



# **FCC Part 15C TEST REPORT**

## **For WiFi**

**Application No.:** SHEM1205000702TX  
**Applicant:** ANDON HEALTH Co., Ltd  
**Equipment Under Test (EUT):**

**NOTE:** The following sample(s) submitted was/were identified on behalf of the client as

**EUT Name:** Wi-Fi Body Analysis Scale  
**Brand Name:** Not supplied by the client  
**Model No:** HS5  
**FCC ID:** ZRYHS5  
**IC:** 9775A-HS5  
**Standards:** FCC PART 15 Subpart C: 2011  
RSS-210 Issue 8 (December 2010)  
RSS-Gen Issue 3 (December 2010)

**Date of Receipt:** May. 27, 2012  
**Date of Test:** May. 28, 2012 to June 06, 2012  
**Date of Issue:** July. 16, 2012

**Test Result :** **PASS \***

In the configuration tested, the EUT complied with the standards specified above.

E&E Section Head  
SGS-CSTC(Shanghai) Co., Ltd.

E&E EMC Engineer  
SGS-CSTC(Shanghai) Co., Ltd.

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## 2 Test Summary

| TEST ITEM                                       | FCC REFERANCE                | IC REFERANCE                    | Test Procedure                    | RESULT |
|---|------------------------------|---------------------------------|-----------------------------------|--------|
| Minimum 6dB Bandwidth                           | 15.247(a)(2)                 | RSS-210 Issue 8<br>Annex 8      | ANSI C63.10,2009<br>Clause 6.9    | PASS   |
| Maximum peak output power                       | 15.247(b)                    | RSS-210 Issue 8<br>Annex 8      | ANSI C63.10,2009<br>Clause 6.10.2 | PASS   |
| Power spectrum density                          | 15.247(e)                    | RSS-210 Issue 8<br>Annex 8      | ANSI C63.10,2009<br>Clause 6.11   | PASS   |
| Conducted Spurious Emission<br>(30MHz to 25GHz) | Section 15.207<br>&15.247(d) | RSS-210 Issue 8<br>Annex 8.5    | ---                               | PASS   |
| Radiated Spurious Emission<br>(30MHz to 25GHz)  | Section 15.209<br>&15.247(d) | RSS-210 Issue 8<br>Annex 8.5    | ANSI C63.4,2003<br>Clause 6.12    | PASS   |
| Radiated Emission BandEdge                      | 15.247(d)                    | ---                             | ANSI C63.10,2009<br>Clause 6.9    | PASS   |
| Occupied bandwidth                              | ---                          | RSS-Gen Issue 3<br>Clause 4.6.1 | RSS-Gen Issue 3<br>Clause 4.6.1   | Tested |



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## 4 General Information

### 4.1 Client Information

|                              |   |
|------------------------------|---|
| <b>Applicant :</b>           | ANDON HEALTH Co., Ltd   |
| <b>Applicant Address:</b>    | No. 3 Jin Ping Street, Ya An Road, Nankai District, Tianjin 300190, China |
| <b>Manufacturer:</b>         | ANDON HEALTH Co., Ltd   |
| <b>Manufacturer Address:</b> | No. 3 Jin Ping Street, Ya An Road, Nankai District, Tianjin 300190, China |

### 4.2 Details of E.U.T.

|                                   |   |
|-----------------------------------|---|
| <b>EUT Name:</b>                  | Wi-Fi Body Analysis Scale   |
| <b>Brand Name:</b>                | Not supplied by the client  |
| <b>Model No:</b>                  | HS5   |
| <b>Supported Frequency Bands:</b> | Bluetooth: 2.402GHz to 2.480GHz<br>WiFi (802.11 b): 2.412 to 2.462GHz |
| <b>Test Frequency Bands:</b>      | WiFi (802.11 b): 2.412 to 2.462GHz                                    |
| <b>Modulation Type:</b>           | GFSK, $\pi/4$ DQPSK, 8DPSK for Bluetooth<br>DSSS(DQPSK, CCK) for WiFi |
| <b>Antenna Type:</b>              | Integral antenna  |
| <b>Antenna Gain:</b>              | 0dBi for WiFi<br>2.45dBi for Bluetooth                                |
| <b>Battery:</b>                   | 6VDC(4*1.5V AAA)  |
| <b>Remark:</b>                    | For bluetooth 15.247 report, please refer to SHEM120500070202.        |

### 4.3 Other Information Requested by the Customer

None.

### 4.4 Standards Applicable for Testing

The standard used were FCC PART 15 Subpart C: 2011, ANSI C63.10: 2009. RSS-210 Issue 8, RSS-Gen Issue 3.



#### **4.5 Test Location**

Tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.  
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.

Tel: +86 21 6191 5666 Fax: +86 21 6191 5655

#### **4.6 Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.



## 5 Test Instruments

| Item | Test Equipment               | Manufacturer                         | Model No.                     | Serial No.      | Cal. Date  | Cal. Due date |
|------|------------------------------|--------------------------------------|-------------------------------|-----------------|------------|---------------|
| 1    | EMI test receiver            | Rohde & Schwarz                      | ESU40                         | 100109          | 2011-06-03 | 2012-06-01    |
| 2    | Horn Antenna                 | SCHWARZBECK                          | BBHA9120D                     | 9120D-679       | 2011-06-03 | 2012-06-01    |
| 3    | Horn Antenna                 | Rohde & Schwarz                      | HF906                         | 100284          | 2012-03-10 | 2013-03-09    |
| 4    | ANTENNA                      | SCHWARZBECK                          | VULB9168                      | 9168-313        | 2011-06-03 | 2012-06-01    |
| 5    | Ultra broadband antenna      | Rohde & Schwarz                      | HL562                         | 100227          | 2011-10-09 | 2012-10-08    |
| 4    | Horn Antenna                 | SCHWARZBECK                          | BBHA 9170                     | BBHA9170<br>373 | 2012-03-15 | 2013-03-14    |
| 7    | Atmosphere pressure meter    | Shanghai ZhongXuan Electronic Co;Ltd | BY—2009P                      | --              | 2011-10-15 | 2012-10-14    |
| 8    | CLAMP METER                  | FLUKE                                | 316                           | 86080010        | 2012-04-20 | 2013-04-19    |
| 9    | Thermo-Hygrometer            | ZHICHEN                              | ZC1-2                         | 01050033        | 2011-10-14 | 2012-10-13    |
| 11   | High-low temperature cabinet | Shanghai YuanZhen                    | GW2050                        | --              | 2011-06-17 | 2012-06-16    |
| 12   | Tunable Notch Filter         | Wainwright instruments Gmbh          | WRCT1800.0/2000.0-0.2/40-5SSK | 11              | 2011-06-26 | 2012-06-25    |
| 13   | Tunable Notch Filter         | Wainwright instruments Gmbh          | WRCT800.0/880.0-0.2/40-5SSK   | 9               | 2011-06-26 | 2012-06-25    |
| 14   | High pass Filter             | FSCW                                 | HP 12/2800-5AA2               | 19A45-02        | 2012-04-07 | 2013-04-06    |
| 15   | Low noise amplifier          | TESEQ                                | LNA6900                       | 70133           | 2011-07-05 | 2012-07-04    |

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|    |                                      |                 |          |          |            |            |
|----|--------------------------------------|-----------------|----------|----------|------------|------------|
| 16 | EMI test receiver                    | Rohde & Schwarz | ESCS30   | 100086   | 2011-06-04 | 2012-06-03 |
| 17 | Line impedance stabilization network | SCHWARZBECK     | NSLK8127 | 8127-490 | 2011-05-07 | 2012-05-06 |

## 6 Test Procedure & Measurement Data

### 6.1 E.U.T. Operation

**Input voltage:** 6VDC(4\*1.5V AAA)

**Operating Environment:**

Temperature: 25.0 °C  
Humidity: 45 % RH  
Atmospheric Pressure: 1013 mbar

**EUT Operation:** The EUT has been tested under operating condition.

Test program was used to control the EUT for staying in continuous transmitting mode is programmed.

For 2412-2462MHz Band Channel low (2412MHz) mid(2437MHz) high(2462MHz)

### 6.2 6dB Bandwidth

**Test Requirement:** FCC Part15 247(a)(2)

**Test date:** Mar. 30.2012

**Standard Applicable:** According to section 15.247(a)(2),and Systems using digital modulation techniques may operate in the 902-928MHz,2400-2483.5MHz,and 5725-5850MHz bands.The minimum 6dB bandwidth shall be at least 500KHz.

**Measurement Procedure:**

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=100KHz, VBW =3\* RBW, Span=30/ 50MHz, Sweep=auto
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

**Measurement Result:**

For DQPSK modulation mode:

| CH   | Frequency (MHz) | Bandwidth (MHz) | Limit Bandwidth (KHz) | Result |
|------|-----------------|-----------------|-----------------------|--------|
| LOW  | 2412            | 10.10           | 500                   | PASS   |
| MID  | 2437            | 10.20           | 500                   | PASS   |
| HIGH | 2462            | 10.10           | 500                   | PASS   |



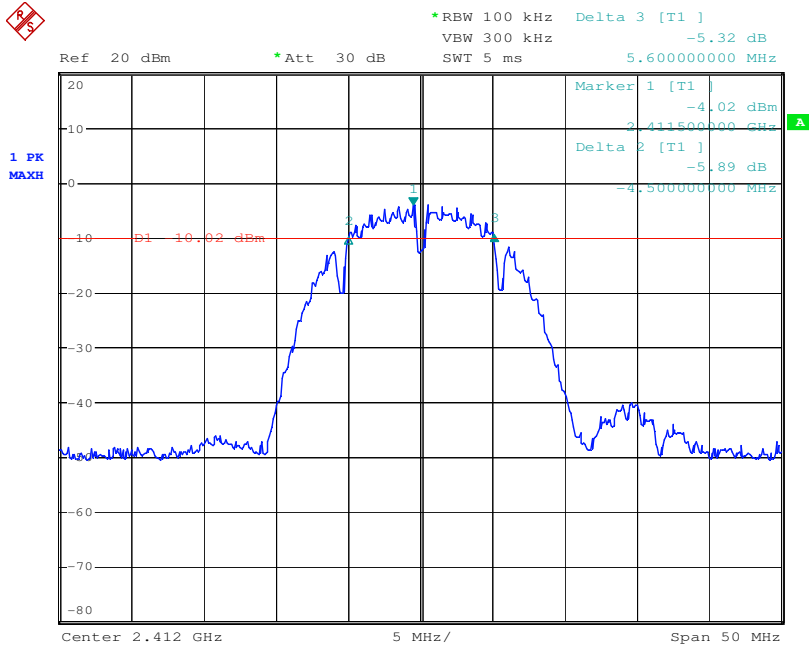


For CCK modulation mode:

| CH   | Frequency (MHz) | Bandwidth (MHz) | Limit Bandwidth (KHz) | Result |
|------|-----------------|-----------------|-----------------------|--------|
| LOW  | 2412            | 11.30           | 500                   | PASS   |
| MID  | 2437            | 10.50           | 500                   | PASS   |
| HIGH | 2462            | 10.10           | 500                   | PASS   |

6dB Band Width Test Data CH 2412MHz:

DQPSK mode

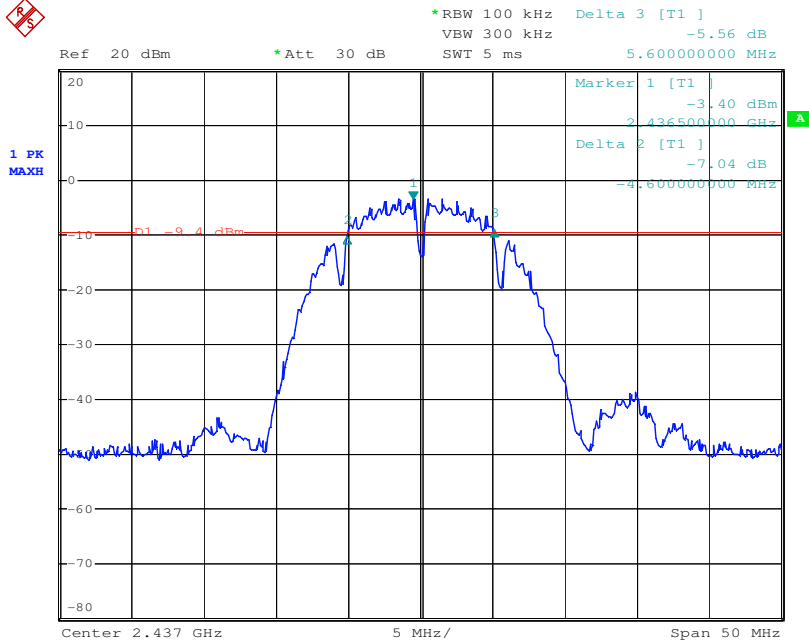


Date: 1.JAN.2000 05:57:53



6dB Band Width Test Data CH 2437MHz:

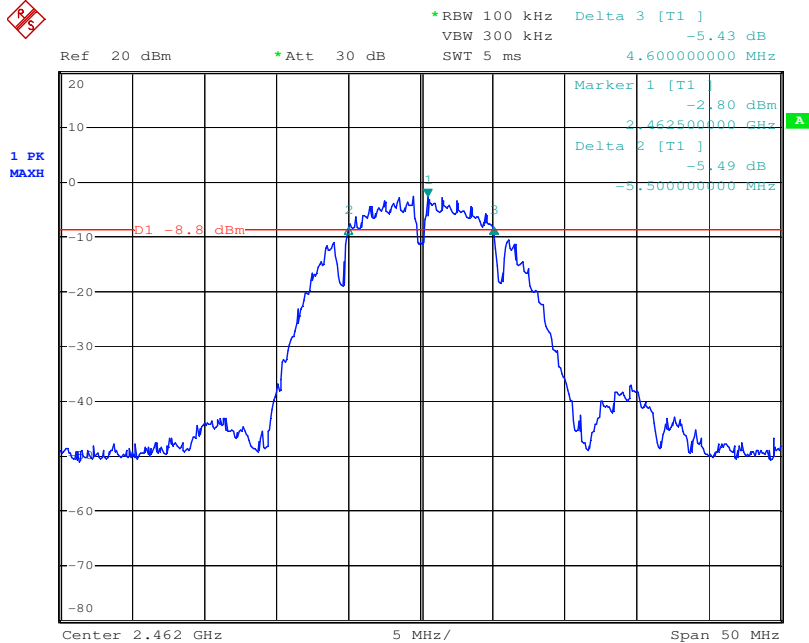
DQPSK mode



Date: 1.JAN.2000 06:28:33

6dB Band Width Test Data CH 2462MHz:

