



FCC/IC Test Report

FOR

Manufacturer: Trimble Navigation Limited

Model Number: 88161

Product Description: Industrial Handheld Computer

FCC ID: JUP88161

IC ID: 1756A-88161

47 CFR Part 15.247 for DTS Systems, 2.4 & 5 GHz WLAN

IC RSS-210 Issue 8, Annex 8

TEST REPORT #: EMC_TRIM2-017-13001_DTS

DATE: 2013-10-09



FCC :
Accredited

IC recognized #
3462B-1

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CETECOM Inc. is a Delaware Corporation with Corporation number: 2905571

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1 Assessment

The following equipment (and as identified in Ch.3 of this test report) was evaluated against the applicable criteria specified in FCC CFR47 Part 15.247, 15.207, 15.209 and Industry Canada Standards RSS-210 Issue 8, Annex 8.

No deviations were ascertained during the course of the tests performed.

Company	Description	Model #
Trimble Navigation Limited	Industrial Handheld Computer	88161

Responsible for Testing Laboratory:

2013-10-09 Compliance Franz Engert
(Manager of Compliance)

Date	Section	Name	Signature
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Responsible for the Report:

2013-10-09 Compliance Josie Sabado
(Test Lab Manager)

Date	Section	Name	Signature
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The test results of this test report relate exclusively to the test item specified in Section3.

CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

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Date of Report : 2013-10-09

IC ID: 1756A-88161



2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Test Lab Manager:	Tunji Yusuf
Responsible Project Leader:	Yadvinder Garcha

2.2 Identification of the Client

Client:	Trimble Navigation Limited
Street Address:	935 Stewart Drive, Sunnyvale
City/Zip Code	CA, 94088-3642
Country	USA
Contact Person:	Bruce Maule
Phone No.	+6439635628
e-mail:	bruce_maule@trimble.com

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as client.
Manufacturers Address:	
City/Zip Code	
Country	

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Marketing Name:	GeoExplorer® 7 Series handheld, Geo 7X
Model No:	88161
FCC-ID:	JUP88161
ICC ID:	1756A-88161
Product Description:	Industrial Handheld Computer
Technology/ Type(s) of Modulation:	2.4 GHz 802.11 b/g: CCK, BPSK, QPSK, 16QAM, 64QAM
Nominal Channel Bandwidths	20 MHz
Operating Frequency Ranges (MHz)/ Channels:	Nominal band: 2400 – 2483.5 MHz; Center to center with 20MHz BW: 2412(ch 1) – 2462(ch 11), 11 channels
Other radios included in the device:	GPRS / EGPRS / WCDMA / CDMA: Cinterion PXS8 Bluetooth: Murata LBEE19NJZC GPS 1575.42MHz, 1227.60MHz
Antenna info:	Ceramic Chip 2.4 GHz: 1.7 dBi
Max. Output Powers:	2.4 GHz: Conducted (Measured): 17.75 dBm Radiated–EIRP (Calculated): 19.45 dBm
Rated Operating Voltage:	9V DC (Low) / 11.1V DC (Nom) / 15.75V DC (High)
Rated Operating temperature range:	–20°C ~ +60°C
Other radios supported in the device:	GSM/GPRS/EGPRS: 850/900/1800/1900 UMTS FDD Bands I/II/ V/VIII Bluetooth: 2402 – 2480 MHz / 79 Channels GPS (Rx Only): 1.575 GHz, 1.227 GHz / 2 Channels
Test sample status:	Identical Prototype

Test Report #: EMC_TRIM2-017-13001_DTS

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3.2 Identification of the Equipment Under Test (EUT)

EUT #	Serial Number	HW Version	SW Version
1	5315414835	Rev A	6.7.0

3.3 Identification of Accessory Equipment

No Accessory Equipment

3.4 Environmental conditions during Test:

Ambient Temperature: 20-25°C

Relative humidity: 40-60%

3.5 Dates of Testing:

August 29, 2013

3.6 Other Testing Notes:

The device was configured with a manufacturer provided test SW, capable of setting the unit in different supported modulation schemes, data rates and channels of operation.

The Device was set to continuous Tx mode per test SW and could thus be operated with 100% duty cycle during testing.

The EUT was tested on low, mid and high channels 802.11b and 802.11g modes.

The below listed worst case test modes of operation have been established from the output power measurement and evaluation of long term test data available to the lab for the different data rates and modulations which are supported by the equipment.

Mode		Data rate (Mbps)	Modulation scheme
2.4 GHz	802.11b	1.0	BPSK
	802.11g	6.0	BPSK

4 Subject of Investigation

The objective of the measurements applied by CETECOM Inc. was to establish compliance of the EUT as described under Ch. 3 of this Test Report, with the applicable criteria specified in

- FCC CFR47 Parts 15.247, 15.207, 15.209
- IC RSS-210 Issue 8

This test report is to support a request for new equipment authorization under the FCC ID: **JUP88161** and IC ID **1756A-88161**.

All testing was performed on the product referred to in Section 3 as EUT.

The equipment specified under section 3 above is a variant of the model 88951, previously authorized under FCC ID: JUP616 and IC ID: 1756A-616 (March 2011). Both models have implemented an identical Bluetooth and WLAN (802.11 b/g) radio portion, as declared by the applicant. Based on this declared equality, only those tests were applied to the new model for which measurement procedures have changed since approval of the previous model. Results from the unchanged tests are leveraged from test report number EMC_TRIM2_001_09001_15.247WLAN_616_rev2 issued by CETECOM Inc.



5 Summary of Measurement Results

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
§15.247(e) RSS-210 A8.2(b)	Power Spectral Density	Nominal	802.11 b/g	■	□	□	□	Complies
§15.247(a)(1) RSS-210 A8.1(b)	Carrier Frequency Separation	Nominal	--	□	□	■	□	See Note 1
§15.247(a)(1) RSS-210 A8.1(d)	Number of Hopping Channels	Nominal	--	□	□	■	□	See Note 1
§15.247(a)(1)(iii) RSS-210 A8.3(1)	Time of occupancy	Nominal	--	□	□	■	□	See Note 1
§15.247(a)(2) RSS-210 A8.2(a)	Spectrum Bandwidth	Nominal	802.11 b/g	■	□	□	□	Complies
§15.247(b)(3) RSS-210 A8.4(4)	Maximum Peak Conducted Output Power	Nominal	802.11 b/g	■	□	□	□	Complies
§15.247(d) RSS-210 A8.5	Unwanted Emissions into non-Restricted Frequency Bands band edge-Conducted	Nominal	--	□	□	□	■	See Note 2
§15.247(d) §15.209(a) RSS-GEN 7.2	Unwanted Emissions into Restricted Frequency Bands band edge-Radiated	Nominal	--	□	□	□	■	See Note 3
§15.247(d) RSS-210 A8.5	Unwanted Emissions into Non-Restricted Frequency Bands-Conducted	Nominal	802.11 b/g	■	□	□	□	Complies
§15.247(d) §15.209(a) RSS-GEN 7.2	Unwanted Emissions into Restricted Frequency Bands - Radiated	Nominal	--	□	□	□	■	See Note 3

Note: NA= Not Applicable; NP= Not Performed.

1. Test only applicable to frequency hopping systems.
2. Band Edge compliance-conducted is not performed as the device passes radiated measurement against the more stringent restricted band limits.
3. Test result leveraged from testing of model previous 88951 certified under FCC ID: JUP616 and IC ID: 1756A-616.

6 Measurements

6.1 Measurement Method:

In addition to the related rules in FCC 15.247 and RSS-210 the measurement guidelines in FCC publication KDB558074 D01Meas Guidance v03: Measurement Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) operating under 15.247, April 2013 has been applied.

6.1.1 Radiated Measurement Procedure

6.1.1.1 ANSI C63.4 (2009) Section 8.3.1.1: Exploratory radiated emission measurements

Exploratory radiated measurements shall be performed at the measurement distance or at a closer distance than that specified for compliance to determine the emission characteristics of the EUT. At near distances, for EUTs of comparably small size, it is relatively easy to determine the spectrum signature of the EUT and, if applicable, the EUT configuration that produces the maximum level of emissions. A shielded room may be used for exploratory testing, but may have anomalies that can lead to significant errors in amplitude measurements.

Broadband antennas and a spectrum analyzer or a radio-noise meter with a panoramic display are often useful in this type of testing. It is recommended that either a headset or loudspeaker be connected as an aid in detecting ambient signals and finding frequencies of significant emission from the EUT when the exploratory and final testing is performed in an OATS with strong ambient signals. Caution should be taken if either antenna height between 1 and 4 meters or EUT azimuth is not fully explored. Not fully exploring these parameters during exploratory testing may require complete testing at the OATS or semi-anechoic chamber when the final full spectrum testing is conducted.

The EUT should be set up in its typical configuration and arrangement, and operated in its various modes. For tabletop systems, cables or wires should be manipulated within the range of likely arrangements. For floor-standing equipment, the cables or wires should be located in the same manner as the user would install them and no further manipulation is made. For combination EUTs, the tabletop and floor-standing portions of the EUT shall follow the procedures for their respective setups and cable manipulation. If the manner of cable installation is not known, or if it changes with each installation, cables or wires for floor-standing equipment shall be manipulated to the extent possible to produce the maximum level of emissions.

For each mode of operation required to be tested, the frequency spectrum shall be monitored. Variations in antenna height between 1 and 4 m, antenna polarization, EUT azimuth, and cable or wire placement (each variable within bounds specified elsewhere) shall be explored to produce the emission that has the highest amplitude relative to the limit. A step-by-step technique for determining this emission can be found in Annex C.

When measuring emissions above 1 GHz, the frequencies of maximum emission shall be determined by manually positioning the antenna close to the EUT and by moving the antenna over all sides of the EUT while observing a spectral display. It will be advantageous to have prior knowledge of the frequencies of emissions above 1 GHz. If the EUT is a device with dimensions approximately equal to that of the measurement antenna beam width, the measurement antenna shall be aligned with the EUT.

6.1.1.2 ANSI C63.4 (2009) Section 8.3.1.2: Final radiated emission measurements

Based on the measurement results in 8.3.1.1, the one EUT, cable and wire arrangement, and mode of operation that produces the emission that has the highest amplitude relative to the limit is selected for the final measurement. The final measurement is then performed on a site meeting the requirements of 5.3, 5.4, or 5.5 as appropriate without variation of the EUT arrangement or EUT mode of operation. If the EUT is relocated from an exploratory test site to a final test site, the highest emission shall be re-maximized at the final test location before final radiated emissions measurements are performed. However, antenna height and polarity and EUT azimuth are to be varied. In addition, the full frequency spectrum (for the range to be checked for meeting compliance) shall be investigated.

This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. During the full frequency spectrum investigation, particular focus should be made on those frequencies found in exploratory testing that were used to find the final test configuration, mode of operation, and arrangement (associated with achieving the least margin with respect to the limit). This full spectrum test constitutes the compliance measurement.

For measurements above 1 GHz, use the cable, EUT arrangement, and mode of operation determined in the exploratory testing to produce the emission that has the highest amplitude relative to the limit. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the antenna in the “cone of radiation” from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response. The antenna may have to be higher or lower than the EUT, depending on the EUT’s size and mounting height, but the antenna should be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. If the transmission line for the measurement antenna restricts its range of height and polarization, the steps needed to ensure the correct measurement of the maximum emissions, shall be described in detail in the report of measurements. Data collected shall satisfy the report requirements of Clause 10.

