EMC Test Report
Application for Grant of Equipment Authorization
Industry Canada RSS-Gen Issue 3 / RSS 210 Issue 8
FCC Part 15 Subpart C

Model: BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card

IC CERTIFICATION #:	4324A-BRCM1060
FCC ID:	QDS-BRCM1060
APPLICANT:	Broadcom Corporation 190 Mathilda Ave Sunnyvale, CA 94086
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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ACCREDITED
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REVISION HISTORY

Rev#	Date	Comments	Modified By
-	08-11-2011	First release	

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SCOPE

An electromagnetic emissions test has been performed on the Broadcom Corporation model BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card, pursuant to the following rules:

Industry Canada RSS-Gen Issue 3
RSS 210 Issue 8 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15 Subpart C

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

ANSI C63.4:2003
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.

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

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

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

STATEMENT OF COMPLIANCE

The tested sample of Broadcom Corporation model BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card complied with the requirements of the following regulations:

Industry Canada RSS-Gen Issue 3
RSS 210 Issue 8 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15 Subpart C

Maintenance of compliance is the responsibility of the manufacturer. Any 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 Broadcom Corporation model BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card and therefore apply only to the tested sample. The sample was selected and prepared by Anne Liang of Broadcom Corporation.

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	b Mode: 8.1 MHz g Mode: 15.3 MHz n40 Mode: 36.3 MHz n20 Mode: 16.6 MHz BLE: 565 kHz	>500kHz	Complies
15.247 (b) (3)	RSS 210 A8.2 (4)	Output Power (multipoint systems)	b Mode: 17.7 dBm (0.059 Watts) g Mode: 17.4 dBm (0.055 Watts) n40 Mode: 15.3 dBm (0.034 Watts) n20 mode: 15.6 dBm (0.036 Watts) BLE: 2.7dBm (0.002 Watts) EIRP = 0.177 W Note 1	1Watt, EIRP limited to 4 Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	b Mode: -4.0 dBm / 3kHz g Mode: -4.4 dBm / 3kHz n40 Mode: -9.9 dBm / 3kHz n20 Mode: -4.3 dBm / 3kHz BLE: -11.2 dBm / 3kHz	8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	All emissions below -30dBc limit	< -30dBc Note 2	Complies
15.247(c) / 15.209	RSS 210 A8.5	Radiated Spurious Emissions 30MHz – 25 GHz	53.9dBµV/m @ 2389.9MHz (-0.1dB)	15.207 in restricted bands, all others <-30dBc Note 2	Complies

Note 1: EIRP calculated using antenna gain 3.9 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	The EUT has u.FL connectors	Unique or integral antenna required	Complies
15.207	RSS GEN Table 2	AC Conducted Emissions	54.8dBµV @ 0.151MHz (-11.1dB)	Refer to page 18	Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	46.2dBµV/m @ 2437.0MHz (-7.8dB)	Refer to page 19	Complies
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations, RSS 102 declaration and User Manual statements.	Refer to OET 65, FCC Part 1 and RSS 102	Complies
-	RSP 100 RSS GEN 7.1.5	User Manual	Refer to user's manual	Statement required regarding non-interference	Complies
-	RSP 100 RSS GEN 7.1.5	User Manual	Refer to user's manual	Statement for products with detachable antenna	Complies
-	RSP 100 RSS GEN 4.4.1	99% Bandwidth	b Mode: 10.4 MHz g Mode: 17.1 MHz n40 Mode: 36.4 MHz n20 Mode: 18.2 MHz BLE: 1.96 MHz	Information only	N/A

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 Broadcom Corporation model BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card is a WLAN+Bluetooth PCI-E Minicard, that is designed to enable WLAN or Bluetooth connections when installed in PCs. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 3.3Vdc, 800mA.

The sample was received on May 23, 2011 and tested on May 23, 26, 27, July 6, 21, 22, 24, 25, 28, August 1 and 4, 2011. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Broadcom	BCM943227HMB	2.4GHz WLAN + BT 4.0	-	QDS-BRC1060

OTHER EUT DETAILS

The Bluetooth is rev 4.0, supporting the basic, EDR and LE modes. The results for the LE mode are reported here. The results for the basic and EDR modes are reported in Elliott report R84214.

ANTENNA SYSTEM

The antennas connect to the EUT via non-standard u.Fl antenna connectors, thereby meeting the requirements of FCC 15.203.

ENCLOSURE

The EUT does not have an enclosure as it is designed to be installed within the enclosure of a host computer or system.

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
Lenovo	4446	Laptop	-	-
Catalyst	-	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)
Extender Board	Laptop	-	-	-
Antenna A & B	EUT	-	-	-
AC Power	AC Mains	2Wire	Unshielded	0.8

EUT OPERATION

During testing, the EUT was configured to continuously transmit at the noted channel at the maximum output power. For 802.11b mode testing, the data rate was set to 1 Mb/s. For 802.11g mode, the data rate was set to 6 Mb/s. For 802.11n20 and 802.11n40, the data rate was set to MCS0. These data rates represent worse case, as they resulted in the highest output power.

802.11b operation is limited to the main chain only.

For the BLE mode, the EUT was configured to continuously transmit at the noted channel at the maximum output power. Channel hopping was disabled.

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.

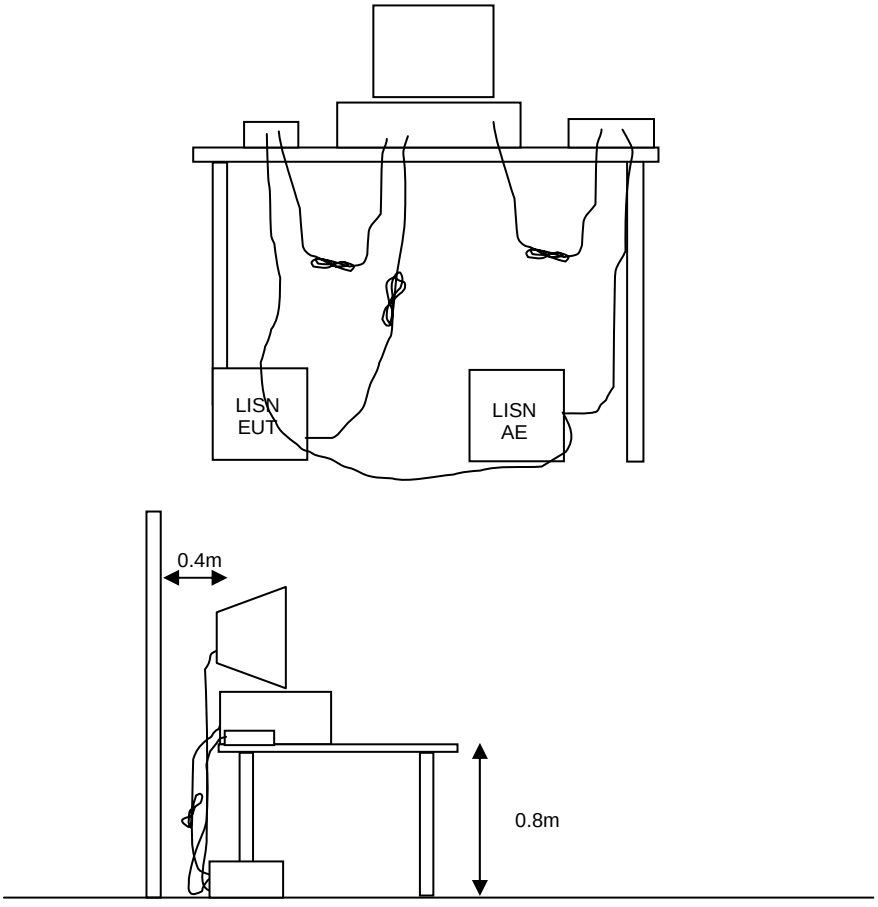


Figure 1 Typical Conducted Emissions Test Configuration

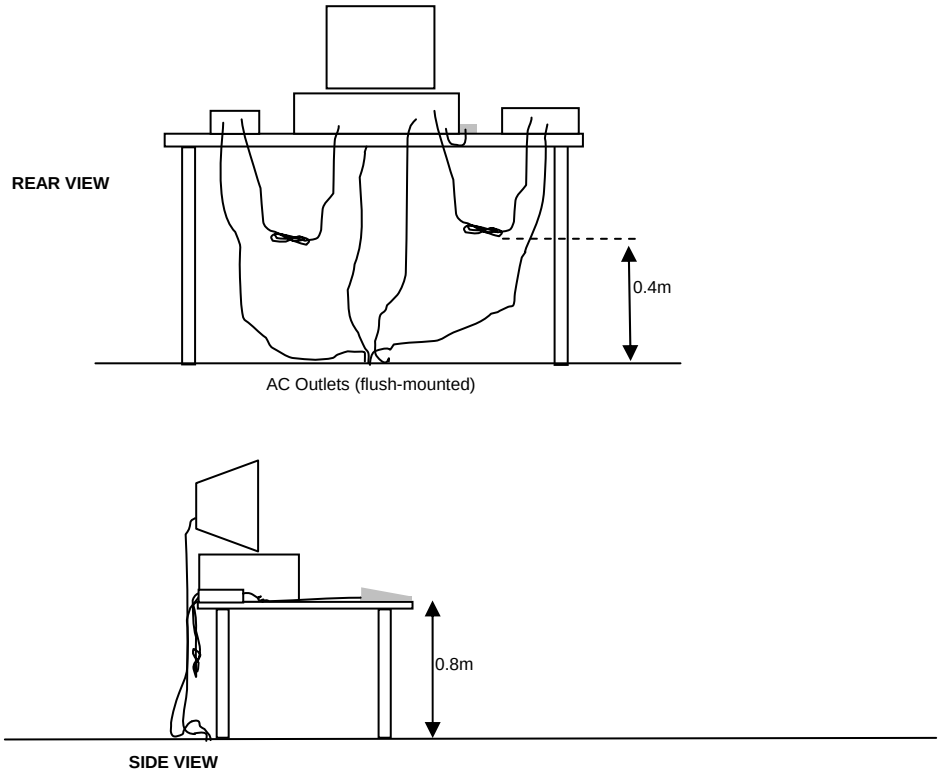
RADIATED EMISSIONS

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.

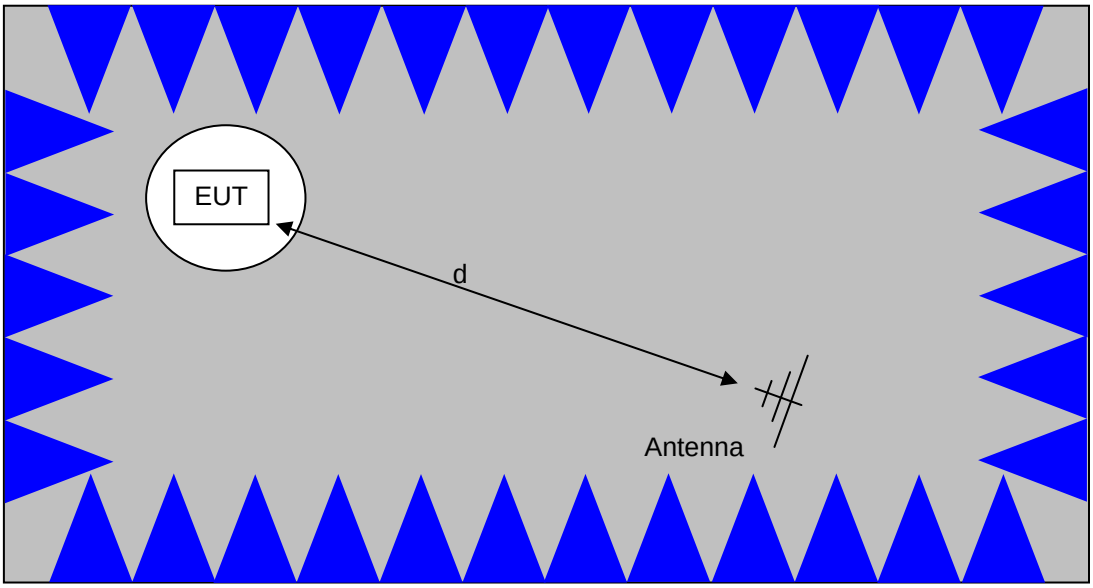
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

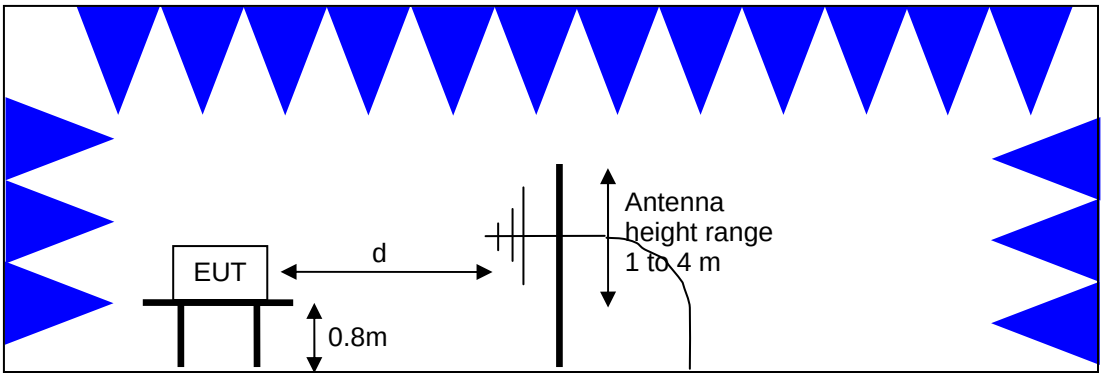


Typical Test Configuration for Radiated Field Strength Measurements



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.

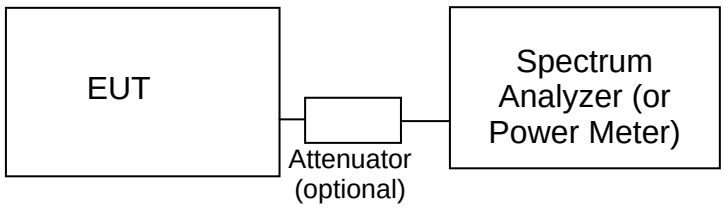
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



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

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

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

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

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

OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS

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

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

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

TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

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

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

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

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

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

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

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

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, 30 - 1,000 MHz & CE, 23-May-11

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	LISN, 10 kHz-100 MHz	3825/2	1292	3/1/2012
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1401	4/21/2012
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
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447D OPT 010	1826	5/17/2012

Radiated Emissions, 30 - 1,000 MHz, 26-May-11

Manufacturer	Description	Model	Asset #	Cal Due
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
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1548	6/24/2012
Com-Power Corp.	Preamplifier, 30-1000 MHz	PA-103A	2359	2/15/2012

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

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	372	1/25/2012
EMCO	LISN, 10 kHz-100 MHz	3825/2	1292	3/1/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	11/2/2011

DTS Spurs, 06-Jul-11

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	8/2/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	11/2/2011

Radiated Emissions, 1000 - 26,000 MHz, 21-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
Hewlett Packard	Head (Inc W1-W4, 1742 , 1743) Blue	84125C	1620	5/9/2012
A.H. Systems	Blue System Horn, 18-40GHz	SAS-574, p/n: 2581	2159	3/23/2012
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2249	10/11/2011

Radiated Emissions, 1000 - 18,000 MHz, 22-Jul-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	5/18/2012
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	8/12/2011
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	8/10/2011
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	4/6/2012

TX Spurious Emissions, 22-Jul-11

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	4/6/2012

Radio Antenna Port (Power and Spurious Emissions), 24-Jul-11 thru 28-Jul-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, 1000 - 25,000 MHz, 01-Aug-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	5/18/2012
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/8/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	8/14/2011
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

Radio Antenna Port (Power and Spurious Emissions), 01-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, 1000 - 18,000 MHz, 04-Aug-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/8/2011
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	8/12/2011
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	8/3/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	11/2/2011

Appendix B Test Data

T83863 Pages 26 - 137

Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		-
Emissions Standard(s):	FCC 15.247/RSS-210	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Broadcom Corporation

Model

BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card

Date of Last Test: 8/9/2011

Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	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: 8/1/2011
Test Engineer: Mark Hill
Test Location: FT Lab#4

Config. Used: 1
Config Change: None
Host Unit 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: 20.6 °C
Rel. Humidity: 35 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	-	-	Output Power	15.247(b)	Pass	17.7 dBm
2	-	-	Power spectral Density (PSD)	15.247(d)	Pass	-4.0 dBm/3kHz
3	-	-	Minimum 6dB Bandwidth	15.247(a)	Pass	8.1 MHz
3	-	-	99% Bandwidth	RSS GEN	-	10.4 MHz
4	-	-	Spurious emissions	15.247(b)	Pass	All emissions below the -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

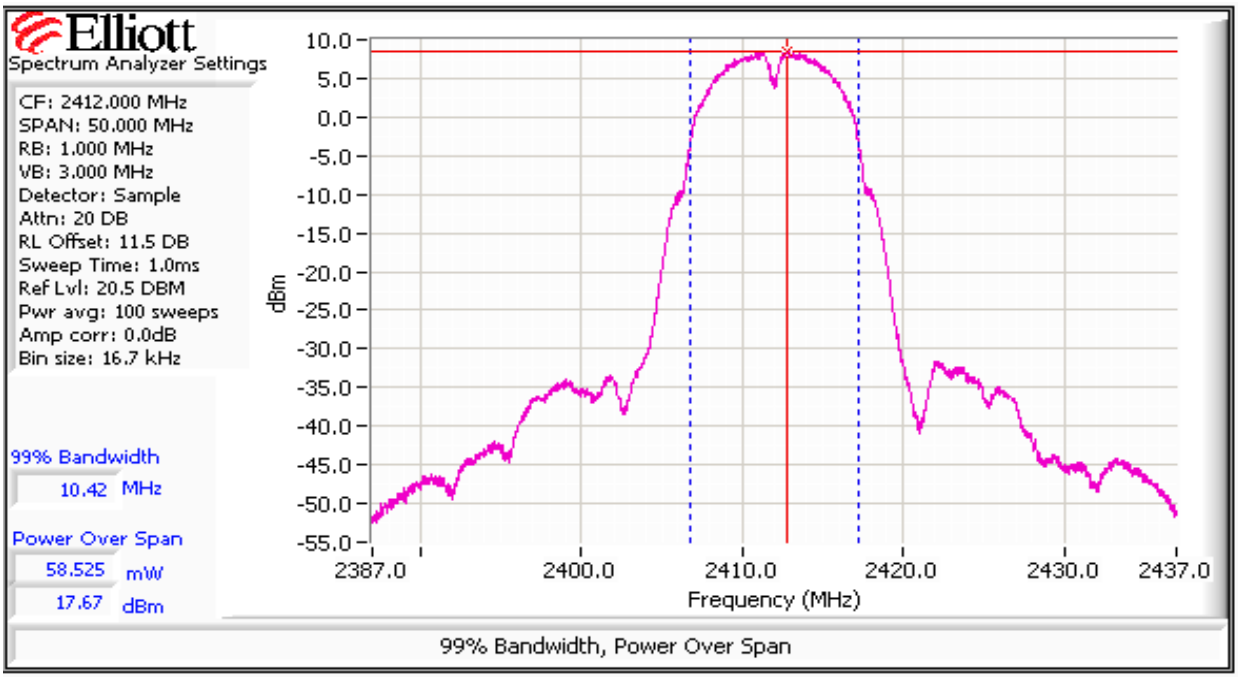
No deviations were made from the requirements of the standard.

Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #1: Output Power

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP dBm	EIRP W	Output Power (dBm)[3]	Output Power mW
-	2412	17.7	58.9	3.9	Pass	21.6	0.145	17.0	50.1
-	2437	17.7	58.9	3.9	Pass	21.6	0.145	17.0	50.1
-	2462	16.3	42.7	3.9	Pass	20.2	0.105	15.9	38.9

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.
Note 3:	Power measured using average power meter and is included for reference only.

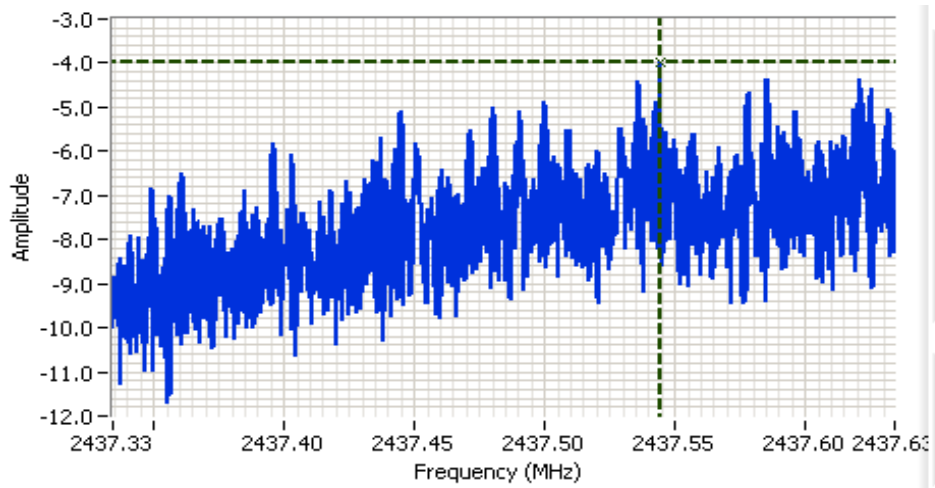


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
-	2412	-4.1	8.0	Pass
-	2437	-4.0	8.0	Pass
-	2462	-5.8	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.

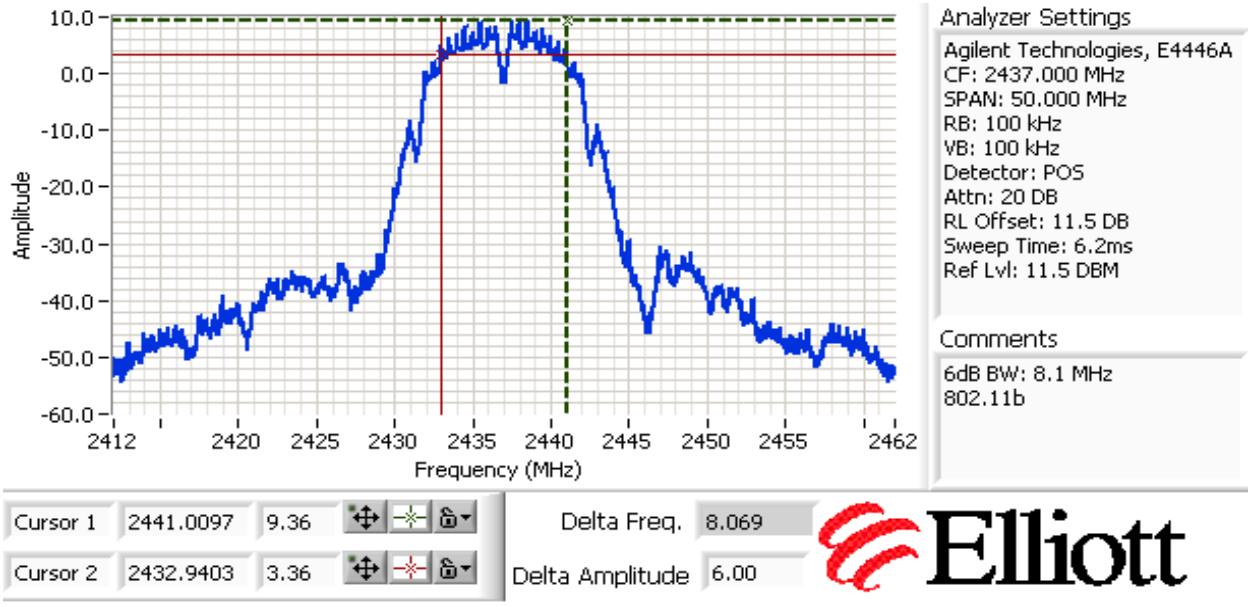


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
-	2412	100kHz	8.1	10.4
-	2437	100kHz	8.1	10.4
-	2462	100kHz	8.1	10.4

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

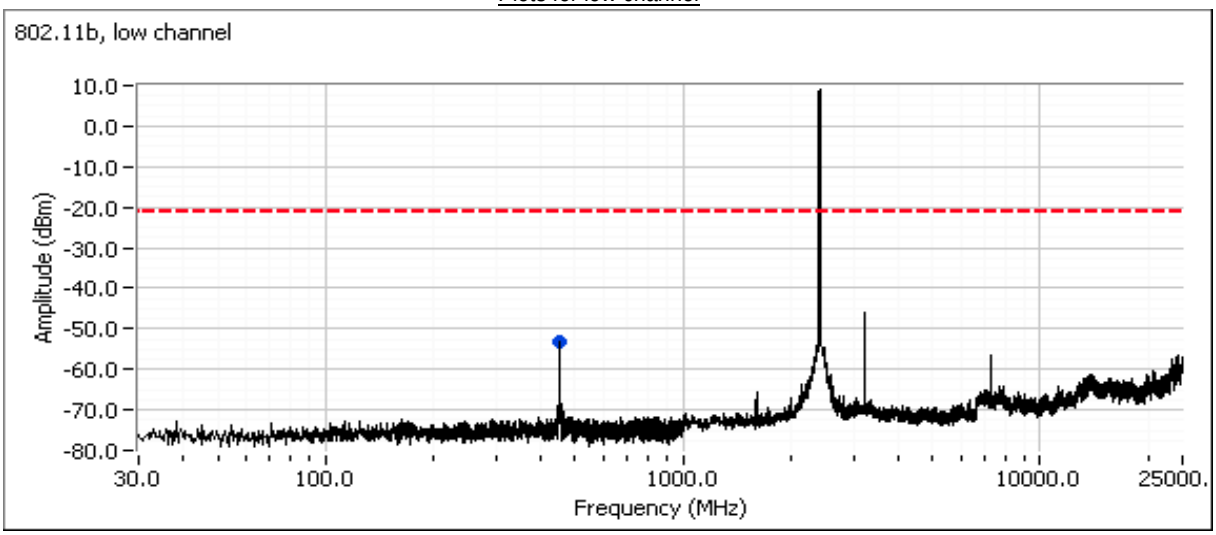


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #4: Out of Band Spurious Emissions

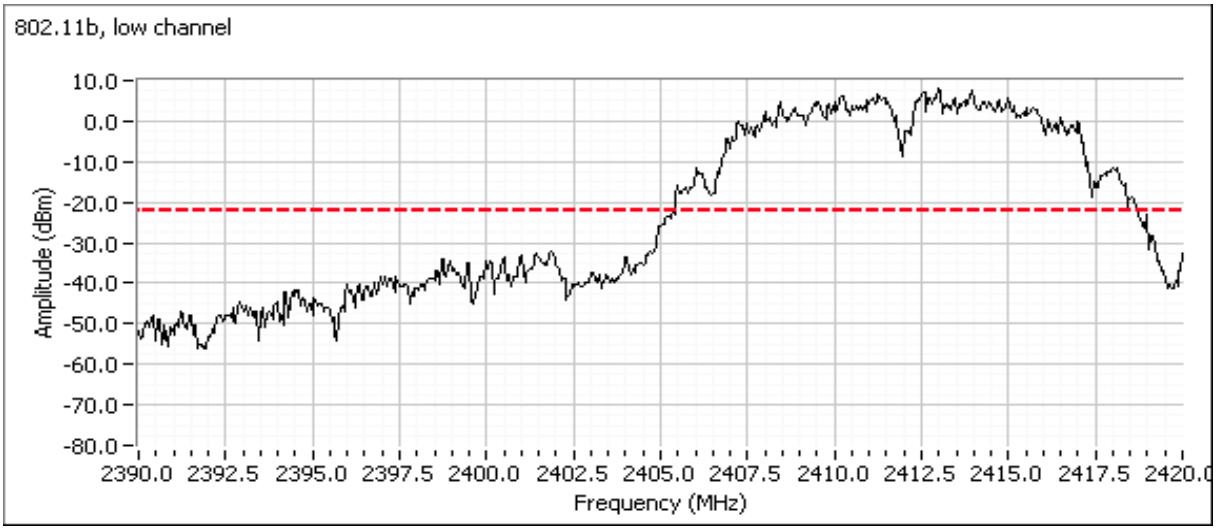
Frequency (MHz)	Limit	Result
2412	-30dBc	Pass
2437	-30dBc	Pass
2462	-30dBc	Pass

Plots for low channel

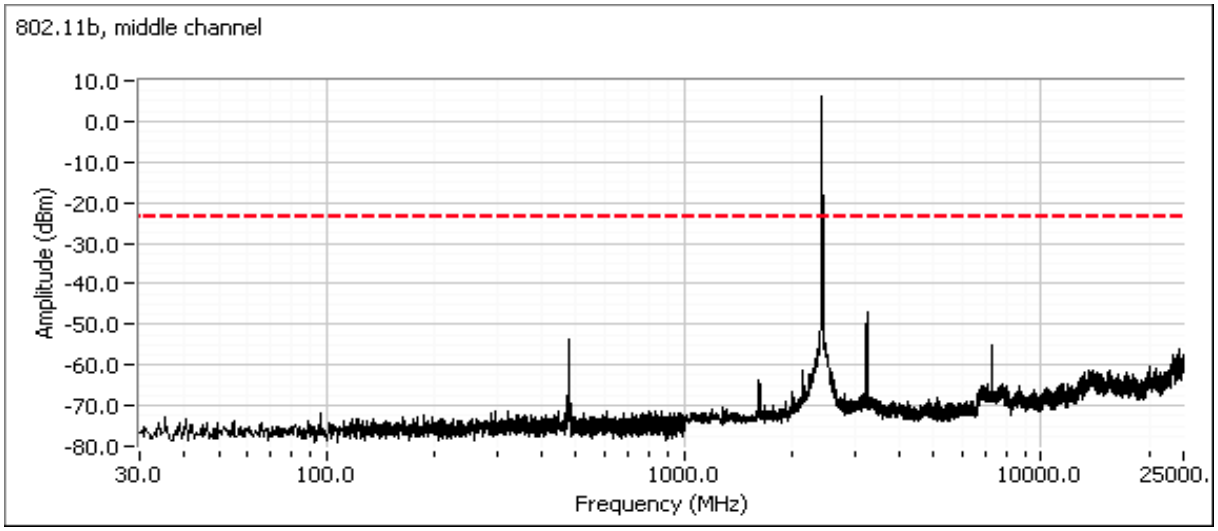


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

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.