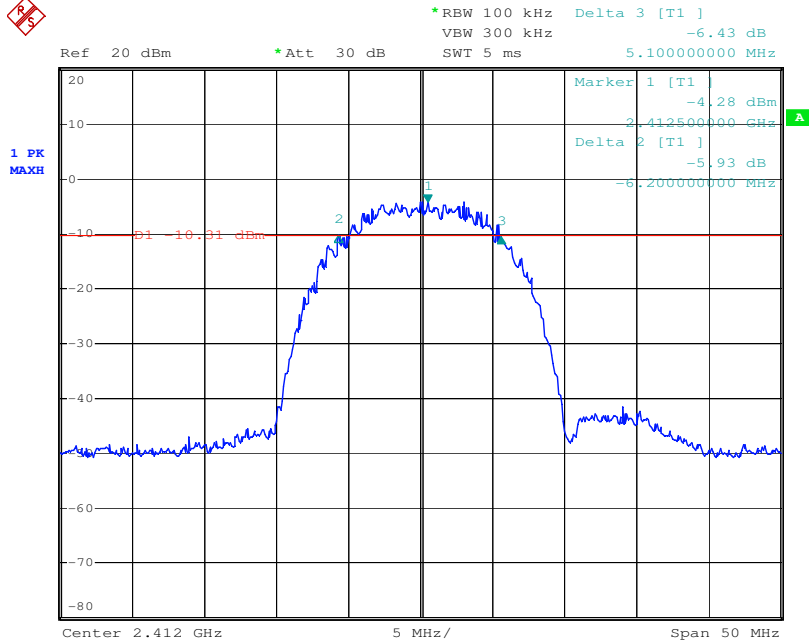
DQPSK mode



Date: 1.JAN.2000 06:46:06

6dB Band Width Test Data CH 2412MHz:

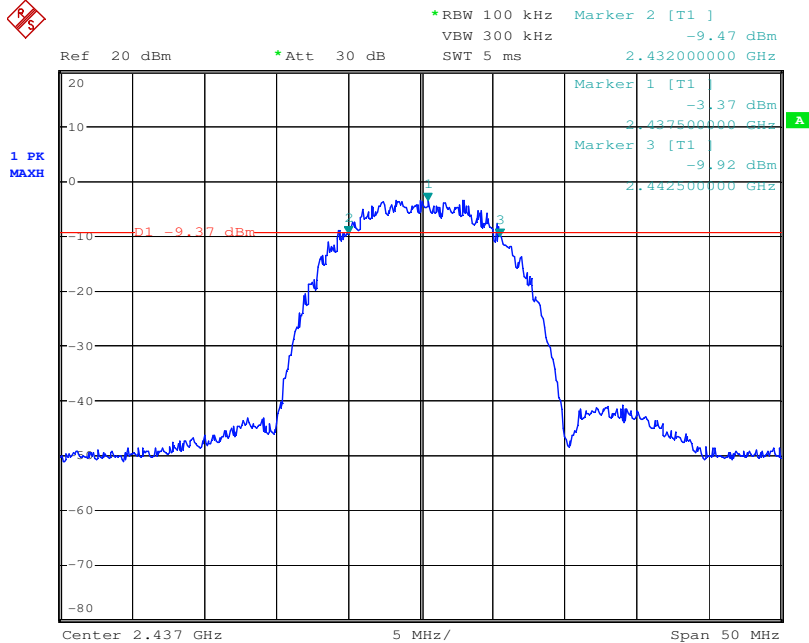
CCK mode



Date: 1.JAN.2000 07:01:56

6dB Band Width Test Data CH 2437MHz:

CCK mode

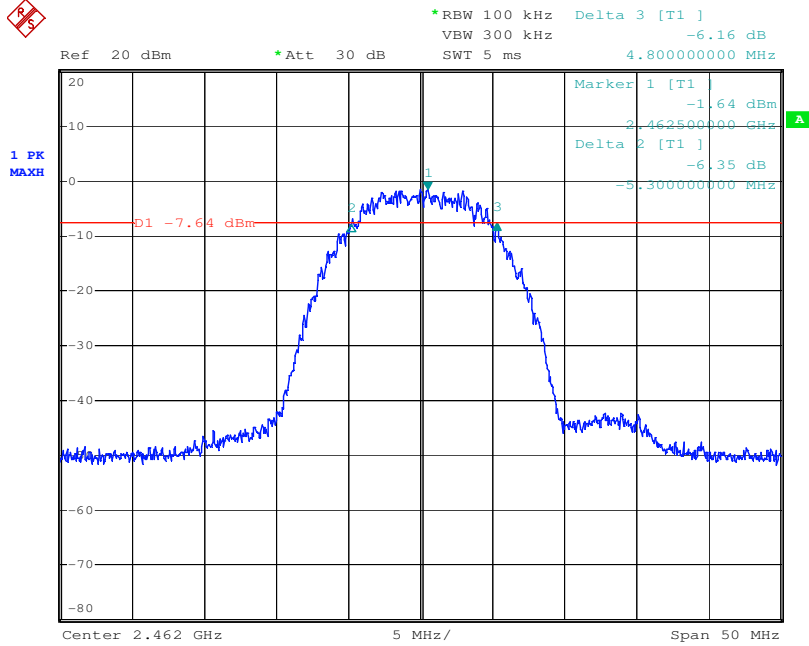


Date: 1.JAN.2000 07:20:45



6dB Band Width Test Data CH 2462MHz:

CCK mode



Date: 1.JAN.2000 00:07:00

### 6.3 Peak Output Power Measurement

**Test Requirement:** FCC Part 15 15.247(a)(2),(b)  
**Test date** Mar. 26, 2012  
**Standard Applicable:** According to section 15.247(a)(2),(b)  
 (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

**Measurement Procedure**

1. Place the EUT on the table and set it in transmitting mode.
  2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum.
  3. Set the occur band to the entire emission 26dB bandwidth of the signal.
  4. Record the max.channel power reading
- Repeat above procedures until all the frequency measured were complete.

**Measurement Result:**

For DQPSK mode:

| CH   | Frequency (MHz) | Reading Peak Power (dBm) | Cable Loss (dB) | Output Peak Power (dBm) | Output Peak Power (mW) | Peak Power Limit (dBm) | Result |
|------|-----------------|--------------------------|-----------------|-------------------------|------------------------|------------------------|--------|
| LOW  | 2412            | 9.39                     | 0.5             | 9.89                    | 9.75                   | 30                     | PASS   |
| MID  | 2437            | 10.03                    | 0.5             | 10.53                   | 11.30                  | 30                     | PASS   |
| HIGH | 2462            | 10.82                    | 0.5             | 11.32                   | 13.55                  | 30                     | PASS   |

For CCK mode:

| CH   | Frequency (MHz) | Reading Peak Power (dBm) | Cable Loss (dB) | Output Peak Power (dBm) | Output Peak Power (mW) | Peak Power Limit (dBm) | Result |
|------|-----------------|--------------------------|-----------------|-------------------------|------------------------|------------------------|--------|
| LOW  | 2412            | 10.91                    | 0.5             | 11.41                   | 13.84                  | 30                     | PASS   |
| MID  | 2437            | 11.62                    | 0.5             | 12.12                   | 16.29                  | 30                     | PASS   |
| HIGH | 2462            | 12.08                    | 0.5             | 12.58                   | 18.11                  | 30                     | PASS   |



