EMC Test Report
Application for Grant of Equipment Authorization
FCC Part 15 Subpart C

Model: eQ102

FCC ID:	BBP-WLNEWS102
APPLICANT:	Ricoh Company, Ltd. 810 Shimoimaizumi, Ebina-Shi Kanagawa-Ken, 243-0460 Japan
TEST SITE(S):	Elliott Laboratories 41039 Boyce Road. Fremont, CA. 94538-2435
IC SITE REGISTRATION #:	2845B-3; 2845B-4, 2845B-5, 2845B-7
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PROGRAM MGR /
TECHNICAL REVIEWER:

Mark E Hill
Staff Engineer

QUALITY ASSURANCE DELEGATE /
FINAL REPORT PREPARER:

David Guidotti
Senior Technical Writer

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REVISION HISTORY

Rev#	Date	Comments	Modified By
1	09-23-2011	First release	

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SCOPE

An electromagnetic emissions test has been performed on the Ricoh Company, Ltd. model eQ102, pursuant to the following rules:

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
FCC DTS Measurement Procedure KDB558074, March 2005

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.

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.

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 Ricoh Company, Ltd. model eQ102 complied with the requirements of the following regulations:

FCC Part 15 Subpart C

Maintenance of compliance is the responsibility of the manufacturer. Any modifications to the product should be assessed to determine their potential impact on the compliance status of the device with respect to the standards detailed in this test report.

The test results recorded herein are based on a single type test of Ricoh Company, Ltd. model eQ102 and therefore apply only to the tested sample. The sample was selected and prepared by Jay Moulton an agent of Ricoh Company, Ltd..

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

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	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth	802.11b: 8.6 MHz 802.11g: 16.4 MHz 802.11n: 17.0 MHz	>500kHz	Complies
15.247 (b) (3)	RSS 210 A8.2 (4)	Output Power (multipoint systems)	802.11b: 17.1 dBm (0.051 W) 802.11g: 14.5 dBm (0.028 W) 802.11n20: 14.6 dBm (0.029 W) EIRP = 0.085 W Note 1	1Watt, EIRP limited to 4 Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	802.11b: -2.4 dBm / 3kHz 802.11g: -8.2 dBm / 3kHz 802.11n: -7.2 dBm / 3kHz	8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	All emissions < -30dBc	< -30dBc Note 2	Complies
15.247(c) / 15.209	RSS 210 A8.5	Radiated Spurious Emissions 30MHz – 25 GHz	53.9dBµV/m @ 2390.0MHz (-0.1dB)	15.207 in restricted bands, all others <-30dBc Note 2	Complies

Note 1: EIRP calculated using antenna gain of 2.2 dBi for the highest EIRP system.
Note 2: Limit of -30dBc used because the power was measured using the UNII test procedure (maximum power averaged over a transmission burst).

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 integral and internal to the EUT	Unique or integral antenna required	Complies
15.207	RSS GEN Table 2	AC Conducted Emissions	47.5dBµV @ 2.451MHz (-8.5dB)	Refer to page 17	Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	N/A – Tunes above 960 MHz	Refer to Standard	N/A
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to SAR report and RSS 102 declaration	Refer to OET 65, FCC Part 1 and RSS 102	Complies

MEASUREMENT UNCERTAINTIES

ISO/IEC 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	Measurement Unit	Frequency Range	Expanded Uncertainty
RF power, conducted (power meter)	dBm	25 to 7000 MHz	± 0.52 dB
RF power, conducted (Spectrum analyzer)	dBm	25 to 7000 MHz	± 0.7 dB
Conducted emission of transmitter	dBm	25 to 26500 MHz	± 0.7 dB
Conducted emission of receiver	dBm	25 to 26500 MHz	± 0.7 dB
Radiated emission (substitution method)	dBm	25 to 26500 MHz	± 2.5 dB
Radiated emission (field strength)	dBµV/m	25 to 1000 MHz	± 3.6 dB
		1000 to 40000 MHz	± 6.0 dB
Conducted Emissions (AC Power)	dBµV	0.15 to 30 MHz	± 2.4 dB

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Ricoh Company, Ltd. model eQ102 is an eWriter/tablet computer.

The sample was received on July 25, 2011 and tested on July 25, 26, 27 and 28, 2011. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Ricoh	eQuill	e-book reader/tablet computer	-	BBP-WLNEWS102
V-Infinity	3A-061WU05B	AC/DC Adapter	-	N/A

OTHER EUT DETAILS

The Bluetooth/WiFi radio uses a printed inverted-F pcb trace antenna, 2.2dBi max gain.

ENCLOSURE

The EUT enclosure measures approximately 19 by 24.5 by 0.5 centimeters. It is primarily constructed of uncoated plastic.

MODIFICATIONS

No modifications were made to the EUT during the time the product was at Elliott.

SUPPORT EQUIPMENT

The following equipment was used as support equipment for testing:

Company	Model	Description	Serial Number	FCC ID
Dell	D620	Laptop Computer	14030653249	DoC
RII EPT	-	USB Extender Board	-	-

EUT INTERFACE PORTS

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Laptop USB	Extender	Multiconductor	Shielded	1.0
Extender	EUT	Ribbon Cable	Unshielded	0.2
USB	AC/DC Adapter	Multiconductor	Shielded	1.5

EUT OPERATION

During testing, the EUT configured to continuously transmit a modulated signal on the channels noted. For 802.11b, the data rate was 1Mb/s. For 802.11g, the data rate was 6Mb/s. For 802.11n, the data rate was 6.5Mb/s.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken at the test sites listed below. 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 and with industry Canada.

Site	Registration Numbers		Location
	FCC	Canada	
Chamber 3	769238	2845B-3	41039 Boyce Road Fremont, CA 94538-2435
Chamber 4	211948	2845B-4	
Chamber 5	211948	2845B-5	
Chamber 7	A2LA accreditation	2845B-7	

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. The test site(s) contain 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.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4:2003. 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.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1-1 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 specifies 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.

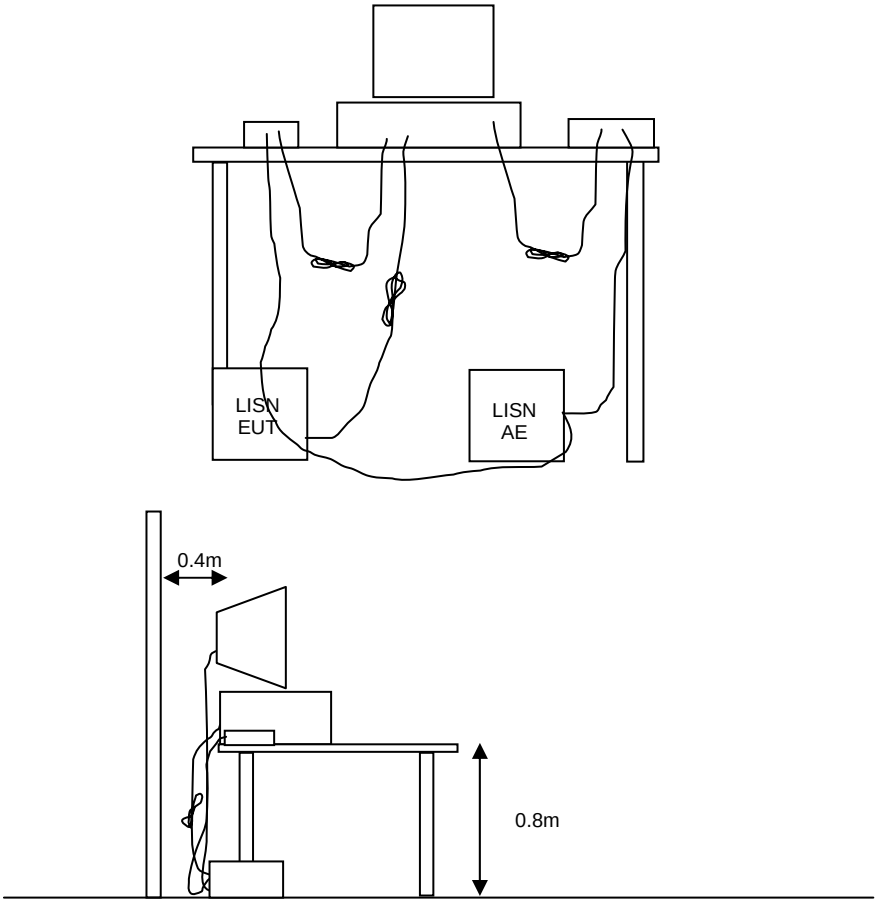


Figure 1 Typical Conducted Emissions Test Configuration

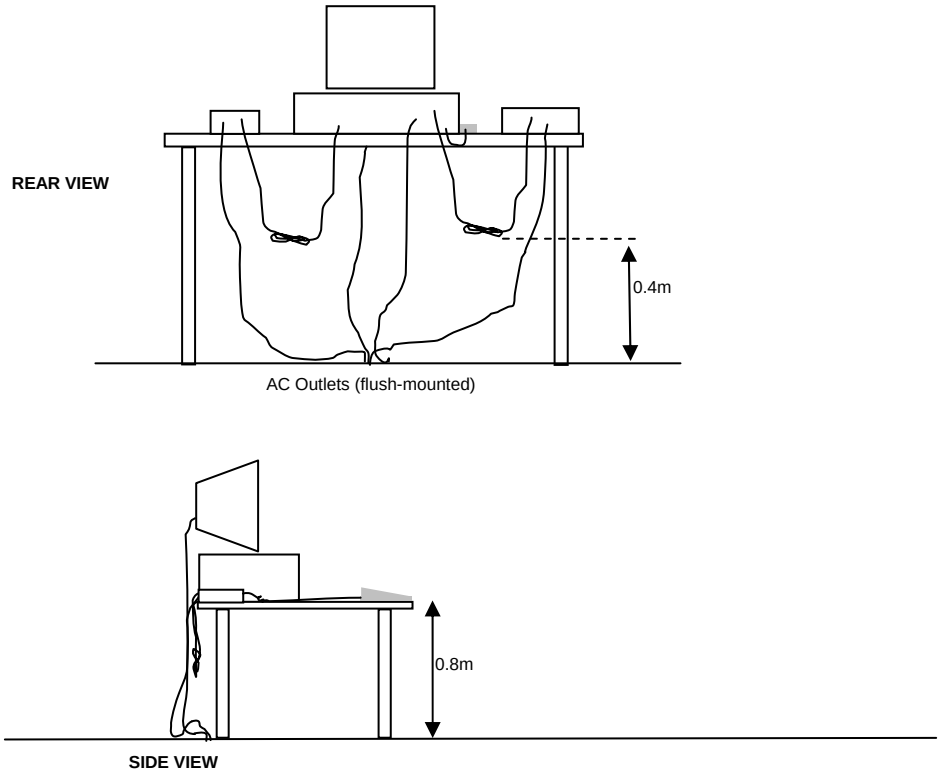
RADIATED EMISSIONS

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.

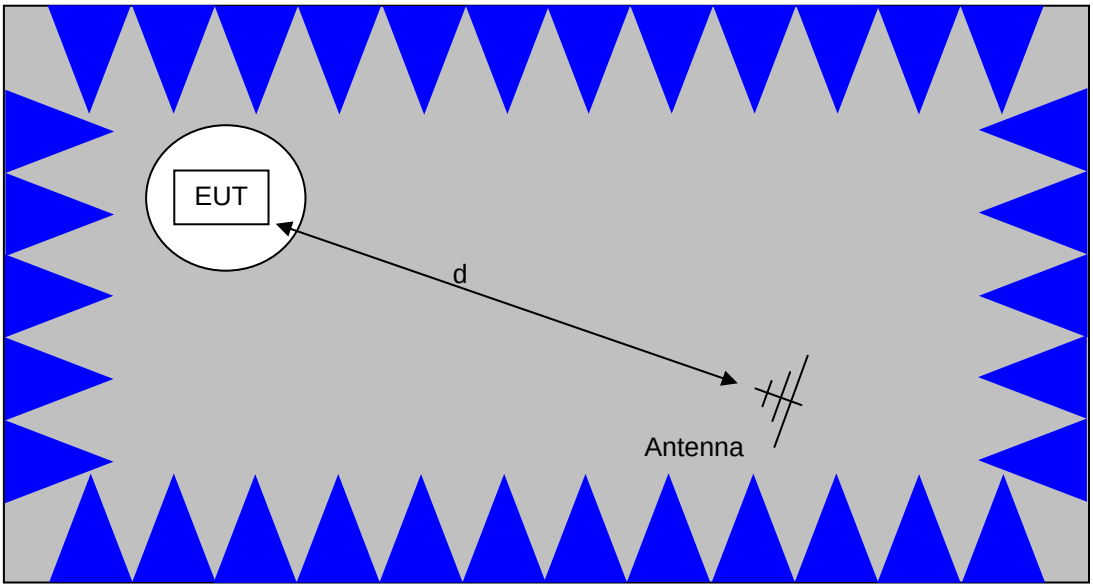
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

When testing above 18 GHz, the receive antenna is located at 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.

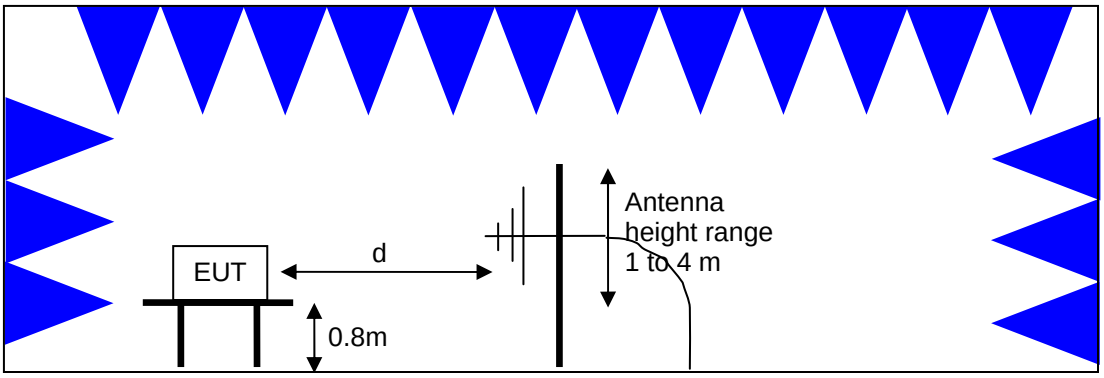


Typical Test Configuration for Radiated Field Strength Measurements



The anechoic materials on the walls and ceiling ensure compliance with the normalized site attenuation requirements of CISPR 16 / CISPR 22 / ANSI C63.4 for an alternate test site at the measurement distances used.

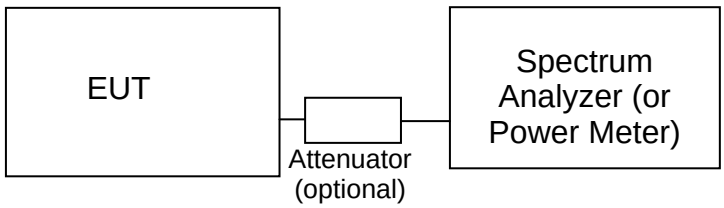
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



Test Configuration for Radiated Field Strength Measurements
Semi-Anechoic Chamber, Plan and Side Views

CONDUCTED EMISSIONS FROM ANTENNA PORT

Direct measurements of power, bandwidth and power spectral density are performed, where possible, with the antenna port of the EUT connected to either the power meter or spectrum analyzer via a suitable attenuator and/or filter. These are used to ensure that the front end of the measurement instrument is not overloaded by the fundamental transmission.



Test Configuration for Antenna Port Measurements

Measurement bandwidths (video and resolution) are set in accordance with the relevant standards and Elliott's test procedures for the type of radio being tested. When power measurements are made using a resolution bandwidth less than the signal bandwidth the power is calculated by summing the power across the signal bandwidth using either the analyzer channel power function or by capturing the trace data and calculating the power using software. In both cases the summed power is corrected to account for the equivalent noise bandwidth (ENBW) of the resolution bandwidth used.

If power averaging is used (typically for certain digital modulation techniques), the EUT is configured to transmit continuously. Power averaging is performed using either the built-in function of the analyzer or, if the analyzer does not feature power averaging, using external software. In both cases the average power is calculated over a number of sweeps (typically 100). When the EUT cannot be configured to continuously transmit then either the analyzer is configured to perform a gated sweep to ensure that the power is averaged over periods that the device is transmitting or power averaging is disabled and a max-hold feature is used.

If a power meter is used to make output power measurements the sensor head type (peak or average) is stated in the test data table.

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 bands[1] (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	$2400/F_{KHz}$ @ 300m	$67.6-20*\log_{10}(F_{KHz})$ @ 300m
0.490-1.705	$24000/F_{KHz}$ @ 30m	$87.6-20*\log_{10}(F_{KHz})$ @ 30m
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

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).

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

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:

$$F_d = 20*LOG_{10} (D_m/D_s)$$

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:

$$F_d = 40*LOG_{10} (D_m/D_s)$$

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 = Receiver Reading in dBuV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBuV/m

L_S = Specification Limit in dBuV/m

M = 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 d (meters) from the equipment under test:

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

where P is the eirp (Watts)

For a measurement at 3m the conversion from a logarithmic value for field strength (dBuV/m) to an eirp power (dBm) is -95.3dB.

Appendix A Test Equipment Calibration Data

Radiated Emissions, 1000 - 26,000 MHz, 25-Jul-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/8/2011
Hewlett Packard	Head (Inc flex cable, 1143, 2198) Red	84125C	1145	2/17/2012
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	8/12/2011
Hewlett Packard	High Pass filter, 3.5 GHz	P/N 84300-80038	1157	9/3/2011
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	9/21/2012
A.H. Systems	Purple System Horn, 18-40GHz	SAS-574, p/n: 2581	2160	2/9/2012
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2249	10/11/2011

Radiated Emissions, 30 - 6,000 MHz, 26-Jul-11

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/8/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	11/2/2011
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447D OPT 010	1826	5/17/2012
Hewlett Packard	9kHz-40GHz Analyzer	8564E	2190	8/21/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	2197	12/29/2011
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	2199	2/23/2012

Conducted Emissions - AC Power Ports, 27-Jul-11

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	LISN, 10 kHz-100 MHz	3825/2	1293	3/1/2012
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz - 22 GHz	8593EM	1319	11/22/2011
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	1/17/2012
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1594	5/17/2012

Radiated Emissions, 1000 - 18,000 MHz, 28-Jul-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	5/18/2012
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	9/21/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	8/14/2011
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	8/10/2011

Radiated Emissions, 30 - 6,000 MHz, 28-Jul-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	5/18/2012
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz - 22 GHz	8593EM	1319	11/22/2011
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	1/17/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	8/14/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1548	6/24/2012
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
Com-Power Corp.	Preamplifier, 30-1000 MHz	PA-103	1632	4/29/2012

Conducted Emissions - AC Power Ports, 28-Jul-11

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	LISN, 10 kHz-100 MHz	3825/2	1293	3/1/2012
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz - 22 GHz	8593EM	1319	11/22/2011
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	1/17/2012
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1594	5/17/2012

Radio Antenna Port (Power and Spurious Emissions), 02-Aug-11

Manufacturer	Description	Model	Asset #	Cal Due
Agilent	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	1/26/2012

Radiated Emissions, 30 - 26,500 MHz, 09-Aug-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/8/2011
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/8/2012
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	8/12/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1657	5/28/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	4/6/2012
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2238	10/1/2011
Com-Power Corp.	Preamplifier, 30-1000 MHz	PA-103A	2359	2/15/2012

Fundamental, 11-Aug-11

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	11/2/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	2197	12/29/2011

Radiated Emissions, Power, 15-Aug-11

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/6/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	11/2/2011

Radiated Emissions, Fundamental and 1,500 - 20,000 MHz, 22-Aug-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	SpecAn 9 KHz-26.5 GHz, Non-Program	8563E	284	1/13/2012
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	2/28/2012
Hewlett Packard	High Pass filter, 3.5 GHz	P/N 84300-80038	1157	8/5/2012
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	9/21/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	4/13/2012
Hewlett Packard	High Pass filter, 1.5 GHz (Purple System)	P/N 84300-80037 (84125C)	1769	11/29/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	2237	7/14/2012

Appendix B Test Data

T84001 Pages 24 – 82

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Emissions Standard(s):	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	B

EMC Test Data

For The

Ricoh

Model

eQ102 (FCC ID: BBP-WLNEWS102)

Date of Last Test: 9/1/2011

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	B

Conducted Emissions

(Elliott Laboratories Fremont Facility, Semi-Anechoic Chamber)

Test Specific Details

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: 7/28/2011
Test Engineer: Chris Groat
Test Location: Fremont Chamber #7
Config. Used: 1
Config Change: EUT powered by AC adaptor
EUT Voltage: 120V/60Hz

General Test Configuration

For tabletop equipment, the EUT was located on a wooden table inside the semi-anechoic chamber, 40 cm from a vertical coupling plane and 80cm from the LISN. A second LISN was used for all local support equipment. Remote support equipment was located outside of the semi-anechoic chamber. Any cables running to remote support equipment where routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.

Ambient Conditions:

Temperature: 21 °C
Rel. Humidity: 42 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power, 120V/60Hz	FCC Class B	Pass	47.5dBµV @ 2.451MHz (-8.5dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

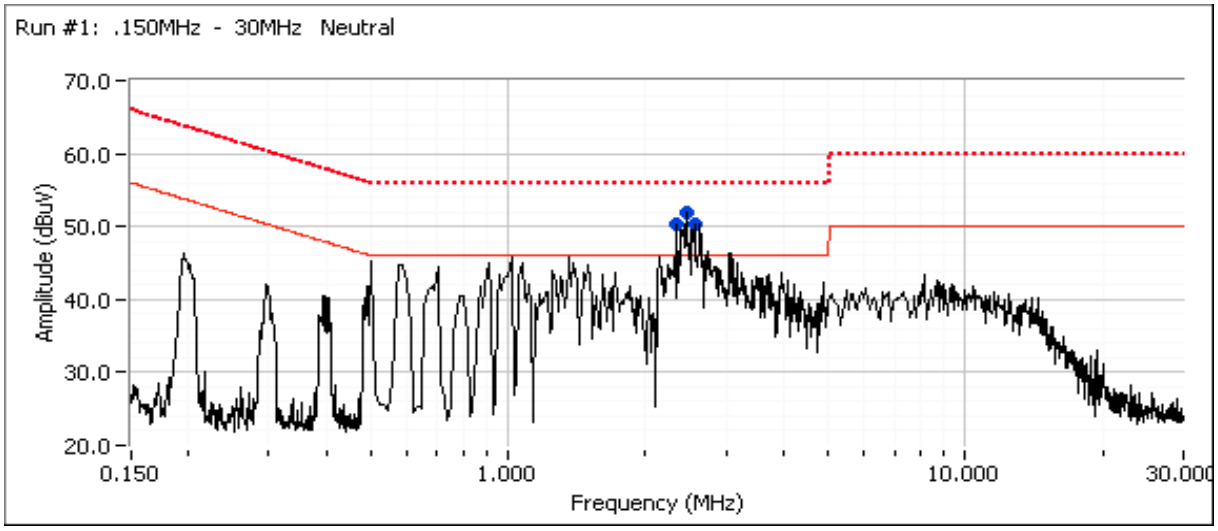
Deviations From The Standard

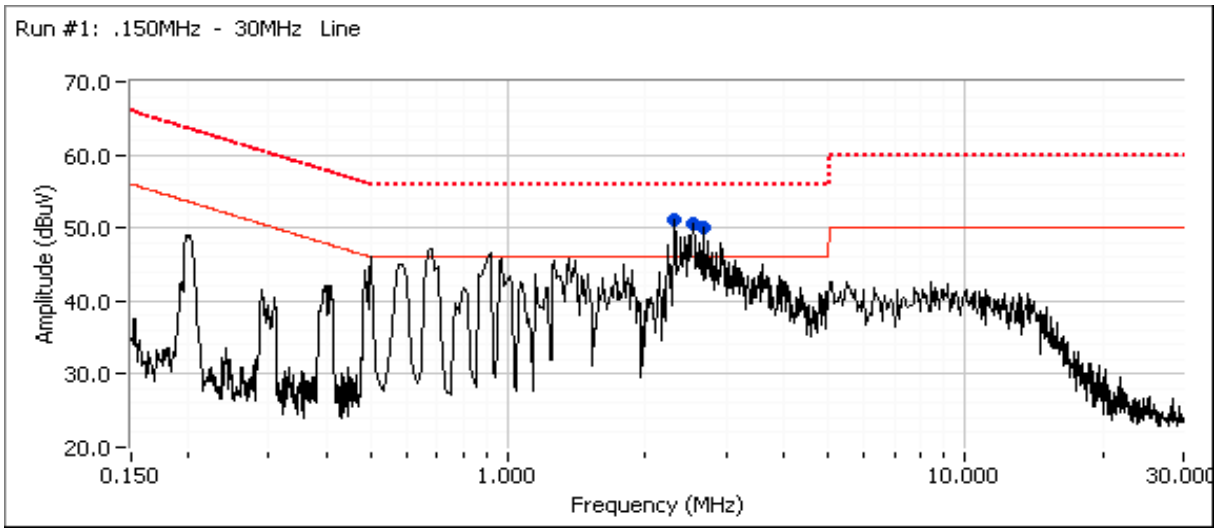
No deviations were made from the requirements of the standard.