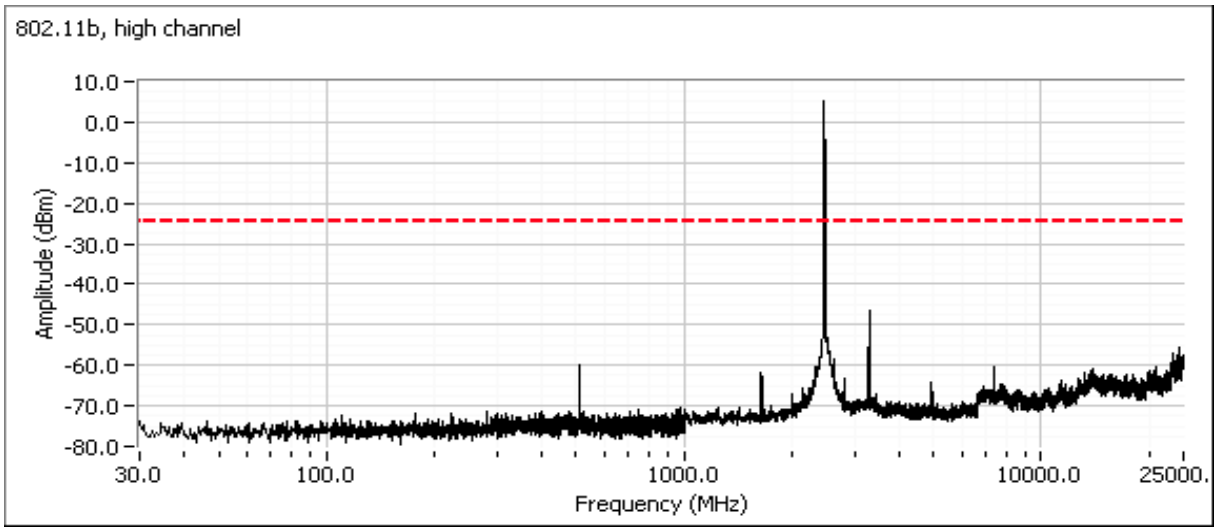


Plots for center channel



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Plots for high channel



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	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: 7/24/2011
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #4

Config. Used: 1
Config Change: None
Host Unit 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: 20.6 °C
Rel. Humidity: 35 %

Summary of Results

Run #	Pwr setting	Test Performed	Limit	Pass / Fail	Result / Margin
1	-	Output Power	15.247(b)	Pass	17.4 dBm
2	-	Power spectral Density (PSD)	15.247(d)	Pass	-4.4 dBm/3kHz
3	-	Minimum 6dB Bandwidth	15.247(a)	Pass	15.3 MHz
3	-	99% Bandwidth	RSS GEN	-	17.1 MHz
4	-	Spurious emissions	15.247(b)	Pass	All emissions below the -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

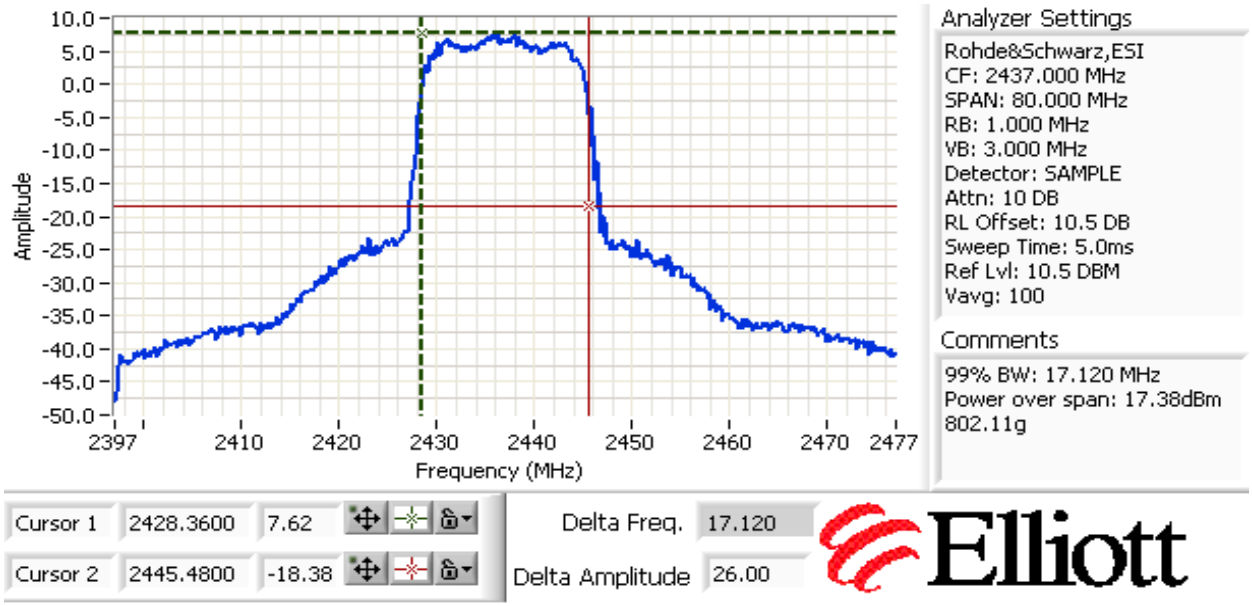
No deviations were made from the requirements of the standard.

Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #1a: Output Power
802.11g

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP dBm	EIRP W	Output Power (dBm)[3]	Output Power mW
-	2412	11.5	14.1	3.9	Pass	15.4	0.035		
-	2437	17.4	55.0	3.9	Pass	21.3	0.135		
-	2462	11.2	13.2	3.9	Pass	15.1	0.032		

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 not continuous but the ESI analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting) and power integration over 80 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.
Note 3:	Power measured using average power meter and is included for reference only.

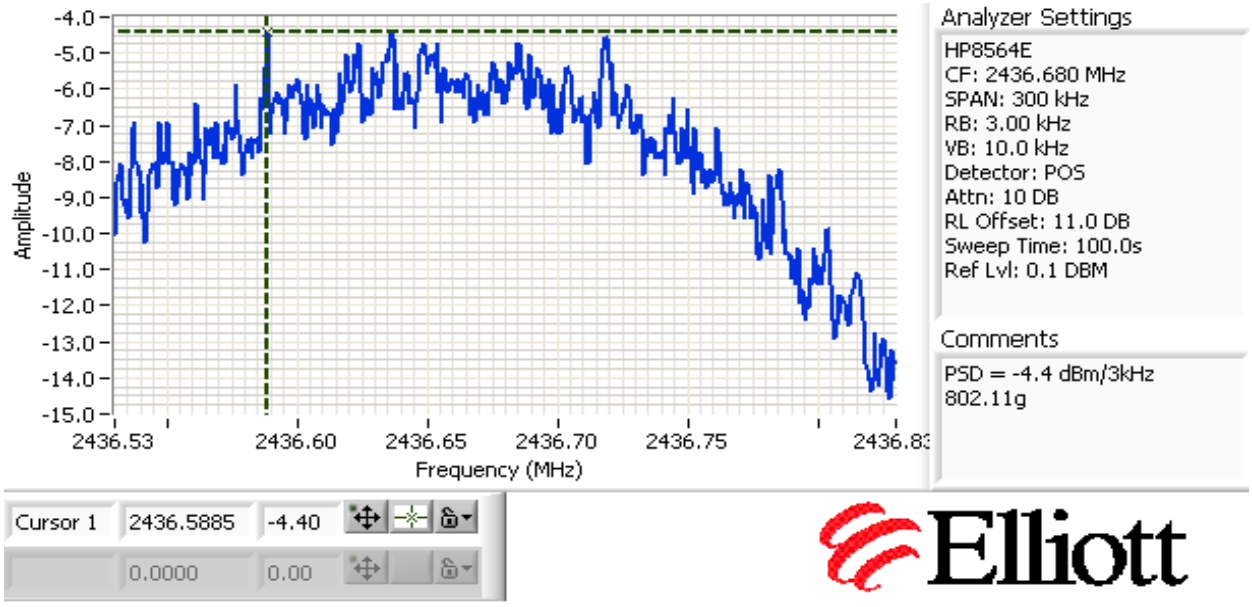


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
-	2412	-9.1	8.0	Pass
-	2437	-4.4	8.0	Pass
-	2462	-10.0	8.0	Pass

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

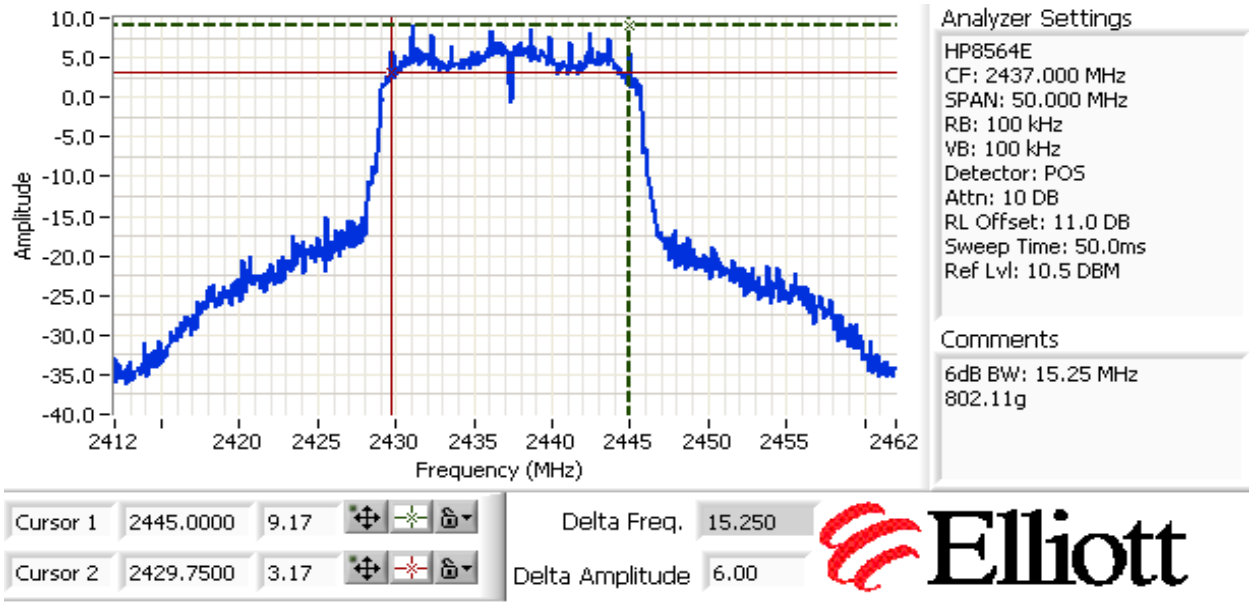


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
-	2412 - g	100kHz	15.3	17.0
-	2437 - g	100kHz	15.3	17.1
-	2462 - g	100kHz	15.3	17.0

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

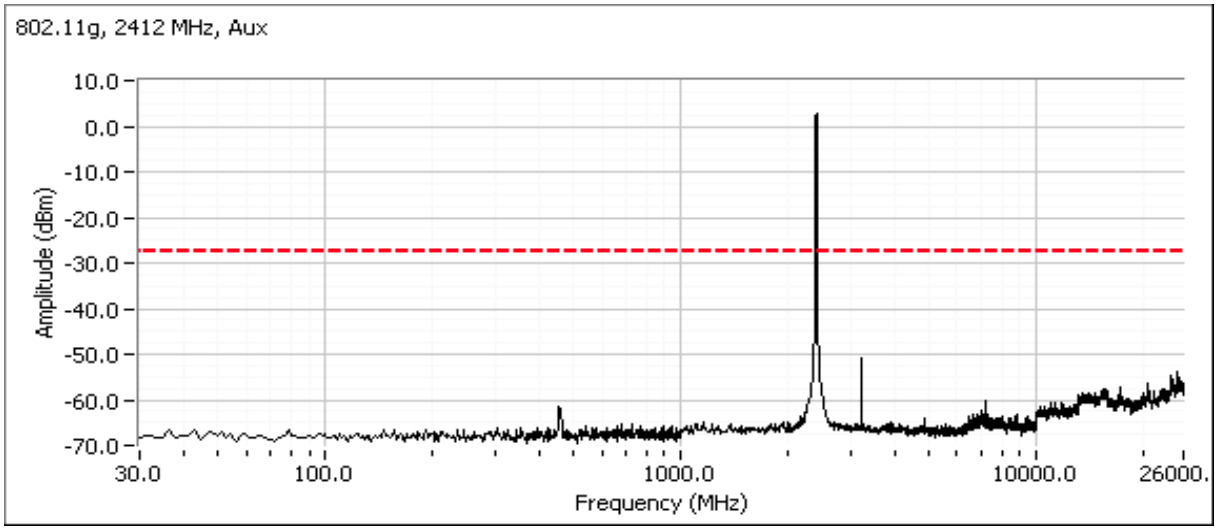


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

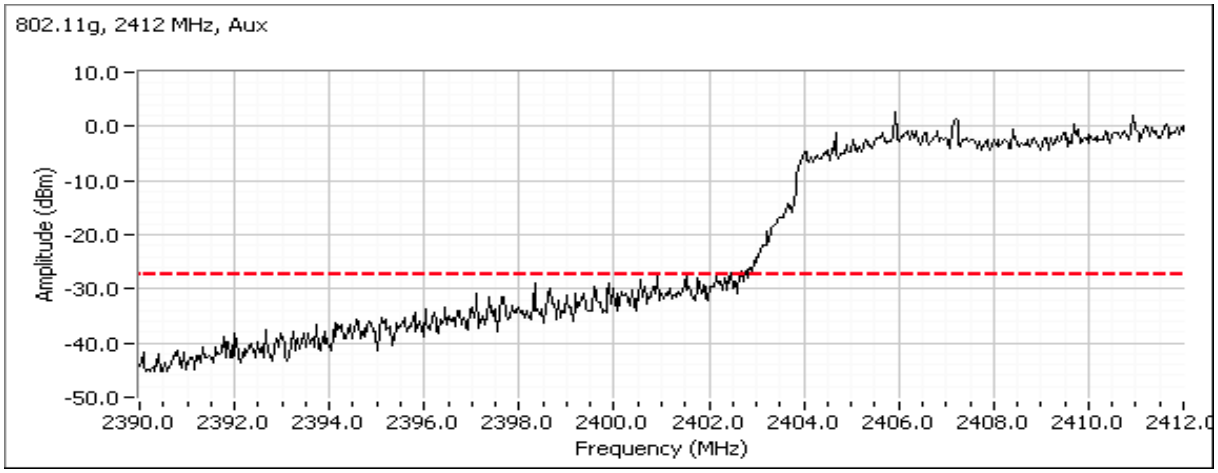
Run #4: Out of Band Spurious Emissions

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

Plots for low channel

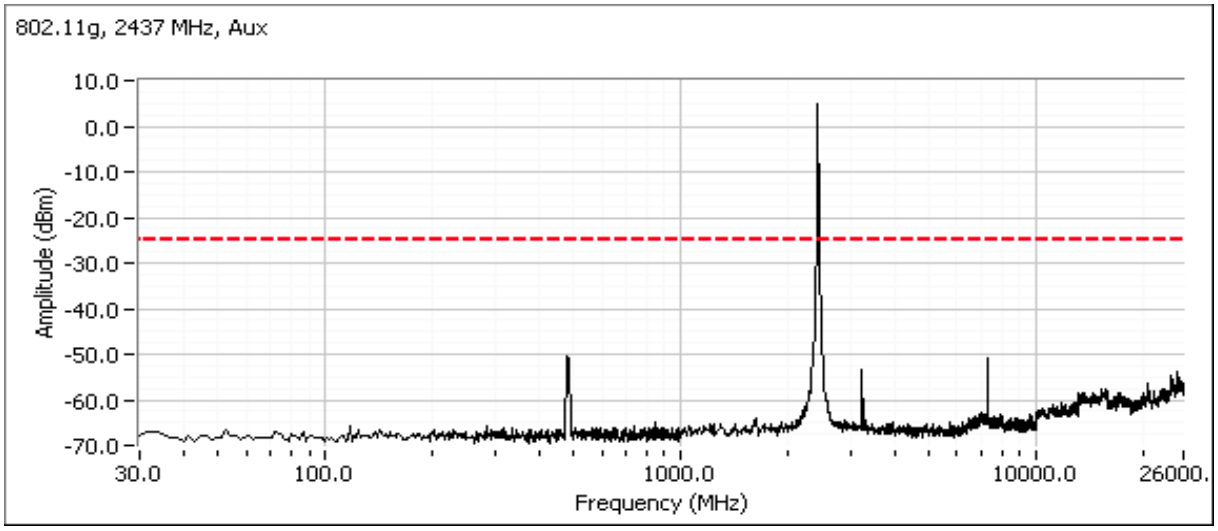


Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

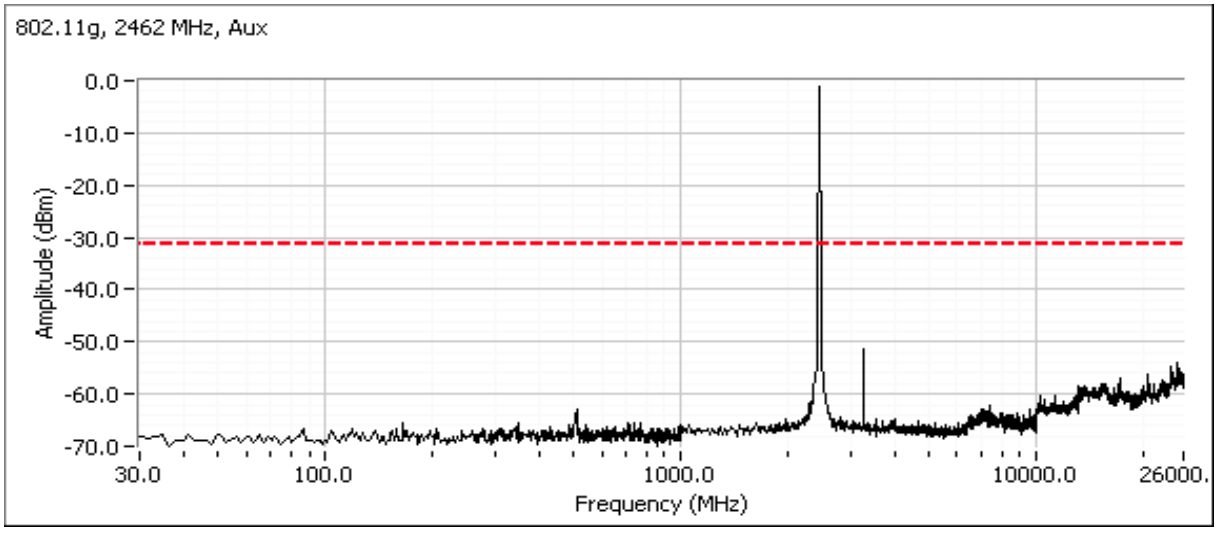


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Plots for center channel



Plots for high channel



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements
MIMO and Smart Antenna Systems
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: 7/25 & 7/28/2011 1:33:00 PM
Test Engineer: John Caizzi / R. Varelas
Test Location: Fremont EMC Lab #4

Config. Used: Coax connection to antenna ports.
Config Change: None
Host Unit 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: 23 °C
Rel. Humidity: 39 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
Chain A + B						
1	-	-	Output Power	15.247(b)	Pass	15.3 dBm
2	-	-	Power spectral Density (PSD)	15.247(d)	Pass	-9.9 dBm/3kHz
3	-	-	Minimum 6dB Bandwidth	15.247(a)	Pass	36.3 MHz
3	-	-	99% Bandwidth	RSS GEN	-	36.4 MHz
4	-	-	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:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #1: Output Power - Chain A + B

Operating Mode: 802.11n40

Transmitted signal on chain is coherent ? yes

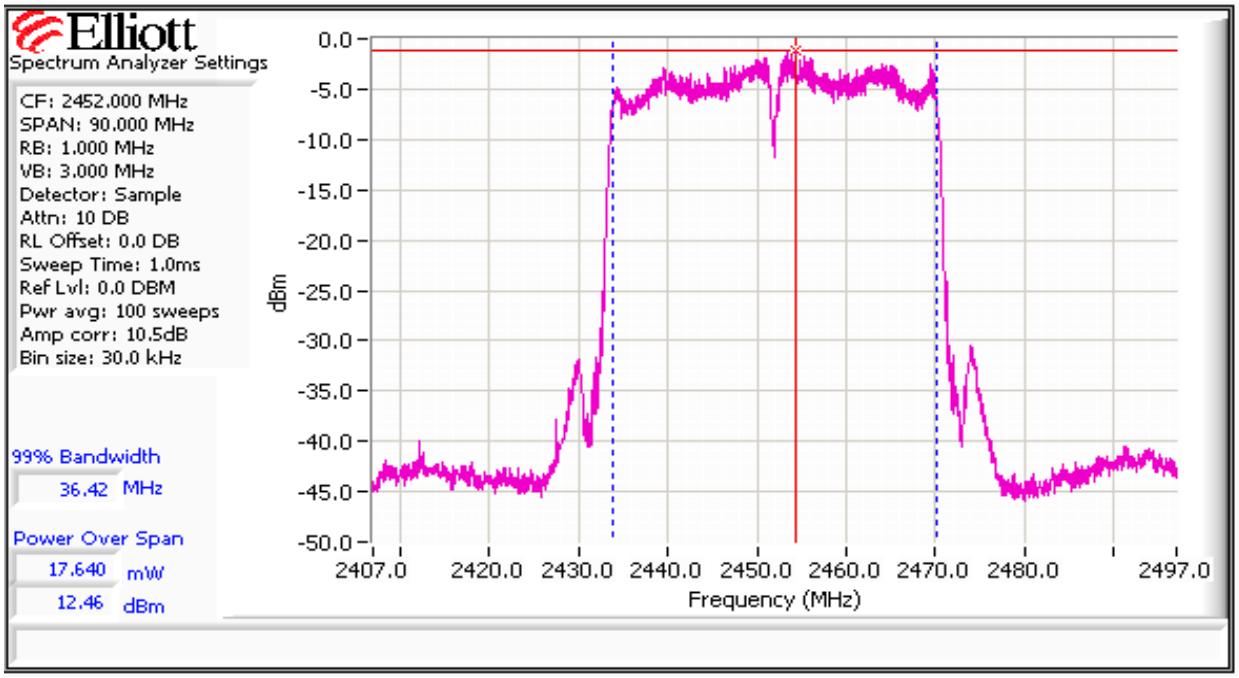
2422 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	-	-						
Output Power (dBm) Note 1	11.46	11.53			14.5 dBm	0.028 W	29.1 dBm	0.811 W
Antenna Gain (dBi) Note 2	3.9	3.9			6.9 dBi		Pass	
eirp (dBm) Note 2	15.36	15.43			21.4 dBm	0.139 W		

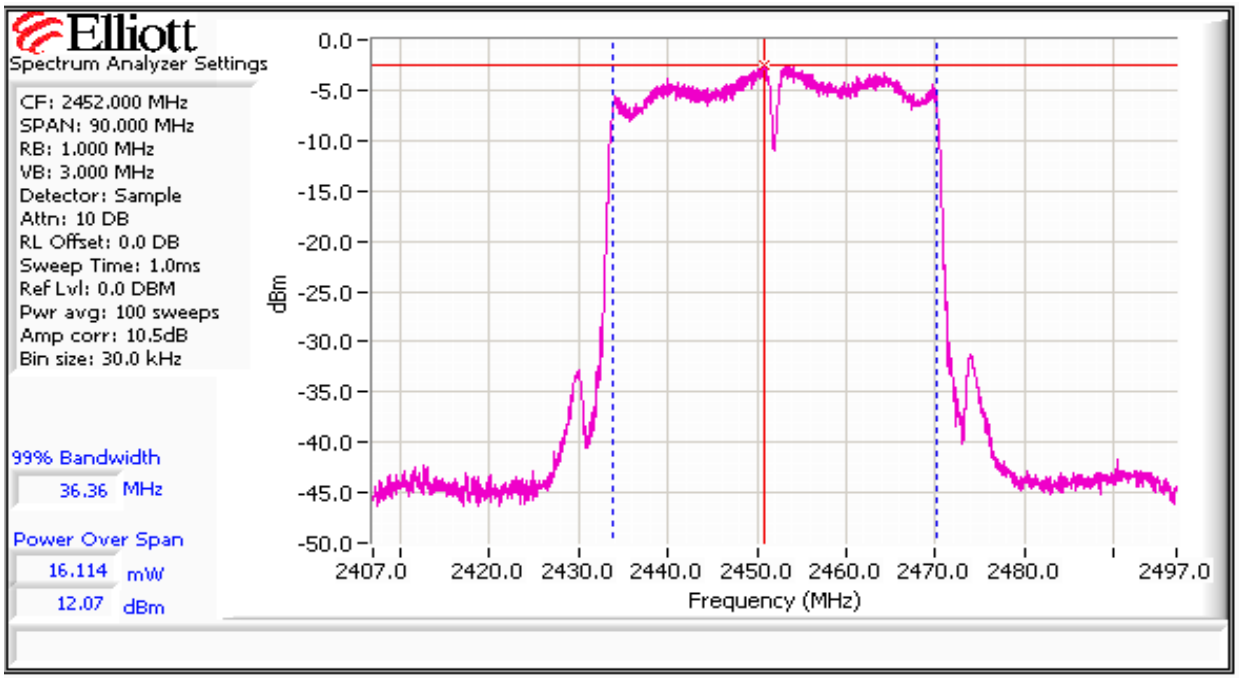
2437 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	-	-						
Output Power (dBm) Note 1	11.91	11.96			14.9 dBm	0.031 W	29.1 dBm	0.811 W
Antenna Gain (dBi) Note 2	3.9	3.9			6.9 dBi		Pass	
eirp (dBm) Note 2	15.81	15.86			21.9 dBm	0.153 W		

2452 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	-	-						
Output Power (dBm) Note 1	12.46	12.07			15.3 dBm	0.034 W	29.1 dBm	0.811 W
Antenna Gain (dBi) Note 2	3.9	3.9			6.9 dBi		Pass	
eirp (dBm) Note 2	16.36	15.97			22.2 dBm	0.166 W		

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 not continuous but the analyzer was configured with a gated sweep such that it was sweeping only when the device was transmitting) and power integration over 100 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:	As there is coherency between chains the effective antenna gain is the sum of the individual antenna gains and the eirp is the product of the total power and the effective antenna gain
Note 3:	Power setting - if a single number the same power setting was used for each chain. If multiple numbers the power setting for each chain is separated by a comma (e.g. x,y would indicate power setting x for chain 1, power setting y for chain 2.

Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A





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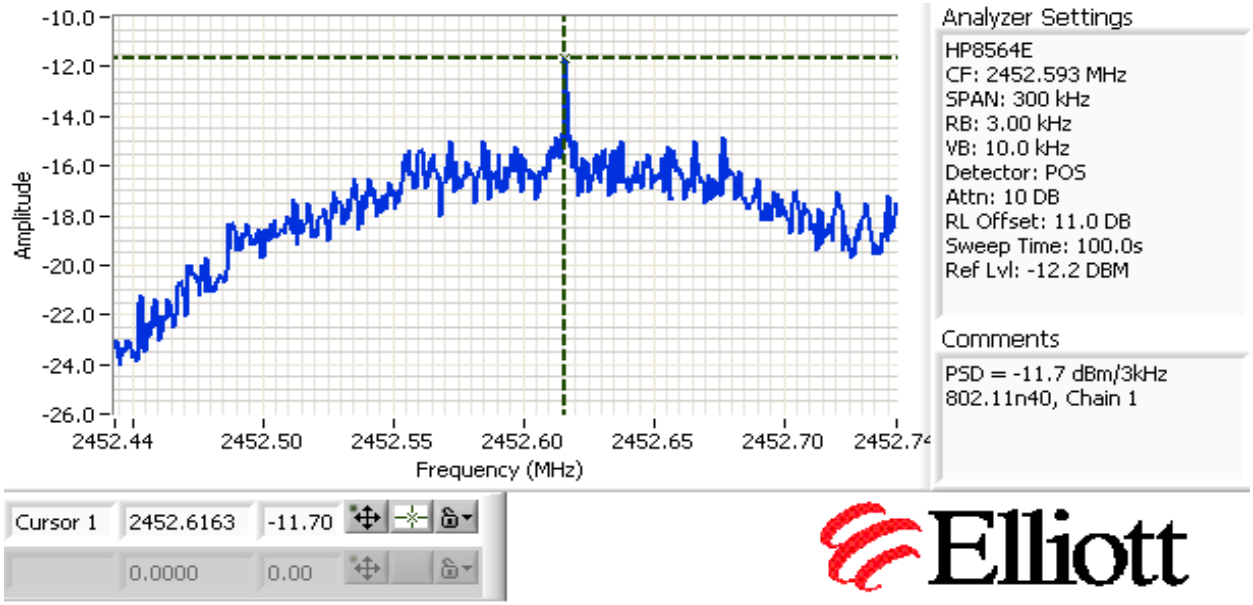
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1 Chain 1	Chain 2	Chain 3	Chain 4	Total	Limit dBm/3kHz	Result
-	2422	-15.2	-14.5			-11.8	8.0	Pass
-	2437	-14.5	-13.5			-11.0	8.0	Pass
-	2452	-11.7	-14.5			-9.9	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.