NOTES

- 1— Where limits are specified by agencies for both average and peak (or quasi-peak) detection, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.
- 2—Use of waveguide and flexible waveguide may be necessary at frequencies above 10 GHz to achieve usable signal-to noise ratios at required measurement distances. If so, it may be necessary to restrict the height search of the antenna, and special care should be taken to ensure that maximum emissions are correctly measured.
- 3—All presently known devices causing emissions above 10 GHz are physically small compared with the beam-widths of typical horn antennas used for EMC measurements. For such EUTs and frequencies, it may be preferable to vary the height and polarization of the EUT instead of the receiving antenna to maximize the measured emissions.

Radiated Measurement Uncertainty: $\pm 3\text{dB}$

6.1.1.3 Sample Calculation for Radiated Measurements

Field Strength Measurements:

Measurements from the Spectrum Analyzer/ Receiver are used to calculate the Field Strength, taking into account the following parameters:

1. Measured reading in dBμV
2. Cable Loss between the receiving antenna and SA in dB and
3. Antenna Factor in dB/m

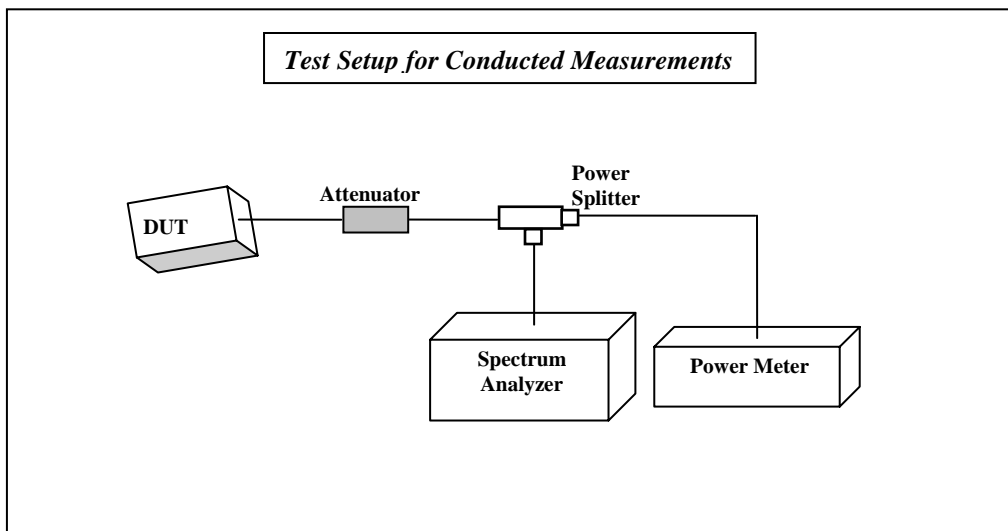
$$FS \text{ (dB}\mu\text{V/m)} = \text{Measured Value on SA (dB}\mu\text{V)} + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$$

Eg:

Frequency (MHz)	Measured SA (dBμV)	Cable Loss (dB)	Antenna Factor Correction (dB)	Field Strength Result (dBμV/m)
1000	80.5	3.5	14	98.0

All radiated measurement plots in this report are taken from a test SW that calculates the Field Strength based on the above equation.

6.1.2 Conducted Measurement Procedure



1. Connect the equipment as shown in the above diagram.
2. A test SW provided by the manufacturer is used to control the different modulations, data rates and max output power configurations.
3. Measurements are to be performed with the EUT set to the low, middle and high channels for 802.11b and 802.11g modes.

Measurement uncertainty for all conducted measurements: $\pm 0.5\text{dB}$

6.2 Maximum Peak Conducted Output Power

6.2.1 Limits:

§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, based on antenna gain < 6dBi.

RSS 210 – A8.4(4)

For systems employing digital modulation techniques operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz, the maximum peak conducted output power shall not exceed 1 W. Except as provided in Section A8.4 (5), the e.i.r.p. shall not exceed 4 W.

6.2.2 Test Conditions:

Tnom: 20°C; Vnom: 11.1 VDC

6.2.3 Test Procedure:

Measurement according to FCC KDB 558074 D01 DTS Meas Guidance v03, section 9.1.2- Integrated Band Power Method

Spectrum Analyzer settings:

RBW=1MHz, VBW=3MHz, Detector: Peak- Max Hold.

Sweep Time: Auto

Span= 20 MHz / 25 MHz (to fully encompass DTS Bandwidth for 802.11 a/b/g & n modes)

Manufacturer Declared Maximum Antenna Gain (dBi):

2.4 GHz: 1.7 dBi

6.2.4 Test Verdict

Pass

6.2.5 Test Results:

6.2.5.1 2.4GHz Band

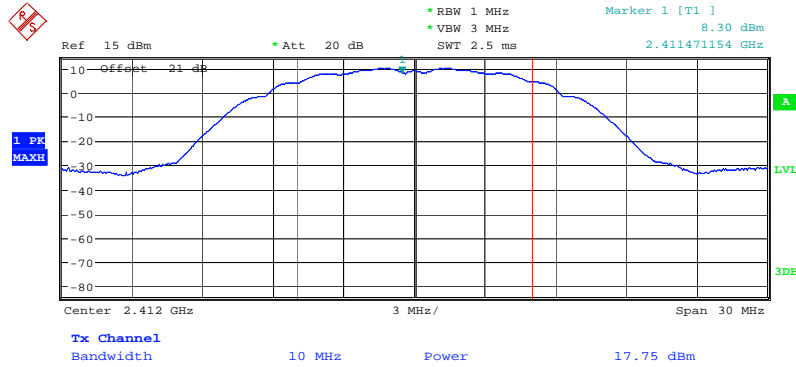
Measured Maximum Peak Conducted Output Power (dBm)			
Mode	Frequency (MHz)		
	2412 Channel 1	2437 Channel 6	2462 Channel 11
802.11b	17.75	17.27	17.13
802.11g	16.59	14.87	17.7

Calculated Maximum Peak Radiated Output Power (dBm)			
Mode	Frequency (MHz)		
	2412 Channel 1	2437 Channel 6	2462 Channel 11
802.11b	19.45	18.97	18.83
802.11g	18.29	16.57	19.4

Note: Radiated EIRP is calculated as
Conducted Measurement + Antenna Gain

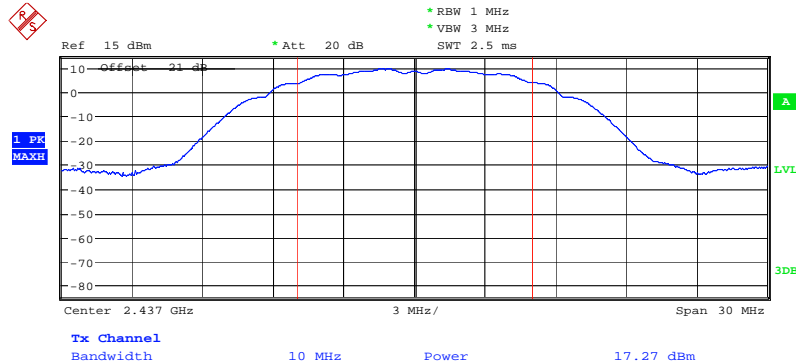
6.2.6 Test Data/plots:

Conducted Peak Power 802.11b 2412 MHz



Date: 29.AUG.2013 15:41:53

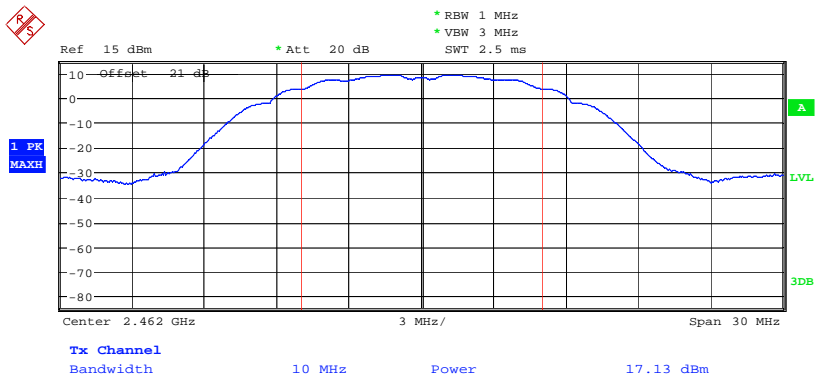
Conducted Peak Power 802.11b 2437 MHz



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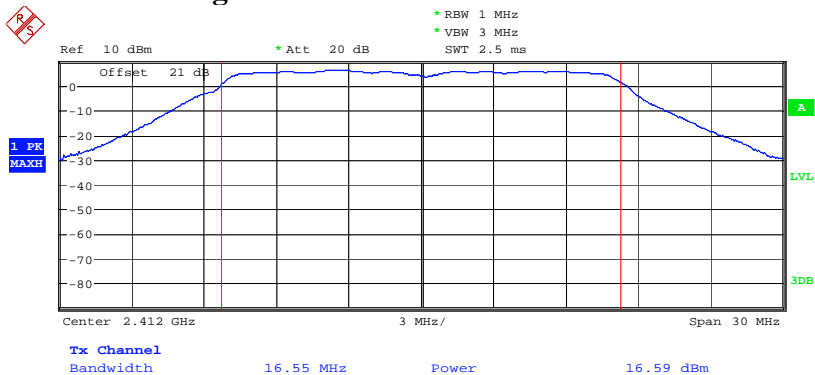


Conducted Peak Power 802.11b 2462 MHz



Date: 29.AUG.2013 16:27:33

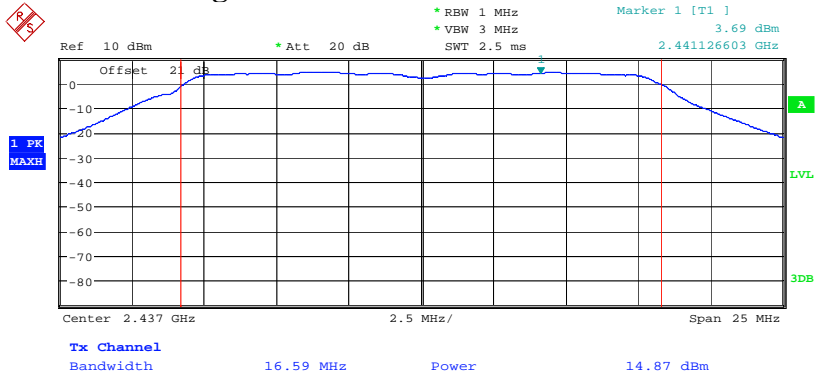
Conducted Peak Power 802.11g 2412 MHz



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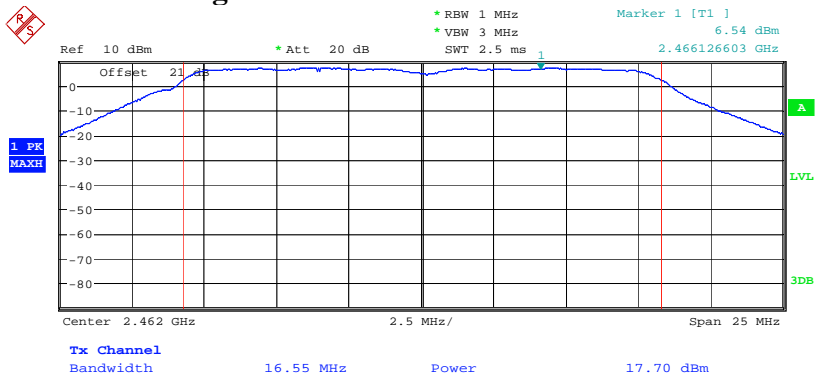