CH Low 2412MHz

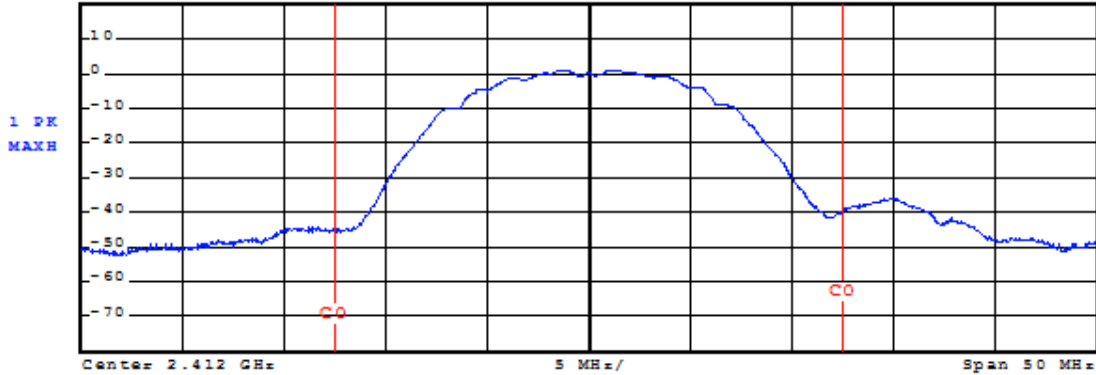


DQPSK mode

RBW 1 MHz  
VBW 3 MHz  
SWT 5 ms

Ref 20 dBm

Att 30 dB



Tx Channel  
Bandwidth

25 MHz

Power

9.39 dBm

CH Low 2437MHz

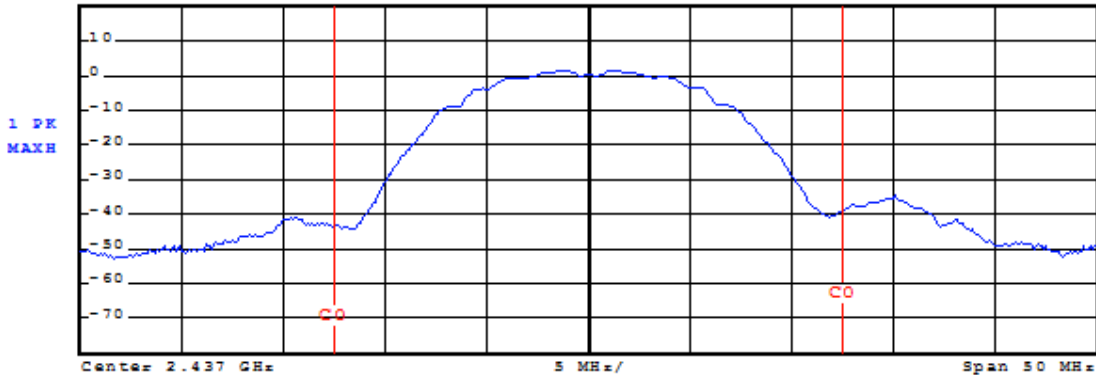


DQPSK mode

RBW 1 MHz  
VBW 3 MHz  
SWT 2.5 ms

Ref 20 dBm

Att 30 dB



Tx Channel  
Bandwidth

25 MHz

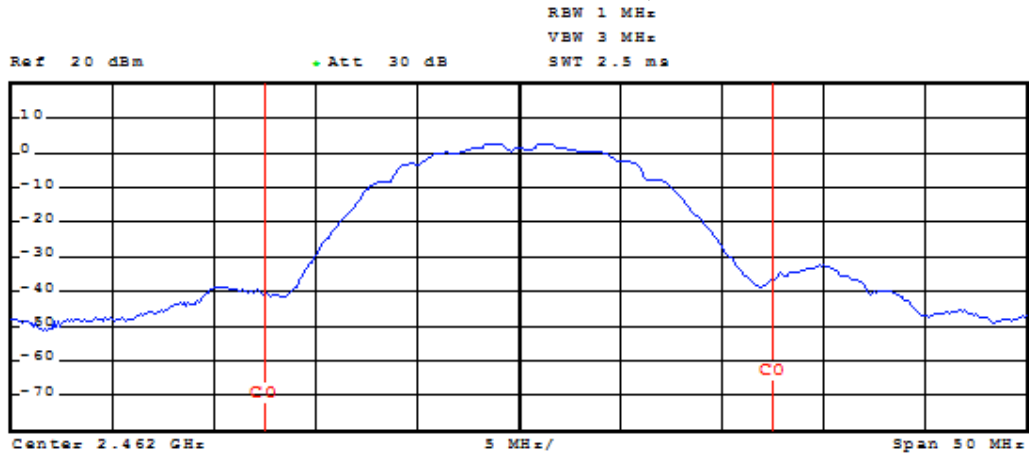
Power

10.03 dBm



CH Low 2462MHz

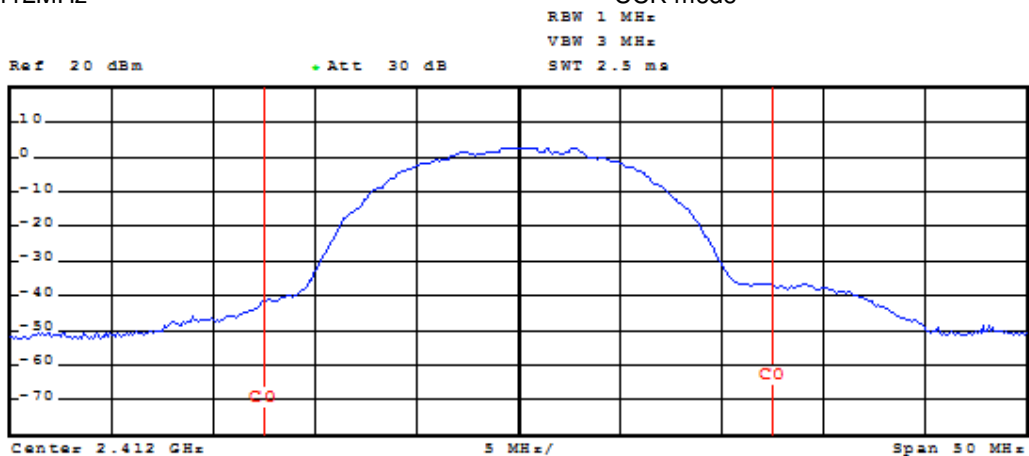
DQPSK mode



Tx Channel Bandwidth 25 MHz Power 10.82 dBm

CH Low 2412MHz

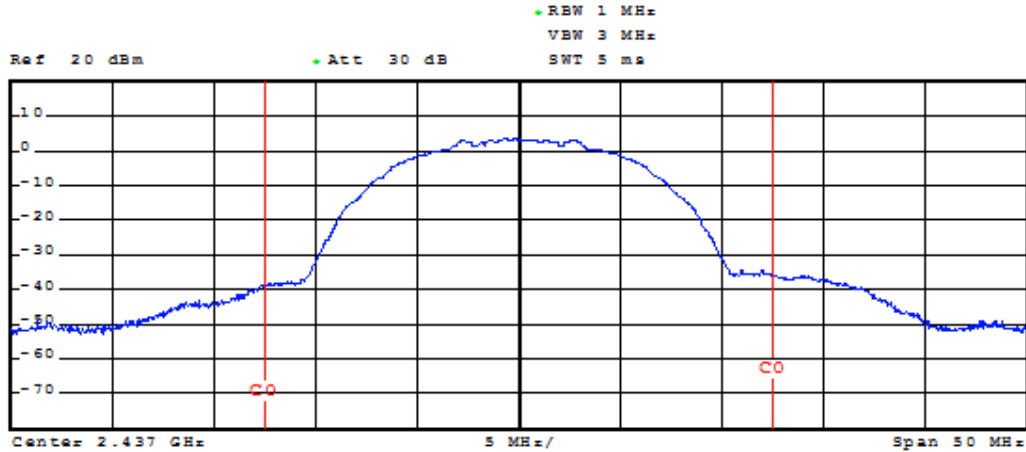
CCK mode



Tx Channel Bandwidth 25 MHz Power 10.91 dBm

CH Low 2437MHz

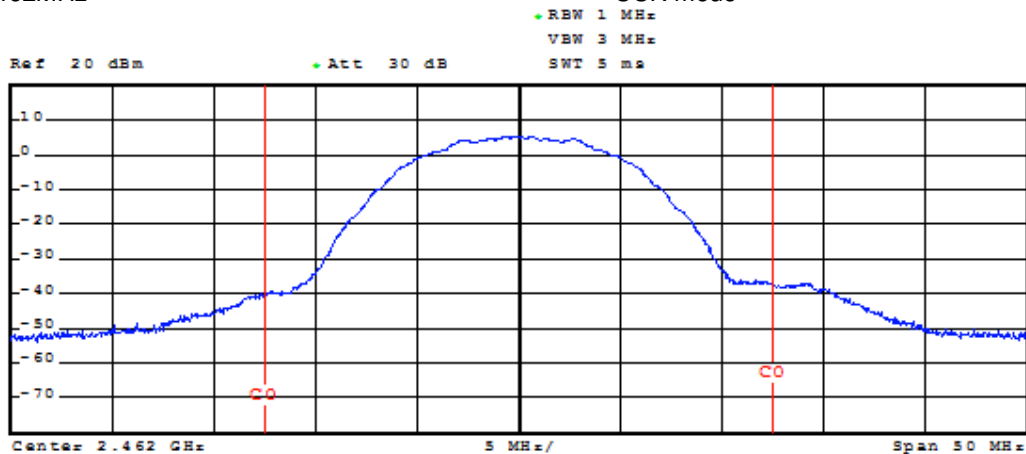
CCK mode



Tx Channel Bandwidth 25 MHz Power 11.62 dBm

CH Low 2462MHz

CCK mode



Tx Channel Bandwidth 25 MHz Power 12.08 dBm



#### 6.4 Peak Power Spectral Density

**Test Requirement:** FCC Part15 247(e)

**Test date:** Mar. 30, 2012

**Standard Applicable:** According to section 15.247(e),For digitally modulated systems,the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dB in any 3KHz band during any time in terval of continuous transmission.This power spectral density shall be determined in accordance with the provisions of paragraph(b) of this section.The same method of determining the conducted output power shall be used to determine the powr spectral density.

**Measurement Procedure:** The EUT was tested according ANSI C63.10,2009 Clause 6.11 for compliance to FCC 47CFR 15.247 requiremnts.

**Measurement Result:**

For DQPSK modulation

| CH   | Frequency (MHz) | Reading (dBm) | Cable Loss (dB) | RF Power Density (dBm) | Limit (dBm) | Result |
|------|-----------------|---------------|-----------------|------------------------|-------------|--------|
| LOW  | 2411.56         | -12.18        | 0.5             | -11.68                 | 8           | PASS   |
| MID  | 2436.57         | -11.09        | 0.5             | -10.59                 | 8           | PASS   |
| HIGH | 2463.56         | -11.81        | 0.5             | -11.31                 | 8           | PASS   |

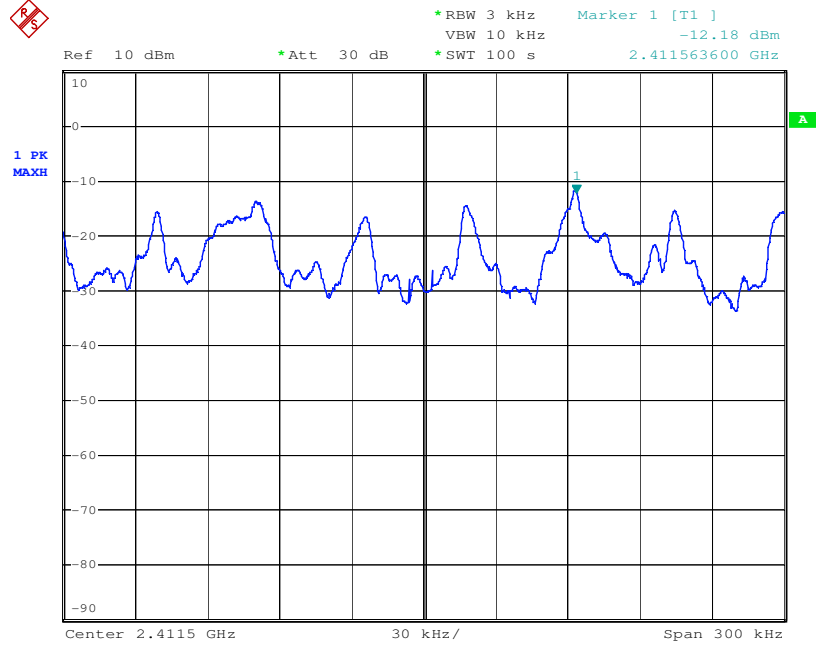
For CCK modulation

| CH   | Frequency (MHz) | Reading (dBm) | Cable Loss (dB) | RF Power Density (dBm) | Limit (dBm) | Result |
|------|-----------------|---------------|-----------------|------------------------|-------------|--------|
| LOW  | 2411.56         | -11.73        | 0.5             | -11.23                 | 8           | PASS   |
| MID  | 2436.57         | -11.03        | 0.5             | -10.53                 | 8           | PASS   |
| HIGH | 2461.71         | -11.27        | 0.5             | -10.77                 | 8           | PASS   |



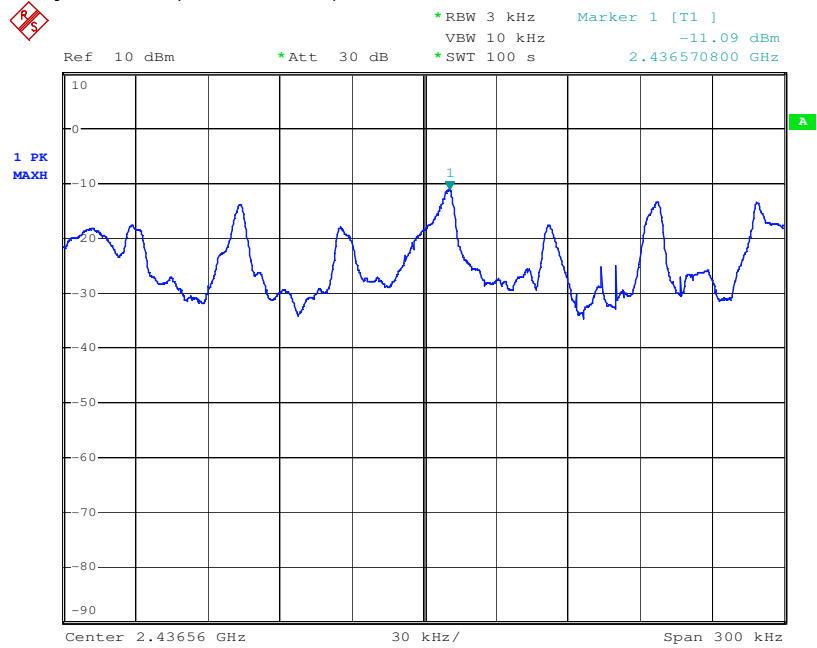
Power Spectral Density Test Plot(CH 2412MHz)

DQPSK modulation



Power Spectral Density Test Plot(CH 2437MHz)

DQPSK modulation

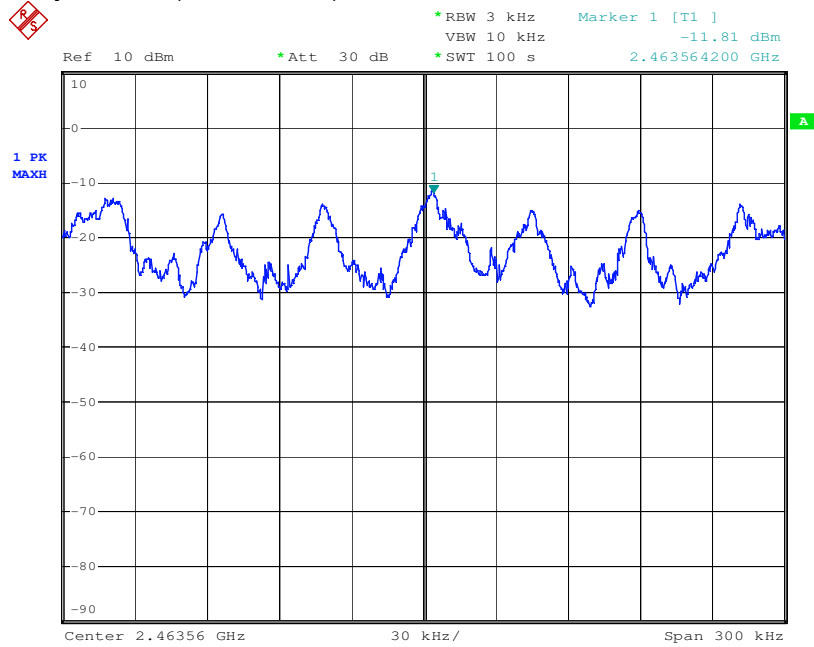


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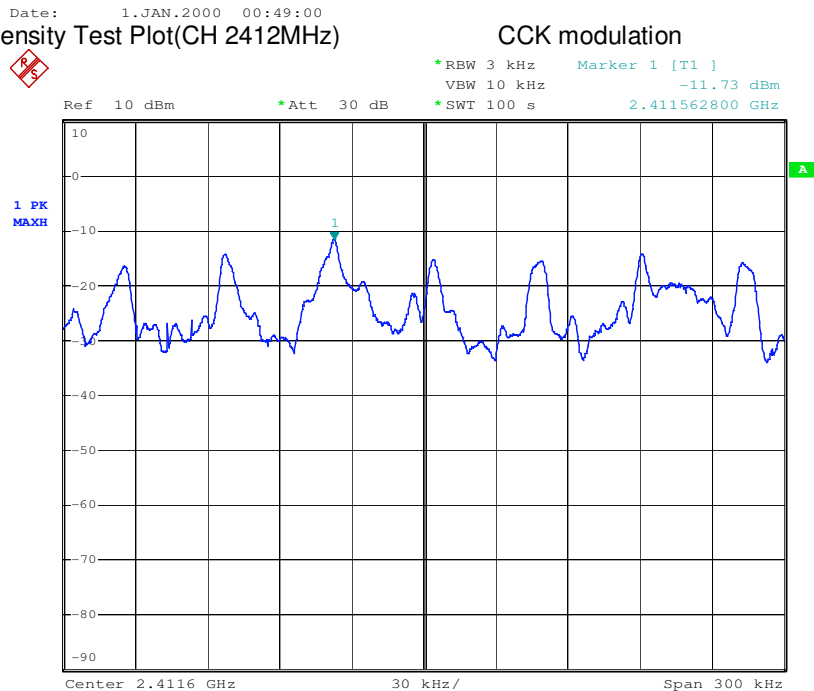
Power Spectral Density Test Plot(CH 2462MHz)

DQPSK modulation



Power Spectral Density Test Plot(CH 2412MHz)

CCK modulation

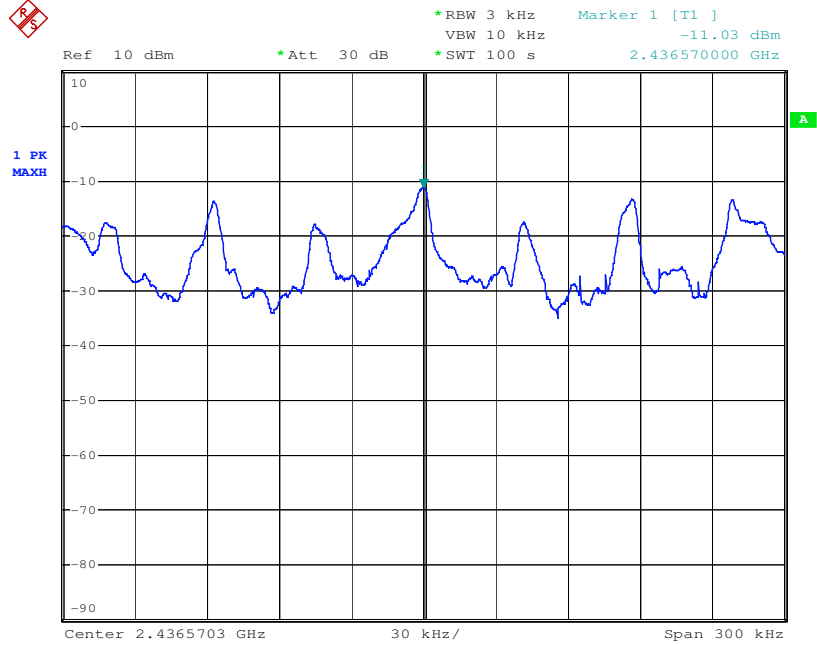


Date: 1.JAN.2000 00:15:39



Power Spectral Density Test Plot(CH 2437MHz)