Note: EUT in default operation mode (CDMA and Wifi radios active)

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	B

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz





Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	B

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency	Level	AC	FCC Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
2.451	51.8	Neutral	46.0	5.8	Peak	
2.322	51.1	Line 1	46.0	5.1	Peak	
2.554	50.5	Line 1	46.0	4.5	Peak	
2.555	50.4	Neutral	46.0	4.4	Peak	
2.326	50.4	Neutral	46.0	4.4	Peak	
2.667	50.1	Line 1	46.0	4.1	Peak	

Final quasi-peak and average readings

Frequency	Level	AC	FCC Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
2.451	47.5	Neutral	56.0	-8.5	QP	QP (1.00s)
2.326	46.0	Neutral	56.0	-10.0	QP	QP (1.00s)
2.555	45.6	Neutral	56.0	-10.4	QP	QP (1.00s)
2.554	45.5	Line 1	56.0	-10.5	QP	QP (1.00s)
2.322	45.4	Line 1	56.0	-10.6	QP	QP (1.00s)
2.667	42.7	Line 1	56.0	-13.3	QP	QP (1.00s)
2.326	31.7	Neutral	46.0	-14.3	AVG	AVG (0.10s)
2.451	31.2	Neutral	46.0	-14.8	AVG	AVG (0.10s)
2.555	30.8	Neutral	46.0	-15.2	AVG	AVG (0.10s)
2.554	30.7	Line 1	46.0	-15.3	AVG	AVG (0.10s)
2.322	28.5	Line 1	46.0	-17.5	AVG	AVG (0.10s)
2.667	23.5	Line 1	46.0	-22.5	AVG	AVG (0.10s)

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions

Test Specific Details

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature: 20-25 °C

Rel. Humidity: 30-40 %

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
802.11bg - WiFi Operation							
1a	802.11b	1 - 2412 MHz	20	Upright	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	50.5dBµV/m @ 2387.5MHz (-3.5dB)
1a	802.11b	1 - 2412 MHz	20	Side	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	51.8dBµV/m @ 2387.5MHz (-2.2dB)
1a	802.11b	1 - 2412 MHz	20	Flat	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.0dBµV/m @ 2387.5MHz (-1.0dB)
1b	802.11b	6 - 2437 MHz	20	Upright	Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	40.9dBµV/m @ 1320.1MHz (-13.1dB)
1b	802.11b	6 - 2437 MHz	20	Side	Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	39.1dBµV/m @ 1200.0MHz (-14.9dB)
1b	802.11b	6 - 2437 MHz	20	Flat	Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	41.1dBµV/m @ 1200.1MHz (-12.9dB)

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.

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

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

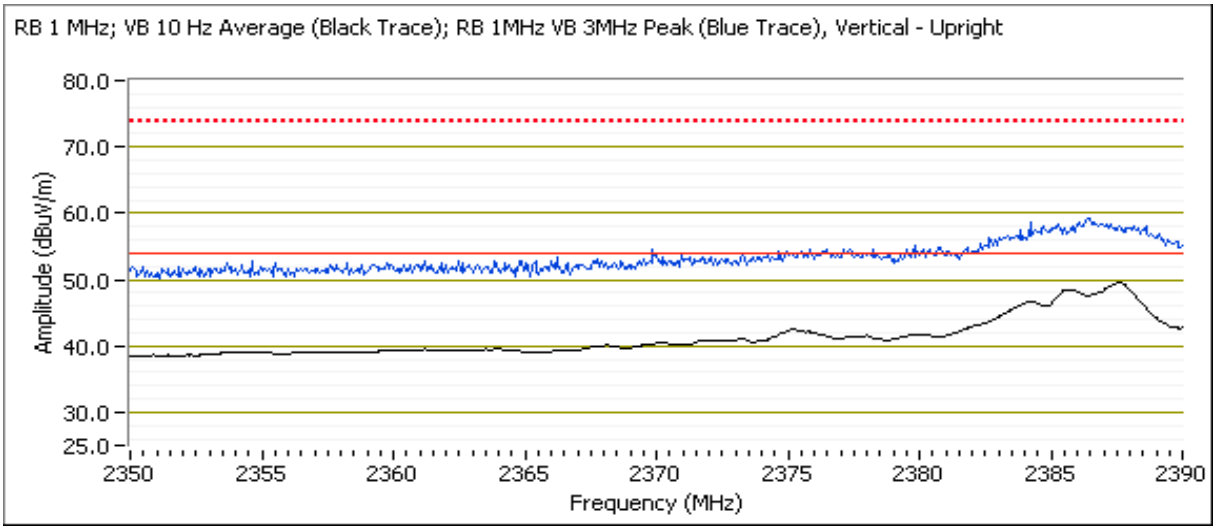
Date of Test: 25-Jul Test Location: FT Chamber #3

Test Engineer: Mehran Birgani

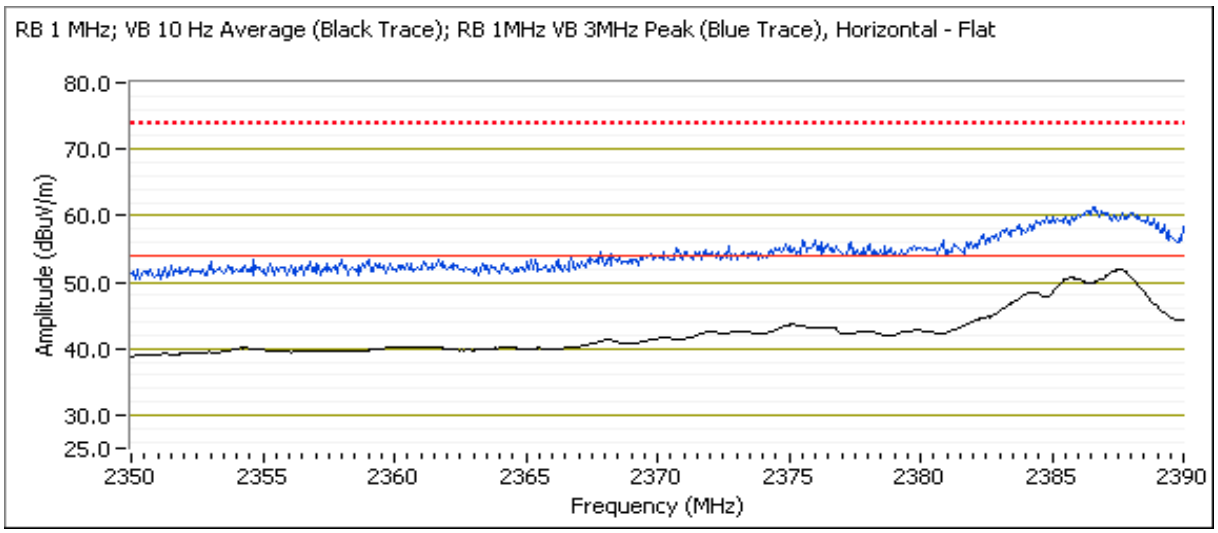
Run #1a: Low Channel @ 2412 MHz

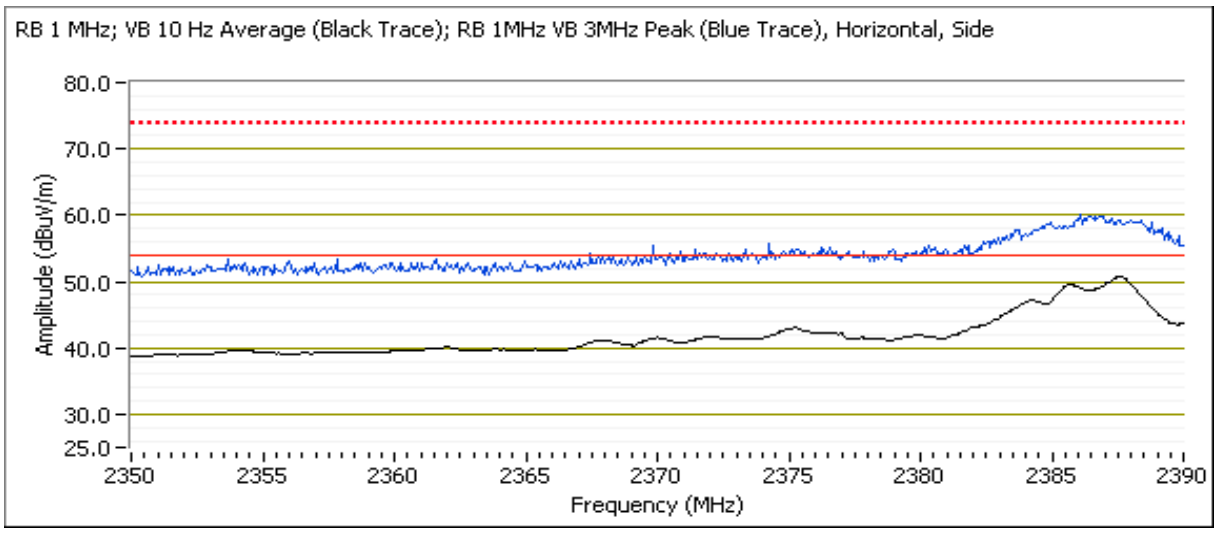
Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2387.470	50.5	V	54.0	-3.5	AVG	49	1.0	Upright
2386.400	58.6	V	74.0	-15.4	PK	49	1.0	Upright
2387.600	47.7	H	54.0	-6.3	AVG	235	1.2	Upright
2386.130	56.5	H	74.0	-17.5	PK	235	1.2	Upright
2387.600	47.1	V	54.0	-6.9	AVG	310	1.8	Flat
2386.000	55.8	V	74.0	-18.2	PK	310	1.8	Flat
2387.530	53.0	H	54.0	-1.0	AVG	116	1.1	Flat
2386.600	60.3	H	74.0	-13.7	PK	116	1.1	Flat
2387.400	48.9	V	54.0	-5.1	AVG	101	1.0	Side
2386.270	57.3	V	74.0	-16.7	PK	101	1.0	Side
2387.470	51.8	H	54.0	-2.2	AVG	174	1.1	Side
2386.600	59.4	H	74.0	-14.6	PK	174	1.1	Side



Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

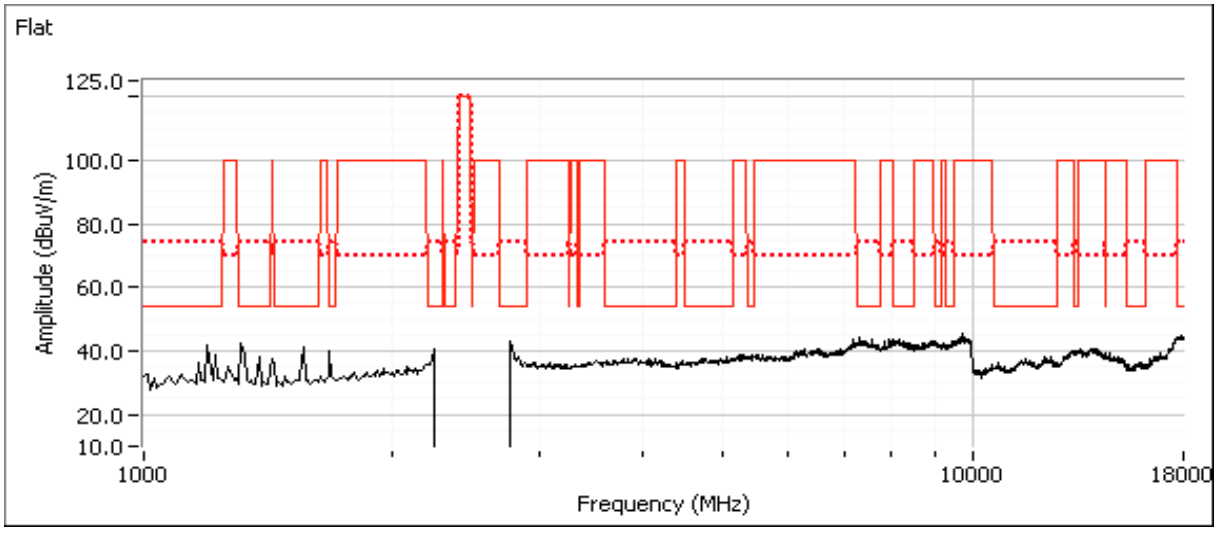




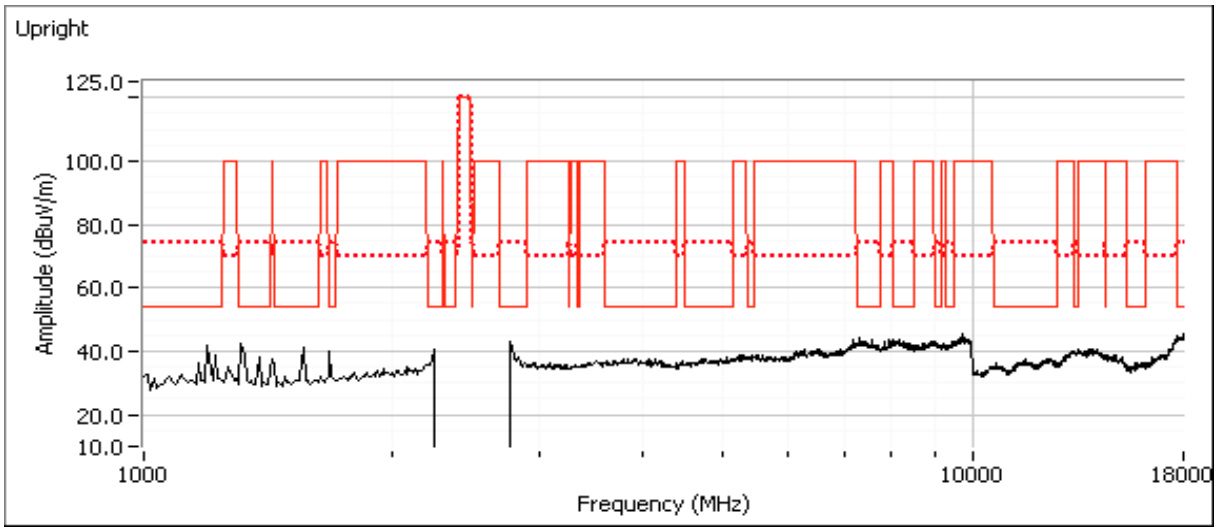
Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

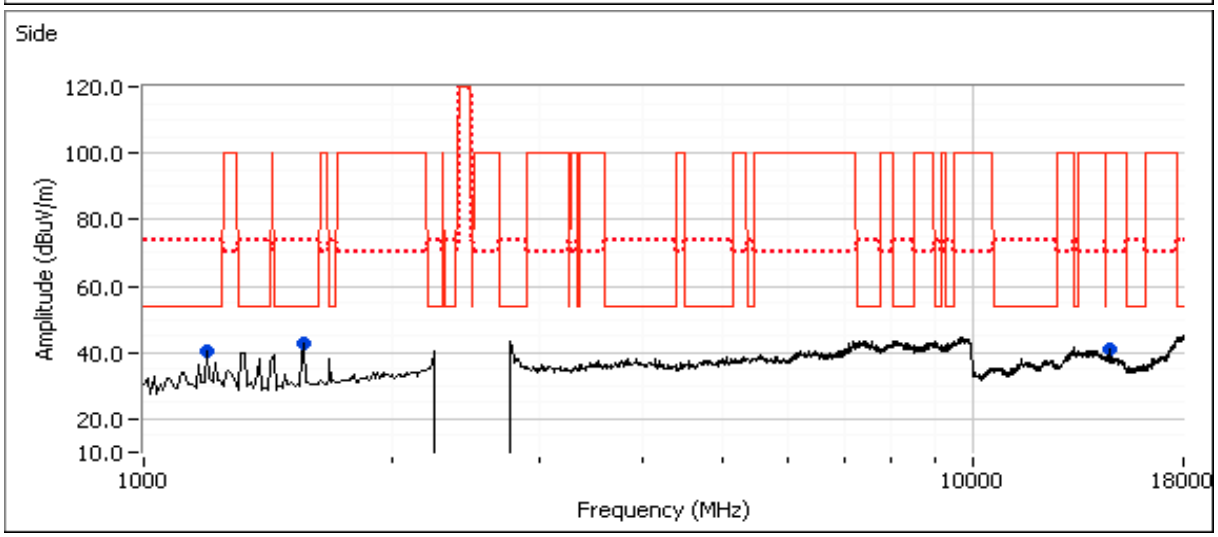
Run #1b: Center Channel @ 2437 MHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments	
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
1320.080	40.9	H	54.0	-13.1	AVG	330	1.2	RB 1 MHz;VB 10 Hz;Pk	Upright
1320.110	45.1	H	74.0	-28.9	PK	330	1.2	RB 1 MHz;VB 3 MHz;Pk	Upright
1200.130	40.4	H	54.0	-13.6	AVG	13	1.0	RB 1 MHz;VB 10 Hz;Pk	Upright
1199.860	45.0	H	74.0	-29.0	PK	13	1.0	RB 1 MHz;VB 3 MHz;Pk	Upright
1200.060	41.1	H	54.0	-12.9	AVG	37	1.2	RB 1 MHz;VB 10 Hz;Pk	Flat
1200.270	45.1	H	74.0	-28.9	PK	37	1.2	RB 1 MHz;VB 3 MHz;Pk	Flat
1320.060	41.0	H	54.0	-13.0	AVG	55	1.0	RB 1 MHz;VB 10 Hz;Pk	Flat
1320.110	45.3	H	74.0	-28.7	PK	55	1.0	RB 1 MHz;VB 3 MHz;Pk	Flat
14626.670	41.3	V	70.0	-28.7	Peak	360	1.0		Side
1560.070	38.9	V	54.0	-15.1	AVG	352	1.8	RB 1 MHz;VB 10 Hz;Pk	Side
1560.120	43.4	V	74.0	-30.6	PK	352	1.8	RB 1 MHz;VB 3 MHz;Pk	Side
1200.040	39.1	V	54.0	-14.9	AVG	36	1.0	RB 1 MHz;VB 10 Hz;Pk	Side
1200.080	43.9	V	74.0	-30.1	PK	36	1.0	RB 1 MHz;VB 3 MHz;Pk	Side



Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A





Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions

Test Specific Details

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature: 20-25 °C

Rel. Humidity: 30-40 %

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
802.11bg - WiFi Operation							
1a	802.11b	1 - 2412 MHz	20		Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.0dBµV/m @ 2387.5MHz (-1.0dB)
			20		Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	43.5dBµV/m @ 1320.1MHz (-10.5dB)
1b	802.11b	6 - 2437 MHz	20		Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	41.1dBµV/m @ 1200.1MHz (-12.9dB)
1c	802.11b	11 - 2462 MHz	20		Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	52.2dBµV/m @ 2486.5MHz (-1.8dB)
			20		Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	43.9dBµV/m @ 1320.0MHz (-10.1dB)
2a	802.11g	1 - 2412 MHz	14.5		Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	73.7dBµV/m @ 2389.3MHz (-0.3dB)
			14.5		Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	44.3dBµV/m @ 1320.1MHz (-9.7dB)
2b	802.11g	6 - 2437 MHz	20		Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	44.6dBµV/m @ 1320.1MHz (-9.4dB)
2c	802.11g	11 - 2462 MHz	14.0		Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	53.8dBµV/m @ 2483.5MHz (-0.2dB)
			14.0		Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	44.5dBµV/m @ 1320.1MHz (-9.5dB)
3a	802.11n20	1 - 2412 MHz	15.0		Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.9dBµV/m @ 2390.0MHz (-0.1dB)
			15.0		Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	40.4dBµV/m @ 1200.0MHz (-13.6dB)

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

3b	802.11n20	6 - 2437 MHz	20		Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	39.5dBµV/m @ 1200.0MHz (-14.5dB)
3c	802.11n20	11 - 2462 MHz	13.5		Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	53.5dBµV/m @ 2483.6MHz (-0.5dB)
			13.5		Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	39.8dBµV/m @ 1200.0MHz (-14.2dB)

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
Bluetooth Operation							
4a	BT - Basic	2402 MHz	15	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	39.9dBµV/m @ 2381.3MHz (-14.1dB)
			15	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	40.2dBµV/m @ 12010.4MHz (-13.8dB)
4b	BT - Basic	2441 MHz	15	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	40.5dBµV/m @ 12210.2MHz (-13.5dB)
4c	BT - Basic	2480 MHz	15	-	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	45.3dBµV/m @ 2483.5MHz (-8.7dB)
			15	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	44.7dBµV/m @ 1500.1MHz (-9.3dB)
5a	BT - EDR	2402 MHz	15	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	41.4dBµV/m @ 2389.9MHz (-12.6dB)
			15	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	43.1dBµV/m @ 1500.1MHz (-10.9dB)
5b	BT - EDR	2441 MHz	15	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	39.7dBµV/m @ 2728.3MHz (-14.3dB)
5c	BT - EDR	2480 MHz	15	-	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	48.2dBµV/m @ 2483.5MHz (-5.8dB)
			15	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	39.6dBµV/m @ 2729.1MHz (-14.4dB)

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.

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

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

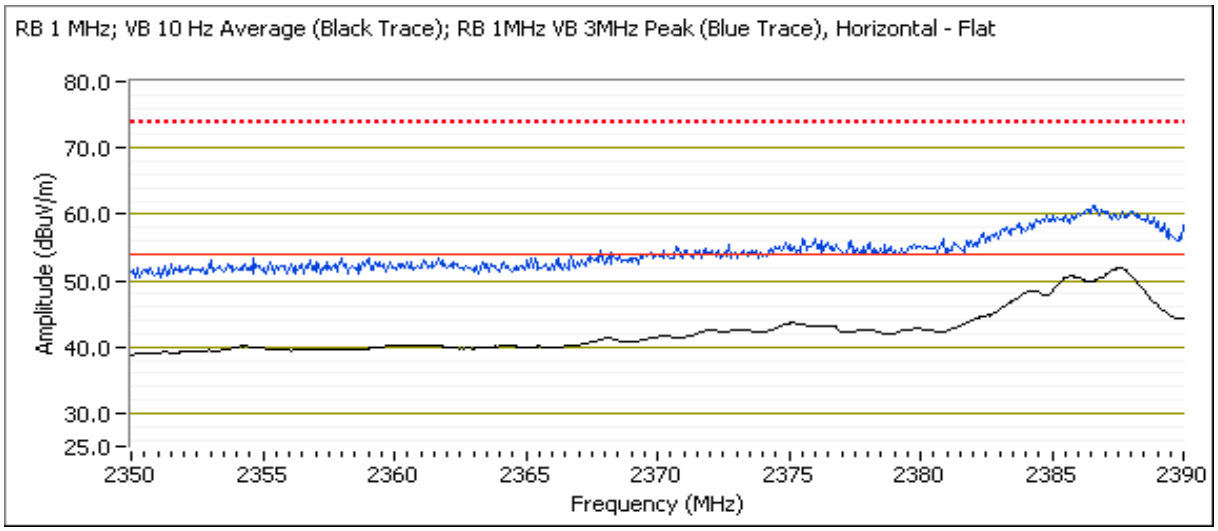
Date of Test: 7/25/2011 Test Location: FT Chamber #3

Test Engineer: Mehran Birgani

Run #1a: Low Channel @ 2412 MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2387.530	53.0	H	54.0	-1.0	AVG	116	1.1	Flat
2387.600	47.1	V	54.0	-6.9	AVG	310	1.8	Flat
2386.600	60.3	H	74.0	-13.7	PK	116	1.1	Flat
2386.000	55.8	V	74.0	-18.2	PK	310	1.8	Flat

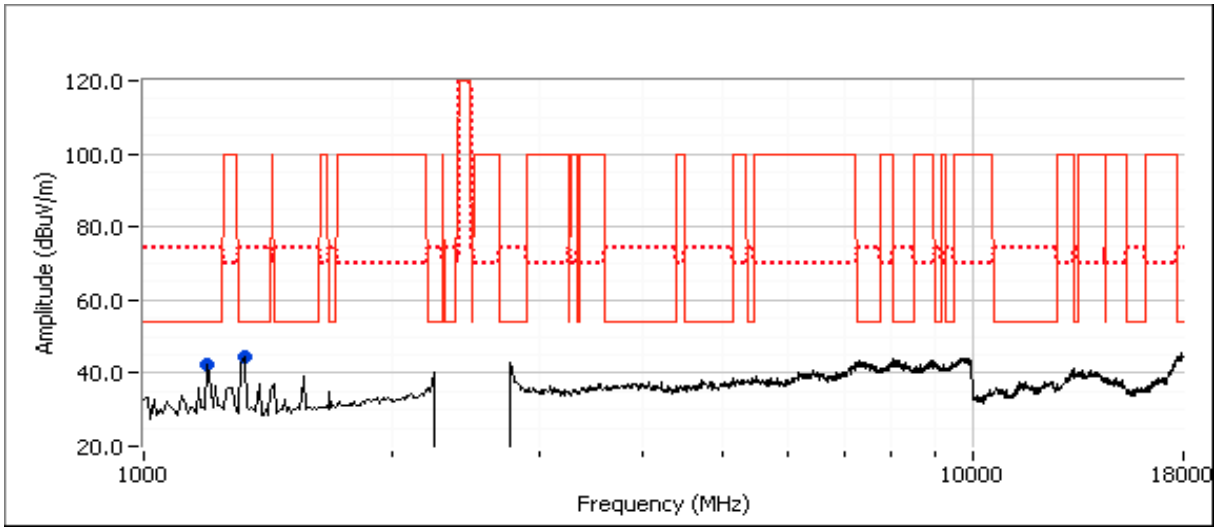


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Other Spurious Emissions
Orientation: Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1320.060	43.5	H	54.0	-10.5	AVG	55	1.1	RB 1 MHz;VB 10 Hz;Pk
1320.260	46.8	H	74.0	-27.2	PK	55	1.1	RB 1 MHz;VB 3 MHz;Pk
1200.040	42.4	H	54.0	-11.6	AVG	50	1.3	RB 1 MHz;VB 10 Hz;Pk
1199.960	46.1	H	74.0	-27.9	PK	50	1.3	RB 1 MHz;VB 3 MHz;Pk

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.