Conducted Peak Power 802.11g 2437 MHz



Date: 29.AUG.2013 18:41:18

Conducted Peak Power 802.11g 2462 MHz



Date: 29.AUG.2013 20:00:02



6.3 Emission & Occupied Bandwidth

6.3.1 Limits:

§15.247 (a)(2)

RSS-210 A8.2 (a)

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

6.3.2 Test Conditions:

Tnom: 20°C; Vnom: 3.8 VDC

6.3.3 Test Procedure:

Measurement according to FCC KDB 558074 D01 Meas Guidance v03, section 8.1 – DTS (6dB)

Channel Bandwidth Procedure Option 1

Spectrum Analyzer settings:

DTS (6dB) Bandwidth:

RBW = 100 kHz, VBW = 300 kHz, Detector: Peak- Max hold;

Sweep Time: Auto

Span = b mode: 15 MHz; g and n modes: 20 MHz

99% Bandwidth:

RBW = 300 kHz, VBW = 1 MHz, Detector: Peak-Max hold;

Sweep Time: Auto

Span = 2 x Signal Bandwidth

6.3.4 Test Result:

6.3.4.1 2.4GHz Band

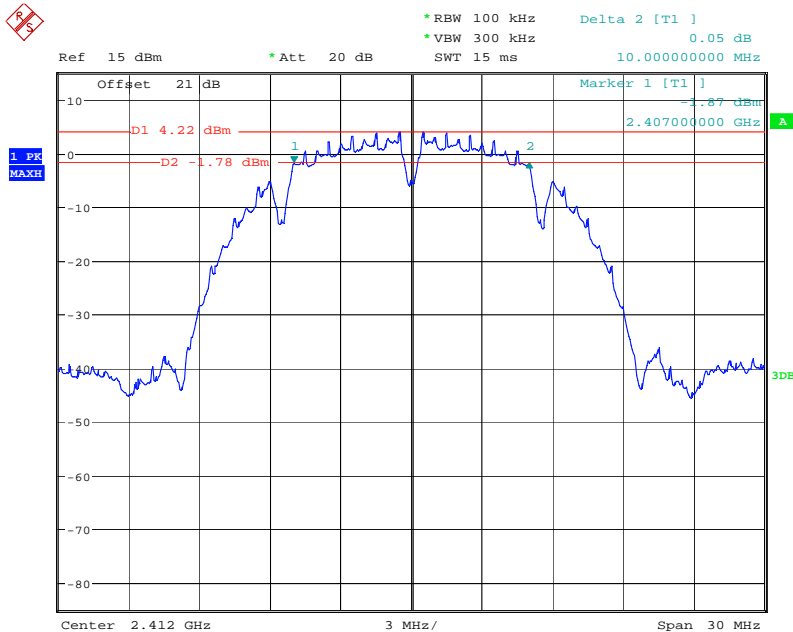
Emission & Occupied Bandwidth (MHz)						
Mode	Frequency (MHz)					
	2412 Channel 1		2437 Channel 6		2462 Channel 11	
	6dB	99%	6dB	99%	6dB	99%
802.11b	10	13.75	10	13.75	10	13.7
802.11g	16.54	16.55	16.59	16.54	16.55	16.55
Measurement Uncertainty: ±100 kHz						

6.3.5 Test Verdict

Pass.

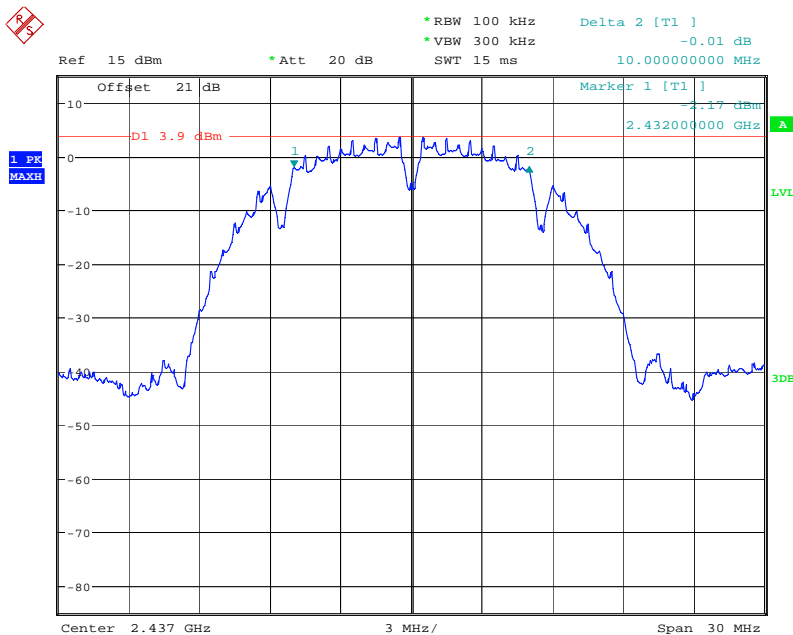
6.3.6 Test Data/plots:

6.3.6.1 2.4 GHz 6dB Bandwidth: 6dB Bandwidth 802.11b 2412 MHz



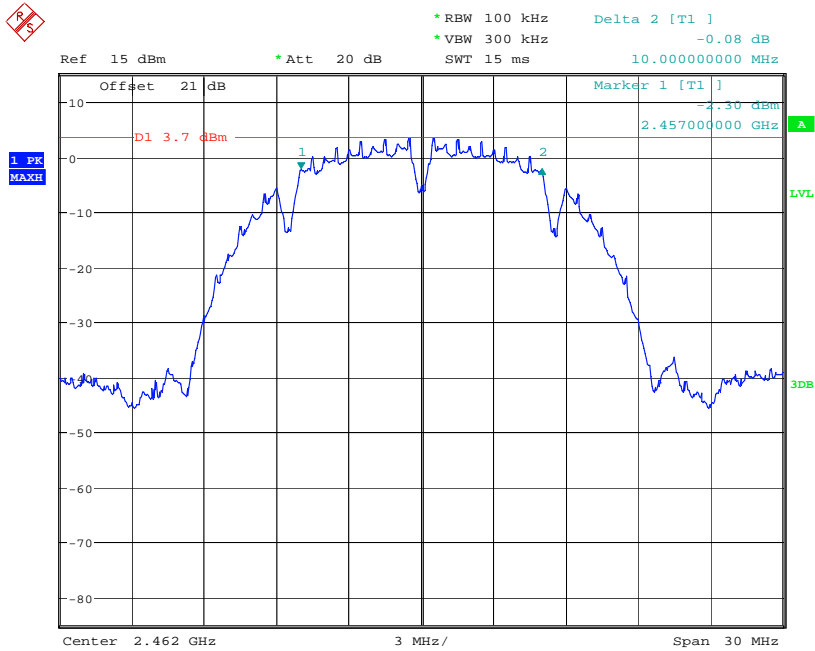
Date: 29.AUG.2013 15:09:42

6dB Bandwidth 802.11b 2437 MHz



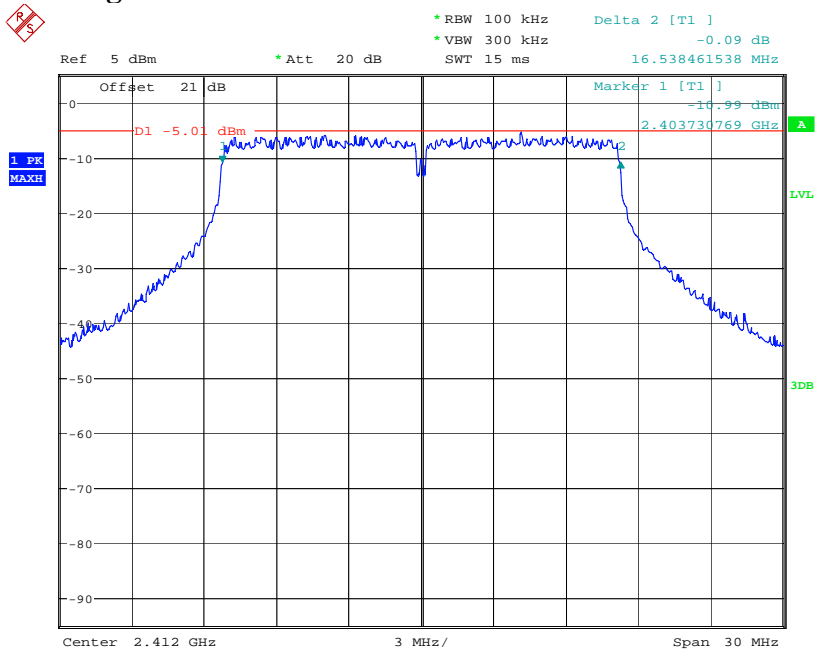
Date: 29.AUG.2013 16:04:14

6dB Bandwidth 802.11b 2462 MHz



Date: 29.AUG.2013 16:17:47

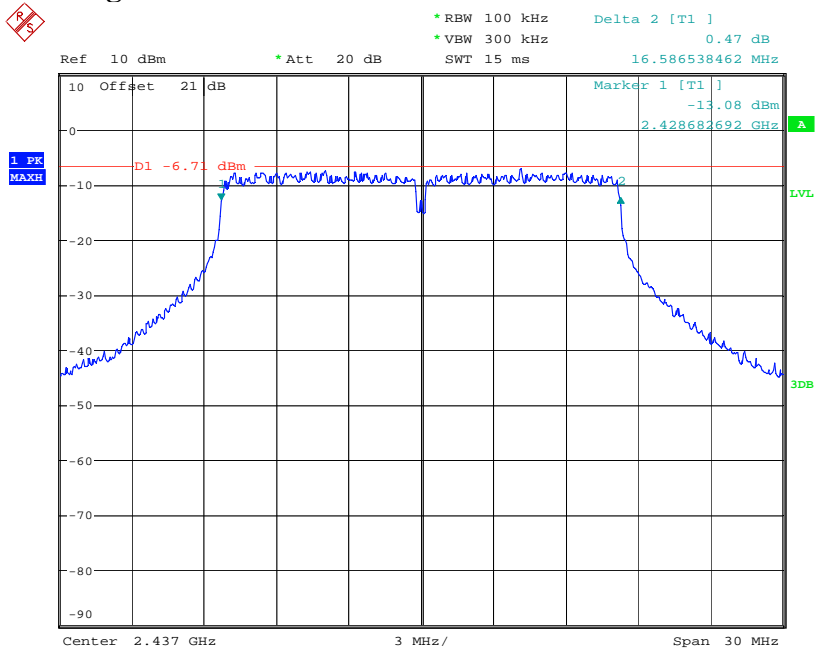
6dB Bandwidth 802.11g 2412 MHz



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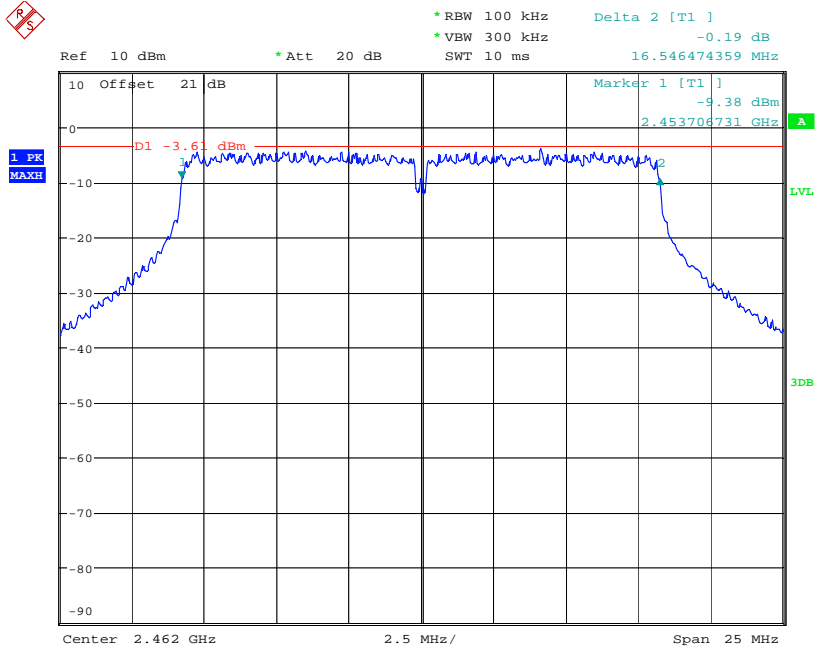