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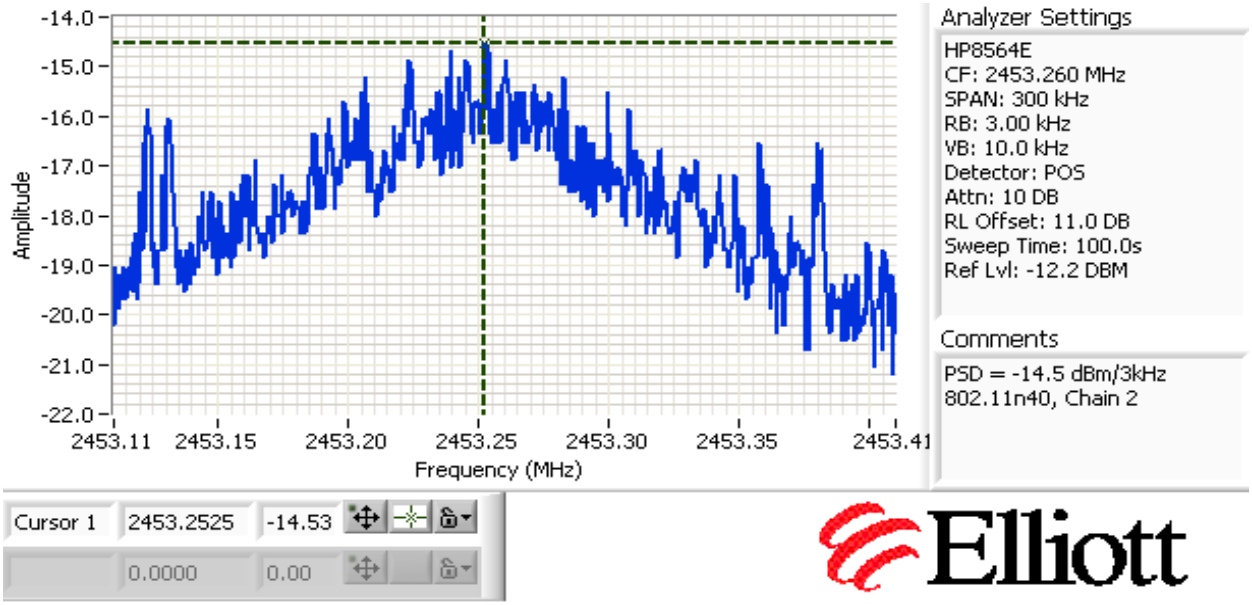
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A



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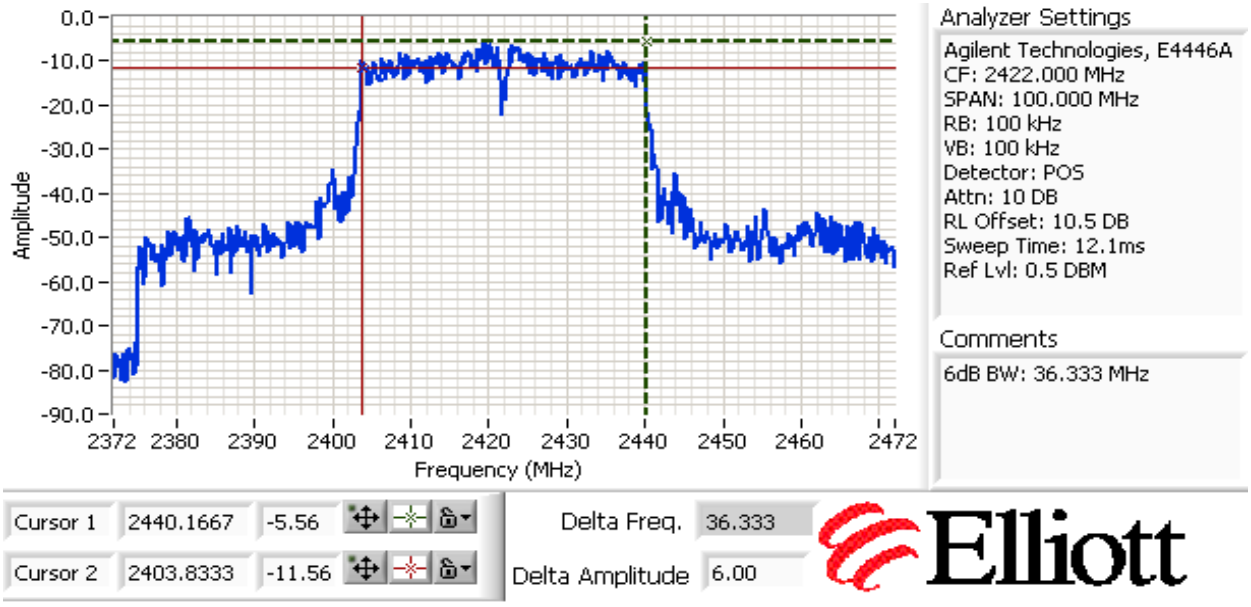
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
-	2422	100 kHz	36.3	36.4
-	2437	100 kHz	36.5	36.4
-	2452	100 kHz	36.3	36.4

Note 1:	Measured on a single chain
Note 2:	99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB



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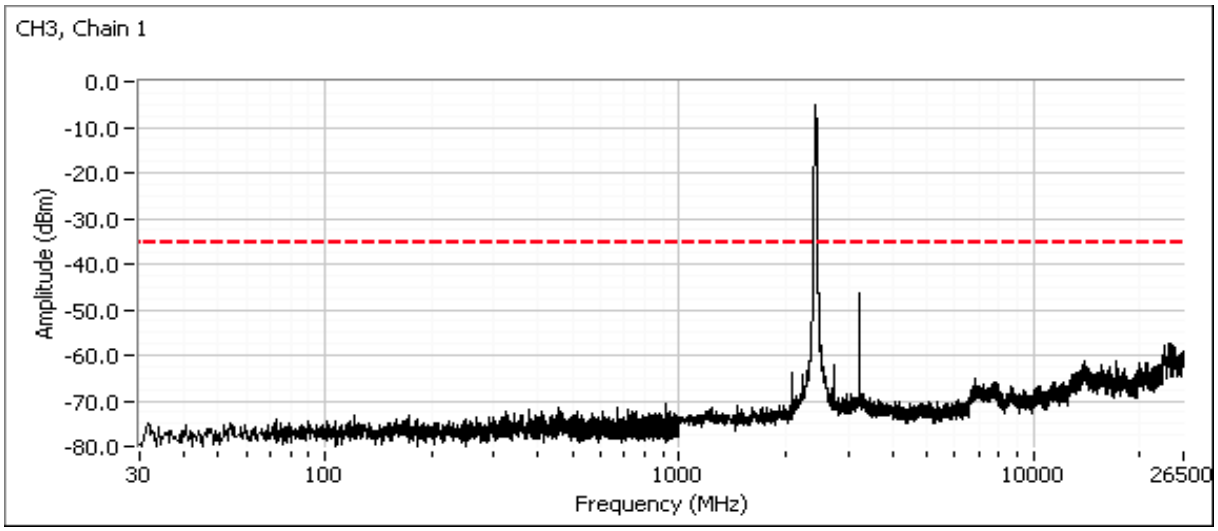
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #4: Out of Band Spurious Emissions

Power Setting Per Chain				Frequency (MHz)	Limit	Result
#1	#2	#3	#4			
-	-			2422	-30 dBc	Pass
-	-			2437	-30 dBc	Pass
-	-			2452	-30 dBc	Pass

Note 1:	Measured on each chain individually

Plots for low channel



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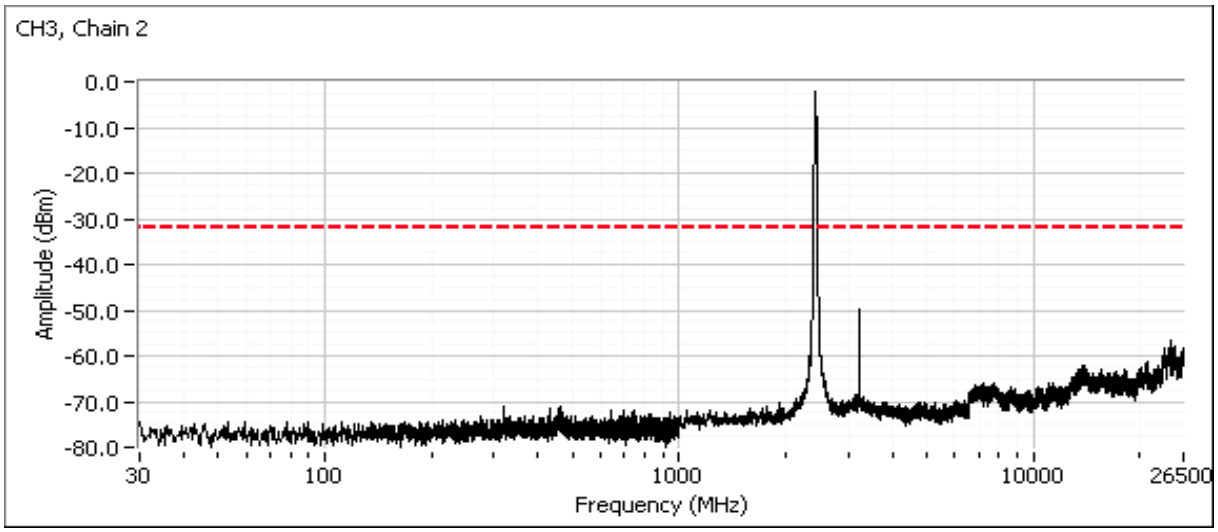
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A



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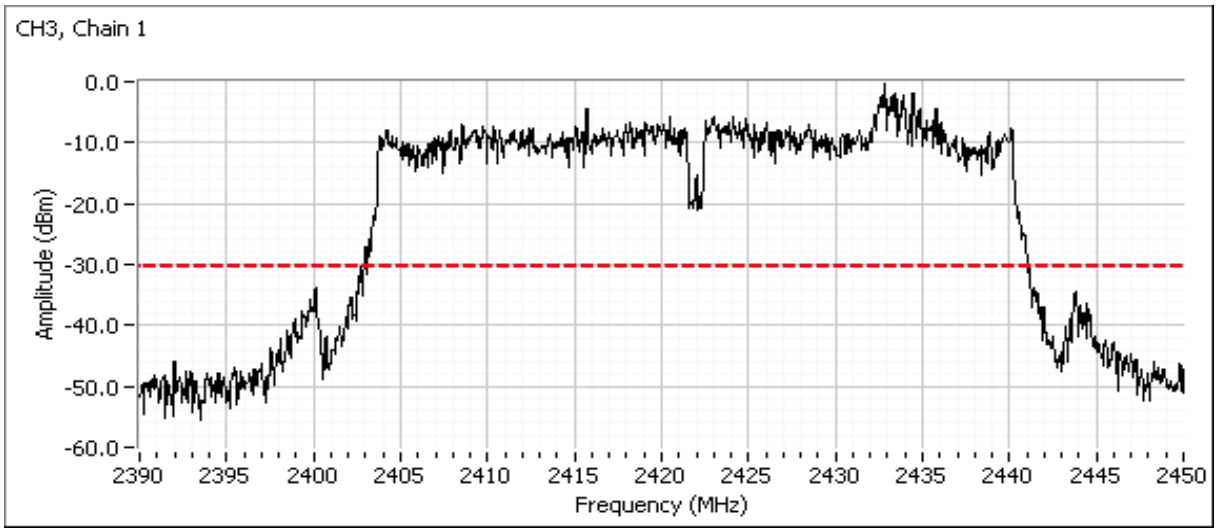
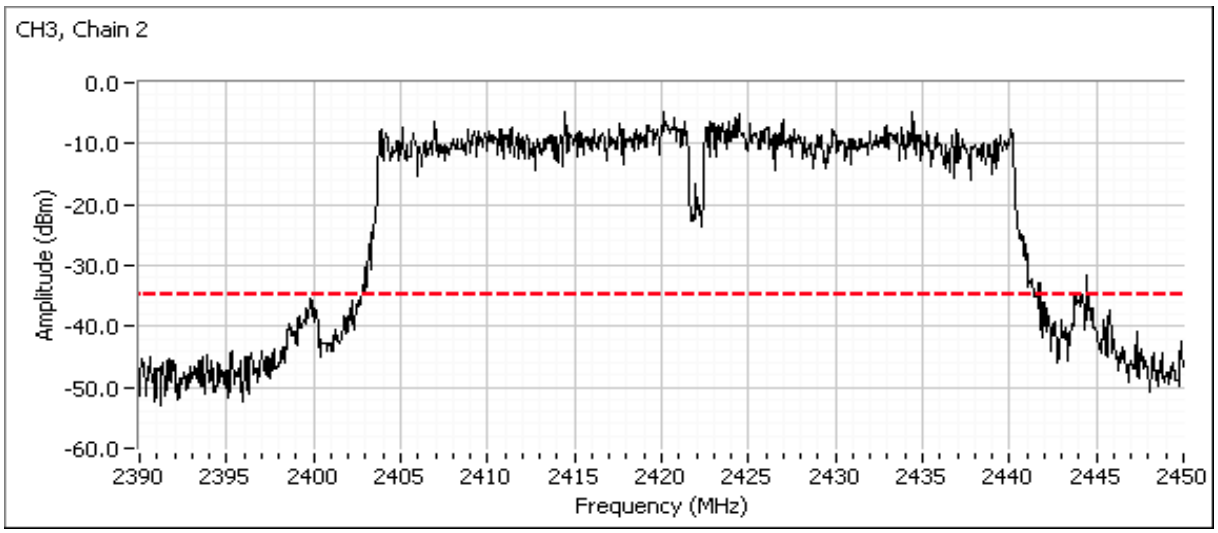
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

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.





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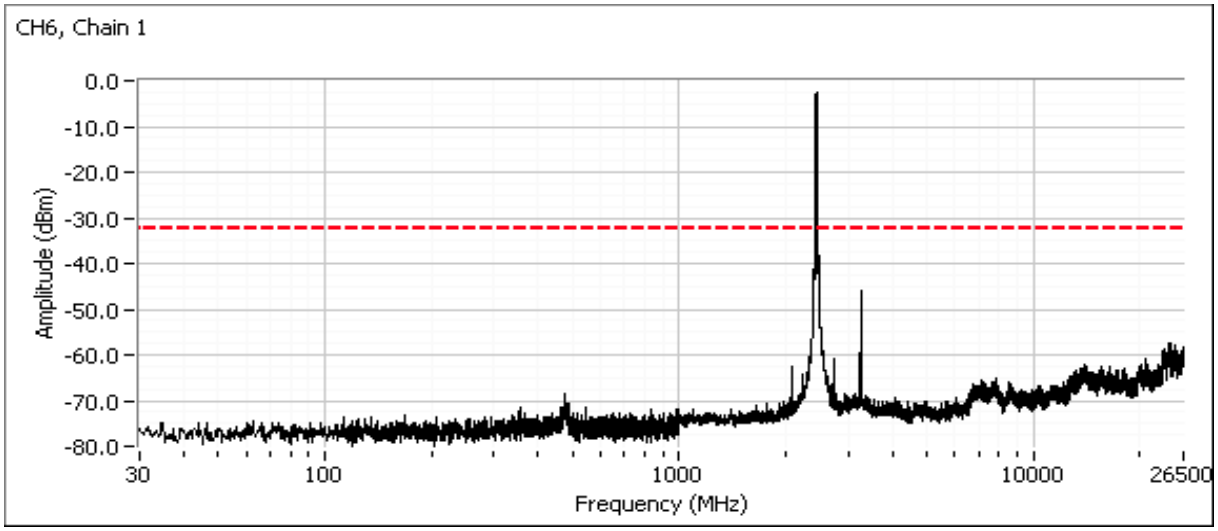
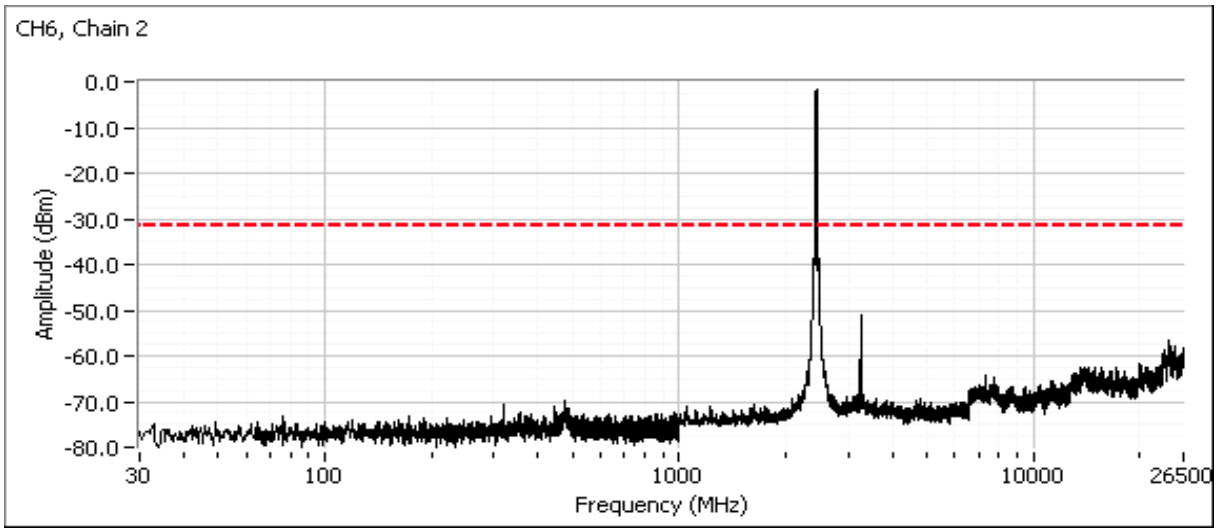
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Plots for center channel





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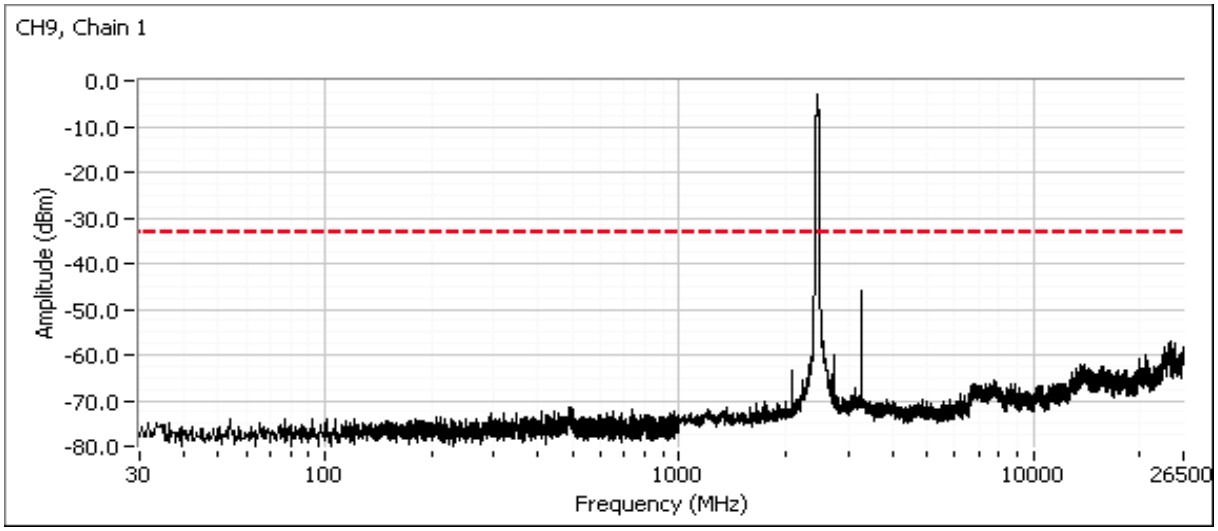
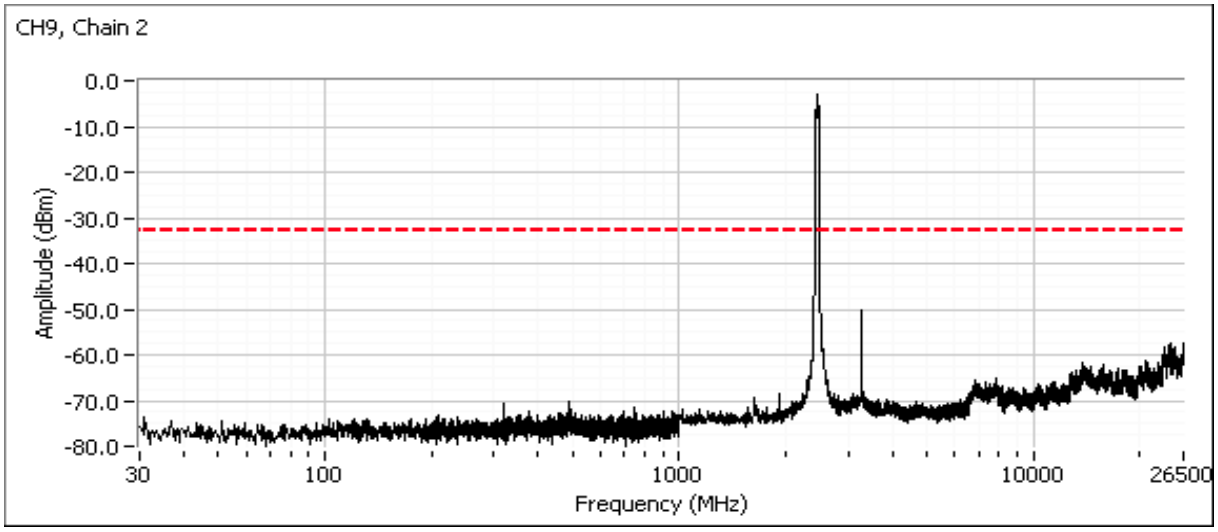
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Plots for high channel





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Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements
MIMO and Smart Antenna Systems
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: 7/24/2011 & 7/25/2011
Test Engineer: Rafael Varelas & John Caizzi
Test Location: Fremont Chamber #4

Config. Used: 1
Config Change: None
Host Unit 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: 20.6 °C
Rel. Humidity: 35 %

Summary of Results

Run #	Pwr setting	Test Performed	Limit	Pass / Fail	Result / Margin
Chain A + B					
1	-	Output Power	15.247(b)	Pass	15.6 dBm
2	-	Power spectral Density (PSD)	15.247(d)	Pass	-4.3 dBm/3kHz
3	-	Minimum 6dB Bandwidth	15.247(a)	Pass	16.6 MHz
3	-	99% Bandwidth	RSS GEN	-	18.2 MHz
4	-	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:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #1: Output Power - Chain A + B

Operating Mode: n20

Transmitted signal on chain is coherent ? yes

2412 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	-	-						
Output Power (dBm) Note 1	11.9	11.7			14.8 dBm	0.030 W	29.1 dBm	0.811 W
Antenna Gain (dBi) Note 2	3.9	3.9			6.9 dBi		Pass	
eirp (dBm) Note 2	15.8	15.6			21.7 dBm	0.149 W		

2437 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	-	-						
Output Power (dBm) Note 1	12.7	12.4			15.6 dBm	0.036 W	29.1 dBm	0.811 W
Antenna Gain (dBi) Note 2	3.9	3.9			6.9 dBi		Pass	
eirp (dBm) Note 2	16.6	16.3			22.5 dBm	0.177 W		

2462 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	-	-						
Output Power (dBm) Note 1	11.5	11.6			14.6 dBm	0.029 W	29.1 dBm	0.811 W
Antenna Gain (dBi) Note 2	3.9	3.9			6.9 dBi		Pass	
eirp (dBm) Note 2	15.4	15.5			21.5 dBm	0.140 W		

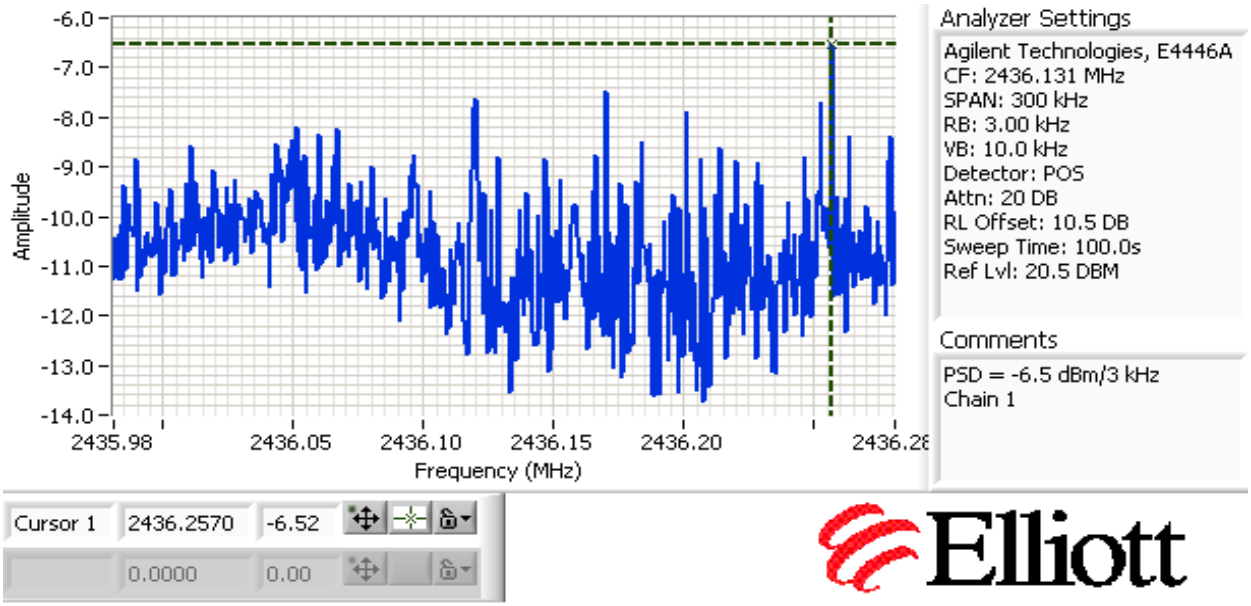
Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was not continuous but the ESI analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting) 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:	As there is coherency between chains the effective antenna gain is the sum of the individual antenna gains and the eirp is the product of the total power and the effective antenna gain
Note 3:	Power setting - if a single number the same power setting was used for each chain. If multiple numbers the power setting for each chain is separated by a comma (e.g. x,y would indicate power setting x for chain 1, power setting y for chain 2.

Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1 Chain 1	Chain 2	Chain 3	Chain 4	Total	Limit dBm/3kHz	Result
-	2412	-6.7	-9.1			-4.7	8.0	Pass
-	2437	-6.5	-8.2			-4.3	8.0	Pass
-	2462	-9.2	-8.6			-5.8	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.



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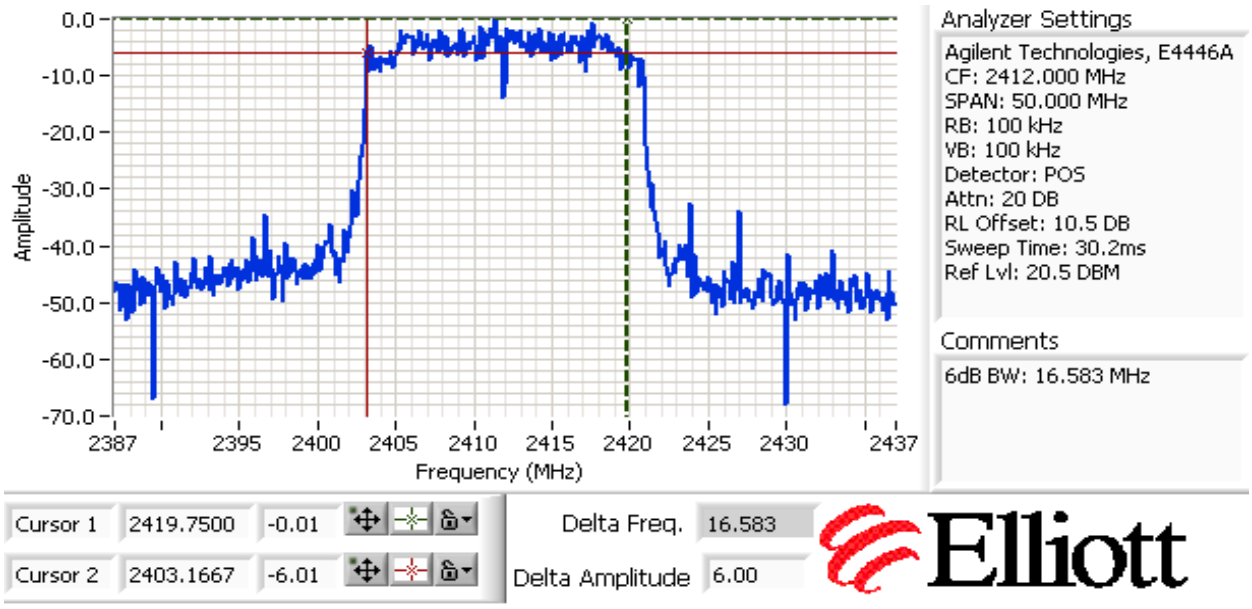
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
-	2412	100kHz	16.6	18.2
-	2437	100kHz	17.3	18.1
-	2462	100kHz	16.9	18.1

Note 1:	Measured on a single chain
Note 2:	99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB



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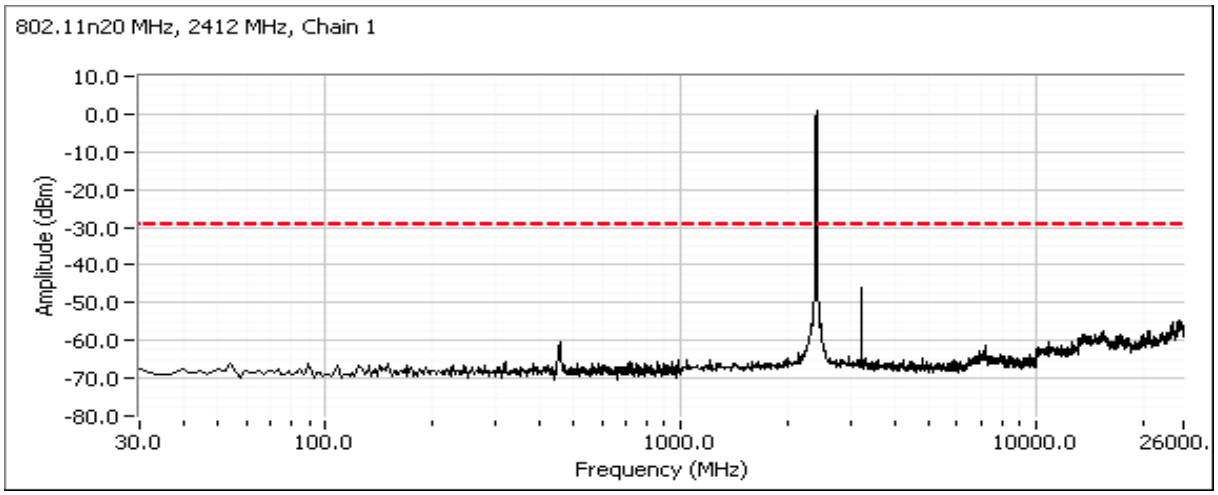
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

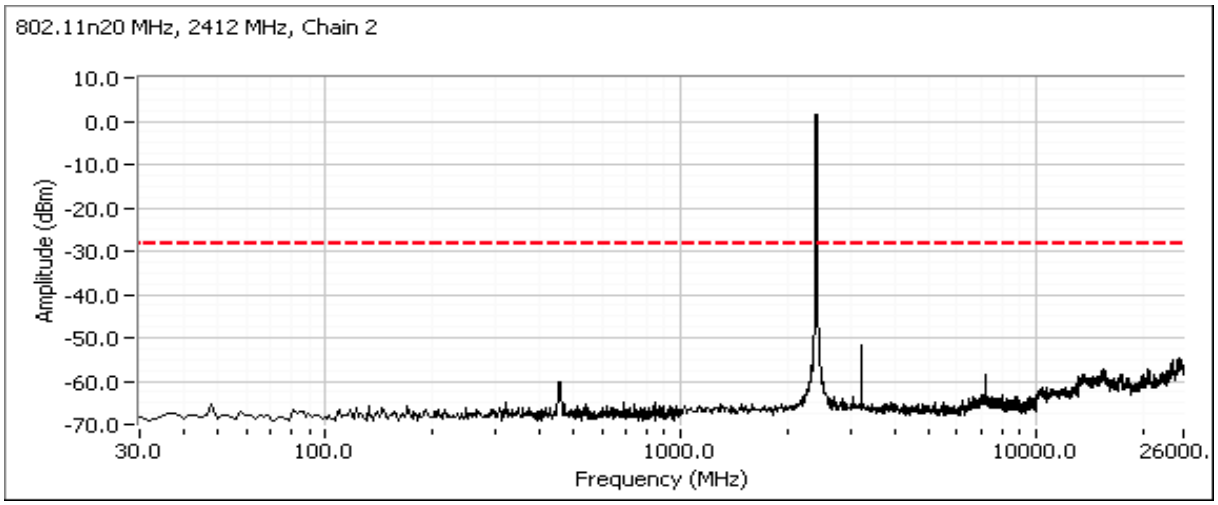
Run #4: Out of Band Spurious Emissions

Power Setting Per Chain				Frequency (MHz)	Limit	Result
#1	#2	#3	#4			
-	-			2412	-30dBc	Pass
-	-			2437	-30dBc	Pass
-	-			2462	-30dBc	Pass

