

**Electromagnetic Emissions Test Report
and
Application for Grant of Equipment Authorization
pursuant to**

**Industry Canada RSS-Gen Issue 1 / RSS 210 Issue 6
FCC Part 15 Subpart C**

**on the
2Wire, Inc.
Transmitter
Model: RG2701HG-00 and RG271HG-00**

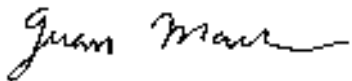
UPN: 3439B-2W2701
FCC ID: PGR2W2701

GRANTEE: 2Wire, Inc.
1704 Automation Parkway
San Jose, CA 95131

TEST SITE: Elliott Laboratories, Inc.
684 W. Maude Ave
Sunnyvale, CA 94086

REPORT DATE: July 26, 2006

FINAL TEST DATE: July 5, July 7, July 12 and July 19, 2006

AUTHORIZED SIGNATORY: 

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2016-01

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REVISION HISTORY

Revision #	Date	Comments	Modified By
1	August 11, 2006	Initial Release	David Guidotti

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SCOPE

An electromagnetic emissions test has been performed on the 2Wire, Inc. model RG2701HG-00 and RG271HG-00 pursuant to the following rules:

Industry Canada RSS-Gen Issue 1
RSS 210 Issue 6 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15 Subpart C

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards and as outlined in Elliott Laboratories test procedures:

ANSI C63.4:2003
RSS-212 Issue 1 Test Facilities and Test Methods for Radio Equipment

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant Industry Canada performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

The test results recorded herein are based on a single type test of the 2Wire, Inc. model RG2701HG-00 and RG271HG-00 and therefore apply only to the tested sample. The sample was selected and prepared by Jeremy Muir of 2Wire, Inc.

OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, all unlicensed transmitters and transceivers require certification. Receive-only devices operating between 30 MHz and 960 MHz are subject to either certification or a manufacturer's declaration of conformity, with all other receive-only devices exempt from the technical requirements.

Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification. Class II devices are required to meet the appropriate technical requirements but are exempt from certification requirements.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

STATEMENT OF COMPLIANCE

The tested sample of 2Wire, Inc. model RG2701HG-00 and RG271HG-00 complied with the requirements of the following regulations:

Industry Canada RSS-Gen Issue 1
RSS 210 Issue 6 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15 Subpart C

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

TEST RESULTS SUMMARY**DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHz)**

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 210 A8.2	Digital Modulation	Systems uses OFDM / DSSS techniques	-	Complies
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth	16.6 MHz (802.11g) 12.3 MHz (802.11b)	>500kHz	Complies
	RSP100	99% Bandwidth	MHz	Information only	Complies
15.247 (b) (3)	RSS 210 A8.2 (4)	Output Power (multipoint systems)	25.5 dBm (.354 Watts) EIRP = 0.447 W ^{Note 1}	1Watt, EIRP limited to 4 Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	3.2 dBm / kHz (802.11b) 2.1 dBm / kHz (802.11g)	8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	All Emissions < 30dB	< -30dBc ^{Note 2}	Complies
15.247(c) / 15.209	RSS 210 A8.5	Radiated Spurious Emissions 30MHz – 25 GHz	53.7 dBuV/m @ 2483.5 MHz (-0.3 dB)	15.207 in restricted bands, all others <-30dBc ^{Note 2}	Complies

Note 1: EIRP calculated using antenna gain of dBi (1) for the highest EIRP multi-point system

Note 2: Limit of -30dBc used because the power was measured using the UNII test procedure (maximum power averaged over a transmission burst) / RMS averaging over a time interval, as permitted under RSS 210 section A8.4(4).

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Antenna is permanently attached		Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	36 dBuV/m @ 2000 MHz (-18 dB)	Refer to standard	Complies
15.207	RSS GEN Table 2	AC Conducted Emissions	47.5 dBuV @ .517 MHz (-8.5 dB)	Refer to standard	Complies
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations in Exhibit 11, RSS 102 declaration and User Manual statements.	Refer to OET 65, FCC Part 1 and RSS 102	Complies
	RSP 100 RSS GEN 7.1.5	User Manual		Statement required regarding non-interference	

MEASUREMENT UNCERTAINTIES

ISO Guide 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

Measurement Type	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	± 2.4
Radiated Emissions	0.015 to 30	± 3.0
Radiated Emissions	30 to 1000	± 3.6
Radiated Emissions	1000 to 40000	± 6.0

EQUIPMENT UNDER TEST (EUT) DETAILS**GENERAL**

The 2Wire, Inc. model RG2701HG-00 and RG271HG-00 is a ADSL router that is designed to provide ADSL internet connectivity to home users. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 120 Volts , 60 Hz, 0.3 Amps.

The sample was received on July 5, 2006 and tested on July 5, July 7, July 12 and July 19, 2006. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number	FCC ID
2Wire	RG2701	ADSL Router	-	DoC
Sunfone	ACW011C-05U	AC/DC Adapter	-	N/A

ANTENNA SYSTEM

The antenna system used with the 2Wire, Inc. model RG2701HG-00 and RG271HG-00 is permanently attached.

ENCLOSURE

The EUT enclosure is primarily constructed of plastic. It measures approximately 19 cm wide by 16.5 cm deep by 3.5 cm high.

MODIFICATIONS

The EUT did not require modifications during testing in order to comply with emissions specifications.

SUPPORT EQUIPMENT

The following equipment was used as local support equipment for emissions testing:

Manufacturer	Model	Description	Serial Number	FCC ID
DELL	PPX	INSPIRON 3700 Laptop	-	-
Epson	P110A	Printer	A6R1320291	DoC

EUT INTERFACE PORTS

The I/O cabling configuration during emissions testing was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Ethernet	Local Laptop	CAT 5	Unshielded	1.0
Ethernet (x2)	Unterminated	CAT 5	Unshielded	1.0
Parallel	Local Laptop	Multiconductor	Shielded	1.5
DC Power	AC/DC Adapter	Multiconductor	Unshielded	1.0

EUT OPERATION

During emissions testing the EUT was set to transmit at maximum power on the low, middle, and high channels.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on July 5, July 7, July 12 and July 19, 2006 at the Elliott Laboratories Open Area Test Site #1 & 2 located at 684 West Maude Avenue, Sunnyvale, California or 41039 Boyce Road, Fremont, California Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission.

ANSI C63.4:2003 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement with the exception of predictable local TV, radio, and mobile communications traffic. The test site contains separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4:2003 and RSS 212.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4:2003 and RSS 212. Measurements are made with the EUT connected to the public power network through a nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment or in a semi-anechoic chamber. The test sites are maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4:2003 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4:2003 / RSS 212.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements. If the repetition frequency of the signal being measured is below 20Hz, peak measurements are made in lieu of Quasi-Peak measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz, unless the signal is pulsed in which case the average (or video) bandwidth of the measuring instrument is reduced to onset of pulse desensitization and then increased.

INSTRUMENT CONTROL COMPUTER

The receivers utilize either a Rohde & Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers.

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer run automated data collection programs which control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A loop antenna is used below 30 MHz. For the measurement range 30 MHz to 1000 MHz either a combination of a biconical antenna and a log periodic or a bi-log antenna is used. Above 1000 MHz, horn antennas are used. The antenna calibration factors to convert the received voltage to an electric field strength are included with appropriate cable loss and amplifier gain factors to determine an overall site factor, which is then programmed into the test receivers or incorporated into the test software.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

ANSI C63.4:2003 and RSS 212 specify that the test height above ground for table mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

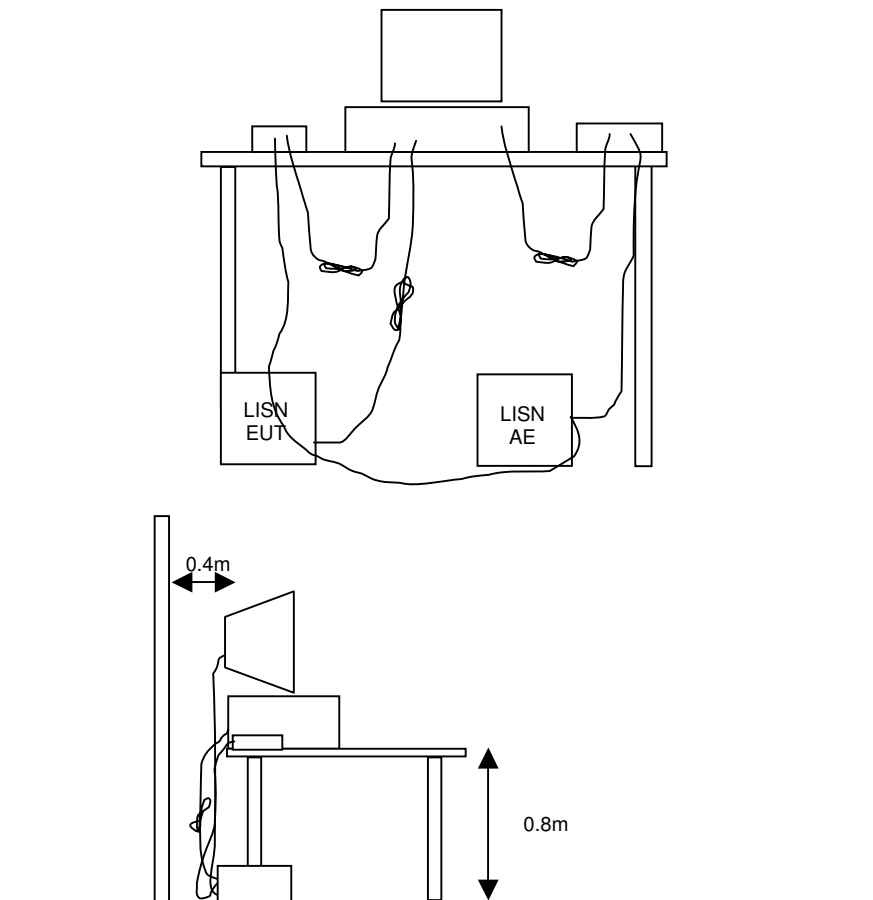
TEST PROCEDURES

EUT AND CABLE PLACEMENT

The regulations require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4:2003, and the worst-case orientation is used for final measurements.

CONDUCTED EMISSIONS

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord.

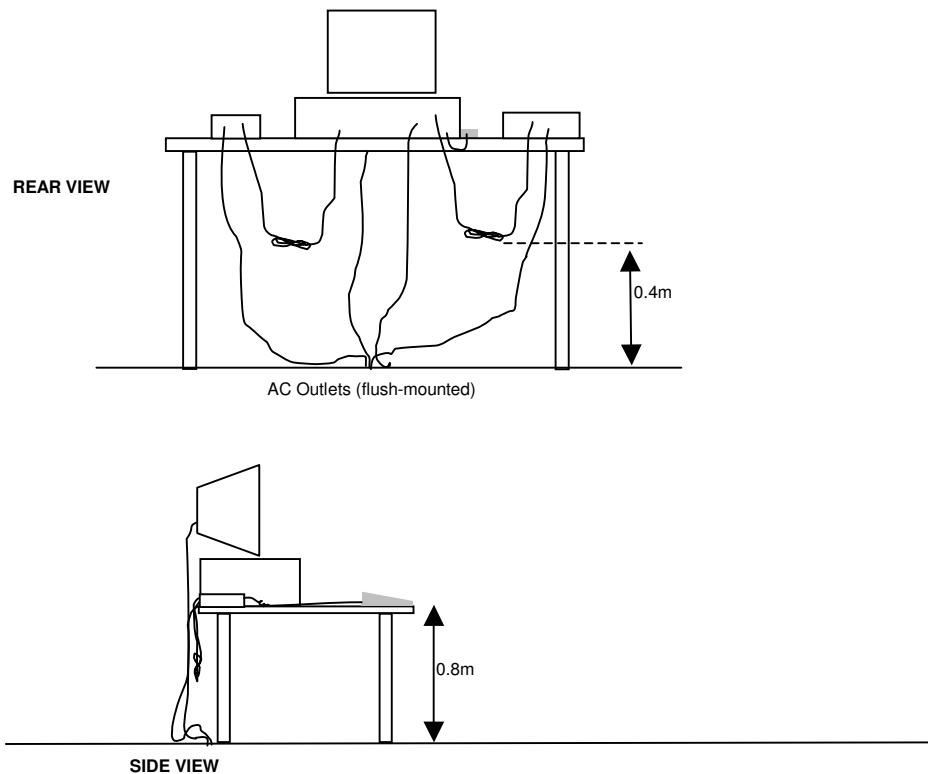


RADIATED EMISSIONS

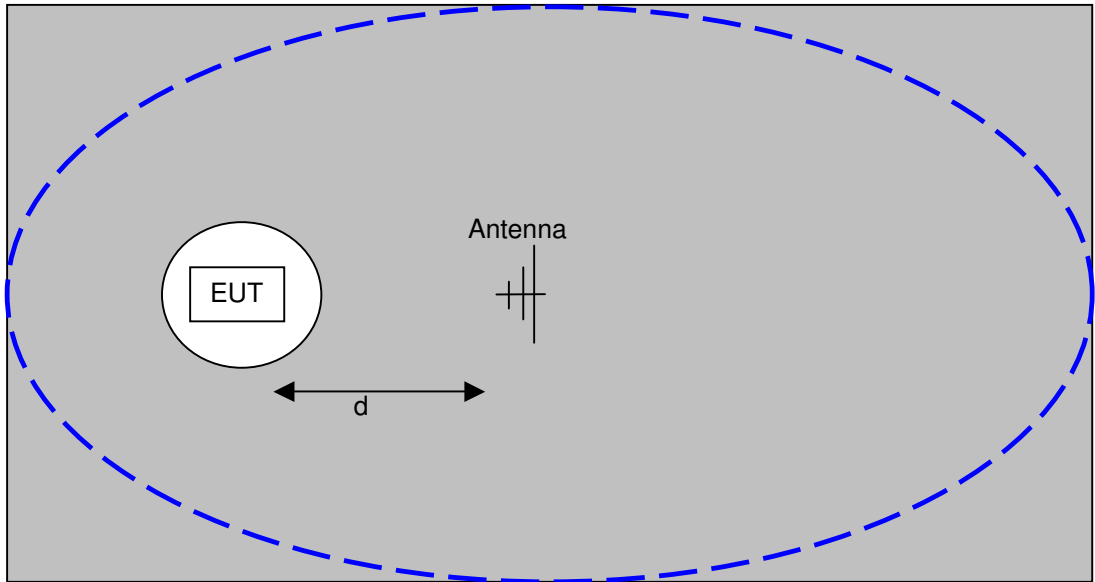
A preliminary scan of the radiated emissions is performed in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one scan for each antenna polarization (horizontal and vertical; loop parallel and perpendicular to the EUT). During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied (for measurements above 30 MHz) and cable positions are varied to determine the highest emission relative to the limit. Preliminary scans may be performed in a fully anechoic chamber for the purposes of identifying the frequencies of the highest emissions from the EUT.

