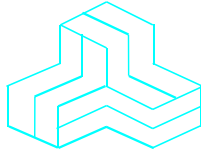


# ENGINEERING TEST REPORT



**Handheld Computer  
Model: 7545MBW  
FCC ID: GM37545MBW**

*Applicant:*

**Psion Inc  
2100 Meadowvale Boulevard  
Mississauga, ON L5N 7J9  
Canada**

*In Accordance With*

**Federal Communications Commission (FCC)  
Part 15, Subpart C, Section 15.247  
Digital Modulation Systems (DTS) Operating within 2400 – 2483.5 MHz Band**

**UltraTech's File No.: TEK-728F15C247-7545MBW**

This Test report is Issued under the Authority of  
Tri M. Luu  
Vice President of Engineering  
UltraTech Group of Labs

Date: October 21, 2013

Report Prepared by: Dan Huynh

Tested by: Mr. Hung Trinh

Issued Date: October 21, 2013

Test Dates: September 27 - October 1, 2013

- *The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
- *This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.*

## UltraTech

3000 Bristol Circle, Oakville, Ontario, Canada, L6H 6G4  
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Website: [www.ultratech-labs.com](http://www.ultratech-labs.com), Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Email: [tri@ultratech-labs.com](mailto:tri@ultratech-labs.com)

**FCC**

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46390-2049



NVLAP LAB CODE 200093-0



SL2-IN-E-1119R



**Korea KCC-RRL**  
CA2049

## TABLE OF CONTENTS

|                   |                                                                                           |           |
|-------------------|-------------------------------------------------------------------------------------------|-----------|
| <b>EXHIBIT 1.</b> | <b>INTRODUCTION.....</b>                                                                  | <b>1</b>  |
| 1.1.              | SCOPE .....                                                                               | 1         |
| 1.2.              | RELATED SUBMITTAL(S)/GRANT(S) .....                                                       | 1         |
| 1.3.              | NORMATIVE REFERENCES .....                                                                | 1         |
| <b>EXHIBIT 2.</b> | <b>PERFORMANCE ASSESSMENT.....</b>                                                        | <b>2</b>  |
| 2.1.              | CLIENT INFORMATION .....                                                                  | 2         |
| 2.2.              | EQUIPMENT UNDER TEST (EUT) INFORMATION .....                                              | 2         |
| 2.3.              | EUT'S TECHNICAL SPECIFICATIONS.....                                                       | 3         |
| 2.4.              | ASSOCIATED ANTENNA DESCRIPTION .....                                                      | 3         |
| 2.5.              | LIST OF EUT'S PORTS.....                                                                  | 3         |
| 2.6.              | ANCILLARY EQUIPMENT .....                                                                 | 3         |
| <b>EXHIBIT 3.</b> | <b>EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS.....</b>                      | <b>4</b>  |
| 3.1.              | CLIMATE TEST CONDITIONS.....                                                              | 4         |
| 3.2.              | OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS.....                                  | 4         |
| <b>EXHIBIT 4.</b> | <b>SUMMARY OF TEST RESULTS.....</b>                                                       | <b>5</b>  |
| 4.1.              | LOCATION OF TESTS .....                                                                   | 5         |
| 4.2.              | APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS .....                                | 5         |
| 4.3.              | MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES.....                        | 5         |
| <b>EXHIBIT 5.</b> | <b>TEST DATA .....</b>                                                                    | <b>6</b>  |
| 5.1.              | OCCUPIED BANDWIDTH [§ 15.215(c)] .....                                                    | 6         |
| 5.2.              | PEAK CONDUCTED OUTPUT POWER - DTS [§ 15.247(b)(3)] .....                                  | 10        |
| 5.3.              | TRANSMITTER BAND-EDGE & SPURIOUS CONDUCTED EMISSIONS [§ 15.247(d)] .....                  | 14        |
| 5.4.              | TRANSMITTER SPURIOUS RADIATED EMISSIONS AT 3 METERS [§§ 15.247(d), 15.209 & 15.205] ..... | 36        |
| <b>EXHIBIT 6.</b> | <b>TEST EQUIPMENT LIST .....</b>                                                          | <b>38</b> |
| <b>EXHIBIT 7.</b> | <b>MEASUREMENT UNCERTAINTY .....</b>                                                      | <b>39</b> |
| 7.1.              | LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY .....                                     | 39        |
| 7.2.              | RADIATED EMISSION MEASUREMENT UNCERTAINTY .....                                           | 39        |

## EXHIBIT 1. INTRODUCTION

### 1.1. SCOPE

|                                      |                                                                                                                                        |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Reference:</b>                    | FCC Part 15, Subpart C, Section 15.247                                                                                                 |
| <b>Title:</b>                        | Code of Federal Regulations (CFR), Title 47 – Telecommunication, Part 15 – Radio Frequency Devices                                     |
| <b>Purpose of Test:</b>              | Class II Permissive Change for software change to add additional frequencies.                                                          |
| <b>Test Procedures:</b>              | <ul style="list-style-type: none"><li>▪ ANSI C63.4-2009</li><li>▪ ANSI C63.10</li><li>▪ FCC KDB Publication No. 558074 D01</li></ul>   |
| <b>Environmental Classification:</b> | <input checked="" type="checkbox"/> Commercial, industrial or business environment<br><input type="checkbox"/> Residential environment |

### 1.2. RELATED SUBMITTAL(S)/GRANT(S)

None.

### 1.3. NORMATIVE REFERENCES

| Publication                  | Year                         | Title                                                                                                                                                               |
|------------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 47 CFR Parts 0-19            | 2013                         | Code of Federal Regulations (CFR), Title 47 – Telecommunication                                                                                                     |
| ANSI C63.4                   | 2009                         | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40 GHz |
| ANSI C63.10                  | 2009                         | American National Standard for Testing Unlicensed Wireless Devices                                                                                                  |
| CISPR 22 & EN 55022          | 2008-09, Edition 6.0<br>2006 | Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement                                                            |
| CISPR 16-1-1<br>+A1<br>+A2   | 2006<br>2006<br>2007         | Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-1: Measuring Apparatus                                                     |
| CISPR 16-1-2<br>+A1<br>+A2   | 2003<br>2004<br>2006         | Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-2: Conducted disturbances                                                  |
| D01 DTS Meas Guidance v03r01 | 2013                         | Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247                                                       |

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File #: TEK-728F15C247-7545MBW

October 21, 2013

*All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

## EXHIBIT 2. PERFORMANCE ASSESSMENT

### 2.1. CLIENT INFORMATION

| APPLICANT              |                                                                                                                              |
|------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Name:</b>           | Psion Inc                                                                                                                    |
| <b>Address:</b>        | 2100 Meadowvale Boulevard<br>Mississauga, ON L5N 7J9<br>Canada                                                               |
| <b>Contact Person:</b> | Mr. Sada Dharwarkar<br>Phone #: 905 812 6200 Ext. 3358<br>Fax #: 905 812 6301<br>Email Sada.Dharwarkar@motorolasolutions.com |

| MANUFACTURER           |                                                                                                                              |
|------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Name:</b>           | Psion Inc                                                                                                                    |
| <b>Address:</b>        | 2100 Meadowvale Boulevard<br>Mississauga, ON L5N 7J9<br>Canada                                                               |
| <b>Contact Person:</b> | Mr. Sada Dharwarkar<br>Phone #: 905 812 6200 Ext. 3358<br>Fax #: 905 812 6301<br>Email Sada.Dharwarkar@motorolasolutions.com |

### 2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

|                                       |                                   |
|---------------------------------------|-----------------------------------|
| <b>Brand Name:</b>                    | Psion Inc                         |
| <b>Product Name:</b>                  | Handheld Computer                 |
| <b>Model Name or Number:</b>          | 7545MBW                           |
| <b>Serial Number:</b>                 | Test Sample                       |
| <b>Type of Equipment:</b>             | Digital Transmission System (DTS) |
| <b>Input Power Supply Type:</b>       | Lithium-Ion Battery               |
| <b>Primary User Functions of EUT:</b> | Transmit and receive data         |

---

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## 2.3. EUT'S TECHNICAL SPECIFICATIONS

| Transmitter                     |                                                                                                                                                                                                                                                                                                                 |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equipment Type:                 | Portable                                                                                                                                                                                                                                                                                                        |
| Intended Operating Environment: | Commercial, industrial or business                                                                                                                                                                                                                                                                              |
| Power Supply Requirement:       | 3.7 V DC                                                                                                                                                                                                                                                                                                        |
| RF Output Power Rating:         | Channel 01 to 11 (2412 MHz to 2462 MHz):<br>802.11b : 19.24 dBm (0.084 W)<br>802.11g : 24.51 dBm (0.282 W)<br>802.11n HT 20: 23.74 dBm (0.237 W)<br><br>Channel 12 (2467 MHz) and Channel 13 (2472 MHz):<br>802.11b : 11.13 dBm (0.013 W)<br>802.11g : 13.76 dBm (0.024 W)<br>802.11n HT 20: 13.77dBm (0.024 W) |
| Operating Frequency Range:      | 2412 – 2472 MHz                                                                                                                                                                                                                                                                                                 |
| RF Output Impedance:            | 50 $\Omega$                                                                                                                                                                                                                                                                                                     |
| Channel Spacing:                | 5 MHz                                                                                                                                                                                                                                                                                                           |
| Duty Cycle:                     | 100%                                                                                                                                                                                                                                                                                                            |
| Modulation Type(s):             | 802.11b: DSSS / 802.11g/n: OFDM                                                                                                                                                                                                                                                                                 |
| Oscillator Frequency(ies):      | 32 MHz                                                                                                                                                                                                                                                                                                          |
| Antenna Connector Types:        | U.FL                                                                                                                                                                                                                                                                                                            |

## 2.4. ASSOCIATED ANTENNA DESCRIPTION

|                  |               |
|------------------|---------------|
| Manufacturer:    | Psion Inc.    |
| Type:            | PCB           |
| Model:           | 1004856       |
| Frequency Range: | 2400-2484 MHz |
| Impedance:       | 50 $\Omega$   |
| Gain (dBi):      | 1.9 dBi       |

## 2.5. LIST OF EUT'S PORTS

| Port Number | EUT's Port Description | Number of Identical Ports | Connector Type | Cable Type (Shielded/Non-shielded) |
|-------------|------------------------|---------------------------|----------------|------------------------------------|
| 1           | Docking Port           | 1                         | Pogo           | None                               |

## 2.6. ANCILLARY EQUIPMENT

None.

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### EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

#### 3.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

|                     |                           |
|---------------------|---------------------------|
| Temperature:        | 21 to 23 °C               |
| Humidity:           | 45 to 58%                 |
| Pressure:           | 102 kPa                   |
| Power Input Source: | 3.7 V Lithium-Ion Battery |

#### 3.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS

|                           |                                                                                                                                                                             |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating Modes:          | EUT configured for continuous transmit mode with typical modulation being applied during testing.                                                                           |
| Special Test Software:    | Special software provided by the Applicant to operate the EUT at desired channel frequency continuously during testing in a range of typical modulation modes of operation, |
| Special Hardware Used:    | N/A                                                                                                                                                                         |
| Transmitter Test Antenna: | The EUT is tested with the transmitter antenna port terminated to a 50 $\Omega$ Load.                                                                                       |

| Transmitter Test Signals  |                                                                 |
|---------------------------|-----------------------------------------------------------------|
| Frequency Band(s):        | 2412 – 2472 MHz                                                 |
| Frequency(ies) Tested:    | 2472 MHz (highest channel to extend operating frequency range ) |
| RF Power Output:          | 13.77dBm (0.024 W) Peak (at reduced power level)                |
| Normal Test Modulation:   | 802.11b : DSSS<br>802.11g/n : OFDM                              |
| Modulating Signal Source: | Internal                                                        |

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## EXHIBIT 4. SUMMARY OF TEST RESULTS

### 4.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- AC Power Line Conducted Emissions were performed in UltraTech's shielded room, 24'(L) by 16'(W) by 8'(H).
- Radiated Emissions were performed at the Ultratech's 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville 3-10 TDK Semi-Anechoic Chamber has been filed with FCC office (FCC File No.: 91038) and Industry Canada office (Industry Canada File No.: 2049A-3). Expiry Date: 2014-04-04.

### 4.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

| FCC Section(s)                                                                                                                                                                                                                                                                   | Test Requirements                                                                 | Compliance (Yes/No) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------|
| 15.203                                                                                                                                                                                                                                                                           | Antenna requirements                                                              | Yes*                |
| 15.207(a)                                                                                                                                                                                                                                                                        | AC Power Line Conducted Emissions                                                 | n/a                 |
| 15.215 (c)                                                                                                                                                                                                                                                                       | 20 dB Bandwidth                                                                   | Yes                 |
| 15.247(a)(2)                                                                                                                                                                                                                                                                     | 6 dB Bandwidth                                                                    | n/a                 |
| 15.247(b)(3)                                                                                                                                                                                                                                                                     | Peak Conducted Output Power - DTS                                                 | Yes                 |
| 15.247(d)                                                                                                                                                                                                                                                                        | Band-Edge and RF Conducted Spurious Emissions at the Transmitter Antenna Terminal | Yes                 |
| 15.247(d), 15.209 & 15.205                                                                                                                                                                                                                                                       | Transmitter Spurious Radiated Emissions                                           | Yes                 |
| 15.247(e)                                                                                                                                                                                                                                                                        | Power Spectral Density                                                            | n/a                 |
| 15.247(i) 1.1307, 1.1310, 2.1091 & 2.1093                                                                                                                                                                                                                                        | RF Exposure                                                                       | Yes**               |
| * The EUT complies with the requirement; it employs an integral antenna.<br>** This class II permissive change for software change to add additional frequencies at reduced power does not have any impact on the SAR parameters or highest measured SAR in the original filing. |                                                                                   |                     |

### 4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None.

#### ULTRATECH GROUP OF LABS

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File #: TEK-728F15C247-7545MBW

October 21, 2013

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## EXHIBIT 5. TEST DATA

### 5.1. OCCUPIED BANDWIDTH [§ 15.215(c)]

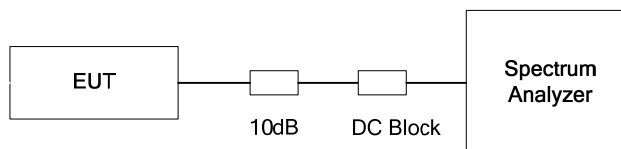
#### 5.1.1. Limit(s)

§ 15.215(c): Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

#### 5.1.2. Method of Measurements

ANSI C63.10-2009, Section 6.9.1

#### 5.1.3. Test Arrangement

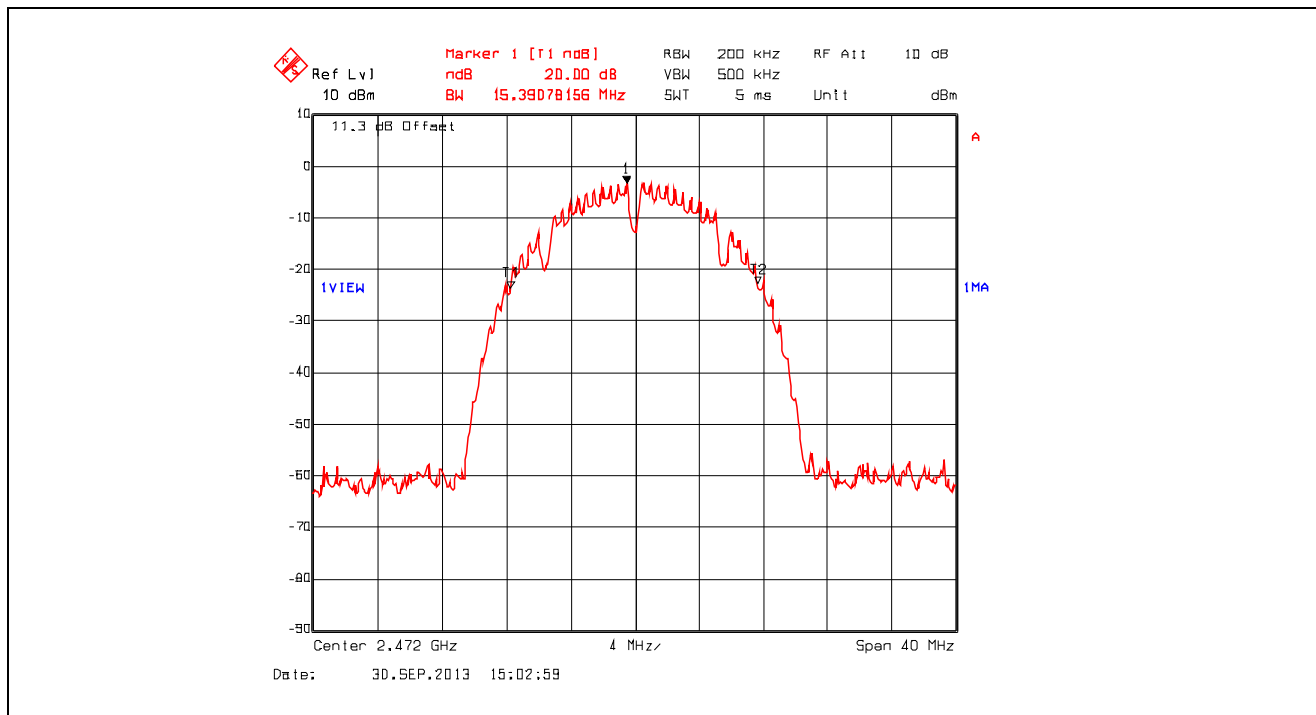


#### 5.1.4. Test Data

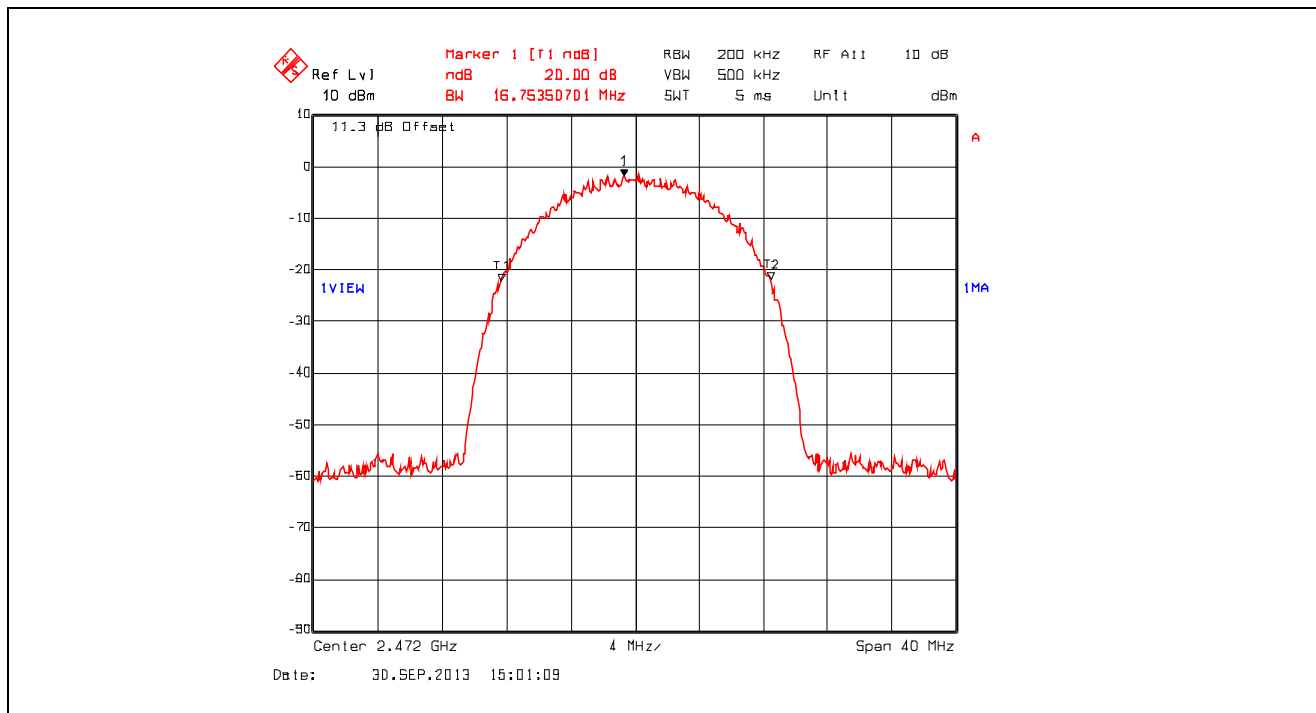
| Operating Mode | Data Rate (Mbps) | Frequency (MHz) | 20 dB Bandwidth (MHz) |
|----------------|------------------|-----------------|-----------------------|
| 802.11b        | 1                | 2472            | 15.39                 |
|                | 11               | 2472            | 16.75                 |
| 802.11g        | 6                | 2472            | 18.92                 |
|                | 54               | 2472            | 18.28                 |
| 802.11n        | 6.5              | 2472            | 19.72                 |
|                | 65               | 2472            | 19.23                 |

See the following plots for detailed measurements.