Note 1:	Measured on each chain individually

Plots for low channel





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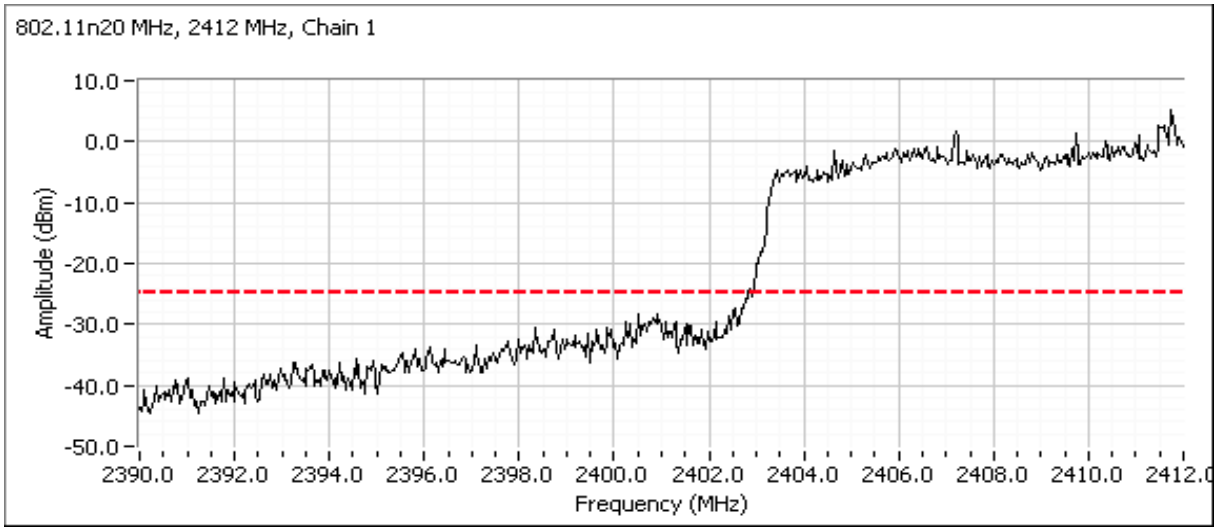
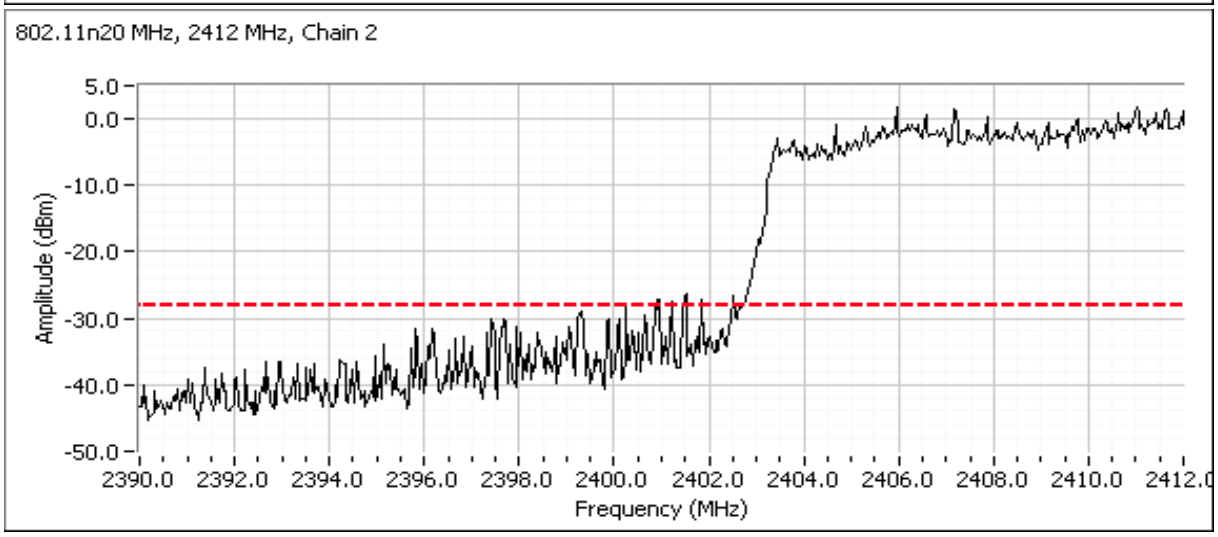
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

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.





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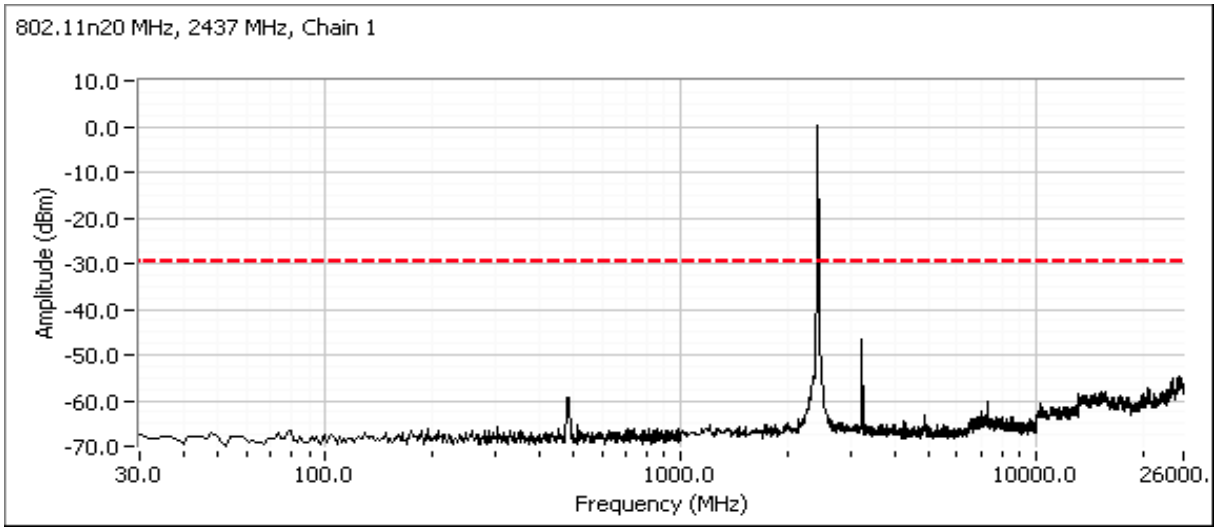
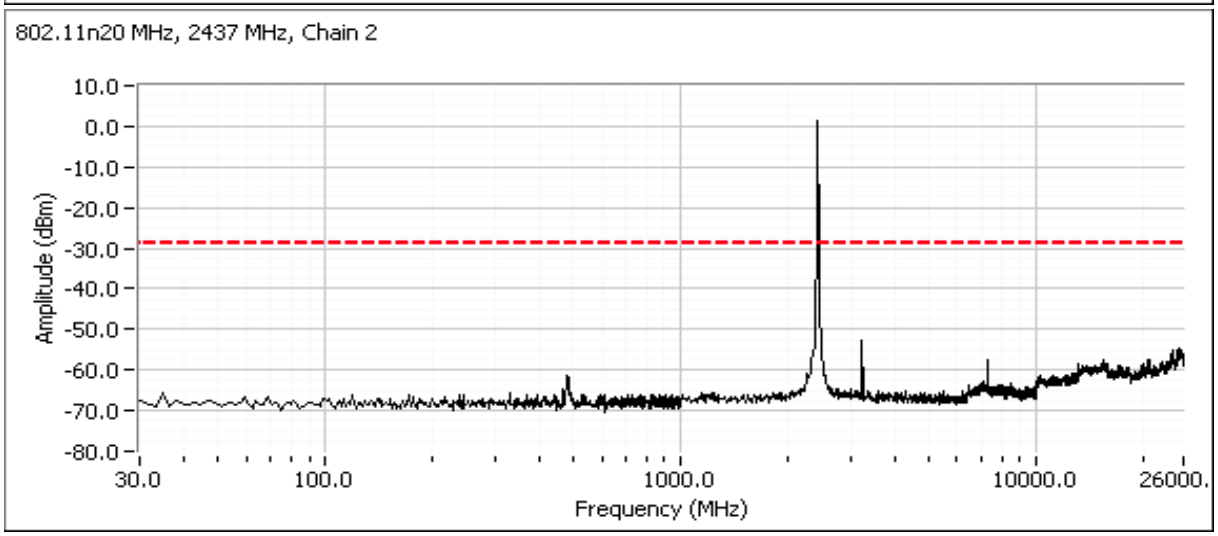
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Plots for center channel





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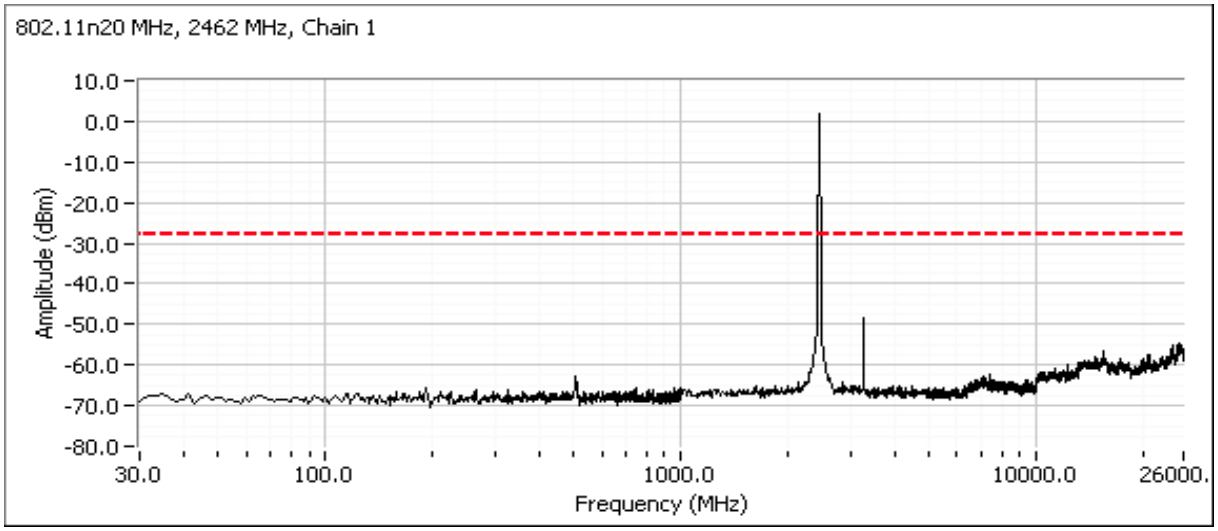
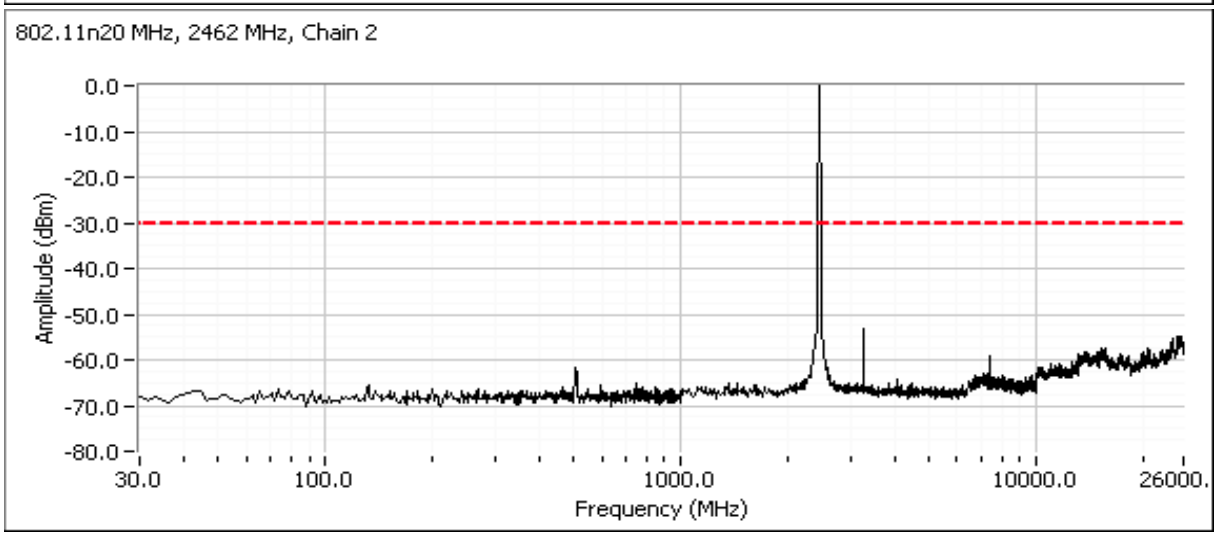
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Plots for high channel





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Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	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. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane or routed in overhead in the GR-1089 test configuration.

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

Ambient Conditions:

Temperature: 18-23 °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
1a	802.11b	1	-	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	51.4dBµV/m @ 2390.0MHz (-2.6dB)
1b	802.11b	10	-	-	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	46.9dBµV/m @ 2483.7MHz (-7.1dB)
1c	802.11b	11	-	-	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	52.8dBµV/m @ 2483.8MHz (-1.2dB)
2a	802.11g	1	-	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.2dBµV/m @ 2390MHz (-0.8dB)
2b	802.11g	2	-	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.7dBµV/m @ 2389.9MHz (-0.3dB)
2c	802.11g	3	-	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.9dBµV/m @ 2389.9MHz (-0.1dB)
2d	802.11g	9	-	-	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	53.4dBµV/m @ 2483.8MHz (-0.6dB)
2e	802.11g	10	-	-	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	53.8dBµV/m @ 2483.6MHz (-0.2dB)
2f	802.11g	11	-	-	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	53.3dBµV/m @ 2483.6MHz (-0.7dB)

Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

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

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
3a	802.11n20	1	-	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.3dBµV/m @ 2390.0MHz (-0.7dB)
3b	802.11n20	2	-	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.9dBµV/m @ 2390.1MHz (-0.1dB)
3c	802.11n20	3	-	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.4dBµV/m @ 2390.1MHz (-0.6dB)
3d	802.11n20	10	-	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.9dBµV/m @ 2485.0MHz (-0.1dB)
3i	802.11n20	11	-	-	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	53.9dBµV/m @ 2485.0MHz (-0.1dB)
4a	802.11n40	3	-	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.2dBµV/m @ 2384.9MHz (-0.8dB)
4b	802.11n40	4	-	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.7dBµV/m @ 2388.7MHz (-0.3dB)
4c	802.11n40	5	-	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.8dBµV/m @ 2389.3MHz (-0.2dB)
4d	802.11n40	6	-	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.9dBµV/m @ 2389.3MHz (-0.1dB)
4e	802.11n40	6	-	-	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	53.9dBµV/m @ 2484.0MHz (-0.1dB)
4f	802.11n40	7	-	-	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	53.8dBµV/m @ 2485.2MHz (-0.2dB)
4g	802.11n40	8	-	-	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	53.8dBµV/m @ 2485.4MHz (-0.2dB)
4h	802.11n40	9	-	-	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	53.3dBµV/m @ 2483.5MHz (-0.7dB)

Note: Additional bandedge measurements performed on channels with higher output power than the channels immediately adjacent to the bandedge.

Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

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:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #1: Radiated Bandedge Measurements, 802.11b

Date of Test: 7/6/2011

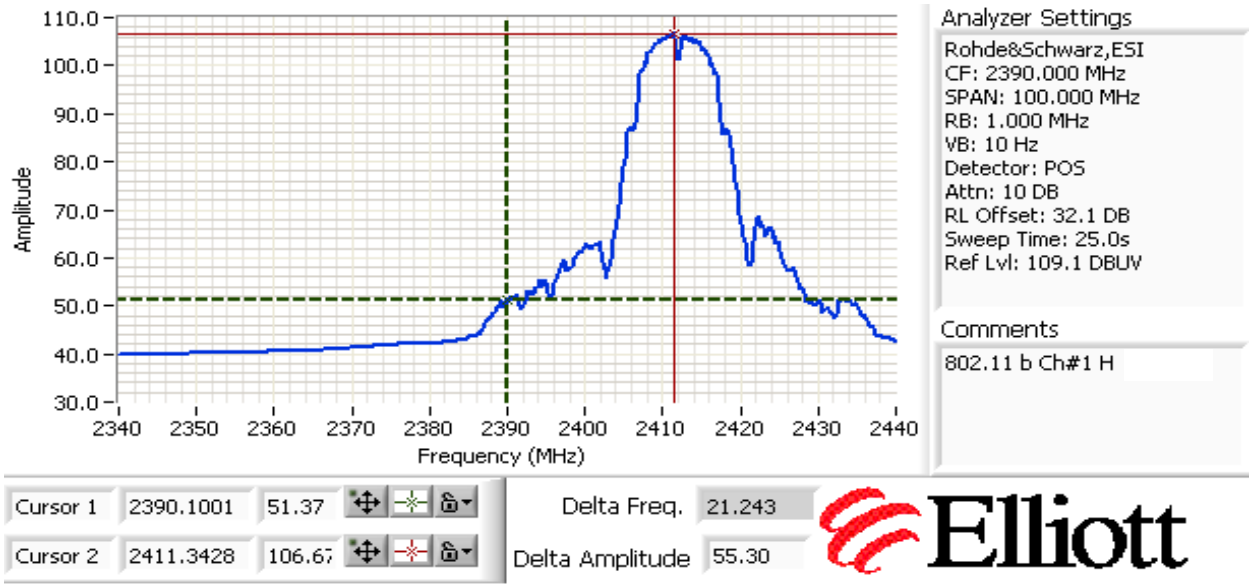
Test Engineer: Suresh Kondapalli

Test Location: FT CH#4

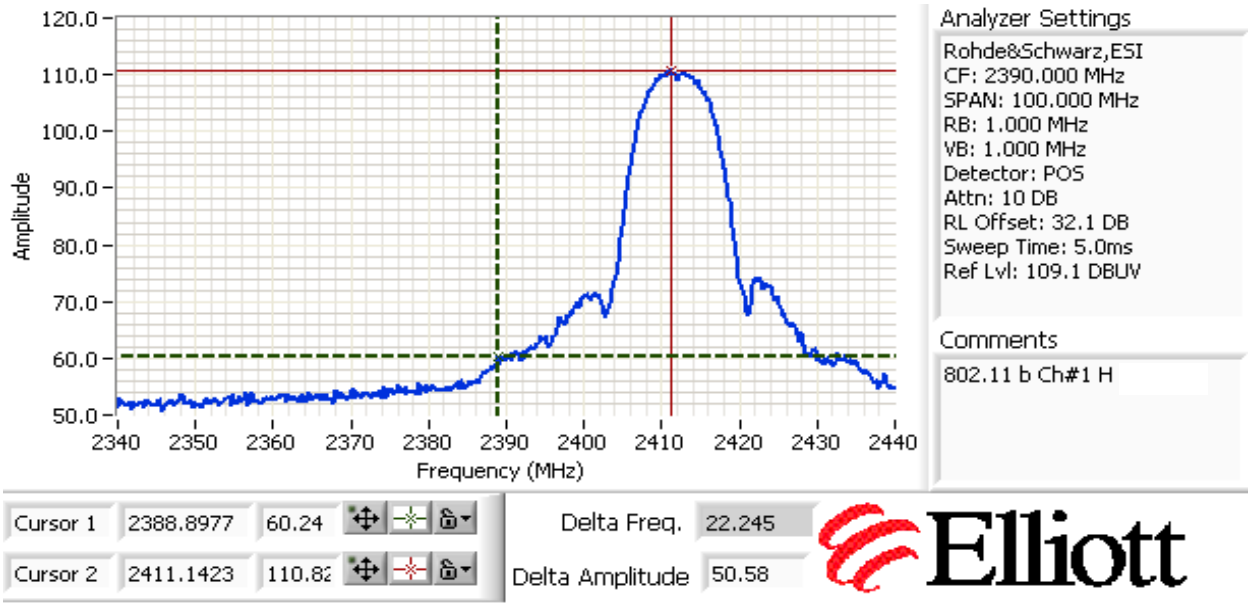
Run #1a: Low Channel @ 2412 MHz

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	51.4	H	54.0	-2.6	Avg	291	1.0	
2388.900	60.2	H	74.0	-13.8	Pk	291	1.0	



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A



EMC Test Data

Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #1b: Channel @ 2457 MHz

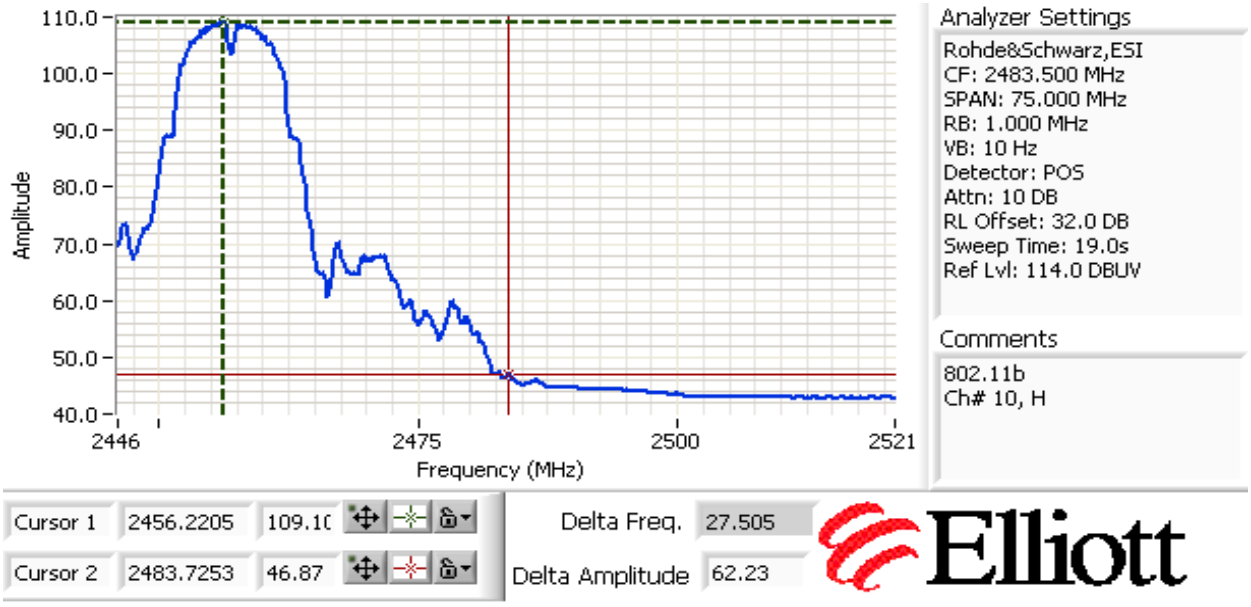
Date of Test: 7/21/2011

Test Engineer: Rafael Varelas

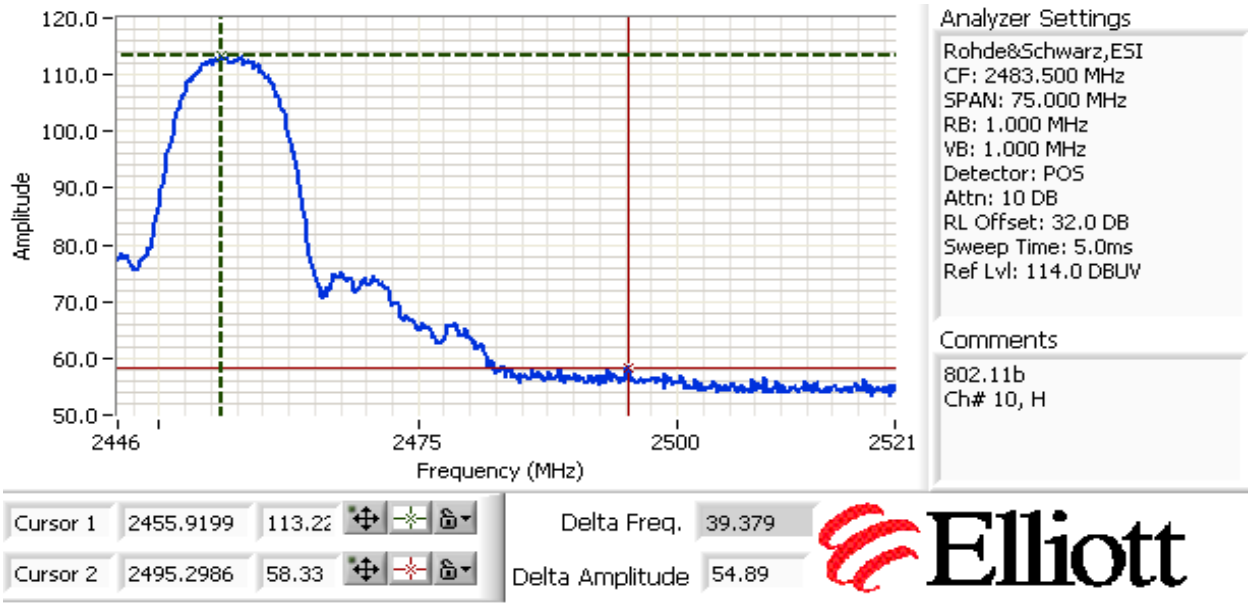
Test Location: FT CH#4

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.725	46.9	H	54.0	-7.1	Avg	158	1.0	
2495.299	58.3	H	74.0	-15.7	Pk	158	1.0	
2483.725	42.6	V	54.0	-11.4	Avg	104	1.0	
2499.808	56.1	V	74.0	-17.9	Pk	104	1.0	



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

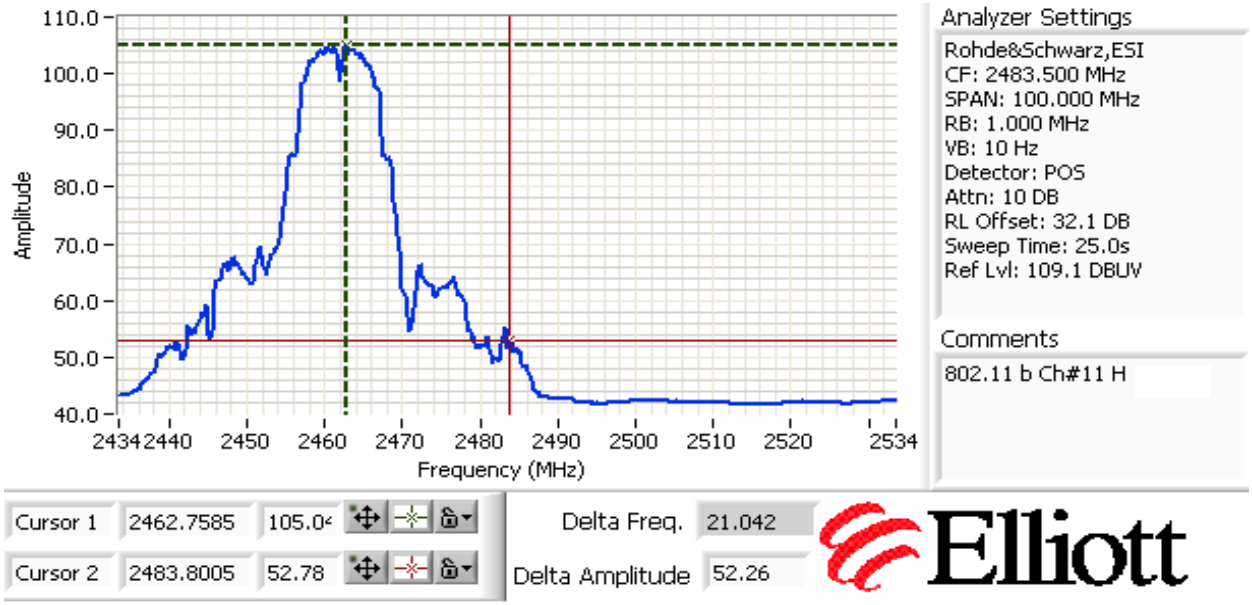


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

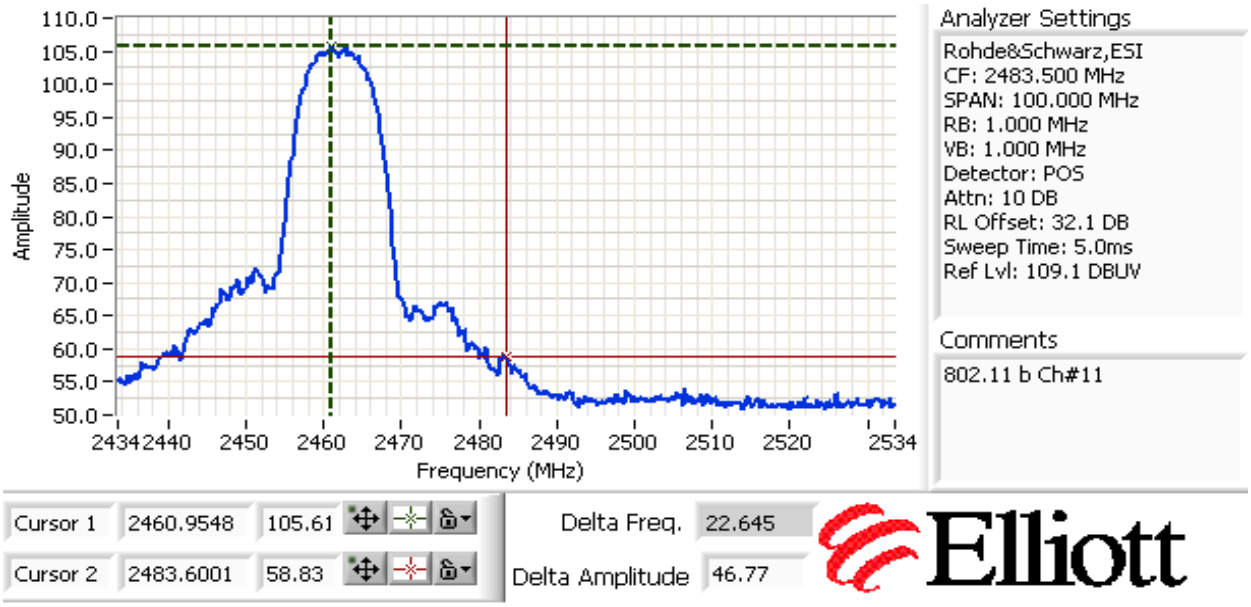
Run #1c: High Channel @ 2462 MHz

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.800	52.8	H	54.0	-1.2	Avg	291	1.0	
2483.600	61.8	H	74.0	-12.2	Pk	291	1.0	