A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

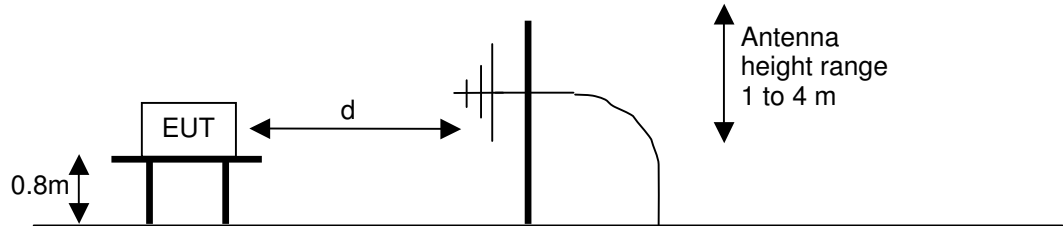
Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth, which results in the highest emission is then maintained while varying the antenna height from one to four meters (for measurements above 30 MHz, measurements below 30 MHz are made with the loop antenna at a fixed height of 1m). The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain.



Typical Test Configuration for Radiated Field Strength Measurements



The ground plane extends beyond the ellipse defined in CISPR 16 / CISPR 22 / ANSI C63.4 and is large enough to accommodate test distances (d) of 3m and 10m. Refer to the test data tables for the actual measurement distance.



Test Configuration for Radiated Field Strength Measurements
OATS- Plan and Side Views

BANDWIDTH MEASUREMENTS

The 6dB, 20dB and/or 26dB signal bandwidth is measured in using the bandwidths recommended by ANSI C63.4. When required, the 99% bandwidth is measured using the methods detailed in RSS GEN.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

CONDUCTED EMISSIONS SPECIFICATION LIMITS: FCC 15.207; FCC 15.107(a), RSS GEN

The table below shows the limits for the emissions on the AC power line from an intentional radiator and a receiver.

Frequency (MHz)	Average Limit (dBuV)	Quasi Peak Limit (dBuV)
0.150 to 0.500	Linear decrease on logarithmic frequency axis between 56.0 and 46.0	Linear decrease on logarithmic frequency axis between 66.0 and 56.0
0.500 to 5.000	46.0	56.0
5.000 to 30.000	50.0	60.0

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands¹ (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

Frequency Range (MHz)	Limit (uV/m)	Limit (dBuV/m @ 3m)
0.009-0.490	$2400/F_{\text{KHz}} @ 300\text{m}$	$67.6-20*\log_{10}(F_{\text{KHz}}) @ 300\text{m}$
0.490-1.705	$24000/F_{\text{KHz}} @ 30\text{m}$	$87.6-20*\log_{10}(F_{\text{KHz}}) @ 30\text{m}$
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100 @ 3m	40 @ 3m
88 to 216	150 @ 3m	43.5 @ 3m
216 to 960	200 @ 3m	46.0 @ 3m
Above 960	500 @ 3m	54.0 @ 3m

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from receivers as detailed in FCC Part 15.109, RSS 210 Table 2, RSS GEN Table 1 and RSS 310 Table 3. Note that receivers operating outside of the frequency range 30 MHz – 960 MHz are exempt from the requirements of 15.109.

Frequency Range (MHz)	Limit (uV/m @ 3m)	Limit (dBuV/m @ 3m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

¹ The restricted bands are detailed in FCC 15.203, RSS 210 Table 1 and RSS 310 Table 2

OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS

The table below shows the limits for output power and output power density. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Output Power	Power Spectral Density
902 – 928	1 Watt (30 dBm)	8 dBm/3kHz
2400 – 2483.5	1 Watt (30 dBm)	8 dBm/3kHz
5725 – 5850	1 Watt (30 dBm)	8 dBm/3kHz

The maximum permitted output power is reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5850 MHz band are not subject to this restriction.

TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

The limits for unwanted (spurious) emissions from the transmitter falling in the restricted bands are those specified in the general limits sections of FCC Part 15 and RSS 210. All other unwanted (spurious) emissions shall be at least 20dB below the level of the highest in-band signal level (30dB if the power is measured using the sample detector/power averaging method).

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form) as follows:

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor, when used for electric field measurements above 30MHz, is calculated by using the following formula:

$$F_d = 20 * \text{LOG}_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

For electric field measurements below 30MHz the extrapolation factor is either determined by making measurements at multiple distances or a theoretical value is calculated using the formula:

$$F_d = 40 * \text{LOG}_{10} (D_m/D_s)$$

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

$$R_r = \text{Receiver Reading in dBuV/m}$$

$$F_d = \text{Distance Factor in dB}$$

$$R_c = \text{Corrected Reading in dBuV/m}$$

$$L_s = \text{Specification Limit in dBuV/m}$$

$$M = \text{Margin in dB Relative to Spec}$$

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp), or where a field strength measurement of output power is made in lieu of a direct measurement, the following formula is used to convert between eirp and field strength at a distance of 3m from the equipment under test:

$$E = \frac{1000000 \sqrt{30 P}}{3} \quad \text{microvolts per meter}$$

where P is the eirp (Watts)

EXHIBIT 1: Test Equipment Calibration Data

1 Page

Radiated Emissions, 30 - 2,000 MHz, 06-Jul-06**Engineer: Riaz Momand**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	487	24-May-08
Hewlett Packard	EMC Spectrum Analyzer, 9 kHz - 6.5 GHz	8595EM	787	10-Jan-07
EMCO	Log Periodic Antenna, 0.2-2 GHz	3148	1321	30-Mar-07
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	23-Aug-06
EMCO	Biconical Antenna, 30-300 MHz	3110B	1498	03-Mar-07

Conducted Emissions - AC Power Ports, 06-Jul-06**Engineer: Riaz Momand**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Elliott Laboratories	LISN-2 + 2 (Solar 8028 + 6512 Cap)	LISN-1	198	19-Dec-06
Elliott Laboratories	LISN, FCC / CISPR	LISN-3, OATS	304	30-Jun-07
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	13-Jan-07
Filtek	Filter, 1 GHz High Pass	HP12/1000-5BA	957	24-Apr-07
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	23-Aug-06

Transmitter Specific Emissions, 07-Jul-06**Engineer: Mark Hill**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FMT (SA40) Blue	8564E (84125C)	1393	10-Nov-06
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1534	21-Apr-07
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	10-May-07
Rohde & Schwarz	Attenuator, 20 dB , 50 Ω , 10W, DC-18 GHz	20dB, 10W, Type N	1795	31-Jan-07

Conducted Emissions, 12-Jul-06**Engineer: Riaz Momand**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Elliott Laboratories	LISN-2 + 2 (Solar 8028 + 6512 Cap)	LISN-1	198	19-Dec-06
Rohde & Schwarz	Test Receiver, 0.009-30 MHz	ESH3	274	28-Feb-07
Elliott Laboratories	LISN, FCC / CISPR	LISN-3, OATS	304	30-Jun-07
Hewlett Packard	EMC Spectrum Analyzer, 9 kHz - 6.5 GHz	8595EM	787	10-Jan-07
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1398	03-Feb-07

Radiated Emissions, 30 - 26,000 MHz, 19-Jul-06**Engineer: Mark Briggs**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	13-Jan-07
Hewlett Packard	Test Sys Head (Inc W1-W4, 1143, 1144)	84125C	1145	07-Sep-06
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	19-May-07
EMCO	Antenna, Horn, 18-26.5 GHz (SA40 30Hz)	3160-09 (84125C)	1150	12-Sep-06
EMCO	Antenna, Horn, 26.5-40 GHz (SA40 30Hz)	3160-10 (84125C)	1151	12-Sep-06
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1534	21-Apr-07
EMCO	Antenna, Horn, 1-18 GHz (SA40 9kHz)	3115	1779	07-Feb-07
Rohde & Schwarz	Power Sensor 300 uW - 30 Watts	NRV-Z54	1788	20-Jan-07

EXHIBIT 2: Test Measurement Data

36 Pages



EMC Test Data

Client:	2Wire	Job Number:	J63083
Model:	RG2701 with SunFone Power Supply	Test-Log Number:	T63701
		Project Manager:	Mark Hill
Contact:	Jeremy Muir		
Emissions Spec:	EN55022/FCC, 15.247, RSS-210	Class:	B
Immunity Spec:	EN 300 386	Environment:	TTE

EMC Test Data

For The

2Wire

Model

RG2701 with SunFone Power Supply

Date of Last Test: 8/7/2006



EMC Test Data

Client:	2Wire	Job Number:	J63083
Model:	RG2701 with SunFone Power Supply	Test-Log Number:	T63701
Contact:	Jeremy Muir	Project Manager:	Mark Hill
Emissions Spec:	EN55022/FCC, 15.247, RSS-210	Class:	B
Immunity Spec:	EN 300 386	Environment:	TTE

EUT INFORMATION

*The following information was collected during the test sessions(s).
The client agreed provide the following information after the test session(s).*

General Description

The EUT is a ADSL router that is designed to provide ADSL internet connectivity to home users. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 120 Volts , 60 Hz, 0.3 Amps.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
2Wire	RG2701	ADSL Router		DoC
Sunfone	ACW011C-05U	AC/DC Adapter		N/A

EUT Enclosure

The EUT enclosure is primarily constructed of plastic. It measures approximately 19 cm wide by 16.5 cm deep by 3.5 cm high.

Modification History

Mod. #	Test	Date	Modification
1	-	-	None
2			
3			

Modifications applied are assumed to be used on subsequent tests unless otherwise stated as a further modification.



EMC Test Data

Client:	2Wire	Job Number:	J63083
Model:	RG2701 with SunFone Power Supply	T-Log Number:	T63701
Contact:	Jeremy Muir	Project Manager:	Mark Hill
Emissions Spec:	EN55022/FCC, 15.247, RSS-210	Class:	B
Immunity Spec:	EN 300 386	Environment:	TTE

Test Configuration #1

The following information was collected during the test sessions(s).

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
DELL	PPX	INSPIRON 3700 Laptop	-	-
Epson	P110A	Printer	A6R1320291	DoC

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
None	-	-	-	-

Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Ethernet	Local Laptop	CAT 5	Unshielded	1.0
Ethernet (x2)	Unterminated	CAT 5	Unshielded	1.0
Parallel	Local Laptop	Multiconductor	Shielded	1.5
DC Power	AC/DC Adapter	Multiconductor	Unshielded	1.0

Note: The RJ-11 port was not connected during testing. As this was not need to have the radio operating.

EUT Operation During Radio Tests

During emissions testing the EUT was set to transmit at maximum power on the low, middle, and high channels.



EMC Test Data

Client:	2Wire	Job Number:	J63083
Model:	RG2701 with SunFone Power Supply	T-Log Number:	T63701
Contact:	Jeremy Muir	Project Manager:	Mark Hill
Emissions Spec:	EN55022/FCC, 15.247, RSS-210	Class:	B
Immunity Spec:	EN 300 386	Environment:	TTE

EUT Operation During Emissions Tests

During emissions testing the EUT _____ .

EUT Operation During Immunity Tests

During immunity test the EUT will be exercised by _____ .

Normal operation is indicated by _____ and shall be monitored by _____ .

Performance Criteria for Immunity Tests

Criterion A:

During and after testing the EUT shall continue to _____ .

Criterion B:

During application of the transient test, degradation of performance including _____ is allowed provided that the EUT self-recovers to normal operation after testing without any operator intervention.

Criterion C:

Loss of function is allowed provided that normal operation can be restored by _____ .

Performance Criteria for Medical Tests

During and after immunity testing the EUT shall continue to _____ .



EMC Test Data

Client:	2Wire	Job Number:	J63083
Model:	RG2701 with SunFone Power Supply	T-Log Number:	T63701
		Account Manager:	Mark Hill
Contact:	Jeremy Muir		
Spec:	EN55022/FCC, 15.247, RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements Power, Bandwidth and Spurious Emissions (802.11g)

Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 7/7/2006	Config. Used: 1
Test Engineer: Mark Hill	Config Change: None
Test Location: SVOATS #2	EUT Voltage: 120V/60Hz

General Test Configuration

The EUT was connected to the spectrum analyzer or power meter via a suitable attenuator.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions: Temperature: **28.3 °C**
 Rel. Humidity: **42 %**

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	26.1 dBm
2	Power Spectral Density (PSD)	15.247(d)	Pass	2.1 dBm/3kHz
3	6dB Bandwidth	15.247(a)	Pass	16.58 MHz
3	99% Bandwidth	RSS GEN	-	18.47 MHz
4	Spurious emissions	15.247(b)	Pass	All emissions below the -30dBc limit

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.