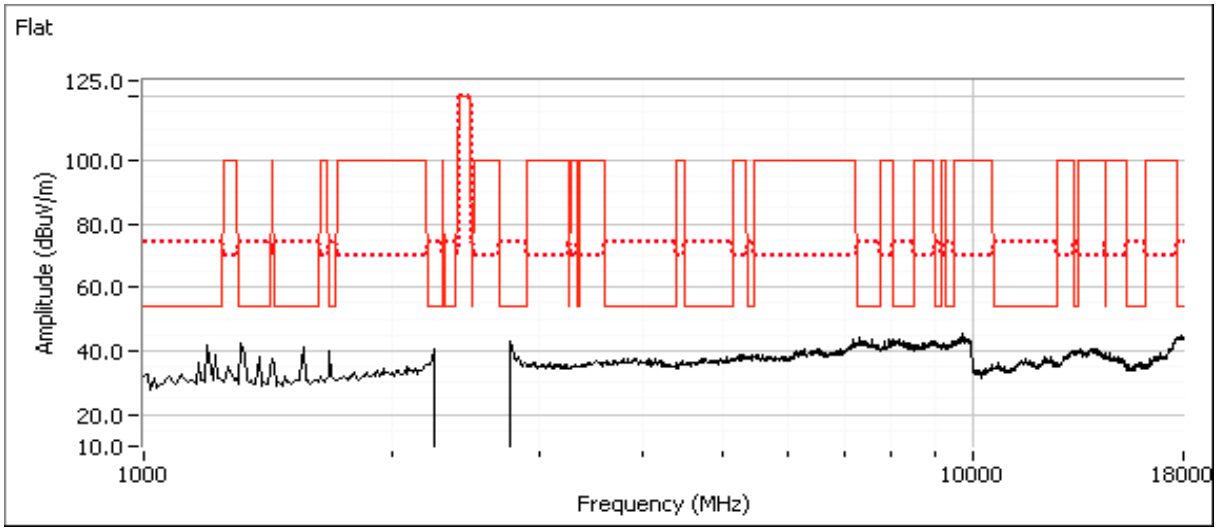
Run #1b: Center Channel @ 2437 MHz
Date of Test: 7/25/2011 Test Location: FT Chamber #3
Test Engineer: M. Birgani / R. Varelas

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments	
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
1320.080	40.9	H	54.0	-13.1	AVG	330	1.2	RB 1 MHz;VB 10 Hz;Pk	Upright
1320.110	45.1	H	74.0	-28.9	PK	330	1.2	RB 1 MHz;VB 3 MHz;Pk	Upright
1200.130	40.4	H	54.0	-13.6	AVG	13	1.0	RB 1 MHz;VB 10 Hz;Pk	Upright
1199.860	45.0	H	74.0	-29.0	PK	13	1.0	RB 1 MHz;VB 3 MHz;Pk	Upright

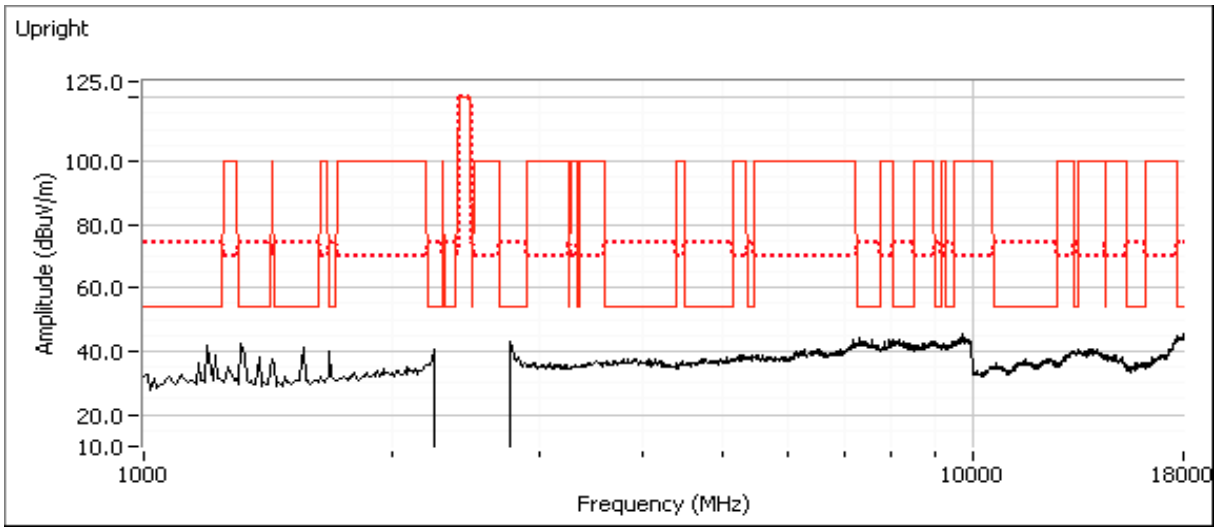
Client:	Ricoh						Job Number:	J83980	
Model:	eQ102 (FCC ID: BBP-WLNEWS102)						T-Log Number:	T84001	
							Account Manager:	Christine Krebill	
Contact:	Jay Moulton @ RF Exposure								
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24						Class:	N/A	

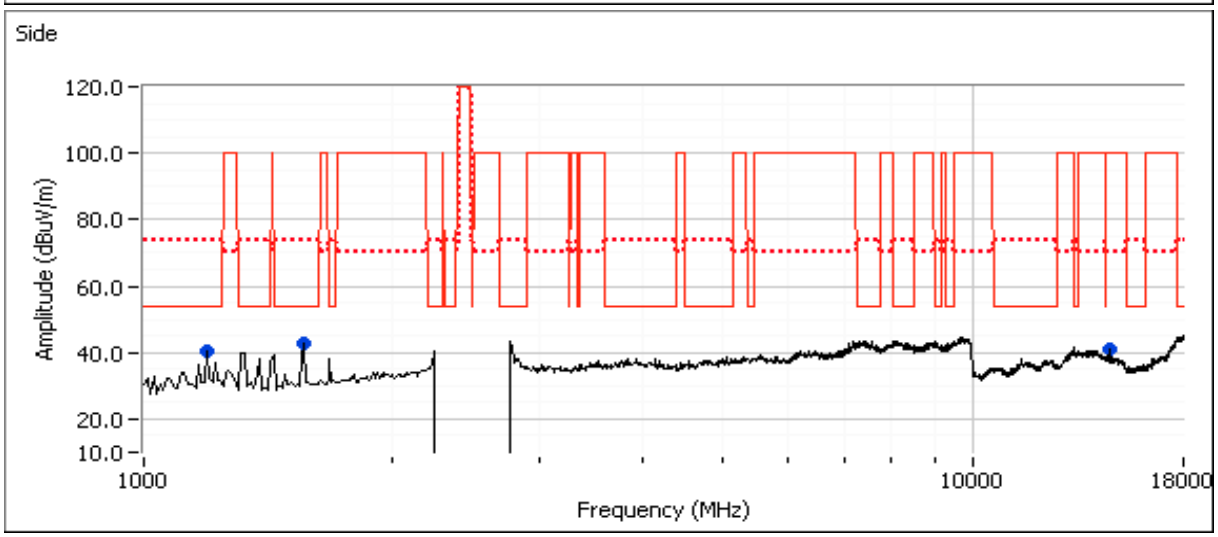
1200.060	41.1	H	54.0	-12.9	AVG	37	1.2	RB 1 MHz;VB 10 Hz;Pk	Flat
1200.270	45.1	H	74.0	-28.9	PK	37	1.2	RB 1 MHz;VB 3 MHz;Pk	Flat
1320.060	41.0	H	54.0	-13.0	AVG	55	1.0	RB 1 MHz;VB 10 Hz;Pk	Flat
1320.110	45.3	H	74.0	-28.7	PK	55	1.0	RB 1 MHz;VB 3 MHz;Pk	Flat
14626.670	41.3	V	70.0	-28.7	Peak	360	1.0		Side
1560.070	38.9	V	54.0	-15.1	AVG	352	1.8	RB 1 MHz;VB 10 Hz;Pk	Side
1560.120	43.4	V	74.0	-30.6	PK	352	1.8	RB 1 MHz;VB 3 MHz;Pk	Side
1200.040	39.1	V	54.0	-14.9	AVG	36	1.0	RB 1 MHz;VB 10 Hz;Pk	Side
1200.080	43.9	V	74.0	-30.1	PK	36	1.0	RB 1 MHz;VB 3 MHz;Pk	Side

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.



Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

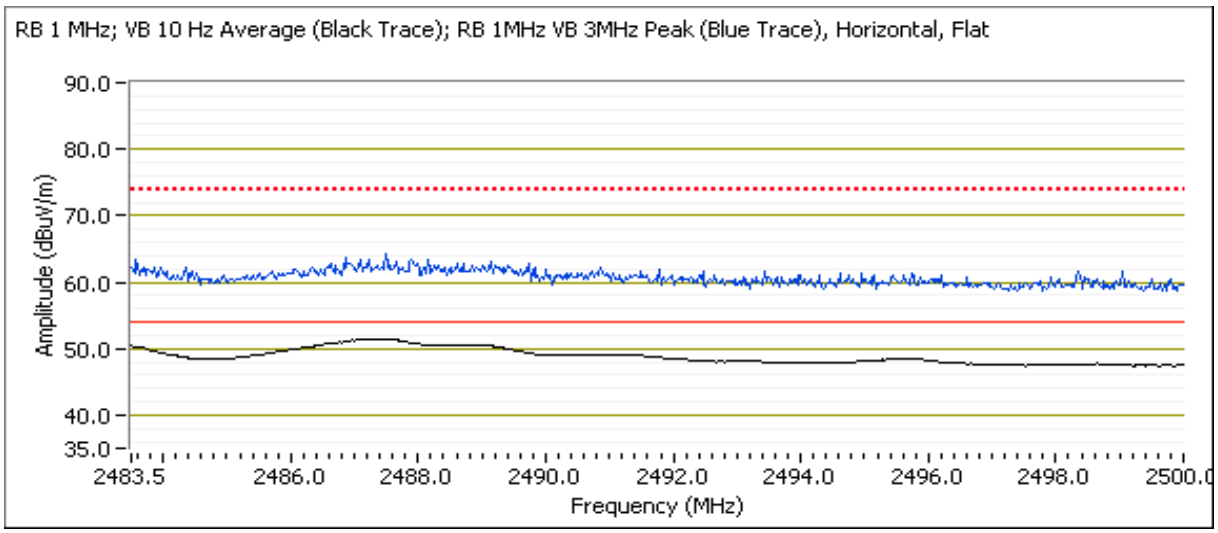




Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #1c: High Channel @ 2462 MHz
Band Edge Signal Field Strength - Direct measurement of field strength
Orientation: Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2486.460	52.2	H	54.0	-1.8	AVG	297	1.0	RB 1 MHz;VB 10 Hz;Pk
2485.810	62.2	H	74.0	-11.8	PK	297	1.0	RB 1 MHz;VB 3 MHz;Pk
2486.460	49.7	V	54.0	-4.3	AVG	137	1.4	RB 1 MHz;VB 10 Hz;Pk
2485.740	60.7	V	74.0	-13.3	PK	137	1.4	RB 1 MHz;VB 3 MHz;Pk

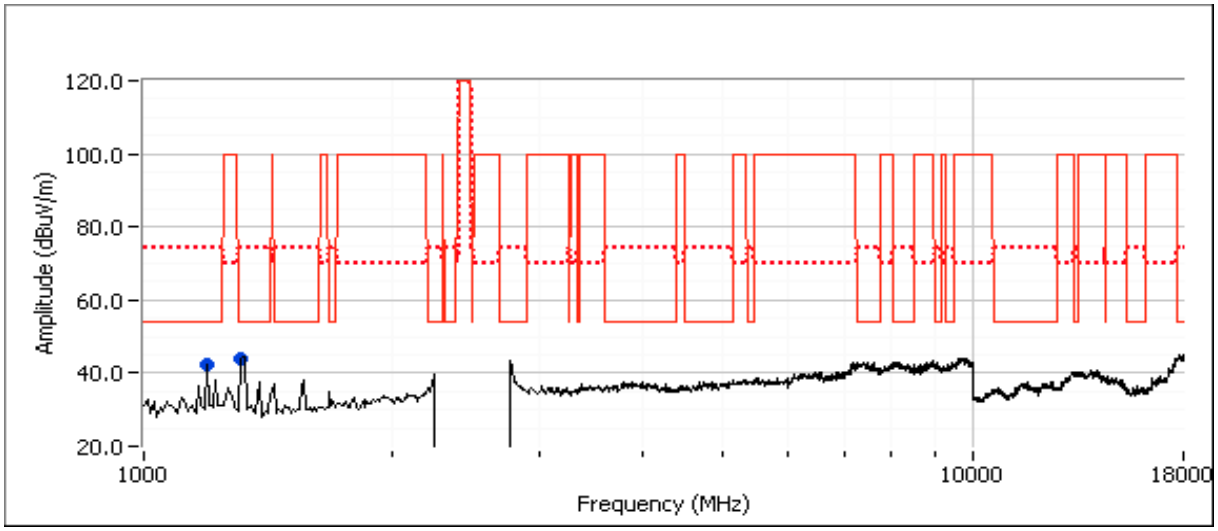


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Other Spurious Emissions
Orientation: Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1320.040	43.9	H	54.0	-10.1	AVG	66	1.0	RB 1 MHz;VB 10 Hz;Pk
1319.970	47.4	H	74.0	-26.6	PK	66	1.0	RB 1 MHz;VB 3 MHz;Pk
1200.050	42.5	H	54.0	-11.5	AVG	50	1.3	RB 1 MHz;VB 10 Hz;Pk
1200.140	45.9	H	74.0	-28.1	PK	50	1.3	RB 1 MHz;VB 3 MHz;Pk

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.

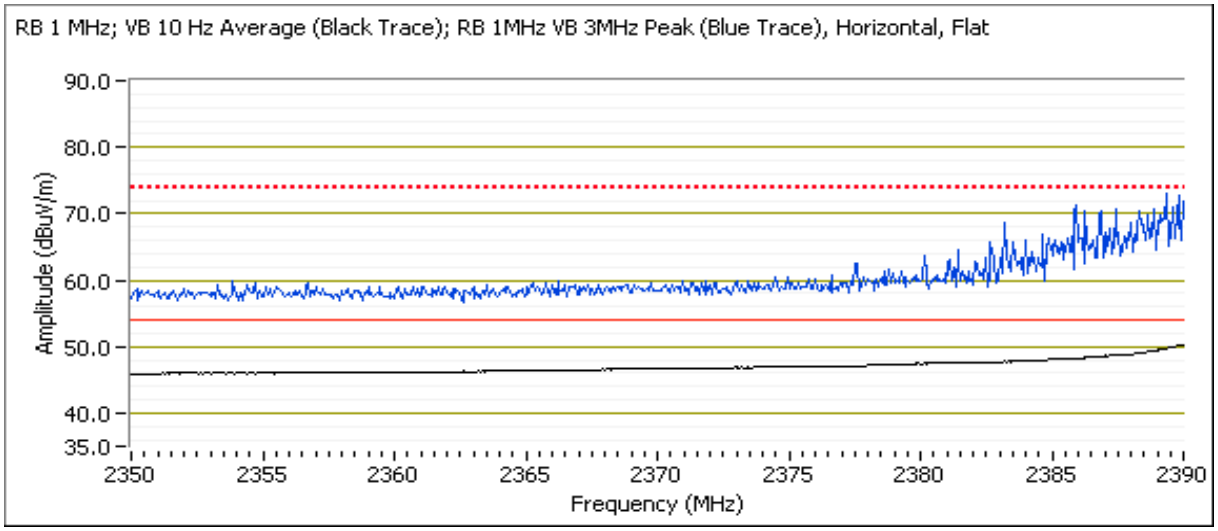


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #2: Radiated Spurious Emissions, 30 - 25000 MHz. Operating Mode: 802.11g
Date of Test: 7/25/2011
Test Engineer: Rafael Varelas
Test Location: FT Chamber #3

Run #2a: Low Channel @ 2412 MHz
Band Edge Signal Field Strength - Direct measurement of field strength
Orientation: Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.900	53.5	H	54.0	-0.5	AVG	294	1.1	RB 1 MHz;VB 10 Hz;Pk
2389.270	73.7	H	74.0	-0.3	PK	294	1.1	RB 1 MHz;VB 3 MHz;Pk
2390.000	48.2	V	54.0	-5.8	AVG	170	1.0	RB 1 MHz;VB 10 Hz;Pk
2389.790	61.8	V	74.0	-12.2	PK	170	1.0	RB 1 MHz;VB 3 MHz;Pk

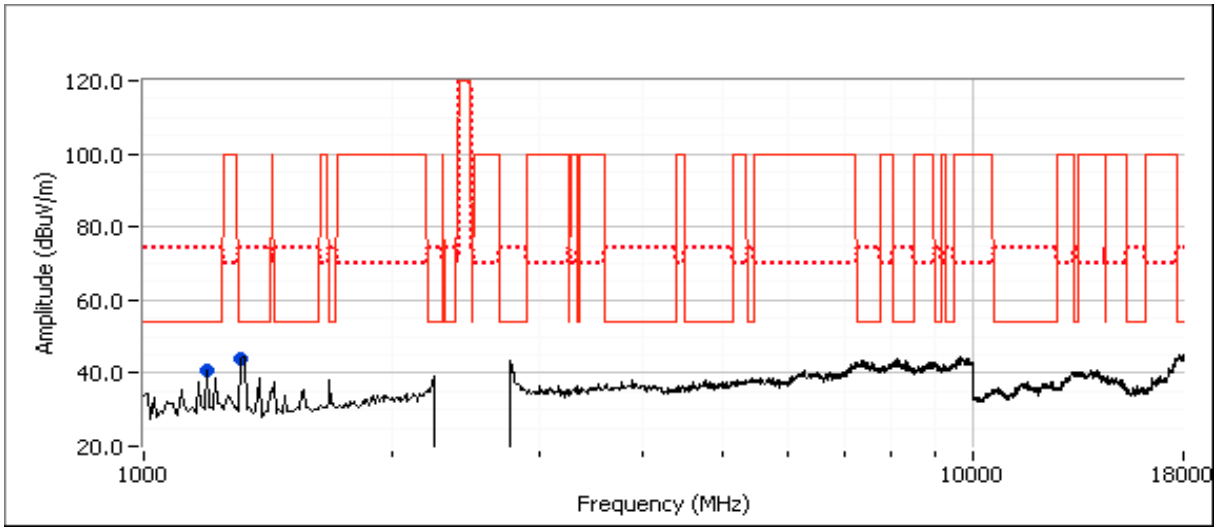


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Other Spurious Emissions
Orientation: Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1320.050	44.3	H	54.0	-9.7	AVG	48	1.0	RB 1 MHz;VB 10 Hz;Pk
1319.920	47.2	H	74.0	-26.8	PK	48	1.0	RB 1 MHz;VB 3 MHz;Pk
1200.040	40.7	H	54.0	-13.3	AVG	45	1.2	RB 1 MHz;VB 10 Hz;Pk
1200.020	45.5	H	74.0	-28.5	PK	45	1.2	RB 1 MHz;VB 3 MHz;Pk

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.

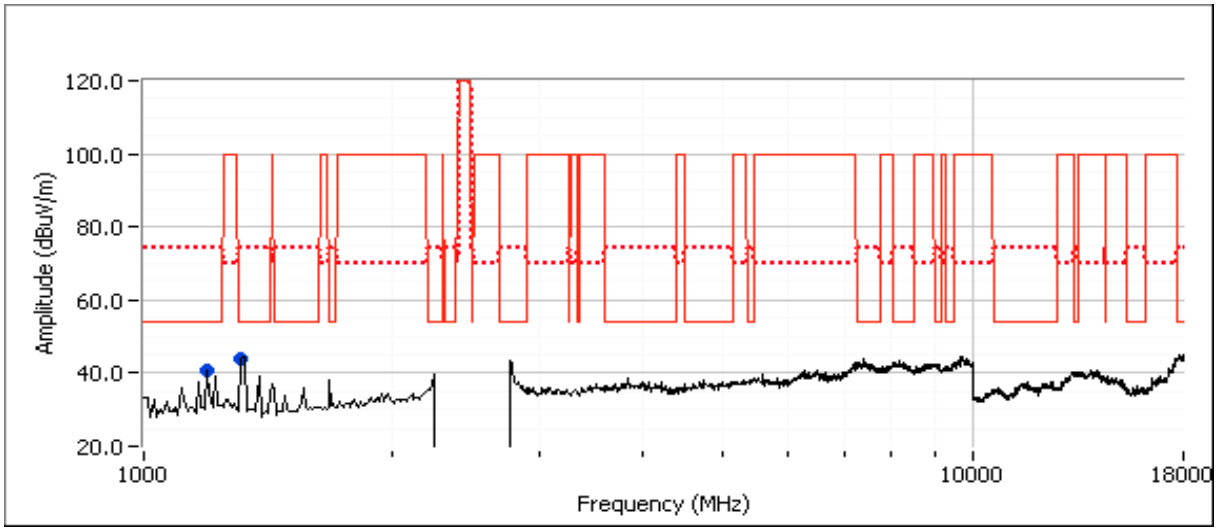


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #2b: Center Channel @ 2437 MHz
Orientation: Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1320.060	44.6	H	54.0	-9.4	AVG	53	1.0	RB 1 MHz;VB 10 Hz;Pk
1319.970	47.3	H	74.0	-26.7	PK	53	1.0	RB 1 MHz;VB 3 MHz;Pk
1200.080	40.6	H	54.0	-13.4	AVG	42	1.2	RB 1 MHz;VB 10 Hz;Pk
1199.930	45.5	H	74.0	-28.5	PK	42	1.2	RB 1 MHz;VB 3 MHz;Pk

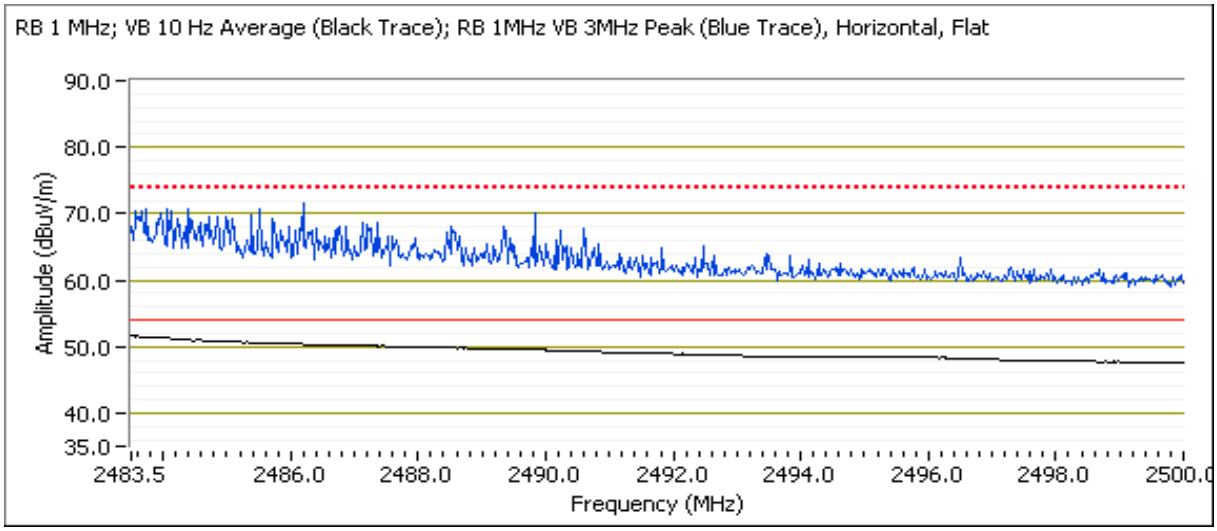
Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is not in a restricted band but the more stringent restricted band limit was used.



Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #2c: High Channel @ 2462 MHz
Band Edge Signal Field Strength - Direct measurement of field strength
Orientation: Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.520	53.8	H	54.0	-0.2	AVG	285	1.0	RB 1 MHz;VB 10 Hz;Pk
2485.000	69.2	H	74.0	-4.8	PK	285	1.0	RB 1 MHz;VB 3 MHz;Pk
2483.500	50.3	V	54.0	-3.7	AVG	137	1.4	RB 1 MHz;VB 10 Hz;Pk
2484.810	63.8	V	74.0	-10.2	PK	137	1.4	RB 1 MHz;VB 3 MHz;Pk

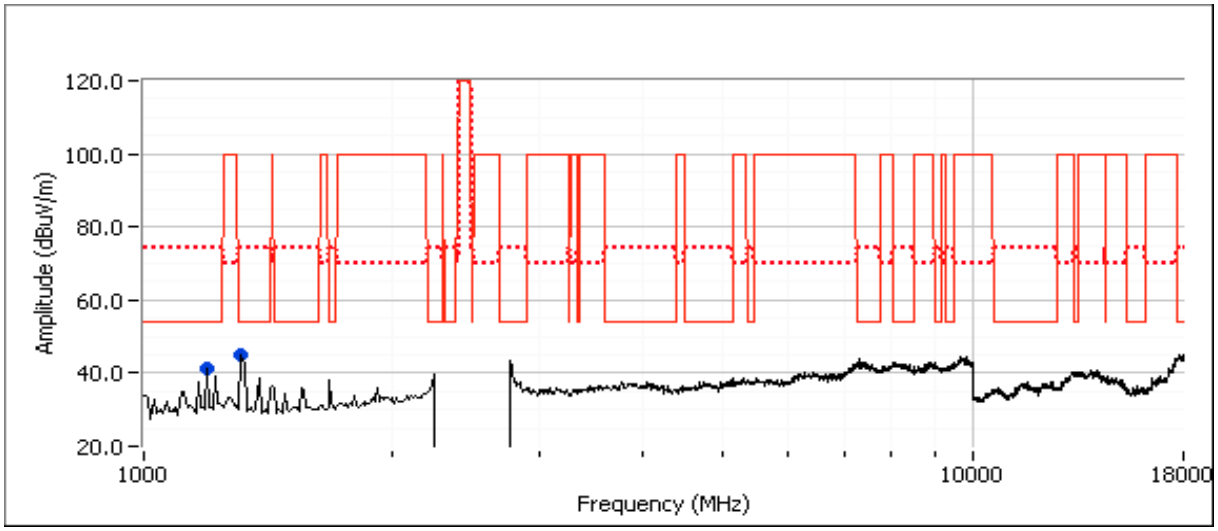


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Other Spurious Emissions
Orientation: Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1320.080	44.5	H	54.0	-9.5	AVG	49	1.0	RB 1 MHz;VB 10 Hz;Pk
1319.970	47.5	H	74.0	-26.5	PK	49	1.0	RB 1 MHz;VB 3 MHz;Pk
1200.050	40.7	H	54.0	-13.3	AVG	42	1.2	RB 1 MHz;VB 10 Hz;Pk
1200.140	45.7	H	74.0	-28.3	PK	42	1.2	RB 1 MHz;VB 3 MHz;Pk

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.

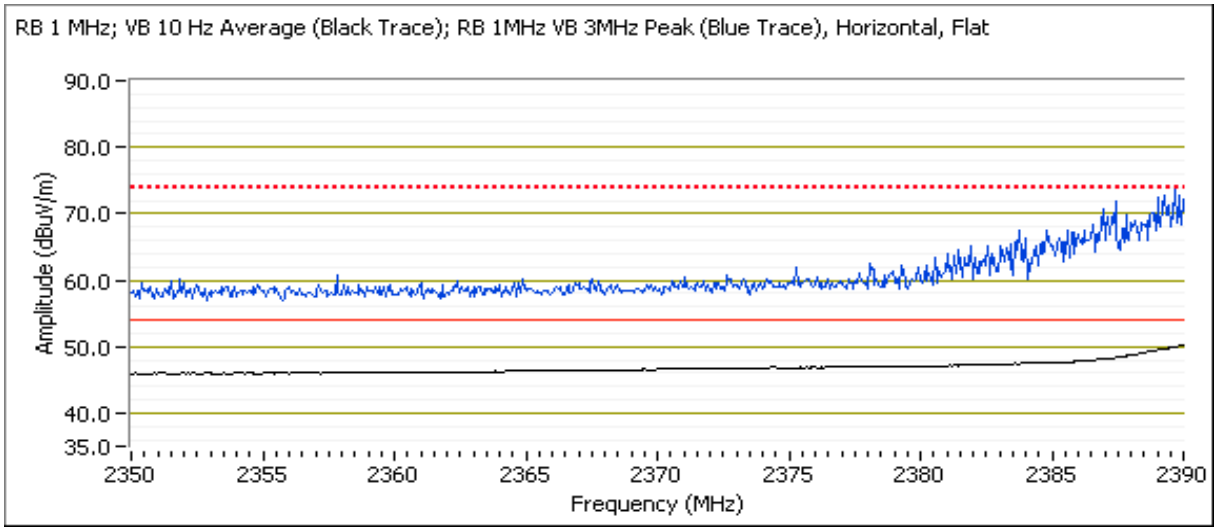


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #3: Radiated Spurious Emissions, 30 - 25000 MHz. Operating Mode: 802.11n20
Date of Test: 7/25/2011
Test Engineer: Rafael Varelas
Test Location: FT Chamber #3

Run #3a: Low Channel @ 2412 MHz
Band Edge Signal Field Strength - Direct measurement of field strength
Orientation: Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.970	53.9	H	54.0	-0.1	AVG	300	1.1	RB 1 MHz;VB 10 Hz;Pk
2389.600	72.0	H	74.0	-2.0	PK	300	1.1	RB 1 MHz;VB 3 MHz;Pk
2389.910	50.1	V	54.0	-3.9	AVG	145	1.9	RB 1 MHz;VB 10 Hz;Pk
2389.430	66.6	V	74.0	-7.4	PK	145	1.9	RB 1 MHz;VB 3 MHz;Pk

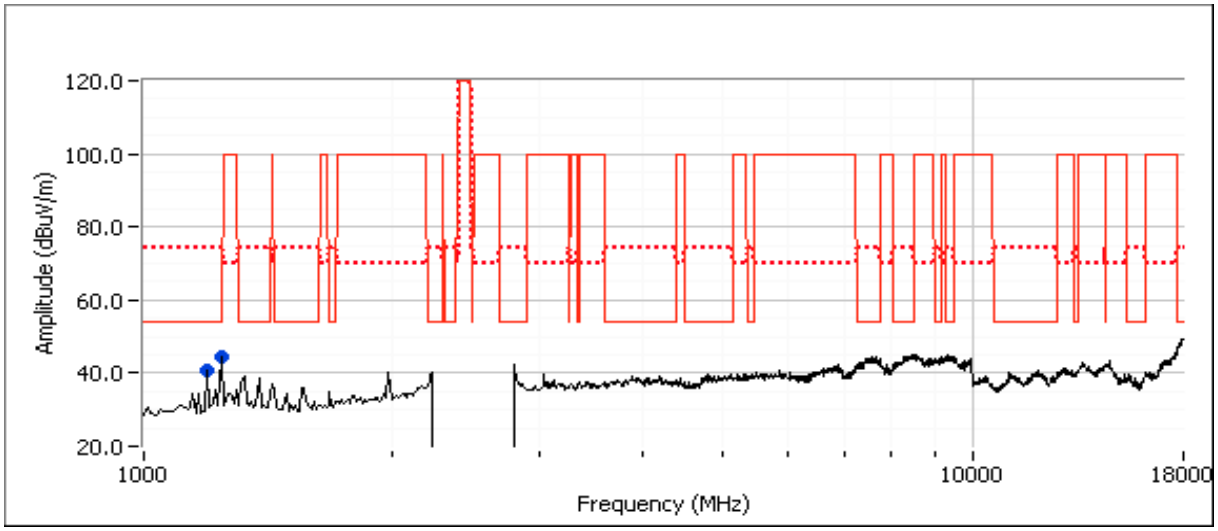


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Other Spurious Emissions
Orientation: Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1200.020	40.4	H	54.0	-13.6	AVG	60	1.1	RB 1 MHz;VB 10 Hz;Pk
1199.970	44.1	H	74.0	-29.9	PK	60	1.1	RB 1 MHz;VB 3 MHz;Pk
1222.030	27.4	V	54.0	-26.6	AVG	89	0.9	RB 1 MHz;VB 10 Hz;Pk
1225.630	37.5	V	74.0	-36.5	PK	89	0.9	RB 1 MHz;VB 3 MHz;Pk

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.

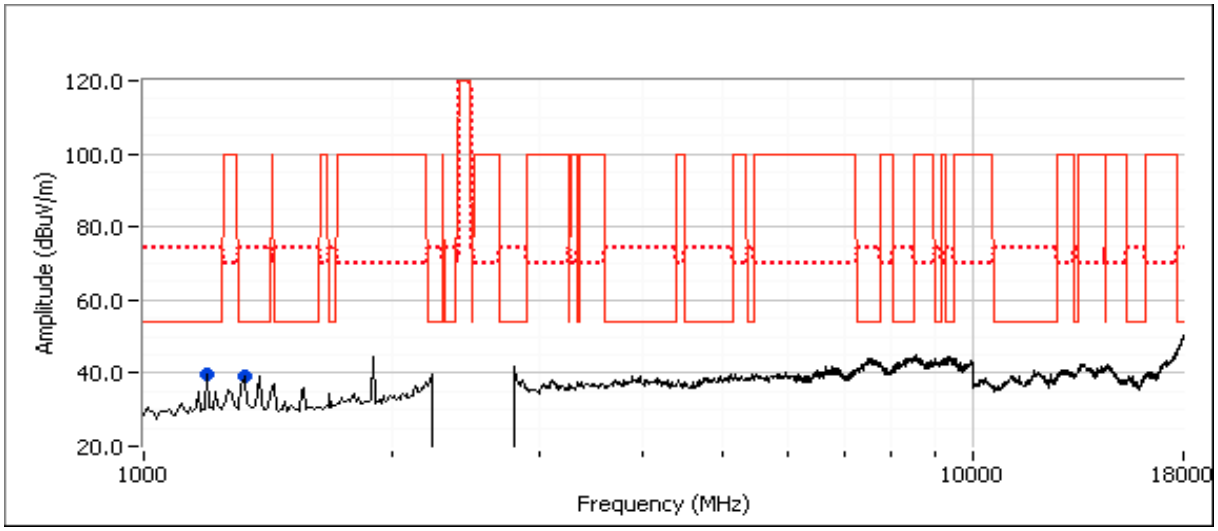


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #3b: Center Channel @ 2437 MHz
Orientation: Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1200.020	39.5	H	54.0	-14.5	AVG	194	1.2	RB 1 MHz;VB 10 Hz;Pk
1199.900	43.0	H	74.0	-31.0	PK	194	1.2	RB 1 MHz;VB 3 MHz;Pk
1326.030	39.2	H	54.0	-14.8	AVG	63	1.0	RB 1 MHz;VB 10 Hz;Pk
1325.970	42.9	H	74.0	-31.1	PK	63	1.0	RB 1 MHz;VB 3 MHz;Pk

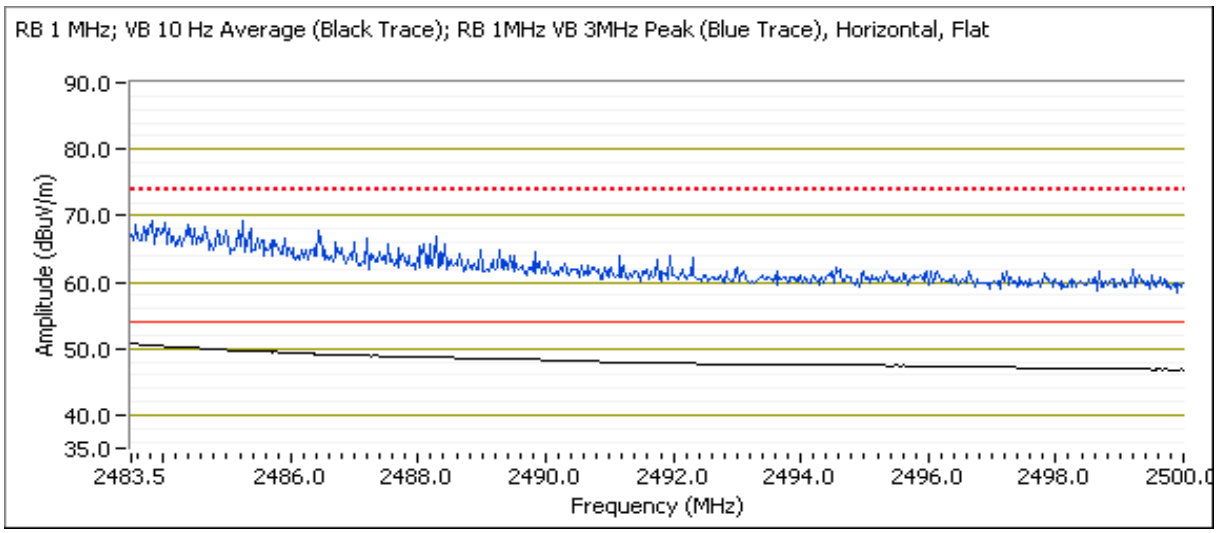
Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is not in a restricted band but the more stringent restricted band limit was used.



Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #3c: High Channel @ 2462 MHz
Band Edge Signal Field Strength - Direct measurement of field strength
Orientation: Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.580	53.5	H	54.0	-0.5	AVG	289	1.0	RB 1 MHz;VB 10 Hz;Pk
2484.510	67.5	H	74.0	-6.5	PK	289	1.0	RB 1 MHz;VB 3 MHz;Pk
2483.500	48.9	V	54.0	-5.1	AVG	66	1.7	RB 1 MHz;VB 10 Hz;Pk
2483.680	60.5	V	74.0	-13.5	PK	66	1.7	RB 1 MHz;VB 3 MHz;Pk

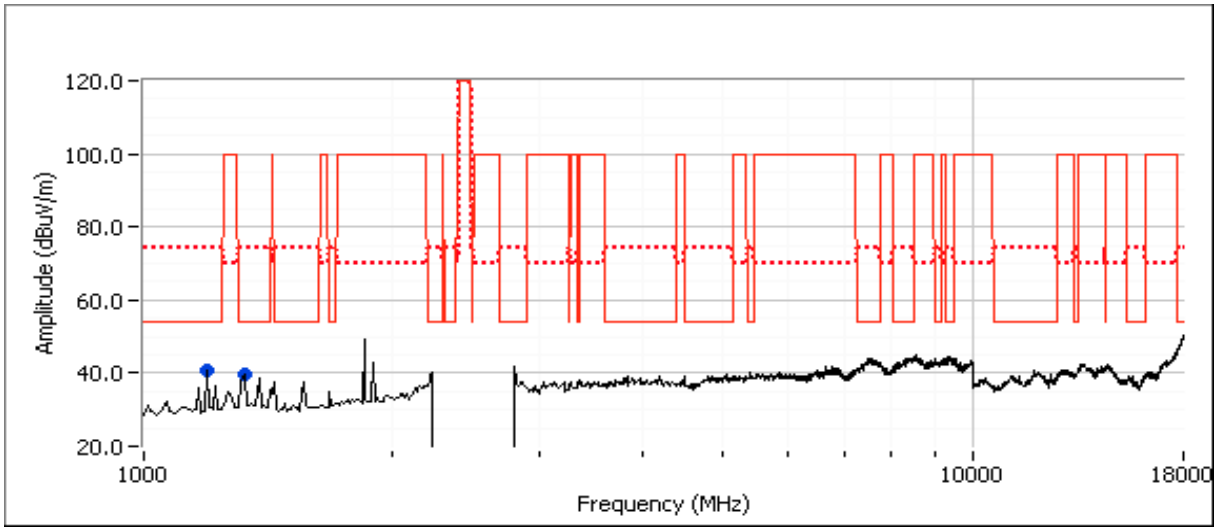


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Other Spurious Emissions
Orientation: Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1200.030	39.8	H	54.0	-14.2	AVG	192	1.2	RB 1 MHz;VB 10 Hz;Pk
1199.960	43.8	H	74.0	-30.2	PK	192	1.2	RB 1 MHz;VB 3 MHz;Pk
1320.010	36.8	H	54.0	-17.2	AVG	81	1.5	RB 1 MHz;VB 10 Hz;Pk
1320.220	41.9	H	74.0	-32.1	PK	81	1.5	RB 1 MHz;VB 3 MHz;Pk

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.



Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #3: Radiated Spurious Emissions, 30 - 25000 MHz. Operating Mode: Bluetooth Basic Mode
Date of Test: 8/8/2011
Test Engineer: Joseph Cadigal
Test Location: FT Chamber#5

Run #3a: Low Channel @ 2402 MHz
Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz
Orientation: Flat

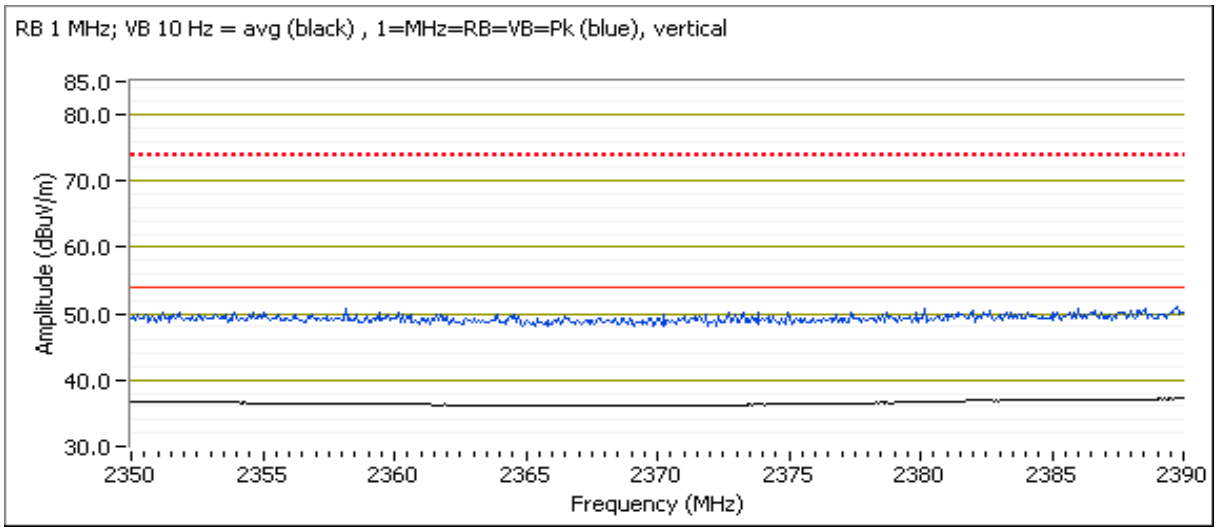
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2402.030	99.9	V	-	-	AVG	351	1.1	RB 1 MHz;VB 10 Hz;Pk
2402.200	100.5	V	-	-	PK	351	1.1	RB 1 MHz;VB 3 MHz;Pk
2402.070	99.9	V	-	-	-	351	1.1	RB 100 kHz;VB 100 kHz;Pk
2402.030	108.8	H	-	-	AVG	118	1.3	RB 1 MHz;VB 10 Hz;Pk
2402.180	109.4	H	-	-	PK	118	1.3	RB 1 MHz;VB 3 MHz;Pk
2402.060	104.4	H	-	-	-	118	1.3	RB 100 kHz;VB 100 kHz;Pk

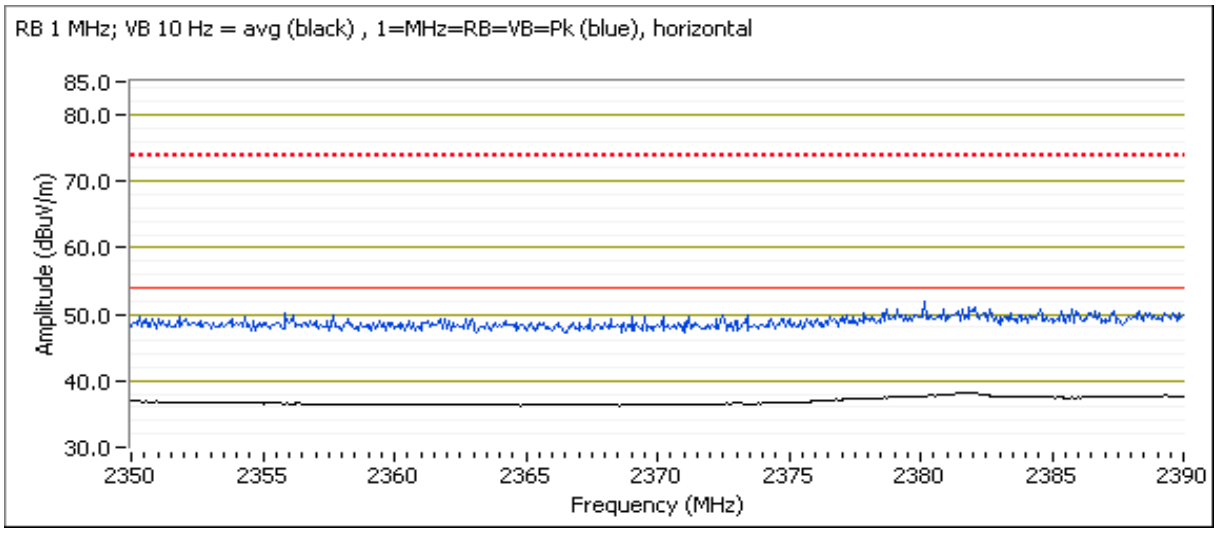
Fundamental emission level @ 3m in 100kHz RBW:	104.4	dBµV/m	
Limit for emissions outside of restricted bands:	84.4	dBµV/m	Limit is -20dBc (Peak power measurement)
Limit for emissions outside of restricted bands:	74.4	dBµV/m	Limit is -30dBc (UNII power measurement)

Band Edge Signal Field Strength - Direct measurement of field strength
Orientation:Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2381.330	39.9	H	54.0	-14.1	AVG	114	1.3	RB 1 MHz;VB 10 Hz;Pk
2387.730	50.7	H	74.0	-23.3	PK	114	1.3	RB 1 MHz;VB 3 MHz;Pk
2389.600	39.3	V	54.0	-14.7	AVG	352	1.1	RB 1 MHz;VB 10 Hz;Pk
2383.470	49.9	V	74.0	-24.1	PK	352	1.1	RB 1 MHz;VB 3 MHz;Pk