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

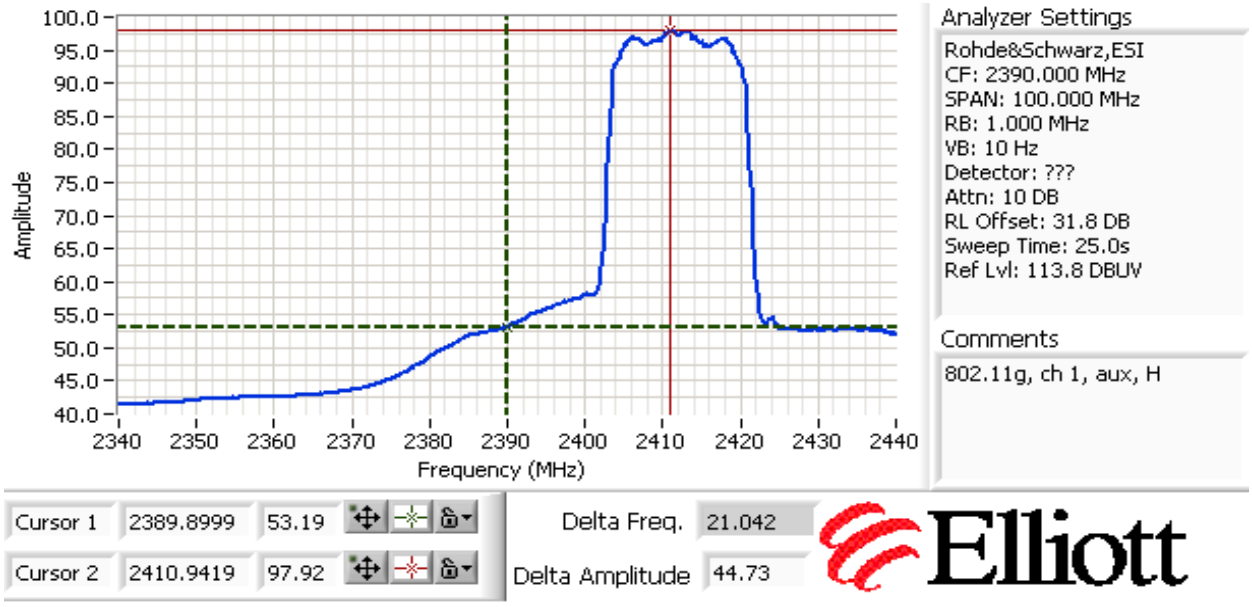
Run #2: Radiated Bandedge Measurements, 802.11g

Date of Test:	7/21/2011	7/22/2011
Test Engineer:	Rafael Varelas	William Kwong
Test Location:	FT Chamber #4	FT Chamber #3

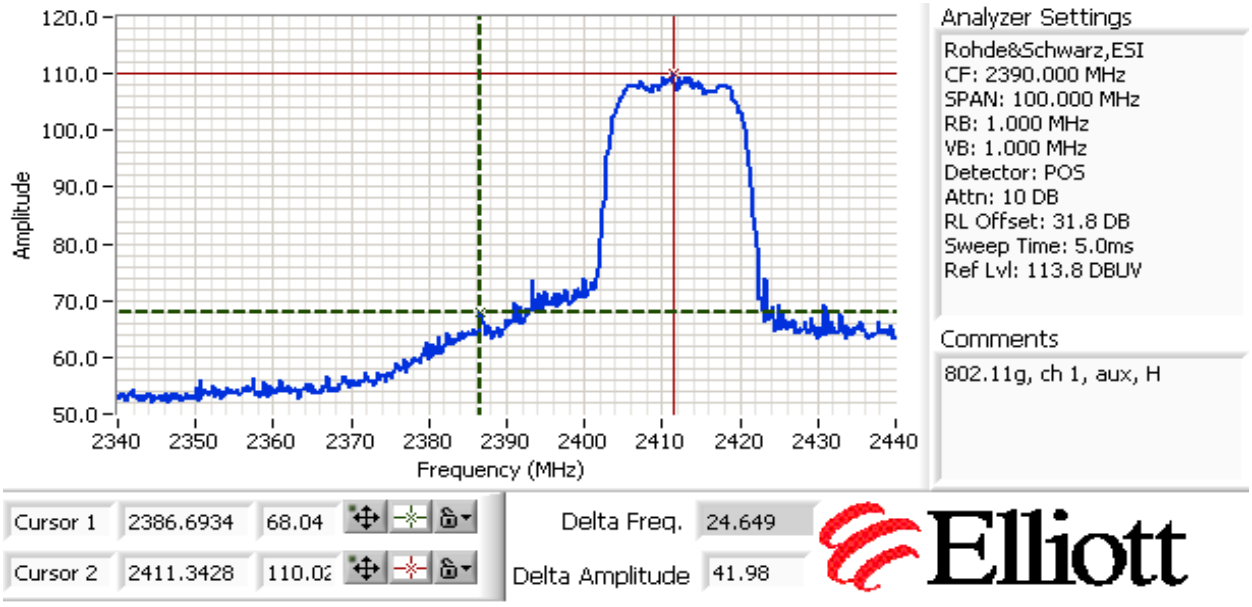
Run #2a: Low Channel @ 2412 MHz

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments	
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
2389.999	53.2	H	54.0	-0.8	Avg	121	1.0	-	aux
2386.690	68.0	H	74.0	-6.0	Pk	121	1.0	-	aux



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

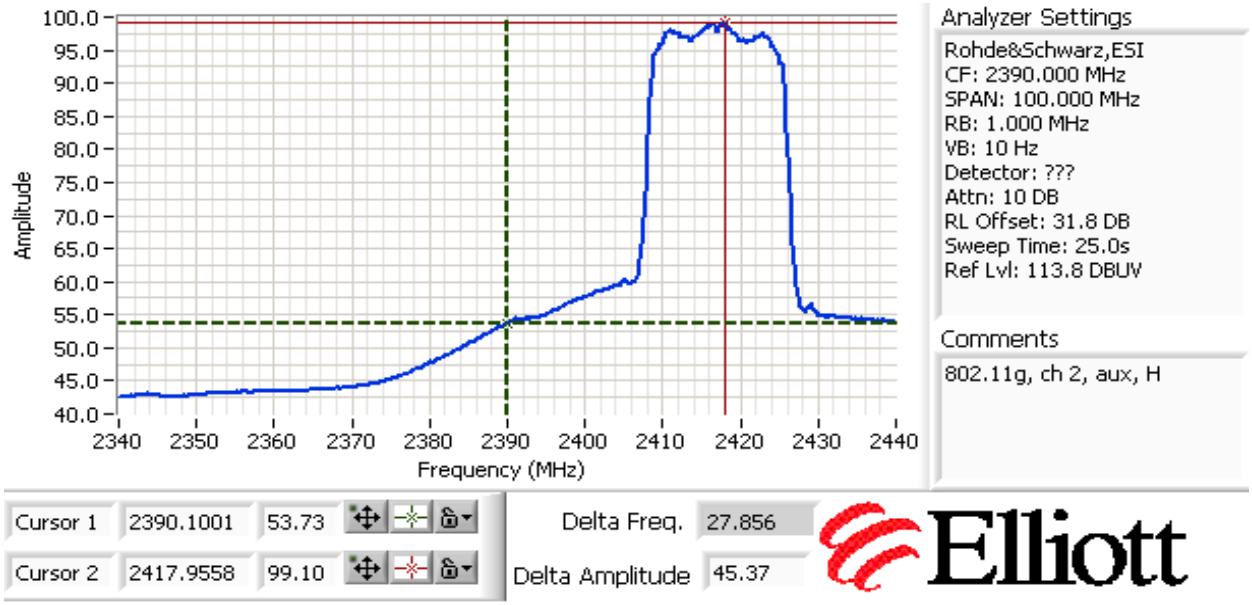


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

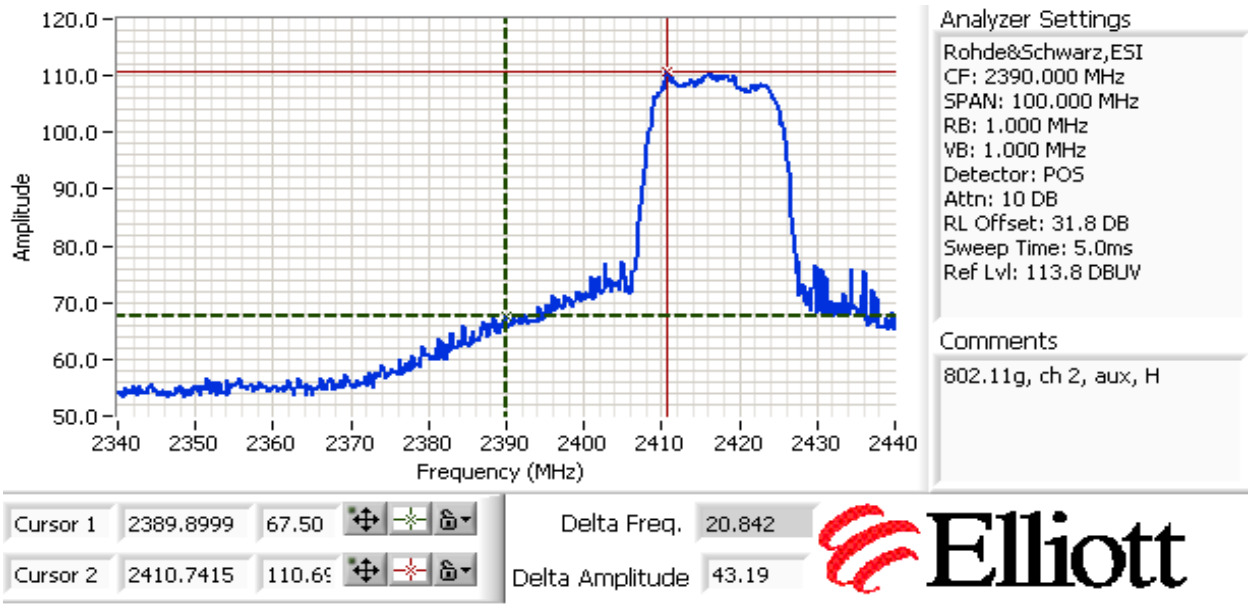
Run #2b: Channel 2 @ 2417 MHz

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.899	53.7	H	54.0	-0.3	Avg	121	1.0	aux
2389.900	67.5	H	74.0	-6.5	Pk	121	1.0	aux



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

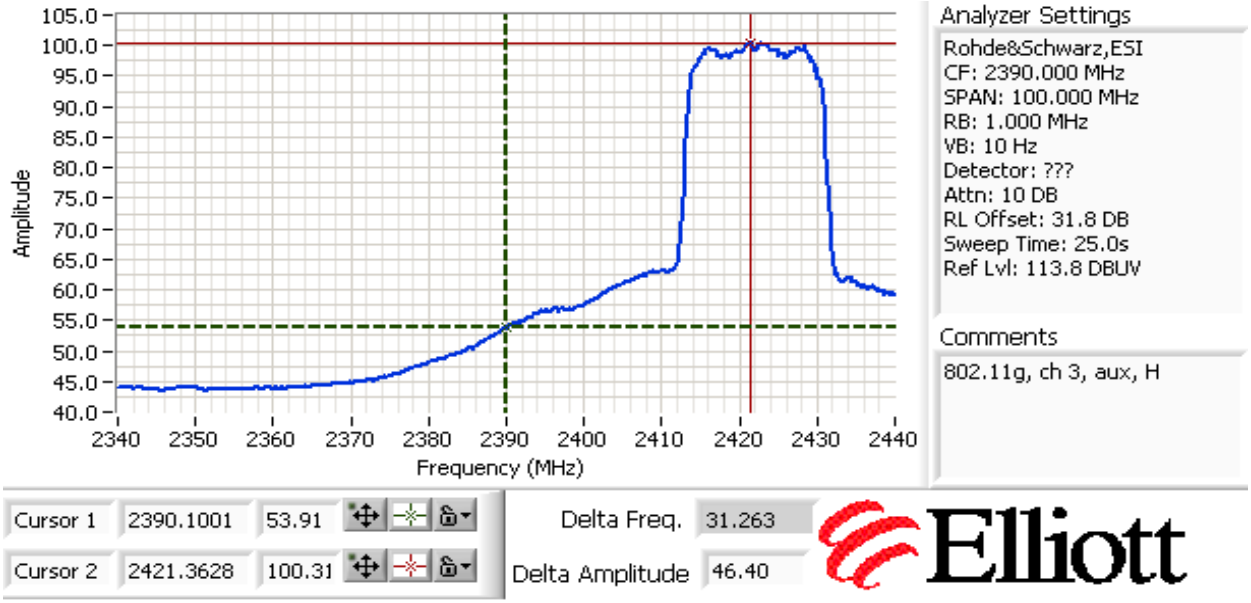


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

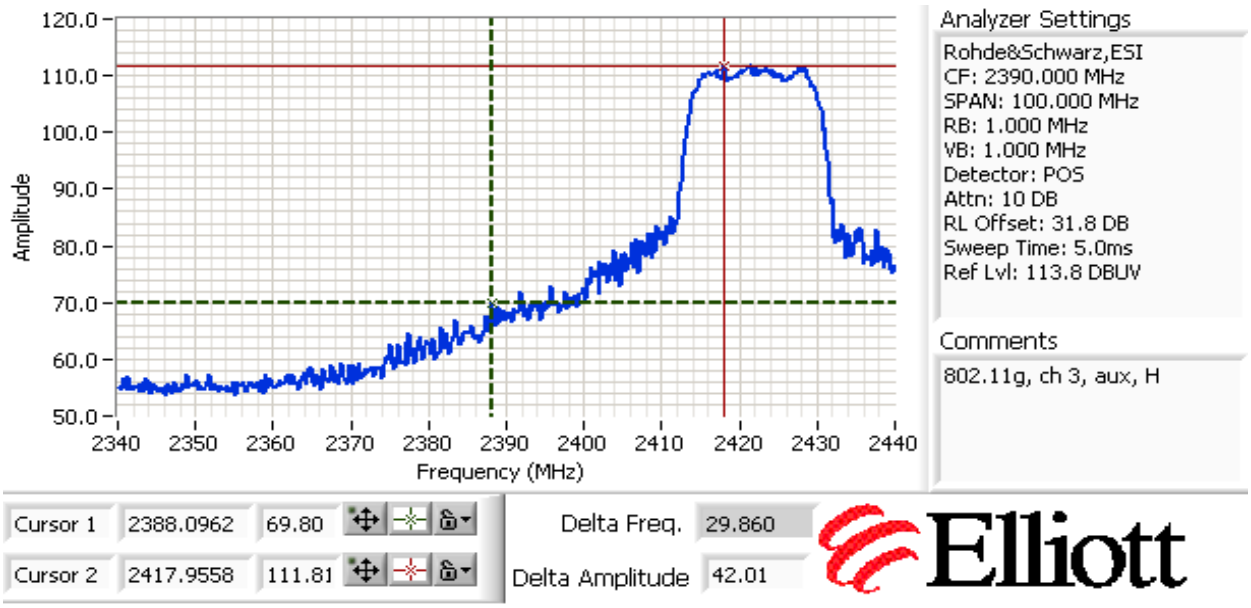
Run #2c: Channel 3 @ 2422 MHz

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.100	53.9	H	54.0	-0.1	Avg	114	1.0	aux
2388.090	69.8	H	74.0	-4.2	Pk	114	1.0	aux



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

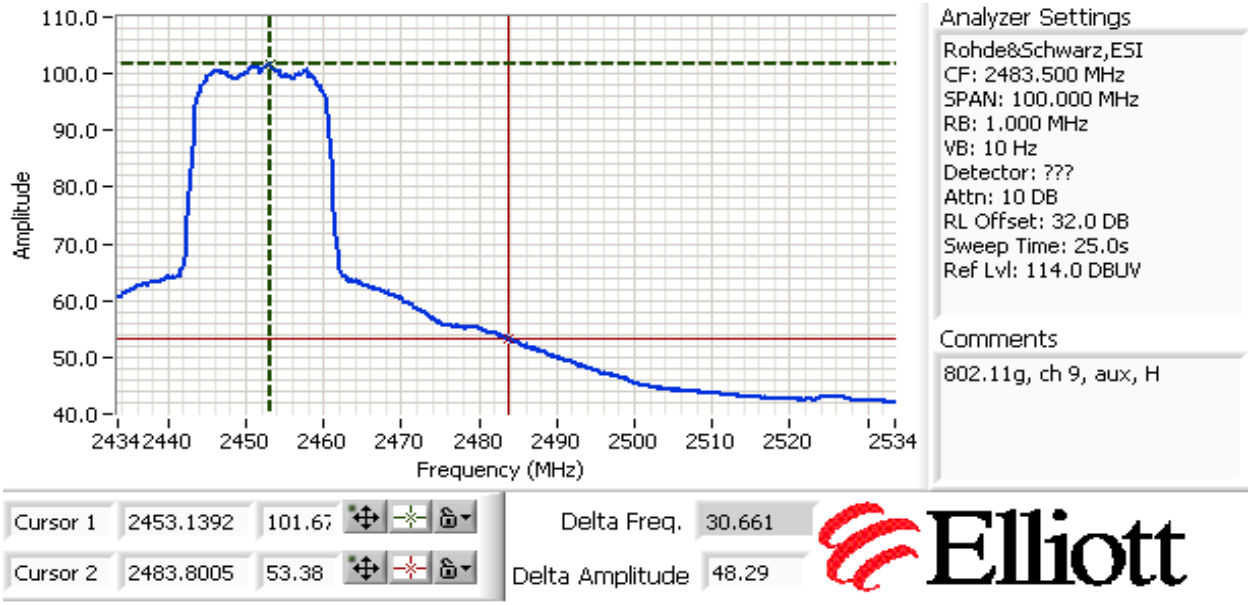


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

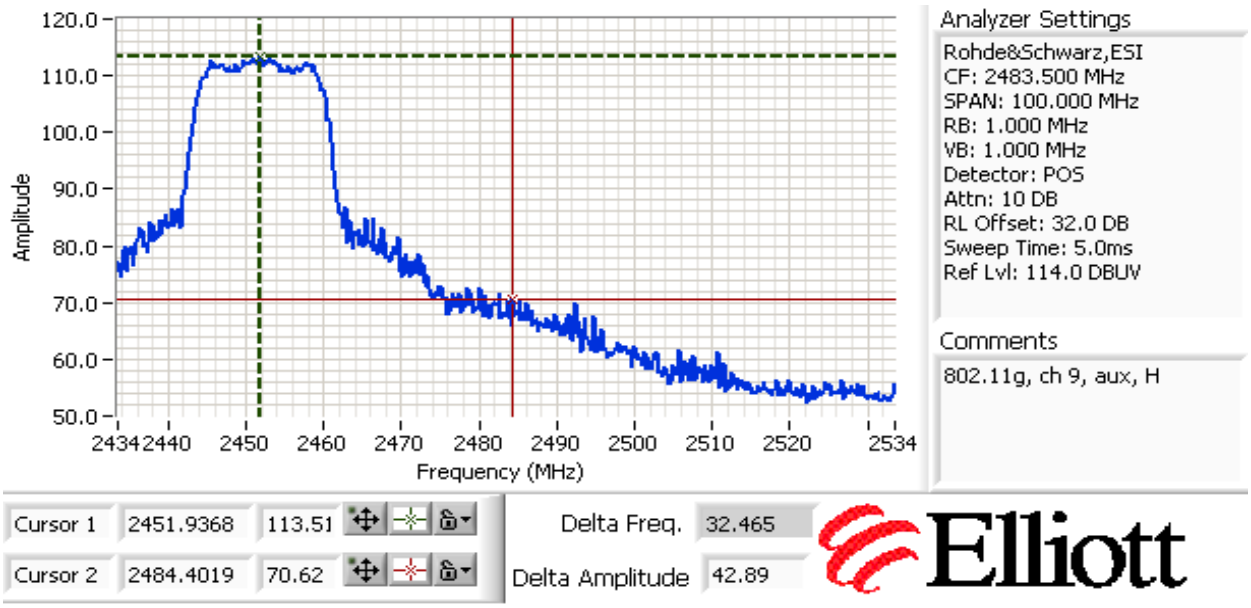
Run #2d: Channel 9 @ 2452 MHz

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.800	53.4	H	54.0	-0.6	Avg	118	1.0	aux
2483.400	70.6	H	74.0	-3.4	Pk	118	1.0	aux



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

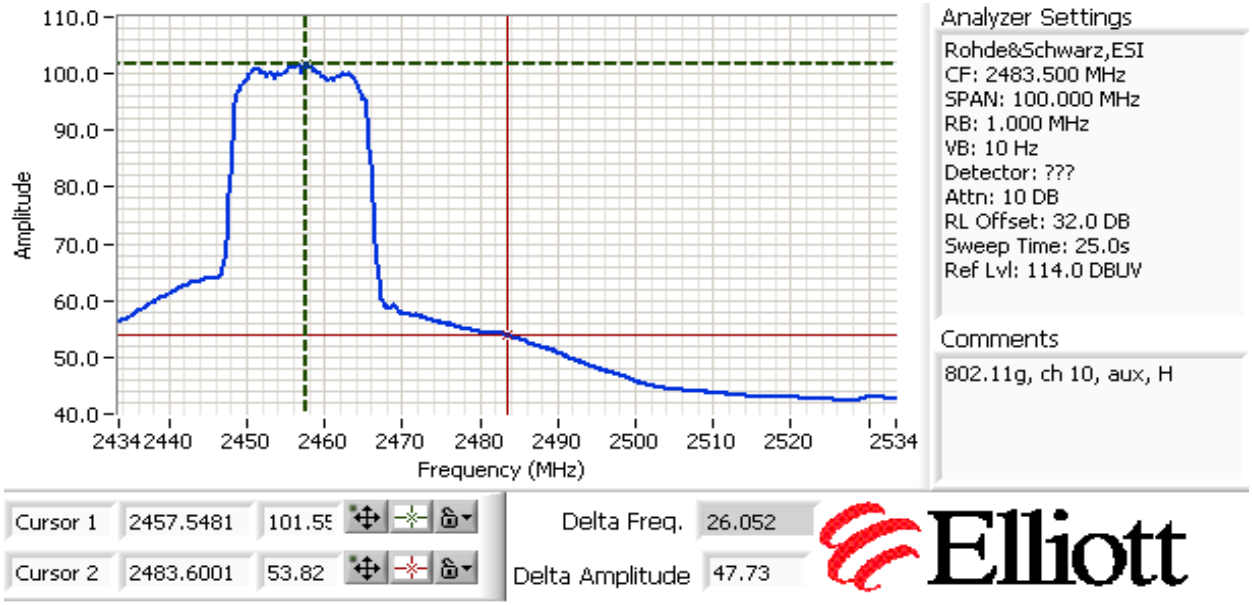


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

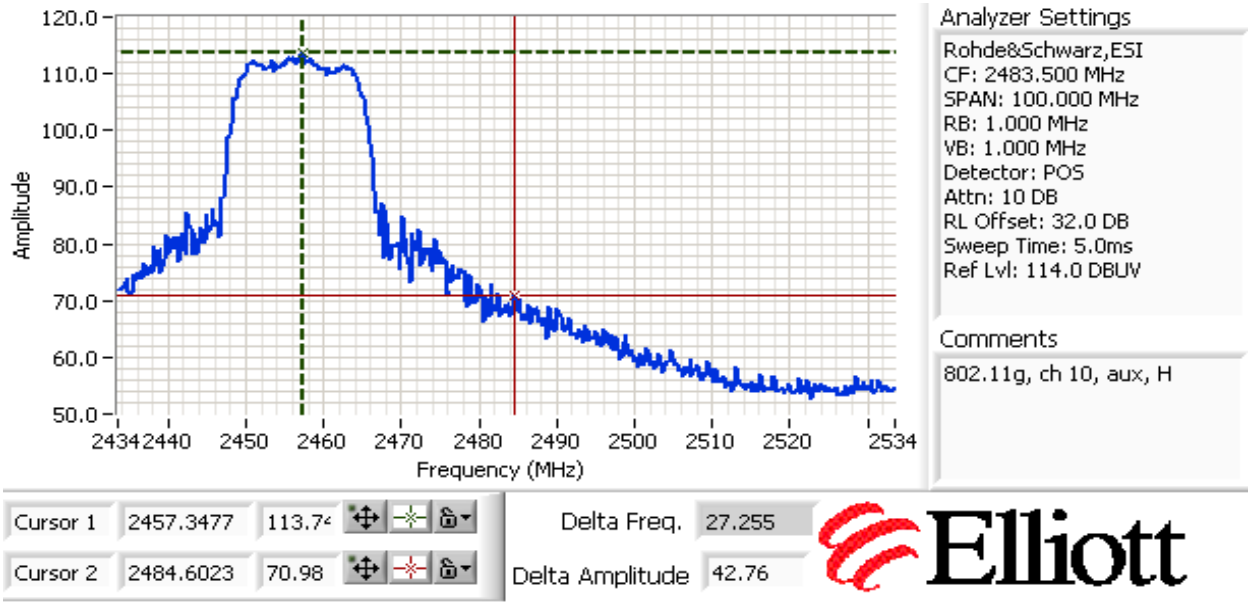
Run #2e: Channel 10 @ 2457 MHz

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.600	53.8	H	54.0	-0.2	Avg	115	1.0	aux
2484.600	71.0	H	74.0	-3.0	Pk	115	1.0	aux



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

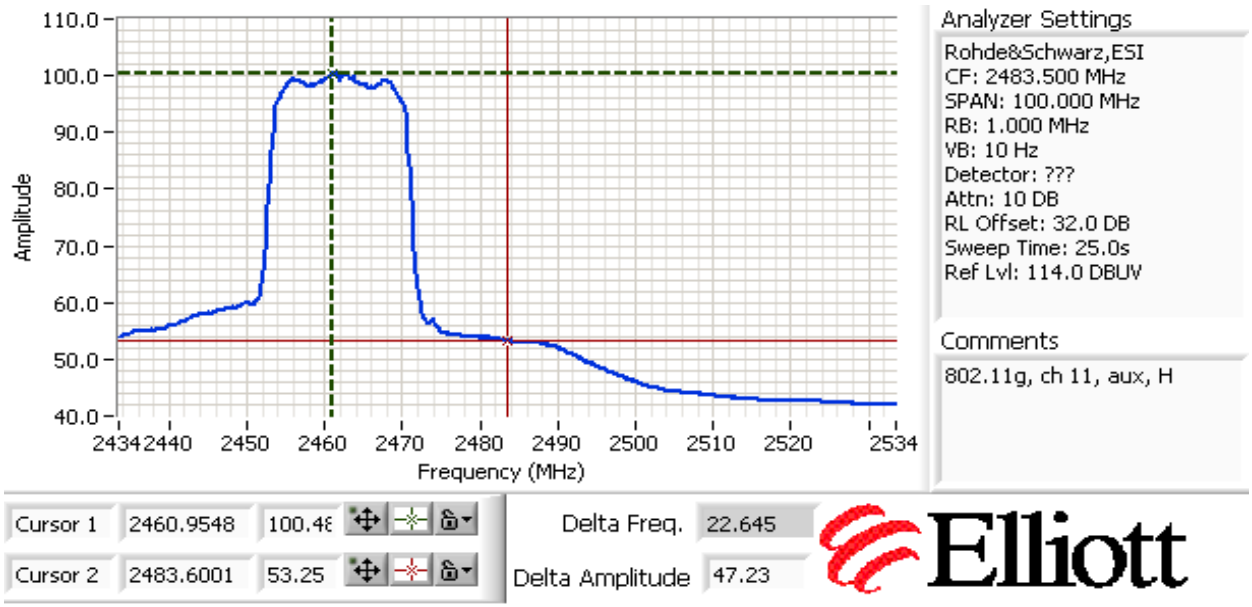


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

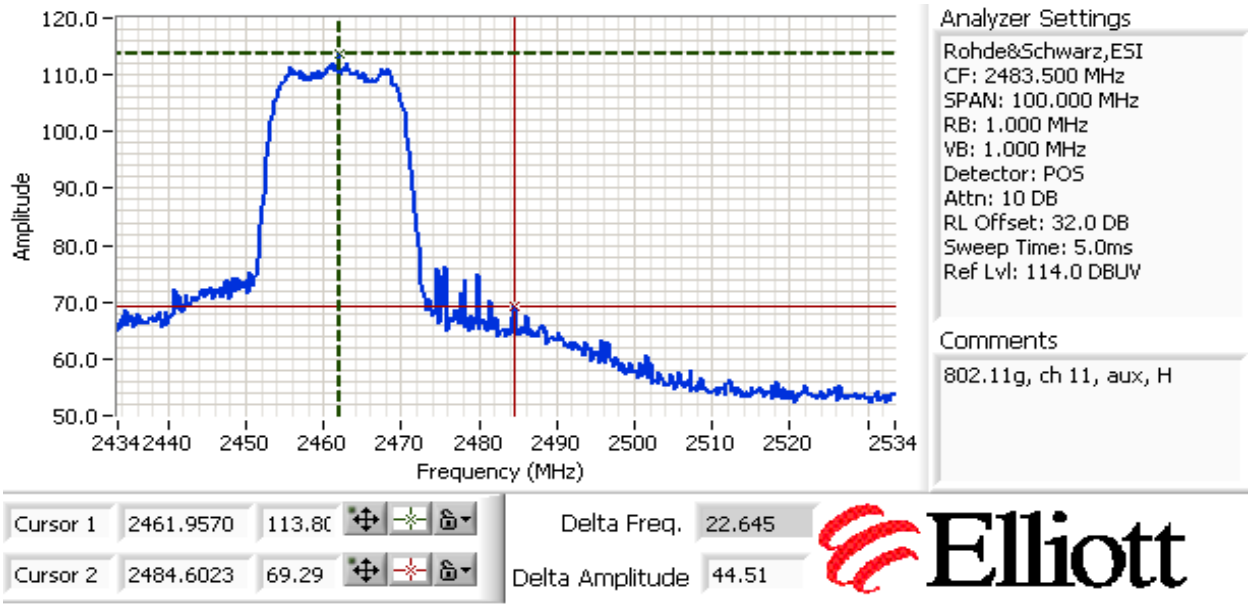
Run #2f: High Channel @ 2462 MHz

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.600	53.3	H	54.0	-0.7	Avg	112	1.0	aux
2484.600	69.3	H	74.0	-4.7	Pk	112	1.0	aux