6dB Bandwidth 802.11g 2437 MHz



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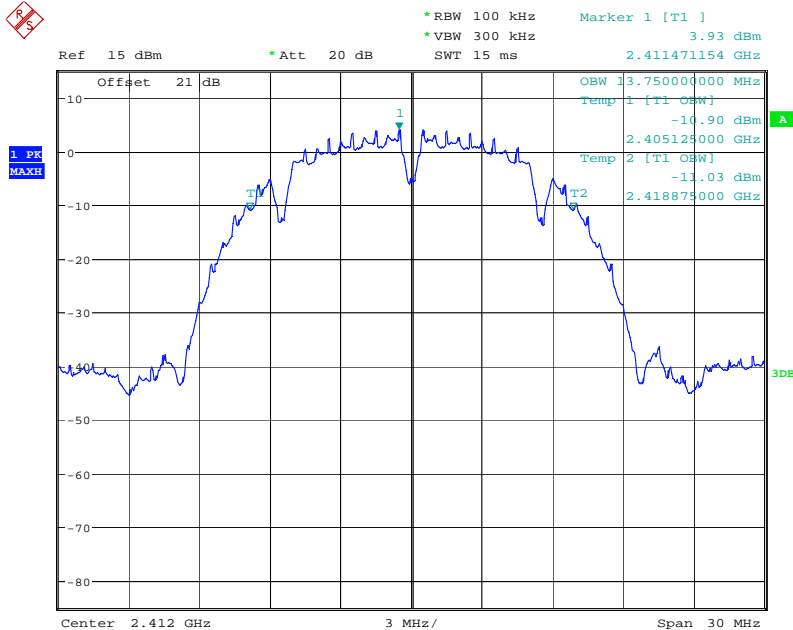
6dB Bandwidth 802.11g 2462 MHz



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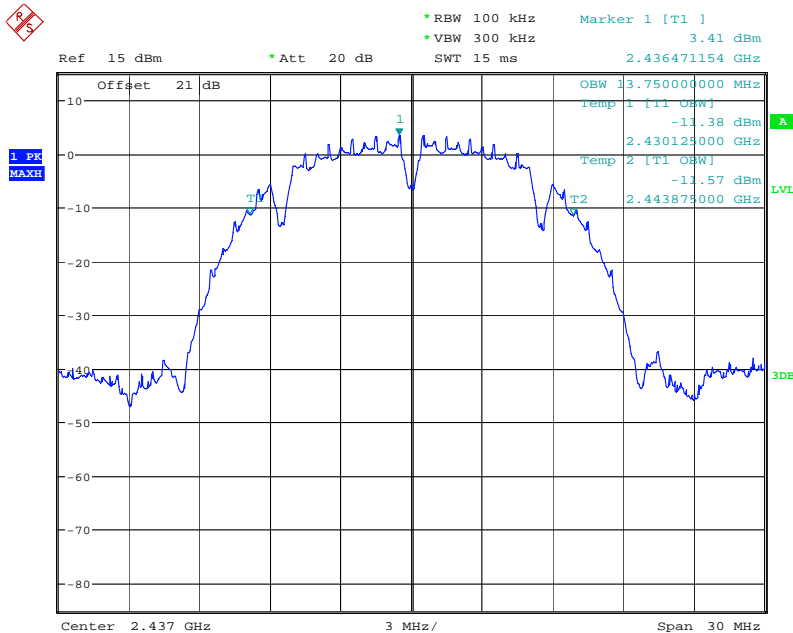
6.3.6.2 2.4 GHz Occupied Bandwidth:

99% Bandwidth 802.11b 2412 MHz



Date: 29.AUG.2013 15:33:08

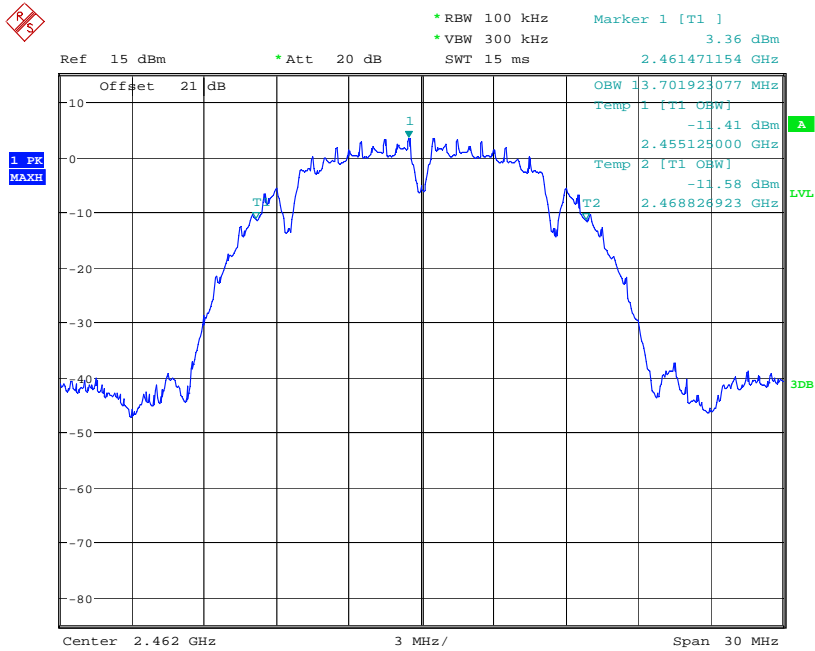
99% Bandwidth 802.11b 2437 MHz



Date: 29.AUG.2013 16:30:29

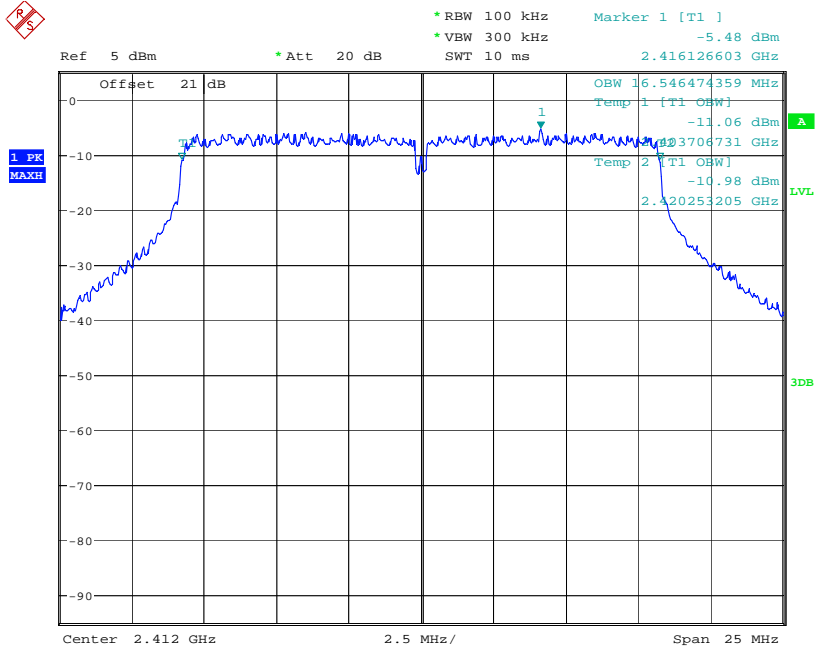


99% Bandwidth 802.11b 2462 MHz



Date: 29.AUG.2013 16:20:33

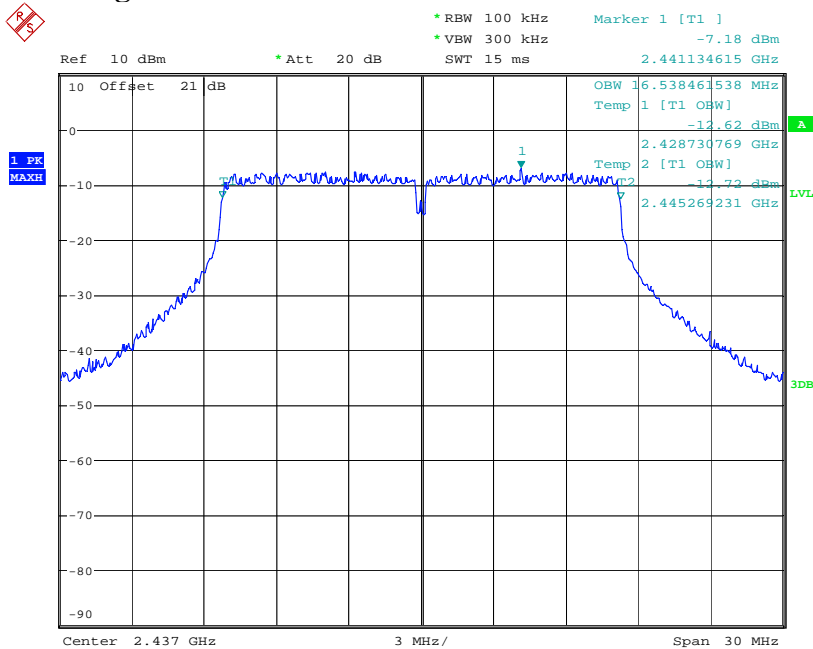
99% Bandwidth 802.11g 2412 MHz



Date: 29.AUG.2013 18:12:58

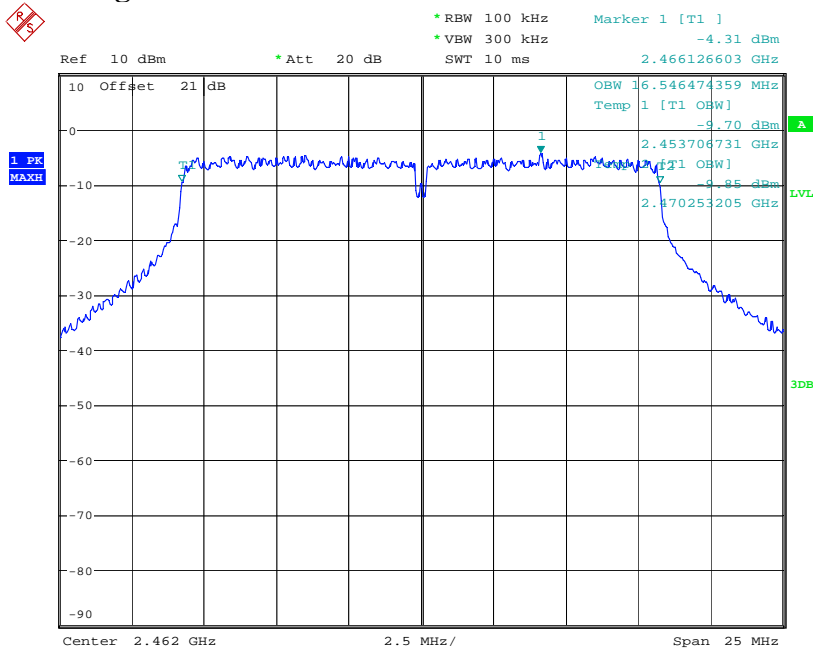


99% Bandwidth 802.11g 2437 MHz



Date: 29.AUG.2013 18:34:39

99% Bandwidth 802.11g 2462 MHz



Date: 29.AUG.2013 19:51:17



6.4 Maximum Power Spectral Density Level in the Fundamental Emission

6.4.1 Limits:

§ 15.247 (e)