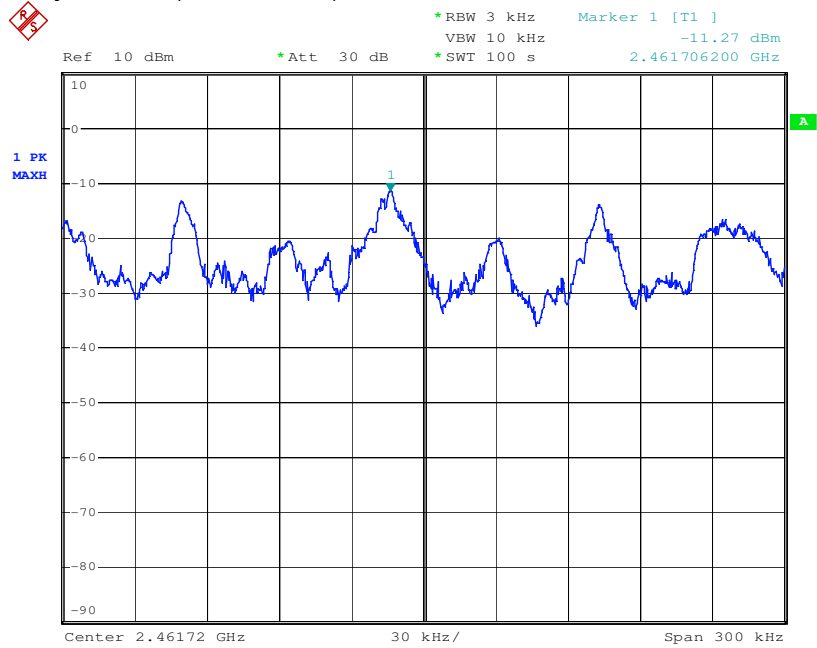
CCK modulation



Date: 1.JAN.2000 00:23:44

Power Spectral Density Test Plot(CH 2462MHz)

CCK modulation



Date: 1.JAN.2000 00:27:53

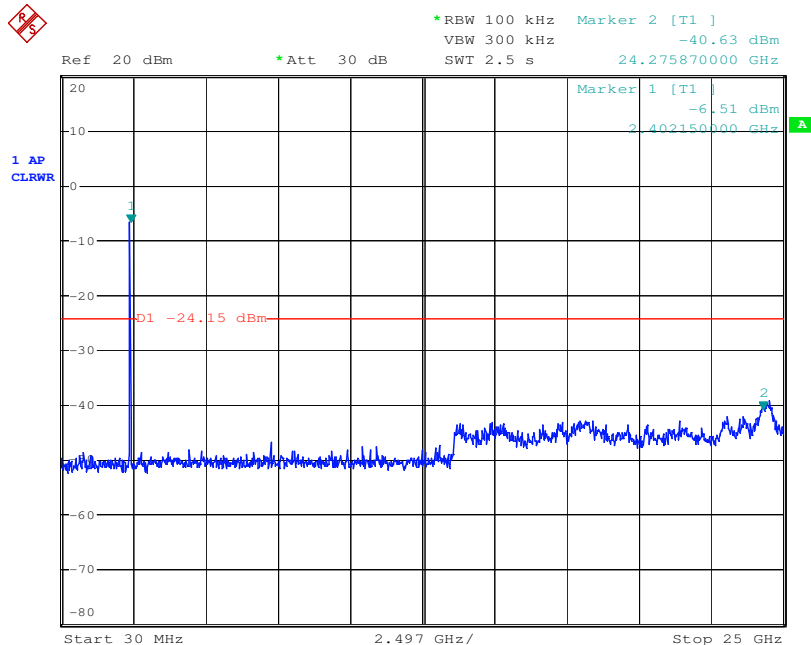
### 6.5 Conducted Spurious Emission Test

**Test Requirement:** FCC Part15 247(c)  
**Test date:** Mar. 26, 2012  
**Standard Applicable:** According to section 15.247(c),in any 100KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating,the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power,In addition,radiated emissions which fall in the restricted bands,as defined in section 15.205(a),must also comply with the radiated emission limits specified in 15.209(a).

- Measurement Procedure:**
1. Place the EUT on the table and set it in transmitting mode.
  2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
  3. Set center frequency of spectrum analyzer = operating frequency.
  4. Set the spectrum analyzer as RBW=100KHz VBW=300KHz, Sweep = auto
  6. Repeat above procedures until all frequency measured were complete.

### Measurement Result:

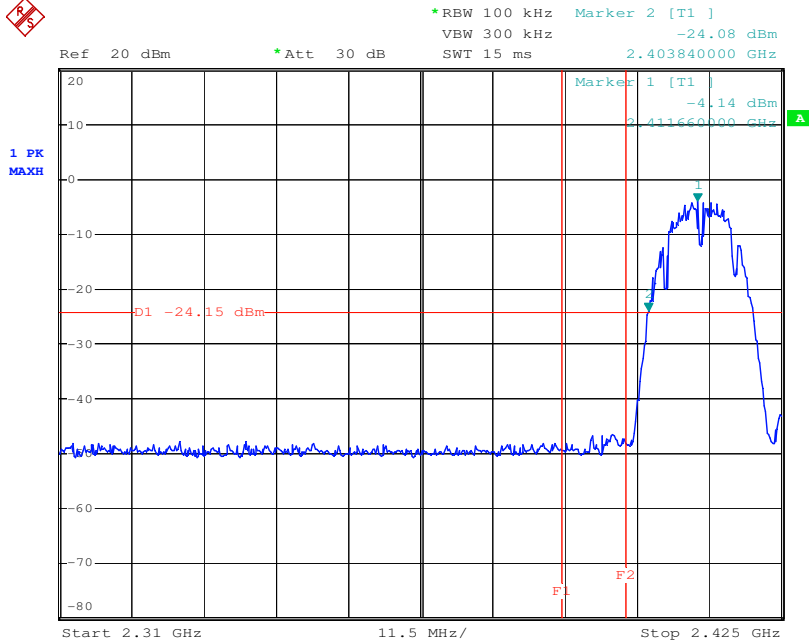
**Conducted spurious Emission Measurement Result For DQPSK mode**  
 CH Low 30MHz-25GHz



Date: 1.JAN.2000 06:02:48

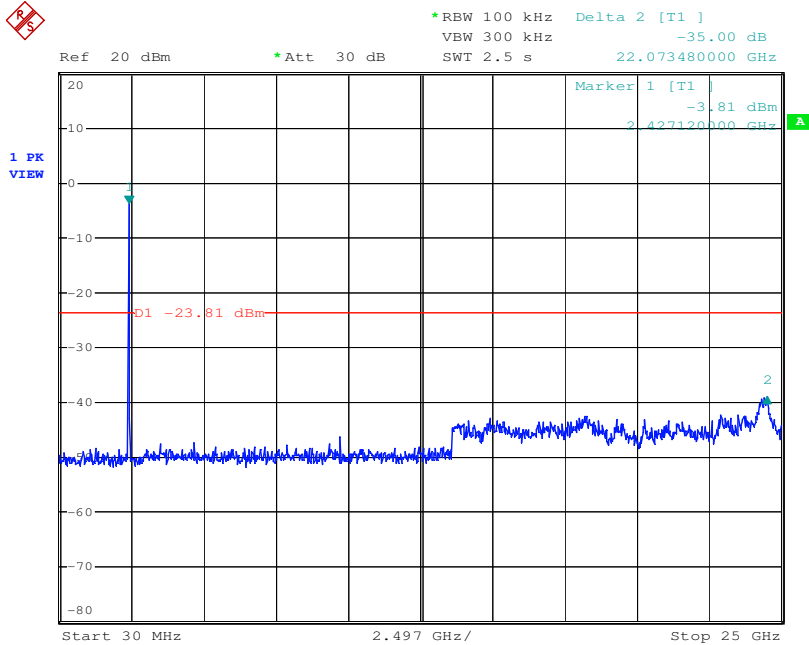


Band Edge (Conducted Mode)



Date: 1.JAN.2000 06:00:21  
Marker: F1=2390MHz, F2=2400MHz

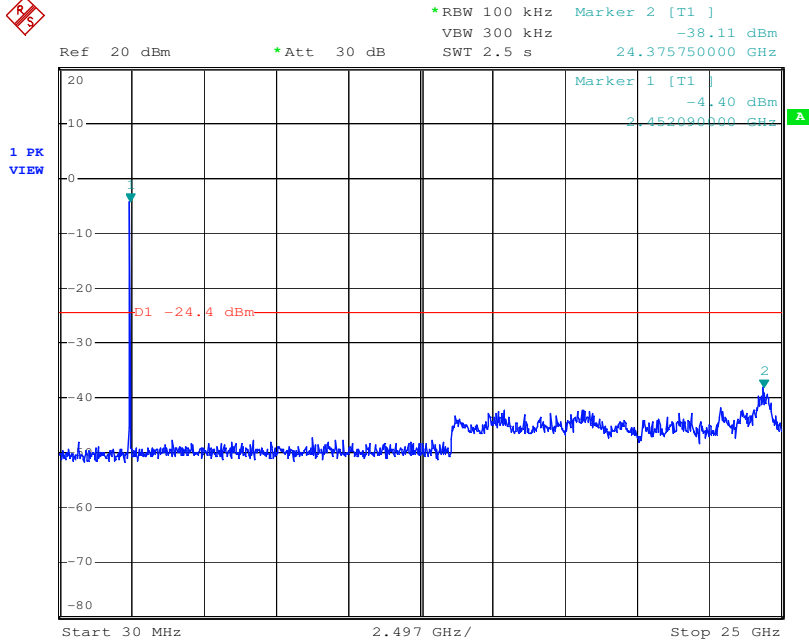
Ch Mid 30MHz-25GHz



Date: 1.JAN.2000 06:31:04

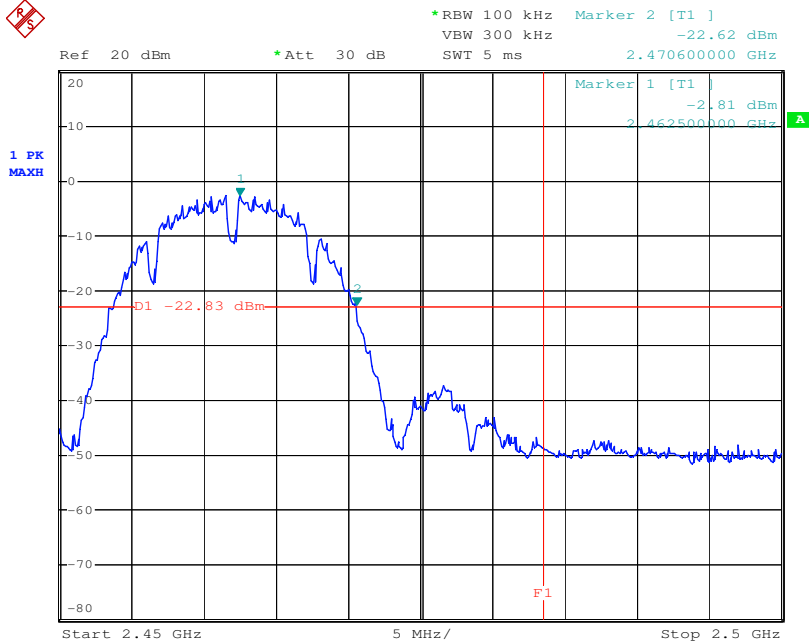


Ch High 30MHz-25GHz



Date: 1.JAN.2000 06:48:47

Band Edge (Conducted Mode)



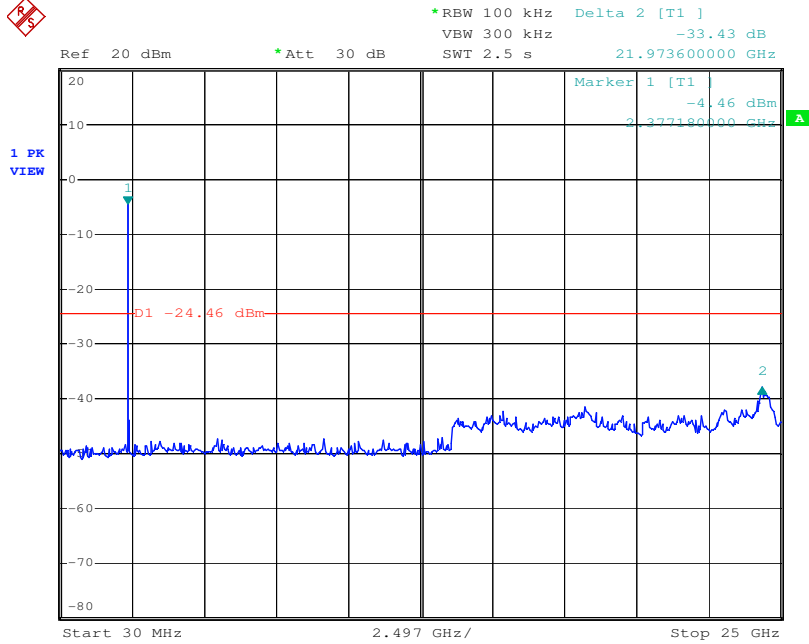
Date: 1.JAN.2000 06:47:38

Marker: F1=2483.5MHz

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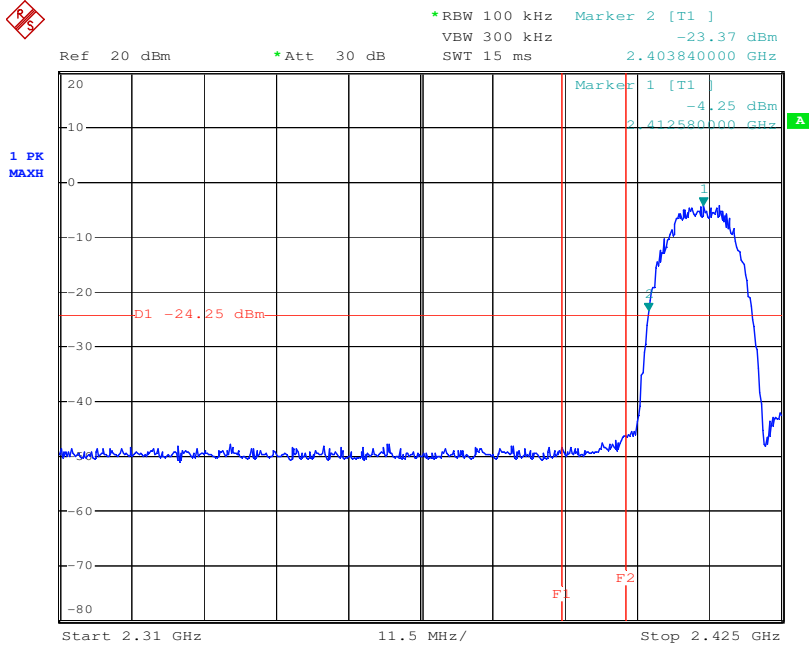