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A



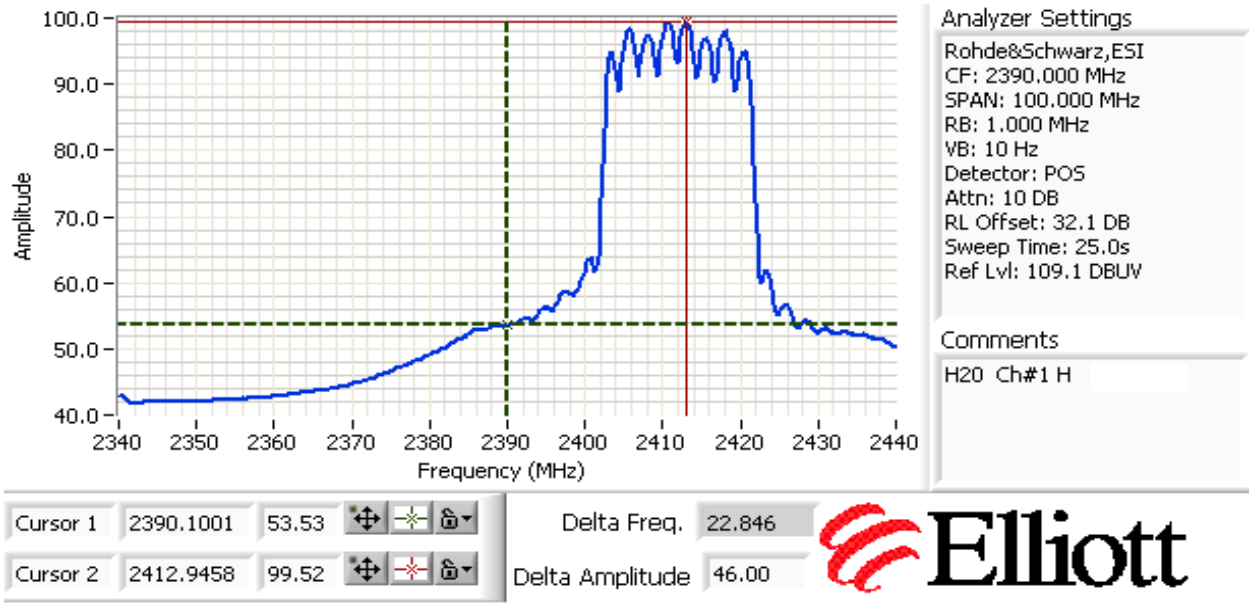
Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #3: Radiated Bandedge Measurements, 802.11n20
Date of Test: 7/6/2011
Test Engineer: Suresh Kondapalli
Test Location: FT CH#4

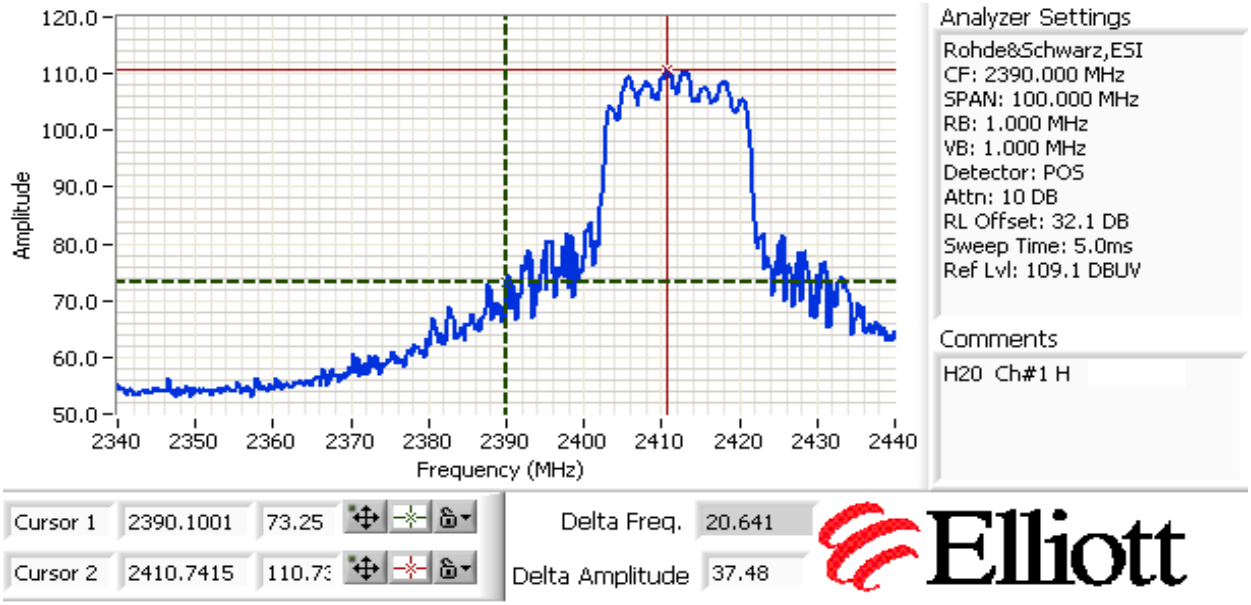
Run #3a: Low Channel @ 2412 MHz
Date of Test: 7/6/2011
Test Engineer: Suresh Kondapalli
Test Location: FT CH#4

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	53.3	H	54.0	-0.7	Avg	291	1.0	
2390.000	73.2	H	74.0	-0.8	Pk	291	1.0	



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

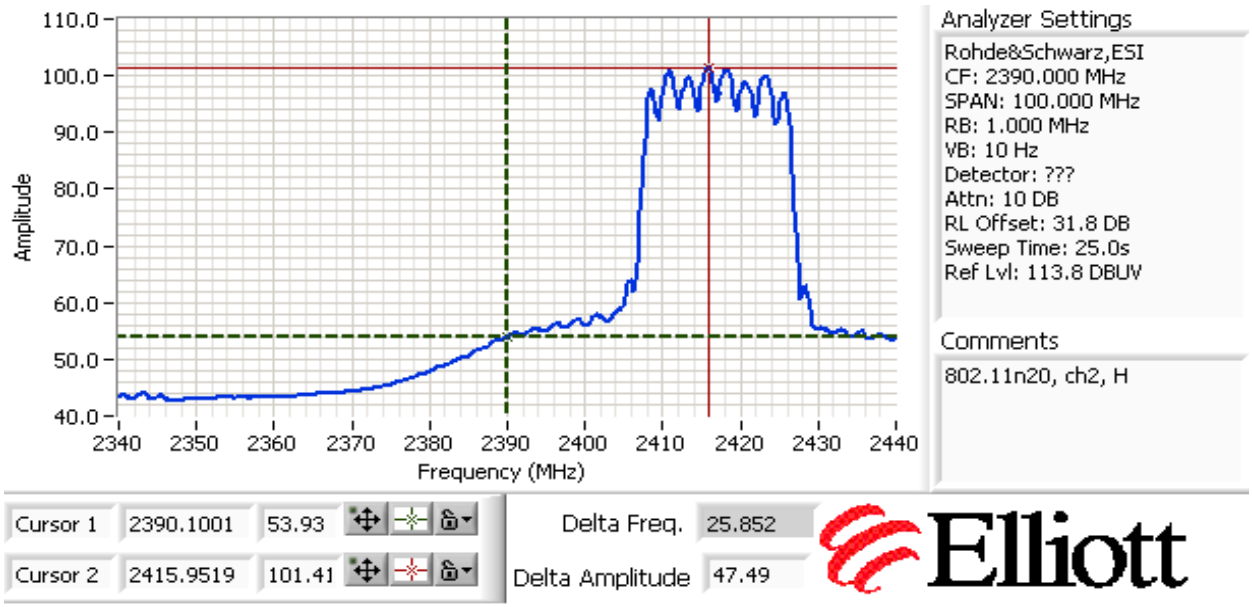


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #3b: Channel @ 2417 MHz

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.100	53.9	H	54.0	-0.1	avg	118	1.0	
2387.895	67.5	H	74.0	-6.5	pk	118	1.0	

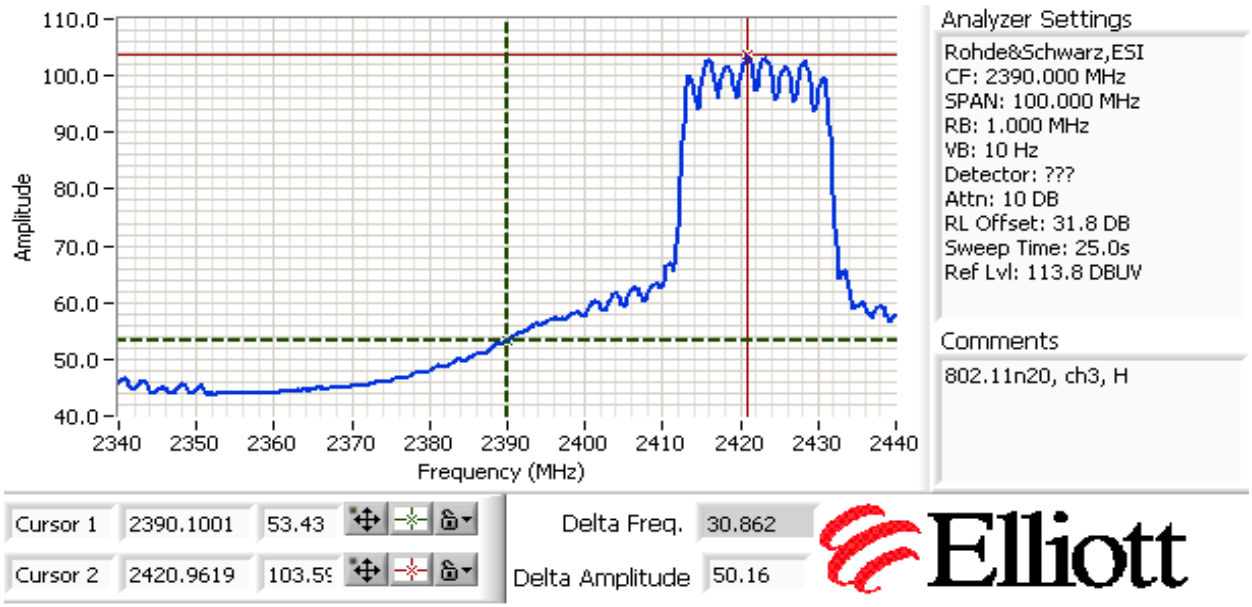


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #3c: Channel @ 2422 MHz

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.100	53.4	H	54.0	-0.6	avg	118	1.0	
2387.490	66.5	H	74.0	-7.6	pk	118	1.0	

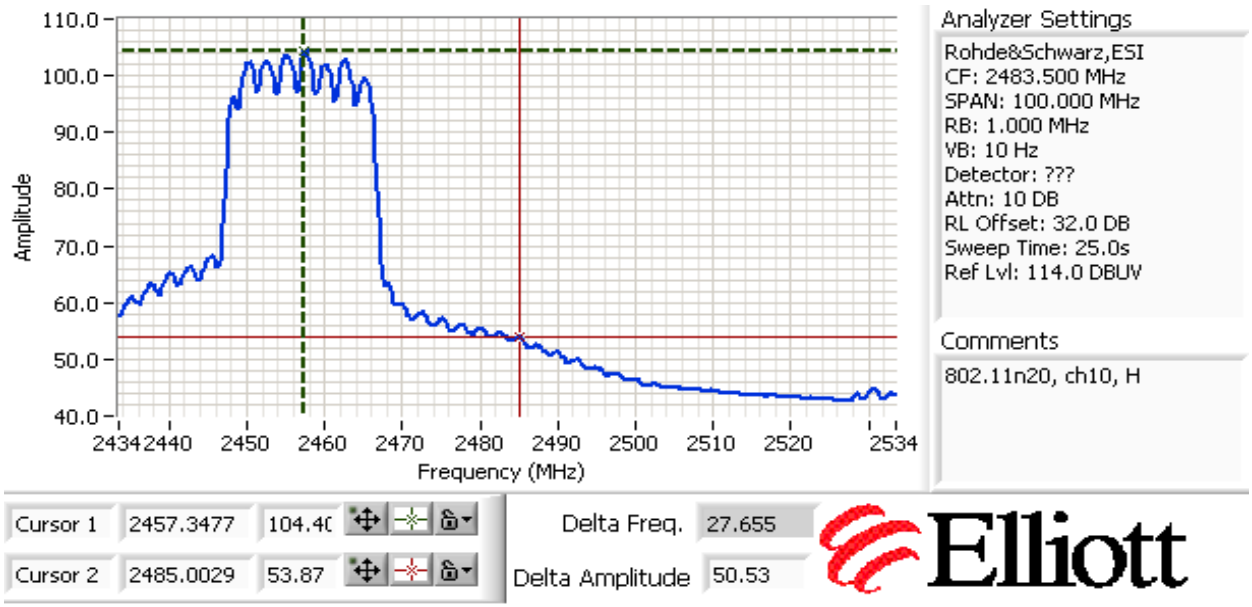


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #3d: Channel @ 2457 MHz

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2485.000	53.9	H	54.0	-0.1	avg	105	1.0	
2483.800	70.8	H	74.0	-3.2	pk	105	1.0	



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #3i: High Channel @ 2462 MHz

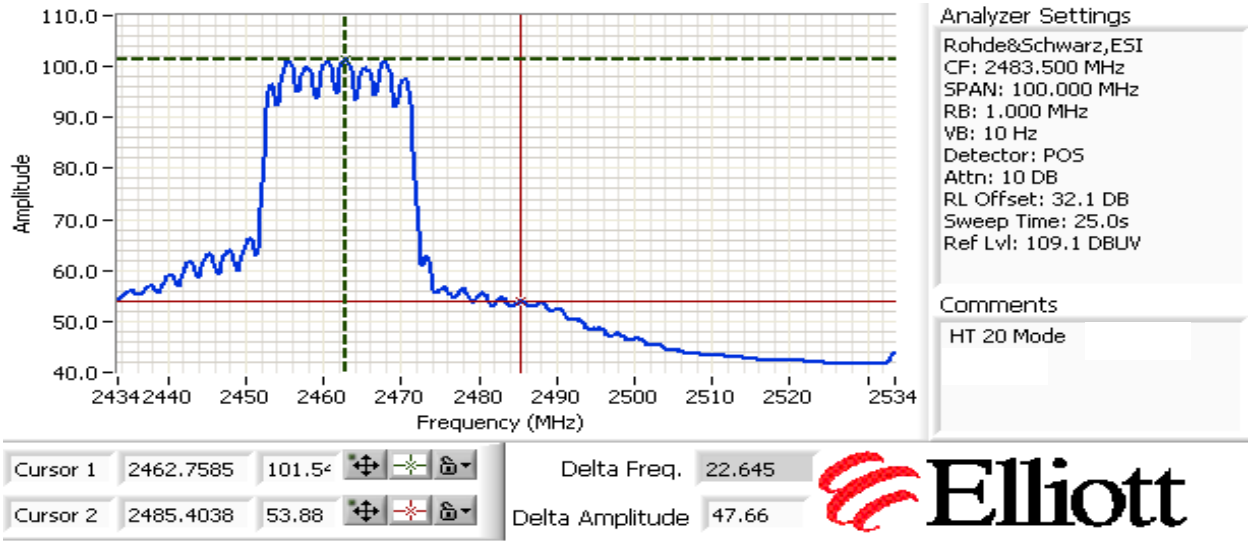
Date of Test: 7/6/2011

Test Engineer: Suresh Kondapalli

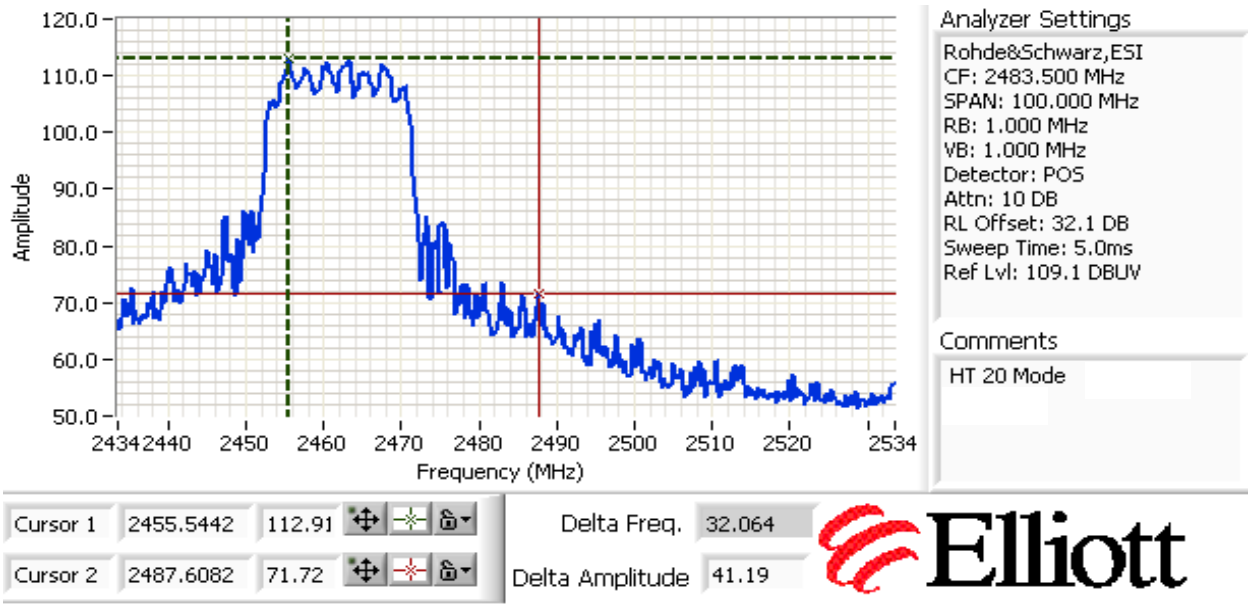
Test Location: FT CH#4

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

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	53.9	H	54.0	-0.1	Avg	291	1.0	
2487.600	71.7	H	74.0	-2.3	Pk	291	1.0	



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #4: Radiated Bandedge Measurements, 802.11n40

Run #4a: Low Channel @ 2422 MHz

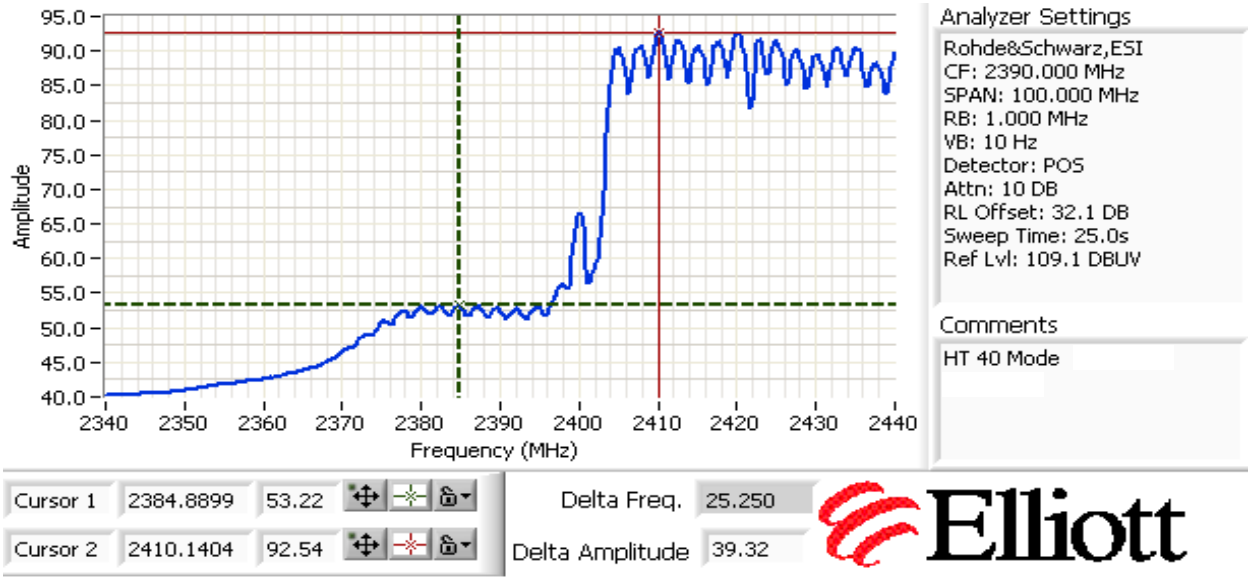
Date of Test: 7/6/2011

Test Engineer: Suresh Kondapalli

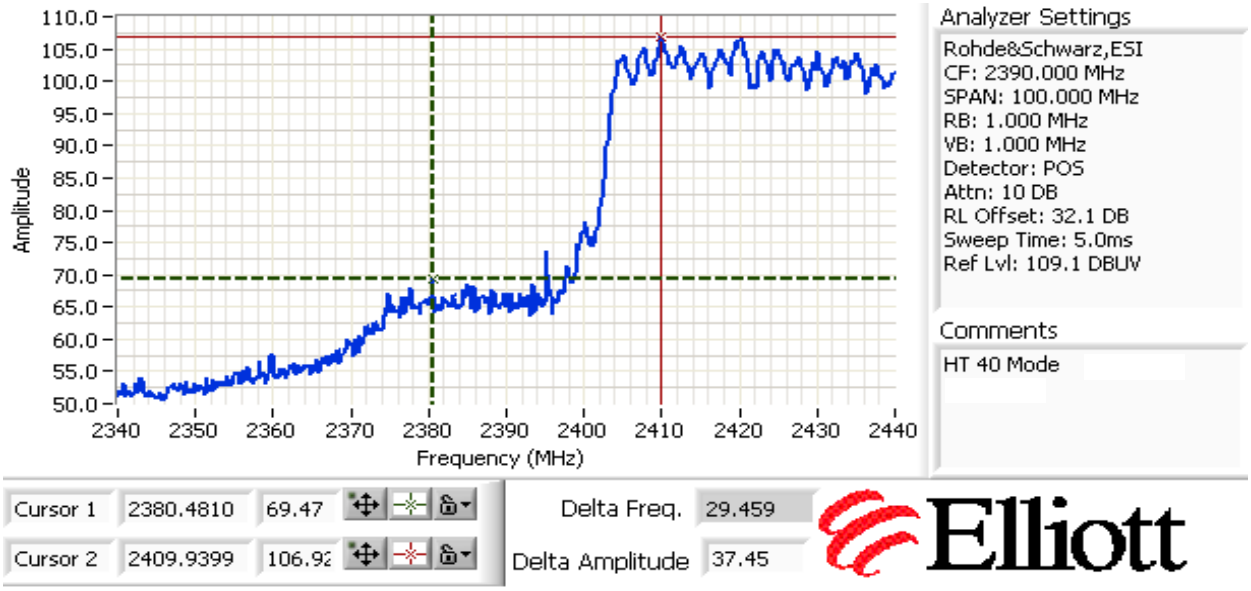
Test Location: FT CH#4

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2384.900	53.2	H	54.0	-0.8	Avg	53	1.7	
2380.481	69.5	H	74.0	-4.5	Pk	53	1.7	



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

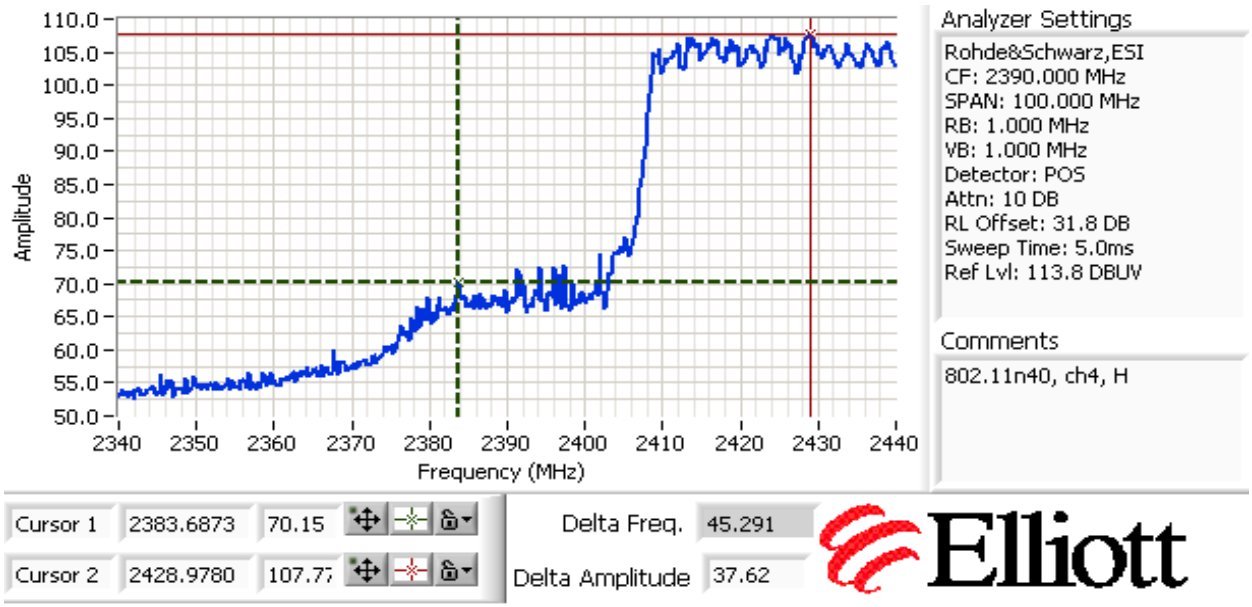


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

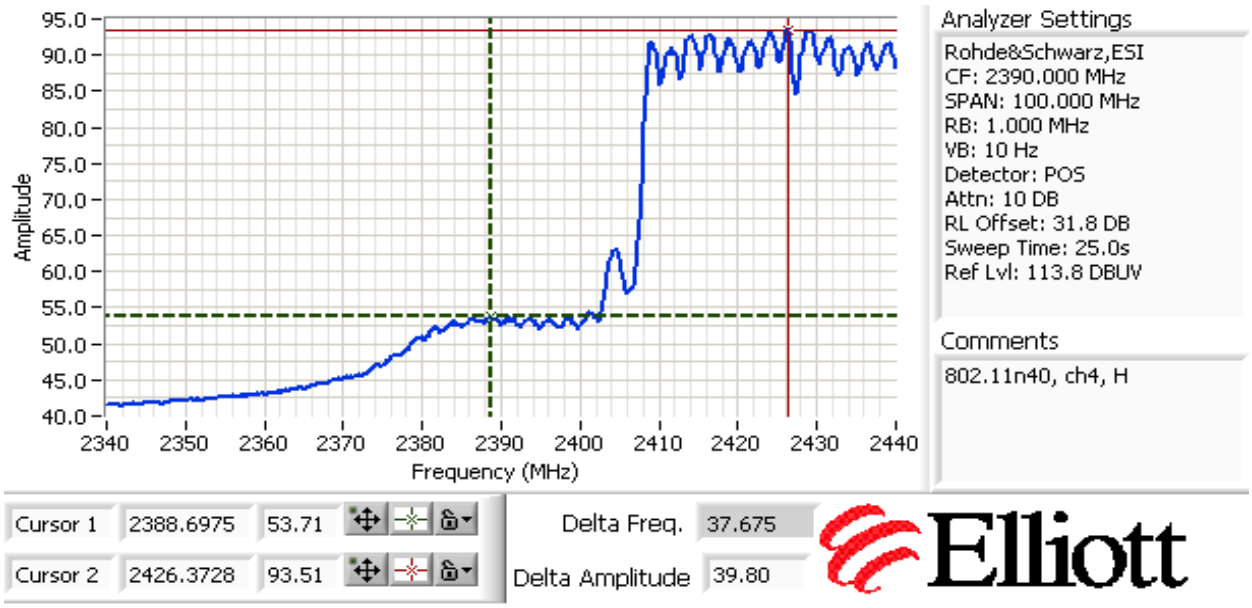
Run #4b: Channel @ 2427 MHz

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2388.698	53.7	H	54.0	-0.3	Avg	130	1.0	
2383.687	70.2	H	74.0	-3.8	Pk	130	1.0	



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

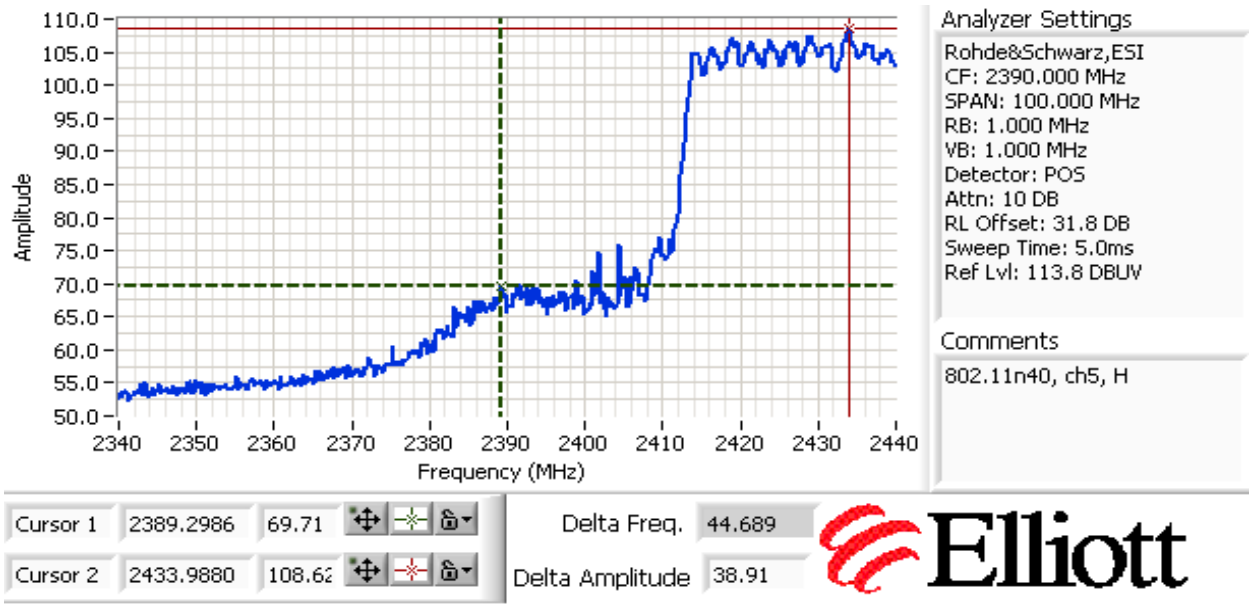


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

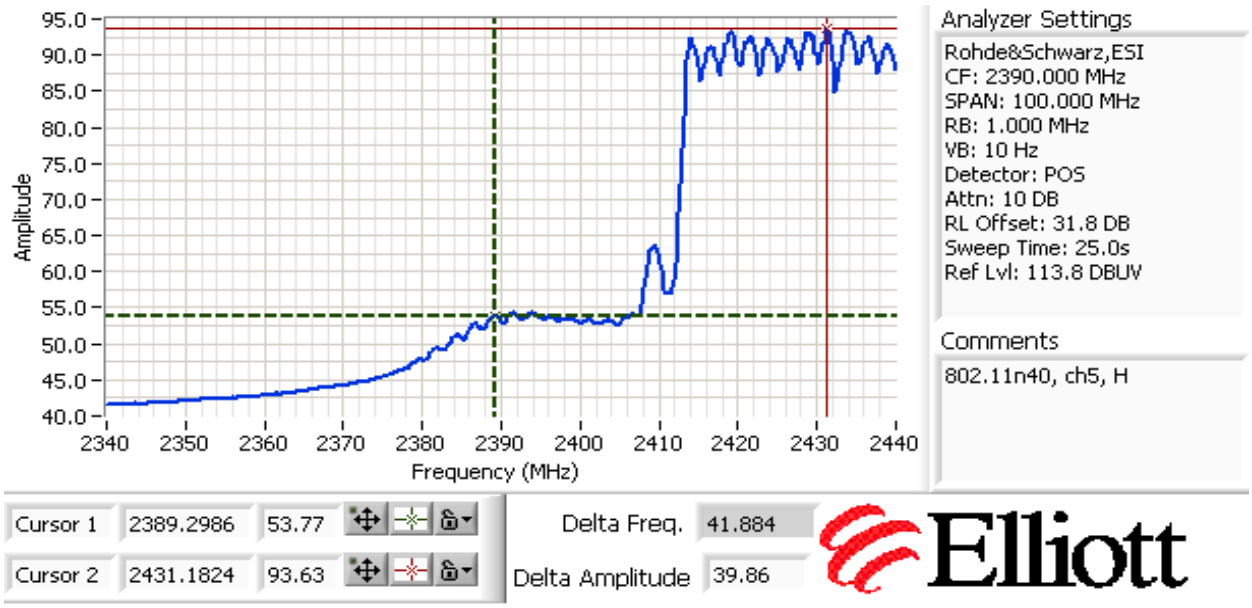
Run #4c: Channel @ 2432 MHz

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.299	53.8	H	54.0	-0.2	Avg	130	1.0	
2389.299	69.7	H	74.0	-4.3	Pk	130	1.0	