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

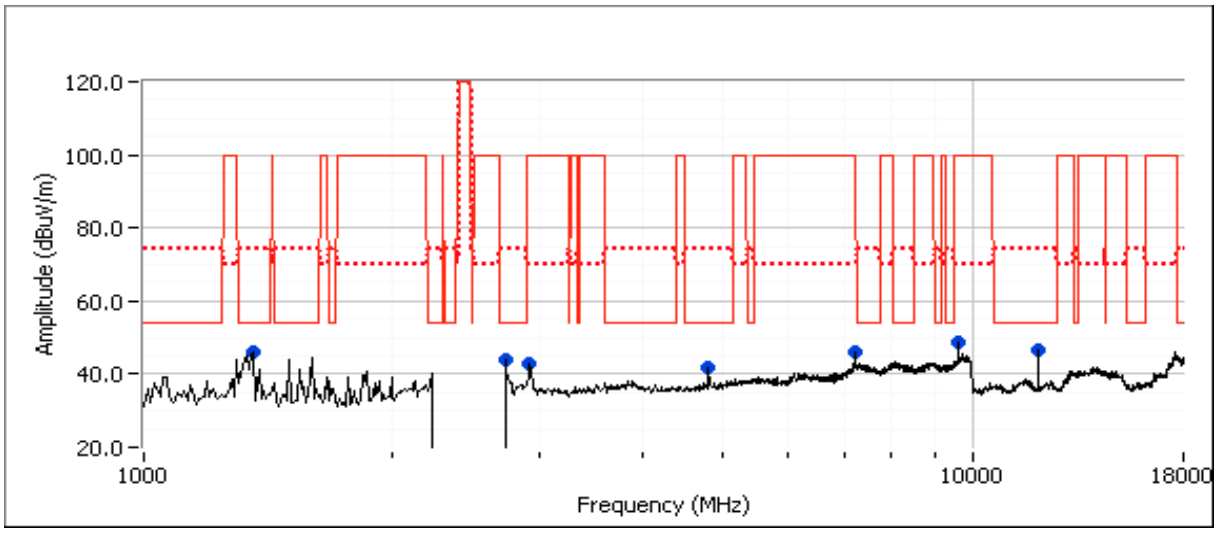




Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Other Spurious Emissions
Orientation:Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
12010.370	40.2	V	54.0	-13.8	AVG	343	1.0	RB 1 MHz;VB 10 Hz;Pk
2730.390	39.2	H	54.0	-14.8	AVG	337	1.9	RB 1 MHz;VB 10 Hz;Pk
4803.980	38.5	H	54.0	-15.5	AVG	0	1.0	RB 1 MHz;VB 10 Hz;Pk
9608.240	52.3	V	70.0	-17.7	PK	189	1.9	RB 1 MHz;VB 3 MHz;Pk
7206.610	51.3	V	70.0	-18.7	PK	302	1.6	RB 1 MHz;VB 3 MHz;Pk
1362.080	53.6	V	74.0	-20.4	PK	223	1.3	RB 1 MHz;VB 3 MHz;Pk
2921.950	49.1	V	70.0	-20.9	PK	166	1.0	RB 1 MHz;VB 3 MHz;Pk
2731.480	51.6	H	74.0	-22.4	PK	337	1.9	RB 1 MHz;VB 3 MHz;Pk
1362.690	29.3	V	54.0	-24.7	AVG	223	1.3	RB 1 MHz;VB 10 Hz;Pk
12010.630	47.5	V	74.0	-26.5	PK	343	1.0	RB 1 MHz;VB 3 MHz;Pk
4803.690	46.4	H	74.0	-27.6	PK	0	1.0	RB 1 MHz;VB 3 MHz;Pk
7206.050	42.7	V	100.0	-57.3	AVG	302	1.6	RB 1 MHz;VB 10 Hz;Pk
9608.250	42.2	V	100.0	-57.8	AVG	189	1.9	RB 1 MHz;VB 10 Hz;Pk
2921.770	34.4	V	100.0	-65.6	AVG	166	1.0	RB 1 MHz;VB 10 Hz;Pk

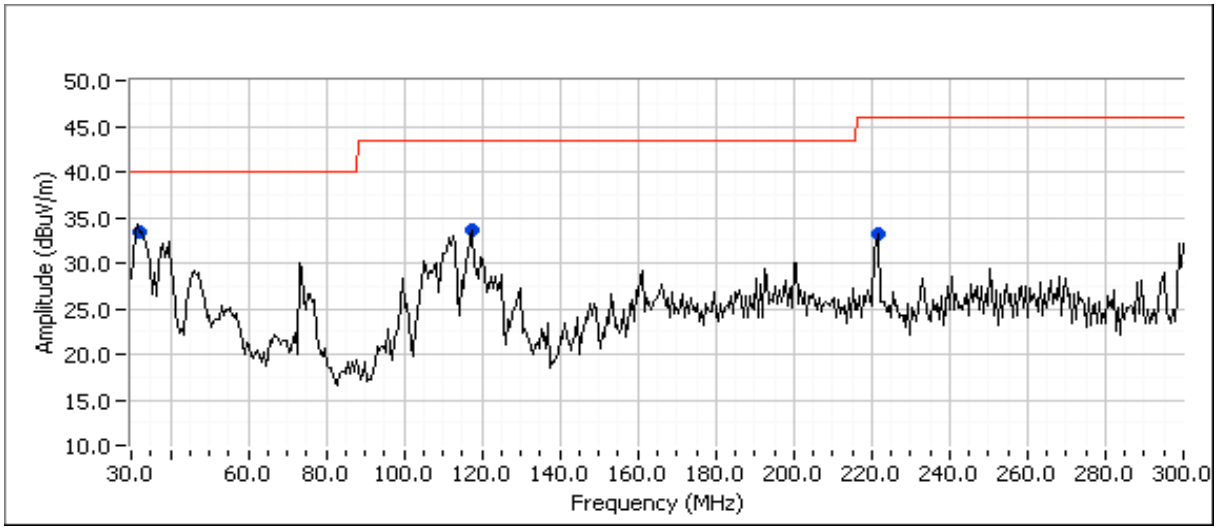


Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is not in a restricted band but the more stringent restricted band limit was used.
Note 3:	No sigificant signals were found from 18-26GHz

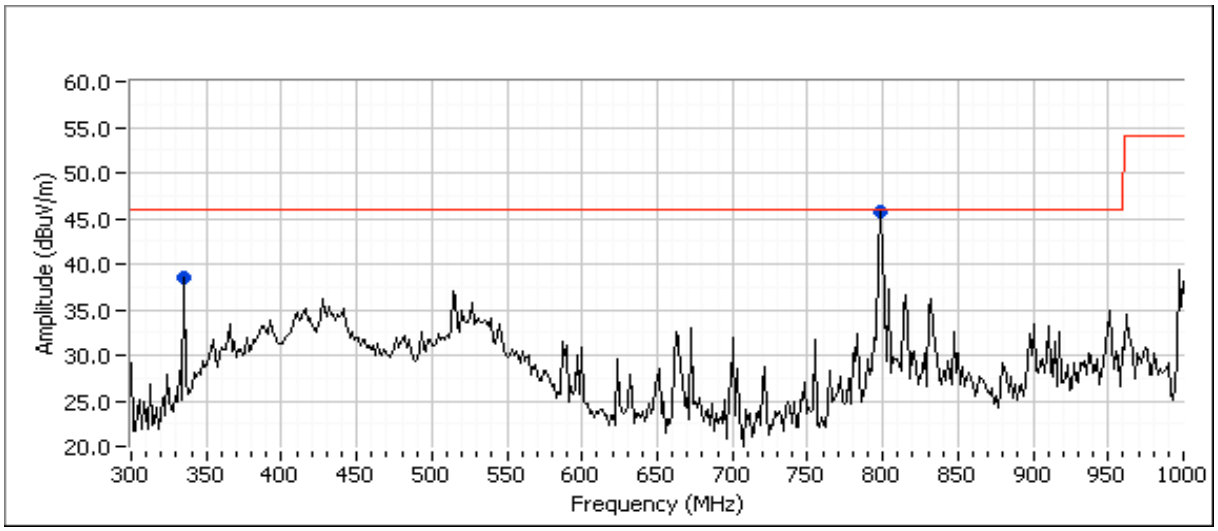
Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

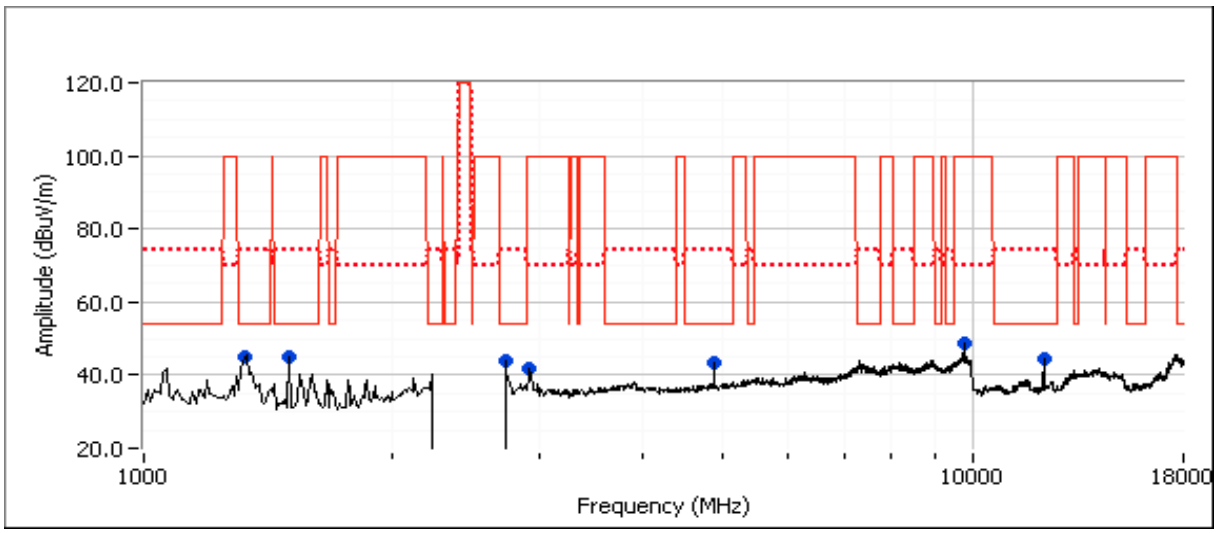
Run #3b: Center Channel @ 2441 MHz
Orientation:

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
12210.170	40.5	V	54.0	-13.5	AVG	307	1.0	RB 1 MHz;VB 10 Hz;Pk
2730.460	39.1	V	54.0	-14.9	AVG	254	1.6	RB 1 MHz;VB 10 Hz;Pk
9767.670	54.1	V	70.0	-15.9	PK	148	1.6	RB 1 MHz;VB 3 MHz;Pk
4884.020	33.2	V	54.0	-20.8	AVG	319	1.3	RB 1 MHz;VB 10 Hz;Pk
2729.940	50.4	V	74.0	-23.6	PK	254	1.6	RB 1 MHz;VB 3 MHz;Pk
1320.090	30.3	V	54.0	-23.7	AVG	174	2.2	RB 1 MHz;VB 10 Hz;Pk
12210.520	48.4	V	74.0	-25.6	PK	307	1.0	RB 1 MHz;VB 3 MHz;Pk
2931.510	43.7	V	70.0	-26.3	PK	166	1.0	RB 1 MHz;VB 3 MHz;Pk
1499.990	27.2	V	54.0	-26.8	AVG	196	1.0	RB 1 MHz;VB 10 Hz;Pk
4884.050	44.1	V	74.0	-29.9	PK	319	1.3	RB 1 MHz;VB 3 MHz;Pk
1319.820	39.0	V	74.0	-35.0	PK	174	2.2	RB 1 MHz;VB 3 MHz;Pk
1499.610	38.3	V	74.0	-35.7	PK	196	1.0	RB 1 MHz;VB 3 MHz;Pk
9768.080	45.0	V	100.0	-55.0	AVG	148	1.6	RB 1 MHz;VB 10 Hz;Pk
2932.070	32.1	V	100.0	-67.9	AVG	166	1.0	RB 1 MHz;VB 10 Hz;Pk
336.010	38.4	H	46.0	-7.6	QP	9	1.5	QP (1.00s)
798.442	36.6	V	46.0	-9.4	QP	180	1.0	QP (1.00s)
221.204	31.0	H	46.0	-15.0	QP	231	2.0	QP (1.00s)
117.373	36.0	H	43.5	-7.5	QP	261	3.0	QP (1.00s)
31.626	34.0	V	40.0	-6.0	QP	360	1.0	QP (1.00s)



Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A





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.
Note 3:	No sigificant signals were found from 18-26GHz

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

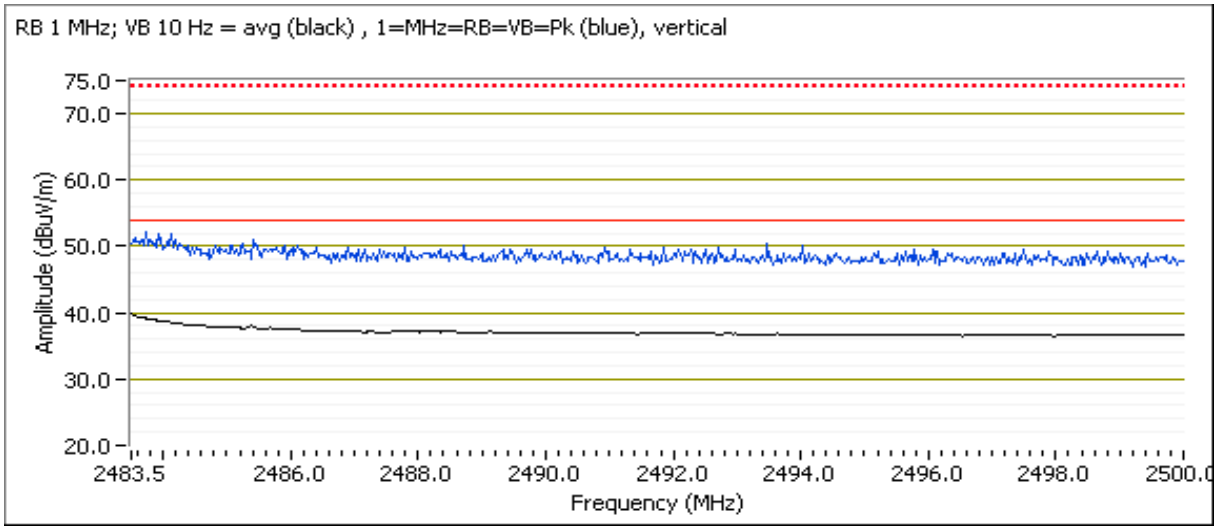
Run #3c: High Channel @ 2480 MHz
Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz
Orientation:Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2479.030	104.8	V	-	-	AVG	344	1.3	RB 1 MHz;VB 10 Hz;Pk
2478.860	105.0	V	-	-	PK	344	1.3	RB 1 MHz;VB 3 MHz;Pk
2479.000	104.2	V	-	-	-	344	1.3	RB 100 kHz;VB 100 kHz;Pk
2479.040	110.2	H	-	-	AVG	16	1.0	RB 1 MHz;VB 10 Hz;Pk
2478.900	110.3	H	-	-	PK	16	1.0	RB 1 MHz;VB 3 MHz;Pk
2479.080	109.7	H	-	-	-	16	1.0	RB 100 kHz;VB 100 kHz;Pk

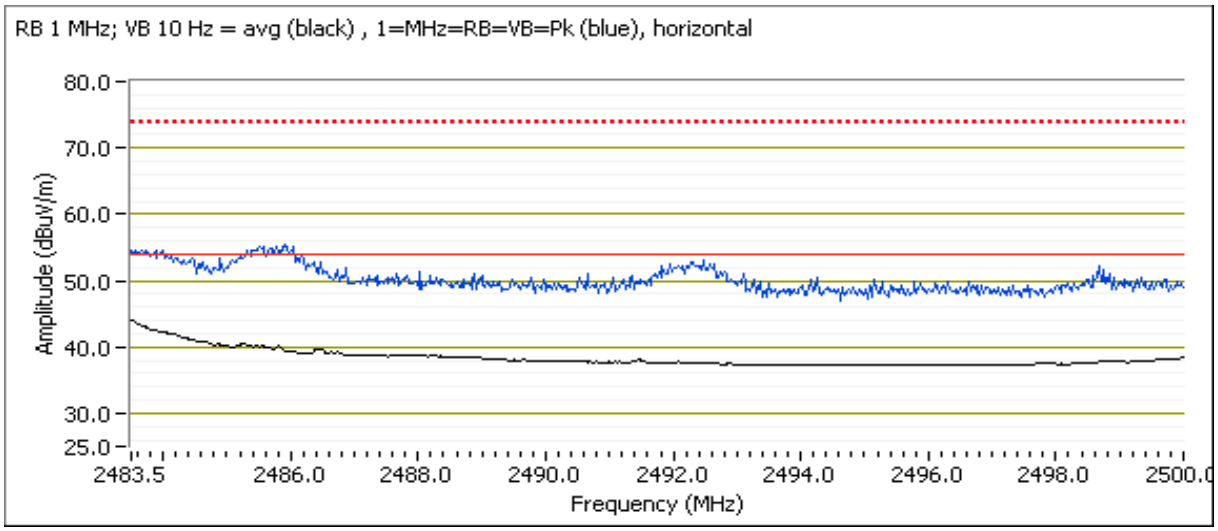
Fundamental emission level @ 3m in 100kHz RBW:	109.7	dBµV/m	
Limit for emissions outside of restricted bands:	89.7	dBµV/m	Limit is -20dBc (Peak power measurement)
Limit for emissions outside of restricted bands:	79.7	dBµV/m	Limit is -30dBc (UNII power measurement)

Band Edge Signal Field Strength - Direct measurement of field strength
Orientation:Flat

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	45.3	H	54.0	-8.7	AVG	13	1.0	RB 1 MHz;VB 10 Hz;Pk
2483.660	56.2	H	74.0	-17.8	PK	13	1.0	RB 1 MHz;VB 3 MHz;Pk
2483.500	41.1	V	54.0	-12.9	AVG	346	1.3	RB 1 MHz;VB 10 Hz;Pk
2484.490	50.9	V	74.0	-23.1	PK	346	1.3	RB 1 MHz;VB 3 MHz;Pk



Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

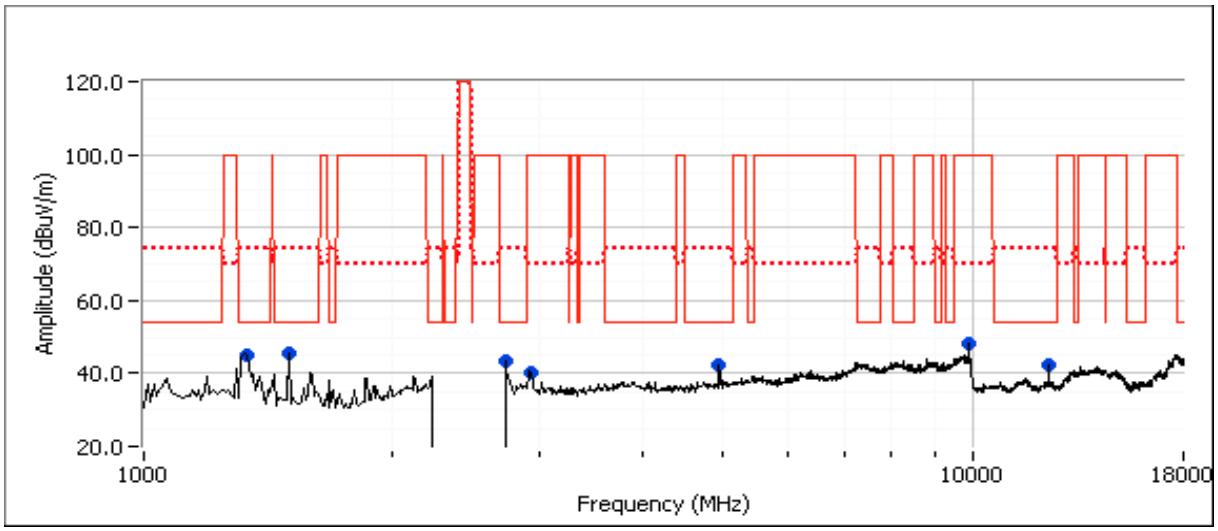


Other Spurious Emissions
Orientation:Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.070	44.7	V	54.0	-9.3	AVG	198	1.0	RB 1 MHz;VB 10 Hz;Pk
4957.960	40.2	V	54.0	-13.8	AVG	316	1.3	RB 1 MHz;VB 10 Hz;Pk
1326.630	59.3	V	74.0	-14.7	PK	170	1.6	RB 1 MHz;VB 3 MHz;Pk
2730.910	39.1	V	54.0	-14.9	AVG	335	1.9	RB 1 MHz;VB 10 Hz;Pk
9915.540	53.1	V	70.0	-16.9	PK	256	1.3	RB 1 MHz;VB 3 MHz;Pk
1327.560	37.0	V	54.0	-17.0	AVG	170	1.6	RB 1 MHz;VB 10 Hz;Pk
2728.770	51.5	V	74.0	-22.5	PK	335	1.9	RB 1 MHz;VB 3 MHz;Pk
2936.190	44.1	V	70.0	-25.9	PK	293	1.0	RB 1 MHz;VB 3 MHz;Pk
4958.280	48.0	V	74.0	-26.0	PK	316	1.3	RB 1 MHz;VB 3 MHz;Pk
1499.930	47.6	V	74.0	-26.4	PK	198	1.0	RB 1 MHz;VB 3 MHz;Pk
9915.870	43.9	V	100.0	-56.1	AVG	256	1.3	RB 1 MHz;VB 10 Hz;Pk
2937.810	32.5	V	100.0	-67.5	AVG	293	1.0	RB 1 MHz;VB 10 Hz;Pk
12395.450	38.1	V	54.0	-15.9	AVG	307	1.3	RB 1 MHz;VB 10 Hz;Pk
12396.220	46.8	V	74.0	-27.2	PK	307	1.3	RB 1 MHz;VB 3 MHz;Pk

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.
Note 3:	No sigificant signals were found from 18-26GHz

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A



Run #4: Radiated Spurious Emissions, 30 - 25000 MHz. Operating Mode: Bluetooth EDR Mode
Date of Test: 8/8/2011
Test Engineer: Joseph Cadigal
Test Location: FT Chamber#5

Run #4a: Low Channel @ 2402 MHz
Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz
Orientation:Flat

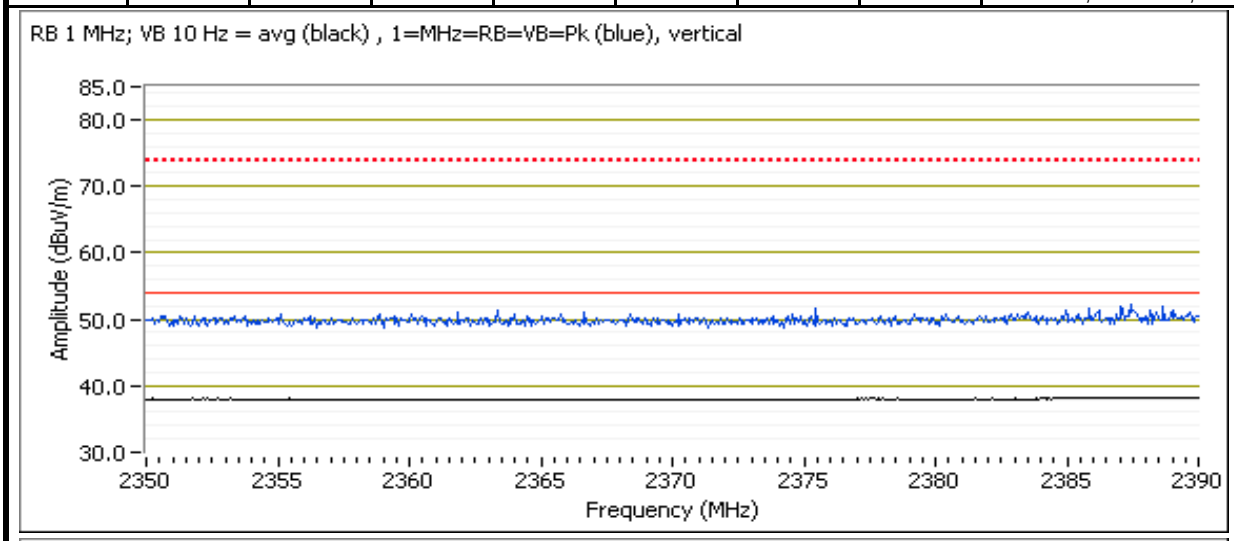
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2402.030	94.7	V	-	-	AVG	129	1.0	RB 1 MHz;VB 10 Hz;Pk
2402.110	98.7	V	-	-	PK	129	1.0	RB 1 MHz;VB 3 MHz;Pk
2401.850	93.6	V	-	-	-	129	1.0	RB 100 kHz;VB 100 kHz;Pk
2401.910	105.2	H	-	-	AVG	144	1.1	RB 1 MHz;VB 10 Hz;Pk
2401.990	109.1	H	-	-	PK	144	1.1	RB 1 MHz;VB 3 MHz;Pk
2401.870	104.2	H	-	-	-	144	1.1	RB 100 kHz;VB 100 kHz;Pk