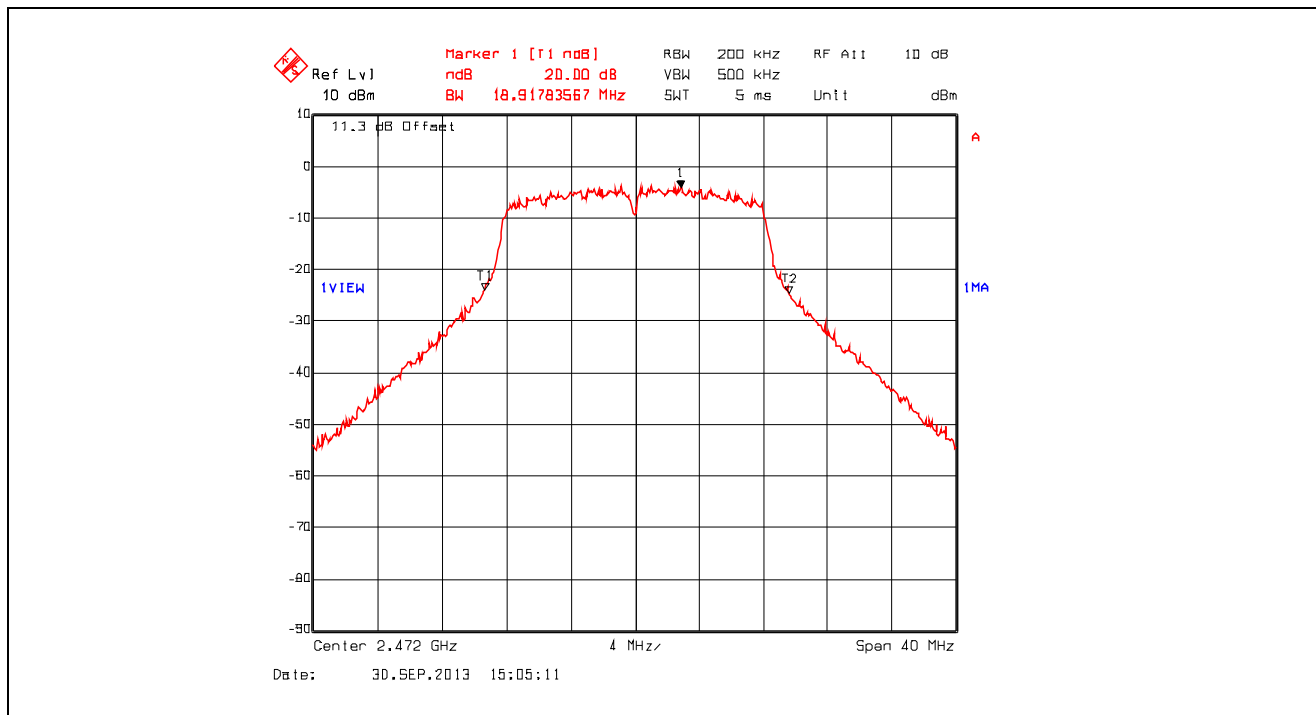
**Plot 5.1.4.1.** 20 dB Bandwidth, 802.11b, 1 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



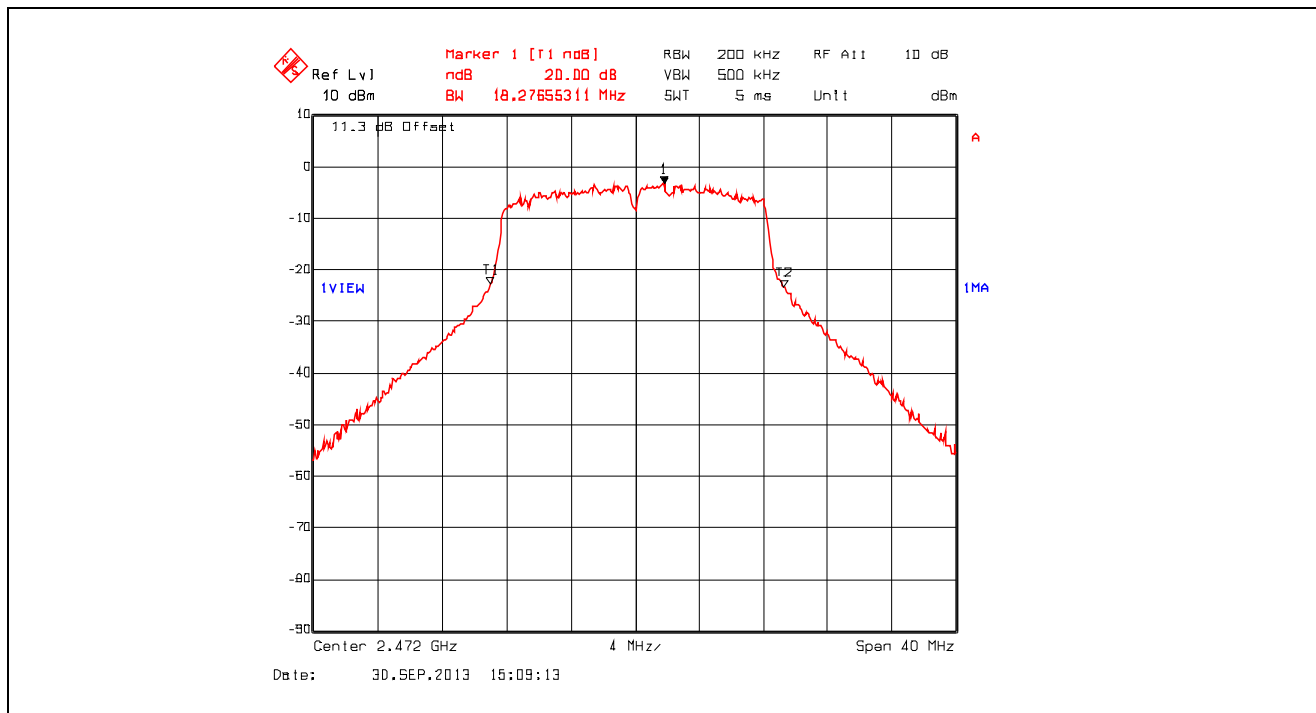
**Plot 5.1.4.2.** 20 dB Bandwidth, 802.11b, 11 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



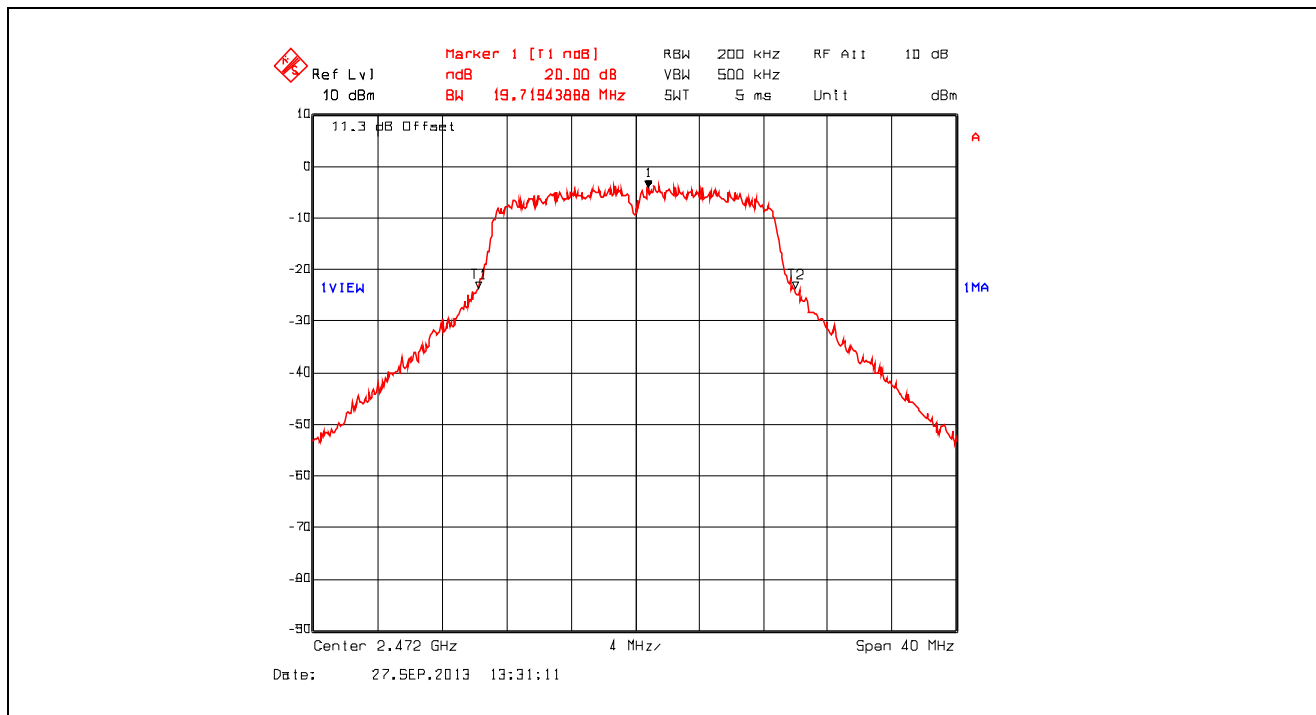
Plot 5.1.4.3. 20 dB Bandwidth, 802.11g, 6 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



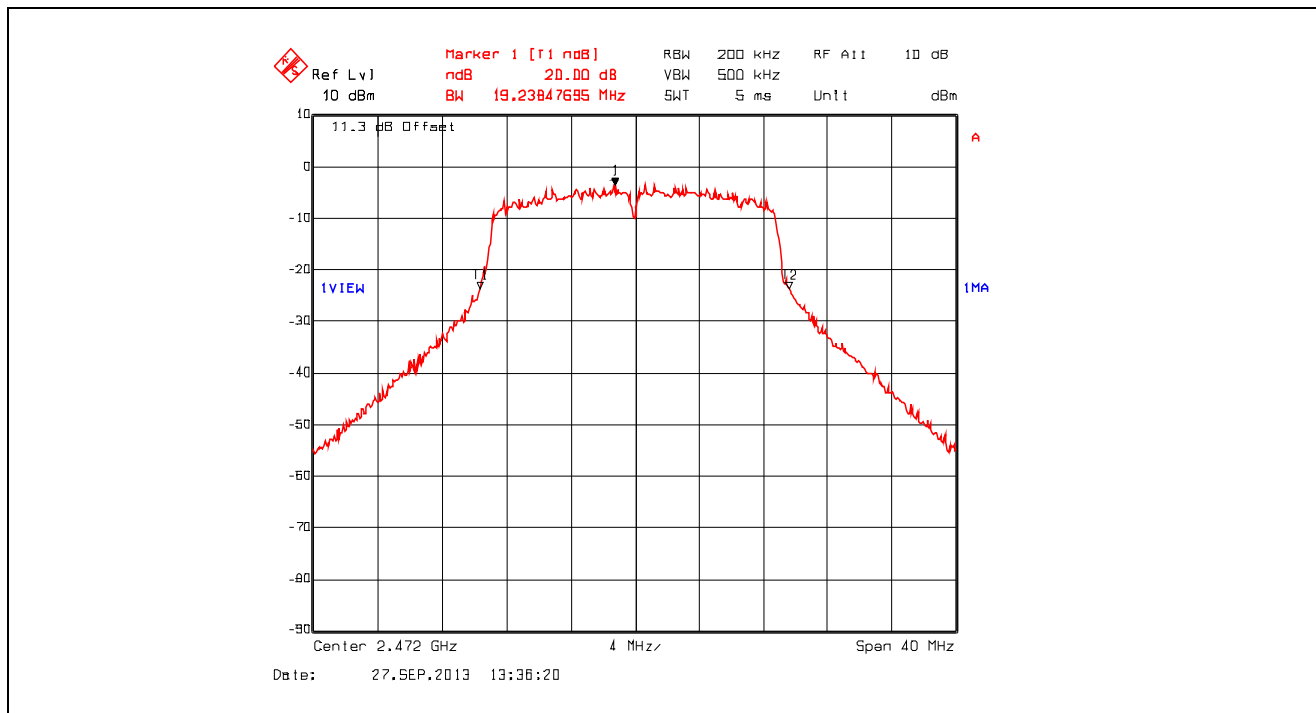
Plot 5.1.4.4. 20 dB Bandwidth, 802.11g, 54 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



Plot 5.1.4.5. 20 dB Bandwidth, 802.11n, 6.5 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



Plot 5.1.4.6. 20 dB Bandwidth, 802.11n, 65 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



## 5.2. PEAK CONDUCTED OUTPUT POWER - DTS [§ 15.247(b)(3)]

### 5.2.1. Limit(s)

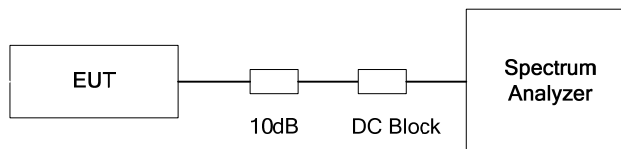
**§ 15.247(b)(3):** For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output 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.

**§15.247(b)(4):** The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 5.2.2. Method of Measurements & Test Arrangement

KDB Publication No. 558074 D01 v03r01 Section 9.1.2 Integrated band power method

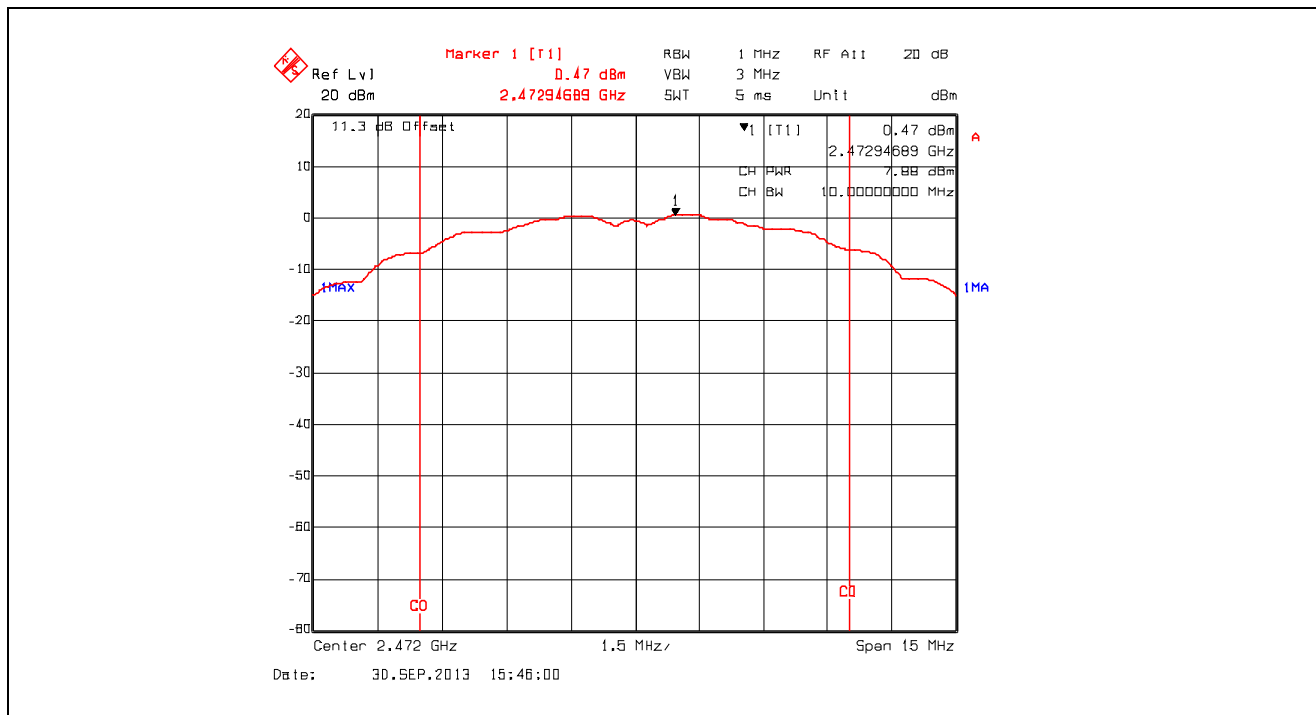
### 5.2.3. Test Arrangement



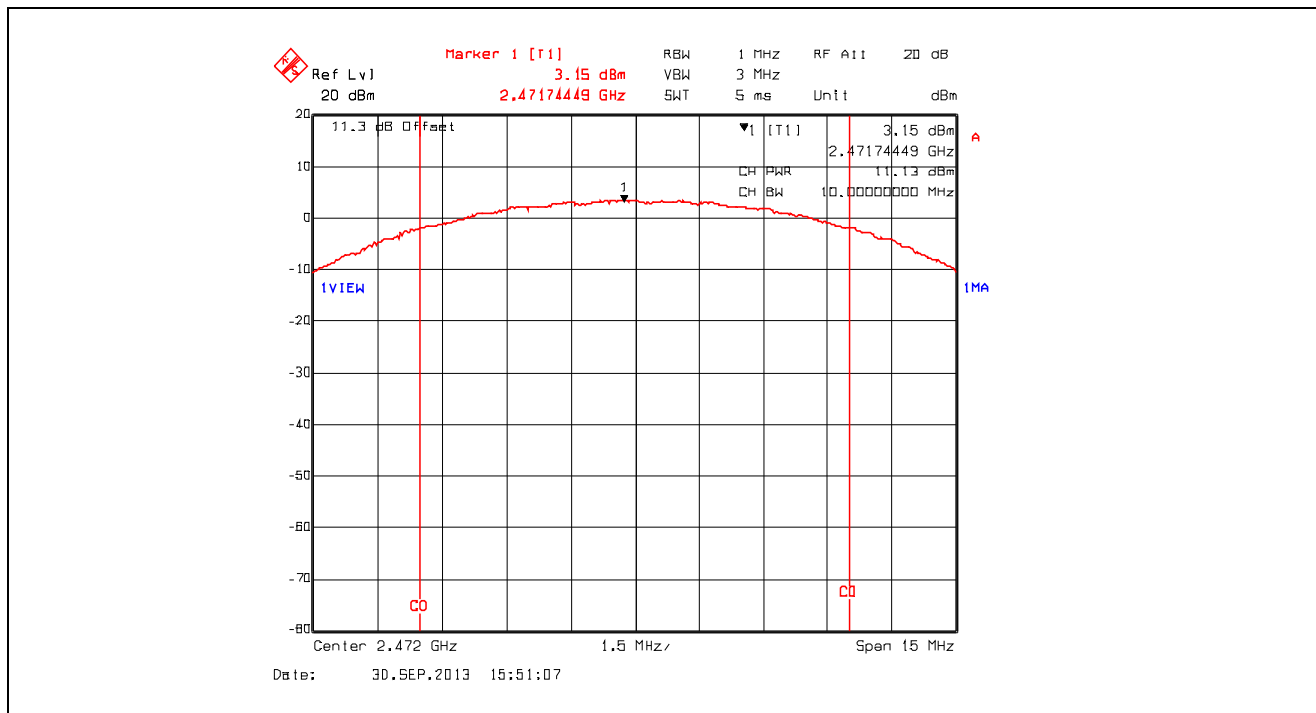
### 5.2.4. Test Data

| Power Setting (dBm) | Operating Mode | Modulation   | Data Rate (Mbps) | Frequency (MHz) | Max.Peak Conducted Power (dBm) |
|---------------------|----------------|--------------|------------------|-----------------|--------------------------------|
| 5                   | 802.11b        | DBPSK        | 1                | 2472            | 7.88                           |
|                     |                | CCK          | 11               | 2472            | 11.13                          |
|                     | 802.11g        | BPSK         | 6                | 2472            | 13.76                          |
|                     |                | 64QAM        | 54               | 2472            | 13.73                          |
|                     | 802.11n        | (MCS0) BPSK  | 6.5              | 2472            | 13.58                          |
|                     |                | (MCS7) 64QAM | 65               | 2472            | 13.77                          |

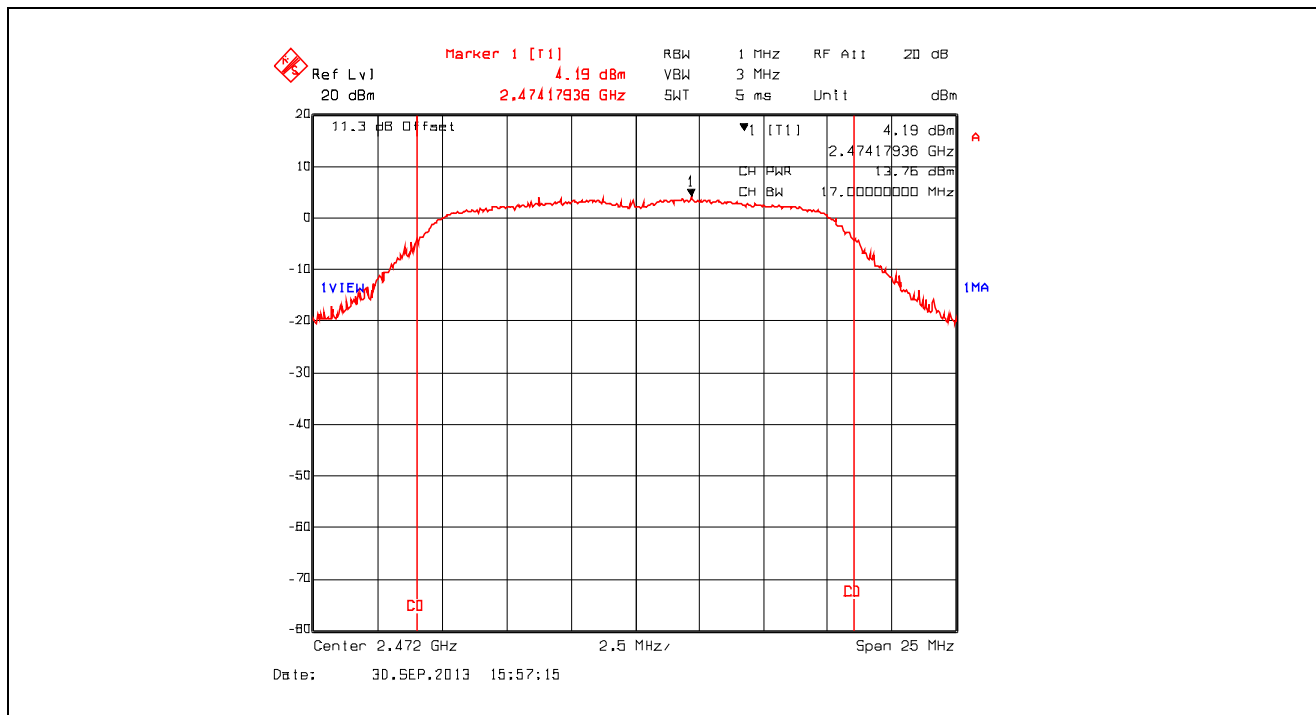
Plot 5.2.4.1. Peak Conducted Power, 802.11b, 1 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



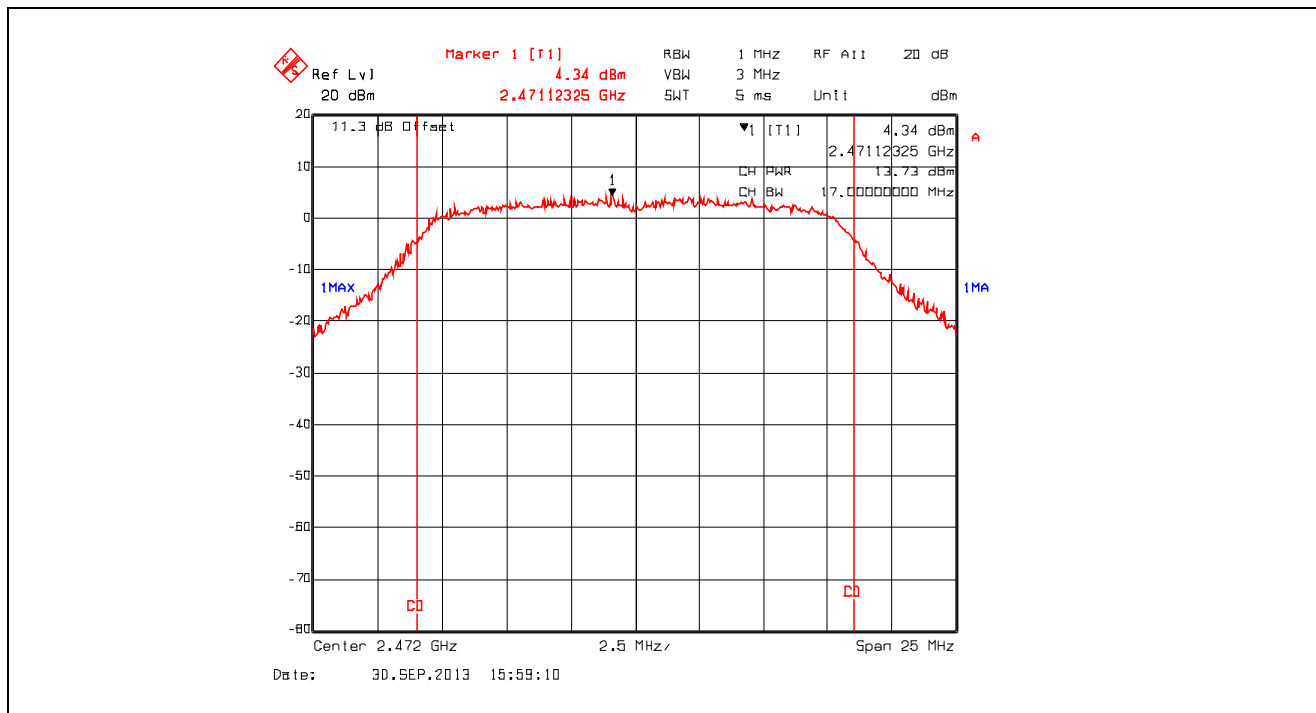
Plot 5.2.4.2. Peak Conducted Power, 802.11b, 11 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