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

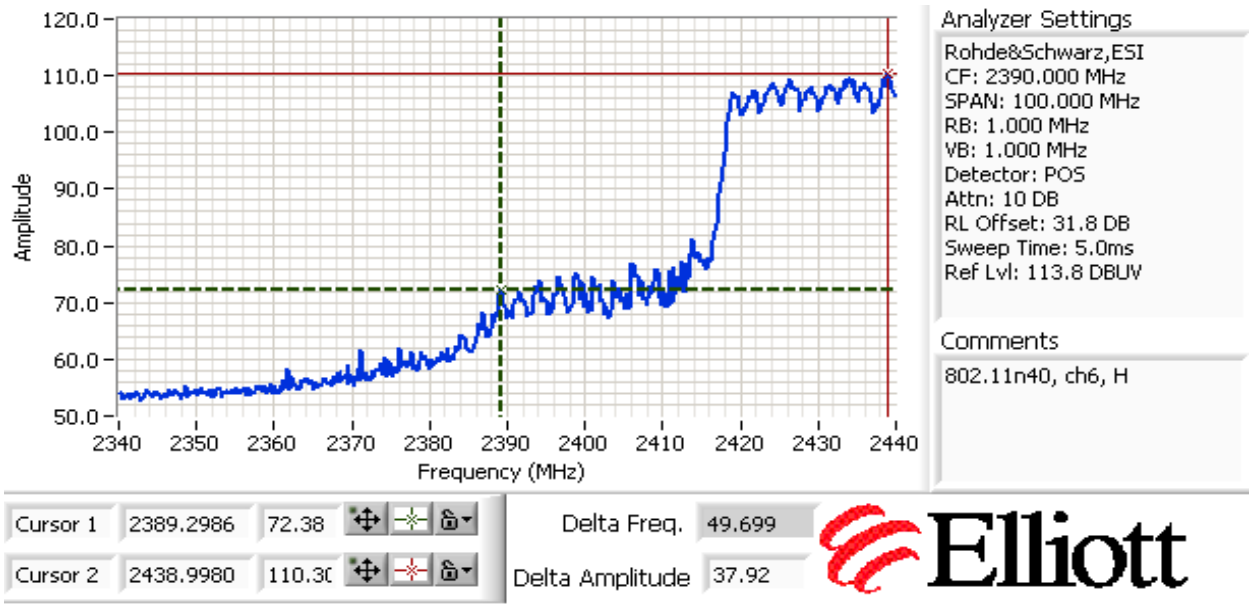


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

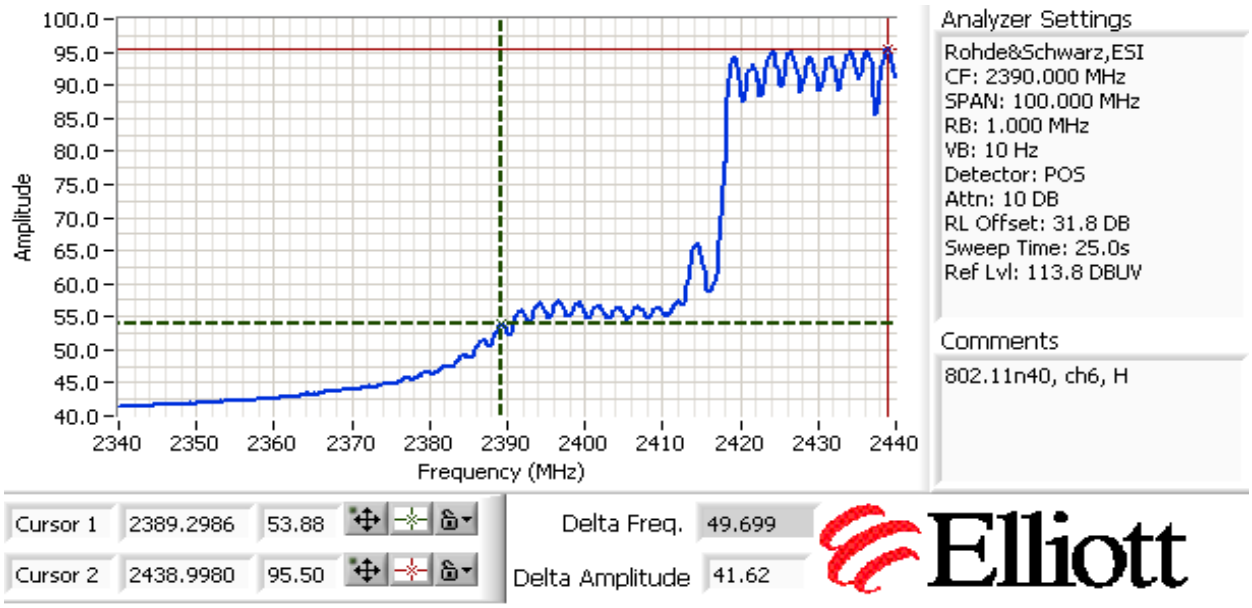
Run #4d: Channel @ 2437 MHz (bandedge at 2390MHz)

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.299	53.9	H	54.0	-0.1	Avg	130	1.0	
2389.299	72.4	H	74.0	-1.6	Pk	130	1.0	



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

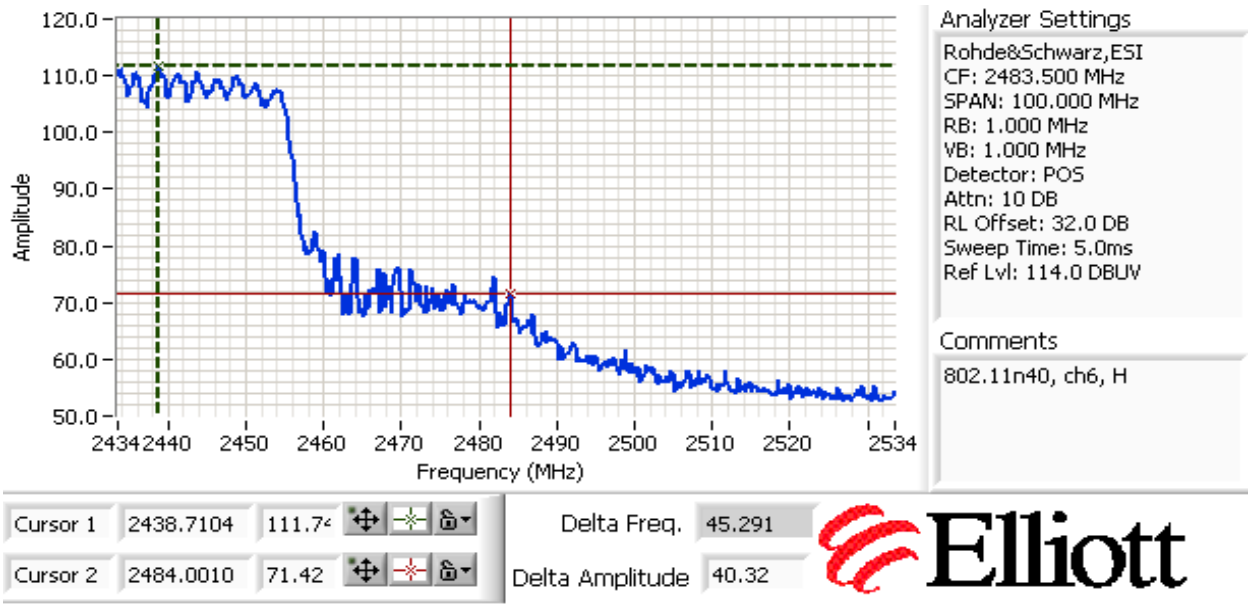


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

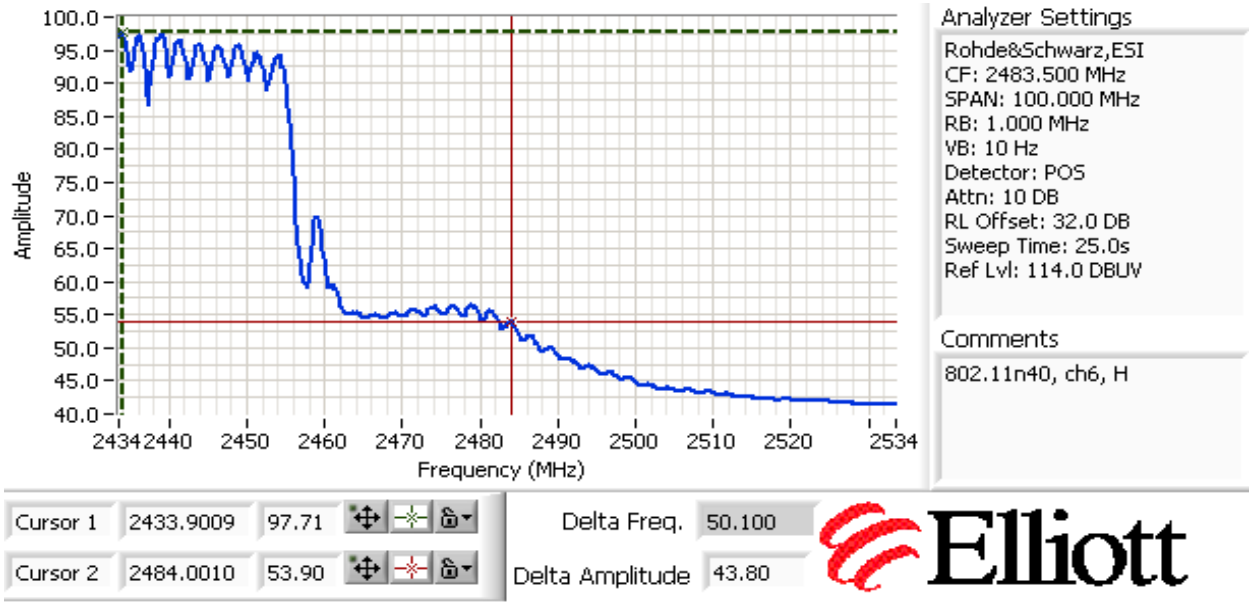
Run #4e: Channel @ 2437 MHz (bandedge at 2483.5MHz)

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2484.001	53.9	H	54.0	-0.1	Avg	130	1.0	
2484.001	71.4	H	74.0	-2.6	Pk	130	1.0	



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

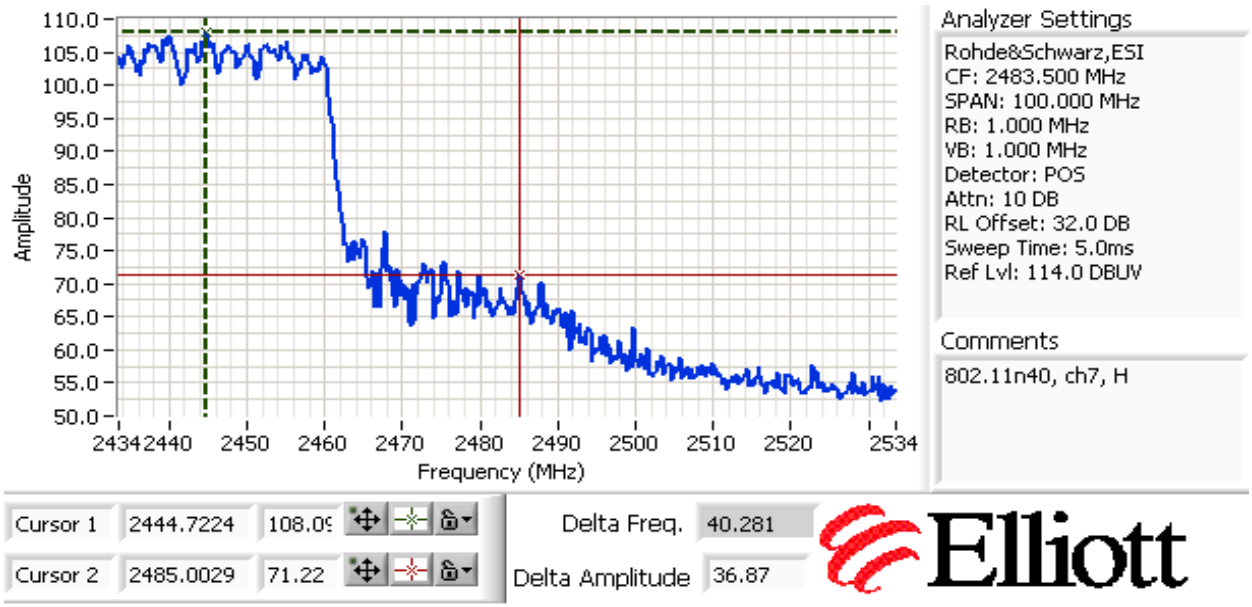


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

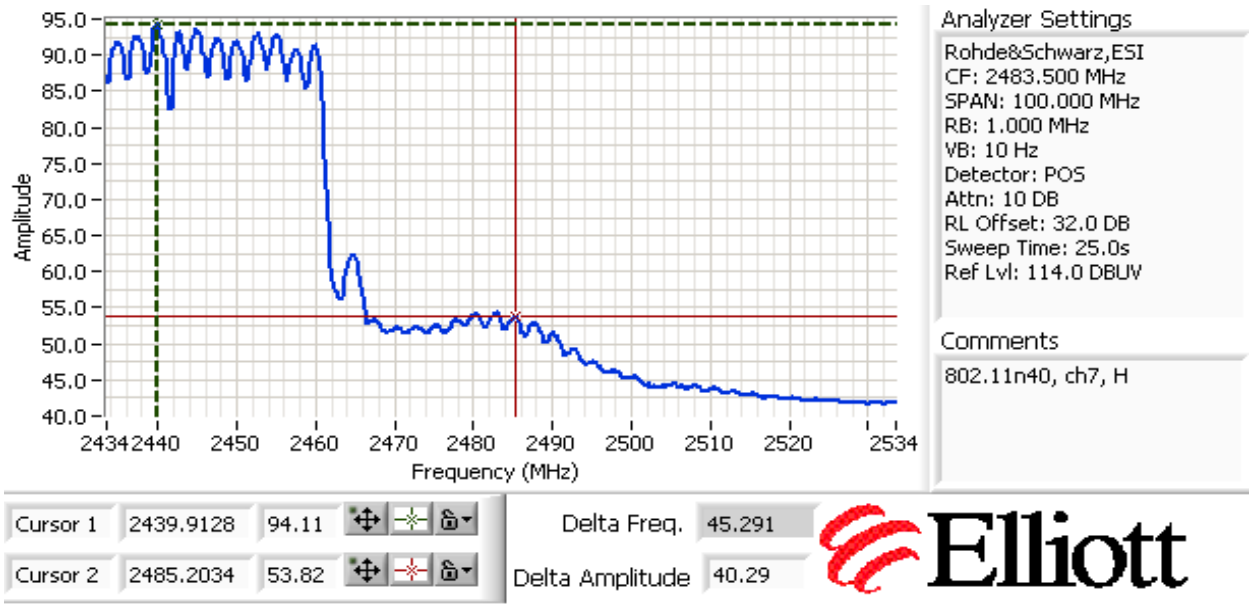
Run #4f: Channel @ 2442 MHz

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2485.203	53.8	H	54.0	-0.2	Avg	104	1.0	
2485.003	71.2	H	74.0	-2.8	Pk	104	1.0	



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

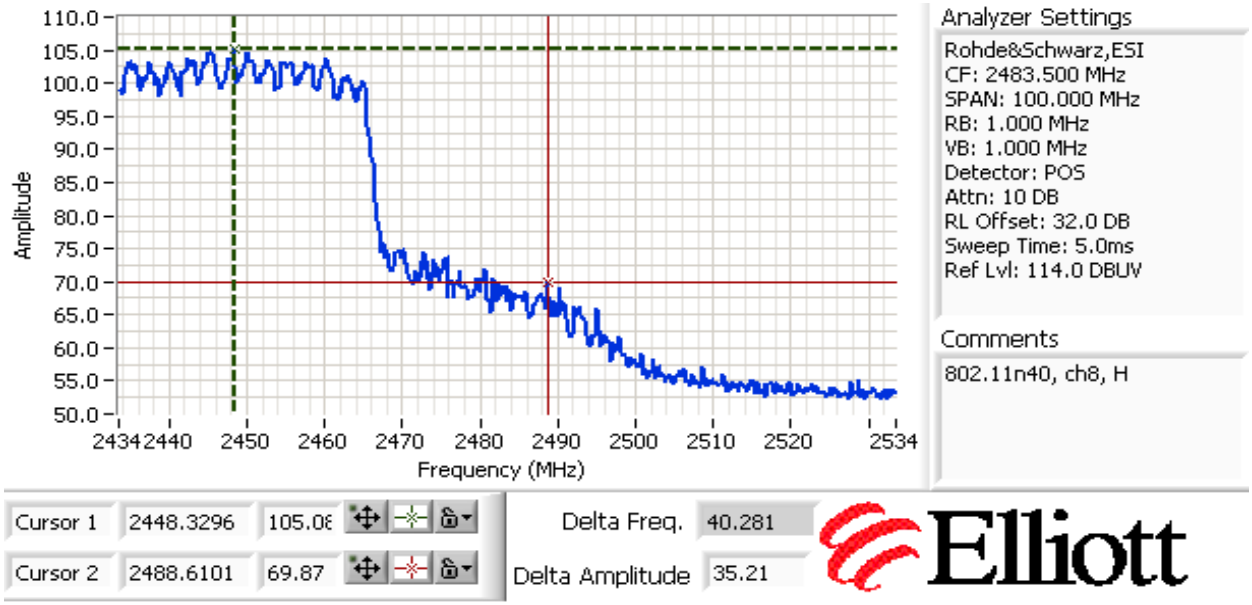


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

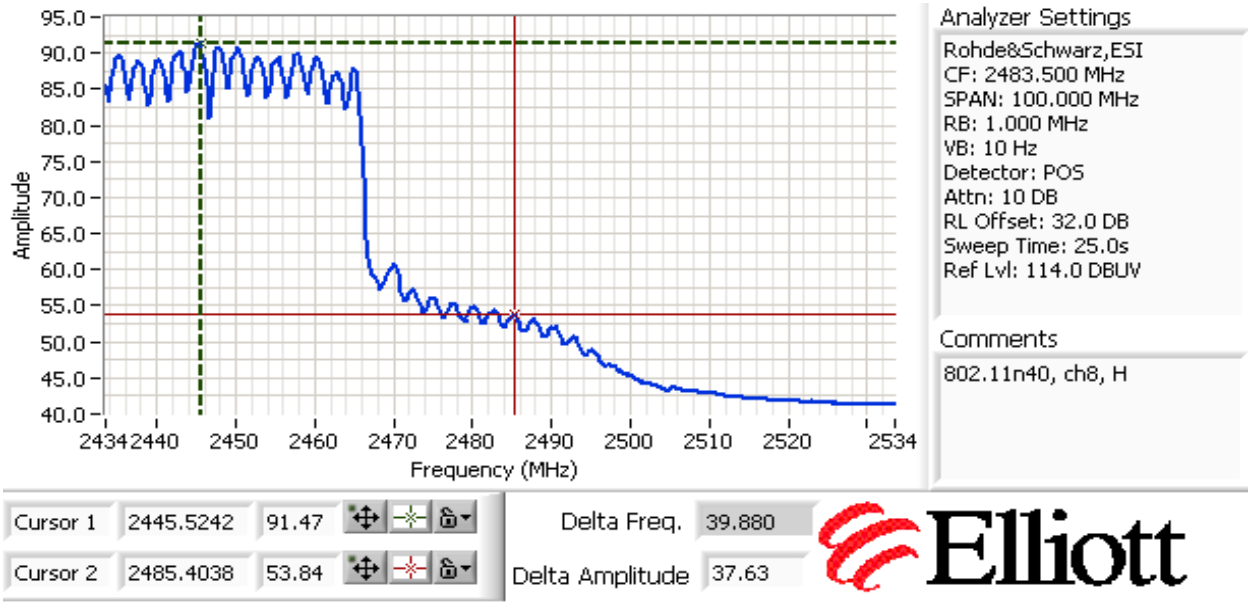
Run #4g: Channel @ 2447 MHz

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2485.404	53.8	H	54.0	-0.2	Avg	104	1.0	
2488.610	69.9	H	74.0	-4.1	Pk	104	1.0	



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

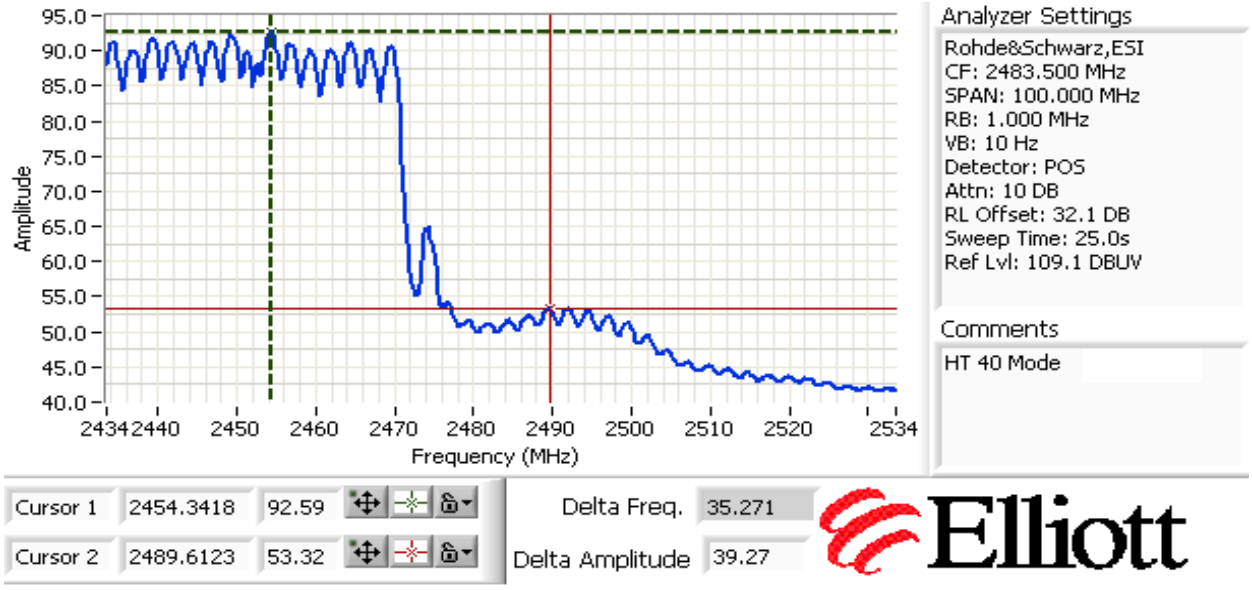


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

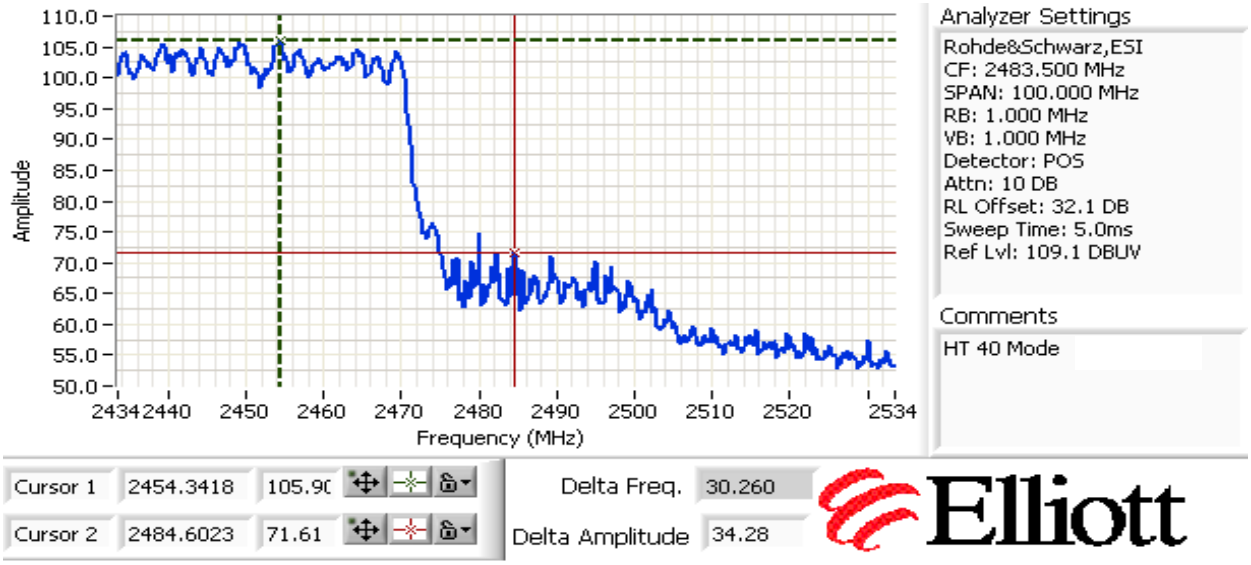
Run #4h: Channel @ 2452 MHz
Date of Test: 7/6/2011
Test Engineer: Suresh Kondapalli
Test Location: FT CH#4

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

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	53.3	H	54.0	-0.7	Avg	53	1.0	
2487.600	71.6	H	74.0	-2.4	Pk	291	1.0	



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	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: 18-23 °C

Rel. Humidity: 30-40 %

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.

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Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

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

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11b	1 - 2412 MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	53.0dBµV/m @ 4824.0MHz (-1.0dB)
1b		6 - 2437 MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	53.6dBµV/m @ 7310.2MHz (-0.4dB)
1c		11 - 2462 MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	53.7dBµV/m @ 7386.7MHz (-0.3dB)
2a	802.11g	1 - 2412 MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	44.4dBµV/m @ 7236.7MHz (-9.6dB)
2b		6 - 2437 MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	52.3dBµV/m @ 7310.1MHz (-1.7dB)
2c		11 - 2462 MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	53.6dBµV/m @ 7385.2MHz (-0.4dB)
3a	802.11n20	1 - 2412 MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	45.1dBµV/m @ 3216.0MHz (-8.9dB)
3b		6 - 2437 MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	53.0dBµV/m @ 7310.1MHz (-1.0dB)
3c		11 - 2462 MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	52.9dBµV/m @ 7385.1MHz (-1.1dB)
4a	802.11n40	3 - 2422 MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	47.1dBµV/m @ 3229.4MHz (-6.9dB)
4b		6 - 2437 MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	48.6dBµV/m @ 3249.4MHz (-5.4dB)
4c		9 - 2452 MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	49.4dBµV/m @ 3269.3MHz (-4.6dB)
5	Receive Mode	6 - 2437 MHz	-	-	Radiated Emissions, 1 - 10 GHz	RSS-GEN	46.2dBµV/m @ 2437.0MHz (-7.8dB)

Not e - Preliminary scans showed no emissions below 1 GHz and above 18GHz from the radio
Preliminary testing was performed to determine the worse case orientaiton of the EUT.