**Conducted spurious Emission Measurement Result For CCK mode**  
CH Low 30MHz-25GHz



Date: 1.JAN.2000 07:03:58

**Band Edge (Conducted Mode)**



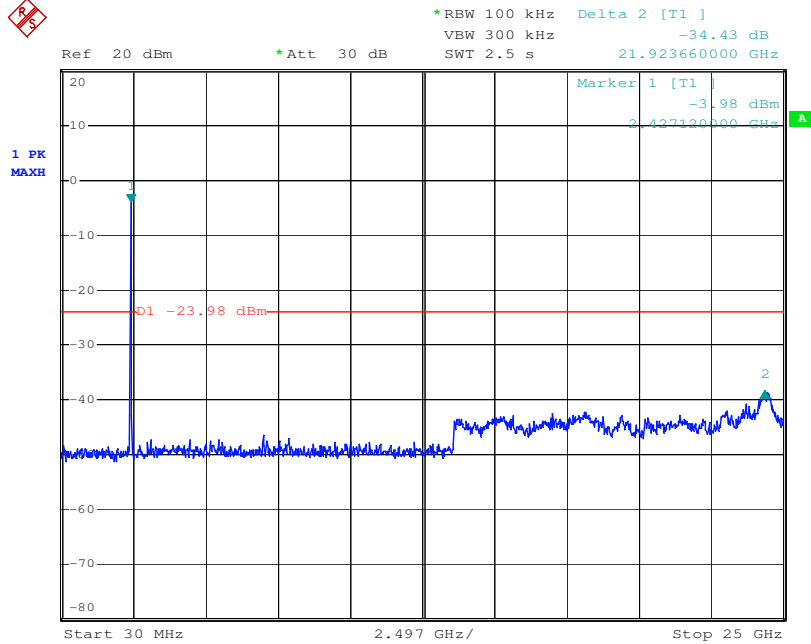
Date: 1.JAN.2000 07:03:20





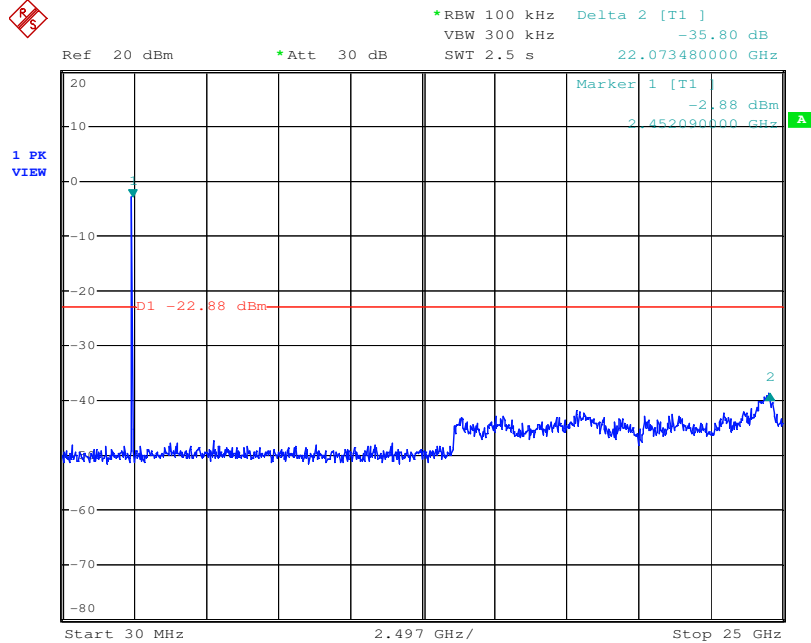
Marker: F1=2390MHz, F2=2400MHz

Ch Mid 30MHz-25GHz



Date: 1.JAN.2000 07:22:08

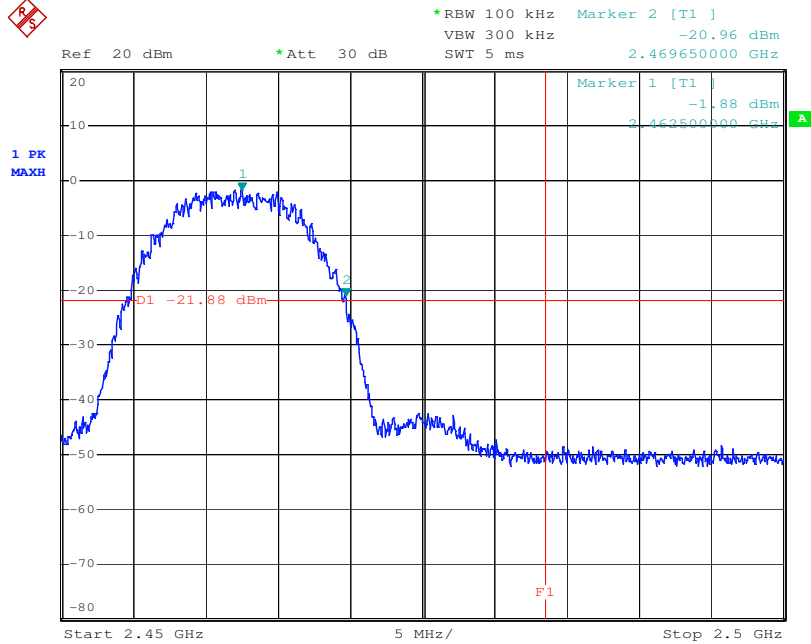
Ch High 30MHz-25GHz



Date: 1.JAN.2000 00:09:28



Band Edge (Conducted Mode)



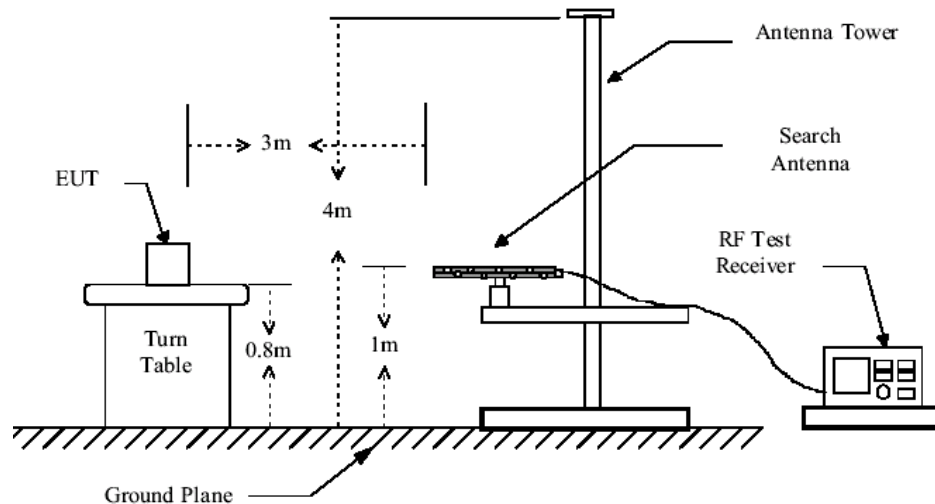
Date: 1.JAN.2000 00:08:34  
Marker: F1=2483.5MHz

## 6.6 Spurious Radiated Emission Test

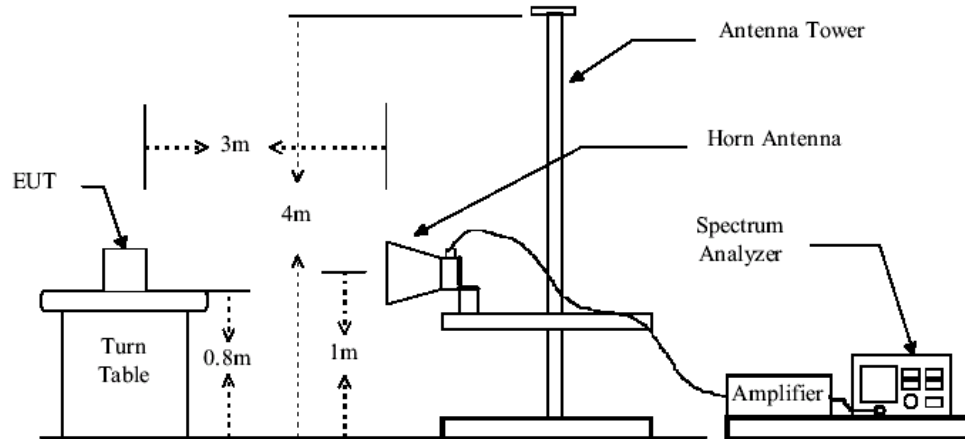
- Test Requirement:** FCC Part15 247(d) and FCC Part 15.209
- Test date:** Mar.31, 2012
- Standard Applicable:** According to section 15.247(c),all other emissions outside these bands shall not exceed the general radiated emission limits specified in section15.209(a).And according to section 15.33(a)(1),for an intentional radiator operates below 10GHz,the frequency range of measurements:to the tenth harmonic of the highest fundamental frequency or to 40GHz,which is lower.
- Measurement Procedure:**
1. The EUT was placed on a turn table which is 0.8m above ground plane.
  2. Pre-test with the Horizontal, Vertical and other status towards to the test antenna. To find the worst status.
  3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
  4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.  
Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz). 1MHz resolution bandwidth and Peak detector apply (1000 MHz – 25GHz )  
Above 1GHz  
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO  
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO.
  5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
  6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
  7. Repeat above procedures until all frequency measured were complete.

### Radiated Test Set-up:

#### Radiated Emission Test Set-up,Frequency Below 1000MHz



Radiated Emission Test Set-up Frequency Over 1GHz



Low noise amplifier was used below 1GHz, High pass Filter was used above 1GHz.

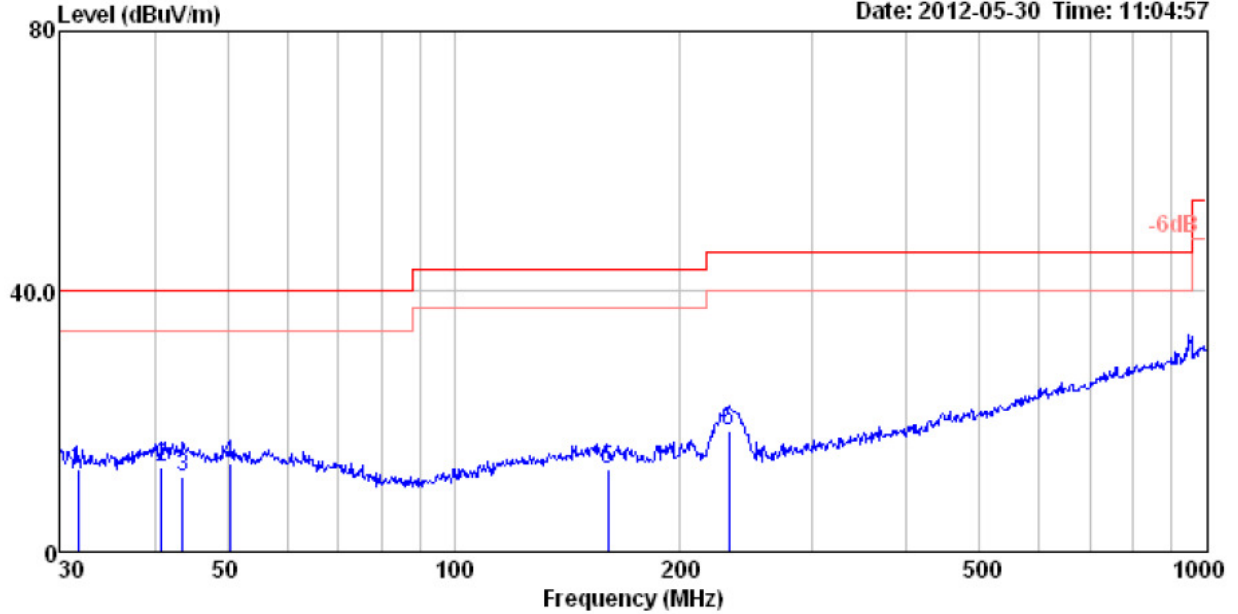
**Tests results:**

**From the pre-test the worst status is the EUT Horizontal towards to the antenna and the operation mode is CCK modulation mode. Below is the worst test results.**

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Antenna:Horizontal

Date: 2012-05-30 Time: 11:04:57



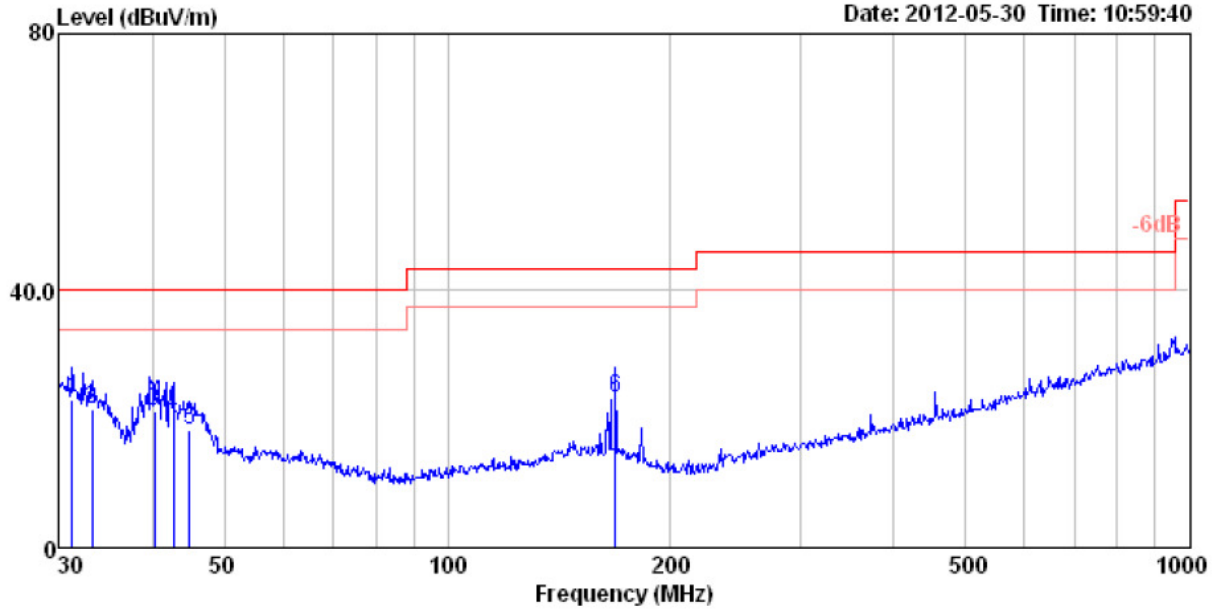
|     | Read   | Antenna | Cable  | Preamp | Limit  | Over   |        |        |        |
|-----|--------|---------|--------|--------|--------|--------|--------|--------|--------|
|     | Freq   | Level   | Factor | Loss   | Factor | Level  | Line   | Limit  | Remark |
|     | MHz    | dBuV    | dB/m   | dB     | dB     | dBuV/m | dBuV/m | dB     |        |
| 1   | 31.65  | 24.68   | 12.20  | 0.44   | 24.70  | 12.62  | 40.00  | -27.38 | QP     |
| 2   | 40.85  | 23.95   | 13.27  | 0.57   | 24.70  | 13.09  | 40.00  | -26.91 | QP     |
| 3   | 43.66  | 22.52   | 13.15  | 0.59   | 24.70  | 11.56  | 40.00  | -28.44 | QP     |
| 4 q | 50.32  | 24.86   | 12.78  | 0.65   | 24.70  | 13.59  | 40.00  | -26.41 | QP     |
| 5   | 160.30 | 23.43   | 12.59  | 1.32   | 24.70  | 12.64  | 43.50  | -30.86 | QP     |
| 6   | 231.72 | 32.01   | 9.49   | 1.65   | 24.58  | 18.57  | 46.00  | -27.43 | QP     |