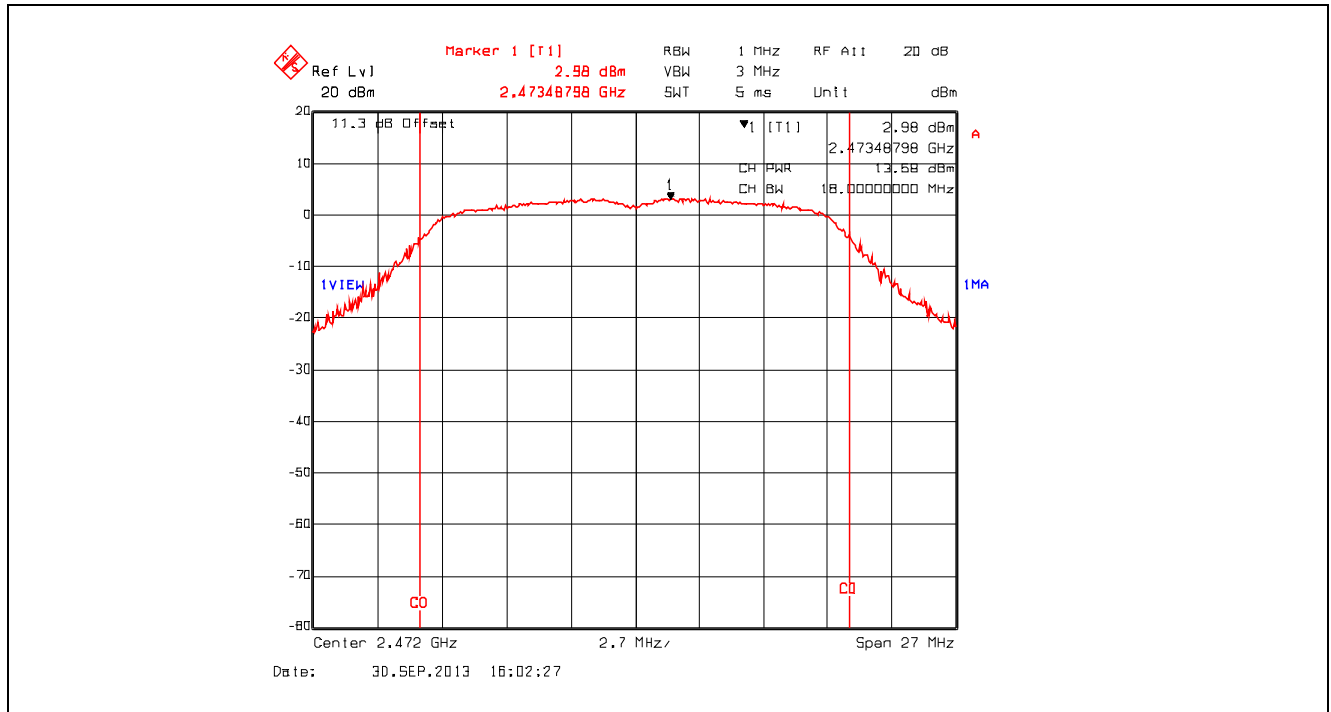
Plot 5.2.4.3. Peak Conducted Power, 802.11g, 6 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



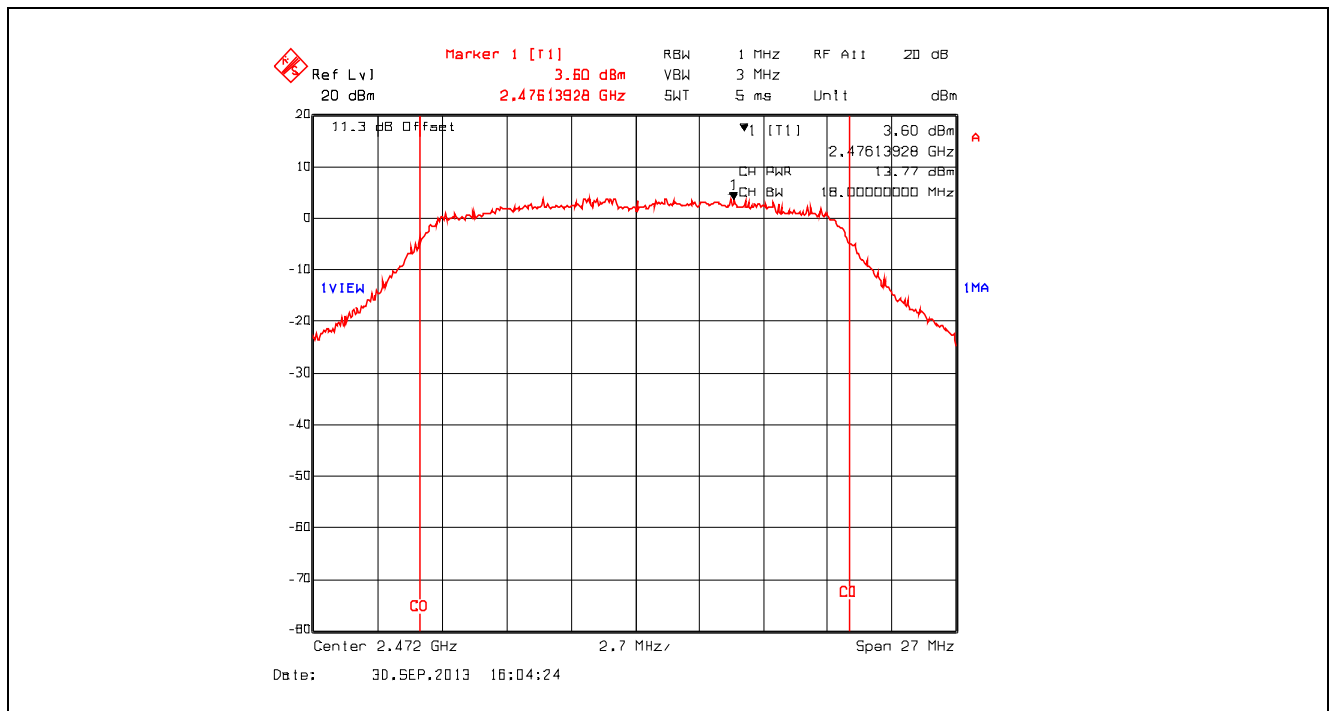
Plot 5.2.4.4. Peak Conducted Power, 802.11g, 54 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



Plot 5.2.4.5. Peak Conducted Power, 802.11n, 6.5 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



Plot 5.2.4.6. Peak Conducted Power, 802.11n, 65 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



### 5.3. TRANSMITTER BAND-EDGE & SPURIOUS CONDUCTED EMISSIONS [§ 15.247(d)]

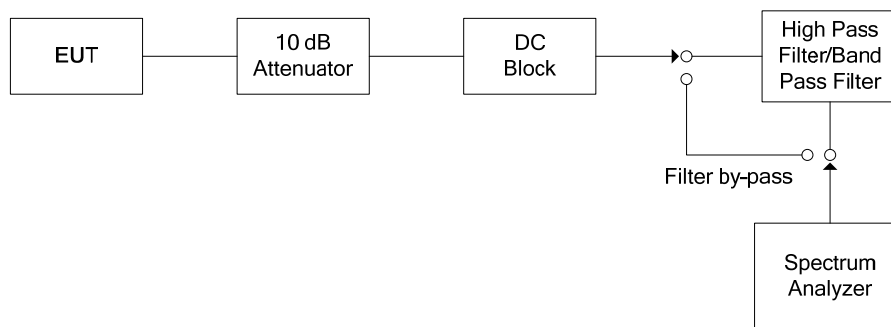
#### 5.3.1. Limit(s)

**§ 15.247 (d):** In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

#### 5.3.2. Method of Measurements

KDB Publication No. 558074 D01, Sections 11.0 Emissions in non-restricted frequency bands, 12.0 Emissions in restricted frequency bands and 13.0 Band-edge measurements

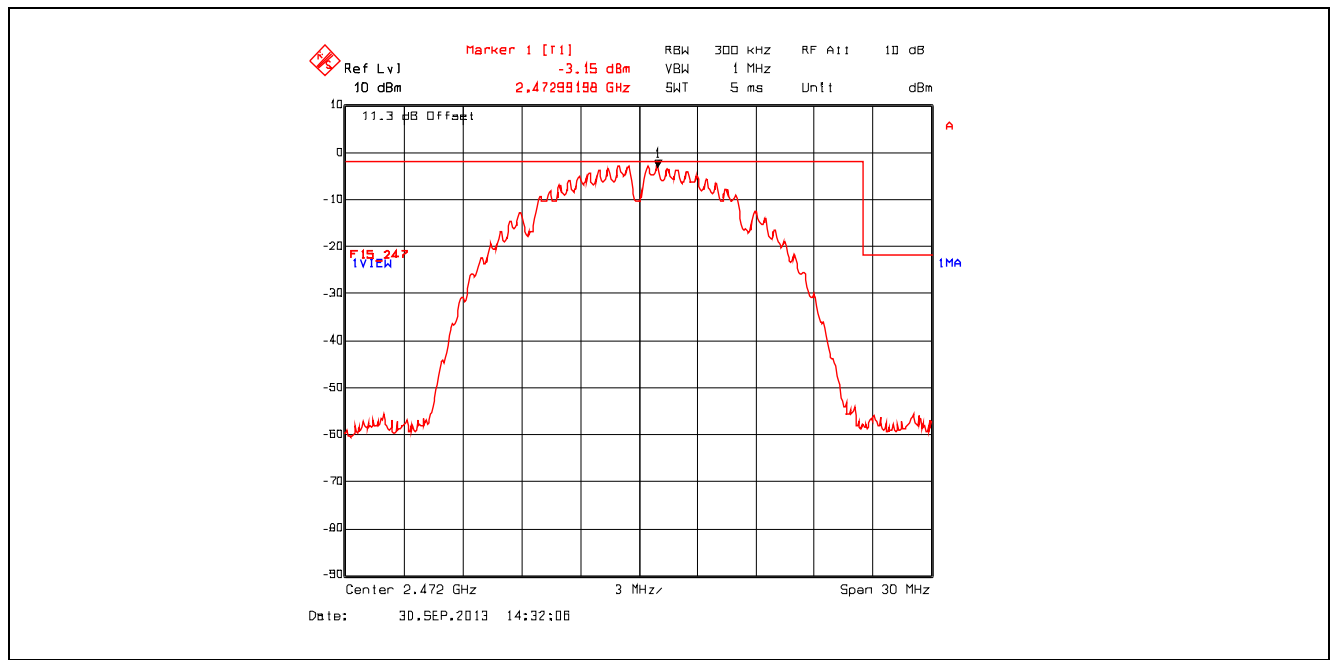
#### 5.3.3. Test Arrangement



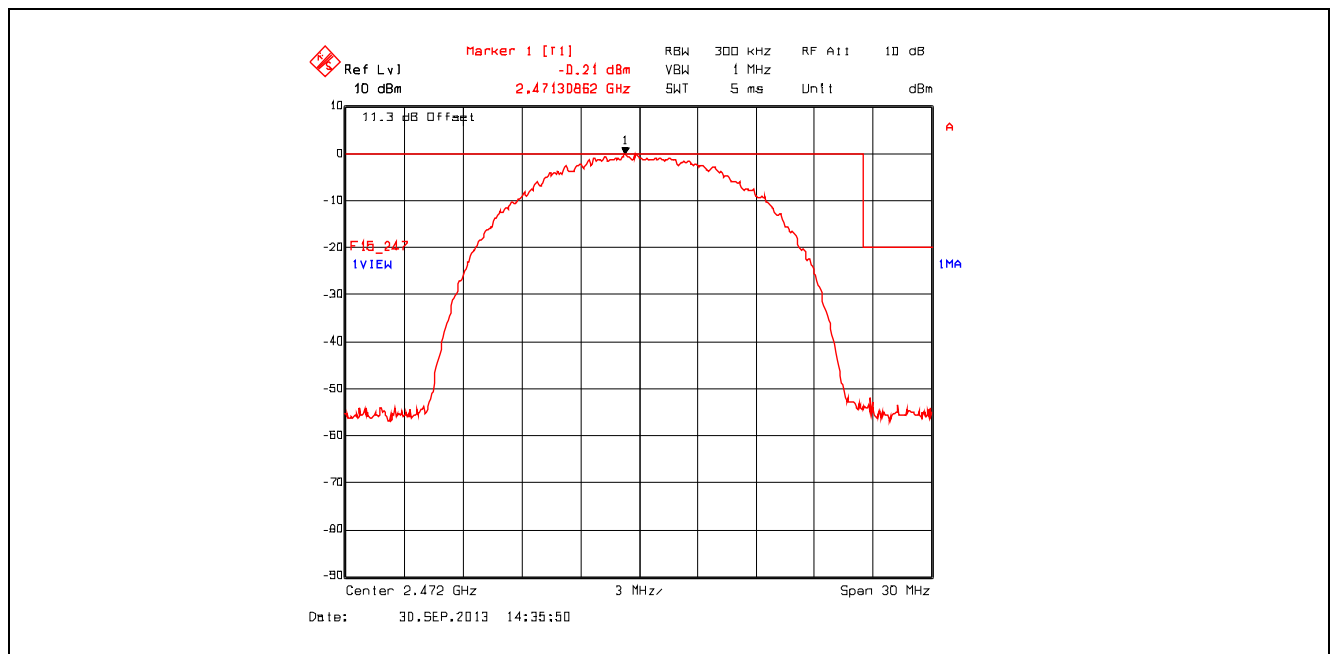
### 5.3.4. Test Data

#### 5.3.4.1. Band-Edge RF Conducted Emissions

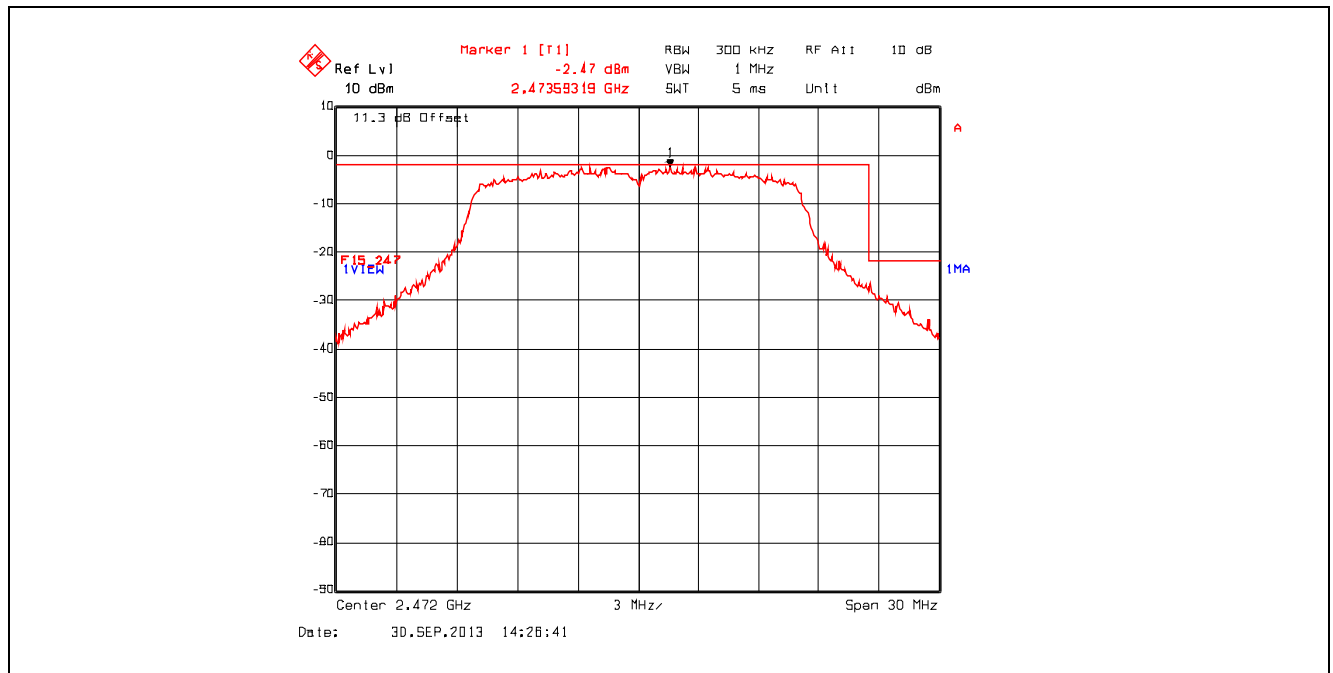
**Plot 5.3.4.1.1.** Band-Edge RF Conducted Emissions, High End of Frequency Band  
802.11b, 1 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



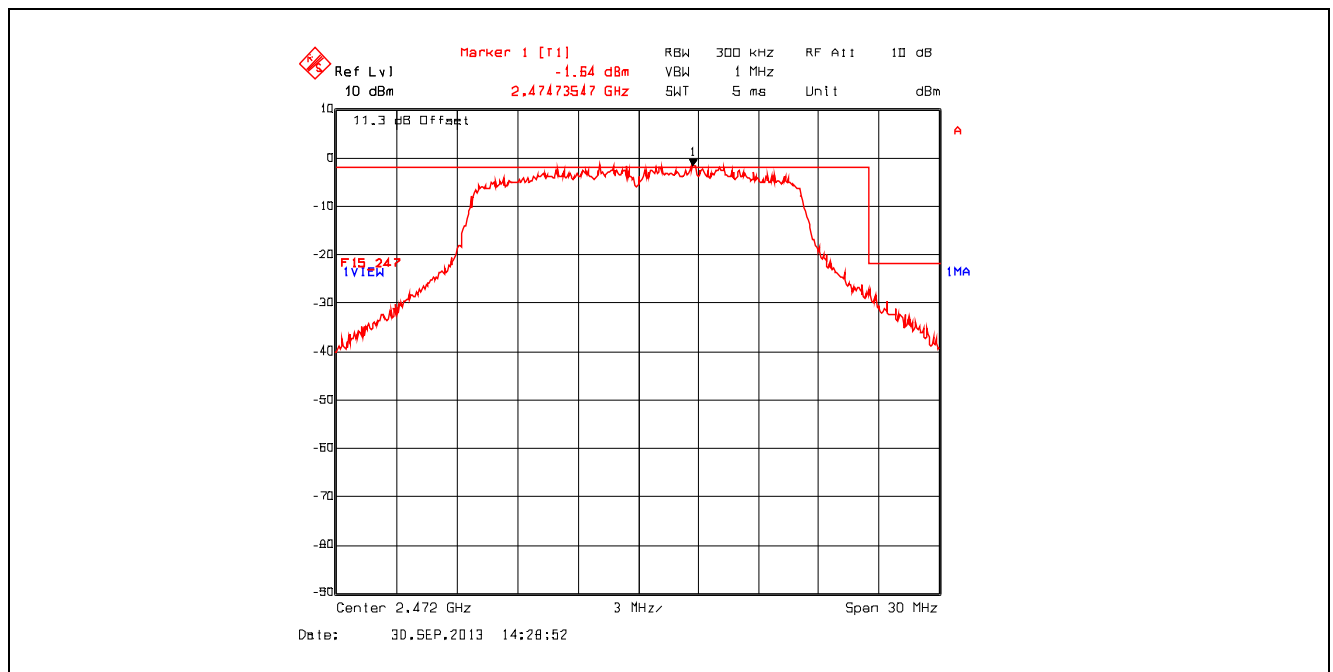
**Plot 5.3.4.1.2.** Band-Edge RF Conducted Emissions, High End of Frequency Band  
802.11b, 11 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



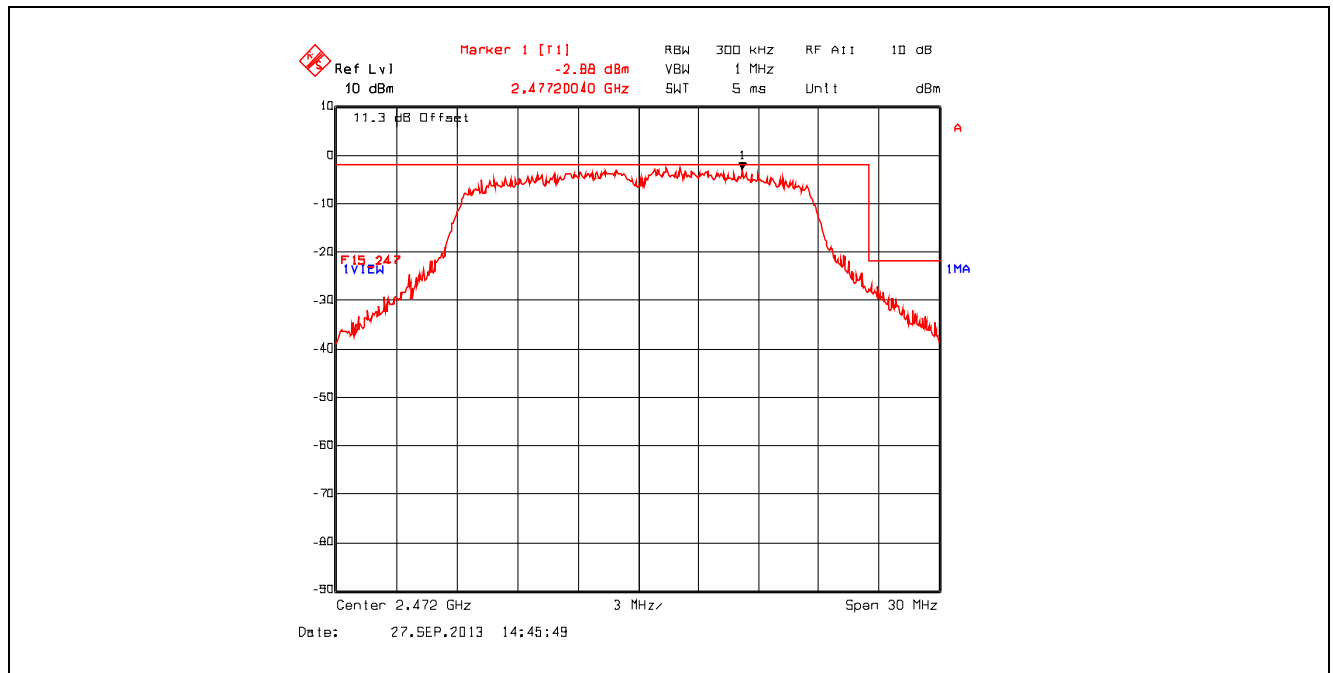
**Plot 5.3.4.1.3.** Band-Edge RF Conducted Emissions, High End of Frequency Band  
802.11g, 6 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



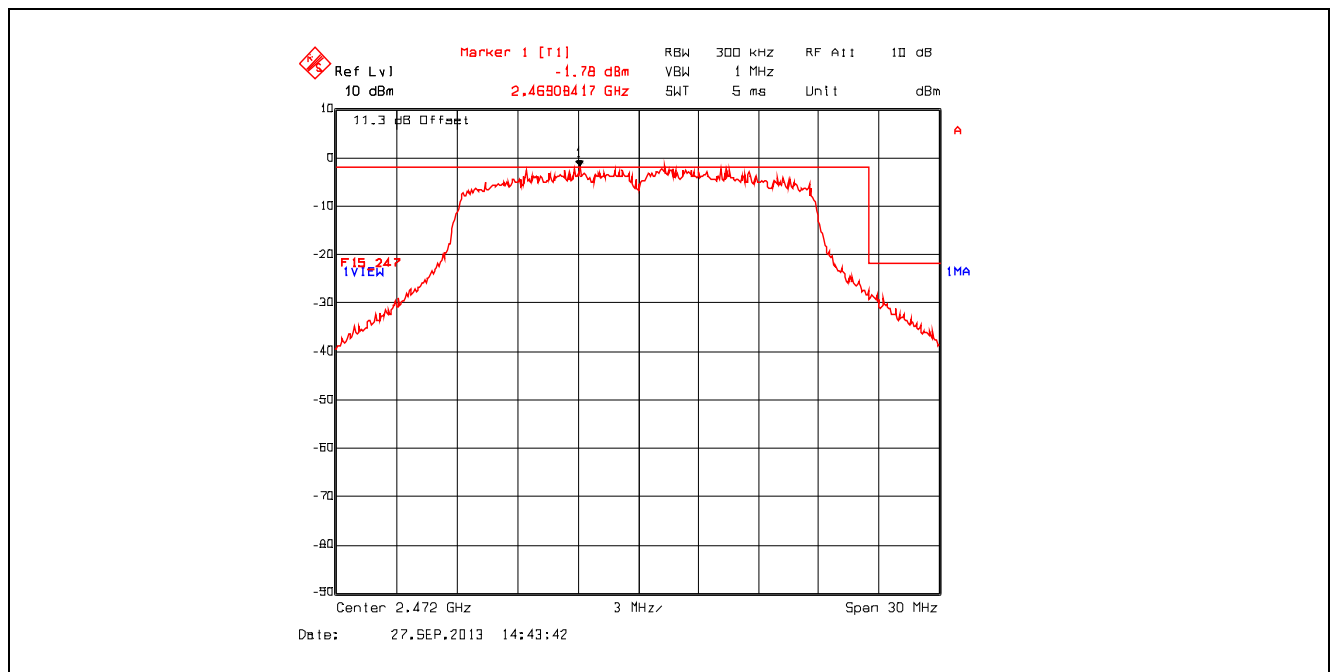
**Plot 5.3.4.1.4.** Band-Edge RF Conducted Emissions, High End of Frequency Band  
802.11g, 54 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting