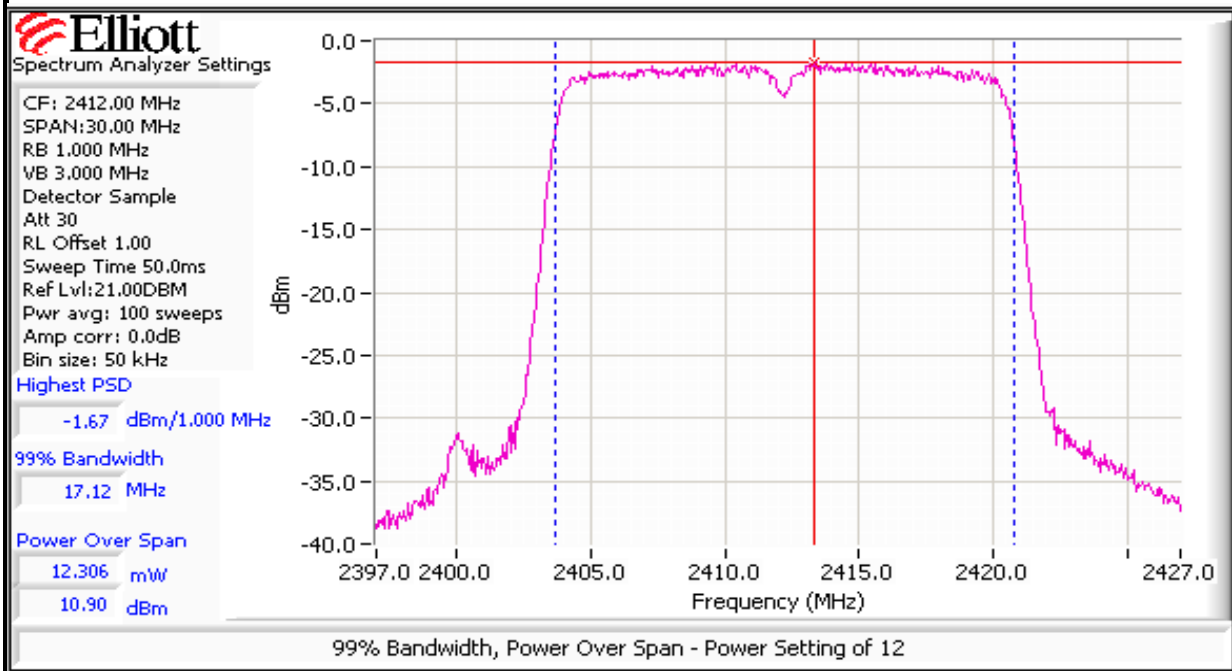
EMC Test Data

Client:	2Wire	Job Number:	J63083
Model:	RG2701 with SunFone Power Supply	T-Log Number:	T63701
Contact:	Jeremy Muir	Account Manager:	Mark Hill
Spec:	EN55022/FCC, 15.247, RSS-210	Class:	N/A

Run #1: Output Power

Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	Result	EIRP		Output Power	
		(dBm) ¹	mW			dBm	W	(dBm) ³	mW
12	2412	10.9	12.3	1.0	Pass	11.9	0.015	26.0	398.1
26	2437	25.1	323.6	1.0	Pass	26.1	0.407	32.4	1737.8
12	2462	10.9	12.3	1.0	Pass	11.9	0.015	25.9	389.0

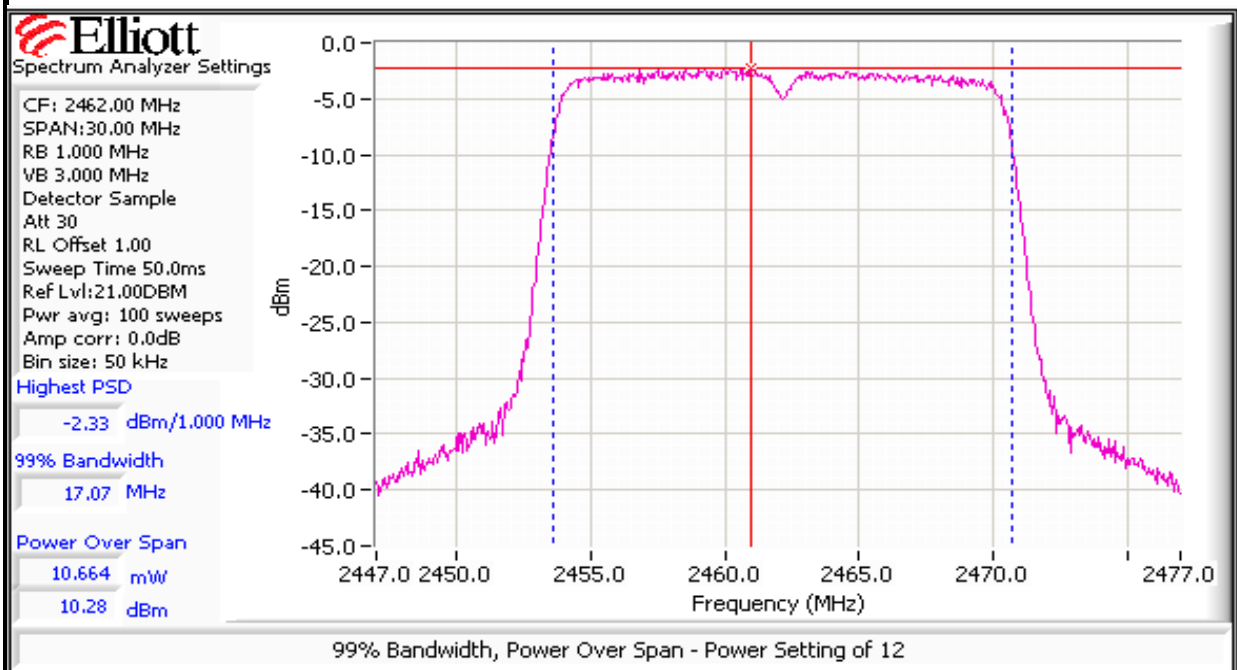
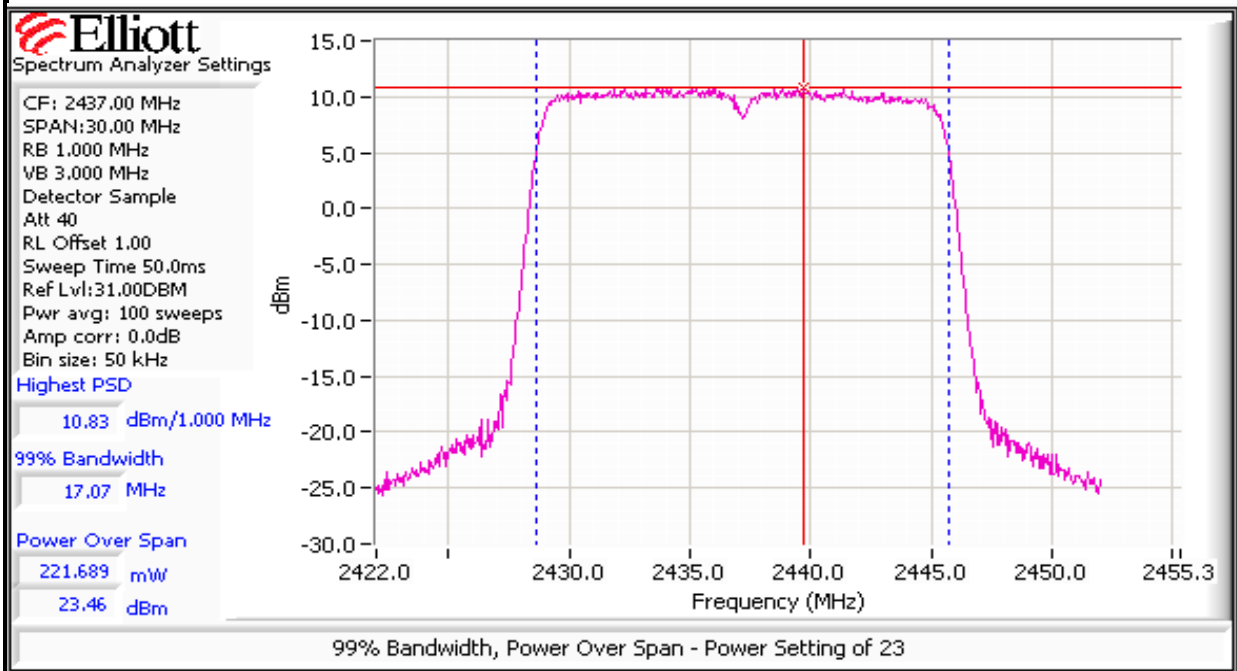
- Note 1: Output power measured using a spectrum analyzer (see plots below):
 RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 30 MHz
 The output power limit is 30dBm
- Note 2: Power setting - the software power setting used during testing, included for reference only.
- Note 3: Power measured using Peak Power Sensor and is included for reference only.
- Note 4: PSD and conducted spurious measurements were all made with a power setting of 26, which would produce results higher than those for the actual power settings to be used in normal operation.





EMC Test Data

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A





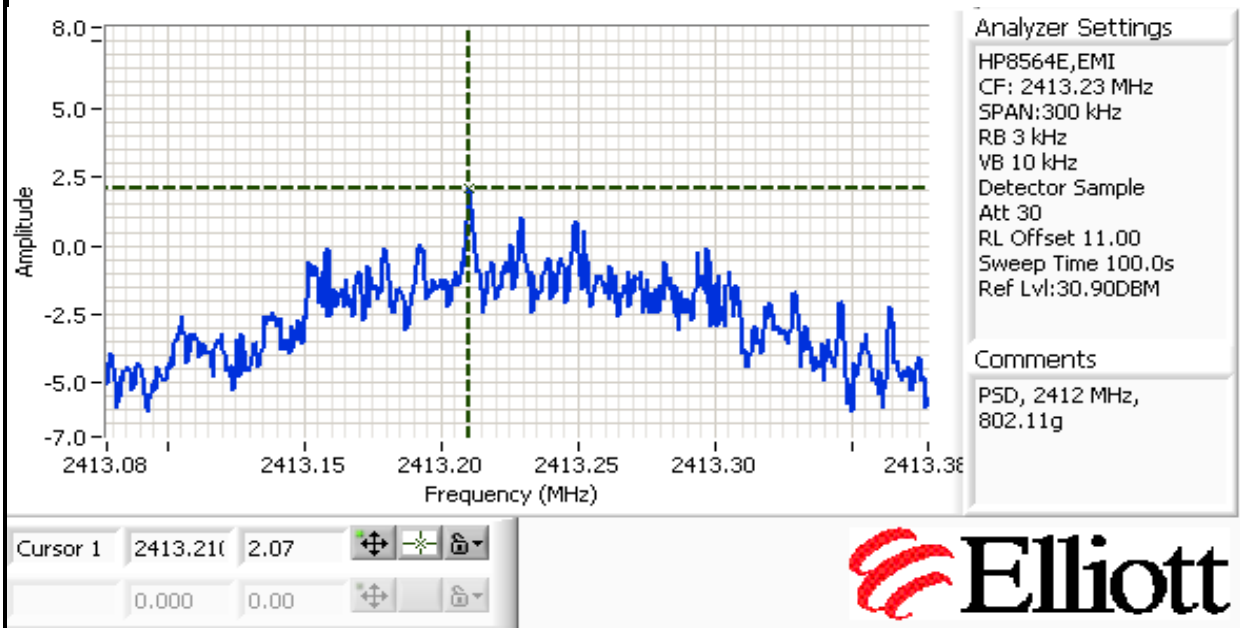
EMC Test Data

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A

Run #2: Power Spectral Density

Power Setting	Frequency (MHz)	PSD	Limit	Result
		(dBm/3kHz) ^{Note 1}	dBm/3kHz	
26	2412	2.1	8.0	Pass
26	2437	1.7	8.0	Pass
26	2462	1.3	8.0	Pass

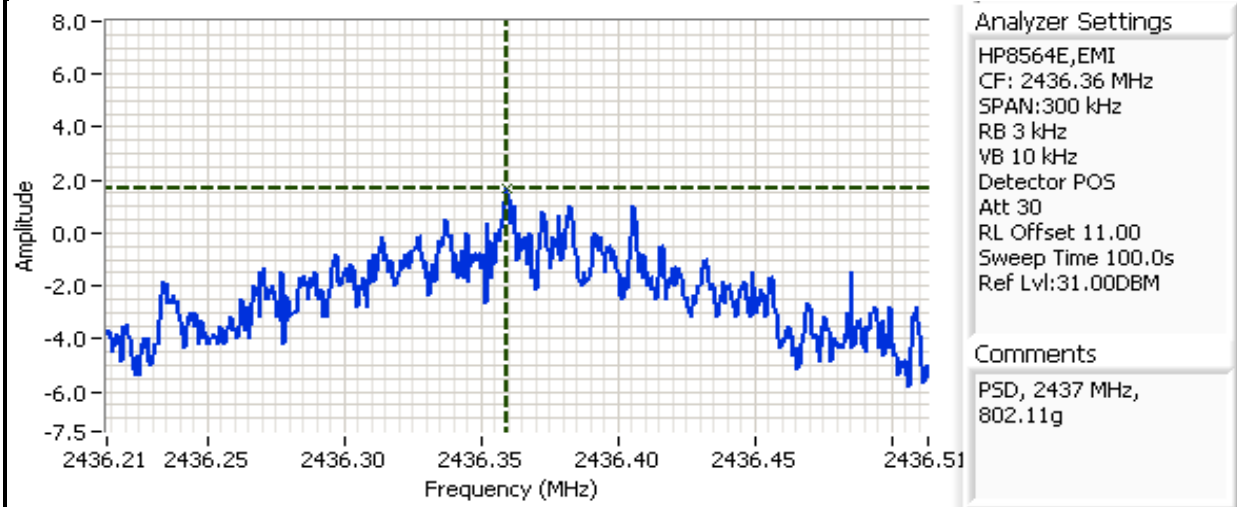
Note 1: Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster rate over the 6dB bandwidth of the signal.