RSS-210 A8.2 (b)

For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

6.4.2 Test procedure:

Measurement according to FCC KDB 558074 D01 Meas Guidance v03, section 10.2

1. Set the analyzer center frequency to DTS channel center frequency
2. Span = 1.5 x DTS channel Bandwidth
3. Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
4. Set the VBW $\geq 3 \times \text{RBW}$
5. Detector: Peak – Max hold

6.4.3 Test Conditions:

Tnom: 20°C; Vnom: 3.8 VDC

6.4.4 Test Verdict:

Pass

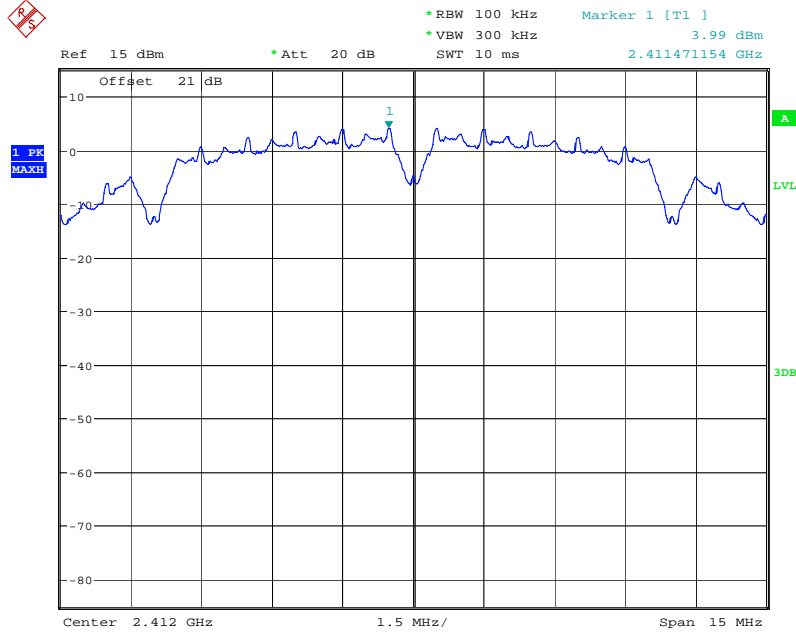
6.4.5 Test results:

Power Spectral Density (dBm/3kHz)			
Mode	Frequency (MHz)		
	2412 Channel 1	2437 Channel 6	2462 Channel 11
802.11b	-11.24	-11.77	-11.8
802.11g	-20.70	-22.43	-19.55
Measurement Uncertainty: ±0.5dB			

Notes: Given results are values measured with RBW 100 kHz but re-calculated to RBW 3 kHz by the factor $10 \cdot \log(3\text{kHz}/100\text{kHz}) = (-15.23 \text{ dB})$

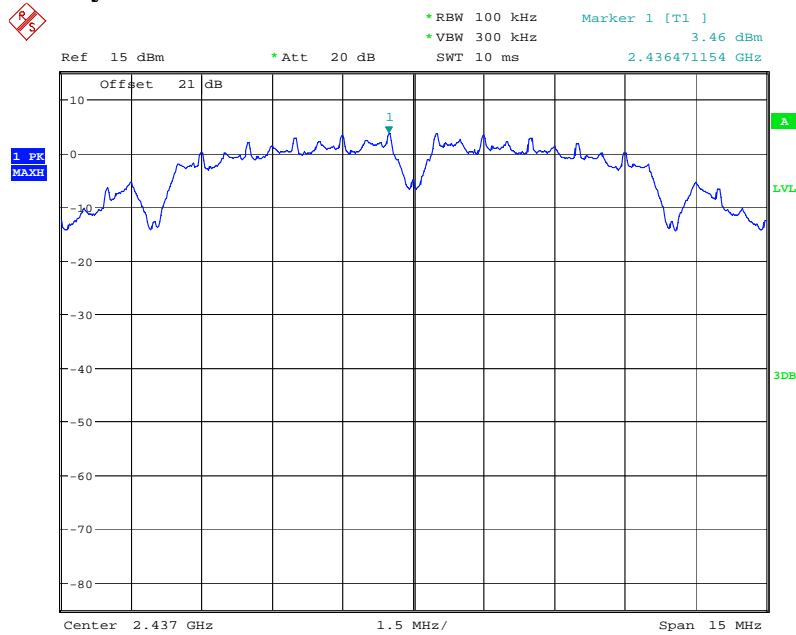
6.4.6 Test Data/plots:

Power Spectral Density 802.11b 2412 MHz



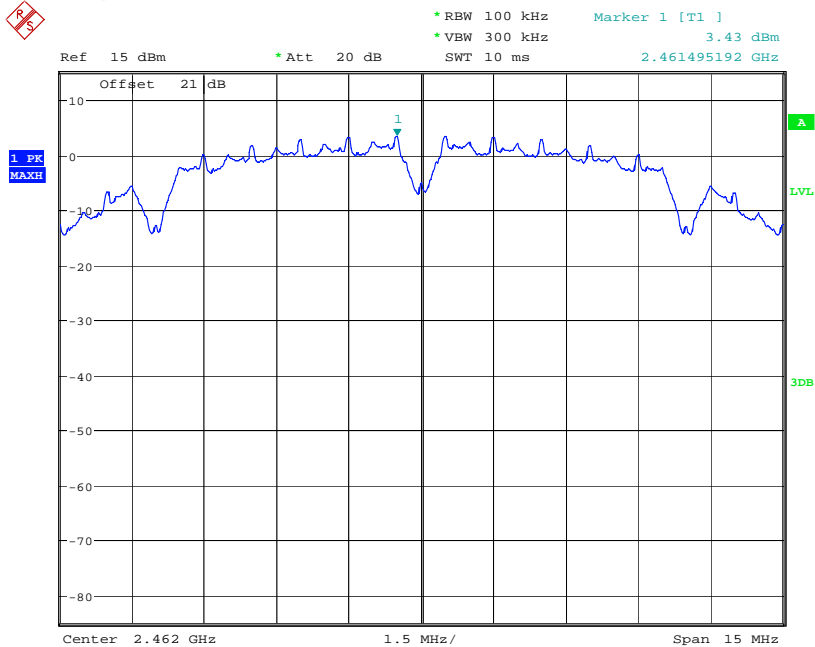
Date: 29.AUG.2013 15:51:07

Power Spectral Density 802.11b 2437 MHz



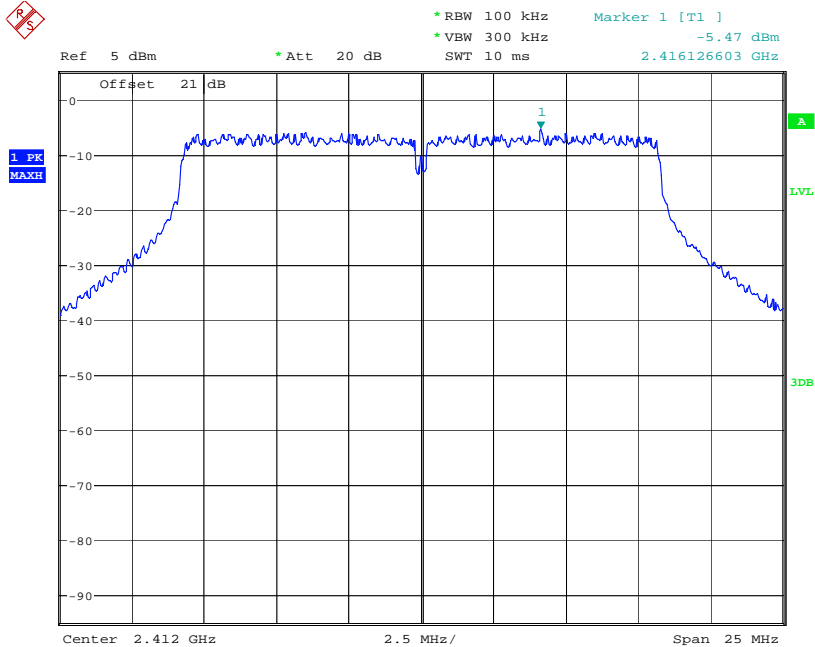
Date: 29.AUG.2013 16:11:35

Power Spectral Density 802.11b 2462 MHz



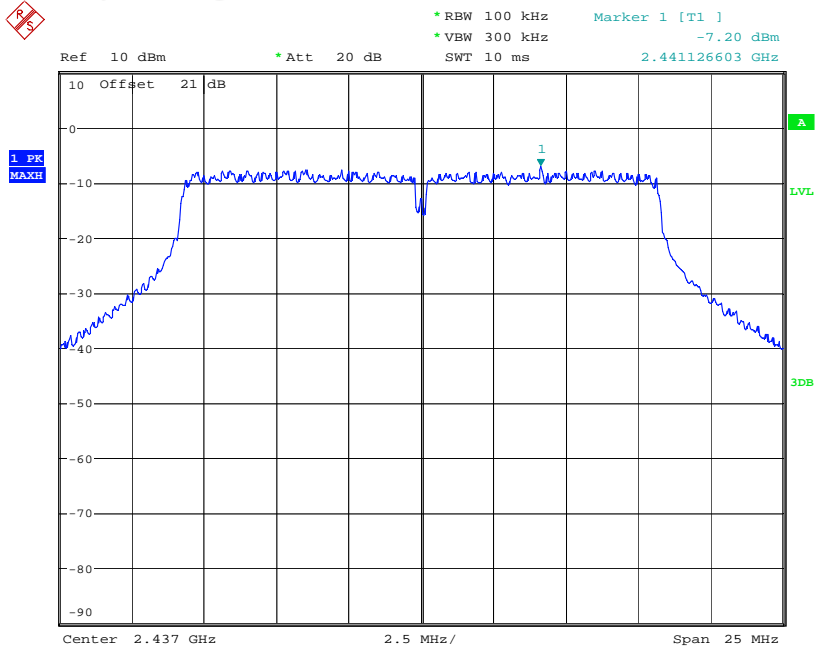
Date: 29.AUG.2013 16:14:27

Power Spectral Density 802.11g 2412 MHz



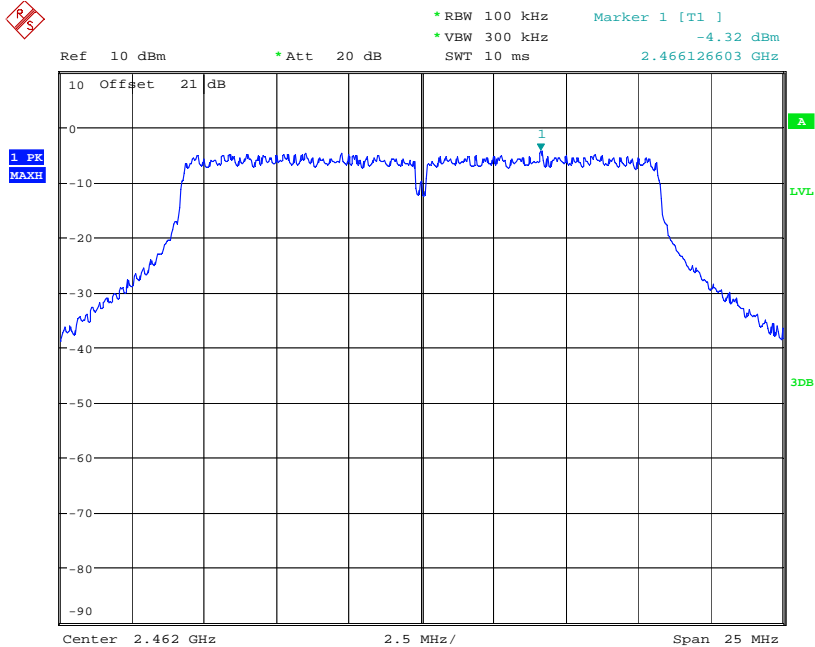
Date: 29.AUG.2013 18:11:32

Power Spectral Density 802.11g 2437 MHz



Date: 29.AUG.2013 18:36:56

Power Spectral Density 802.11g 2462 MHz



Date: 29.AUG.2013 19:39:13

6.5 Unwanted Emissions into Non-Restricted Frequency Bands - Conducted

6.5.1 Reference and Limits:

§ 15.247 (d)

RSS-210 A8.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced 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.