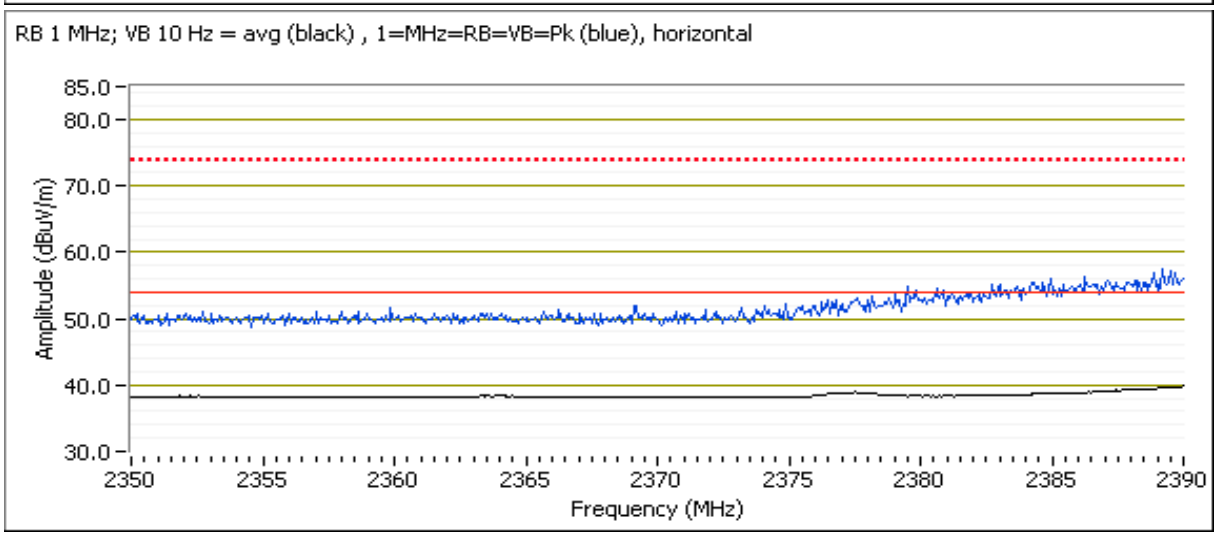
Fundamental emission level @ 3m in 100kHz RBW:	104.2	dBµV/m	
Limit for emissions outside of restricted bands:	84.2	dBµV/m	Limit is -20dBc (Peak power measurement)
Limit for emissions outside of restricted bands:	74.2	dBµV/m	Limit is -30dBc (UNII power measurement)

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Band Edge Signal Field Strength - Direct measurement of field strength
Orientation:Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.870	41.4	H	54.0	-12.6	AVG	144	1.1	RB 1 MHz;VB 10 Hz;Pk
2389.400	39.8	V	54.0	-14.2	AVG	129	1.0	RB 1 MHz;VB 10 Hz;Pk
2386.270	56.8	H	74.0	-17.2	PK	144	1.1	RB 1 MHz;VB 3 MHz;Pk
2383.270	51.8	V	74.0	-22.2	PK	129	1.0	RB 1 MHz;VB 3 MHz;Pk

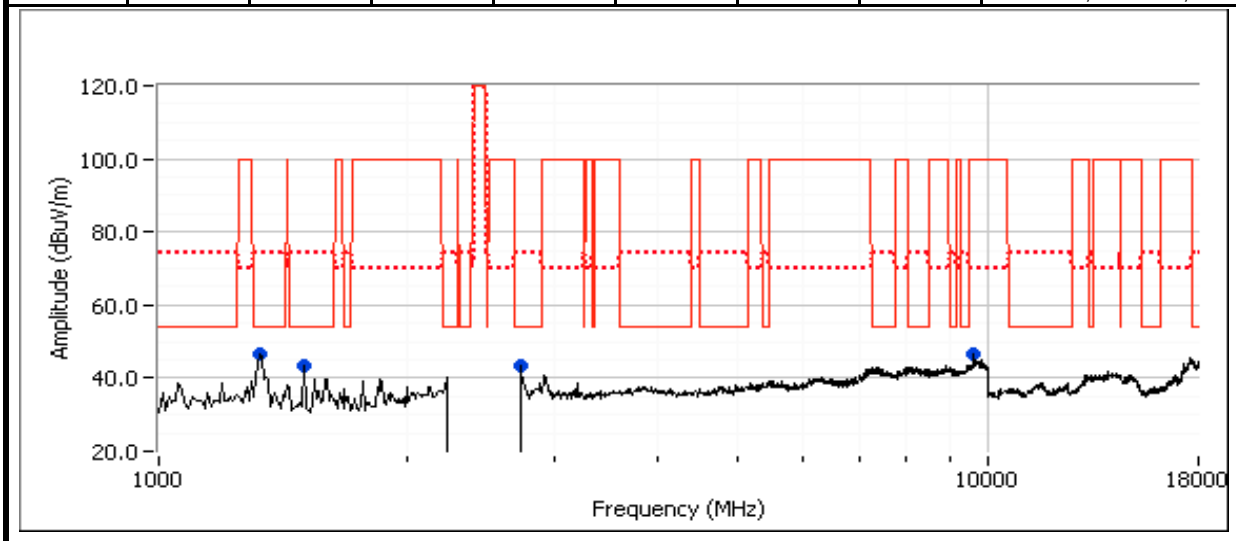




Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Other Spurious Emissions
Orientation:

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.090	43.1	V	54.0	-10.9	AVG	200	1.0	RB 1 MHz;VB 10 Hz;Pk
2733.980	38.8	V	54.0	-15.2	AVG	333	1.0	RB 1 MHz;VB 10 Hz;Pk
9608.150	54.0	V	70.0	-16.0	PK	174	1.6	RB 1 MHz;VB 3 MHz;Pk
1320.080	37.0	H	54.0	-17.0	AVG	237	1.9	RB 1 MHz;VB 10 Hz;Pk
2733.320	50.0	V	74.0	-24.0	PK	333	1.0	RB 1 MHz;VB 3 MHz;Pk
1499.930	46.8	V	74.0	-27.2	PK	200	1.0	RB 1 MHz;VB 3 MHz;Pk
1318.690	44.3	H	74.0	-29.7	PK	237	1.9	RB 1 MHz;VB 3 MHz;Pk
9608.190	43.9	V	100.0	-56.1	AVG	174	1.6	RB 1 MHz;VB 10 Hz;Pk

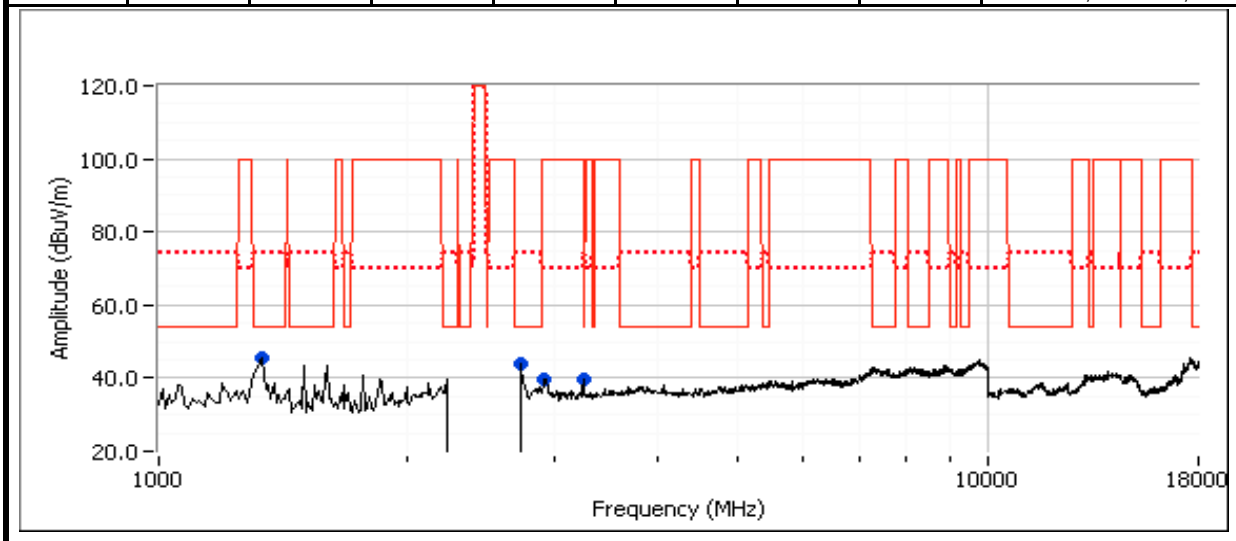


Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is not in a restricted band but the more stringent restricted band limit was used.
Note 3:	No sigificant signals were found from 18-26GHz

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #4b: Center Channel @ 2441 MHz
Orientation:Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2728.290	39.7	V	54.0	-14.3	AVG	115	2.5	RB 1 MHz;VB 10 Hz;Pk
2728.720	39.7	V	54.0	-14.3	AVG	107	2.5	RB 1 MHz;VB 10 Hz;Pk
2727.810	51.9	V	74.0	-22.1	PK	107	2.5	RB 1 MHz;VB 3 MHz;Pk
2728.030	51.1	V	74.0	-22.9	PK	115	2.5	RB 1 MHz;VB 3 MHz;Pk
3256.000	45.5	H	70.0	-24.5	PK	13	1.0	RB 1 MHz;VB 3 MHz;Pk
2917.080	45.1	V	70.0	-24.9	PK	158	1.0	RB 1 MHz;VB 3 MHz;Pk
3255.930	37.2	H	100.0	-62.8	AVG	13	1.0	RB 1 MHz;VB 10 Hz;Pk
2915.410	32.5	V	100.0	-67.5	AVG	158	1.0	RB 1 MHz;VB 10 Hz;Pk



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.
Note 3:	No significant signals were found from 18-26GHz

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

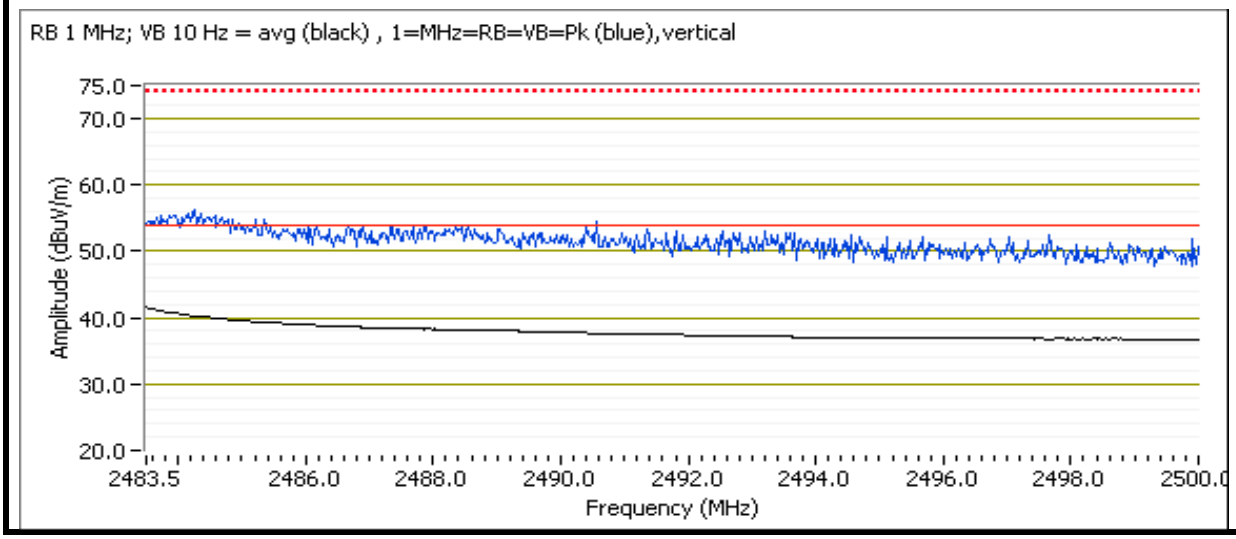
Run #4c: High Channel @ 2480 MHz
Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz
Orientation:Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2478.990	99.0	V	-	-	AVG	360	1.7	RB 1 MHz;VB 10 Hz;Pk
2479.040	101.9	V	-	-	PK	360	1.7	RB 1 MHz;VB 3 MHz;Pk
2479.140	98.1	V	-	-	-	360	1.7	RB 100 kHz;VB 100 kHz;Pk
2478.990	106.3	H	-	-	AVG	16	1.1	RB 1 MHz;VB 10 Hz;Pk
2479.070	109.3	H	-	-	PK	16	1.1	RB 1 MHz;VB 3 MHz;Pk
2479.140	105.2	H	-	-	-	16	1.1	RB 100 kHz;VB 100 kHz;Pk

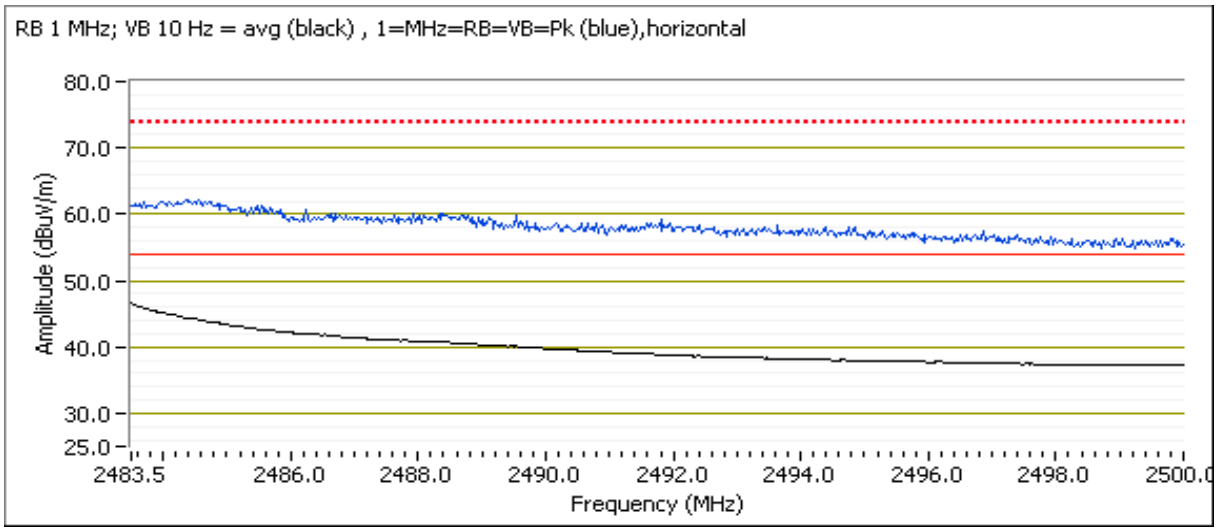
Fundamental emission level @ 3m in 100kHz RBW:	105.2	dBµV/m	
Limit for emissions outside of restricted bands:	85.2	dBµV/m	Limit is -20dBc (Peak power measurement)
Limit for emissions outside of restricted bands:	75.2	dBµV/m	Limit is -30dBc (UNII power measurement)

Band Edge Signal Field Strength - Direct measurement of field strength
Orientation:

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	48.2	H	54.0	-5.8	AVG	11	1.1	RB 1 MHz;VB 10 Hz;Pk
2483.830	61.8	H	74.0	-12.2	PK	11	1.1	RB 1 MHz;VB 3 MHz;Pk
2483.500	43.2	V	54.0	-10.8	AVG	360	1.7	RB 1 MHz;VB 10 Hz;Pk
2484.460	56.7	V	74.0	-17.3	PK	360	1.7	RB 1 MHz;VB 3 MHz;Pk

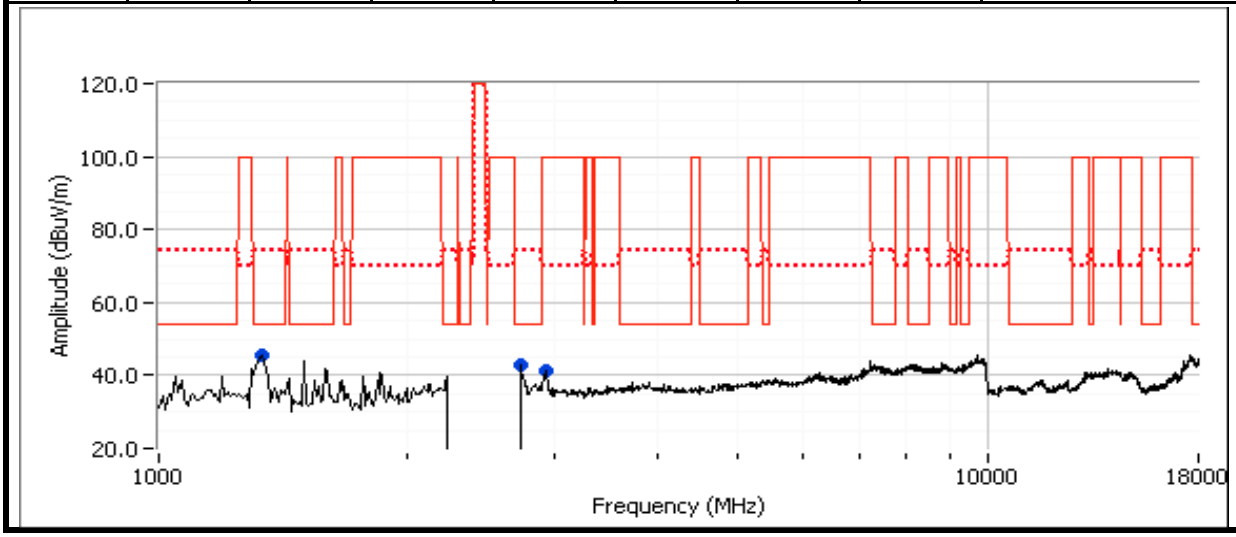


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A



Other Spurious Emissions
Orientation:Flat

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2729.080	39.6	V	54.0	-14.4	AVG	292	2.5	RB 1 MHz;VB 10 Hz;Pk
1326.830	58.1	V	74.0	-15.9	PK	172	1.0	RB 1 MHz;VB 3 MHz;Pk
1327.480	37.2	V	54.0	-16.8	AVG	172	1.0	RB 1 MHz;VB 10 Hz;Pk
2727.800	50.7	V	74.0	-23.3	PK	292	2.5	RB 1 MHz;VB 3 MHz;Pk
2937.670	45.6	V	70.0	-24.4	PK	159	1.0	RB 1 MHz;VB 3 MHz;Pk
2938.250	32.8	V	100.0	-67.2	AVG	159	1.0	RB 1 MHz;VB 10 Hz;Pk



Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

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.
Note 3:	No sigificant signals were found from 18-26GHz

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

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: 7/27/2011
Test Engineer: Rafael Varelas
Test Location: FT Chamber #4

Config. Used: 1
Config Change: None
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: 21.3 °C
Rel. Humidity: 38 %

Summary of Results

Run #	Pwr setting	Test Performed	Limit	Pass / Fail	Result / Margin
1	20	Output Power	15.247(b)	Pass	17.1 dBm
2	20	Power spectral Density (PSD)	15.247(d)	Pass	-2.4 dBm/3kHz
3	20	Minimum 6dB Bandwidth	15.247(a)	Pass	8.6 MHz
3	20	99% Bandwidth	RSS GEN	-	14.1 MHz
4	20	Spurious emissions	15.247(b)	Pass	All emissions below -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

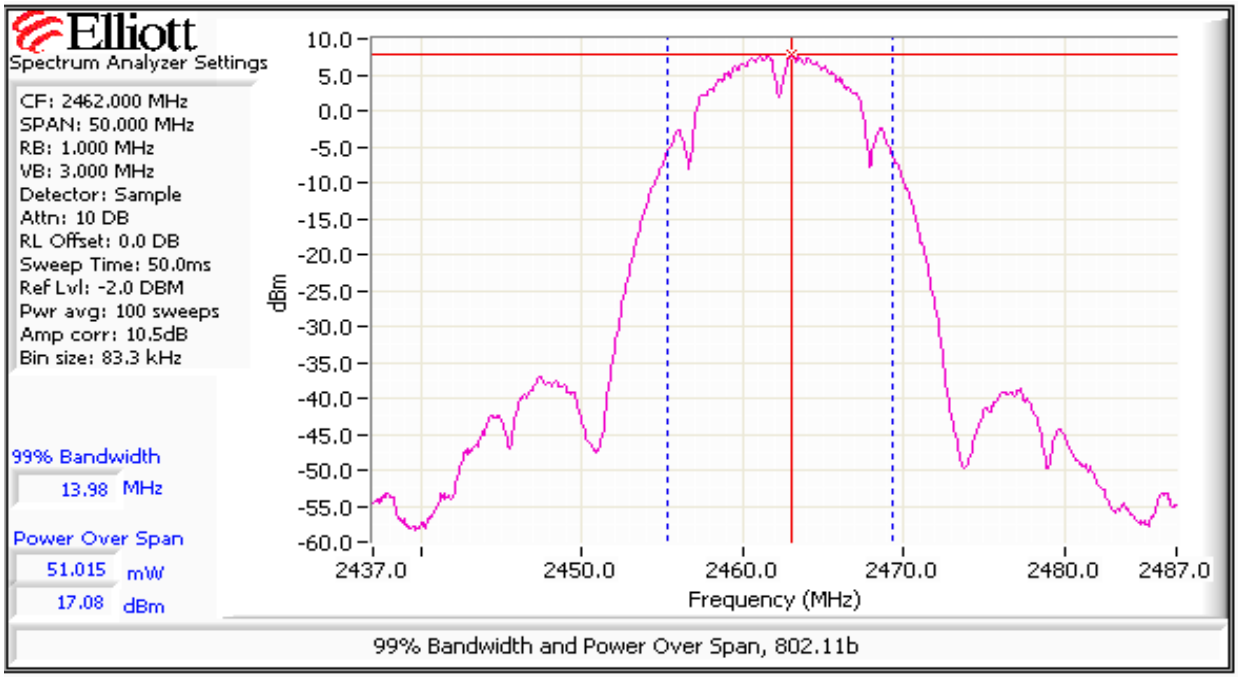
No deviations were made from the requirements of the standard.

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #1: Output Power

Power Setting[2]	Frequency (MHz)	Output Power (dBm) [1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP [Note 2] dBm	EIRP [Note 2] W	Output Power (dBm) [3]	Output Power mW
20.0	2412	16.1	40.7	2.2	Pass	18.3	0.068		
20.0	2437	16.9	49.0	2.2	Pass	19.1	0.081		
20.0	2462	17.1	51.3	2.2	Pass	19.3	0.085		

Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz (option #2, method 1 in KDB 558074, equivalent to method 1 of DA-02-2138A1 for U-NII devices). Spurious limit becomes -30dBc.
Note 2:	Power setting - the software power setting used during testing, included for reference only.