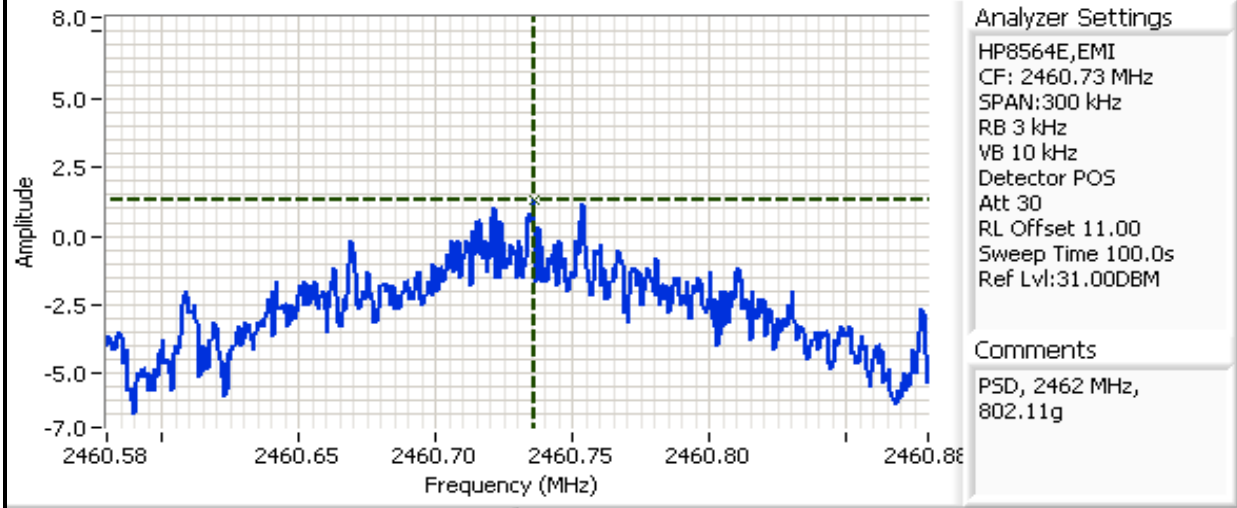
EMC Test Data

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A



Cursor 1 2436.35 1.67

0.000 0.00



Cursor 1 2460.73 1.33

0.000 0.00





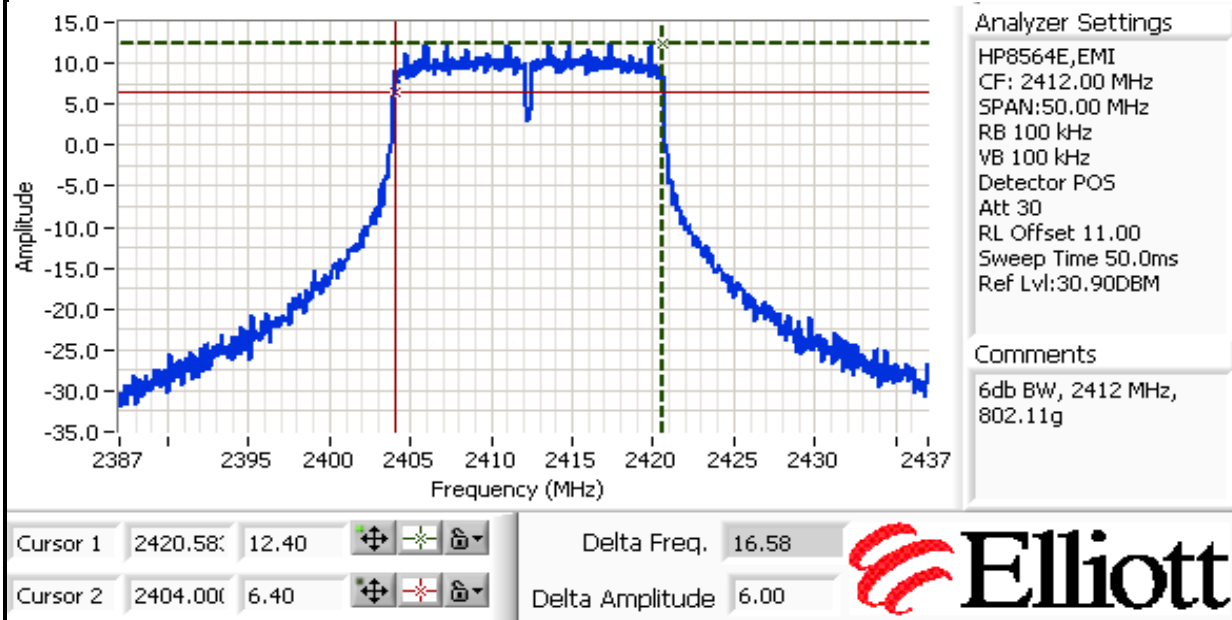
EMC Test Data

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
			6dB	99%
26	2412	100 kHz	16.58	18.47
26	2437	100 kHz	16.58	18.30
26	2462	100 kHz	16.58	18.30

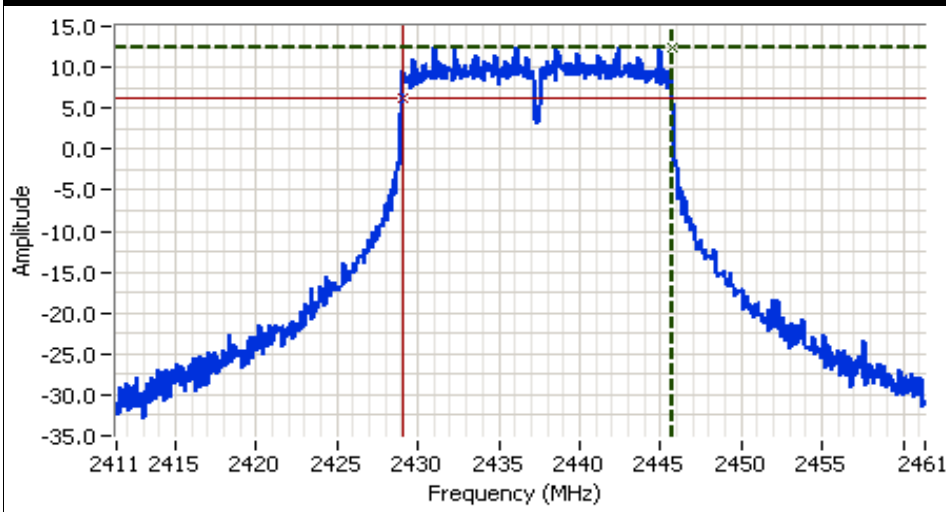
Note 1: 6dB bandwidth measured with RB \geq 5% of the minimum permitted bandwidth (500kHz).
99% bandwidth measured with RB $>$ 1% of span and VB \geq 3xRB





EMC Test Data

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A



Analyzer Settings
HP8564E,EMI
CF: 2436.36 MHz
SPAN:50.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 11.00
Sweep Time 50.0ms
Ref Lvl:31.00DBM

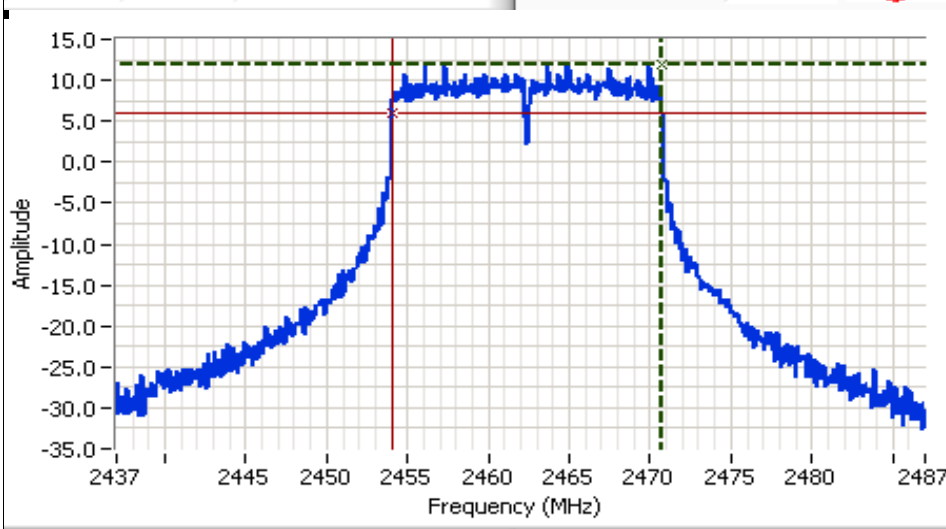
Comments
6dB BW, 2437 MHz,
802.11g

Cursor 1 2445.69; 12.33

Cursor 2 2429.11; 6.33

Delta Freq. 16.58

Delta Amplitude 6.00



Analyzer Settings
HP8564E,EMI
CF: 2462.00 MHz
SPAN:50.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 11.00
Sweep Time 50.0ms
Ref Lvl:31.00DBM

Comments
6db BW, 2462 MHz,
802.11g

Cursor 1 2470.66; 12.00

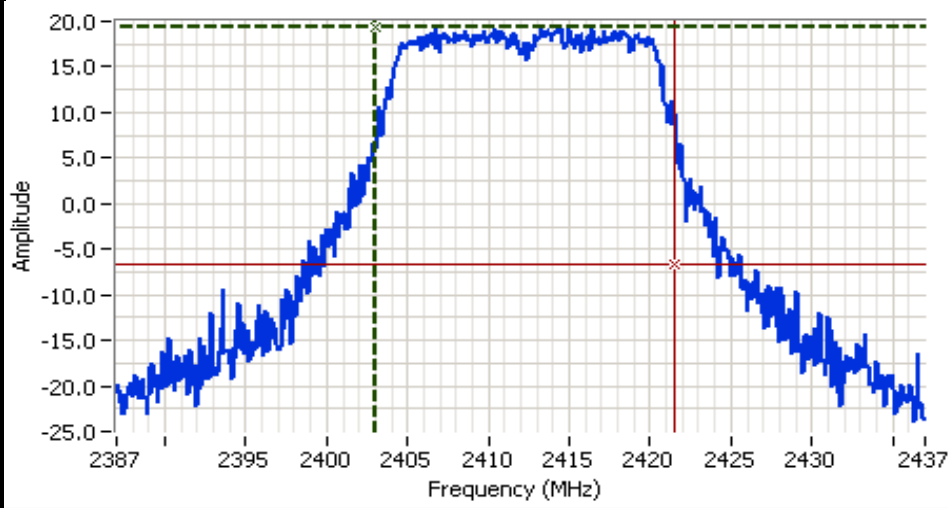
Cursor 2 2454.08; 6.00

Delta Freq. 16.58

Delta Amplitude 6.00



Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A

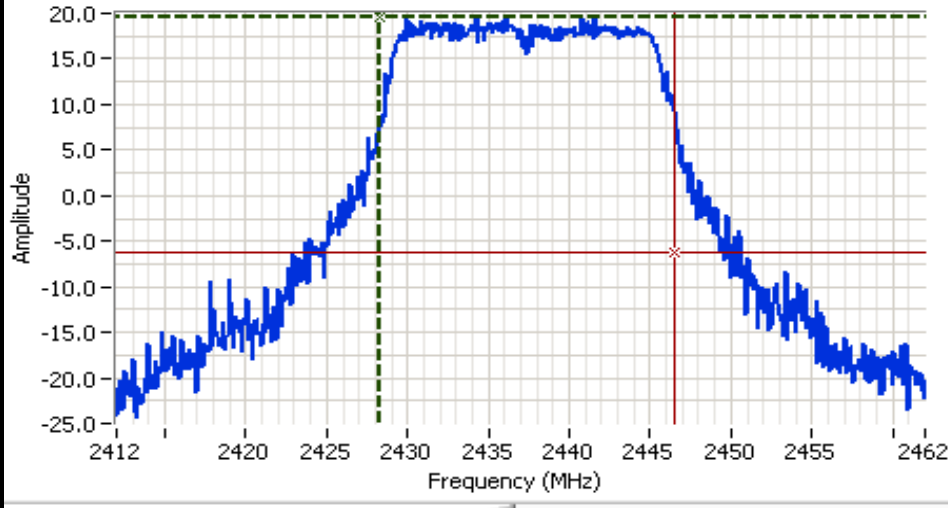


Analyzer Settings
 HP8564E,006,EMI,UK6
 CF: 2412.00 MHz
 SPAN:50.00 MHz
 RB 1.000 MHz
 VB 3.000 MHz
 Detector POS
 Att 40
 RL Offset 0.00
 Sweep Time 50.0ms
 Ref Lvl:25.00DBM

Comments
 99% power bandwidth:
 18.47 MHz

Cursor 1	2403.05f	19.42	
Cursor 2	2421.52f	-6.58	

Delta Freq. 18.47
 Delta Amplitude 26.00



Analyzer Settings
 HP8564E,006,EMI,UK6
 CF: 2437.00 MHz
 SPAN:50.00 MHz
 RB 1.000 MHz
 VB 3.000 MHz
 Detector POS
 Att 40
 RL Offset 0.00
 Sweep Time 50.0ms
 Ref Lvl:25.00DBM

Comments
 99% power bandwidth:
 18.30 MHz

Cursor 1	2428.22f	19.67	
Cursor 2	2446.52f	-6.33	

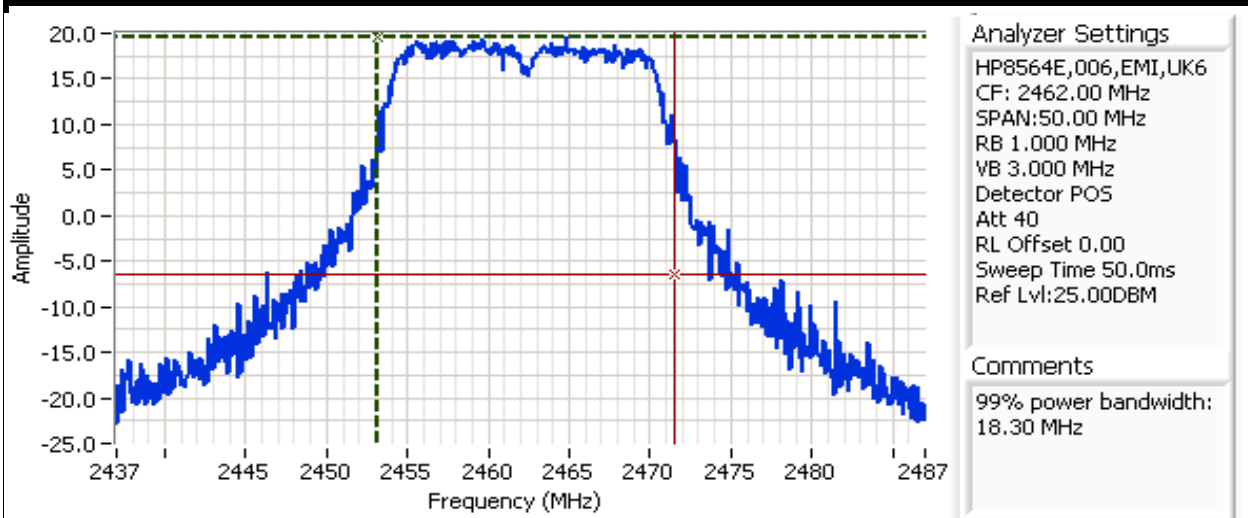
Delta Freq. 18.30
 Delta Amplitude 26.00





EMC Test Data

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A



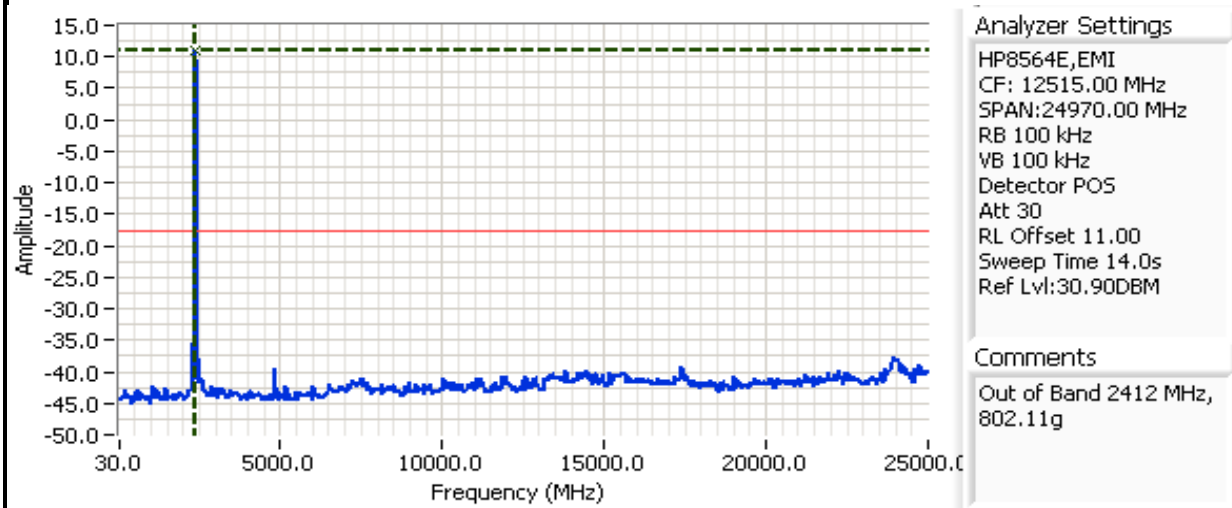
Cursor 1	2453.14	19.50		Delta Freq.	18.30	
Cursor 2	2471.44	-6.50		Delta Amplitude	26.00	