**Plot 5.3.4.1.5.** Band-Edge RF Conducted Emissions, High End of Frequency Band  
802.11n, 6.5 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting

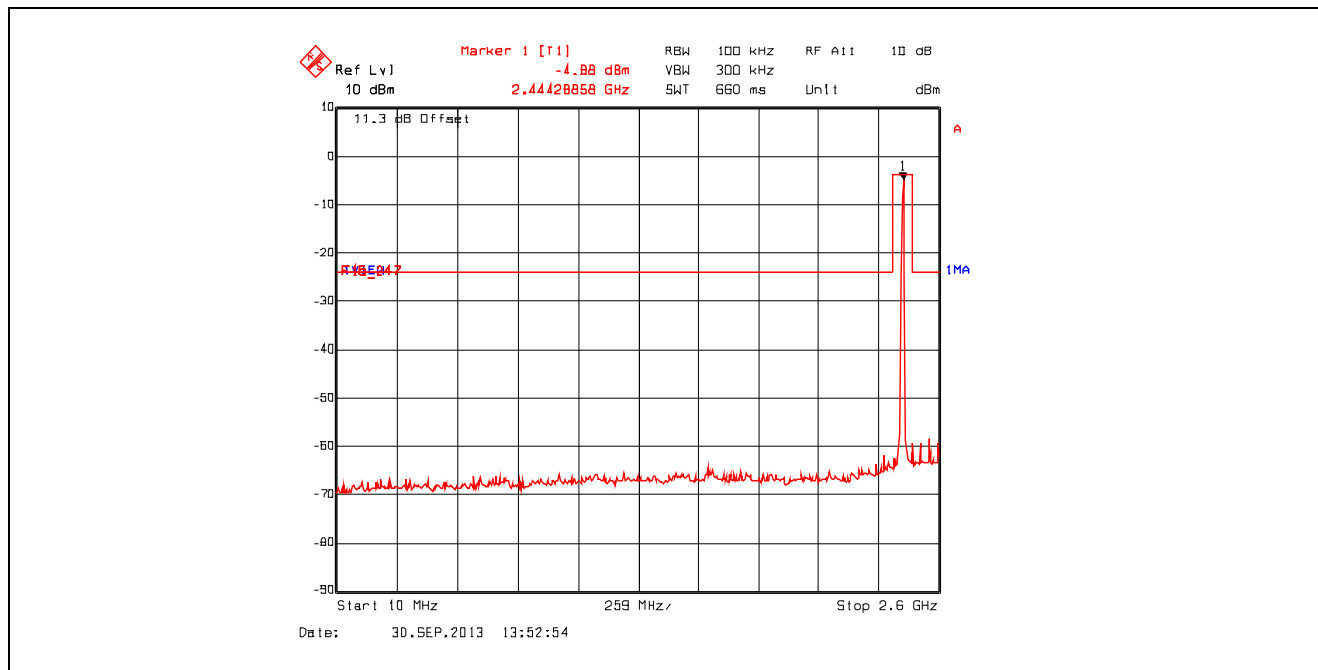


**Plot 5.3.4.1.6.** Band-Edge RF Conducted Emissions, High End of Frequency Band  
802.11n, 6.5 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting

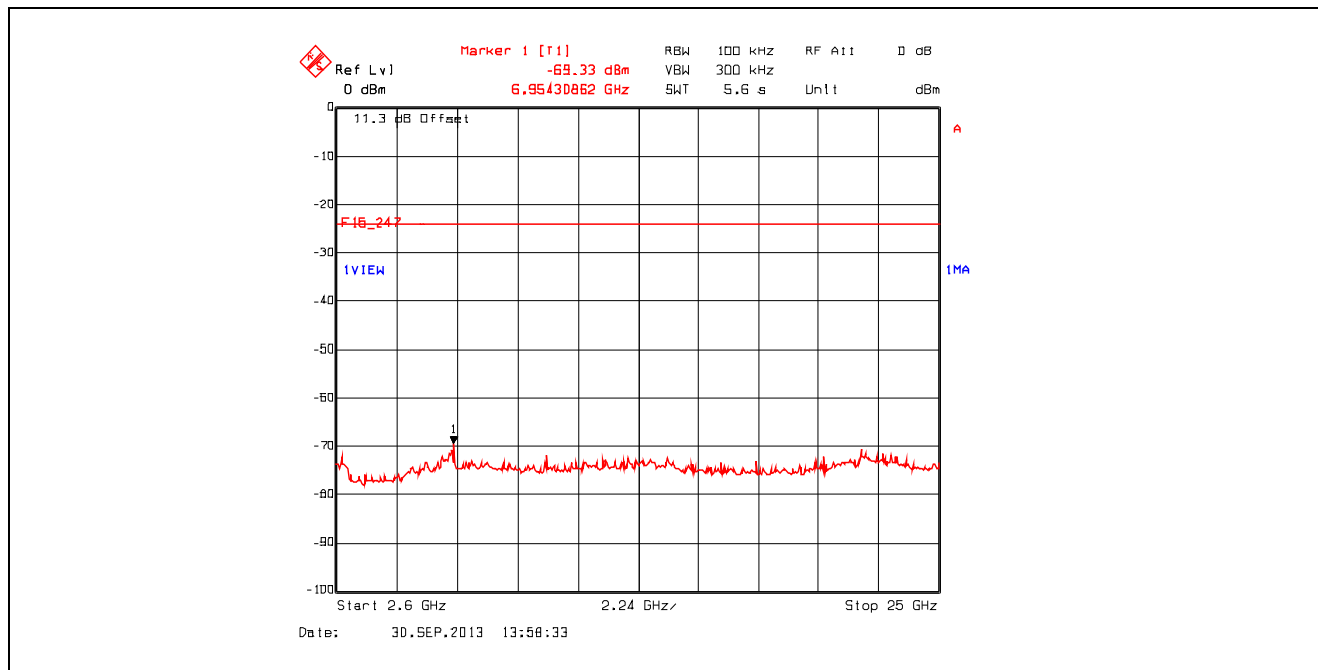


### 5.3.4.2. Conducted Spurious Emissions – Non Restricted Frequency Bands

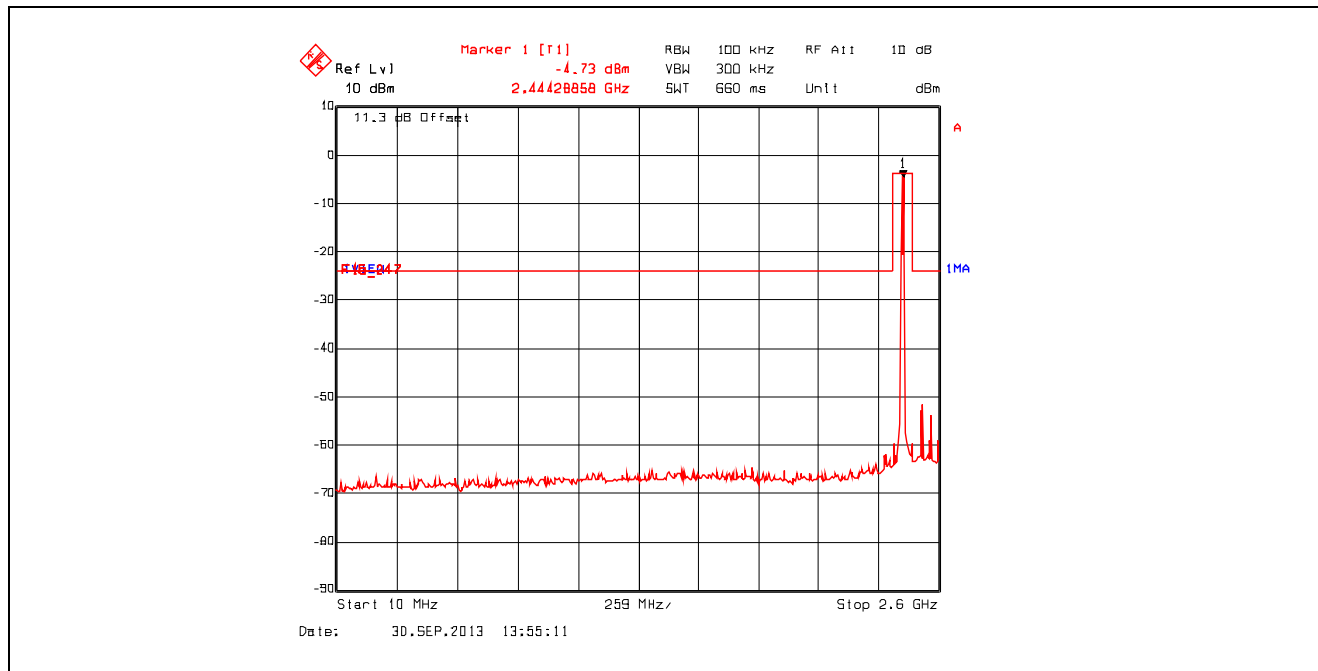
**Plot 5.3.4.2.1.** Conducted Spurious Emissions – Non Restricted Frequency Bands  
802.11b, 1 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 10 MHz – 2.6 GHz



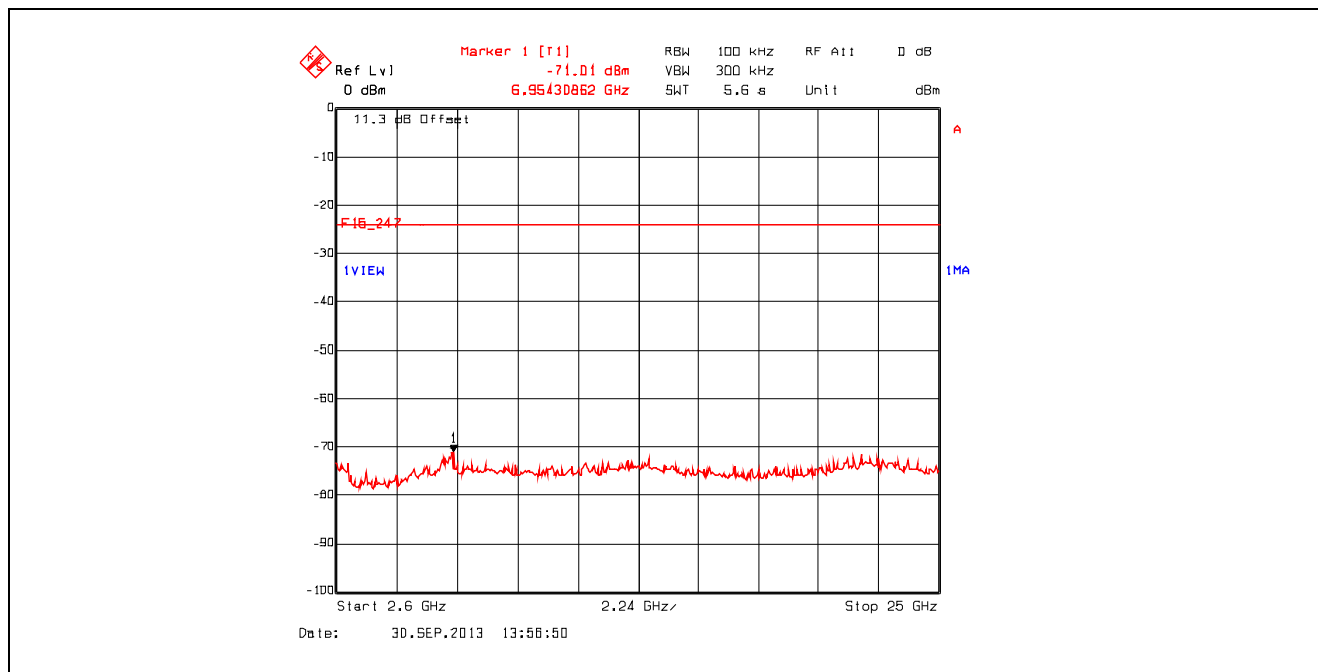
**Plot 5.3.4.2.2.** Conducted Spurious Emissions – Non Restricted Frequency Bands  
802.11b, 1 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 2.6 GHz – 25 GHz



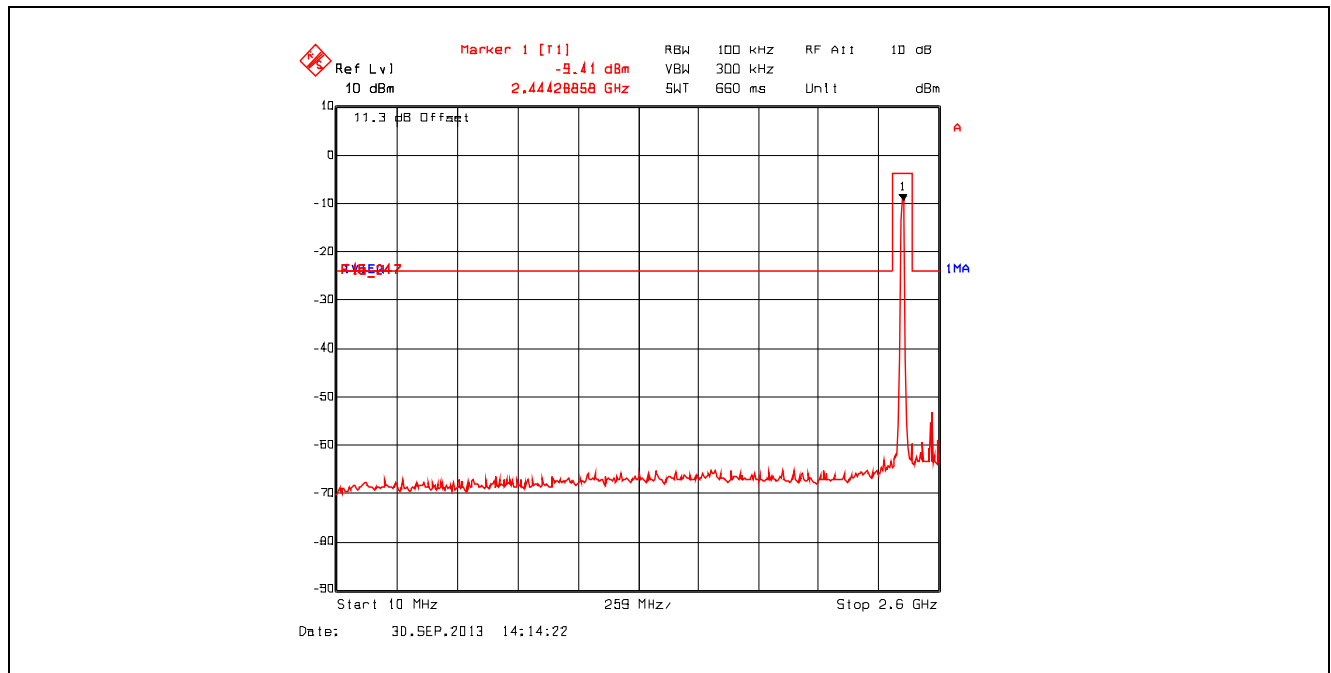
**Plot 5.3.4.2.3.** Conducted Spurious Emissions – Non Restricted Frequency Bands  
802.11b, 11 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 10 MHz – 2.6 GHz



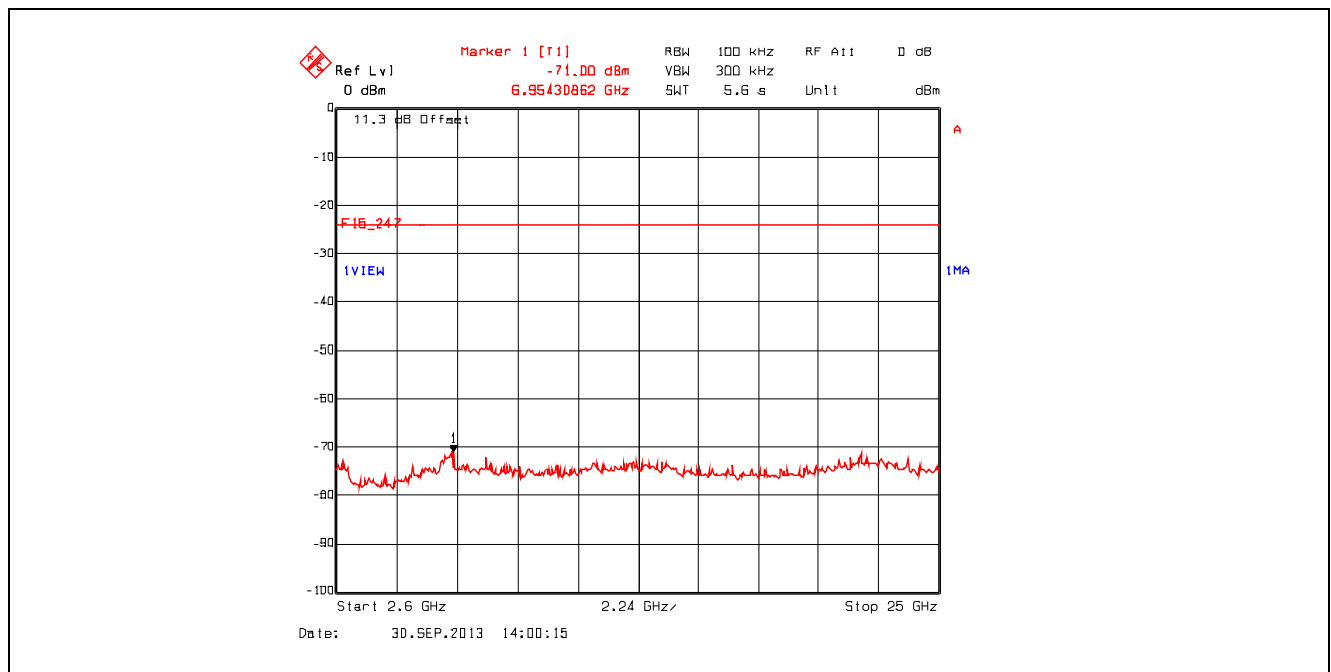
**Plot 5.3.4.2.4.** Conducted Spurious Emissions – Non Restricted Frequency Bands  
802.11b, 11 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 2.6 GHz – 25 GHz



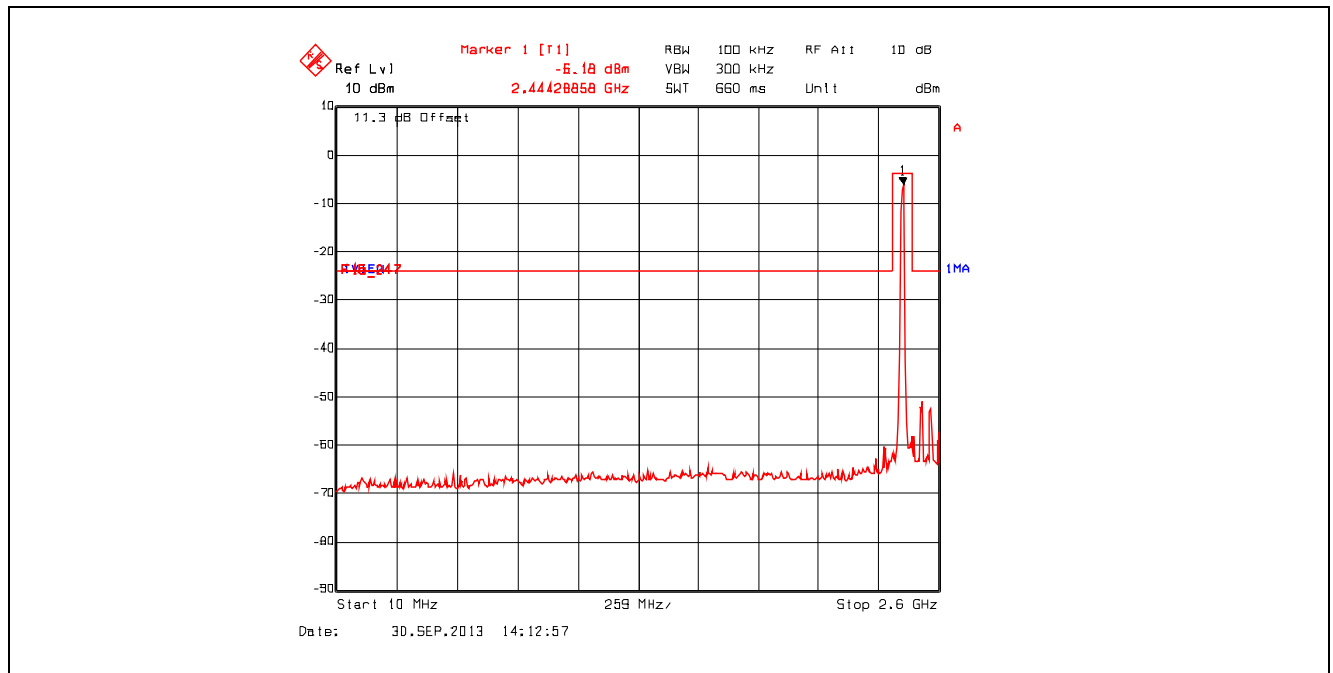
**Plot 5.3.4.2.5. Conducted Spurious Emissions – Non Restricted Frequency Bands**  
802.11g, 6 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 10 MHz – 2.6 GHz



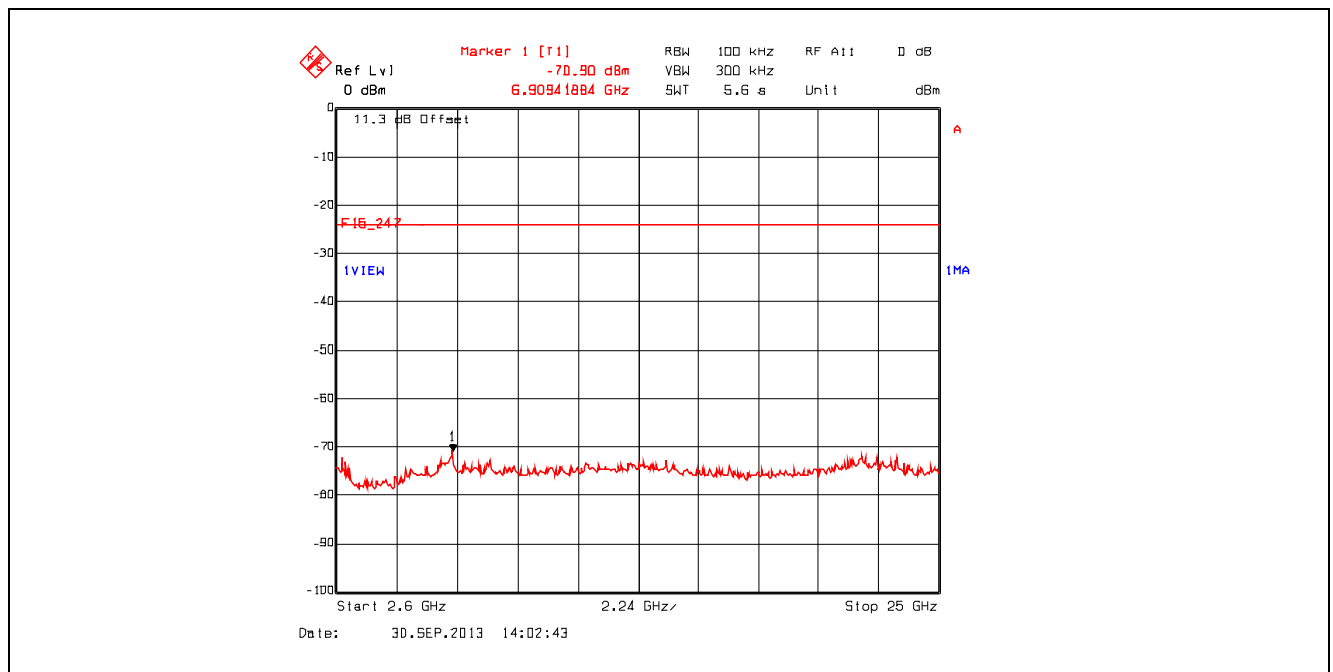
**Plot 5.3.4.2.6. Conducted Spurious Emissions – Non Restricted Frequency Bands**  
802.11g, 6 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 2.6 GHz – 25 GHz