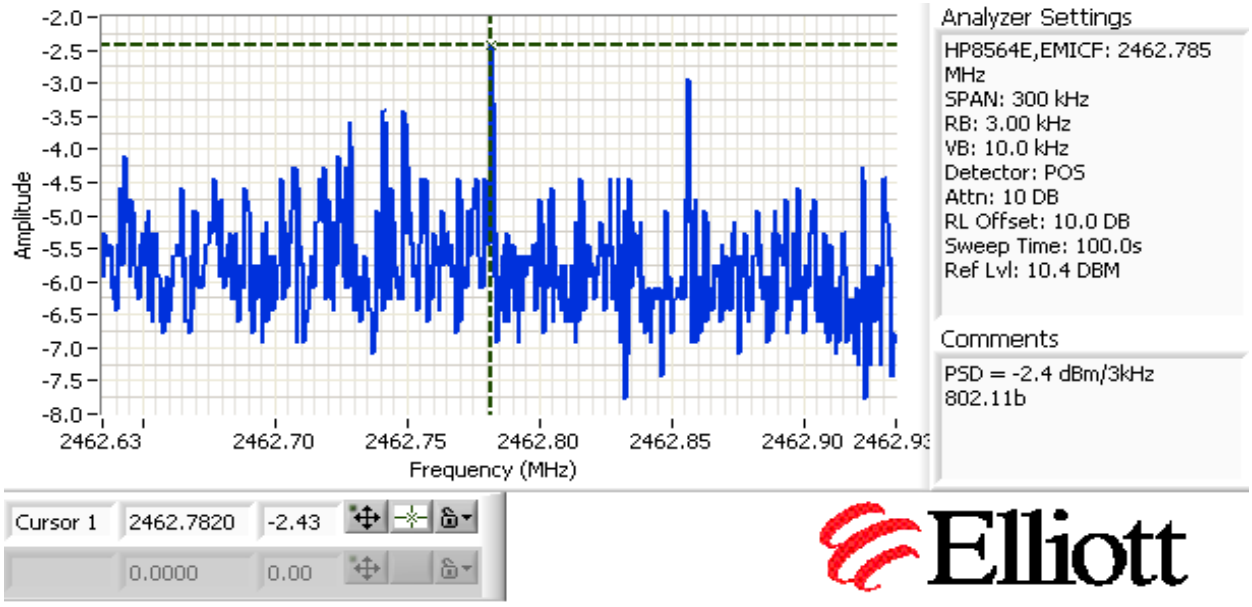


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
20	2411.375	-4.6	8.0	Pass
20	2437.6288	-3.5	8.0	Pass
20	2462.782	-2.4	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.

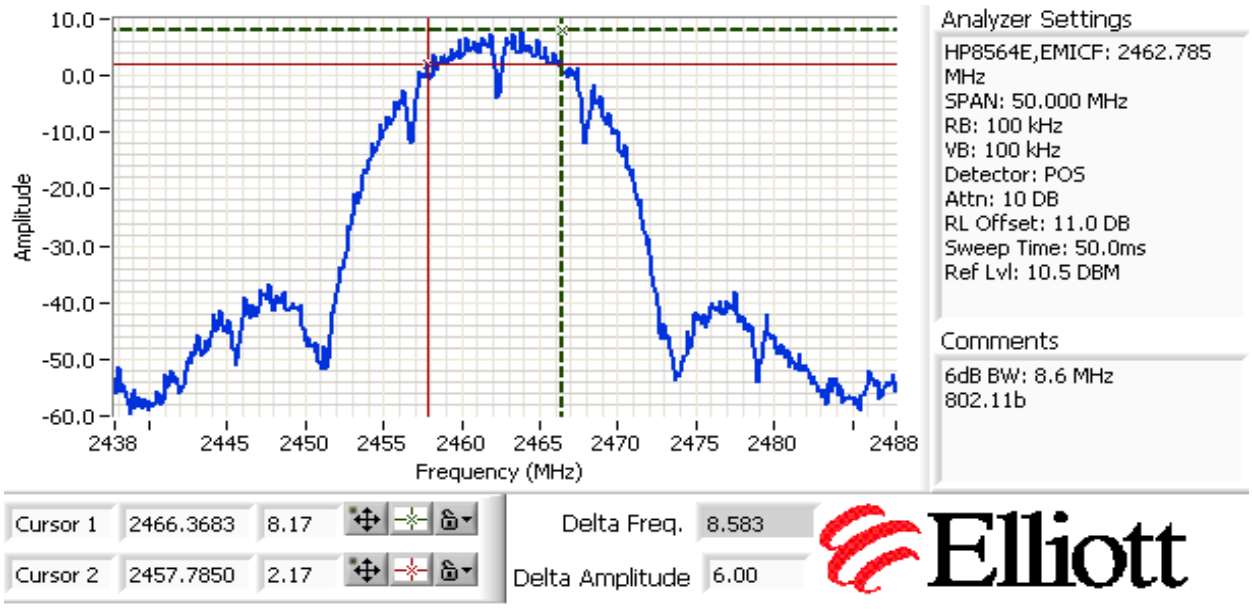


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
			6dB	99%
20	2412	100kHz	8.7	14.1
20	2437	100kHz	9.1	14.1
20	2462	100kHz	8.6	14.0

Note 1:	99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB

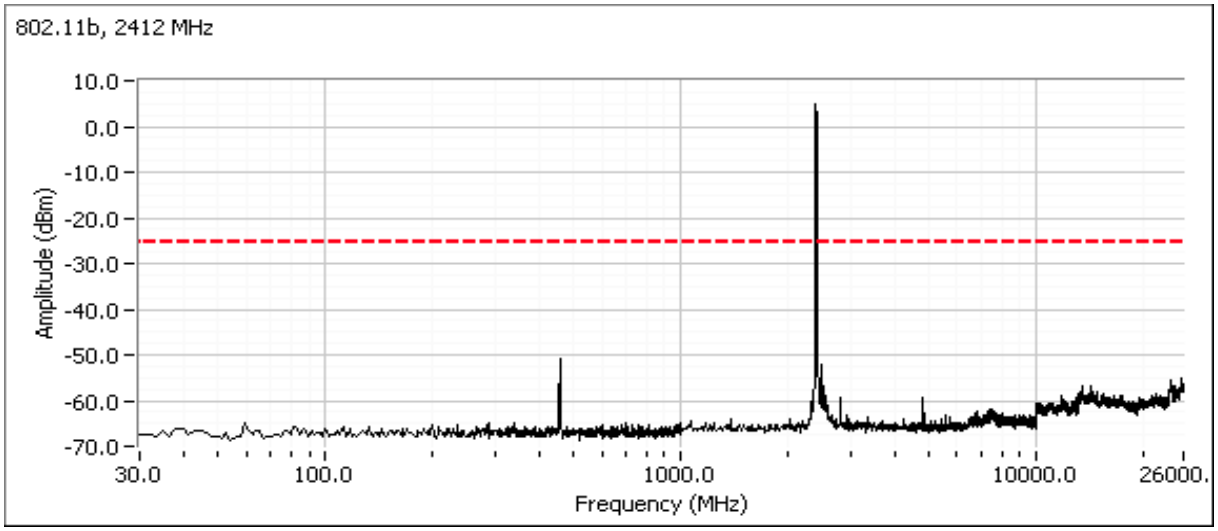


Run #4: Out of Band Spurious Emissions

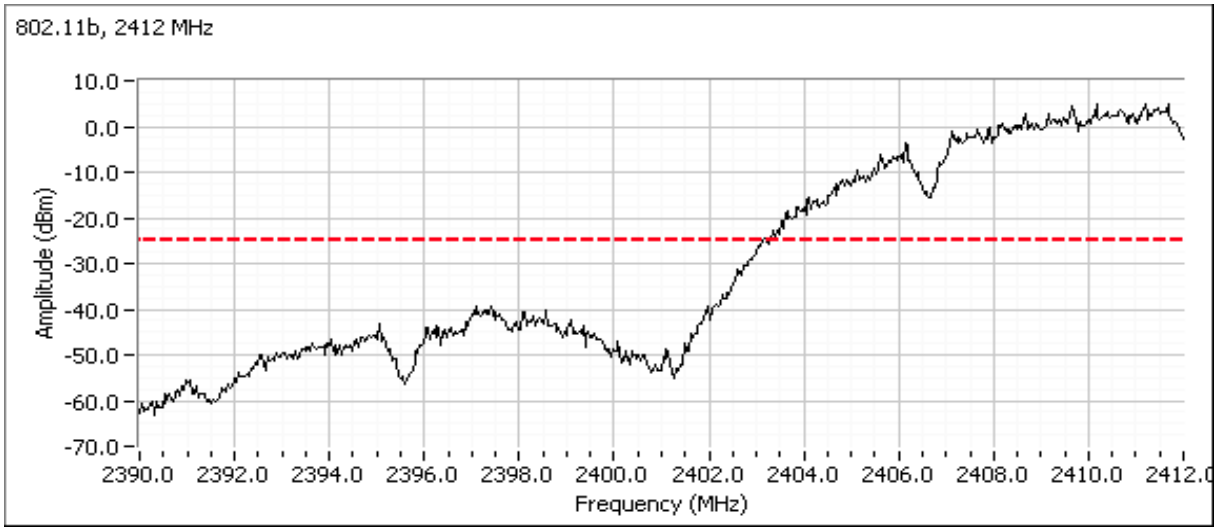
Frequency (MHz)	Limit	Result
2412	-30dBc	Pass
2437	-30dBc	Pass
2462	-30dBc	Pass

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Plots for low channel, power setting(s) = 20.0

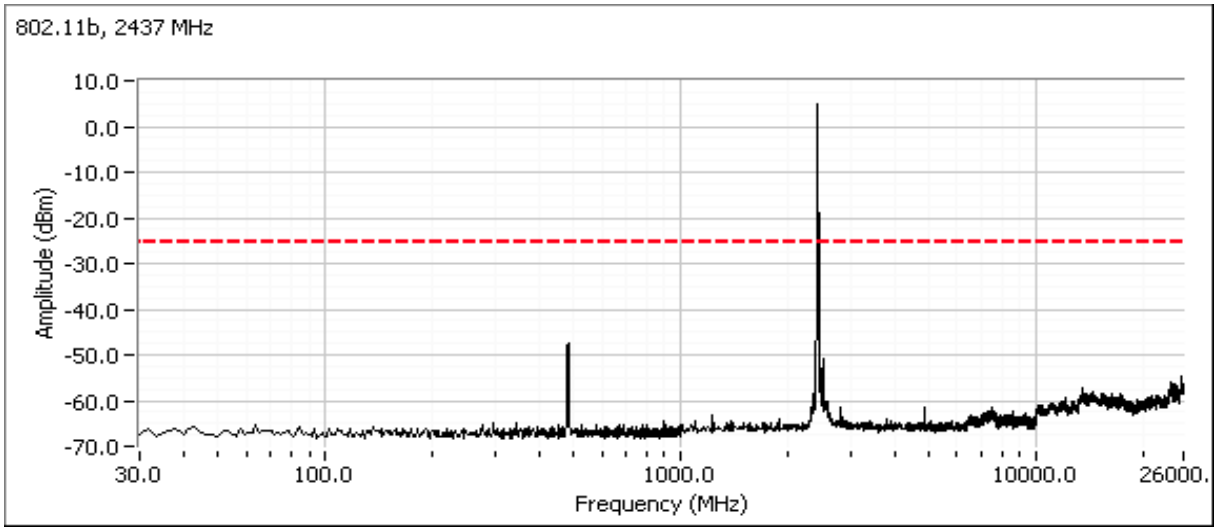


Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

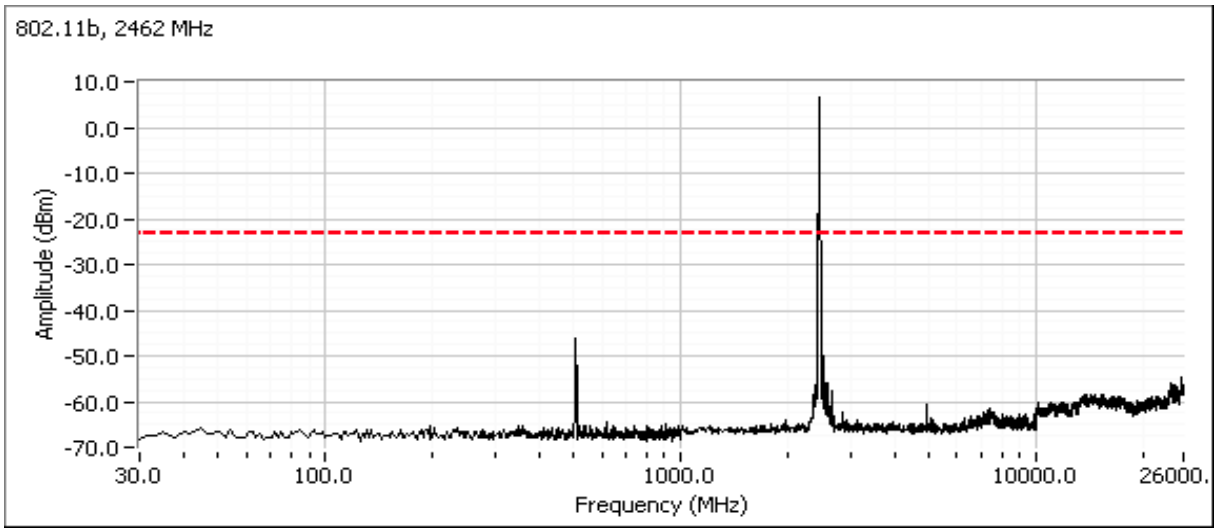


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Plots for center channel, power setting(s) = 20.0



Plots for high channel, power setting(s) = 20.0



Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

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: 7/27/2011
Test Engineer: Rafael Varelas
Test Location: FT Chamber #4

Config. Used: 1
Config Change: None
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: 21.3 °C
Rel. Humidity: 38 %

Summary of Results

Run #	Pwr setting	Test Performed	Limit	Pass / Fail	Result / Margin
1	20	Output Power	15.247(b)	Pass	14.5 dBm
2	20	Power spectral Density (PSD)	15.247(d)	Pass	-8.2 dBm/3kHz
3	20	Minimum 6dB Bandwidth	15.247(a)	Pass	16.4 MHz
3	20	99% Bandwidth	RSS GEN	-	17.0 MHz
4	20	Spurious emissions	15.247(b)	Pass	All emissions below -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

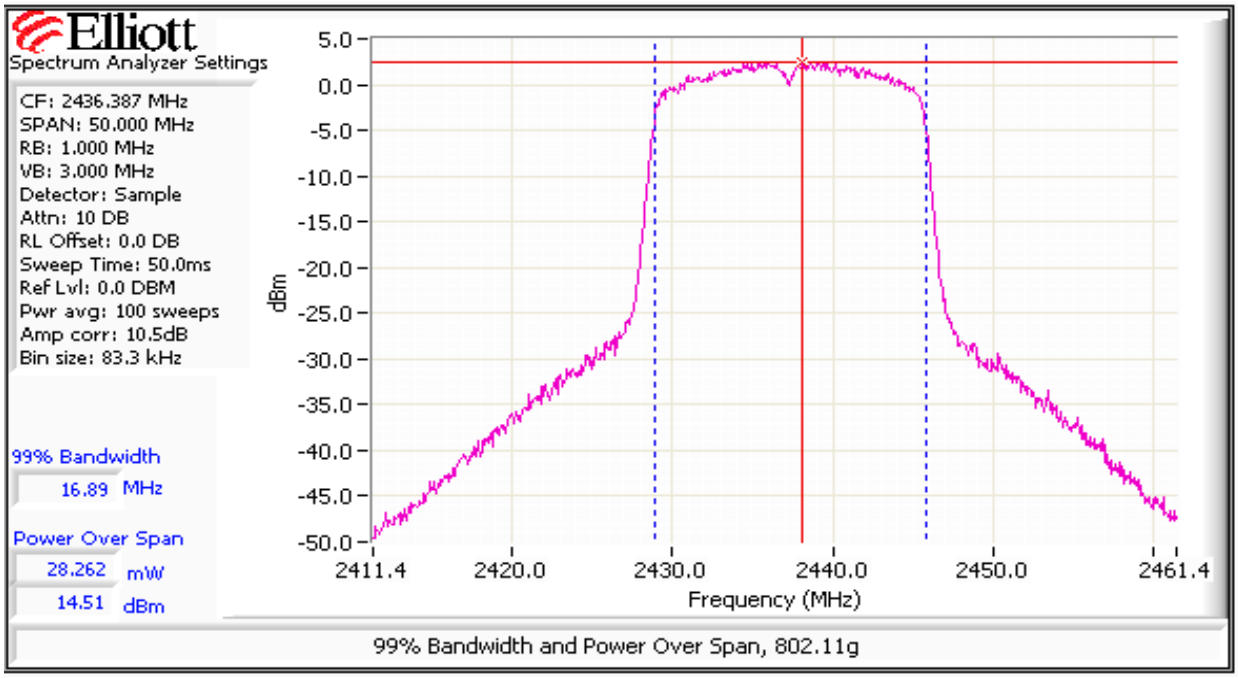
No deviations were made from the requirements of the standard.

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #1: Output Power

Power Setting[2]	Frequency (MHz)	Output Power (dBm) [1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP [Note 2] dBm	EIRP [Note 2] W	Output Power (dBm) [3]	Output Power mW
14.5	2412	11.5	14.1	2.2	Pass	13.7	0.023		
20.0	2437	14.5	28.2	2.2	Pass	16.7	0.047		
14.0	2462	12.0	15.8	2.2	Pass	14.2	0.026		

Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz (option #2, method 1 in KDB 558074, equivalent to method 1 of DA-02-2138A1 for U-NII devices). Spurious limit becomes -30dBc.
Note 2:	Power setting - the software power setting used during testing, included for reference only.

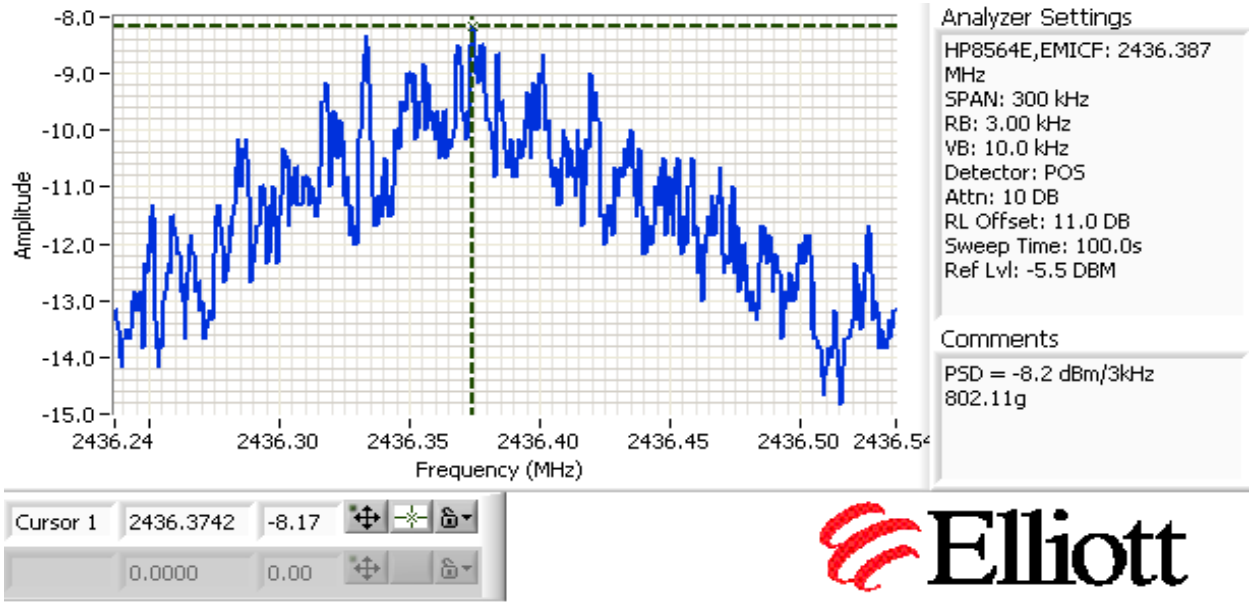


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
14.5	2412.3137	-10.9	8.0	Pass
20.0	2436.3742	-8.2	8.0	Pass
14.0	2461.684	-10.5	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.

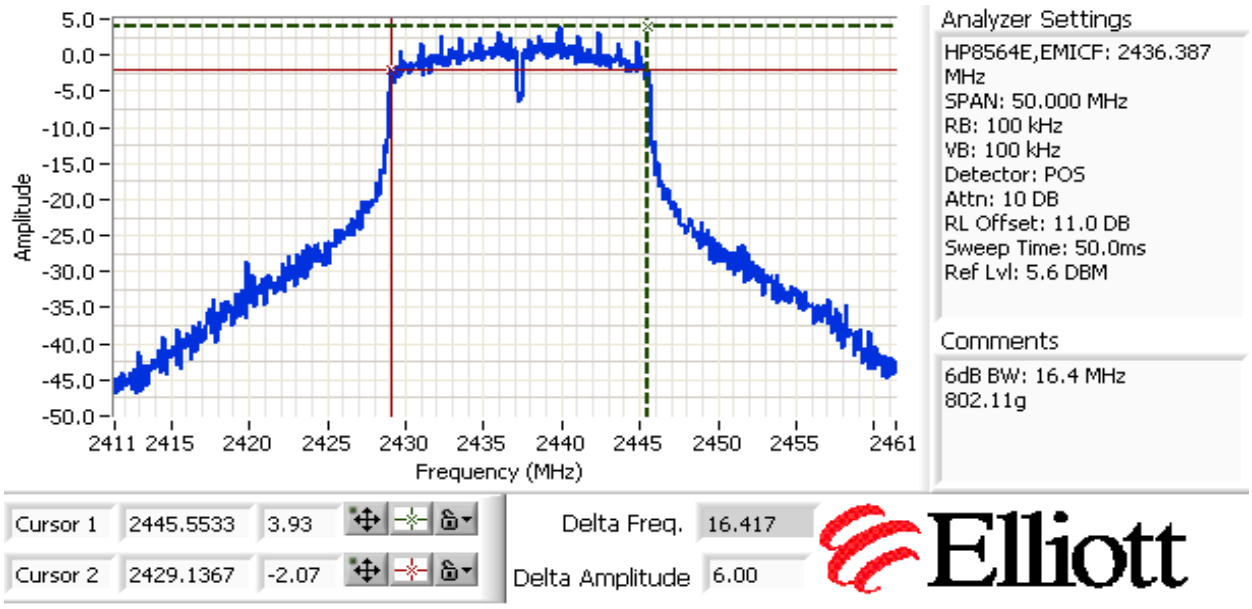


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
			6dB	99%
14.5	2412	100kHz	16.4	16.9
20.0	2437	100kHz	16.4	16.9
14.0	2462	100kHz	16.4	17.0

Note 1:	99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB

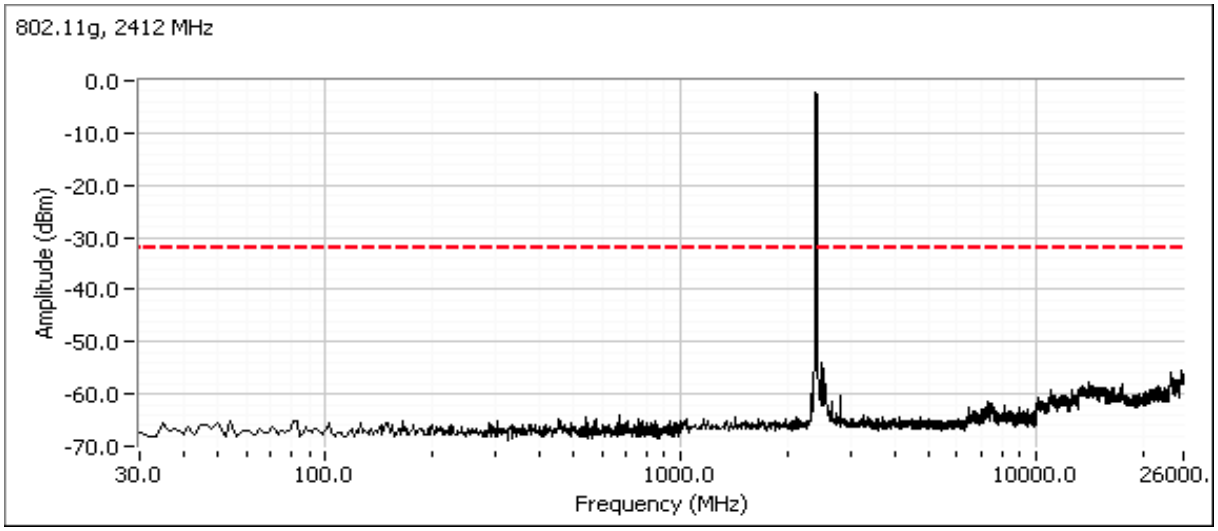


Run #4: Out of Band Spurious Emissions

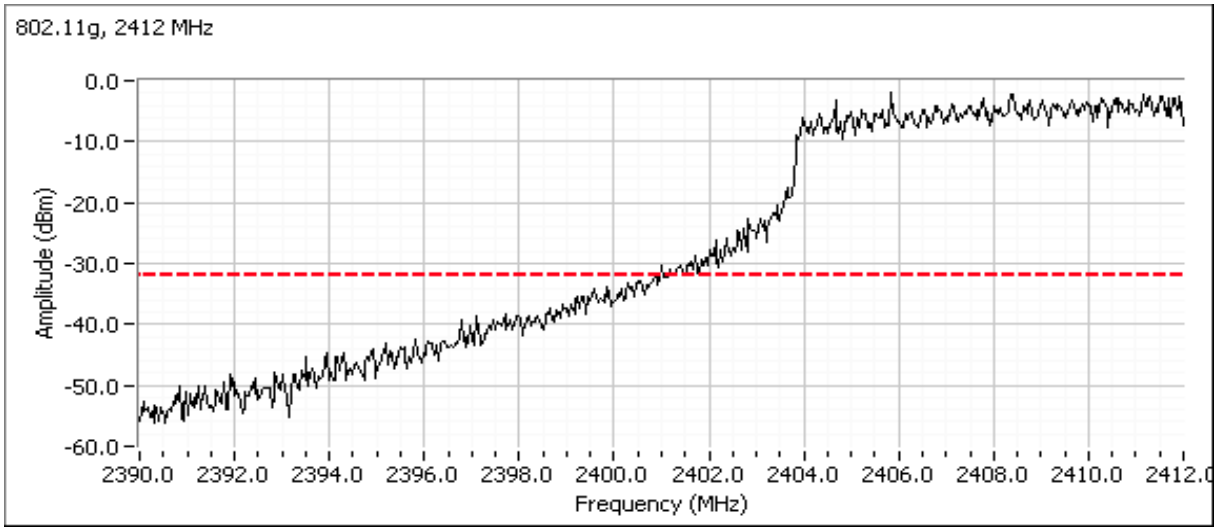
Frequency (MHz)	Limit	Result
2412	-30dBc	Pass
2437	-30dBc	Pass
2462	-30dBc	Pass