The EUT meets the peak conducted power limits; therefore the limit for the non-restricted bands outside the transmission band is -20 dBc / 100 kHz

6.5.2 Test Conditions:

Tnom: 20°C; Vnom: 3.8 VDC

6.5.3 Test Procedure:

Measurement according to FCC KDB 558074 D01 Meas Guidance v03, section 11.0 – Unwanted Emissions into Non-Restricted Frequency Bands

Spectrum Analyzer settings:

RBW=100 kHz, VBW=300 kHz, Detector: Peak- Max hold;

Sweep Time: Auto, Span=Full range

6.5.4 Test Result:

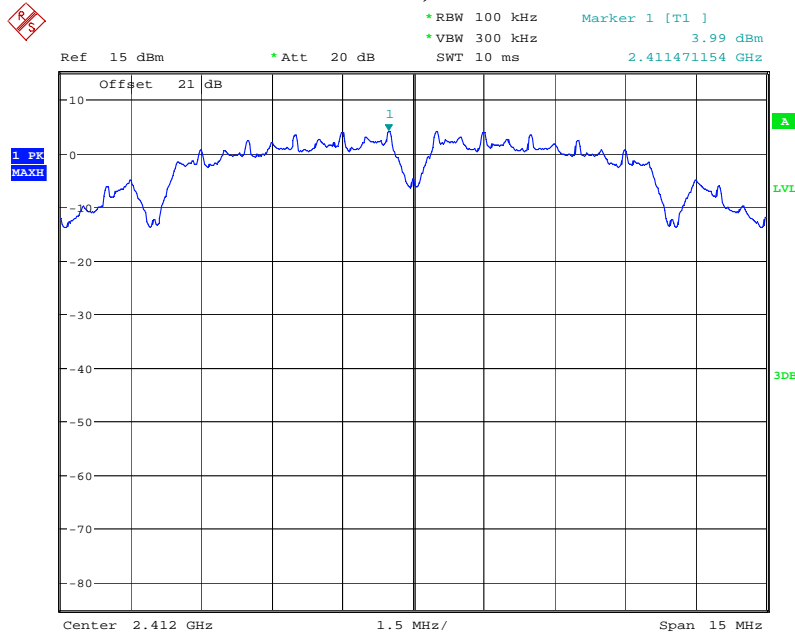
Conducted Unwanted Emissions			
Channel Frequency (MHz)		802.11b	802.11g
Low (2412)	in-band peak PSD	3.99	-5.47
	-20dBc	-16.01	-25.47
	Unwanted Emissions	All other peaks >20dB below limit	
Mid (2437)	in-band peak PSD	3.46	-7.20
	-20dBc	-16.54	-27.20
	Unwanted Emissions	All other peaks >20dB below limit	
High (2462)	in-band peak PSD	3.43	-4.32
	-20dBc	-16.57	-24.32
	Unwanted Emissions	All other peaks >20dB below limit	
Measurement Uncertainty: ±1.0 dB			

6.5.5 Measurement Verdict – Unwanted Emissions into Non-Restricted Frequency Bands-Conducted:

Pass.

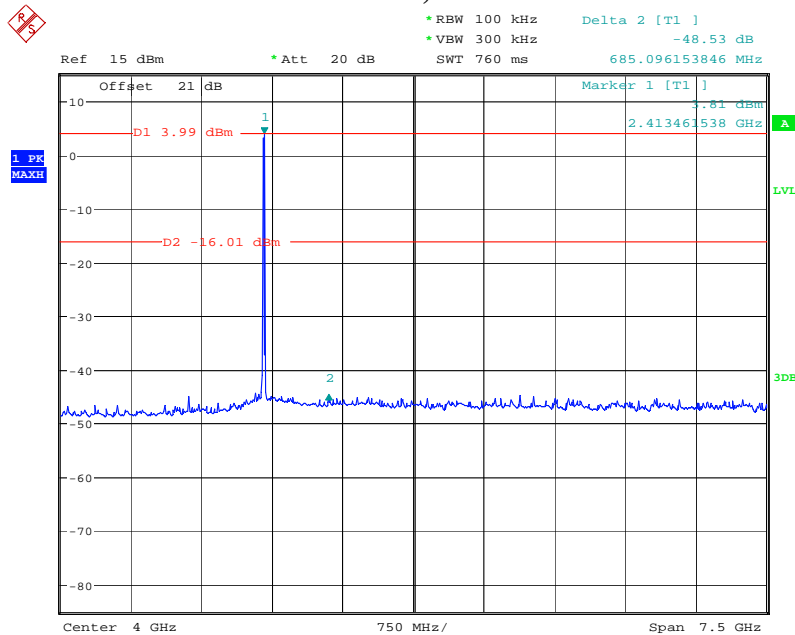
6.5.6 Test data/ plots:

Unwanted emissions into non-restricted Bands, conducted 802.11b 2412 MHz – Reference Level



Date: 29.AUG.2013 15:51:07

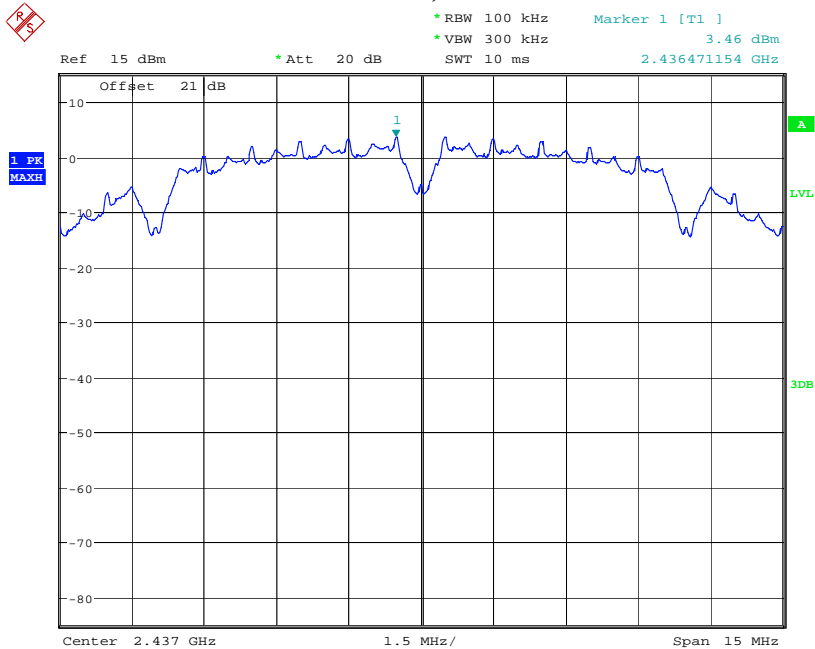
Unwanted emissions into non-restricted Bands, conducted 802.11b 2412 MHz – 30 MHz – 25 GHz



Date: 29.AUG.2013 16:48:16

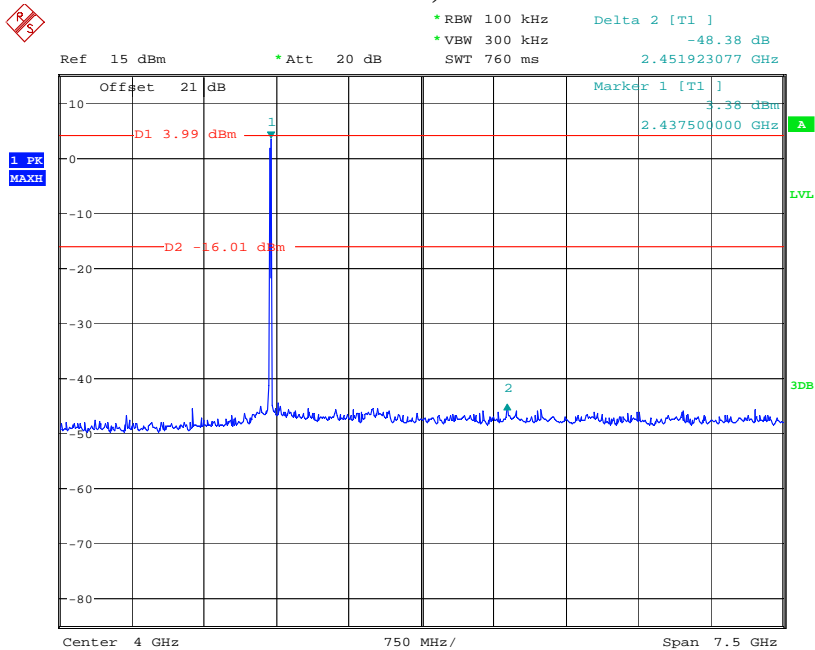


Unwanted emissions into non-restricted Bands, conducted 802.11b 2437 MHz – Reference Level



Date: 29.AUG.2013 16:11:35

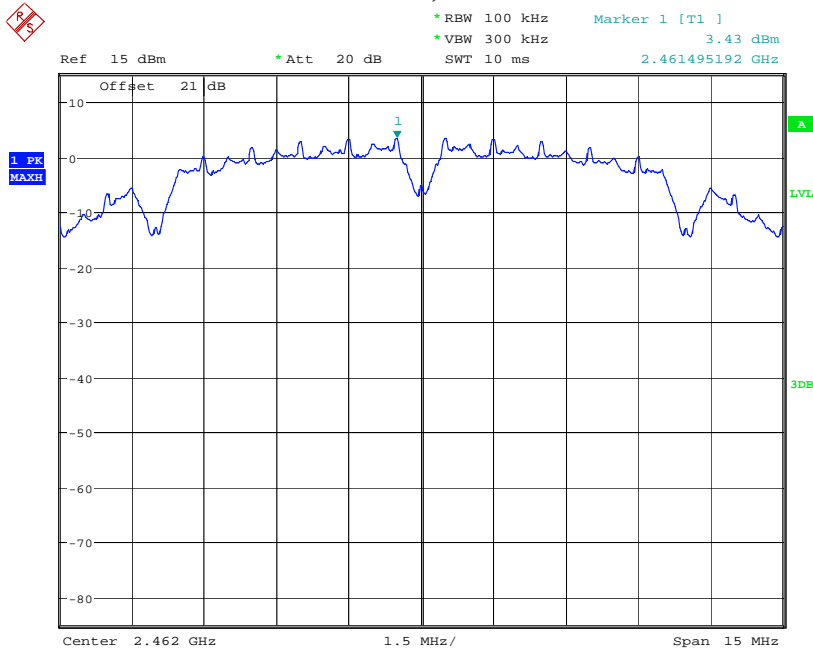
Unwanted emissions into non-restricted Bands, conducted 802.11b 2437 MHz – 30 MHz – 25 GHz