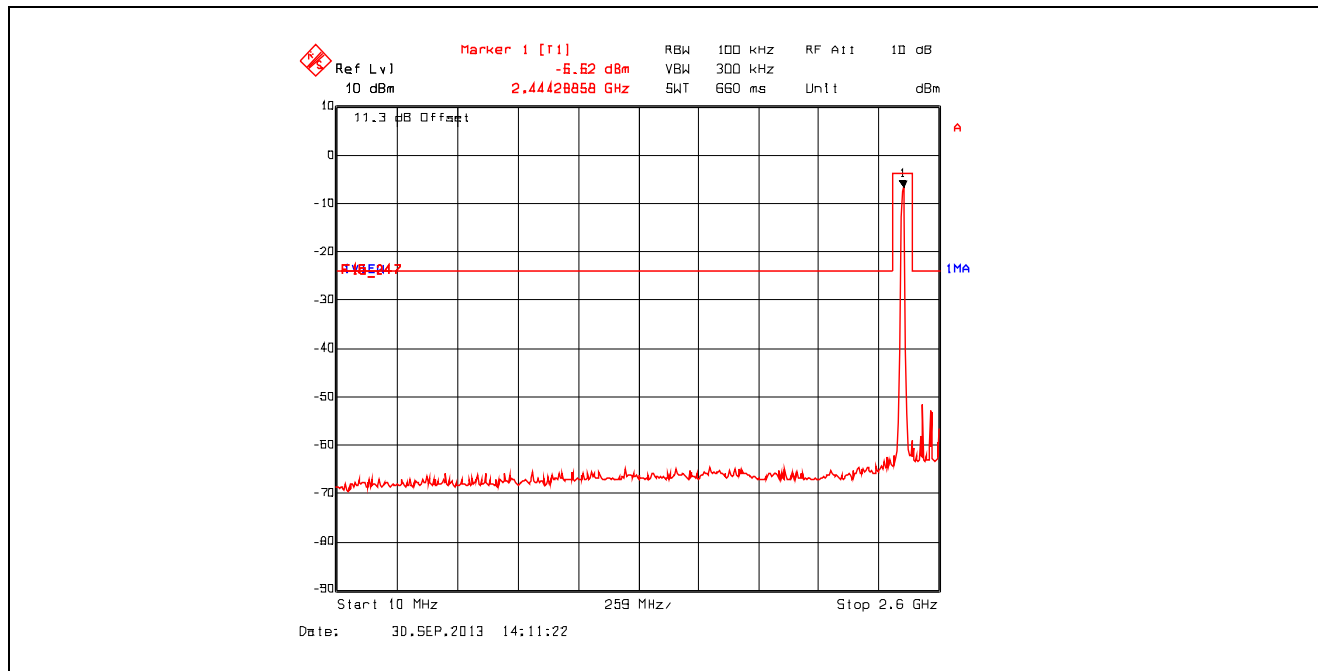
**Plot 5.3.4.2.7. Conducted Spurious Emissions – Non Restricted Frequency Bands**  
802.11g, 54 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 10 MHz – 2.6 GHz



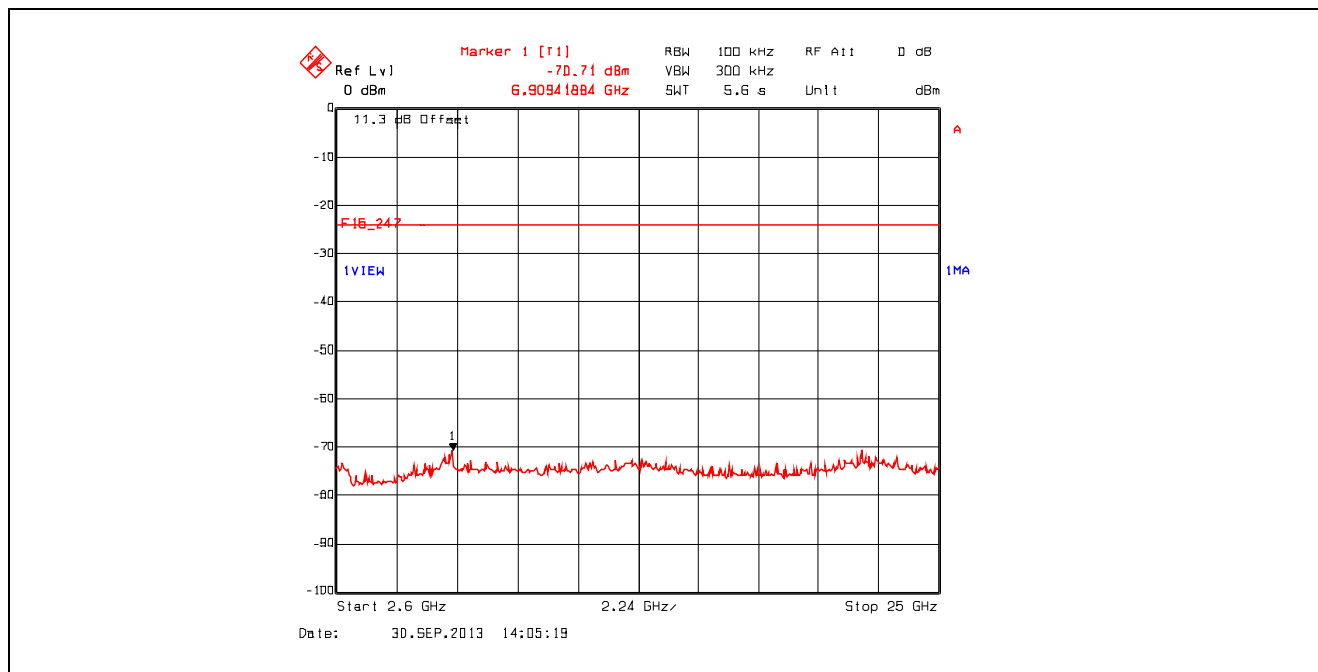
**Plot 5.3.4.2.8. Conducted Spurious Emissions – Non Restricted Frequency Bands**  
802.11g, 54 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 2.6 GHz – 25 GHz



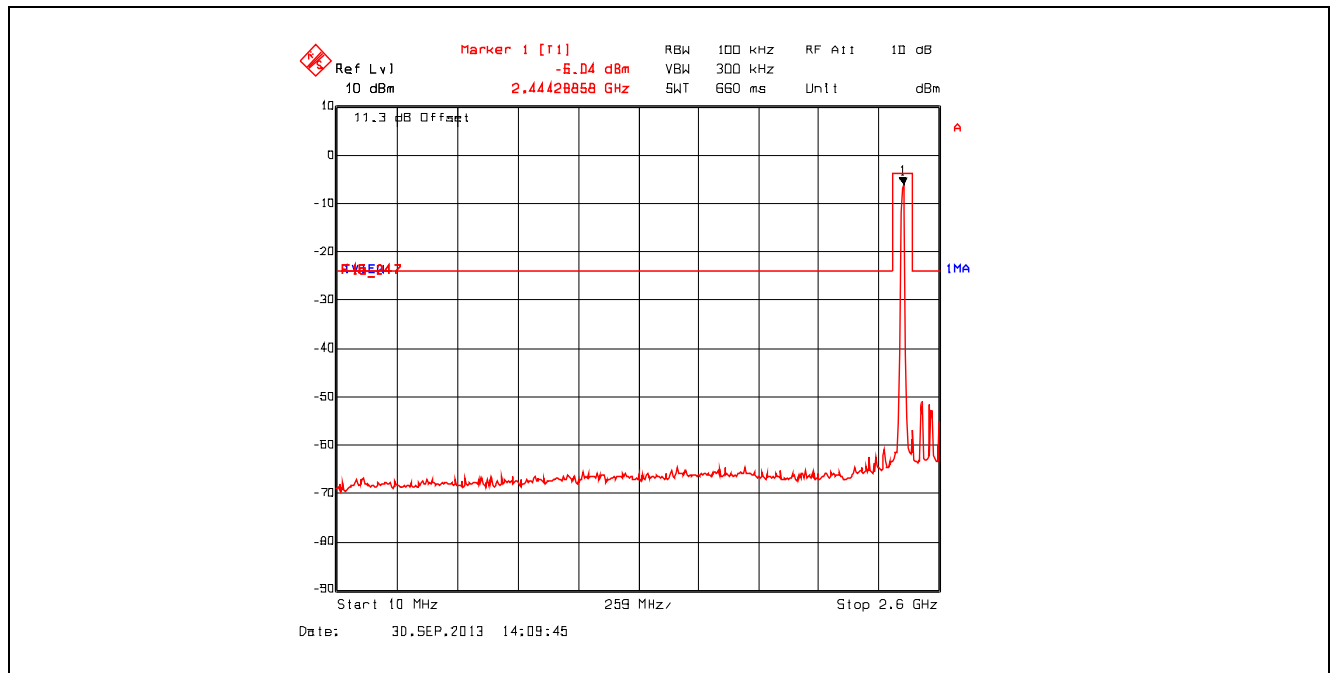
**Plot 5.3.4.2.9.** Conducted Spurious Emissions – Non Restricted Frequency Bands  
802.11n, 6.5 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 10 MHz – 2.6 GHz



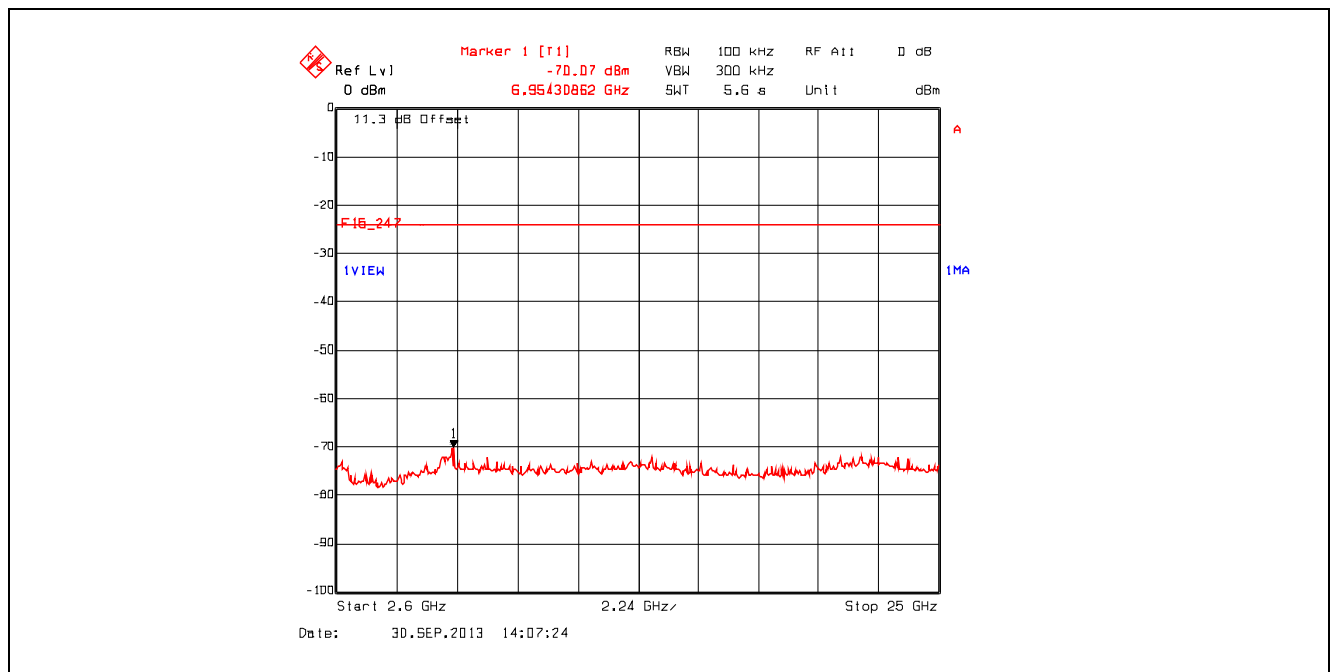
**Plot 5.3.4.2.10.** Conducted Spurious Emissions – Non Restricted Frequency Bands  
802.11n, 6.5 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 2.6 GHz – 25 GHz



**Plot 5.3.4.2.11.** Conducted Spurious Emissions – Non Restricted Frequency Bands  
802.11n, 65 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 10 MHz – 2.6 GHz



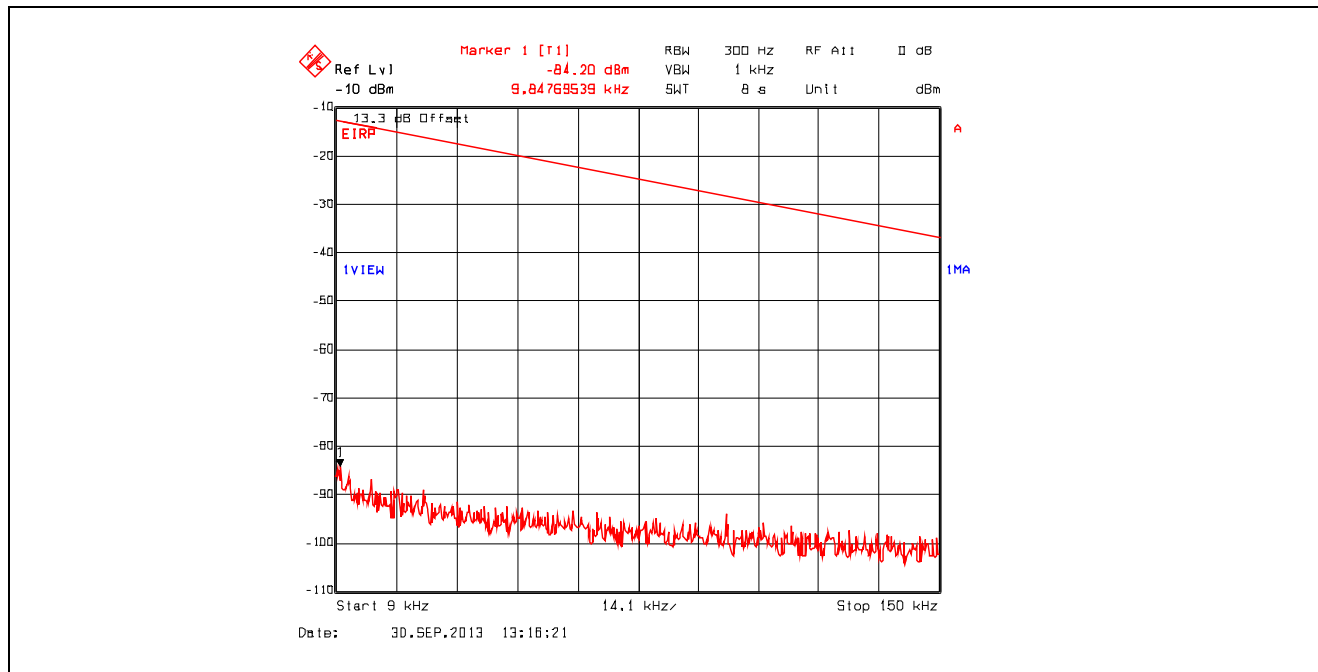
**Plot 5.3.4.2.12.** Conducted Spurious Emissions – Non Restricted Frequency Bands  
802.11n, 65 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 2.6 GHz – 25 GHz



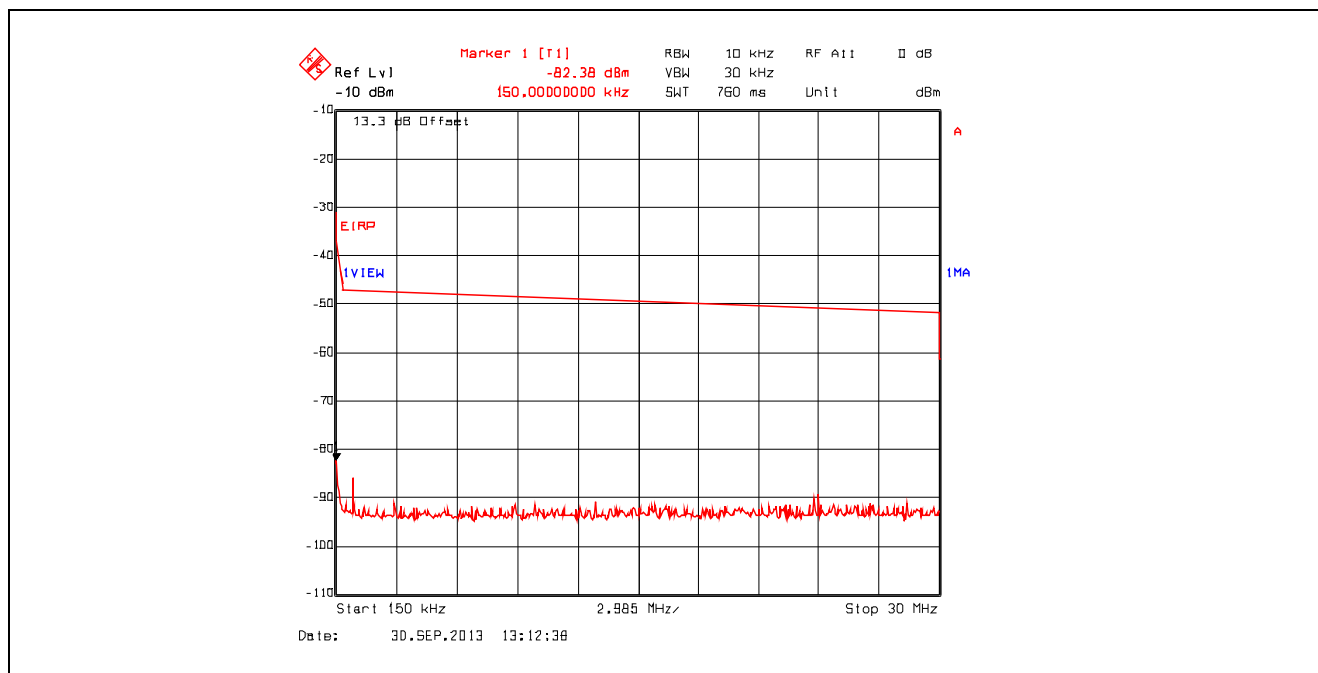
### 5.3.4.3. Conducted Spurious Emissions – Restricted Bands

Remark: Offset = Insertion Loss (11.3 dB) + Antenna Gain (2 dBi worst case) = 13.3 dB

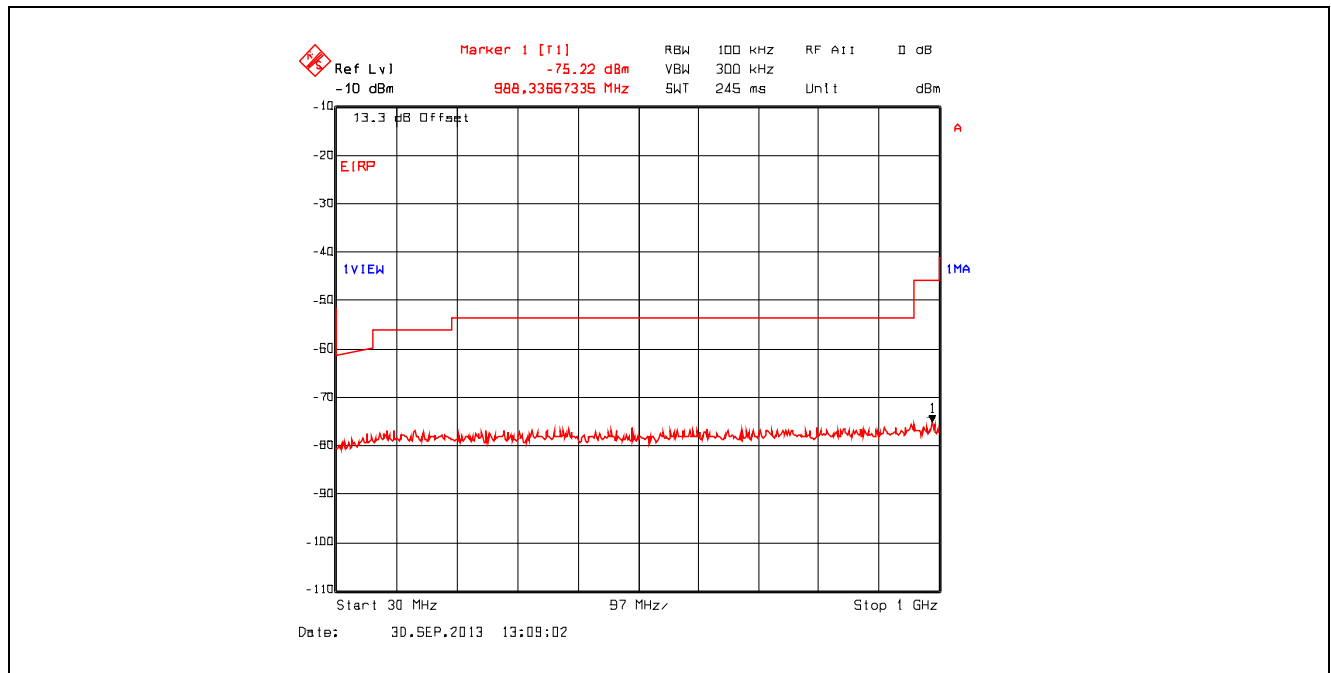
**Plot 5.3.4.3.1.** Conducted Spurious Emissions – Restricted Bands  
802.11b, 1 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 9 kHz - 150 kHz, Peak Detector