30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Antenna:Vertical

Date: 2012-05-30 Time: 10:59:40



|      | Read   | Antenna | Cable | Preamp | Limit  | Over   |        |        |
|------|--------|---------|-------|--------|--------|--------|--------|--------|
| Freq | Level  | Factor  | Loss  | Factor | Level  | Line   | Limit  | Remark |
| MHz  | dBuV   | dB/m    | dB    | dB     | dBuV/m | dBuV/m | dB     |        |
| 1 q  | 31.24  | 12.17   | 0.44  | 24.70  | 23.17  | 40.00  | -16.83 | QP     |
| 2    | 33.21  | 12.29   | 0.46  | 24.70  | 21.55  | 40.00  | -18.45 | QP     |
| 3    | 40.23  | 13.29   | 0.56  | 24.70  | 21.20  | 40.00  | -18.80 | QP     |
| 4    | 42.75  | 13.19   | 0.58  | 24.70  | 20.65  | 40.00  | -19.35 | QP     |
| 5    | 44.86  | 13.11   | 0.60  | 24.70  | 18.33  | 40.00  | -21.67 | QP     |
| 6    | 168.52 | 12.34   | 1.35  | 24.61  | 23.33  | 43.50  | -20.17 | QP     |

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**Operation Mode: TX Low Mid CH 2412MHz**

1~25 GHz Harmonics & Spurious Emissions.

**Peak Measurement:**

| Frequency (MHz) | Antenna factors (dB/m) | Cable loss (dB) | Filter (dB) | Preamp factor (dB) | Reading Level (dBμV) | Emission Level (dBμV/m) | AV Limit (dBμV/m) | Antenna polarization |
|-----------------|------------------------|-----------------|-------------|--------------------|----------------------|-------------------------|-------------------|----------------------|
| 4823.19         | 30.6                   | 6.4             | 0.5         | 42.8               | 48.55                | 43.25                   | 54                | Vertical             |
| 7234.67         | 35.5                   | 8.1             | 0.6         | 43.8               | 46.12                | 46.52                   | 54                | Vertical             |
| 9645.61         | 37.7                   | 9.3             | 0.9         | 42.7               | 42.08                | 47.28                   | 54                | Vertical             |
| 12057.33        | 38.6                   | 10.9            | 1.1         | 44.0               | 41.57                | 48.17                   | 54                | Vertical             |
| 4823.19         | 30.6                   | 6.4             | 0.5         | 42.8               | 47.89                | 42.59                   | 54                | Horizontal           |
| 7234.67         | 35.5                   | 8.1             | 0.6         | 43.8               | 45.74                | 46.14                   | 54                | Horizontal           |
| 9645.61         | 37.7                   | 9.3             | 0.9         | 42.7               | 41.54                | 46.74                   | 54                | Horizontal           |
| 12057.33        | 38.6                   | 10.9            | 1.1         | 44.0               | 42.24                | 48.84                   | 54                | Horizontal           |

The field strength is calculated by adding the Antenna Factor. Cable Factor & Pre-amplifier. The basic equation with a sample calculation is as follows:

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} + \text{Filter} - \text{Pre-amplifier Factor}$$

**Operation Mode: TX Mid CH 2437MHz**

1~25 GHz Harmonics & Spurious Emissions.

**Peak Measurement:**

| Frequency (MHz) | Antenna factors (dB/m) | Cable loss (dB) | Filter (dB) | Preamp factor (dB) | Reading Level (dBμV) | Emission Level (dBμV/m) | AV Limit (dBμV/m) | Antenna polarization |
|-----------------|------------------------|-----------------|-------------|--------------------|----------------------|-------------------------|-------------------|----------------------|
| 4871.44         | 30.6                   | 6.4             | 0.5         | 42.8               | 48.17                | 42.87                   | 54                | Vertical             |
| 7309.25         | 35.5                   | 8.1             | 0.6         | 43.1               | 43.26                | 44.36                   | 54                | Vertical             |
| 9746.38         | 38.1                   | 9.8             | 0.9         | 42.3               | 39.77                | 46.27                   | 54                | Vertical             |
| 12182.11        | 38.6                   | 10.9            | 1.1         | 44.0               | 41.79                | 48.39                   | 54                | Vertical             |
| 4871.44         | 30.6                   | 6.4             | 0.5         | 42.8               | 46.61                | 41.31                   | 54                | Horizontal           |
| 7309.25         | 35.5                   | 8.1             | 0.6         | 43.1               | 43.32                | 44.42                   | 54                | Horizontal           |
| 9746.38         | 38.1                   | 9.8             | 0.9         | 42.3               | 41.17                | 47.67                   | 54                | Horizontal           |
| 12182.11        | 38.6                   | 10.9            | 1.1         | 44.0               | 41.46                | 48.06                   | 54                | Horizontal           |

The field strength is calculated by adding the Antenna Factor. Cable Factor & Pre-amplifier. The basic equation with a sample calculation is as follows:

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} + \text{Filter} - \text{Pre-amplifier Factor}$$



**Operation Mode:TX High CH 2462MHz**

1~25 GHz Harmonics & Spurious Emissions.

**Peak Measurement:**

| Frequency (MHz) | Antenna factors (dB/m) | Cable loss (dB) | Filter (dB) | Preamplifier factor (dB) | Reading Level (dBμV) | Emission Level (dBμV/m) | AV Limit (dBμV/m) | Antenna polarization |
|-----------------|------------------------|-----------------|-------------|--------------------------|----------------------|-------------------------|-------------------|----------------------|
| 4922.39         | 31.6                   | 6.9             | 0.5         | 43.9                     | 47.49                | 42.59                   | 54                | Vertical             |
| 7384.74         | 35.8                   | 8.1             | 0.6         | 43.8                     | 44.66                | 45.36                   | 54                | Vertical             |
| 9848.82         | 38.1                   | 9.8             | 0.9         | 42.3                     | 38.24                | 44.74                   | 54                | Vertical             |
| 12308.43        | 38.6                   | 10.9            | 1.1         | 44.4                     | 41.25                | 47.45                   | 54                | Vertical             |
| 4922.39         | 31.6                   | 6.9             | 0.5         | 43.9                     | 46.34                | 41.44                   | 54                | Horizontal           |
| 7384.74         | 35.8                   | 8.1             | 0.6         | 43.8                     | 42.83                | 43.53                   | 54                | Horizontal           |
| 9848.82         | 38.1                   | 9.8             | 0.9         | 42.3                     | 38.36                | 44.86                   | 54                | Horizontal           |
| 12308.43        | 38.6                   | 10.9            | 1.1         | 44.4                     | 41.19                | 47.39                   | 54                | Horizontal           |

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

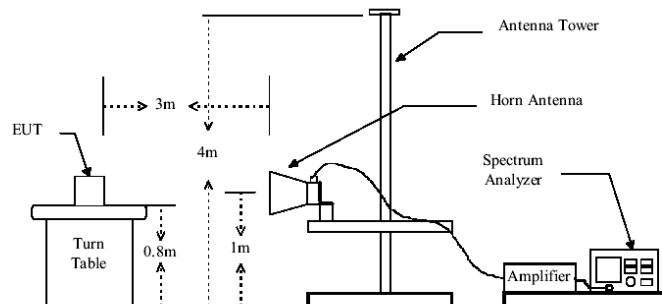
$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} + \text{Filter} - \text{Preamplifier Factor}$$



## 6.7 Radiated Emission Band Edge

- Test Requirement:** FCC Part15 247(c)
- Test date:** May.31.2012
- Standard Applicable:** According to section 15.247(c),in any 100KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating,the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power,In addition,radiated emissions which fall in the restricted bands,as defined in section 15.205(a),must also comply with the radiated emission limits specified in 15.209(a).
- Measurement Distance:** 3m (Semi-Anechoic Chamber)
- Limit:**  
40.0 dB $\mu$ V/m between 30MHz & 88MHz;  
43.5 dB $\mu$ V/m between 88MHz & 216MHz;  
46.0 dB $\mu$ V/m between 216MHz & 960MHz;  
AV 54.0 dB $\mu$ V/m PK 74.0dB $\mu$ V/m above 960MHz.
- Measurement Procedure:** The EUT was setup according to ANSI 63.10,2009 for compliance to FCC 47 CFR 15.247 requirements.The EUT is placed on a turn table which is 0.8 m above ground.The turn table is rotated 360 degrees to determine to the position of the maximum emission level.The EUT was positioned such that the distance from antenna to the EUT was 3 meters.The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level  
This is repeated for both horizontal and vertical polarization of the antenna.In order to find the maximum emission,all of the interface cables were manipulated according to ANSIC 63.10:2009 on radiated measurement.  
Spectrum analyzer parameters setting as shown below:  
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO  
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

### Radiated Emission Test Set-up Frequency Over 1GHz





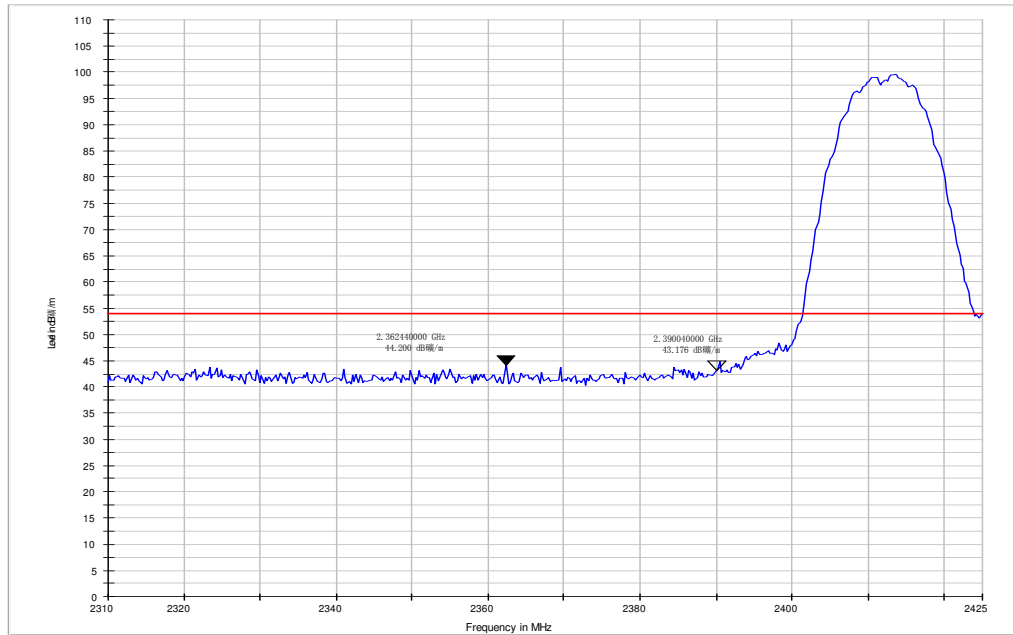
The field strength is calculated by adding the Antenna Factor, Preamplifier Factor & Cable Factor. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

**Radiated Bandedge Measurement Result:**

**CH Low 2412MHz Radiated Bandedge**

**DQPSK Mode, Horizontal, Peak Detector:**

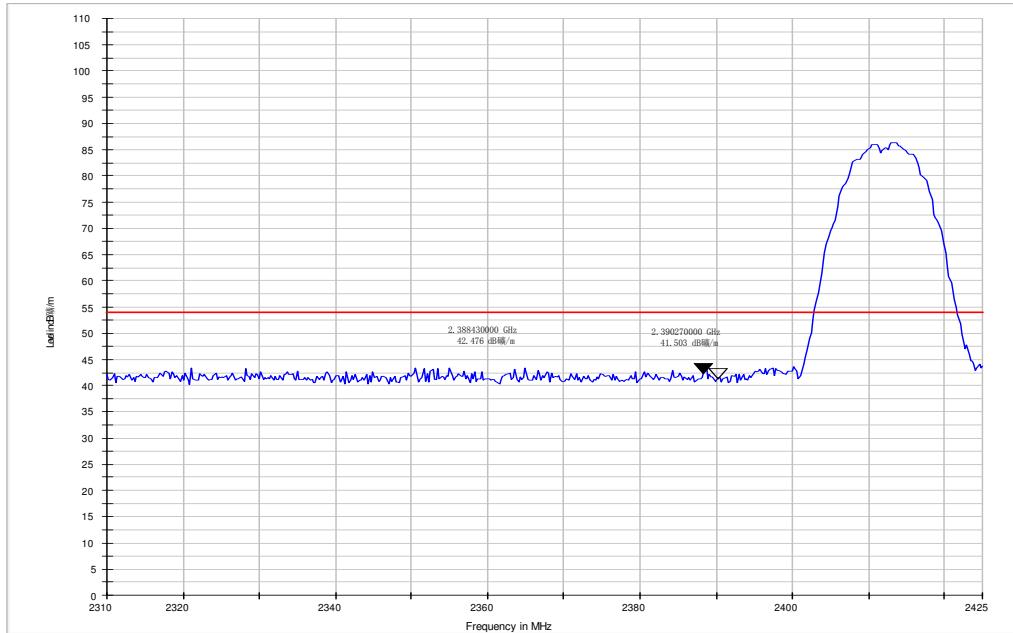


| Frequency (MHz) | Peak Reading (dBuV) | Antenna Factor (dB/m) | PreAmp (dB) | Cable Loss (dB) | Peak Level (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) |
|-----------------|---------------------|-----------------------|-------------|-----------------|---------------------|-------------------|-------------|
| 2390.04         | 54.30               | 27.60                 | 42.50       | 4.80            | 44.20               | 54                | 9.80        |