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A

Run #4: Out of Band Spurious Emissions

Frequency (MHz)	Limit	Result
2412	-30dBc	Refer to Plot
2437	-30dBc	Refer to Plot
2462	-30dBc	Refer to Plot

Plots for low channel, power setting(s) = 26



Analyzer Settings

HP8564E,EMI
 CF: 12515.00 MHz
 SPAN:24970.00 MHz
 RB 100 kHz
 VB 100 kHz
 Detector POS
 Att 30
 RL Offset 11.00
 Sweep Time 14.0s
 Ref Lvl:30.90DBM

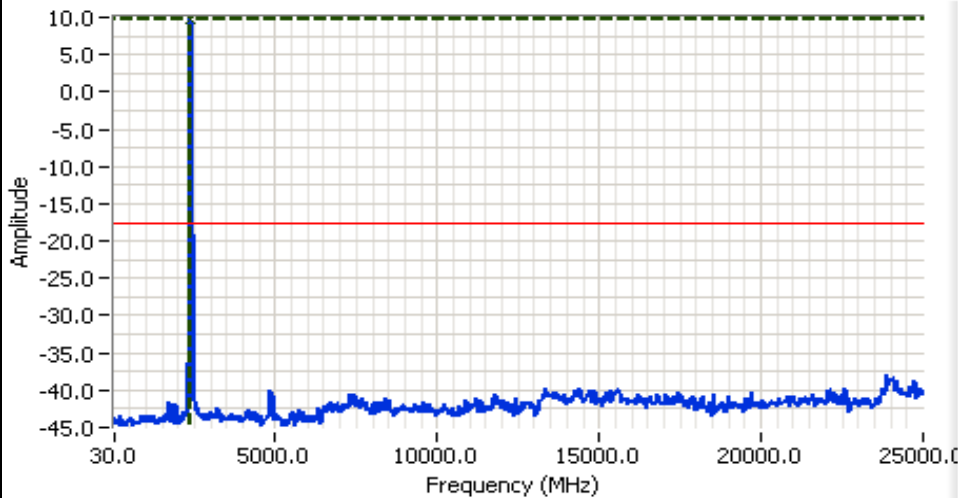
Comments

Out of Band 2412 MHz,
 802.11g

Cursor 1	2360.53	10.90		Delta Freq.	14035.22	
Cursor 1	-11674.6	-17.60		Delta Amplitude	28.50	

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A

Plots for center channel, power setting(s) = 26



Analyzer Settings

HP8564E,EMI
 CF: 12515.00 MHz
 SPAN:24970.00 MHz
 RB 100 kHz
 VB 100 kHz
 Detector POS
 Att 30
 RL Offset 11.00
 Sweep Time 14.0s
 Ref Lvl:31.00DBM

Comments

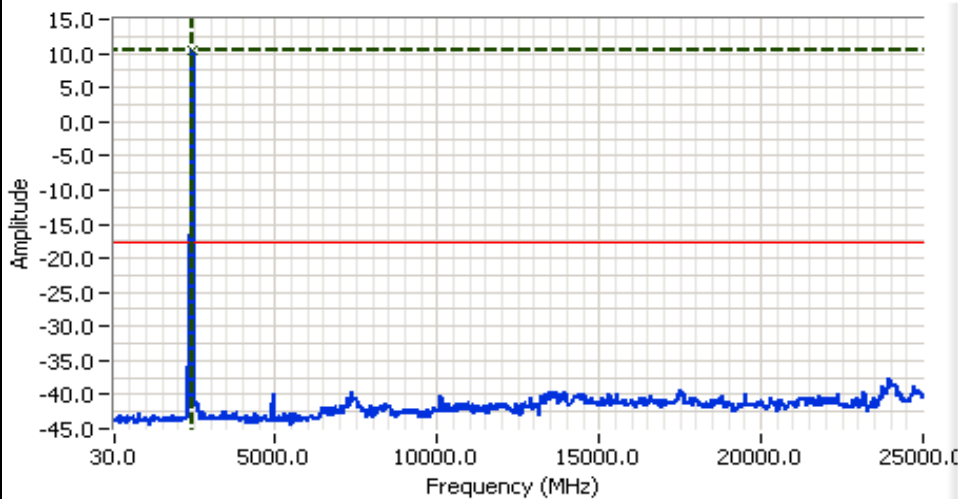
Out of Band
 2437 MHz, 802.11g

Cursor 1	2402.150	9.83	
Cursor 1	-4391.77	-17.50	

Delta Freq. 6793.92
 Delta Amplitude 27.33



Plots for high channel, power setting(s) = ???



Analyzer Settings

HP8564E,EMI
 CF: 12515.00 MHz
 SPAN:24970.00 MHz
 RB 100 kHz
 VB 100 kHz
 Detector POS
 Att 30
 RL Offset 11.00
 Sweep Time 14.0s
 Ref Lvl:31.00DBM

Comments

Out of Band, 2462 MHz, 802.11g

Cursor 1	2443.760	10.50	
Cursor 1	-490.200	-17.70	

Delta Freq. 2933.98
 Delta Amplitude 28.20





EMC Test Data

Client:	2Wire	Job Number:	J63083
Model:	RG2701 with SunFone Power Supply	T-Log Number:	T63701
Contact:	Jeremy Muir	Account Manager:	Mark Hill
Spec:	EN55022/FCC, 15.247, RSS-210	Class:	N/A

Run #1: Radiated Spurious Emissions, 30 - 25000 MHz. Operating Mode: 802.11g

Run #1a: Low Channel @ 2412 MHz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2408.370	93.9	V	-	-	AVG	81	1.6	Power Setting = 12 dBm
2408.370	102.6	V	-	-	PK	81	1.6	Power Setting = 12 dBm
2411.030	93.6	H	-	-	AVG	230	1.3	Power Setting = 12 dBm
2411.030	102.0	H	-	-	PK	230	1.3	Power Setting = 12 dBm

Band Edge Signal Field Strength

Delta Marker - Peak (12 dBm)	38.5 dB	Delta between highest in-band and highest
Delta Marker - Average (12 dBm)	42.5 dB	

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	51.4	V	54.0	-2.6	Avg	81	1.6	
2390.000	64.1	V	74.0	-13.3	PK	81	1.6	

Note 1: Calculated by subtracting the marker delta values from the fundamental field strength measurements. Plots are on the following page (note the power referenced in the plot is the approximate peak power, not average power)

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7235.900	50.1	V	54.0	-3.9	AVG	197	1.6	
4825.000	50.1	H	54.0	-3.9	AVG	193	1.2	
4817.800	47.8	V	54.0	-6.2	AVG	162	1.2	
7236.350	46.3	H	54.0	-7.7	AVG	187	1.0	
7235.900	62.5	V	74.0	-11.5	PK	197	1.6	
4825.000	61.4	H	74.0	-12.6	PK	193	1.2	
4817.800	60.7	V	74.0	-13.3	PK	162	1.2	
7236.350	58.6	H	74.0	-15.4	PK	187	1.0	

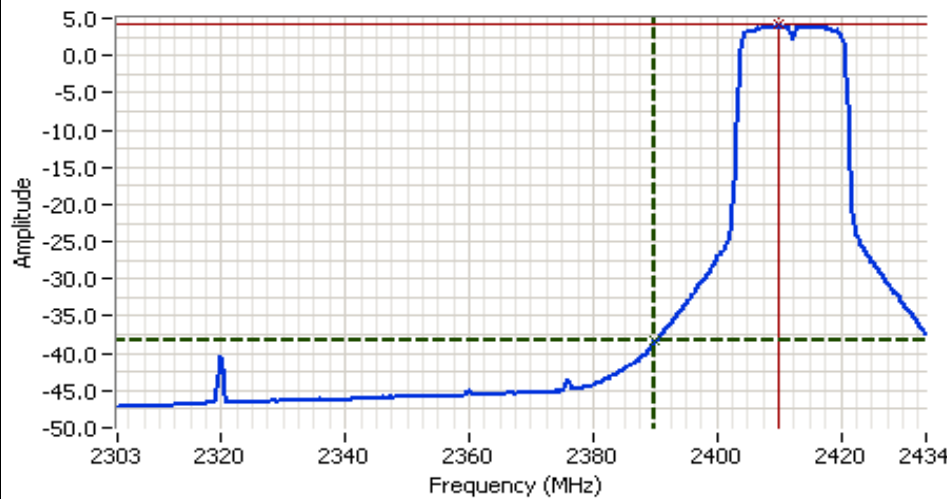
Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Note 2: Signal is not in a restricted band but the more stringent restricted band limit was used.



EMC Test Data

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A

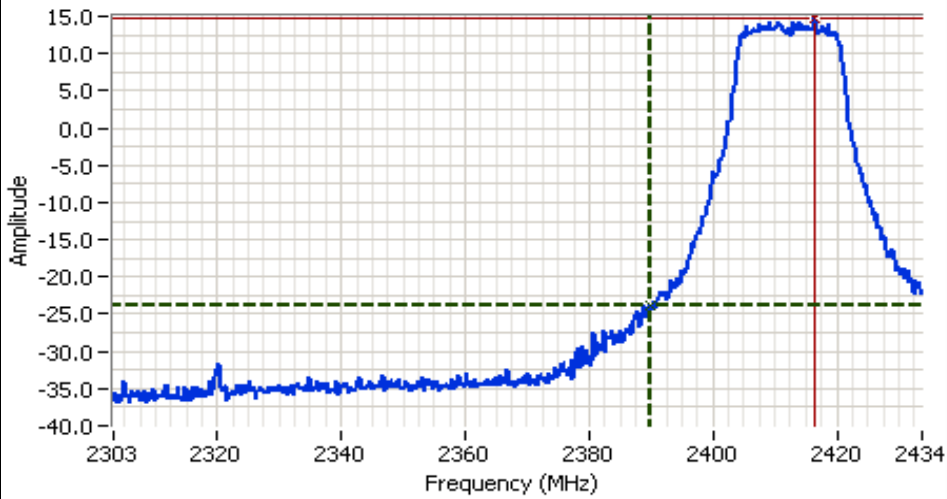


Analyzer Settings
HP8564E,EMI
CF: 2368.49 MHz
SPAN:130.52 MHz
RB 1.000 MHz
VB 10 Hz
Detector Sample
Att 30
RL Offset 11.00
Sweep Time 49.0s
Ref Lvl:30.60DBM

Comments
Avg Bandedge, 2412 MHz, 802.11g
Power Setting - 20dBm

Cursor 1 2390.02 -38.40
Cursor 2 2410.04 4.10

Delta Freq. 20.01
Delta Amplitude 42.50



Analyzer Settings
HP8564E,EMI
CF: 2368.49 MHz
SPAN:130.52 MHz
RB 1.000 MHz
VB 1.000 MHz
Detector POS
Att 30
RL Offset 11.00
Sweep Time 50.0ms
Ref Lvl:30.60DBM

Comments
Pk Bandedge, 2412 MHz, 802.11g
Power Setting - 20dBm

Cursor 1 2389.80 -23.73
Cursor 2 2416.56 14.77

Delta Freq. 26.76
Delta Amplitude 38.50





EMC Test Data

Client:	2Wire	Job Number:	J63083
Model:	RG2701 with SunFone Power Supply	T-Log Number:	T63701
Contact:	Jeremy Muir	Account Manager:	Mark Hill
Spec:	EN55022/FCC, 15.247, RSS-210	Class:	N/A

Run #1b: Center Channel @ 2437 MHz

Fundamental Signal

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2438.670	110.1	V	-	-	AVG	123	1.1	RB = 1MHz, VB = 10Hz
2438.670	118.4	V	-	-	PK	123	1.1	RB = VB = 1MHz
2430.570	109.7	V	-	-	PK	123	1.1	RB = VB = 100kHz

Spurious Signals

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7304.750	50.4	V	54.0	-3.6	AVG	198	1.5	
4871.75	49.7	H	54.0	-4.3	AVG	191	1.1	
4871.750	47.8	V	54.0	-6.2	AVG	159	1.0	
7308.95	47.2	H	54.0	-6.8	AVG	190	1.0	
7304.750	62.8	V	74.0	-11.2	PK	198	1.5	
4871.75	60.8	H	74.0	-13.2	PK	191	1.1	
7308.95	59.8	H	74.0	-14.2	PK	190	1.0	
4871.750	59.3	V	74.0	-14.7	PK	159	1.0	
12182.95	37.6	V	54.0	-16.4	AVG	139	1.0	
12184.54	37.6	H	54.0	-16.4	AVG	181	1.0	
12182.95	48.5	V	74.0	-25.5	PK	139	1.0	
12184.54	48.4	H	74.0	-25.6	PK	181	1.0	
14623.40	53.8	H	79.7	-25.9	PK	43	1.0	Not Restricted
14619.30	53.2	V	79.7	-26.5	PK	357	1.0	Not Restricted
9752.500	53.1	V	79.7	-26.6	PK	194	1.4	Not Restricted
9744.35	51.5	H	79.7	-28.2	PK	177	1.0	Not Restricted

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20dB below the level of the fundamental and measured in 100kHz.

Note 2: Signal is not in a restricted band but the more stringent restricted band limit was used.