Date: 29.AUG.2013 16:52:01

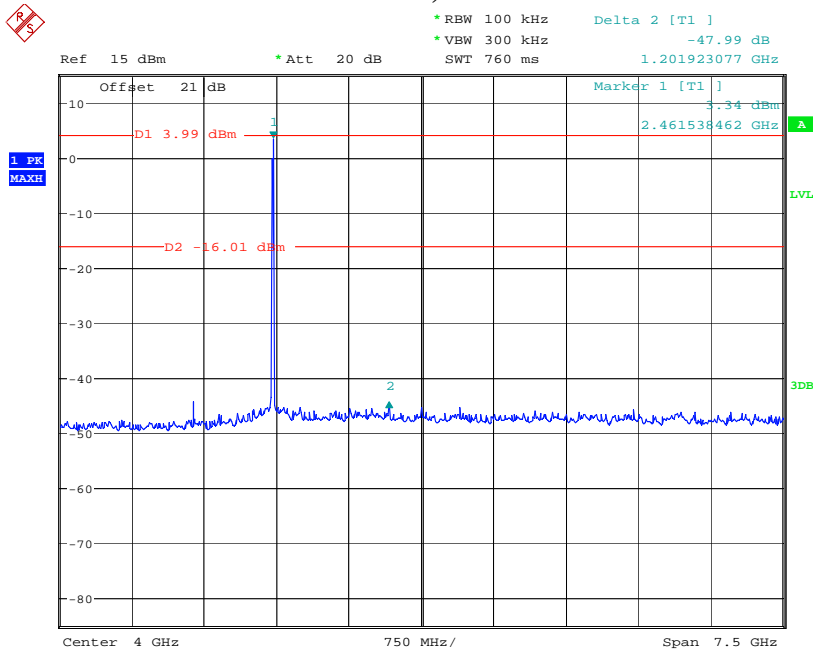


Unwanted emissions into non-restricted Bands, conducted 802.11b 2462 MHz – Reference Level



Date: 29.AUG.2013 16:14:27

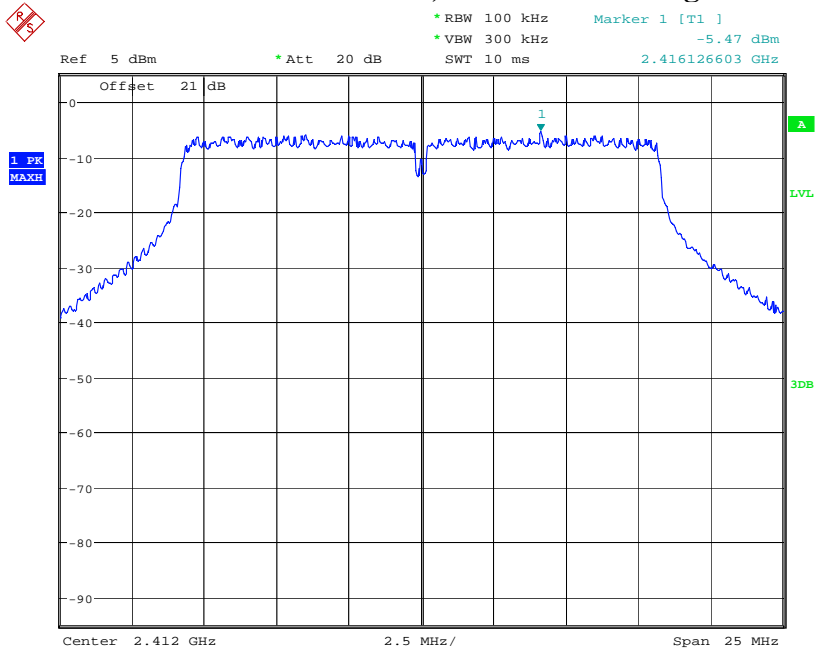
Unwanted emissions into non-restricted Bands, conducted 802.11b 2462 MHz – 30 MHz – 25 GHz



Date: 29.AUG.2013 16:50:36

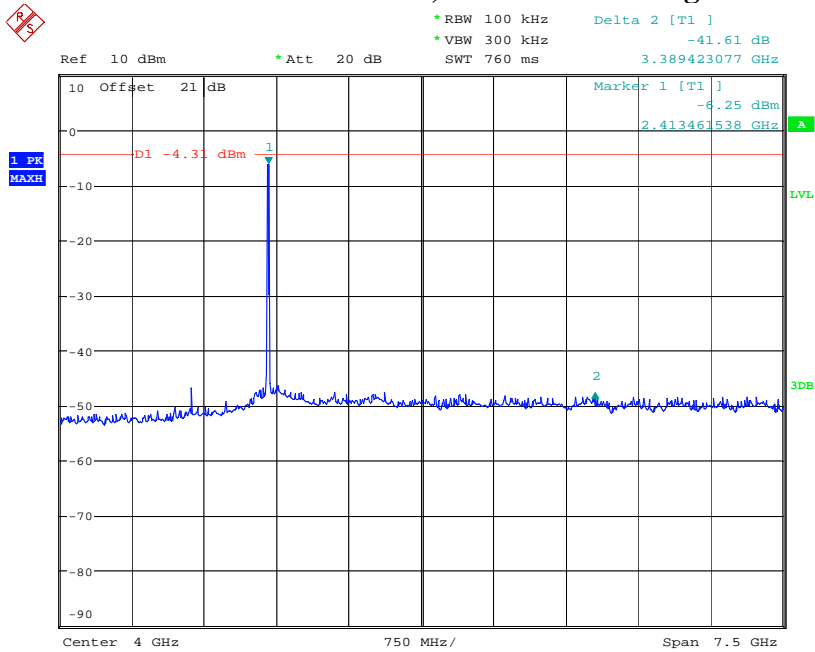


Unwanted emissions into non-restricted Bands, conducted 802.11g 2412 MHz – Reference Level



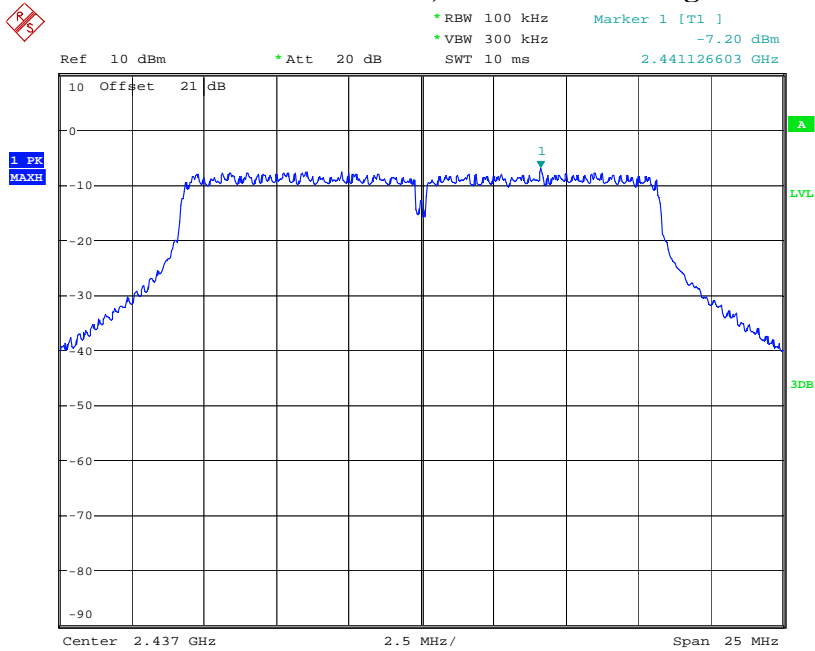
Date: 29.AUG.2013 18:11:32

Unwanted emissions into non-restricted Bands, conducted 802.11g 2412 MHz – 30 MHz – 25 GHz



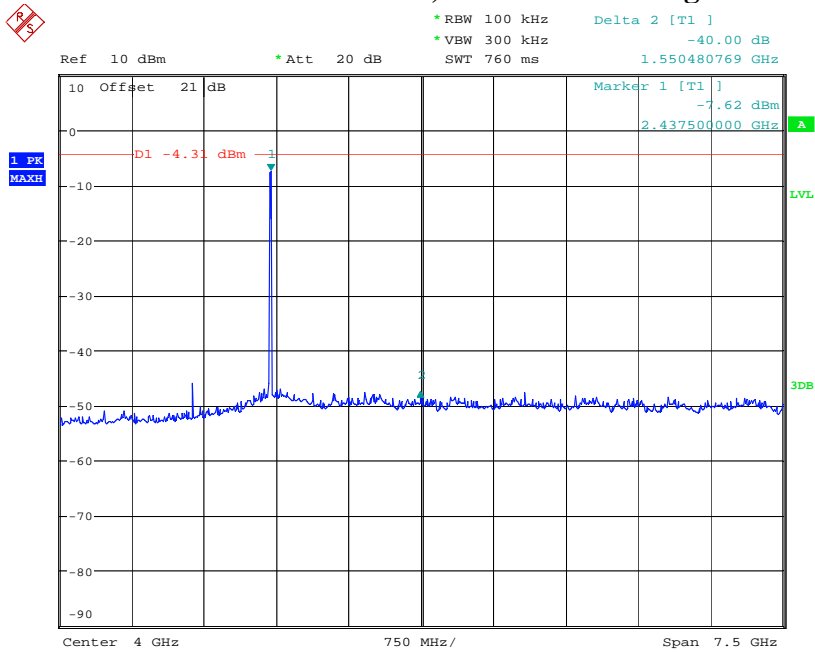
Date: 29.AUG.2013 20:18:44

Unwanted emissions into non-restricted Bands, conducted 802.11g 2437 MHz – Reference Level



Date: 29.AUG.2013 18:36:56

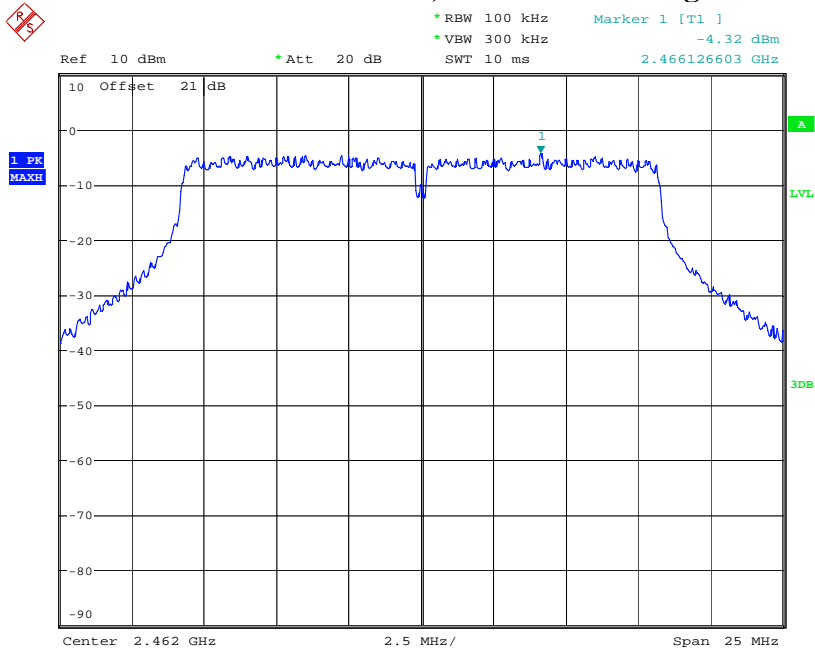
Unwanted emissions into non-restricted Bands, conducted 802.11g 2437 MHz – 30 MHz – 25 GHz