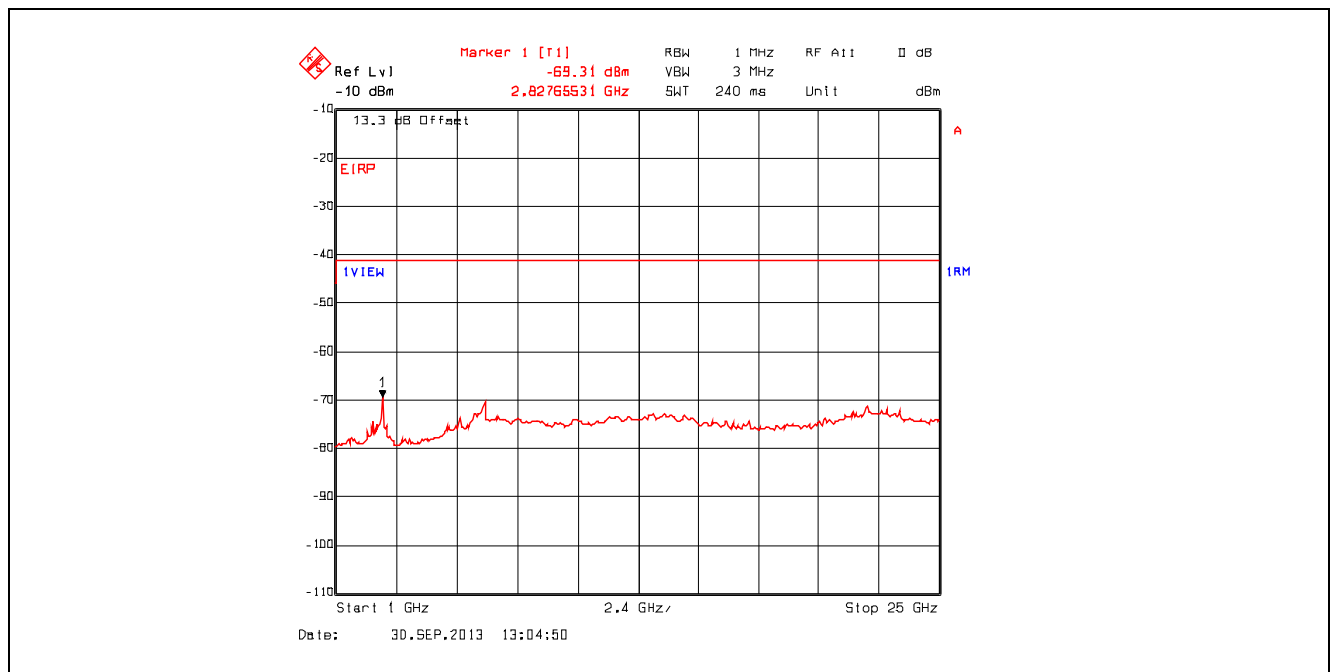
**Plot 5.3.4.3.2.** Conducted Spurious Emissions – Restricted Bands  
802.11b, 1 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 150 kHz - 30 MHz, Peak Detector



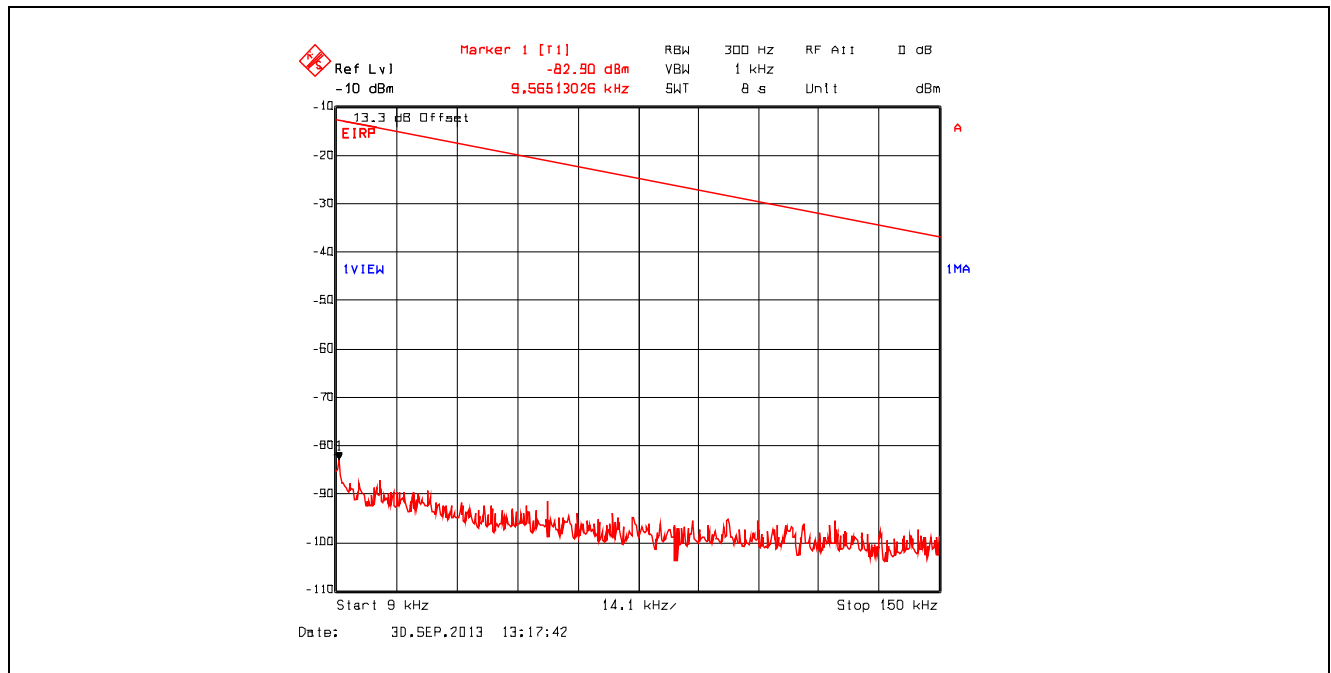
**Plot 5.3.4.3.3. Conducted Spurious Emissions – Restricted Bands**  
802.11b, 1 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 30 MHz - 1 GHz, Peak Detector



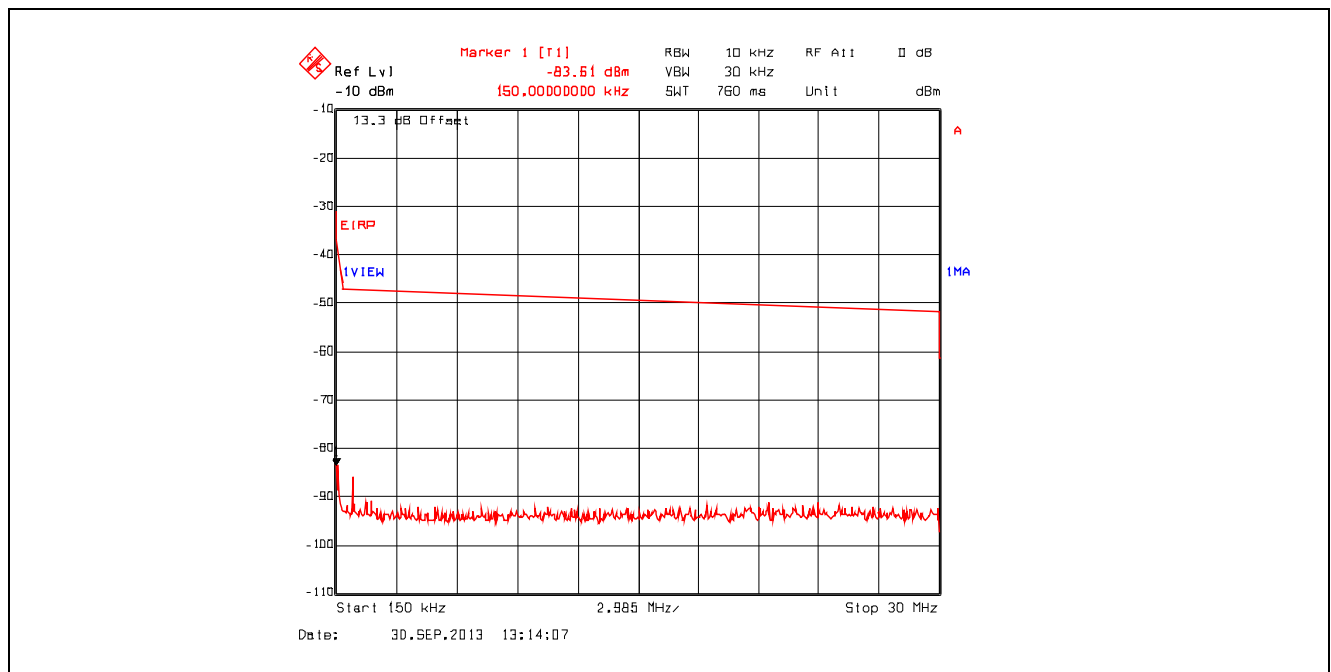
**Plot 5.3.4.3.4. Conducted Spurious Emissions – Restricted Bands**  
802.11b, 1 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 1 GHz - 25 GHz, Power Average (RMS) Detector



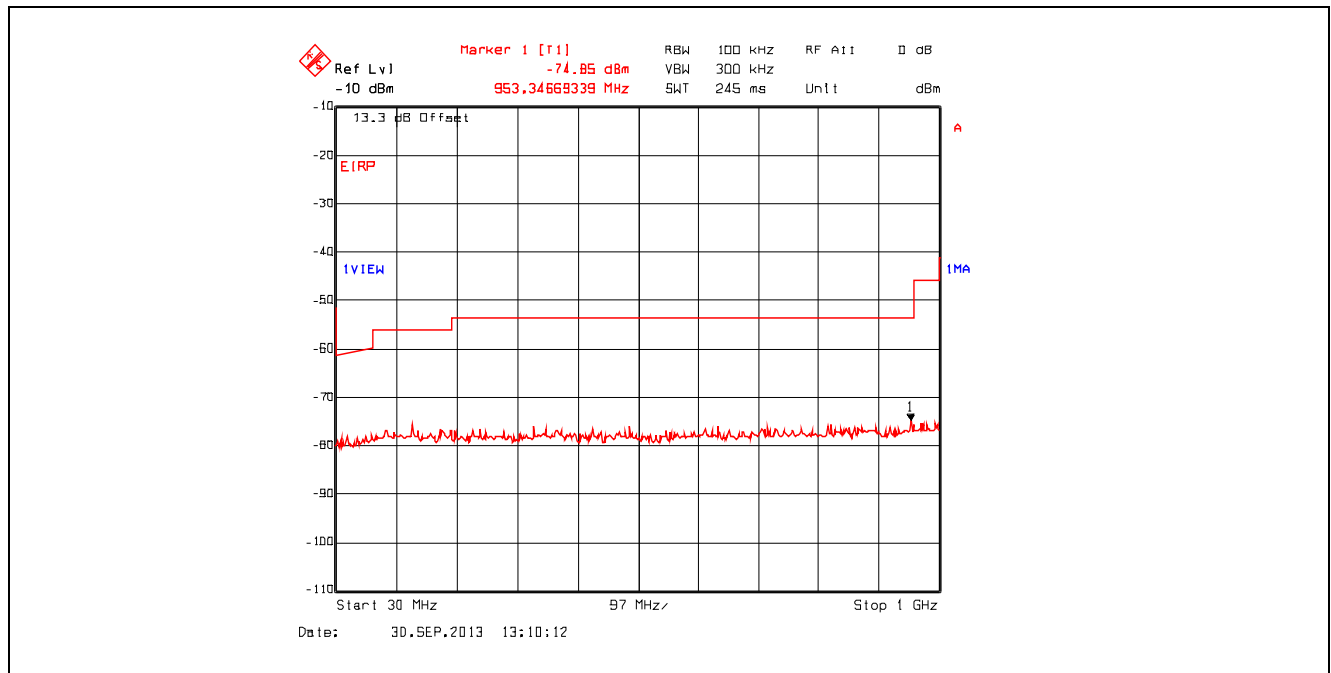
**Plot 5.3.4.3.5. Conducted Spurious Emissions – Restricted Bands**  
802.11b, 11 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 9 kHz - 150 kHz, Peak Detector



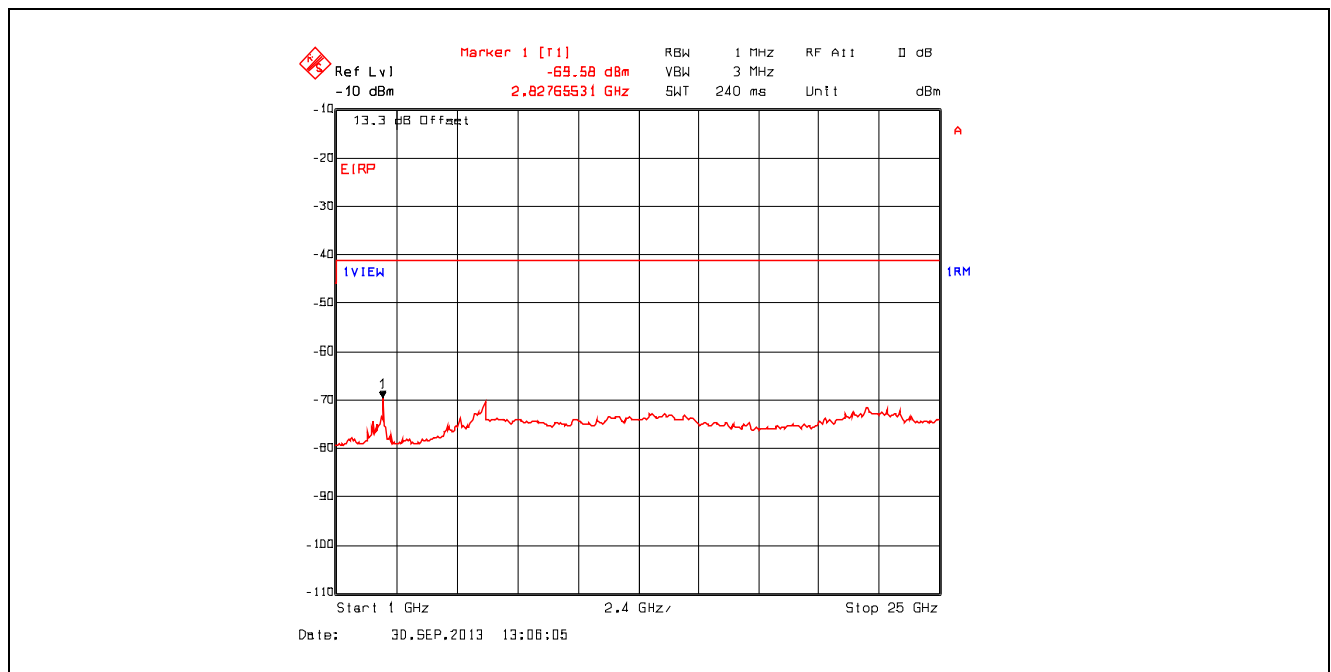
**Plot 5.3.4.3.6. Conducted Spurious Emissions – Restricted Bands**  
802.11b, 11 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 150 kHz - 30 MHz, Peak Detector



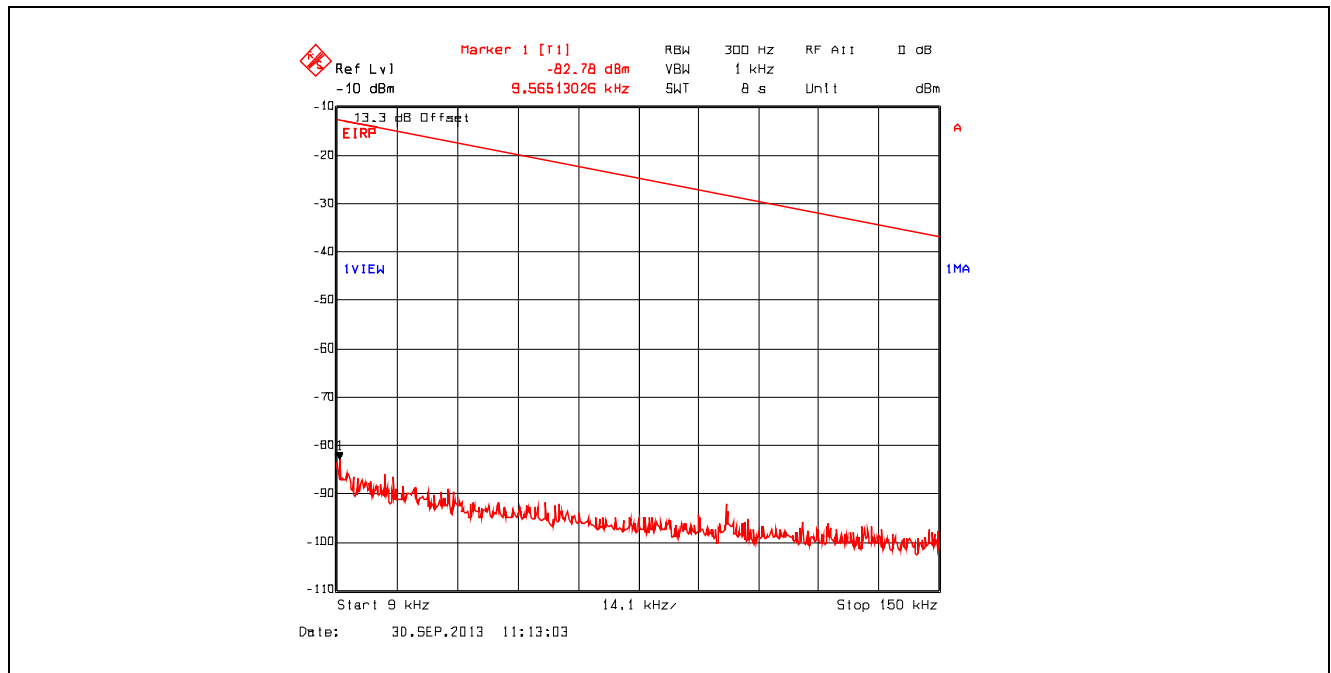
**Plot 5.3.4.3.7. Conducted Spurious Emissions – Restricted Bands**  
802.11b, 11 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 30 MHz - 1 GHz, Peak Detector



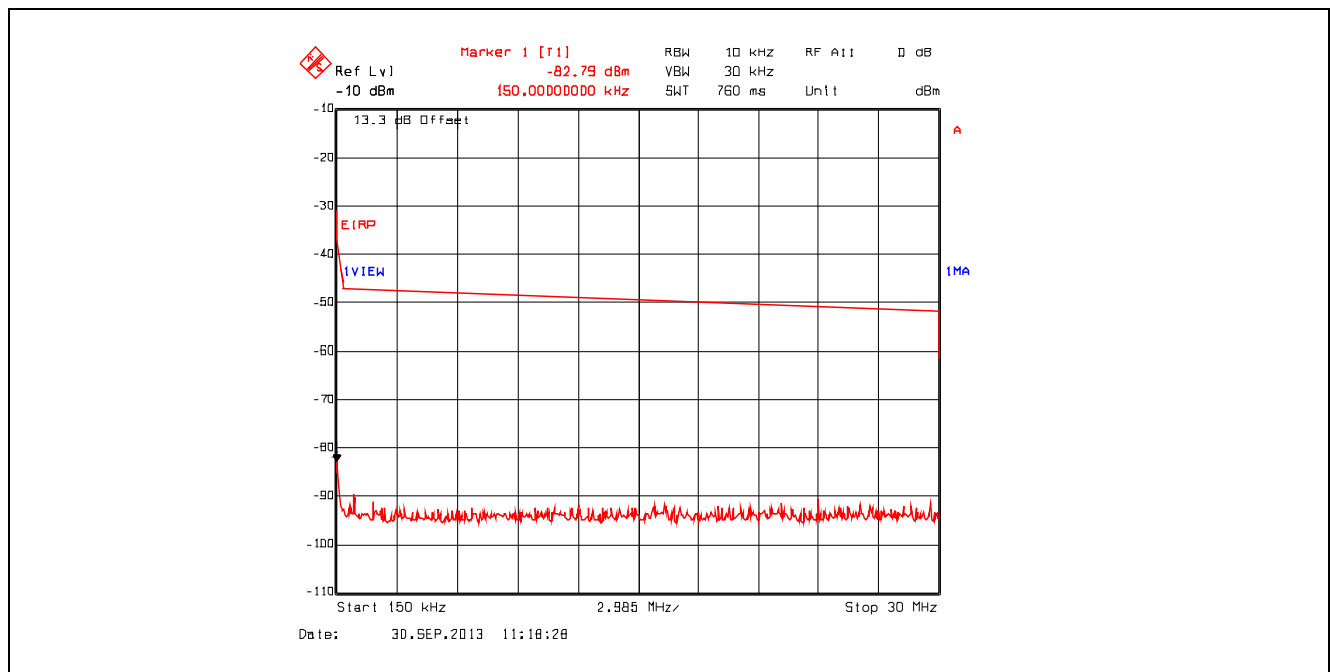
**Plot 5.3.4.3.8. Conducted Spurious Emissions – Restricted Bands**  
802.11b, 11 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 1 GHz - 25 GHz, Power Average (RMS) Detector



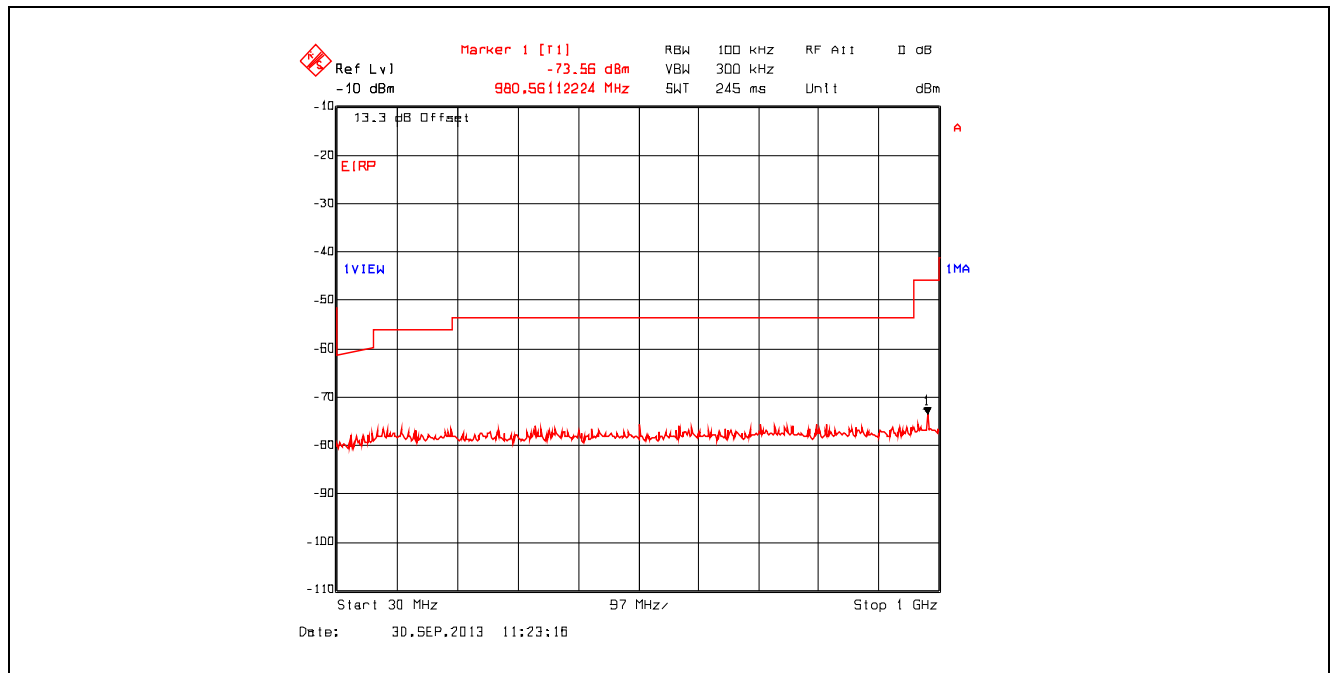
**Plot 5.3.4.3.9. Conducted Spurious Emissions – Restricted Bands**  
802.11g, 6 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 9 kHz - 150 kHz, Peak Detector