EMC Test Data

Client:	2Wire	Job Number:	J63083
Model:	RG2701 with SunFone Power Supply	T-Log Number:	T63701
Contact:	Jeremy Muir	Account Manager:	Mark Hill
Spec:	EN55022/FCC, 15.247, RSS-210	Class:	N/A

Run #1c: High Channel @ 2462 MHz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power output average set to 12dBm, which correspondes to 20dBm peak								
2459.970	93.2	V	-	-	AVG	125	1.1	RB = 1MHz, VB = 10Hz
2459.970	102.0	V	-	-	PK	125	1.1	RB = VB = 1MHz
2460.930	91.9	H	-	-	AVG	268	1.0	RB = 1MHz, VB = 10Hz
2460.930	100.8	H	-	-	PK	268	1.0	RB = VB = 1MHz

Band Edge Signal Field Strength

Delta Marker - Peak (20dBm pk)	44.5 dB	Power setting = 12
Delta Marker - Average (20dBm pk)	40.3 dB	Power setting = 12

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	52.9	v	54.0	-1.1	Avg	125	1.1	Power Set at 20dBm peak
2483.500	57.5	v	74.0	-16.5	Peak	125	1.1	Power Set at 20dBm peak

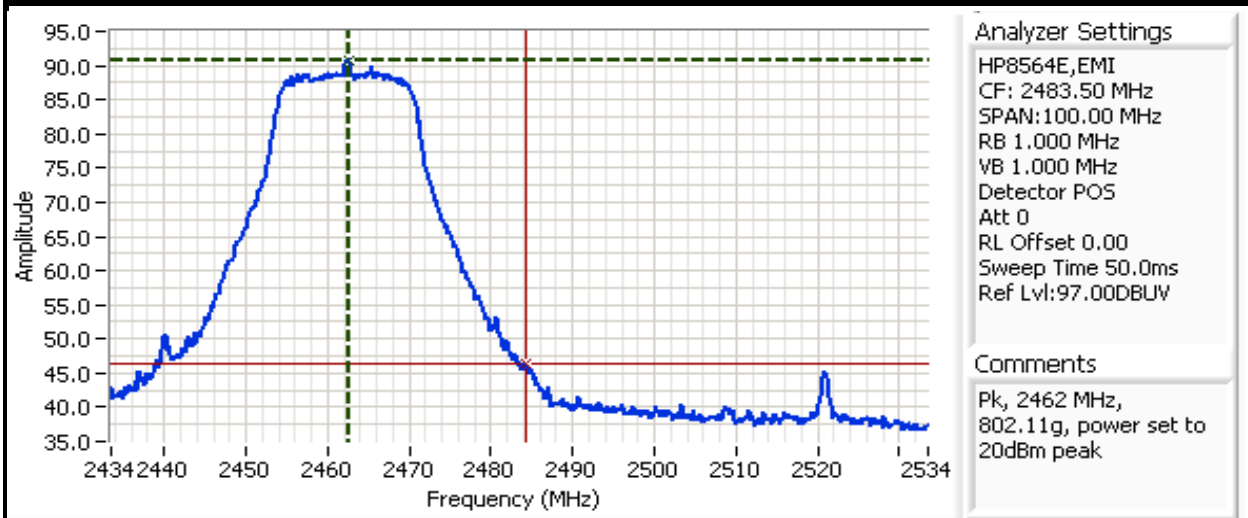
Note 1: Calculated by subtracting the marker delta values from the fundamental field strength measurements. Plots are on the following page (note the power referenced in the plot is the approximate peak power, not average power)

Other Spurious Emissions

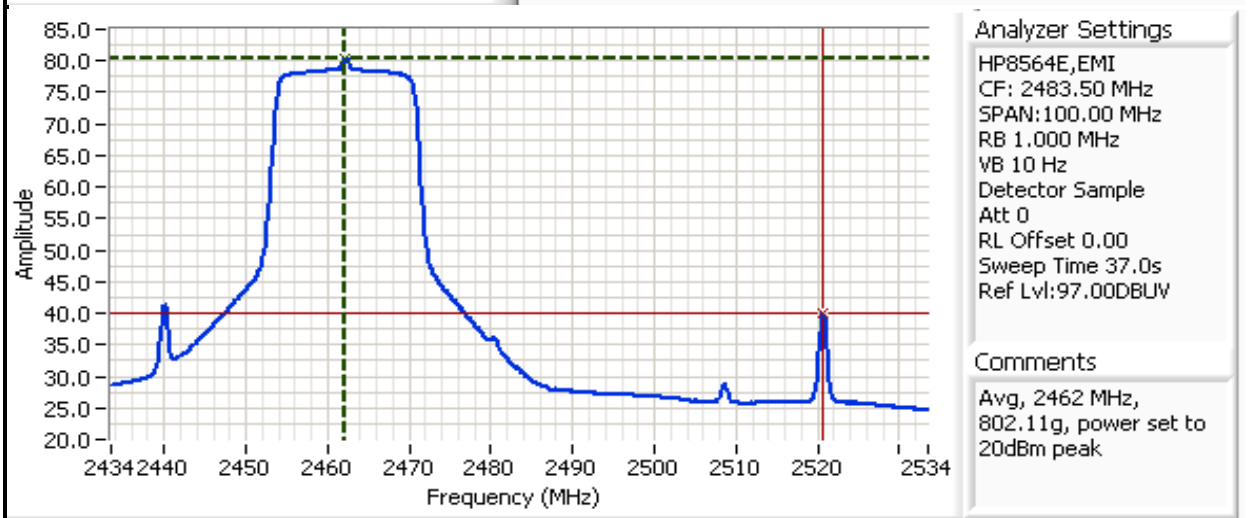
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7385.950	49.9	V	54.0	-4.1	AVG	153	1.1	
7384.350	46.5	H	54.0	-7.5	AVG	189	1.0	
4920.550	44.1	H	54.0	-9.9	AVG	189	1.1	
4925.460	43.6	V	54.0	-10.4	AVG	197	1.1	
7385.950	62.7	V	74.0	-11.3	PK	153	1.1	
7384.350	59.0	H	74.0	-15.0	PK	189	1.0	
4920.550	56.4	H	74.0	-17.6	PK	189	1.1	
4925.460	54.6	V	74.0	-19.4	PK	197	1.1	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20dB below the level of the fundamental and measured in 100kHz.

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A



Cursor 1	2462.50	90.83		Delta Freq.	21.67	
Cursor 2	2484.16	46.33		Delta Amplitude	44.50	



Cursor 1	2462.16	80.33		Delta Freq.	58.50	
Cursor 2	2520.66	40.00		Delta Amplitude	40.33	



EMC Test Data

Client:	2Wire	Job Number:	J63083
Model:	RG2701 with SunFone Power Supply	T-Log Number:	T63701
		Account Manager:	Mark Hill
Contact:	Jeremy Muir		
Spec:	EN55022/FCC, 15.247, RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements Power, Bandwidth and Spurious Emissions (802.11b)

Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 7/7/2006	Config. Used: 1
Test Engineer: Mark Hill	Config Change: None
Test Location: SVOATS #2	EUT Voltage: 120V/60Hz

General Test Configuration

The EUT was connected to the spectrum analyzer or power meter via a suitable attenuator. All measurements were made on a single chain.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions: Temperature: **28.3 °C**
 Rel. Humidity: **42 %**

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	26.5dBm
2	Power Spectral Density (PSD)	15.247(d)	Pass	3.2dBm/3kHz
3	6dB Bandwidth	15.247(a)	Pass	> 11.2 MHz
3	99% Bandwidth	RSS GEN	-	15.6 MHz
4	Spurious emissions	15.247(b)	Pass	All emissions more than -30dBc

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.



EMC Test Data

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A

Run #1: Output Power

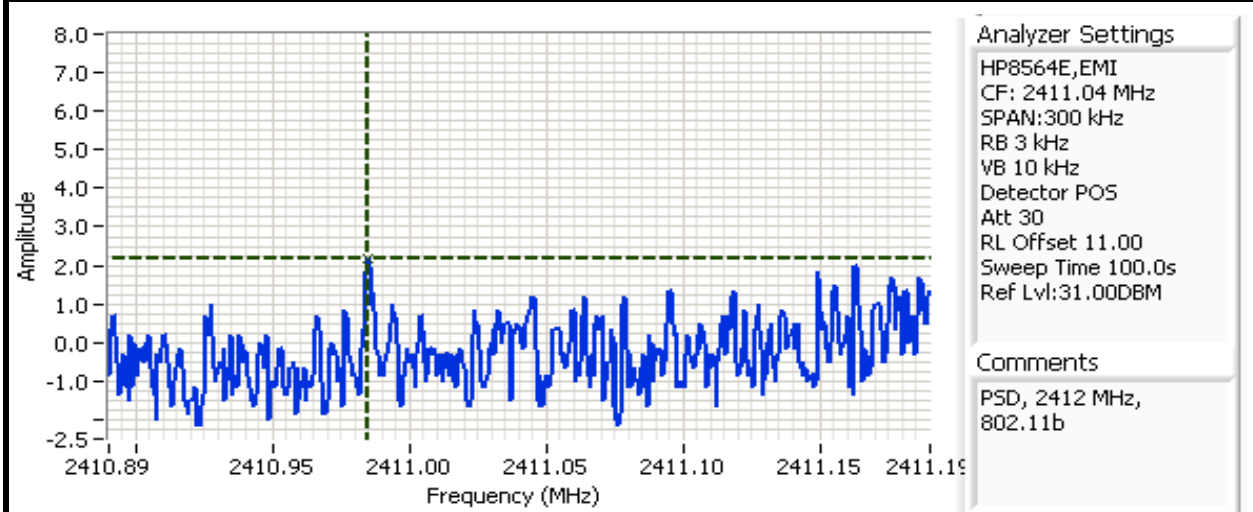
Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	Result	EIRP		Output Power	
		(dBm) ¹	mW			dBm	W	(dBm) ³	mW
18	2412	19.5	89.1	1.0	Pass	20.5	0.112	17.8	60.3
23	2437	25.5	354.8	1.0	Pass	26.5	0.447	23.6	229.1
18	2462	19.8	95.5	1.0	Pass	20.8	0.120	18.0	63.1

- Note 1: Output power measured using a peak power sensor.
- Note 2: Power setting - the software power setting used during testing, included for reference only.
- Note 3: Power measured using Average Power Meter and is included for reference only.
- Note 4: PSD and conducted spurious measurements were all made with a power setting of 26, which would produce results higher than those for the actual power settings to be used in normal operation.

Run #2: Power Spectral Density

Power Setting	Frequency (MHz)	PSD	Limit	Result
		(dBm/3kHz) ^{Note 1}		
26	2412	2.2	8.0	Pass
26	2437	3.2	8.0	Pass
26	2462	2.0	8.0	Pass

Note 1: Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster rate over the 6dB bandwidth of the signal.



Analyzer Settings

HP8564E,EMI
 CF: 2411.04 MHz
 SPAN:300 kHz
 RB 3 kHz
 VB 10 kHz
 Detector POS
 Att 30
 RL Offset 11.00
 Sweep Time 100.0s
 Ref Lvl:31.00DBM

Comments

PSD, 2412 MHz,
 802.11b

Cursor 1 2410.985 2.17

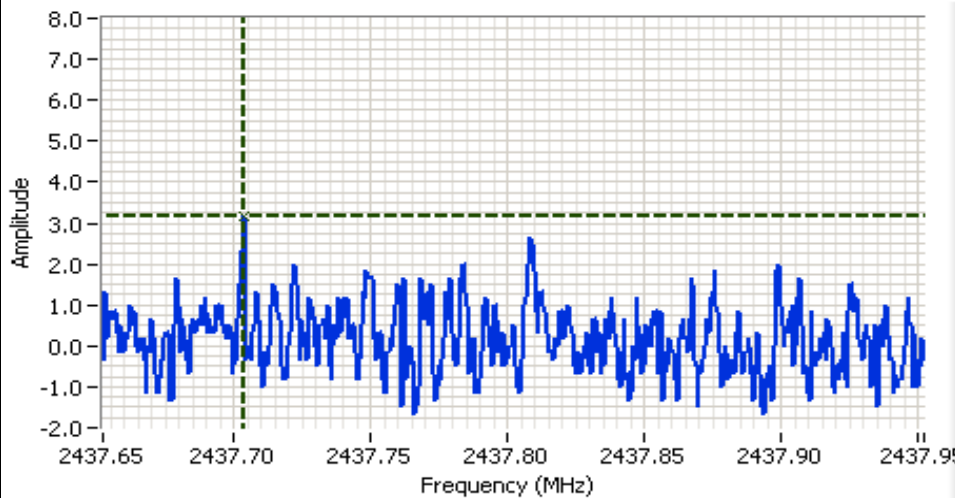
0.000 0.00





EMC Test Data

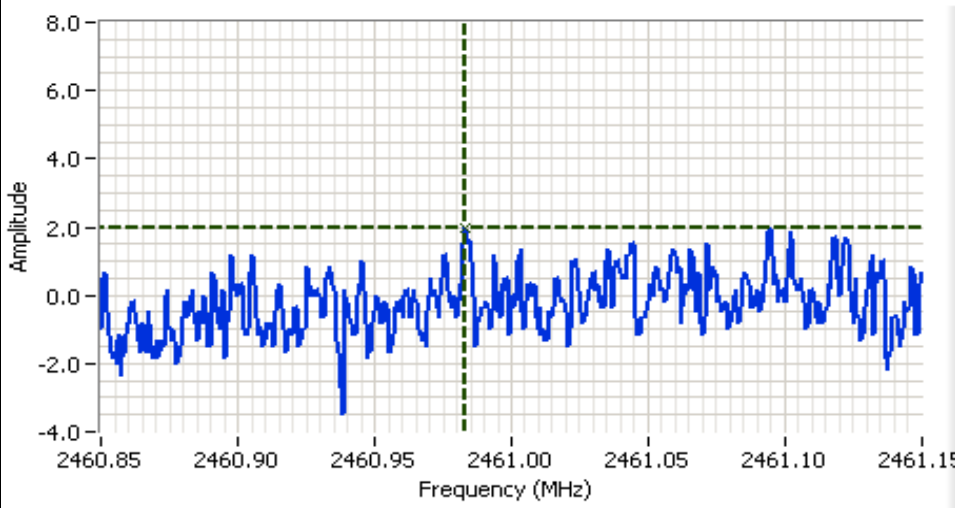
Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A



Analyzer Settings
HP8564E,EMI
CF: 2437.80 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 11.00
Sweep Time 100.0s
Ref Lvl:31.00DBM

Comments
PSD, 2437 MHz,
802.11b

Cursor 1 2437.70 3.17
0.000 0.00



Analyzer Settings
HP8564E,EMI
CF: 2461.00 MHz
SPAN:300 kHz
RB 3 kHz
VB 10 kHz
Detector POS
Att 30
RL Offset 11.00
Sweep Time 100.0s
Ref Lvl:31.00DBM