Date: 29.AUG.2013 20:14:26

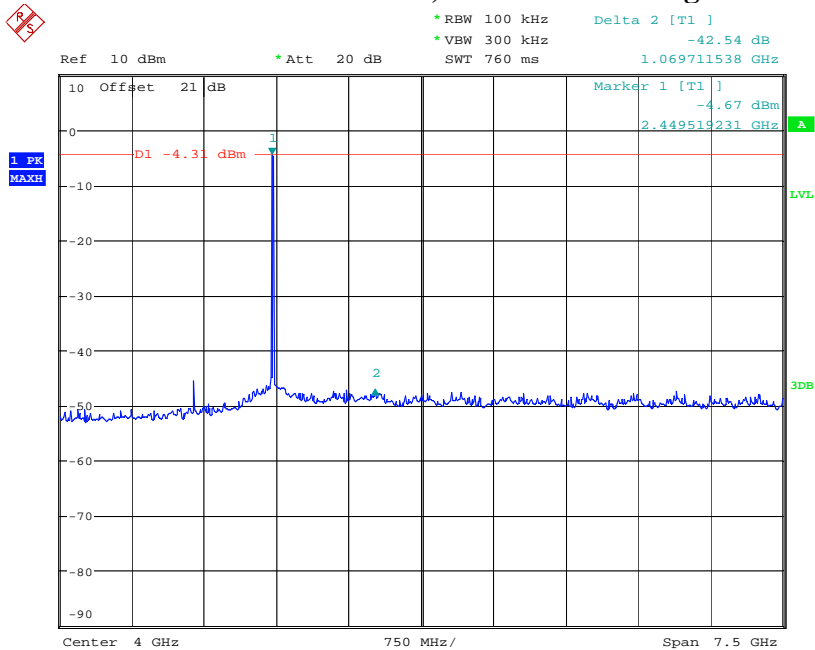


Unwanted emissions into non-restricted Bands, conducted 802.11g 2462 MHz – Reference Level



Date: 29.AUG.2013 19:39:13

Unwanted emissions into non-restricted Bands, conducted 802.11g 2462 MHz – 30 MHz – 25 GHz



Date: 29.AUG.2013 20:11:07



7 Test Equipment and Ancillaries used for tests

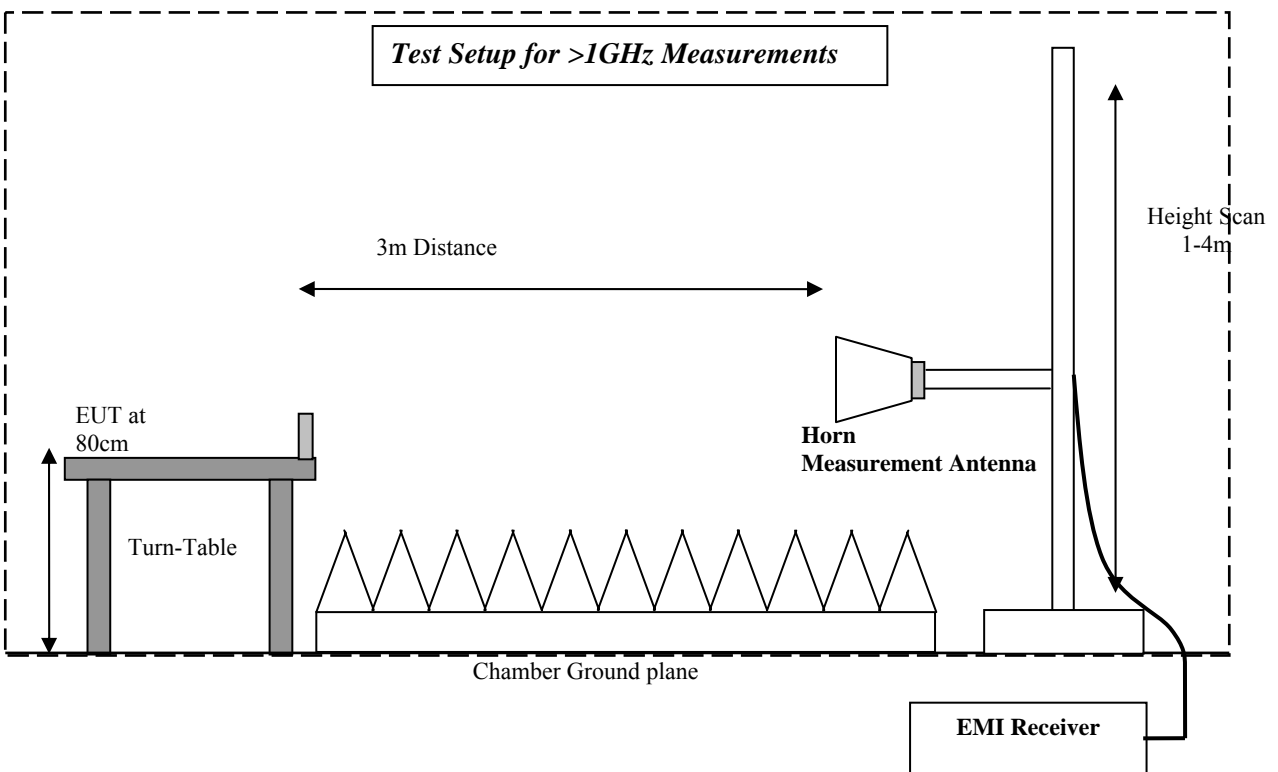
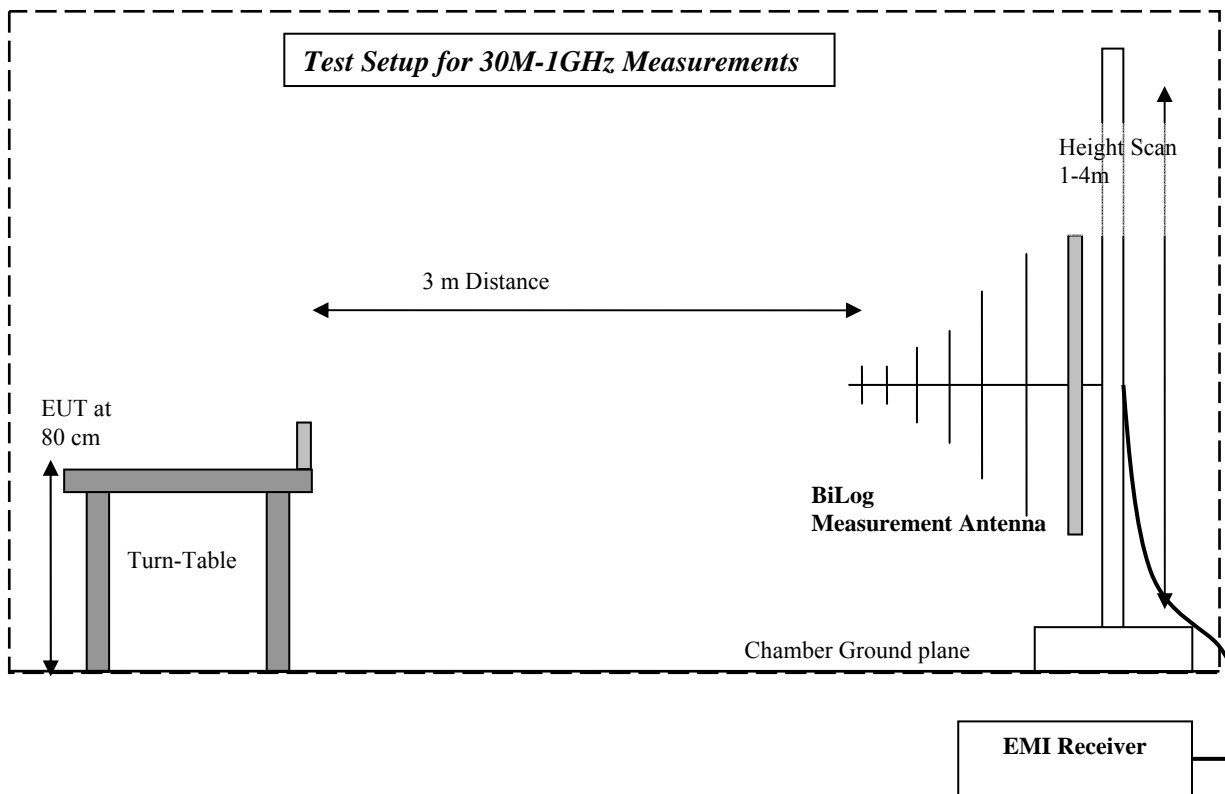
No.	Equipment Name	Manufacturer	Type/model	Serial No.	Cal Date	Cal Interval
3m Semi- Anechoic Chamber:						
	Turn table	EMCO	2075	N/A	N/A	N/A
	MAPS Position Controller	ETS Lindgren	2092	0004-1510	N/A	N/A
	Antenna Mast	EMCO	2075	N/A	N/A	N/A
	Relay Switch Unit	Rohde&Schwarz	RSU	338964/001	N/A	N/A
	EMI Receiver/Analyzer	Rohde&Schwarz	ESU 40	100251	Feb 2013	1 Year
	Spectrum Analyzer	Rohde&Schwarz	FSU	200302	June 2013	2 Years
	1500MHz HP Filter	Filtek	HP12/1700	14c48	N/A	N/A
	2800 MHz HP Filter	Filtek	HP12/2800	14C47	N/A	N/A
	Pre-Amplifier	Miteq	JS40010260	340125	N/A	N/A
	Binconilog Antenna	EMCO	3141	0005-1186	Apr 2012	3 Years
	Binconilog Antenna	ETS	3149	J000123908	Feb 2012	3 years
	Horn Antenna	EMCO	3115	35114	Mar 2012	3 Years
	LISN	FCC	50-25-2-08	08014	Jul 2012	3 Year
Ancillary equipment						
	Multimeter	Klein Tools	MM200	001	Apr 2011	3 Years
	Humidity Temperature Logger	Dickson	TM320	03280063	Mar 2012	2 Year
	Digital Barometer	VWR	35519-055	91119547	Nov 2011	2 Years
	DC Power Supply	HP	E3610A	KR83023316	N/A	N/A
	DC Power Supply	Protek	3003B	H012771	N/A	N/A
	Communication Antenna	IBP5-900/1940	Kathrein	N/A	N/A	N/A

Equipment used meets the measurement uncertainty requirements as required per applicable standards for 95% confidence levels.

Calibration due dates, unless defined specifically, falls on the last day of the month.

Items indicated "N/A" for cal status either do not specifically require calibration or is internally characterized before use.

8 Test Setup Diagrams



Test Report #: EMC_TRIM2-017-13001_DTS

FCC ID: JUP88161

Date of Report : 2013-10-09

IC ID: 1756A-88161



9 Revision History

Date	Report Name	Changes to report	Report prepared by
2013-10-09	EMC_TRIM2-017-13001_DTS	First Version	Josie Sabado