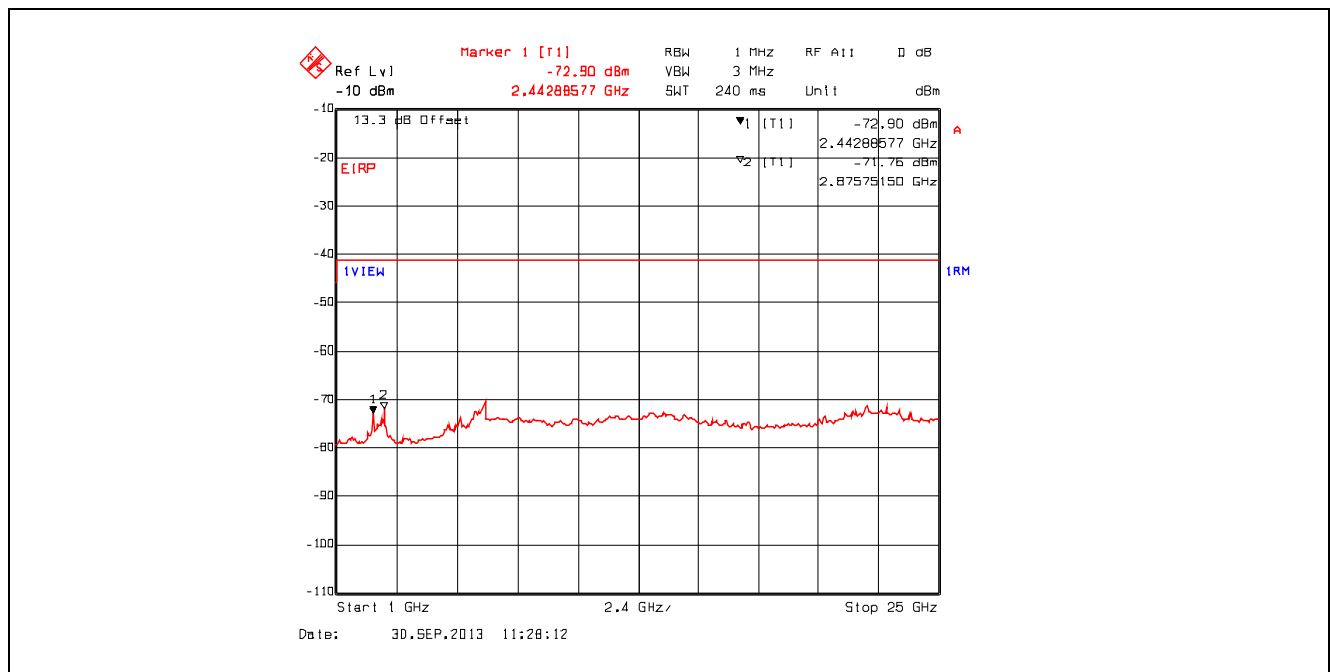
**Plot 5.3.4.3.10. Conducted Spurious Emissions – Restricted Bands**  
802.11g, 6 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 150 kHz - 30 MHz, Peak Detector



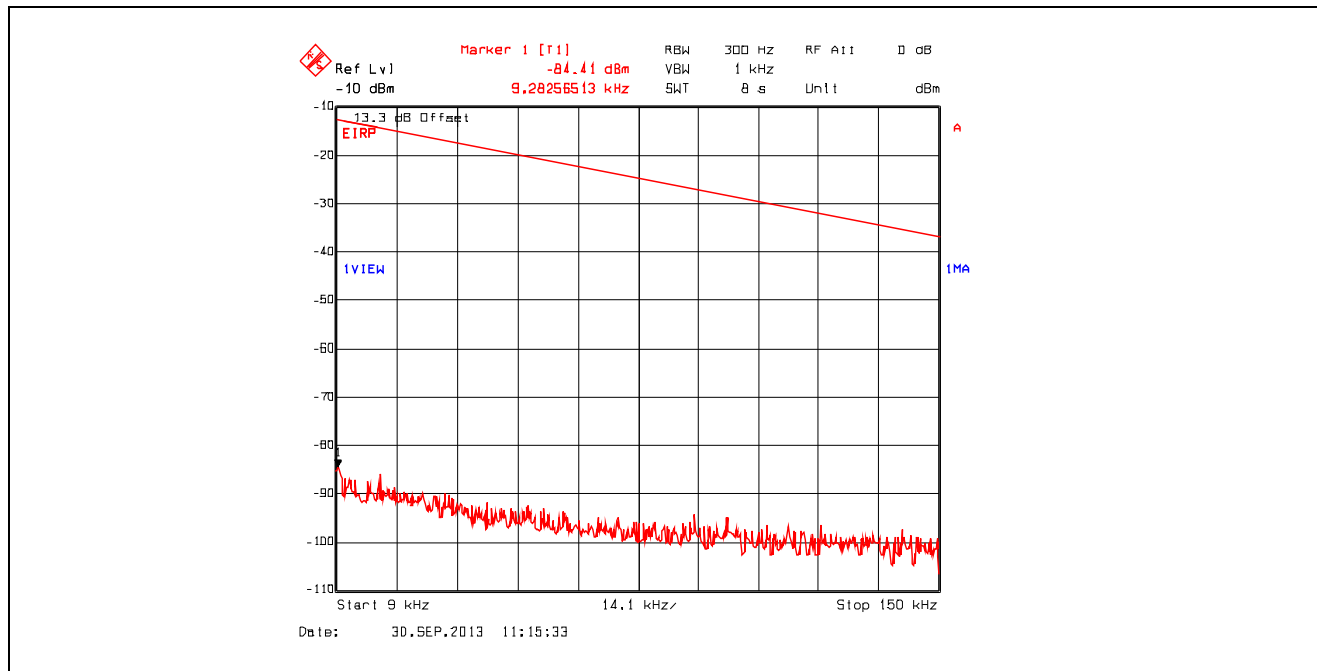
**Plot 5.3.4.3.11. Conducted Spurious Emissions – Restricted Bands**  
802.11g, 6 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 30 MHz - 1 GHz, Peak Detector



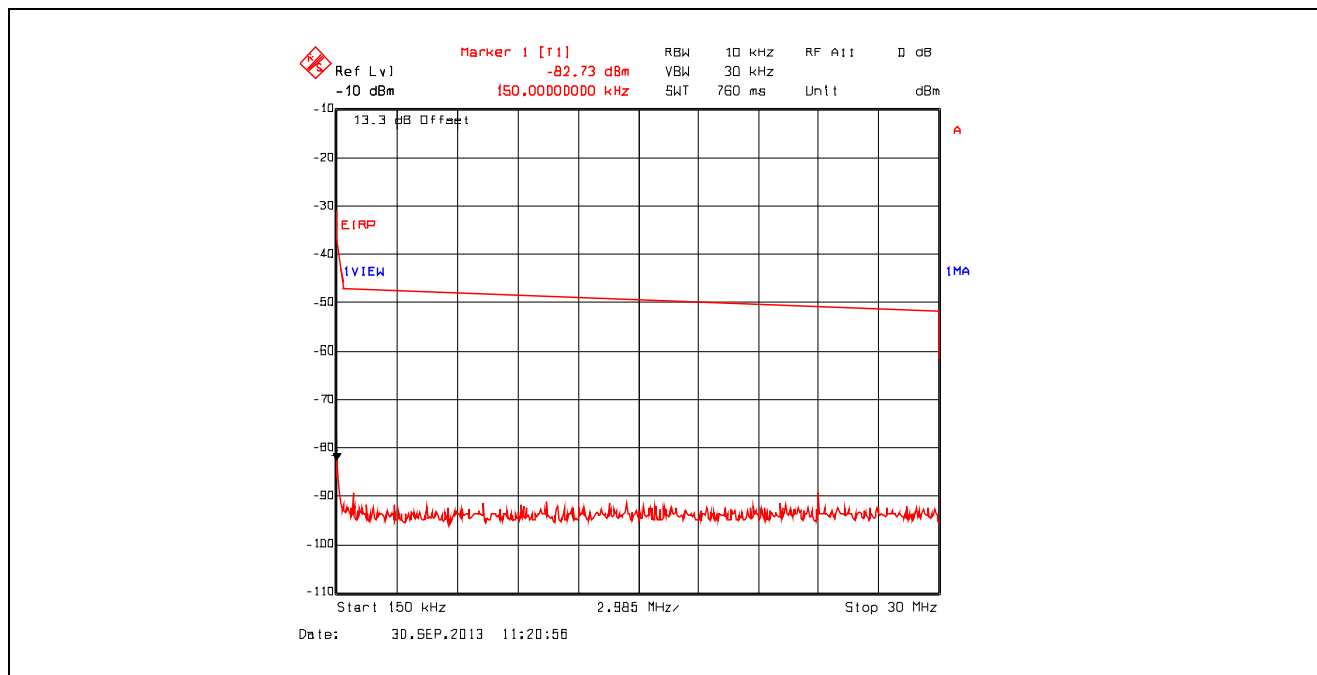
**Plot 5.3.4.3.12. Conducted Spurious Emissions – Restricted Bands**  
802.11g, 6 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 1 GHz - 25 GHz, Power Average (RMS) Detector



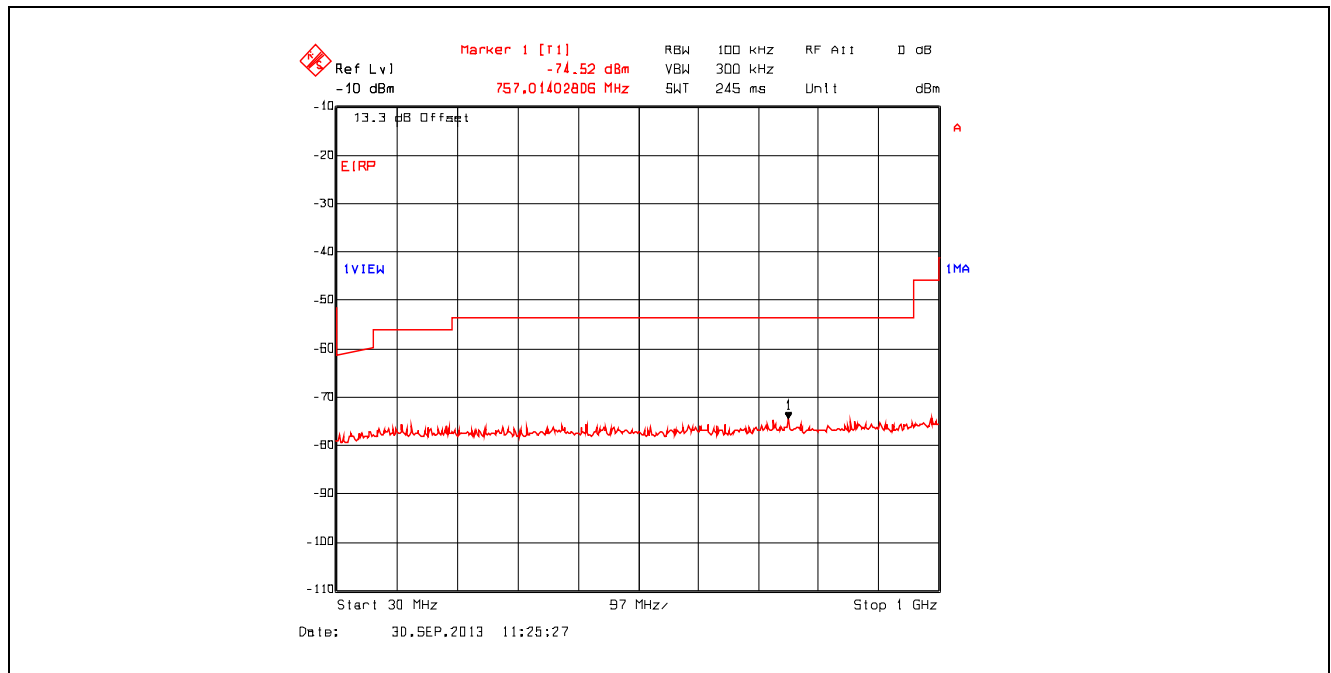
**Plot 5.3.4.3.13. Conducted Spurious Emissions – Restricted Bands**  
802.11g, 54 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 9 kHz - 150 kHz, Peak Detector



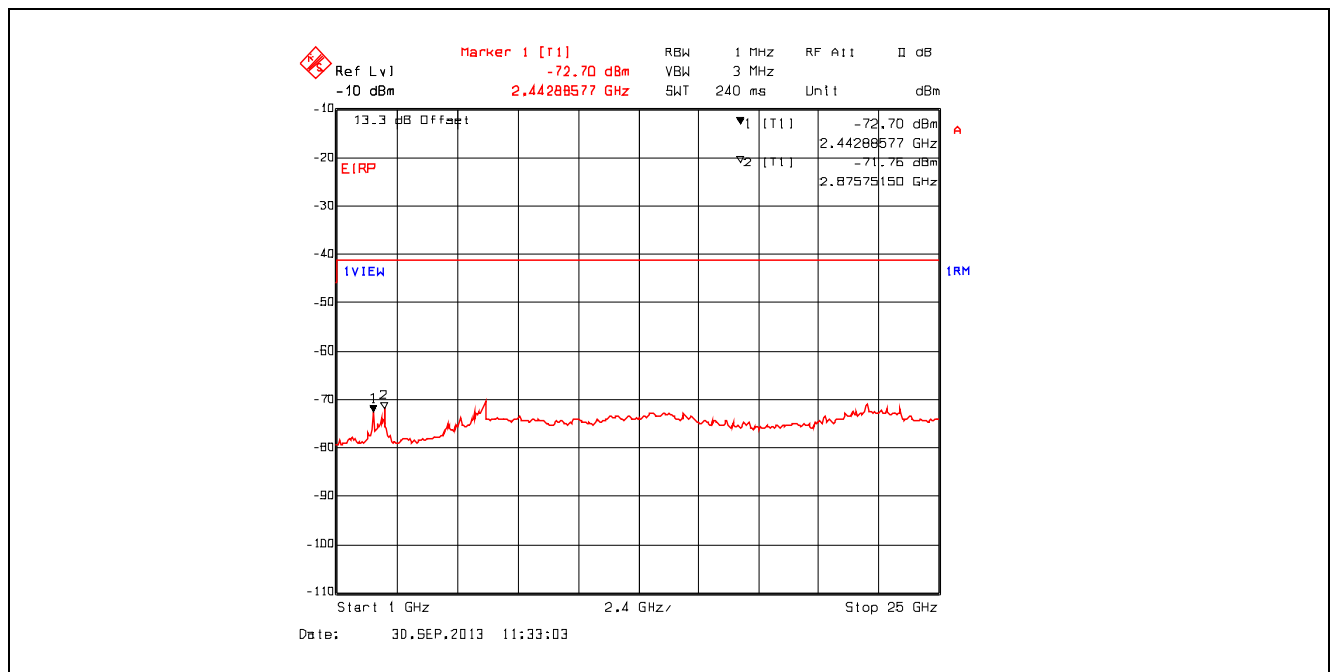
**Plot 5.3.4.3.14. Conducted Spurious Emissions – Restricted Bands**  
802.11g, 54 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 150 kHz - 30 MHz, Peak Detector



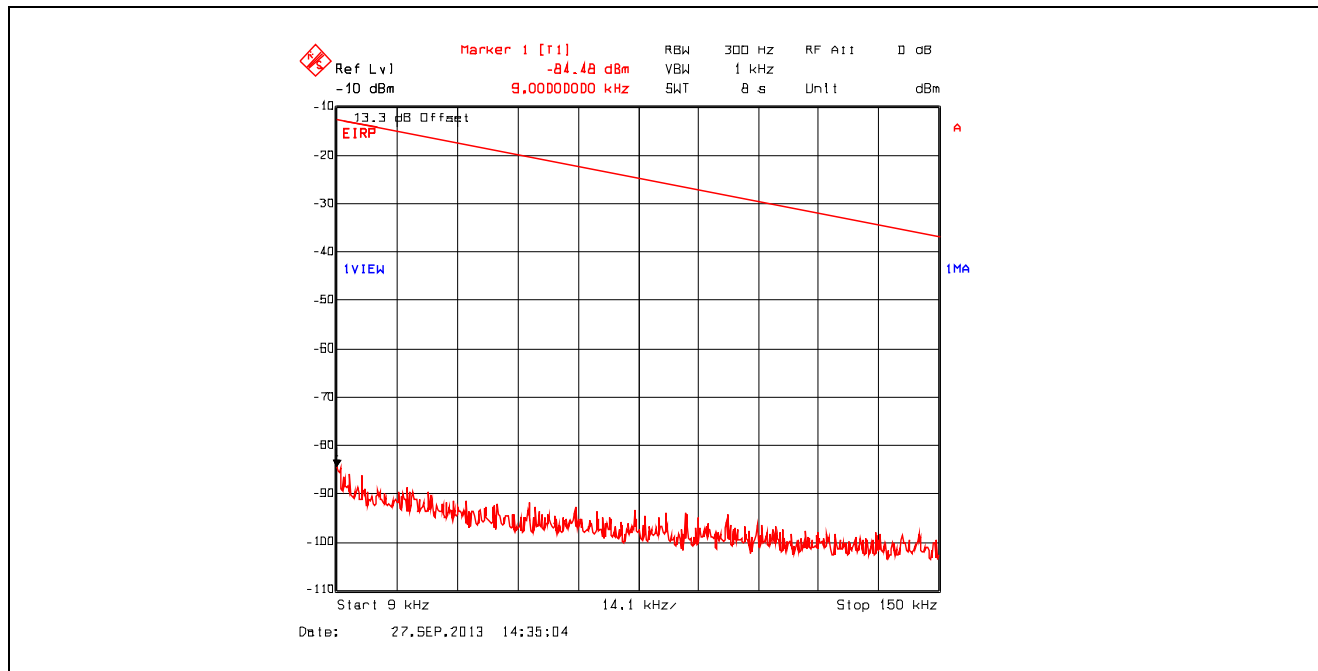
**Plot 5.3.4.3.15. Conducted Spurious Emissions – Restricted Bands**  
802.11g, 54 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 30 MHz - 1 GHz, Peak Detector



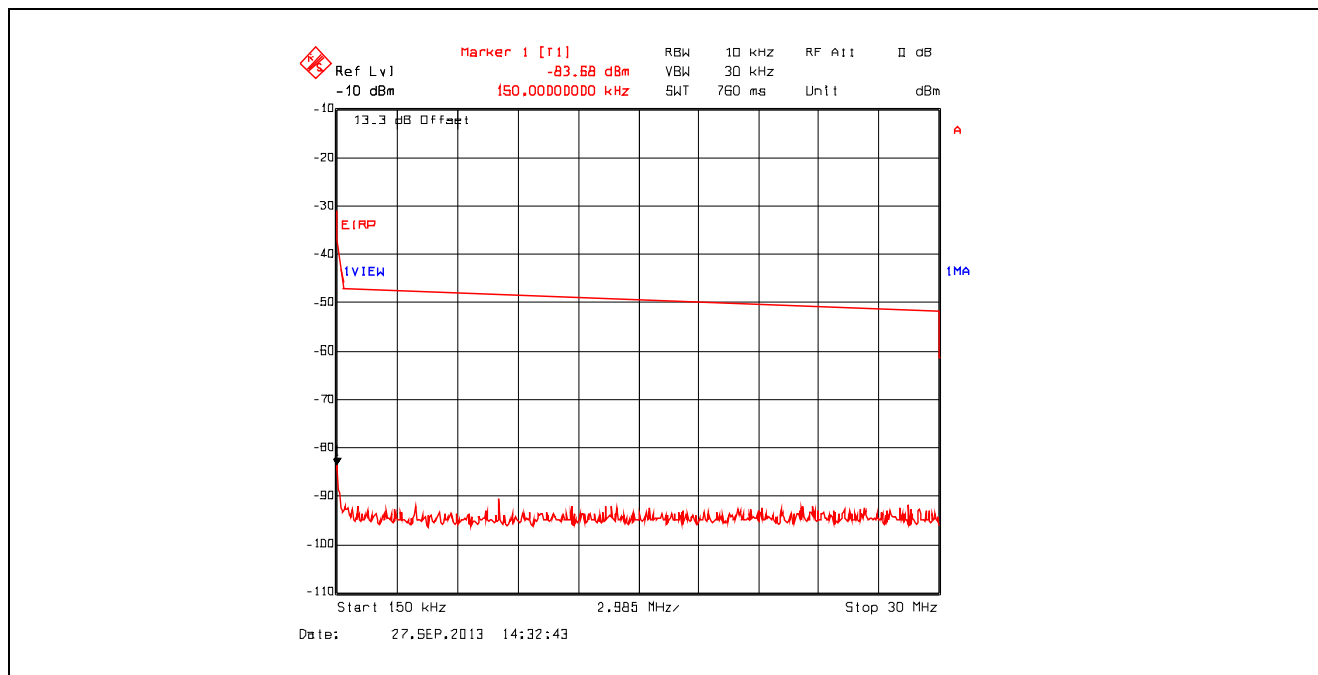
**Plot 5.3.4.3.16. Conducted Spurious Emissions – Restricted Bands**  
802.11g, 54 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 1 GHz - 25 GHz, Power Average (RMS) Detector



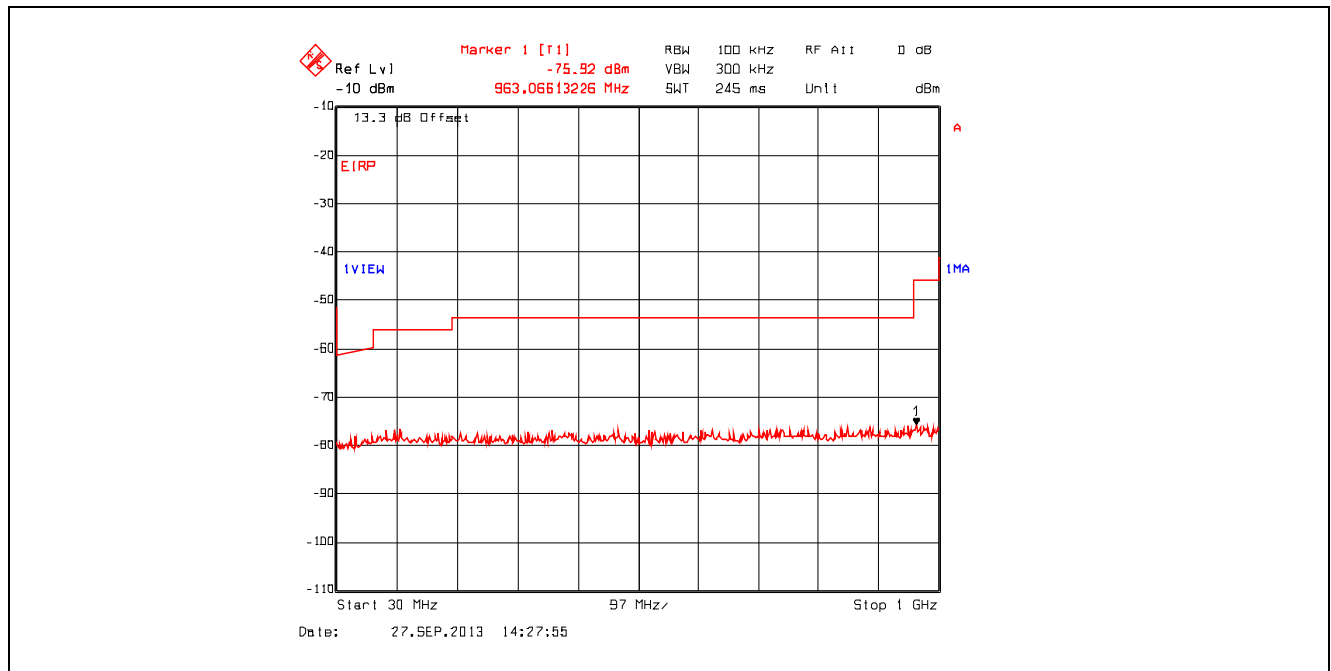
**Plot 5.3.4.3.17. Conducted Spurious Emissions – Restricted Bands**  
802.11n, 6.5 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 9 kHz - 150 kHz, Peak Detector