Comments
PSD, 2462 MHz,
802.11b

Cursor 1 2460.98 2.00
0.000 0.00





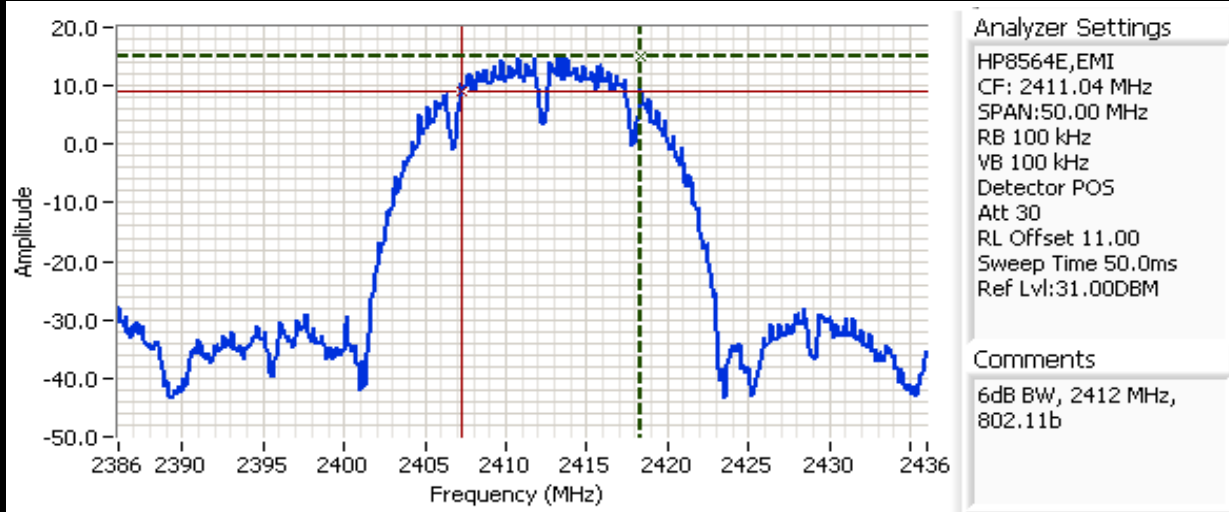
EMC Test Data

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A

Run #3: Signal Bandwidth

Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
		6dB	99%
2412	100 kHz	11.2	15.6
2437	100 kHz	12.3	15.6
2462	100 kHz	11.5	15.6

Note 1: 6dB bandwidth measured with RB >= 5% of the minimum permitted bandwidth (500kHz).
99% bandwidth measured with RB > 1% of span and VB >= 3xRB



Analyzer Settings
 HP8564E,EMI
 CF: 2411.04 MHz
 SPAN:50.00 MHz
 RB 100 kHz
 VB 100 kHz
 Detector POS
 Att 30
 RL Offset 11.00
 Sweep Time 50.0ms
 Ref Lvl:31.00DBM

Comments
 6dB BW, 2412 MHz,
 802.11b

Cursor 1	2418.37	15.00	
Cursor 2	2407.20	9.00	

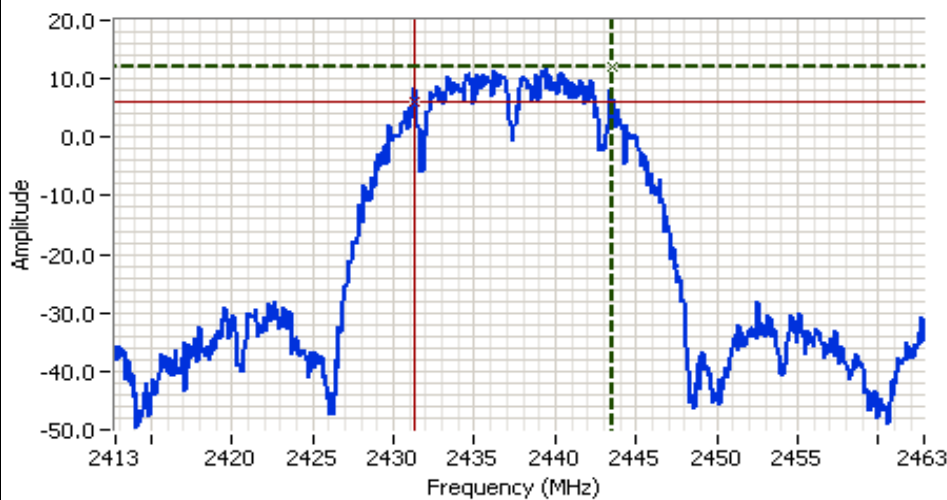
Delta Freq. 11.167
 Delta Amplitude 6.00





EMC Test Data

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A

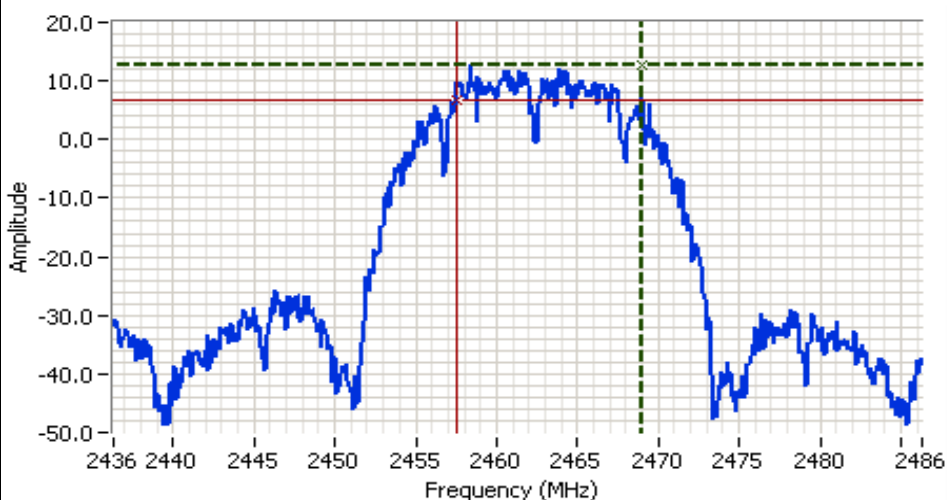


Analyzer Settings
HP8564E,EMI
CF: 2437.80 MHz
SPAN:50.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 11.00
Sweep Time 50.0ms
Ref Lvl:31.00DBM

Comments
6db BW, 2437 MHz,
802.11b

Cursor 1 2443.55: 12.00
Cursor 2 2431.30: 6.00

Delta Freq. 12.25
Delta Amplitude 6.00



Analyzer Settings
HP8564E,EMI
CF: 2461.31 MHz
SPAN:50.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 11.00
Sweep Time 50.0ms
Ref Lvl:31.00DBM

Comments
6db BW, 2462 MHz,
802.11b

Cursor 1 2468.98: 12.67
Cursor 2 2457.48: 6.67

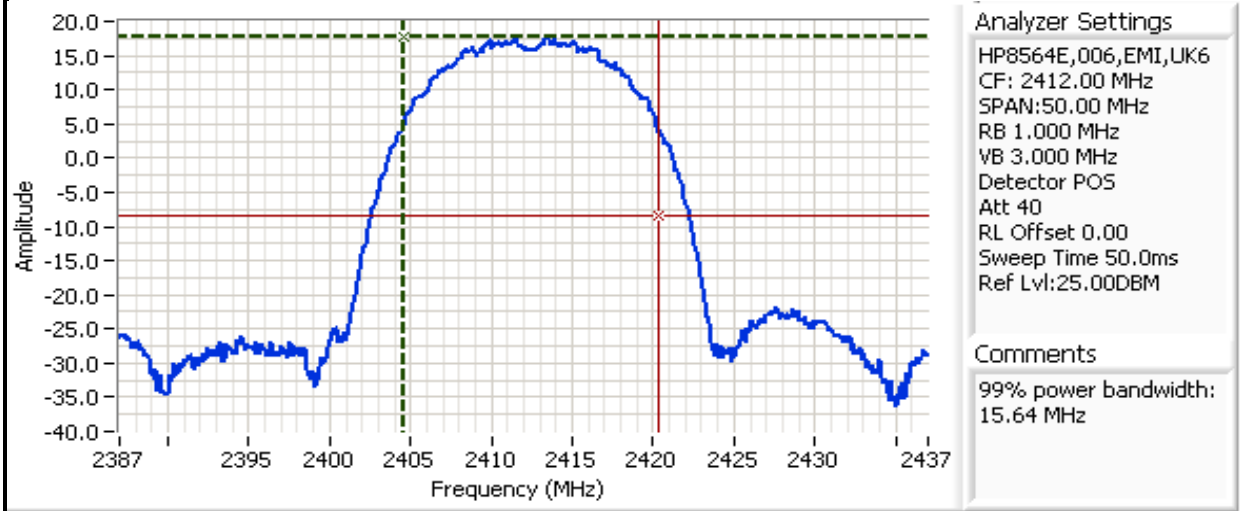
Delta Freq. 11.50
Delta Amplitude 6.00





EMC Test Data

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A

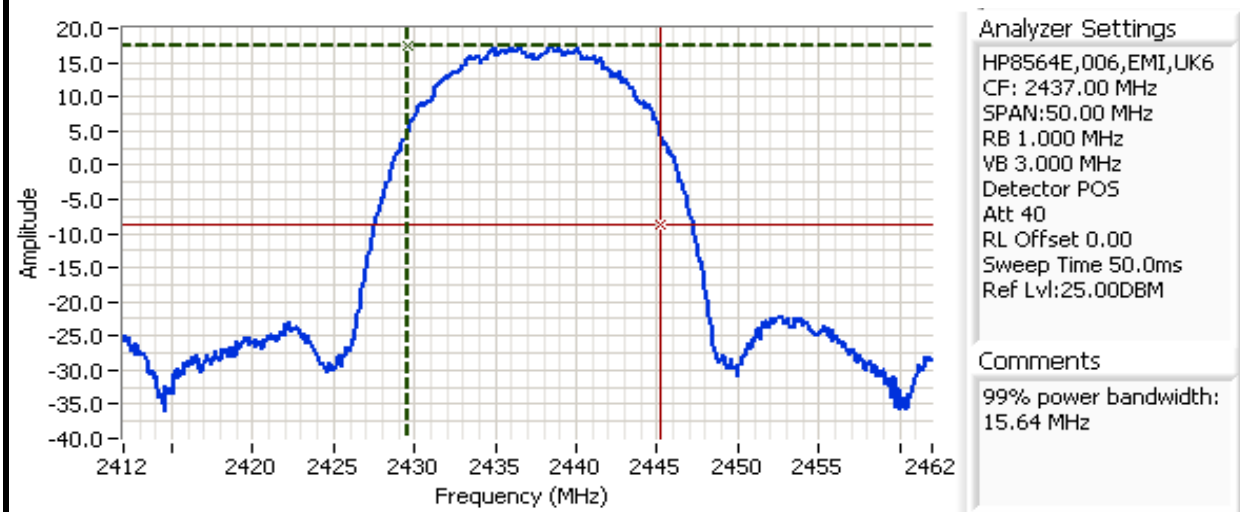


Cursor 1 2404.63 17.67

Cursor 2 2420.27 -8.33

Delta Freq. 15.64

Delta Amplitude 26.00



Cursor 1 2429.55 17.33

Cursor 2 2445.19 -8.67

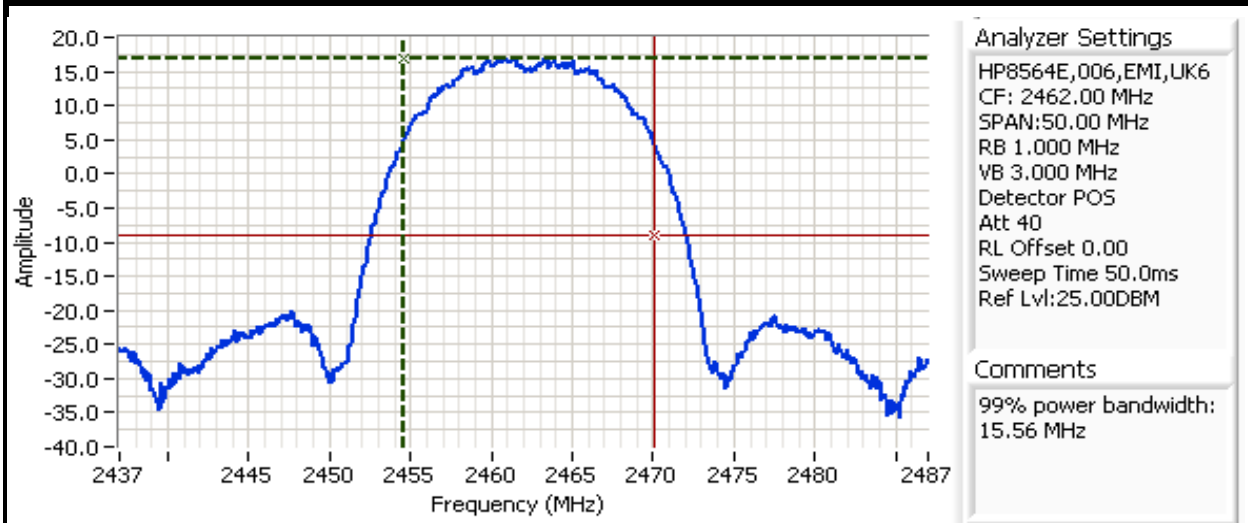
Delta Freq. 15.64

Delta Amplitude 26.00



EMC Test Data

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A



Cursor 1	2454.55	17.00		Delta Freq.	15.56	
Cursor 2	2470.11	-9.00		Delta Amplitude	26.00	



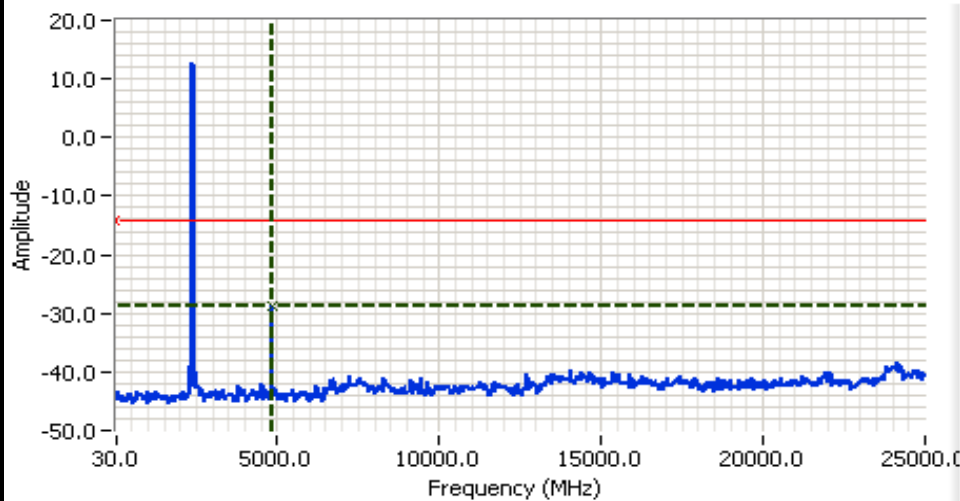
EMC Test Data

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A

Run #4: Out of Band Spurious Emissions

Frequency (MHz)	Limit	Result
2412	-30dBc	-28.7 dBm @ 4824 MHz
2437	-30dBc	-27.8 dBm @ 4874 MHz
2462	-30dBc	-27.3 dBm @ 4924 MHz