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Plots for low channel, power setting(s) = 14.5

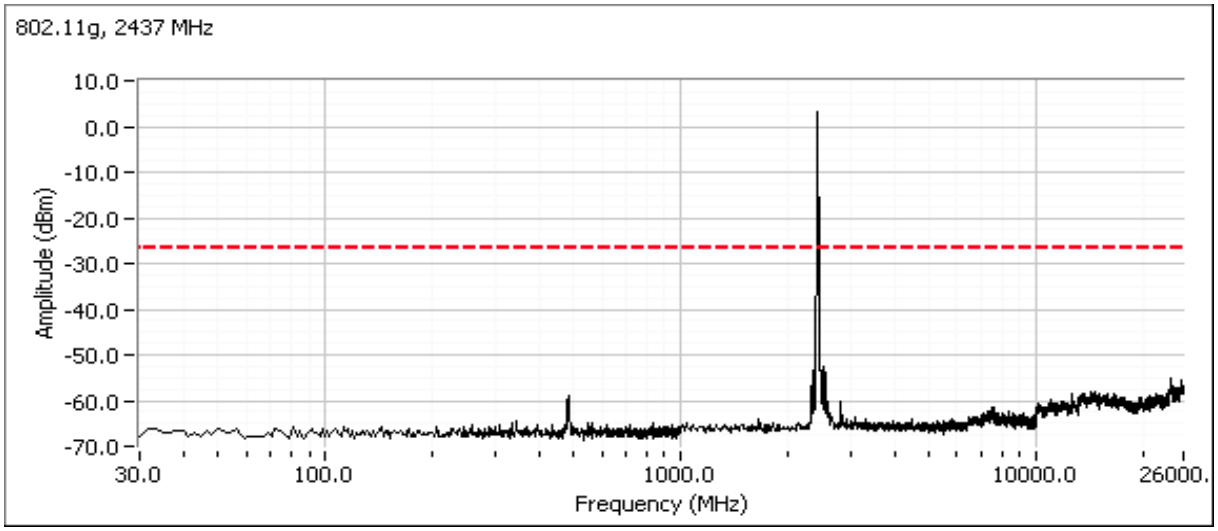


Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

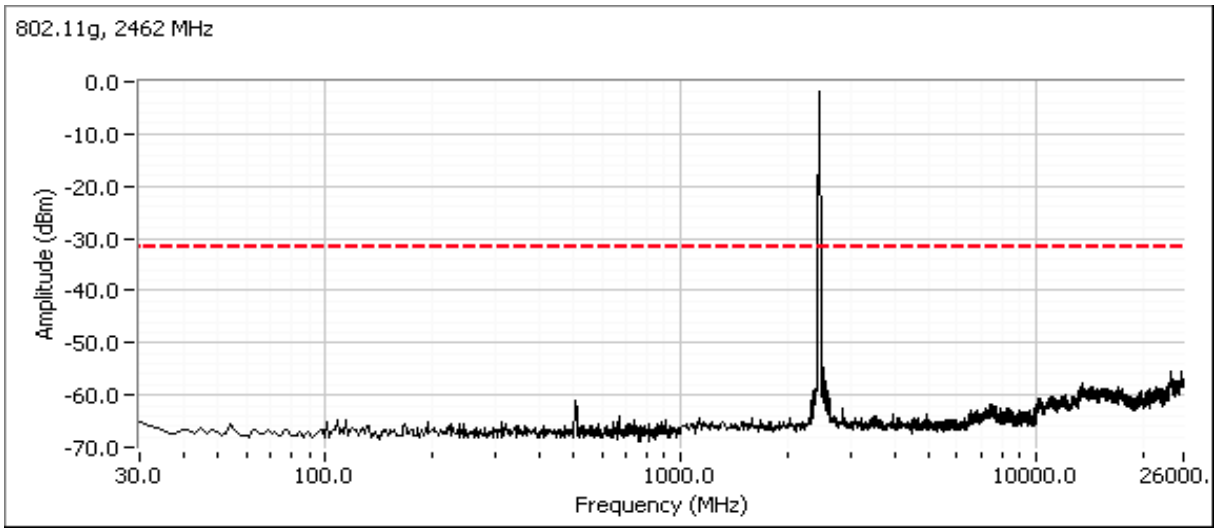


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Plots for center channel, power setting(s) = 20.0



Plots for high channel, power setting(s) = 14.0



Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

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: 7/27/2011
Test Engineer: Rafael Varelas
Test Location: FT Chamber #4

Config. Used: 1
Config Change: None
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: 21.3 °C
Rel. Humidity: 38 %

Summary of Results

Run #	Pwr setting	Test Performed	Limit	Pass / Fail	Result / Margin
1	20	Output Power	15.247(b)	Pass	14.6 dBm
2	20	Power spectral Density (PSD)	15.247(d)	Pass	-7.2 dBm/3kHz
3	20	Minimum 6dB Bandwidth	15.247(a)	Pass	17.0 MHz
3	20	99% Bandwidth	RSS GEN	-	18.1 MHz
4	20	Spurious emissions	15.247(b)	Pass	All emissions below -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

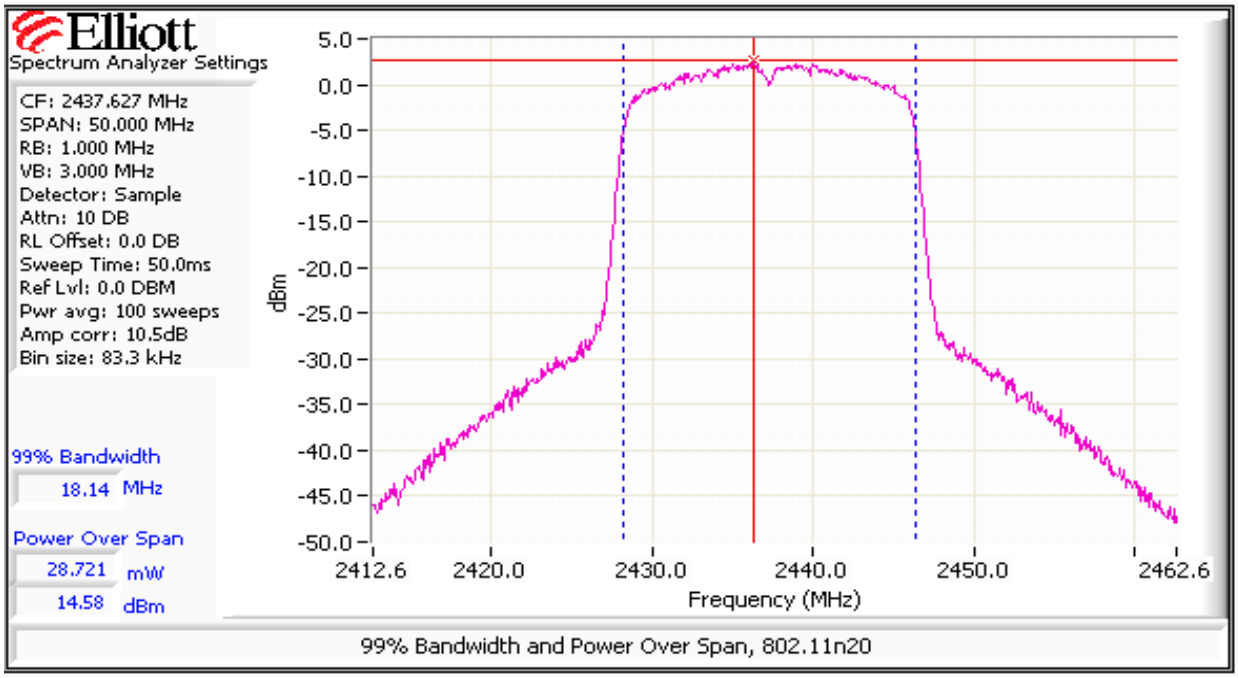
No deviations were made from the requirements of the standard.

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #1: Output Power

Power Setting[2]	Frequency (MHz)	Output Power (dBm) [1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP [Note 2] dBm	EIRP [Note 2] W	Output Power (dBm) [3]	Output Power mW
15.0	2412	12.0	15.8	2.2	Pass	14.2	0.026		
20.0	2437	14.6	28.8	2.2	Pass	16.8	0.048		
13.5	2462	11.6	14.5	2.2	Pass	13.8	0.024		

Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz (option #2, method 1 in KDB 558074, equivalent to method 1 of DA-02-2138A1 for U-NII devices). Spurious limit becomes -30dBc.
Note 2:	Power setting - the software power setting used during testing, included for reference only.

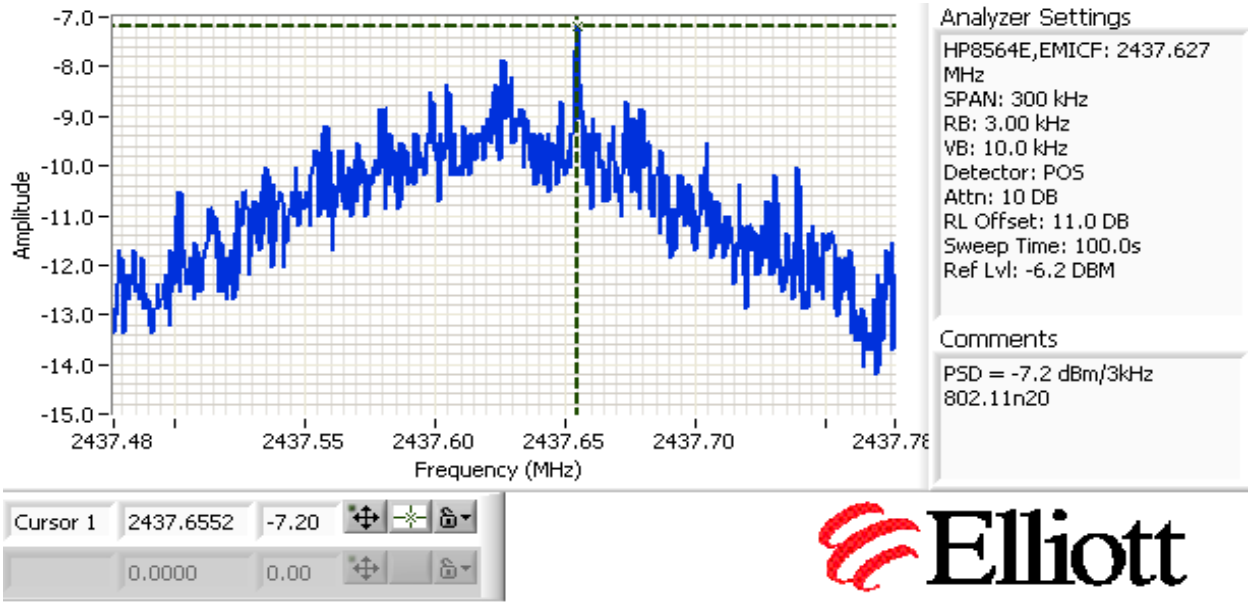


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
15.0	2413.5798	-9.4	8.0	Pass
20.0	2437.6552	-7.2	8.0	Pass
13.5	2461.6995	-10.1	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.

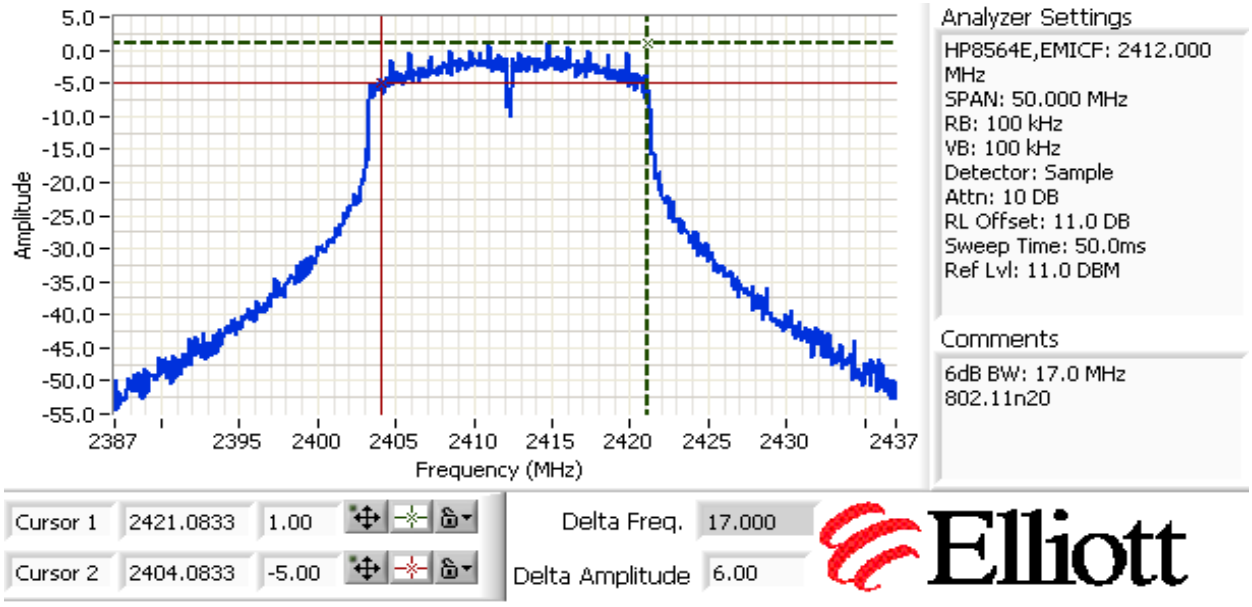


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
			6dB	99%
15.0	2412	100kHz	17.0	18.1
20.0	2437	100kHz	17.1	18.1
13.5	2462	100kHz	17.3	18.1

Note 1:	99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB

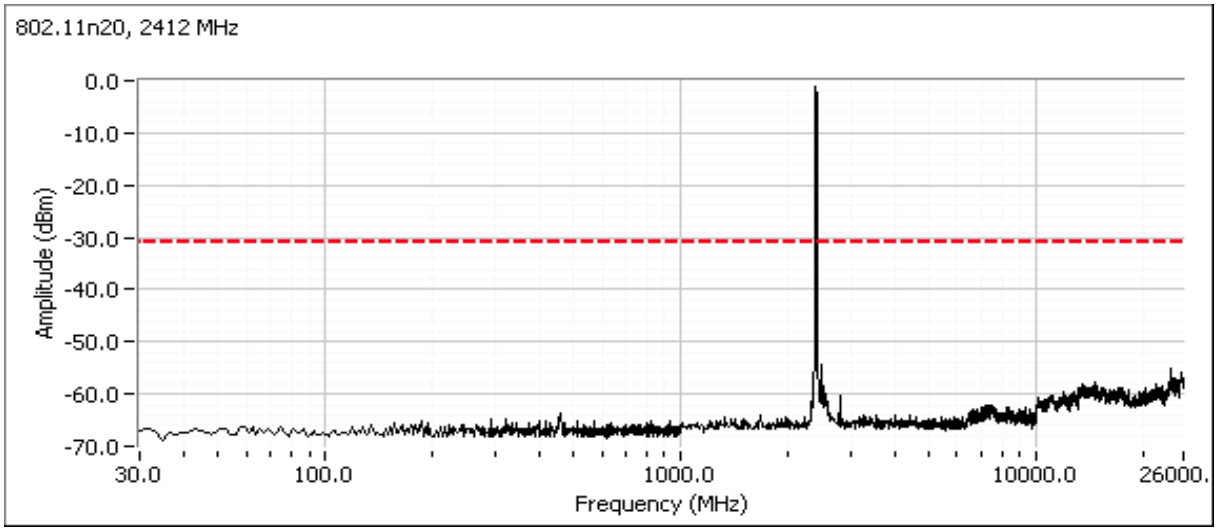


Run #4: Out of Band Spurious Emissions

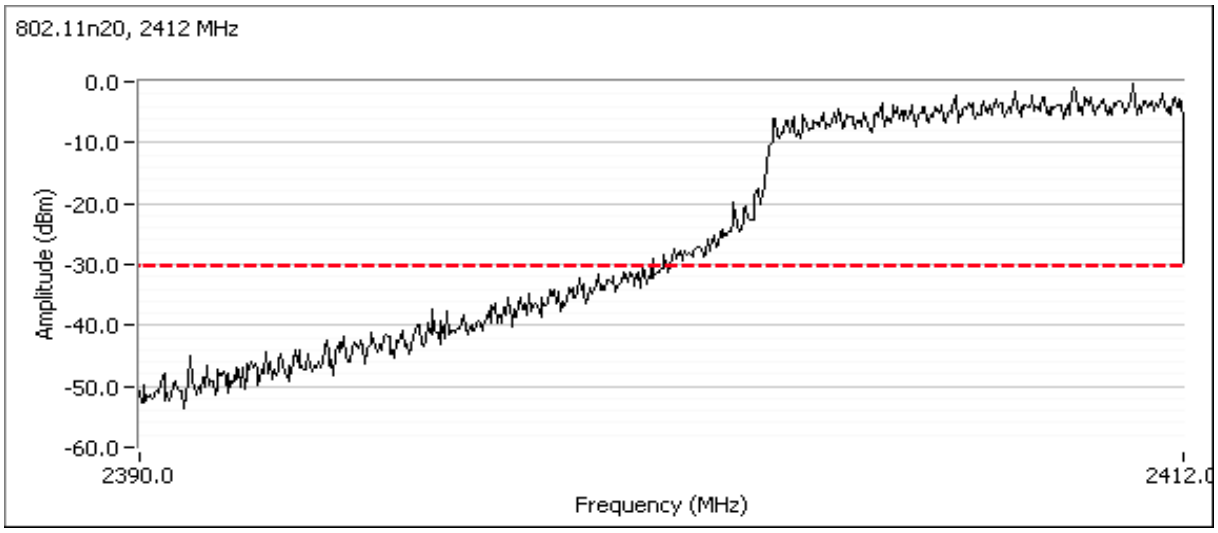
Frequency (MHz)	Limit	Result
2412	-30dBc	Pass
2437	-30dBc	Pass
2462	-30dBc	Pass

Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Plots for low channel, power setting(s) = 15.0

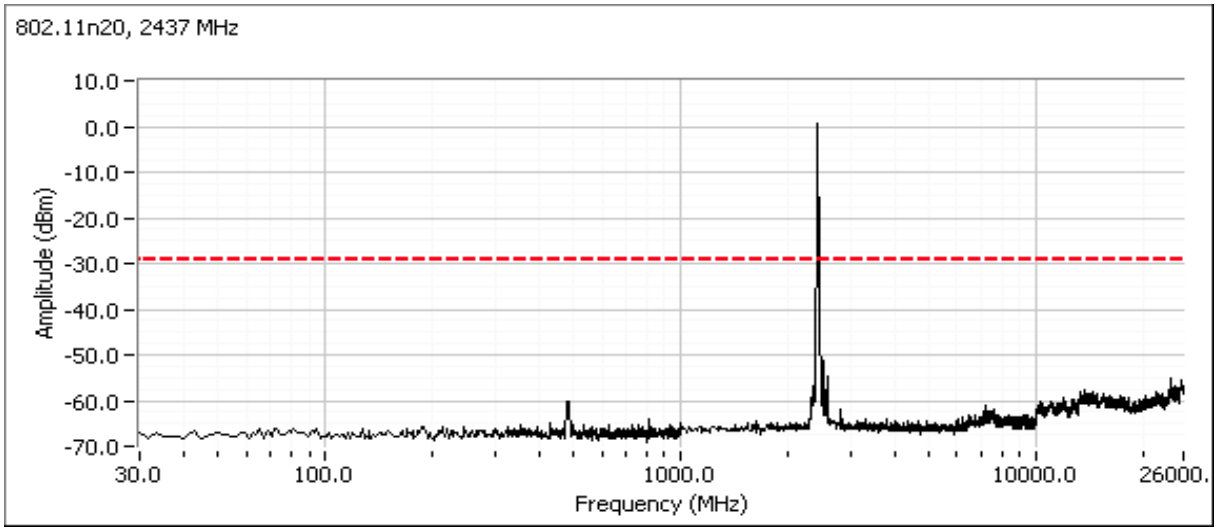


Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

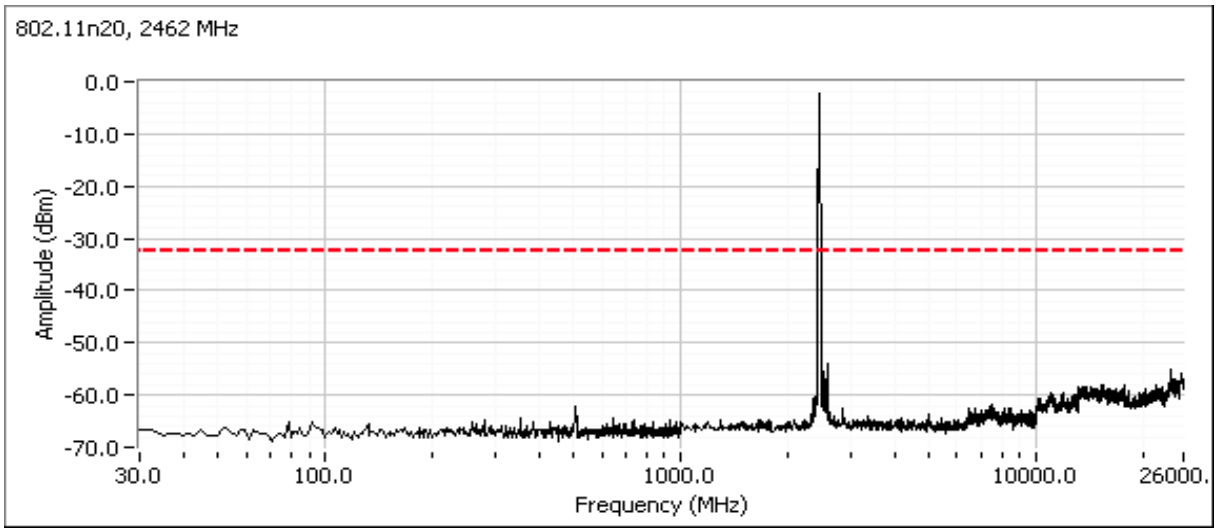


Client:	Ricoh	Job Number:	J83980
Model:	eQ102 (FCC ID: BBP-WLNEWS102)	T-Log Number:	T84001
		Account Manager:	Christine Krebill
Contact:	Jay Moulton @ RF Exposure		
Standard:	FCC part 15.b, FCC 15.247, 15.E, Part 22/24	Class:	N/A

Plots for center channel, power setting(s) = 20.0



Plots for high channel, power setting(s) = 13.5



End of Report

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