**CH Low 2412MHz Radiated Bandedge**

**DQPSK Mode, Vertical, Peak Detector:**



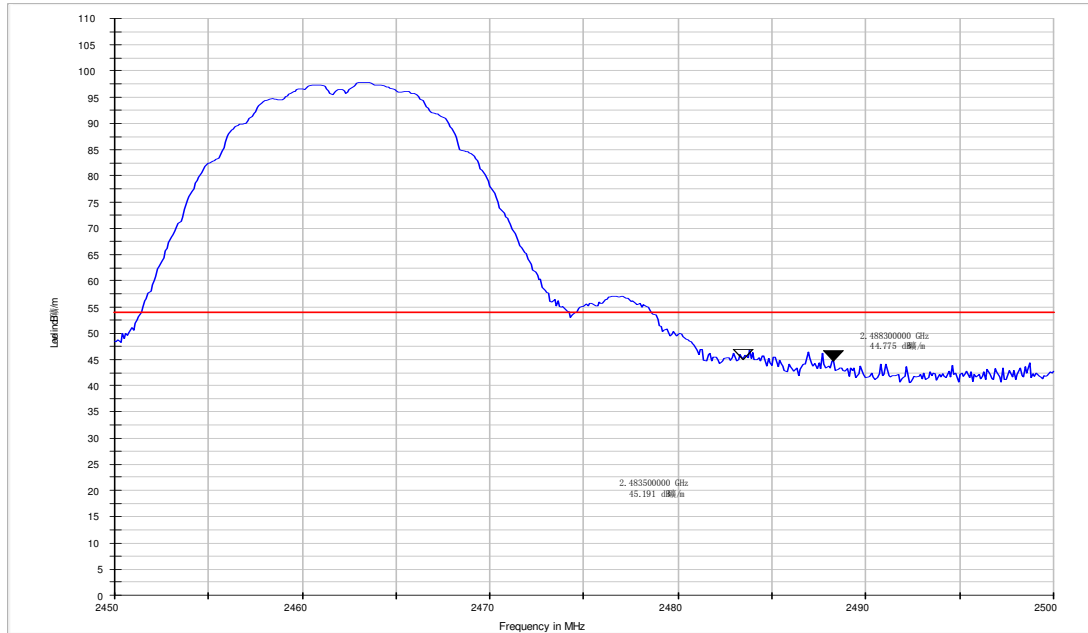
| Frequency (MHz) | Peak Reading (dBuV) | Antenna Factor (dB/m) | PreAmp (dB) | Cable Loss (dB) | Peak Level (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) |
|-----------------|---------------------|-----------------------|-------------|-----------------|---------------------|-------------------|-------------|
| 2390.27         | 52.58               | 27.60                 | 42.50       | 4.80            | 42.48               | 54                | 11.52       |

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**CH Low 2462MHz Radiated Bandedge**

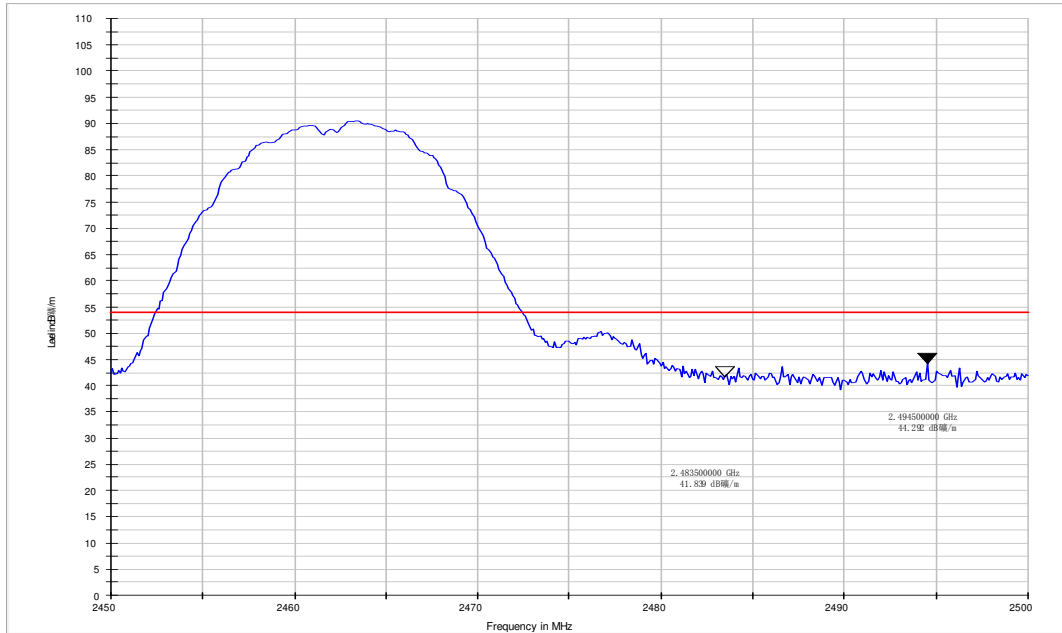
**DQPSK Mode,Horizontal, Peak Detector:**



| Frequency (MHz) | Peak Reading (dBuV) | Antenna Factor (dB/m) | PreAmp (dB) | Cable Loss (dB) | Peak Level (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) |
|-----------------|---------------------|-----------------------|-------------|-----------------|---------------------|-------------------|-------------|
| 2483.50         | 56.29               | 27.60                 | 42.50       | 4.80            | 46.19               | 54                | 7.81        |

**CH Low 2462MHz Radiated Bandedge**

**DQPSK Mode, Vertical, Peak Detector:**

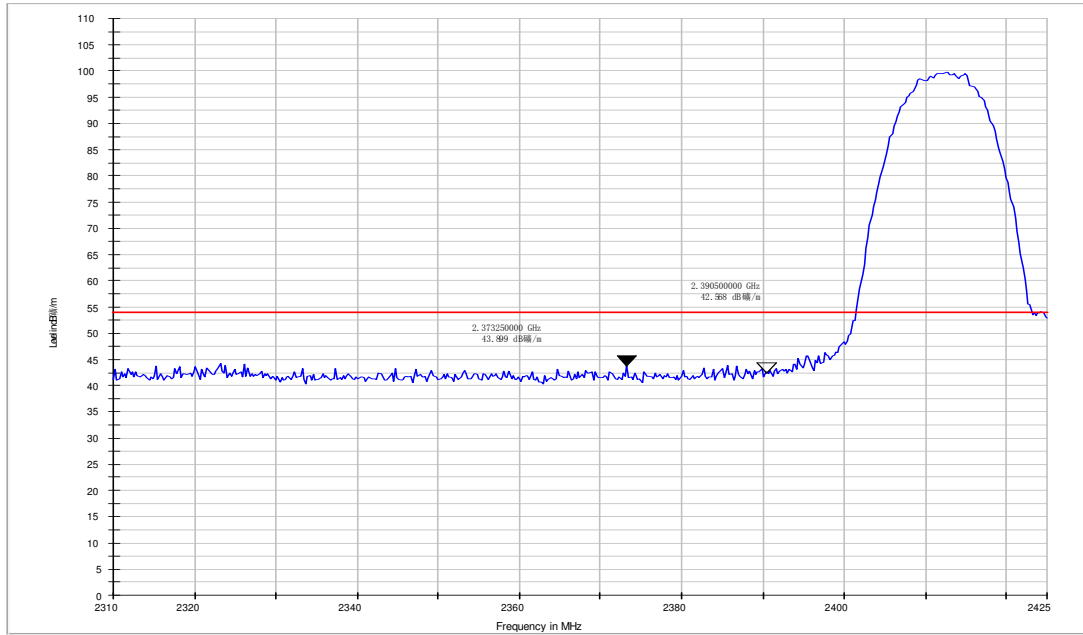


| Frequency (MHz) | Peak Reading (dBuV) | Antenna Factor (dB/m) | PreAmp (dB) | Cable Loss (dB) | Peak Level (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) |
|-----------------|---------------------|-----------------------|-------------|-----------------|---------------------|-------------------|-------------|
| 2483.50         | 56.34               | 27.60                 | 42.50       | 4.80            | 44.29               | 54.00             | 7.76        |



**CH Low 2412MHz Radiated Bandedge**

**CCK Mode,Horizontal, Peak Detector:**



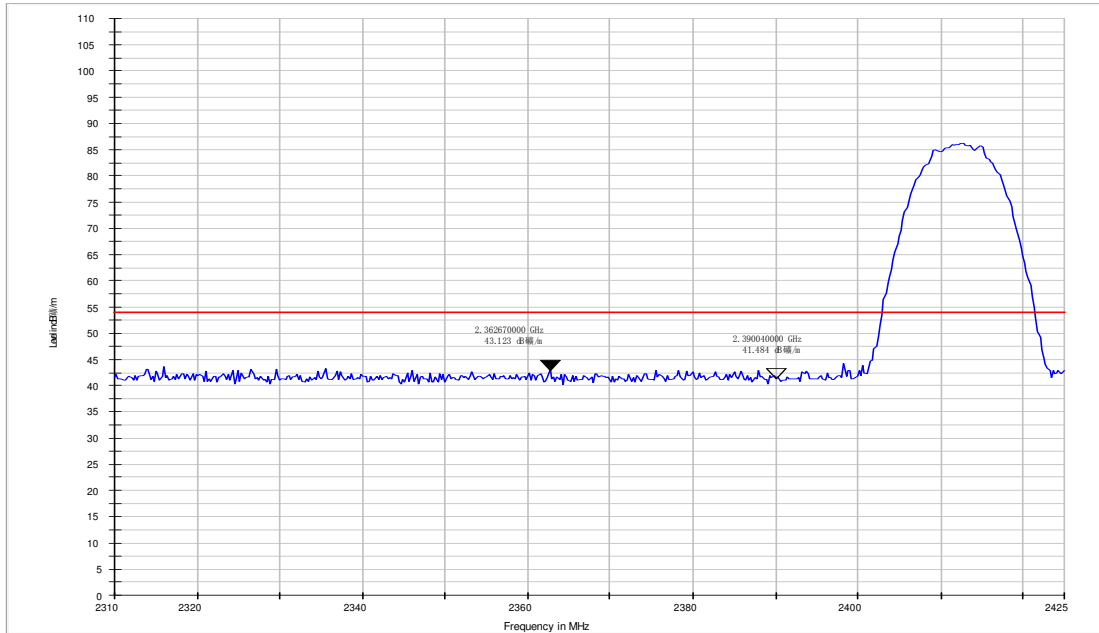
| Frequency (MHz) | Peak Reading (dBuV) | Antenna Factor (dB/m) | PreAmp (dB) | Cable Loss (dB) | Peak Level (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) |
|-----------------|---------------------|-----------------------|-------------|-----------------|---------------------|-------------------|-------------|
| 2390.50         | 54.00               | 27.60                 | 42.50       | 4.80            | 43.90               | 54                | 10.10       |

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**CH Low 2412MHz Radiated Bandedge**

**CCK Mode, Vertical, Peak Detector:**



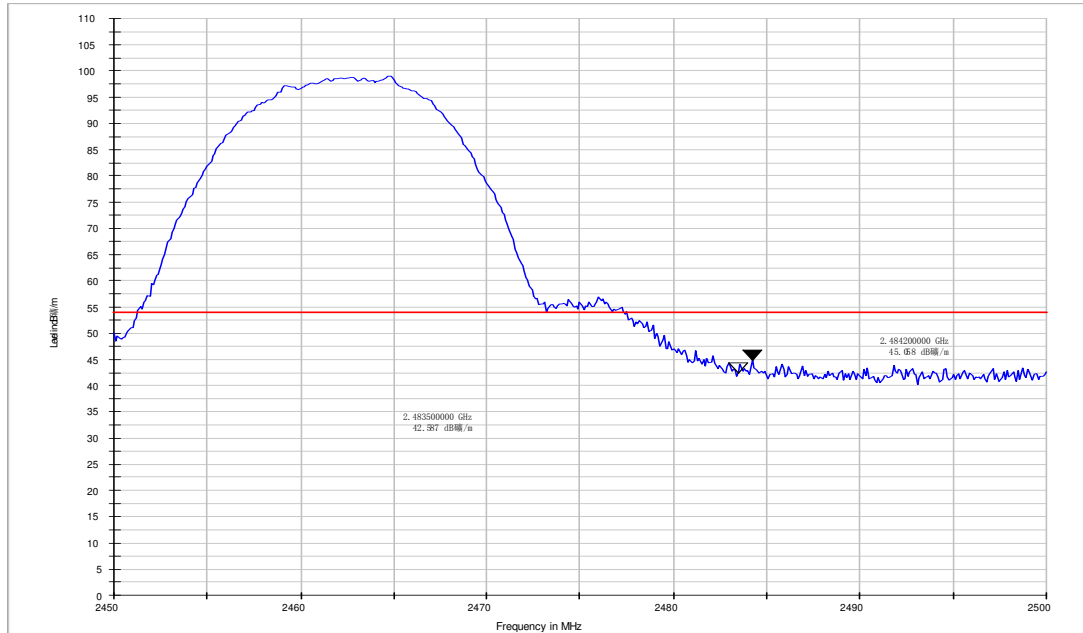
MaxPeak-MaxHold Average-MaxHold FCC AV

| Frequency (MHz) | Peak Reading (dBuV) | Antenna Factor (dB/m) | PreAmp (dB) | Cable Loss (dB) | Peak Level (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) |
|-----------------|---------------------|-----------------------|-------------|-----------------|---------------------|-------------------|-------------|
| 2390.09         | 53.22               | 27.6                  | 42.5        | 4.8             | 43.12               | 54                | 10.88       |

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**CH Low 2462MHz Radiated Bandedge**