Plots for low channel, power setting(s) = 26



Analyzer Settings
HP8564E, EMI
CF: 12515.00 MHz
SPAN: 24970.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 11.00
Sweep Time 14.0s
Ref Lvl: 31.00DBM

Comments
Out of Band, 2412 MHz, 802.11b

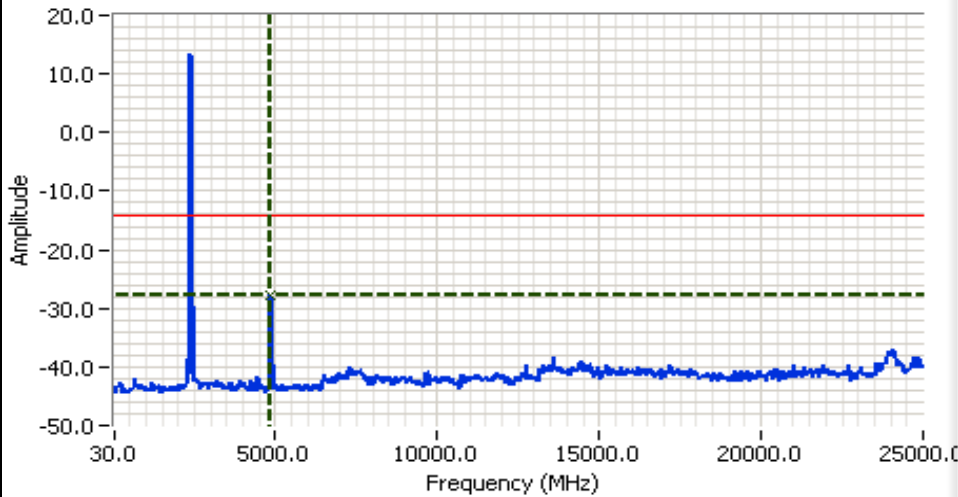
Cursor 1	4815.91	-28.67	+	-	+
Cursor 1	-35.026	-14.30	+	-	+

Delta Freq. 4850.94
Delta Amplitude 14.37



Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A

Plots for center channel, power setting(s) = 26



Analyzer Settings
 HP8564E,EMI
 CF: 12515.00 MHz
 SPAN:24970.00 MHz
 RB 100 kHz
 VB 100 kHz
 Detector POS
 Att 30
 RL Offset 11.00
 Sweep Time 14.0s
 Ref Lvl:31.00DBM

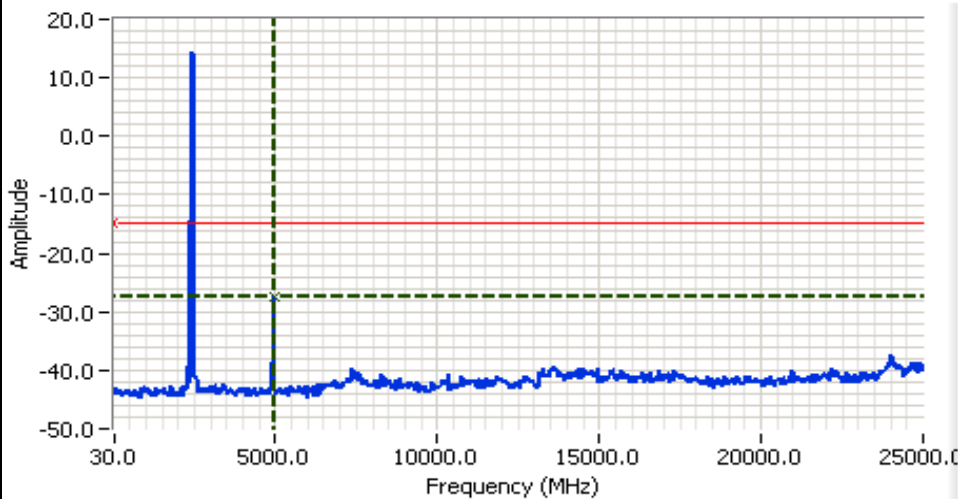
Comments
 Out of Band, 2437 MHz, 802.11b

Cursor 1 4857.53 -27.83
 Cursor 1 -425.182 -14.30

Delta Freq. 5282.72
 Delta Amplitude 13.53



Plots for high channel, power setting(s) = 26



Analyzer Settings
 HP8564E,EMI
 CF: 12515.00 MHz
 SPAN:24970.00 MHz
 RB 100 kHz
 VB 100 kHz
 Detector POS
 Att 30
 RL Offset 11.00
 Sweep Time 14.0s
 Ref Lvl:31.00DBM

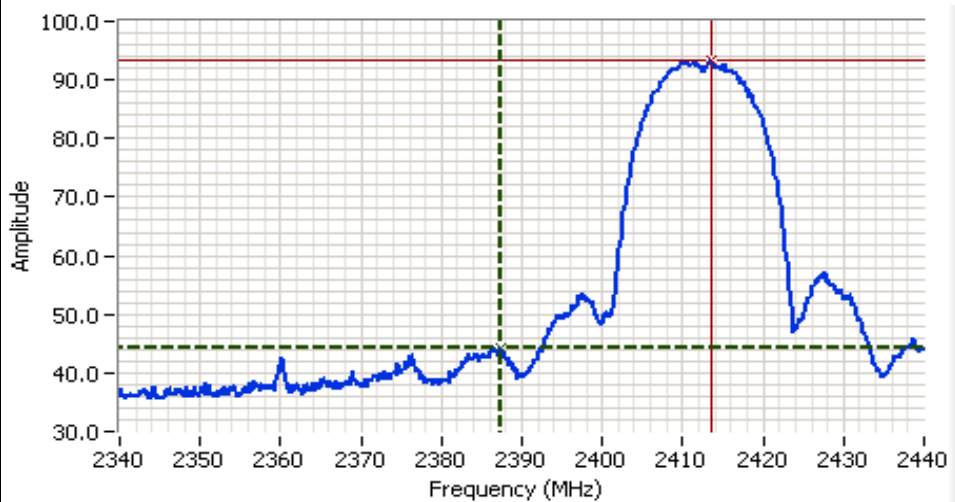
Comments
 Out of Band, 2462 MHz, 802.11b

Cursor 1 4940.76 -27.33
 Cursor 1 -35.026 -14.70

Delta Freq. 4975.79
 Delta Amplitude 12.63



Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A



Analyzer Settings
 HP8564E,EMI
 CF: 2390.00 MHz
 SPAN:100.00 MHz
 RB 1.000 MHz
 VB 1.000 MHz
 Detector POS
 Att 0
 RL Offset 0.00
 Sweep Time 50.0ms
 Ref Lvl:97.00DBUV

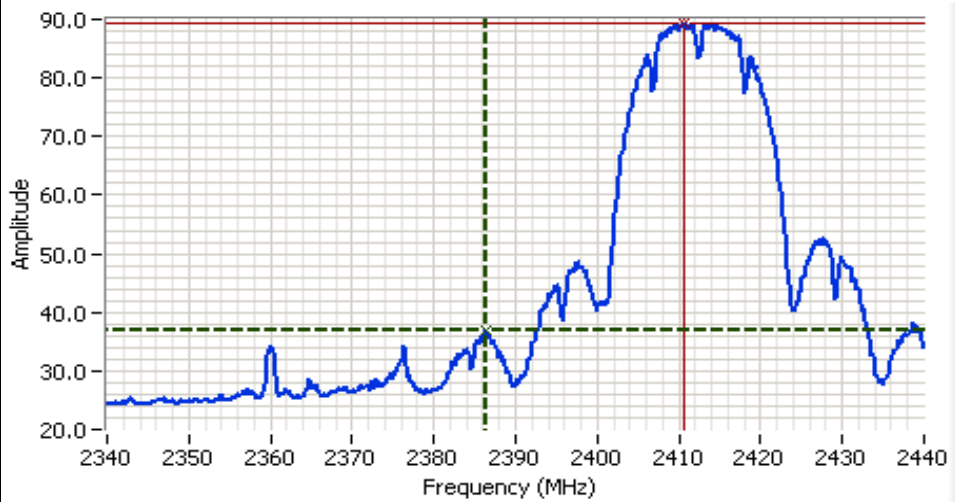
Comments
 Avg, 2412 MHz,
 802.11b, 18dBm
 setting

Cursor 1 2387.33 44.33

Cursor 2 2413.50 93.33

Delta Freq. 26.17

Delta Amplitude 49.00



Analyzer Settings
 HP8564E,EMI
 CF: 2390.00 MHz
 SPAN:100.00 MHz
 RB 1.000 MHz
 VB 10 Hz
 Detector Sample
 Att 0
 RL Offset 0.00
 Sweep Time 37.0s
 Ref Lvl:97.00DBUV

Comments
 Peak, 2412 MHz,
 802.11b, 18dBm
 setting

Cursor 1 2386.50 37.00

Cursor 2 2410.66 89.50

Delta Freq. 24.17

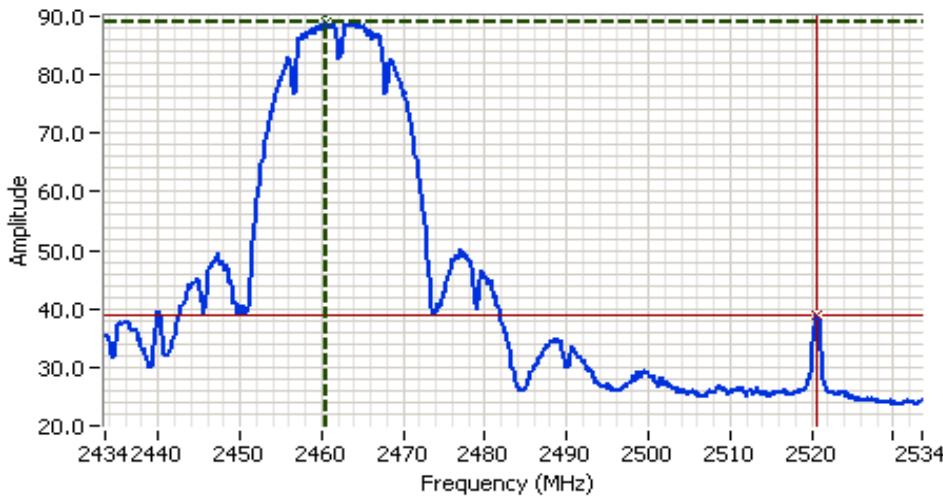
Delta Amplitude 52.50





EMC Test Data

Client: 2Wire	Job Number: J63083
Model: RG2701 with SunFone Power Supply	T-Log Number: T63701
Contact: Jeremy Muir	Account Manager: Mark Hill
Spec: EN55022/FCC, 15.247, RSS-210	Class: N/A

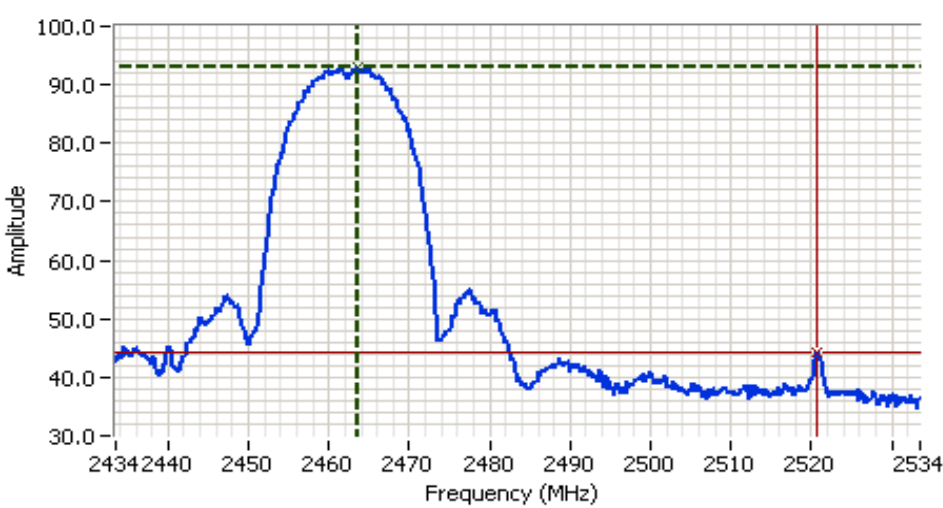


Analyzer Settings
HP8564E,EMI
CF: 2483.50 MHz
SPAN:100.00 MHz
RB 1.000 MHz
VB 10 Hz
Detector Sample
Att 0
RL Offset 0.00
Sweep Time 37.0s
Ref Lvl:97.00DBUV

Comments
Avg, 2462 MHz,
802.11b, 18dBm
setting

Cursor 1	2460.50	89.17	
Cursor 2	2520.66	38.83	

Delta Freq. 60.17
Delta Amplitude 50.33



Analyzer Settings
HP8564E,EMI
CF: 2483.50 MHz
SPAN:100.00 MHz
RB 1.000 MHz
VB 1.000 MHz
Detector POS
Att 0
RL Offset 0.00
Sweep Time 50.0ms
Ref Lvl:97.00DBUV

Comments
Pk, 2462 MHz,
802.11b, 18dBm
setting

Cursor 1	2463.50	93.17	
Cursor 2	2520.66	44.17	

Delta Freq. 57.17
Delta Amplitude 49.00



EXHIBIT 3: Photographs of Test Configurations

Uploaded as a separate attachment

EXHIBIT 4: Proposed FCC ID Label & Label Location

Uploaded as a separate attachment

**EXHIBIT 5: Detailed Photographs
of 2Wire, Inc. Model RG2701HG-00 and RG271HG-00 Construction**

Pages

**EXHIBIT 6: Operator's Manual
for 2Wire, Inc. Model RG2701HG-00 and RG271HG-00**

Uploaded as a separate attachment

**EXHIBIT 7: Block Diagram
of 2Wire, Inc. Model RG2701HG-00 and RG271HG-00**

Uploaded as a separate attachment

**EXHIBIT 8: Schematic Diagrams
for 2Wire, Inc. Model RG2701HG-00 and RG271HG-00**

Uploaded as a separate attachment

**EXHIBIT 9: Theory of Operation
for 2Wire, Inc. Model RG2701HG-00 and RG271HG-00**

Uploaded as a separate attachment

EXHIBIT 10: RF Exposure Information

Uploaded as a separate attachment