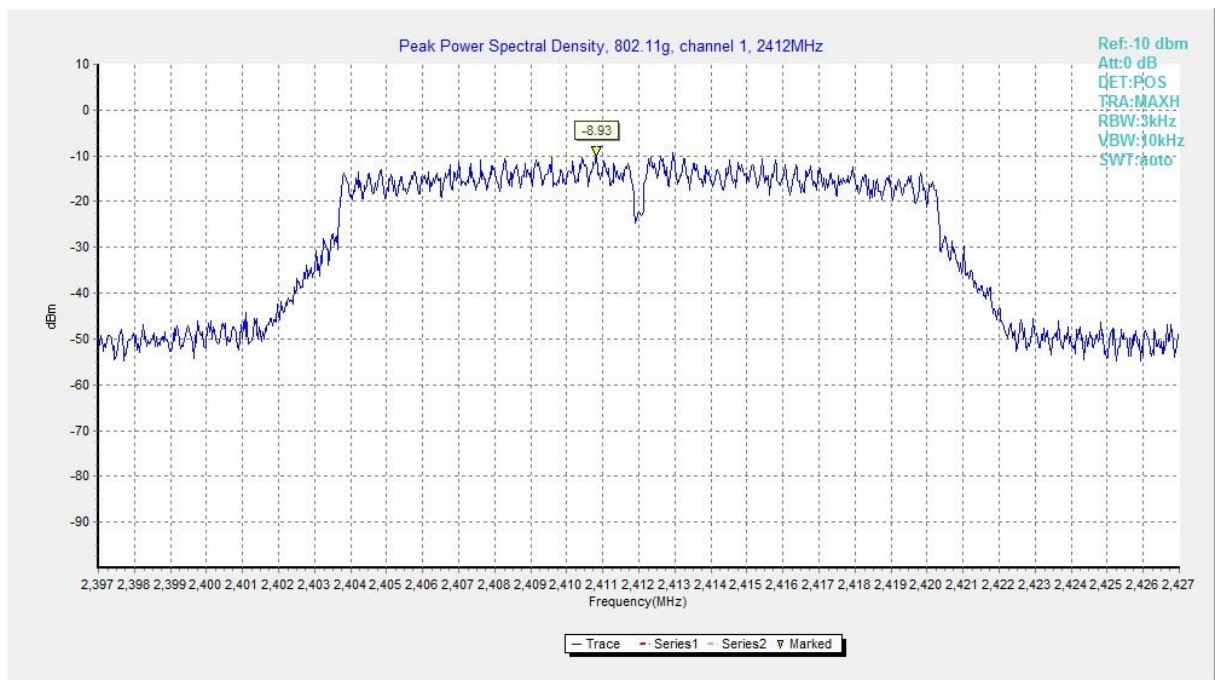
**Fig.A.3.3 Power Spectral Density (802.11b, Ch 11)**



**Fig.A.3.4 Power Spectral Density (802.11b, Ch 12)**



**Fig.A.3.5 Power Spectral Density (802.11b, Ch 13)**



**Fig.A.3.6 Power Spectral Density (802.11g, Ch 1)**