**CCK Mode,Horizontal, Peak Detector:**

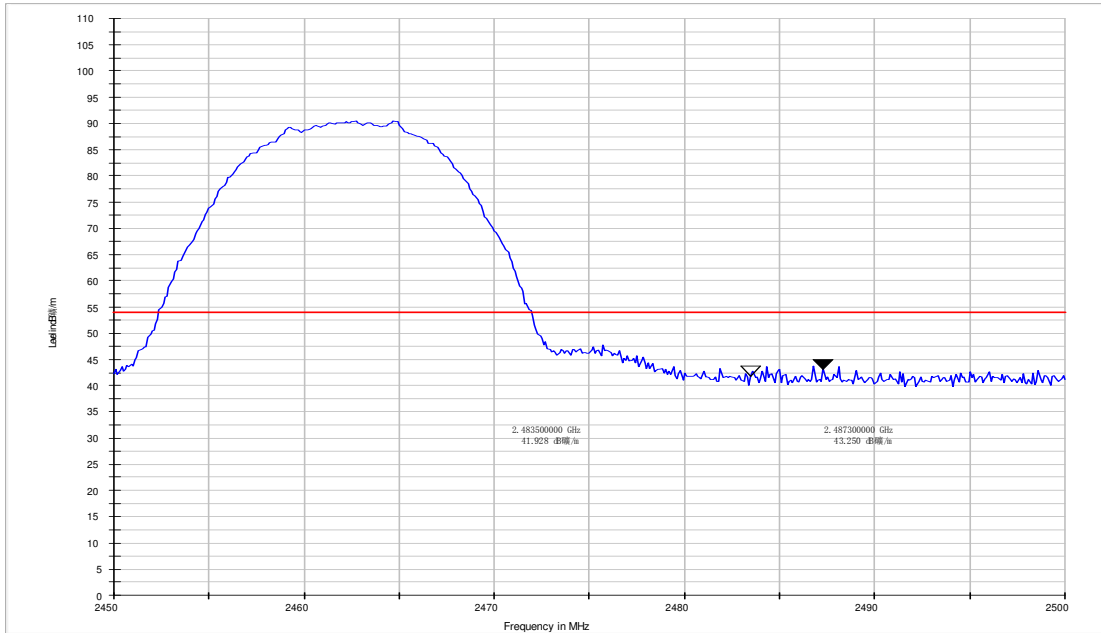


| Frequency (MHz) | Peak Reading (dBuV) | Antenna Factor (dB/m) | PreAmp (dB) | Cable Loss (dB) | Peak Level (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) |
|-----------------|---------------------|-----------------------|-------------|-----------------|---------------------|-------------------|-------------|
| 2484.20         | 55.16               | 27.60                 | 42.50       | 4.80            | 45.06               | 54                | 8.94        |



**CH Low 2462MHz Radiated Bandedge**

**CCK Mode, Vertical, Peak Detector:**



| Frequency (MHz) | Peak Reading (dBuV) | Antenna Factor (dB/m) | PreAmp (dB) | Cable Loss (dB) | Peak Level (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) |
|-----------------|---------------------|-----------------------|-------------|-----------------|---------------------|-------------------|-------------|
| 2483.50         | 53.35               | 27.6                  | 42.5        | 4.8             | 43.25               | 54                | 10.75       |

Remark: 1. The Peak Level less than the AV limit, so the AV level is no greater than the AV limit.

2. No any other emission which fall in restricted bands can be detected and be reported.

All frequencies within the “Restricted bands” have been evaluated to compliance. Section 15.205 Restricted bands of operation.

### 6.8 Occupied Bandwidth Test

**Test Requirement:** RSS-Gen Issue 3 Clause 4.6.1  
**Test date:** Jun. 06, 2012  
**Standard Applicable** According to the section RSS-Gen Issue 3 Clause 4.6.1  
**EUT Setup** The occupied bandwidth per RSS-Gen Issue 3 Clause 4.6.1 was measured using the Spectrum Analyzer with the resolutions set at 100kHz, the video bandwidth set at 1MHz.

**Measurement Result:**

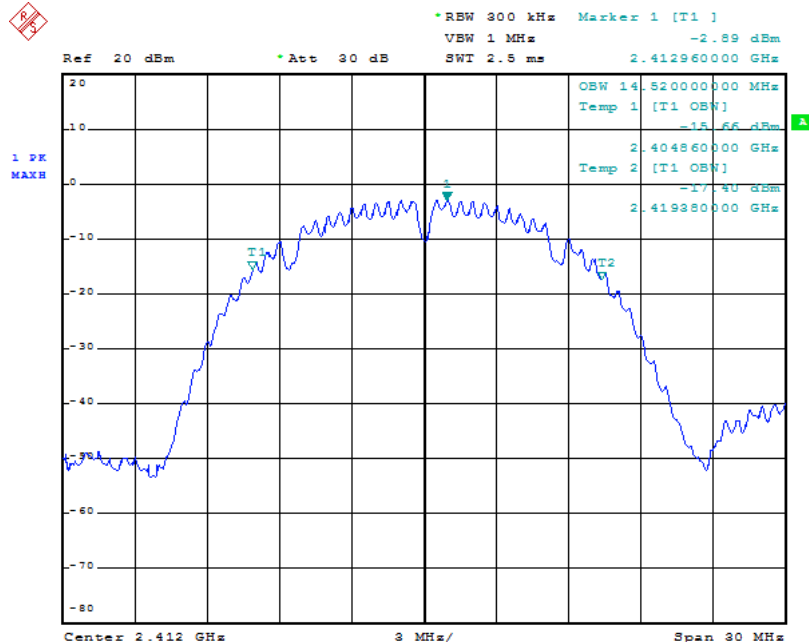
**For DQPSK mode**

| Channel | Frequency (MHz) | Bandwidth (MHz) |
|---------|-----------------|-----------------|
| LOW     | 2412            | 14.52           |
| MID     | 2437            | 14.58           |
| HIGH    | 2462            | 14.64           |

**For CCK mode**

| Channel | Frequency (MHz) | Bandwidth (MHz) |
|---------|-----------------|-----------------|
| LOW     | 2412            | 14.22           |
| MID     | 2437            | 14.22           |
| HIGH    | 2462            | 14.27           |

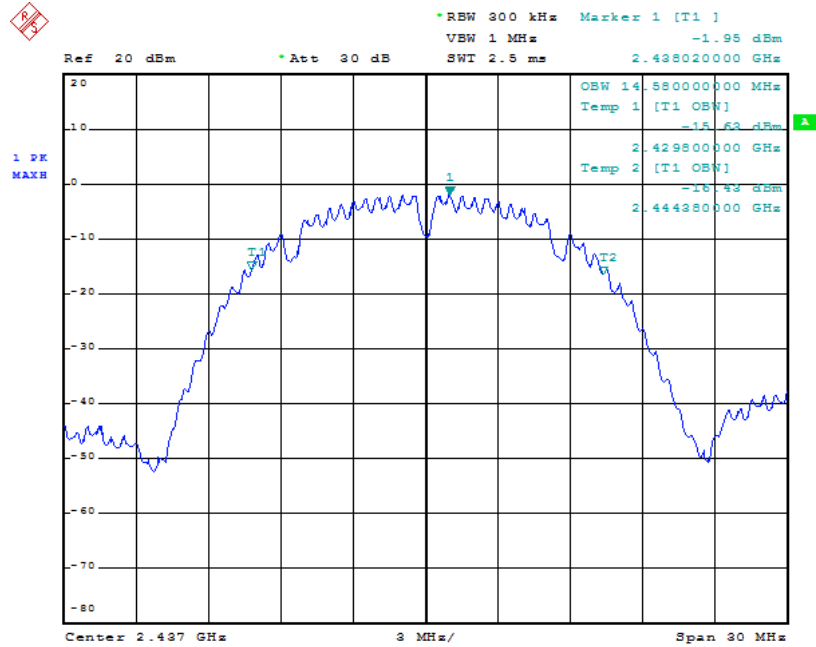
**DQPSK mode Channel 2412MHz**



Date: 1.JAN.2000 06:22:01

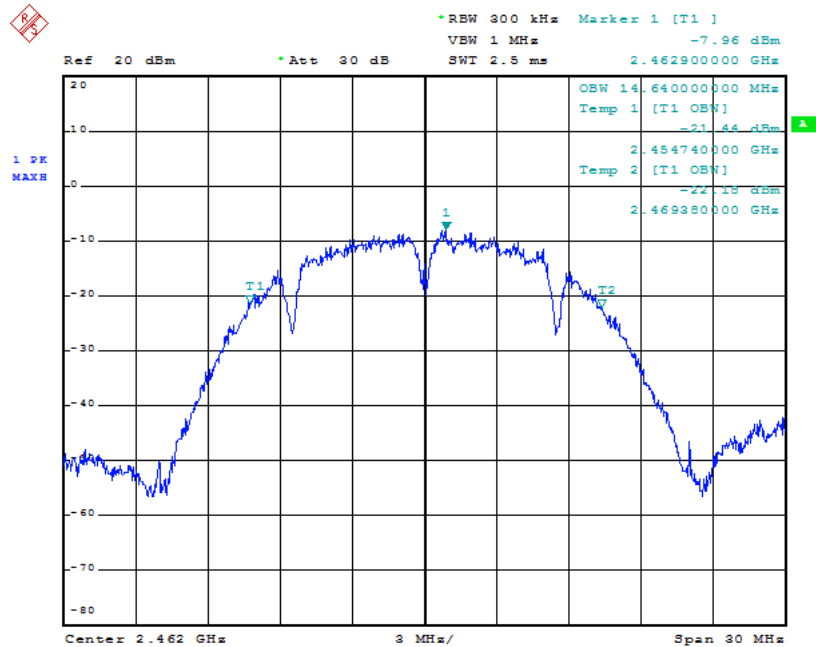


DQPSK mode Channel 2437MHz



Date: 1.JAN.2000 06:27:32

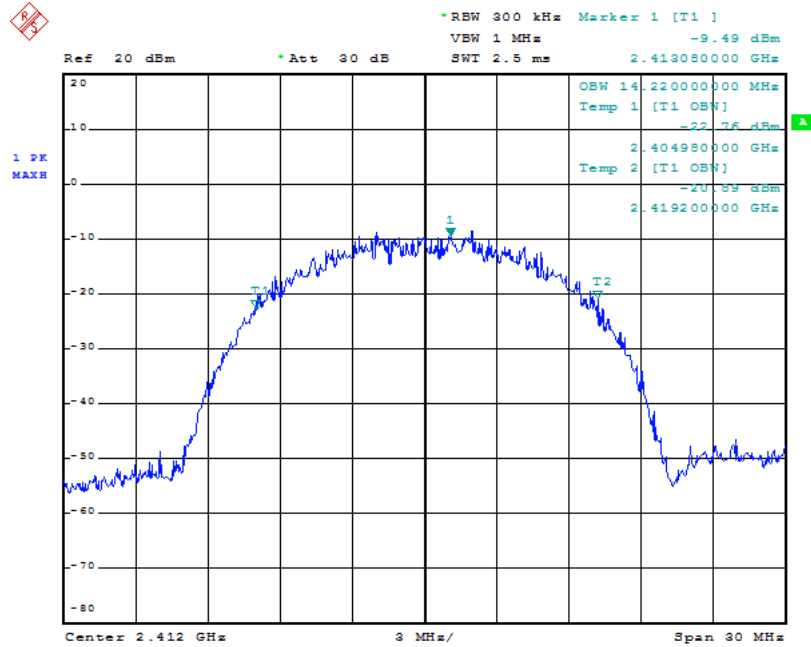
DQPSK mode Channel 2462MHz



Date: 1.JAN.2000 06:49:52

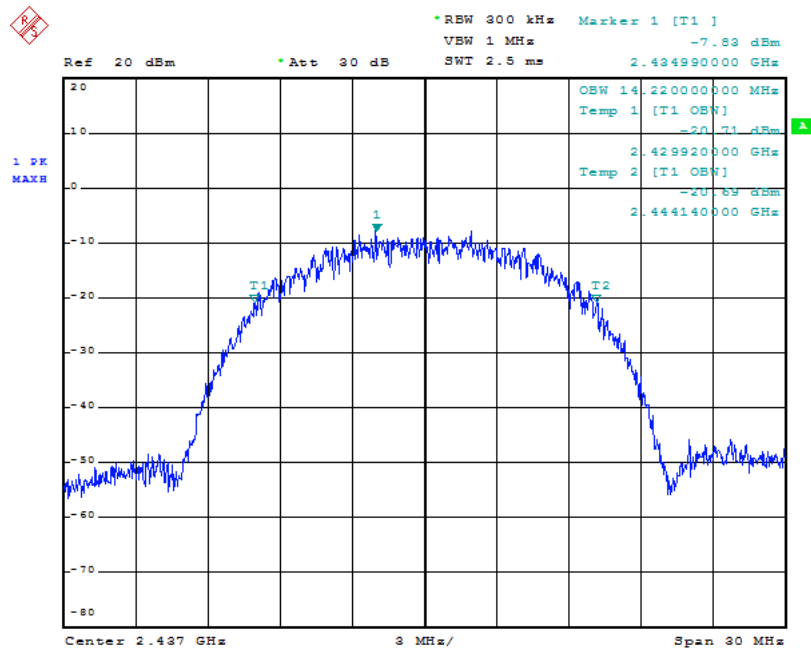


CCK mode Channel 2412MHz



Date: 1.JAN.2000 07:04:42

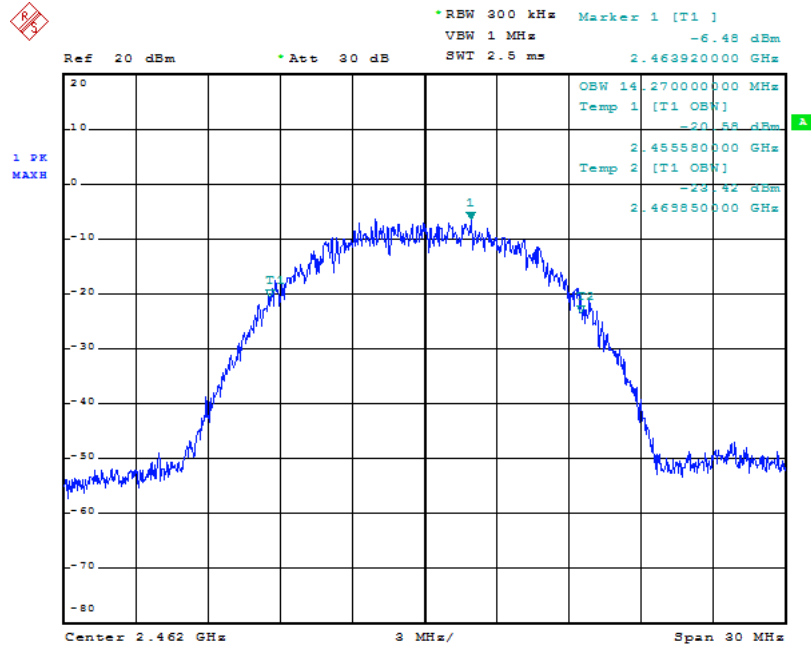
CCK mode Channel 2437MHz



Date: 1.JAN.2000 07:23:02



CCK mode Channel 2462MHz



Date: 1.JAN.2000 00:10:24

**End of Report**