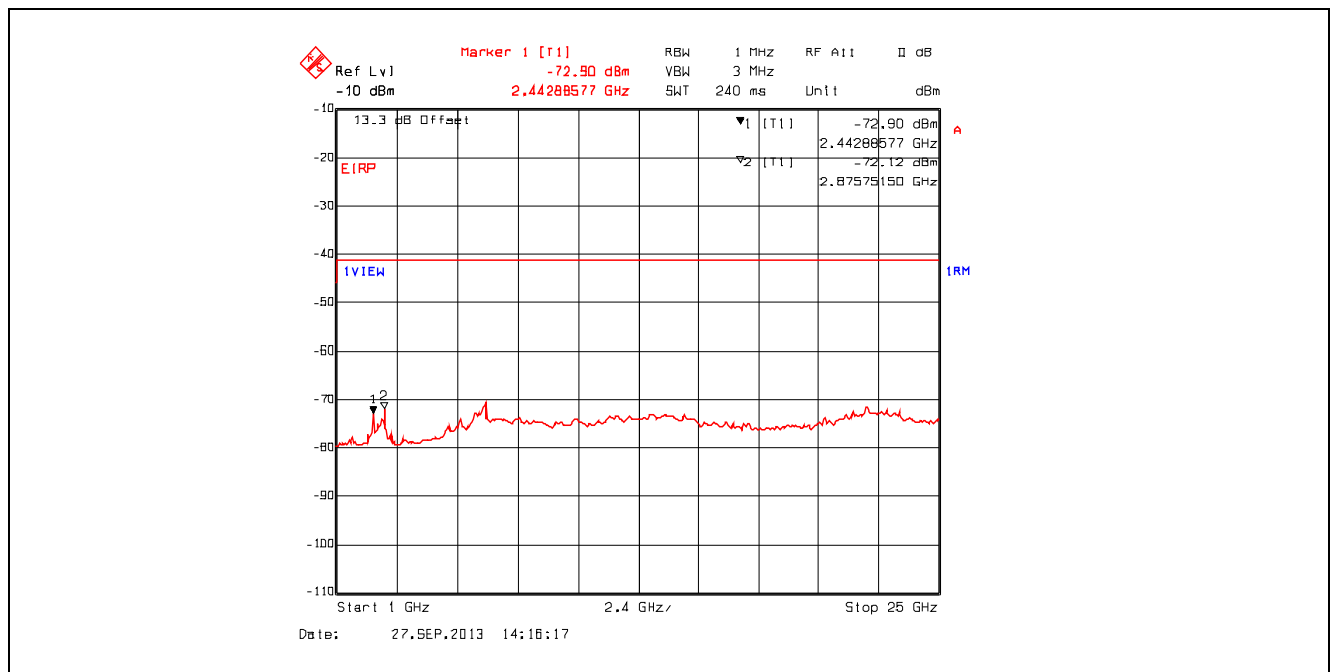
**Plot 5.3.4.3.18. Conducted Spurious Emissions – Restricted Bands**  
802.11n, 6.5 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 150 kHz - 30 MHz, Peak Detector



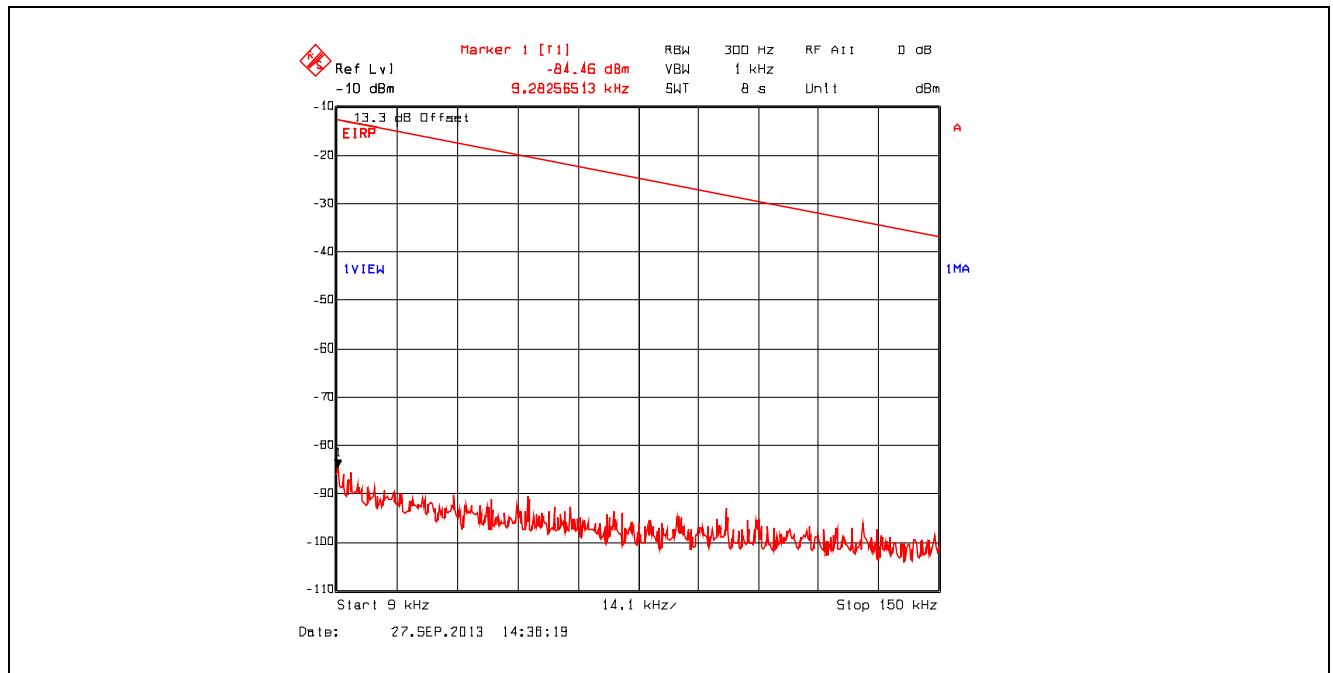
**Plot 5.3.4.3.19. Conducted Spurious Emissions – Restricted Bands**  
802.11n, 6.5 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 30 MHz - 1 GHz, Peak Detector



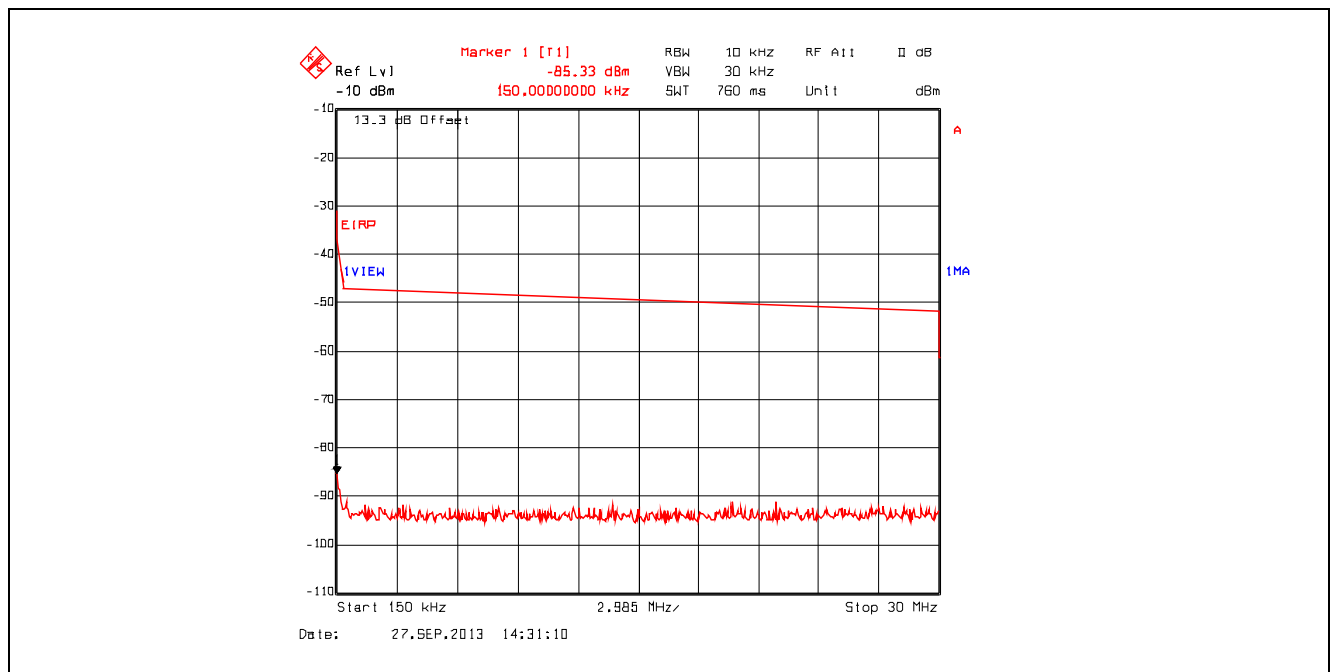
**Plot 5.3.4.3.20. Conducted Spurious Emissions – Restricted Bands**  
802.11n, 6.5 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 1 GHz - 25 GHz, Power Average (RMS) Detector



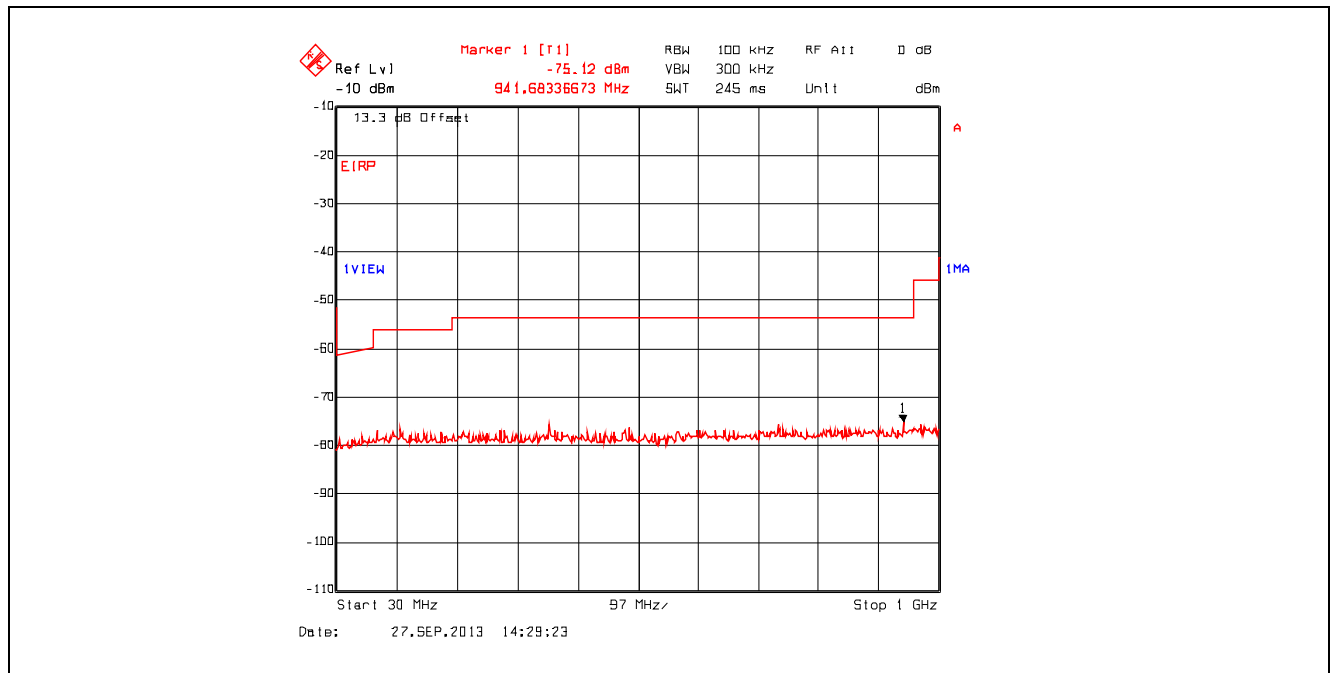
**Plot 5.3.4.3.21. Conducted Spurious Emissions – Restricted Bands**  
802.11n, 65 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 9 kHz - 150 kHz, Peak Detector



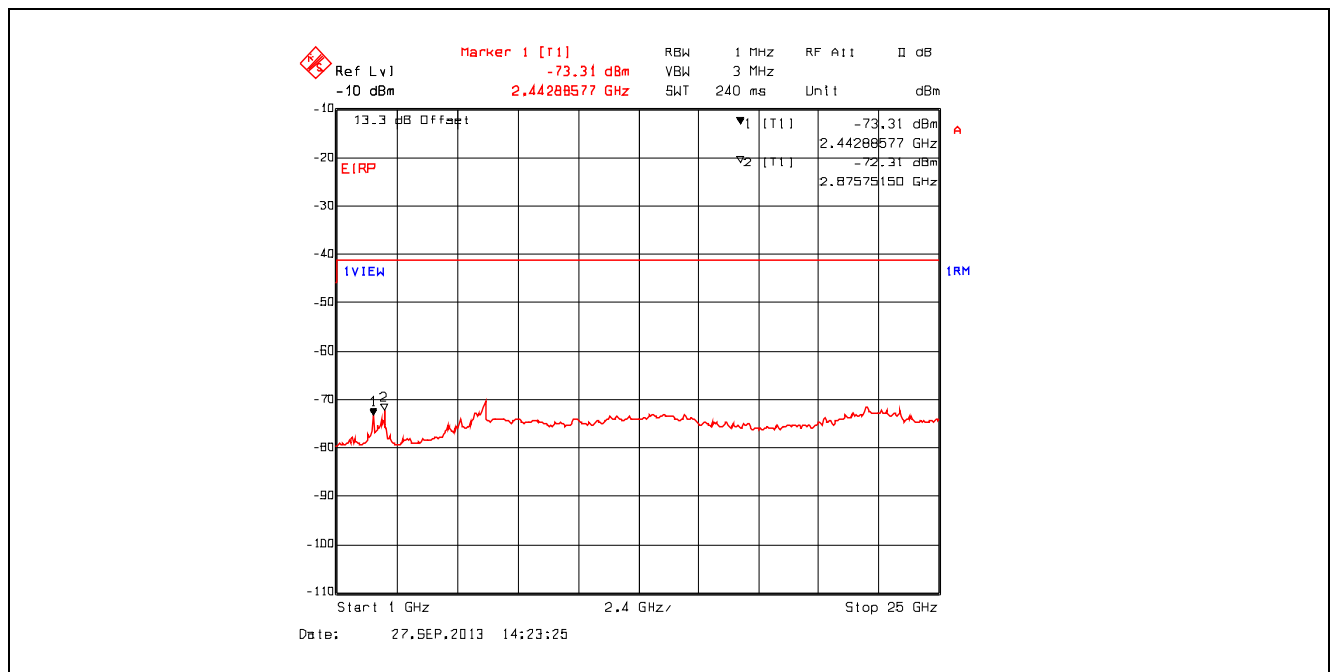
**Plot 5.3.4.3.22. Conducted Spurious Emissions – Restricted Bands**  
802.11n, 65 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 150 kHz - 30 MHz, Peak Detector



**Plot 5.3.4.3.23. Conducted Spurious Emissions – Restricted Bands**  
802.11n, 65 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 30 MHz - 1 GHz, Peak Detector



**Plot 5.3.4.3.24. Conducted Spurious Emissions – Restricted Bands**  
802.11n, 65 Mbps Data Rate, 2472 MHz, 5 dBm Power Setting, 1 GHz - 25 GHz, Power Average (RMS) Detector



#### 5.4. TRANSMITTER SPURIOUS RADIATED EMISSIONS AT 3 METERS [§§ 15.247(d), 15.209 & 15.205]

##### 5.4.1. Limit(s)

§ 15.247 (d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. 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 Section 15.209(a) (see Section 15.205(c)).

#### Section 15.205(a) - Restricted Bands of Operation

| MHz                            | MHz                 | MHz           | GHz              |
|--------------------------------|---------------------|---------------|------------------|
| 0.090–0.110 .....              | 16.42–16.423        | 399.9–410     | 4.5–5.15         |
| <sup>1</sup> 0.495–0.505 ..... | 16.69475–16.69525   | 608–614       | 5.35–5.46        |
| 2.1735–2.1905 .....            | 16.80425–16.80475   | 960–1240      | 7.25–7.75        |
| 4.125–4.128 .....              | 25.5–25.67          | 1300–1427     | 8.025–8.5        |
| 4.17725–4.17775 .....          | 37.5–38.25          | 1435–1626.5   | 9.0–9.2          |
| 4.20725–4.20775 .....          | 73–74.6             | 1645.5–1646.5 | 9.3–9.5          |
| 6.215–6.218 .....              | 74.8–75.2           | 1660–1710     | 10.6–12.7        |
| 6.26775–6.26825 .....          | 108–121.94          | 1718.8–1722.2 | 13.25–13.4       |
| 6.31175–6.31225 .....          | 123–138             | 2200–2300     | 14.47–14.5       |
| 8.291–8.294 .....              | 149.9–150.05        | 2310–2390     | 15.35–16.2       |
| 8.362–8.366 .....              | 156.52475–156.52525 | 2483.5–2500   | 17.7–21.4        |
| 8.37625–8.38675 .....          | 156.7–156.9         | 2655–2900     | 22.01–23.12      |
| 8.41425–8.41475 .....          | 162.0125–167.17     | 3260–3267     | 23.6–24.0        |
| 12.29–12.293 .....             | 167.72–173.2        | 3332–3339     | 31.2–31.8        |
| 12.51975–12.52025 .....        | 240–285             | 3345.8–3358   | 36.43–36.5       |
| 12.57675–12.57725 .....        | 322–335.4           | 3600–4400     | ( <sup>2</sup> ) |
| 13.36–13.41 .....              |                     |               |                  |

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490–0.510 MHz.

<sup>2</sup> Above 38.6

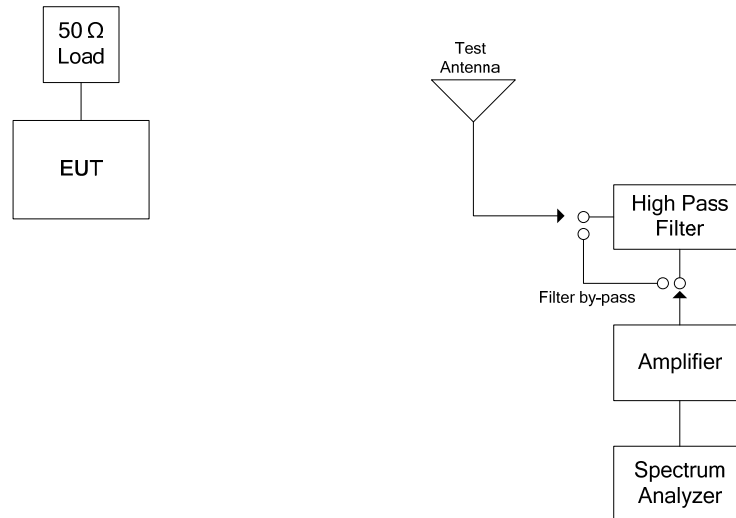
#### Section 15.209(a) -- Field Strength Limits within Restricted Frequency Bands --

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|-----------------|-----------------------------------|-------------------------------|
| 0.009 - 0.490   | 2,400 / F (kHz)                   | 300                           |
| 0.490 - 1.705   | 24,000 / F (kHz)                  | 30                            |
| 1.705 - 30.0    | 30                                | 30                            |
| 30 - 88         | 100                               | 3                             |
| 88 - 216        | 150                               | 3                             |
| 216 - 960       | 200                               | 3                             |
| Above 960       | 500                               | 3                             |

#### 5.4.2. Method of Measurements

ANSI C63.10

#### 5.4.3. Test Arrangement



#### 5.4.4. Test Data

##### Remarks:

- All spurious emissions that are in excess of 20 dB below the specified limit shall be recorded.
- EUT shall be tested in three orthogonal positions.
- The following test results are the worst-case measurements.

| Fundamental Frequency:                                                                |                              | 2472 MHz                    |                           |                             |                             |                |               |
|---------------------------------------------------------------------------------------|------------------------------|-----------------------------|---------------------------|-----------------------------|-----------------------------|----------------|---------------|
| Test Frequency Range:                                                                 |                              | 30 MHz – 25 GHz             |                           |                             |                             |                |               |
| Frequency<br>(MHz)                                                                    | RF<br>Peak Level<br>(dBμV/m) | RF<br>Avg Level<br>(dBμV/m) | Antenna<br>Plane<br>(H/V) | Limit<br>15.209<br>(dBμV/m) | Limit<br>15.247<br>(dBμV/m) | Margin<br>(dB) | Pass/<br>Fail |
| The harmonics and spurious emissions are more than 20 dB below the applicable limits. |                              |                             |                           |                             |                             |                |               |

## EXHIBIT 6. TEST EQUIPMENT LIST

| Test Instruments   | Manufacturer    | Model No.          | Serial No. | Frequency Range       | Cal. Due Date |
|--------------------|-----------------|--------------------|------------|-----------------------|---------------|
| Spectrum Analyzer  | Rohde & Schwarz | FSEK30             | 100077     | 20Hz–40 GHz           | 02 Nov 2013   |
| Attenuator         | Pasternack      | PE7024-10          | -          | DC–26.5 GHz           | Cal on use    |
| DC Block           | Hewlett Packard | 11742A             | 12460      | 0.045–26.5 GHz        | Cal on use    |
| High Pass Filter   | K & L           | 11SH10-4000/T12000 | 4          | Cut off 2400 MHz      | Cal on use    |
| Band Pass Filter   | Micro-Tronics   | BRM50701           | 105        | Cut off 2.4-2.483 GHz | Cal on use    |
| RF Amplifier       | Hewlett Packard | 84498              | 3008A00769 | 1 – 26.5 GHz          | 25 Jun 2014   |
| Biconi-Log Antenna | ETS Lindgren    | 3142C              | 34792      | 26 – 3000 MHz         | 26 Jun 2014   |
| Horn Antenna       | ETS Lindgren    | 3115               | 6570       | 1 -18 GHz             | 07 Jun 2014   |
| Horn Antenna       | EMCO            | 3160-09            | 118385     | 18 – 26.5 GHz         | 30 July 2014  |

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File #: TEK-728F15C247-7545MBW

October 21, 2013

*All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

## EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4-2 @ IEC:2003 and JCGM 100:2008 (GUM 1995) – Guide to the Expression of Uncertainty in Measurement.

### 7.1. LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY

|       | Line Conducted Emission Measurement Uncertainty<br>(9 kHz – 30 MHz):      | Measured   | Limit     |
|-------|---------------------------------------------------------------------------|------------|-----------|
| $u_c$ | Combined standard uncertainty:<br>$u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$ | $\pm 1.44$ | $\pm 1.8$ |
| $U$   | Expanded uncertainty U:<br>$U = 2u_c(y)$                                  | $\pm 2.89$ | $\pm 3.6$ |

### 7.2. RADIATED EMISSION MEASUREMENT UNCERTAINTY

|       | Radiated Emission Measurement Uncertainty @ 3m, Horizontal<br>(30-1000 MHz): | Measured<br>(dB) | Limit<br>(dB) |
|-------|------------------------------------------------------------------------------|------------------|---------------|
| $u_c$ | Combined standard uncertainty:<br>$u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$    | $\pm 2.39$       | $\pm 2.6$     |
| $U$   | Expanded uncertainty U:<br>$U = 2u_c(y)$                                     | $\pm 4.79$       | $\pm 5.2$     |

|       | Radiated Emission Measurement Uncertainty @ 3m, Vertical<br>(30-1000 MHz): | Measured<br>(dB) | Limit<br>(dB) |
|-------|----------------------------------------------------------------------------|------------------|---------------|
| $u_c$ | Combined standard uncertainty:<br>$u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$  | $\pm 2.39$       | $\pm 2.6$     |
| $U$   | Expanded uncertainty U:<br>$U = 2u_c(y)$                                   | $\pm 4.78$       | $\pm 5.2$     |

|       | Radiated Emission Measurement Uncertainty @ 3 m, Horizontal &<br>Vertical (1 – 18 GHz): | Measured<br>(dB) | Limit<br>(dB)          |
|-------|-----------------------------------------------------------------------------------------|------------------|------------------------|
| $u_c$ | Combined standard uncertainty:<br>$u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$               | $\pm 1.87$       | Under<br>consideration |
| $U$   | Expanded uncertainty U:<br>$U = 2u_c(y)$                                                | $\pm 3.75$       | Under<br>consideration |