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Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #1: Radiated Spurious Emissions, 1000-26000 MHz. Operating Mode: 802.11b

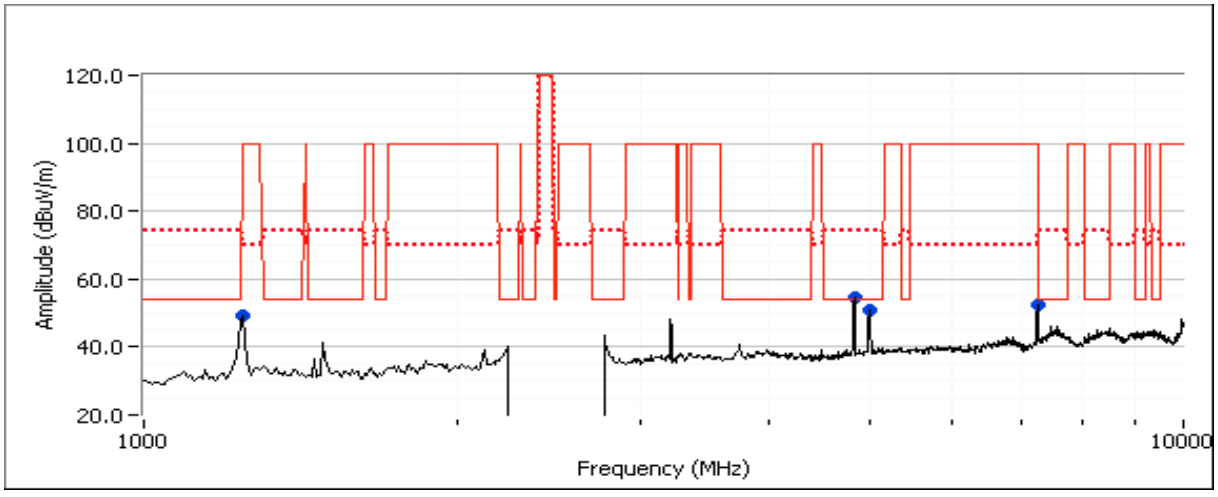
Date of Test: 7/20/2011 Test Location: FT Chamber #3
Test Engineer: Rafael Varelas

Run #1a: Low Channel @ 2412 MHz
Orientation: X

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4823.980	53.0	H	54.0	-1.0	AVG	11	1.1	
4823.960	55.4	H	74.0	-18.6	PK	11	1.1	
4994.480	36.9	V	54.0	-17.1	AVG	6	1.1	RB 1 MHz;VB 10 Hz;Pk
4994.250	54.9	V	74.0	-19.1	PK	6	1.1	RB 1 MHz;VB 3 MHz;Pk
1249.970	49.1	V	54.0	-4.9	Peak	336	1.6	Note 2
7236.750	52.3	V	54.0	-1.7	Peak	86	1.6	Note 2

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. Peak measurement vs average limit.
Note 3:	No significant signals between 10-26GHz



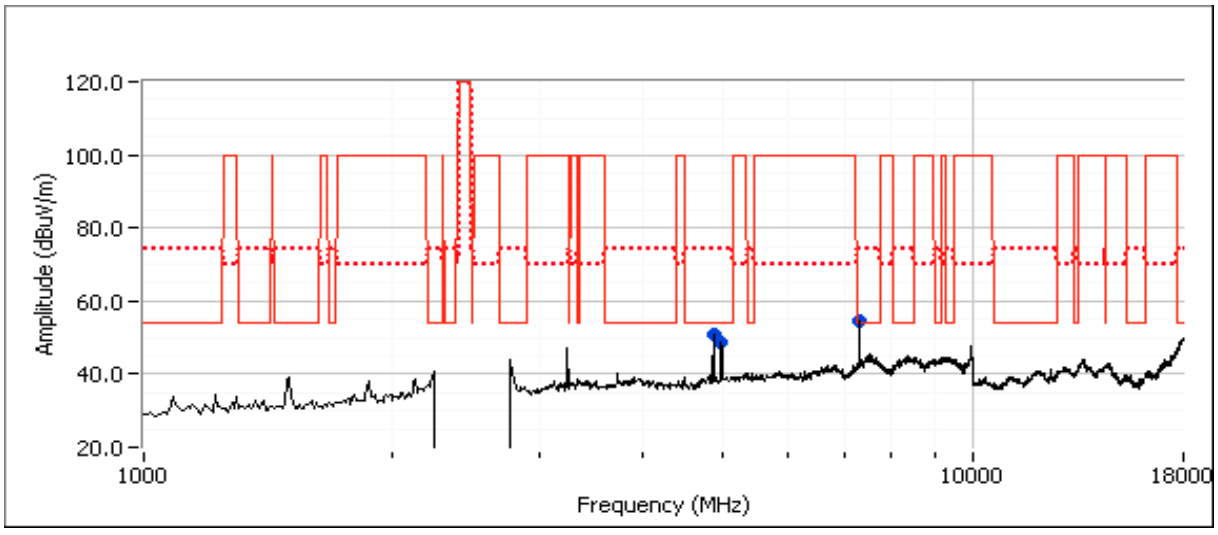
Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #1b: Center Channel @ 2437 MHz
Orientation: X

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7310.170	53.6	V	54.0	-0.4	AVG	240	1.0	RB 1 MHz;VB 10 Hz;Pk
7309.950	58.4	V	74.0	-15.6	PK	240	1.0	RB 1 MHz;VB 3 MHz;Pk
4985.680	38.3	V	54.0	-15.7	AVG	225	1.0	RB 1 MHz;VB 10 Hz;Pk
4983.780	56.2	V	74.0	-17.8	PK	225	1.0	RB 1 MHz;VB 3 MHz;Pk
4873.940	49.5	V	54.0	-4.5	AVG	231	1.0	RB 1 MHz;VB 10 Hz;Pk
4873.900	53.1	V	74.0	-20.9	PK	231	1.0	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used.
Note 2:	Signal is not in a restricted band but the more stringent restricted band limit was used.
Note 3:	No significant signals between 18-26GHz



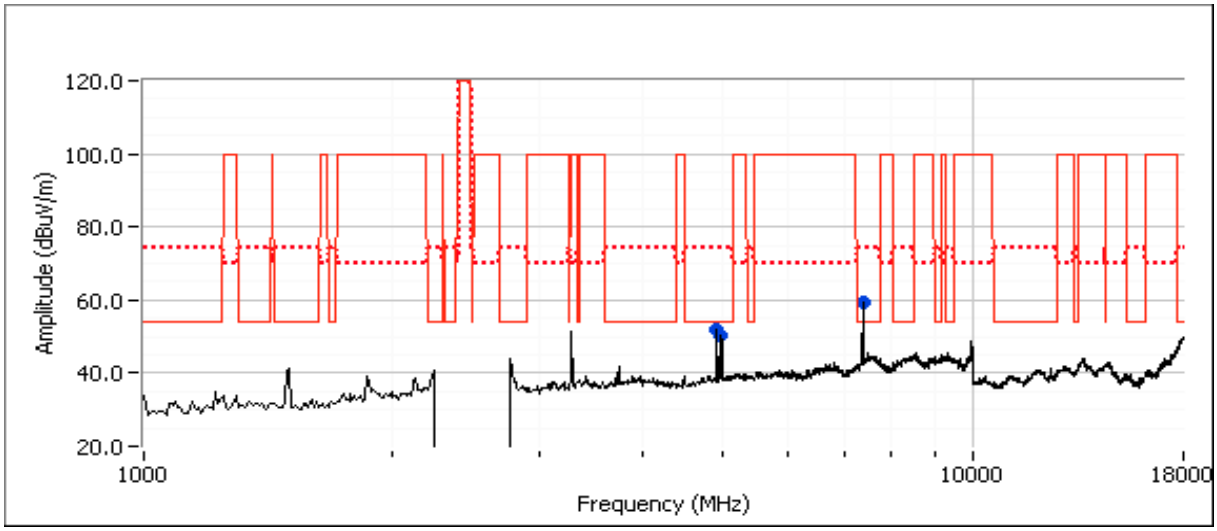
Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #1c: High Channel @ 2462 MHz
Orientation: X

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7386.670	53.7	V	54.0	-0.3	AVG	241	1.0	RB 1 MHz;VB 10 Hz;Pk
7385.670	58.5	V	74.0	-15.5	PK	241	1.0	RB 1 MHz;VB 3 MHz;Pk
4923.930	51.9	V	54.0	-2.1	AVG	292	1.0	RB 1 MHz;VB 10 Hz;Pk
4924.020	54.5	V	74.0	-19.5	PK	292	1.0	RB 1 MHz;VB 3 MHz;Pk
4986.900	40.8	V	54.0	-13.2	AVG	276	1.2	RB 1 MHz;VB 10 Hz;Pk
4990.530	60.0	V	74.0	-14.0	PK	276	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.
Note 3:	No significant signals between 18-26GHz



EMC Test Data

Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #2: Radiated Spurious Emissions, 1000-26000 MHz. Operating Mode: 802.11g

Date of Test: 7/21/2011 Test Location: FT Chamber#5

Test Engineer: Joseph Cadigal

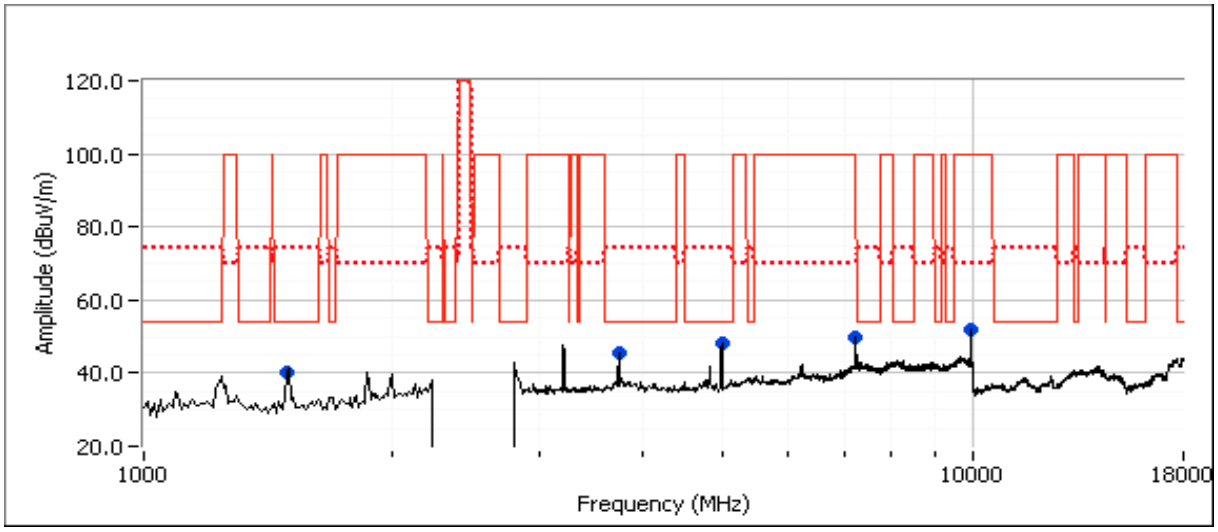
Run #2a: Low Channel @ 2412 MHz

Orientation: X

Antenna	Power Settings Target (dBm)	Measured (dBm)	Software Setting
Main/ Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7236.740	44.4	V	54.0	-9.6	AVG	185	1.6	RB 1 MHz;VB 10 Hz;Pk, note 3
9980.940	41.5	V	54.0	-12.5	AVG	15	1.6	RB 1 MHz;VB 10 Hz;Pk, note 3
9982.570	58.7	V	74.0	-15.3	PK	15	1.6	RB 1 MHz;VB 3 MHz;Pk, note 3
4995.700	36.4	V	54.0	-17.6	AVG	65	1.0	RB 1 MHz;VB 10 Hz;Pk
4994.670	54.0	V	74.0	-20.0	PK	65	1.0	RB 1 MHz;VB 3 MHz;Pk
7239.250	53.9	V	74.0	-20.1	PK	185	1.6	RB 1 MHz;VB 3 MHz;Pk, note 3
3740.840	33.1	H	54.0	-20.9	AVG	94	1.0	RB 1 MHz;VB 10 Hz;Pk
1493.910	33.1	H	54.0	-20.9	AVG	360	1.0	RB 1 MHz;VB 10 Hz;Pk
1493.860	52.8	H	74.0	-21.2	PK	360	1.0	RB 1 MHz;VB 3 MHz;Pk
3742.730	51.3	H	74.0	-22.7	PK	94	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 3:	Signal is not in a restricted band but the more stringent restricted band limit was used.



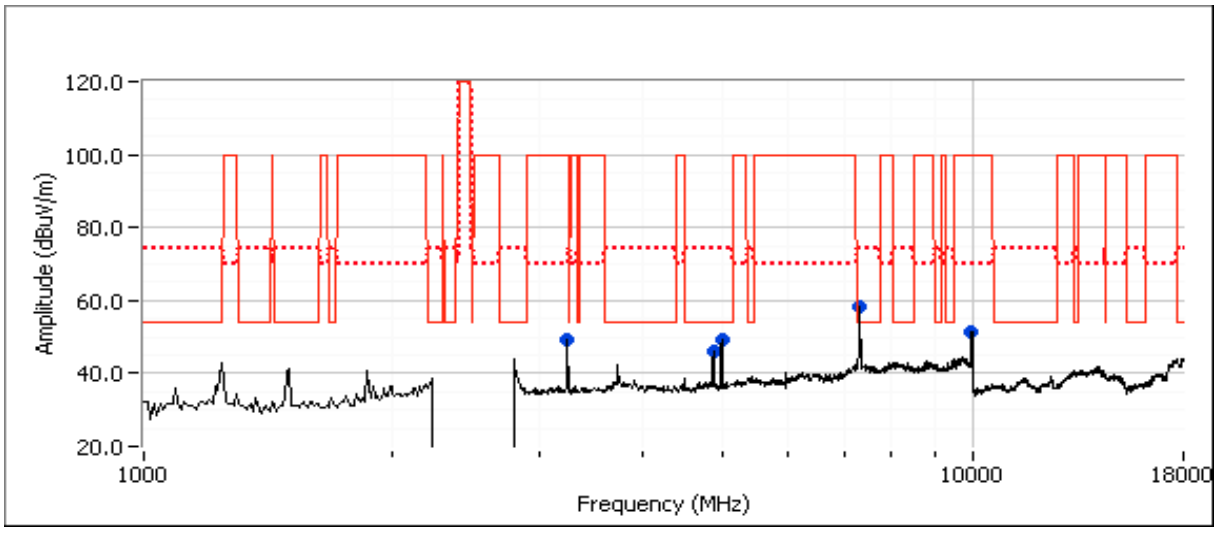
Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

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

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main/ Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7310.120	52.3	V	54.0	-1.7	AVG	0	2.2	RB 1 MHz;VB 10 Hz;Pk
3249.330	49.1	H	54.0	-4.9	AVG	7	1.0	RB 1 MHz;VB 10 Hz;Pk, note 3
4877.000	40.6	V	54.0	-13.4	AVG	51	1.0	RB 1 MHz;VB 10 Hz;Pk
9986.660	40.3	V	54.0	-13.7	AVG	16	1.6	RB 1 MHz;VB 10 Hz;Pk, note 3
7312.670	59.6	V	74.0	-14.4	PK	0	2.2	RB 1 MHz;VB 3 MHz;Pk
4990.880	37.9	V	54.0	-16.1	AVG	59	1.0	RB 1 MHz;VB 10 Hz;Pk
9986.730	57.4	V	74.0	-16.6	PK	16	1.6	RB 1 MHz;VB 3 MHz;Pk, note 3
4991.210	55.9	V	74.0	-18.1	PK	59	1.0	RB 1 MHz;VB 3 MHz;Pk
3249.460	52.6	H	74.0	-21.4	PK	7	1.0	RB 1 MHz;VB 3 MHz;Pk, note 3
4878.160	50.2	V	74.0	-23.8	PK	51	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 3:	Signal is not in a restricted band but the more stringent restricted band limit was used.



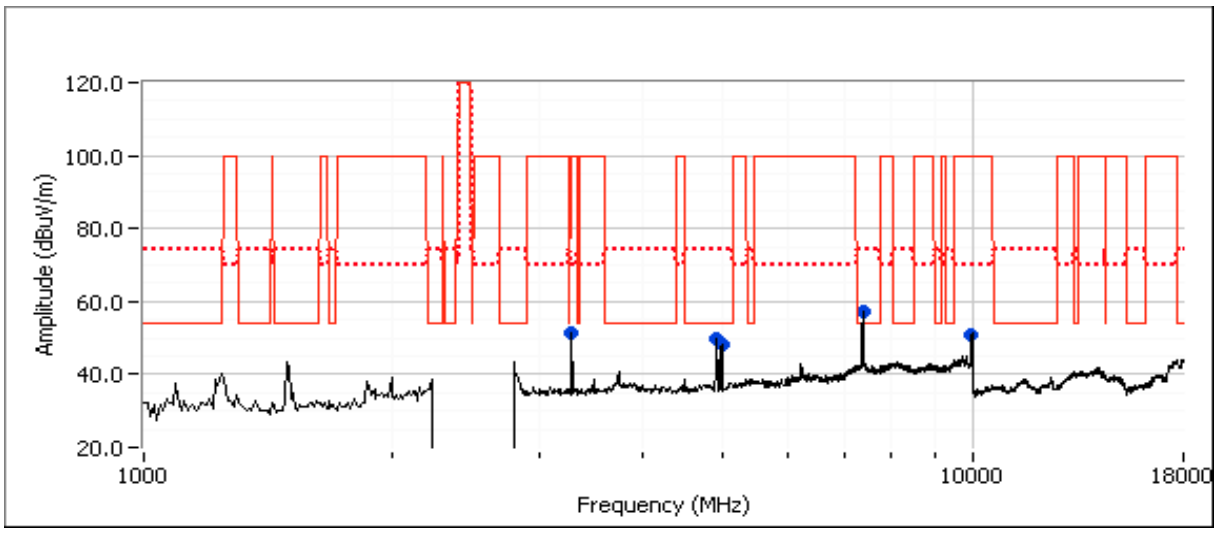
Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #2c: High Channel @ 2462 MHz
Orientation: X

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main/ Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7385.160	53.6	V	54.0	-0.4	AVG	75	1.6	RB 1 MHz;VB 10 Hz;Pk
3282.660	49.7	H	54.0	-4.3	AVG	12	1.0	RB 1 MHz;VB 10 Hz;Pk, note 3
9977.280	42.6	V	54.0	-11.4	AVG	7	1.6	RB 1 MHz;VB 10 Hz;Pk, note 3
9977.410	60.0	V	74.0	-14.0	PK	7	1.6	RB 1 MHz;VB 3 MHz;Pk, note 3
7385.710	59.7	V	74.0	-14.3	PK	75	1.6	RB 1 MHz;VB 3 MHz;Pk
4987.910	38.9	V	54.0	-15.1	AVG	56	1.0	RB 1 MHz;VB 10 Hz;Pk
4918.140	37.9	H	54.0	-16.1	AVG	64	1.0	RB 1 MHz;VB 10 Hz;Pk
4985.470	57.4	V	74.0	-16.6	PK	56	1.0	RB 1 MHz;VB 3 MHz;Pk
3282.650	52.5	H	74.0	-21.5	PK	12	1.0	RB 1 MHz;VB 3 MHz;Pk, note 3
4916.680	50.8	H	74.0	-23.2	PK	64	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 3:	Signal is not in a restricted band but the more stringent restricted band limit was used.



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #3: Radiated Spurious Emissions, 1000-26000 MHz. Operating Mode: 802.11n20 MHz

Date of Test: 7/21/2011 Test Location: FT Chamber#5

Test Engineer: Joseph Cadigal

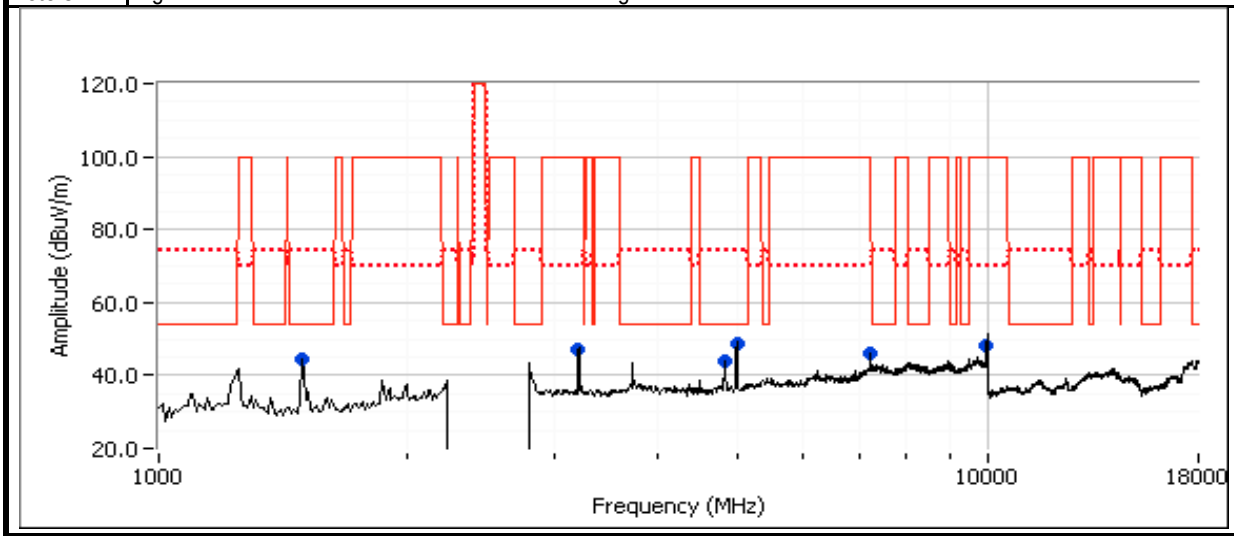
Run #3a: Low Channel @ 2412 MHz

Orientation:

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main/ Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3216.030	45.1	H	54.0	-8.9	AVG	194	1.6	RB 1 MHz;VB 10 Hz;Pk, note 3
4824.060	41.7	H	54.0	-12.3	AVG	28	1.0	RB 1 MHz;VB 10 Hz;Pk
9972.750	41.0	V	54.0	-13.0	AVG	12	1.3	RB 1 MHz;VB 10 Hz;Pk, note 3
4994.710	38.4	V	54.0	-15.6	AVG	54	1.0	RB 1 MHz;VB 10 Hz;Pk
7234.500	38.4	V	54.0	-15.6	AVG	256	1.0	RB 1 MHz;VB 10 Hz;Pk, note 3
4995.020	57.7	V	74.0	-16.3	PK	54	1.0	RB 1 MHz;VB 3 MHz;Pk
9973.030	57.0	V	74.0	-17.0	PK	12	1.3	RB 1 MHz;VB 3 MHz;Pk, note 3
4824.160	54.8	H	74.0	-19.2	PK	28	1.0	RB 1 MHz;VB 3 MHz;Pk
1494.010	32.9	H	54.0	-21.1	AVG	360	1.0	RB 1 MHz;VB 10 Hz;Pk
1493.310	50.8	H	74.0	-23.2	PK	360	1.0	RB 1 MHz;VB 3 MHz;Pk
7232.680	49.8	V	74.0	-24.2	PK	256	1.0	RB 1 MHz;VB 3 MHz;Pk, note 3
3216.000	49.0	H	74.0	-25.0	PK	194	1.6	RB 1 MHz;VB 3 MHz;Pk, note 3

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



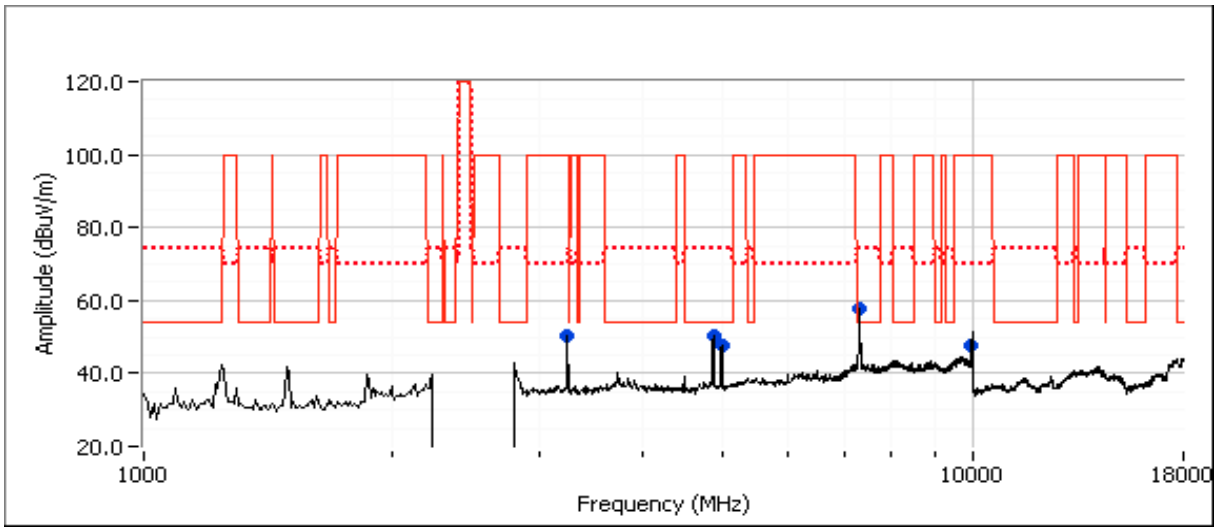
Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

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

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main/ Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7310.130	53.0	V	54.0	-1.0	AVG	115	1.3	RB 1 MHz;VB 10 Hz;Pk
3249.350	48.9	H	54.0	-5.1	AVG	17	1.0	RB 1 MHz;VB 10 Hz;Pk, note 3
7310.460	62.7	V	74.0	-11.3	PK	115	1.3	RB 1 MHz;VB 3 MHz;Pk
9967.600	40.0	V	54.0	-14.0	AVG	1	1.6	RB 1 MHz;VB 10 Hz;Pk, note 3
4868.580	39.4	V	54.0	-14.6	AVG	34	1.3	RB 1 MHz;VB 10 Hz;Pk
4995.260	37.8	V	54.0	-16.2	AVG	47	1.0	RB 1 MHz;VB 10 Hz;Pk
4997.370	56.3	V	74.0	-17.7	PK	47	1.0	RB 1 MHz;VB 3 MHz;Pk
9969.320	56.0	V	74.0	-18.0	PK	1	1.6	RB 1 MHz;VB 3 MHz;Pk, note 3
4868.150	52.9	V	74.0	-21.1	PK	34	1.3	RB 1 MHz;VB 3 MHz;Pk
3249.140	51.9	H	74.0	-22.1	PK	17	1.0	RB 1 MHz;VB 3 MHz;Pk, note 3

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



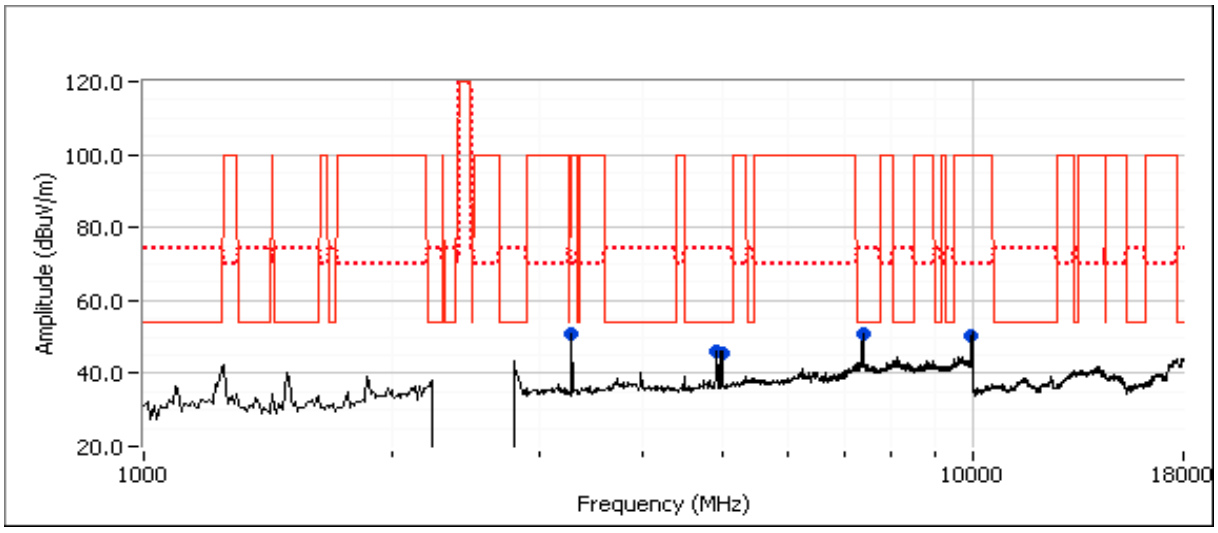
Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #3c: High Channel @ 2462 MHz
Orientation: X

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main/ Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7385.050	52.9	V	54.0	-1.1	AVG	89	1.6	RB 1 MHz;VB 10 Hz;Pk
3282.780	45.9	H	54.0	-8.1	AVG	25	1.0	RB 1 MHz;VB 10 Hz;Pk, note 3
4929.320	40.7	H	54.0	-13.3	AVG	31	1.0	RB 1 MHz;VB 10 Hz;Pk
7385.960	60.2	V	74.0	-13.8	PK	89	1.6	RB 1 MHz;VB 3 MHz;Pk
9949.220	38.3	V	54.0	-15.7	AVG	12	1.6	RB 1 MHz;VB 10 Hz;Pk, note 3
4988.520	37.2	V	54.0	-16.8	AVG	60	1.3	RB 1 MHz;VB 10 Hz;Pk
9948.820	55.1	V	74.0	-18.9	PK	12	1.6	RB 1 MHz;VB 3 MHz;Pk, note 3
4929.060	54.8	H	74.0	-19.2	PK	31	1.0	RB 1 MHz;VB 3 MHz;Pk
4990.720	54.2	V	74.0	-19.8	PK	60	1.3	RB 1 MHz;VB 3 MHz;Pk
3282.570	48.0	H	74.0	-26.0	PK	25	1.0	RB 1 MHz;VB 3 MHz;Pk, note 3

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



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

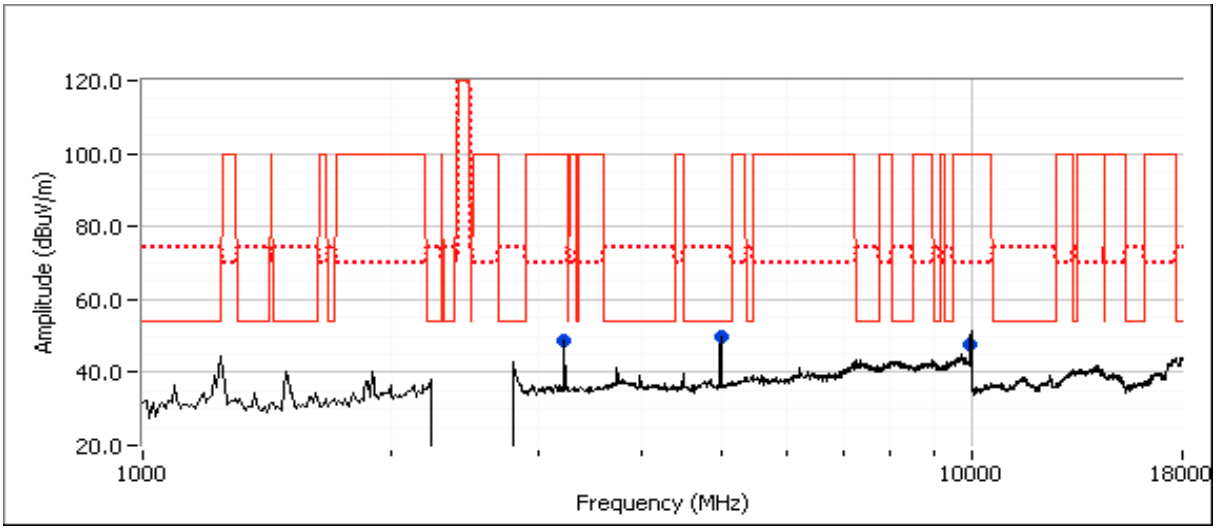
Run #4: Radiated Spurious Emissions, 1000-26000 MHz. Operating Mode: 802.11n40 MHz
Date of Test: 7/21/2011
Test Engineer: Joseph Cadigal
Test Location: FT Chamber #5

Run #4a: Low Channel @ 2422 MHz
Orientation:X

	Power Settings		
Antenna	Target (dBm)	Measured (dBm)	Software Setting
Main/ Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3229.360	47.1	H	54.0	-6.9	AVG	17	1.0	RB 1 MHz;VB 10 Hz;Pk, note 2
9984.900	39.5	V	54.0	-14.5	AVG	174	1.6	RB 1 MHz;VB 10 Hz;Pk, note 2
4999.390	38.9	V	54.0	-15.1	AVG	49	1.0	RB 1 MHz;VB 10 Hz;Pk
5000.430	58.4	V	74.0	-15.6	PK	49	1.0	RB 1 MHz;VB 3 MHz;Pk
9987.130	55.2	V	74.0	-18.8	PK	174	1.6	RB 1 MHz;VB 3 MHz;Pk, note 2
3229.340	50.3	H	74.0	-23.7	PK	17	1.0	RB 1 MHz;VB 3 MHz;Pk, note 2

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.



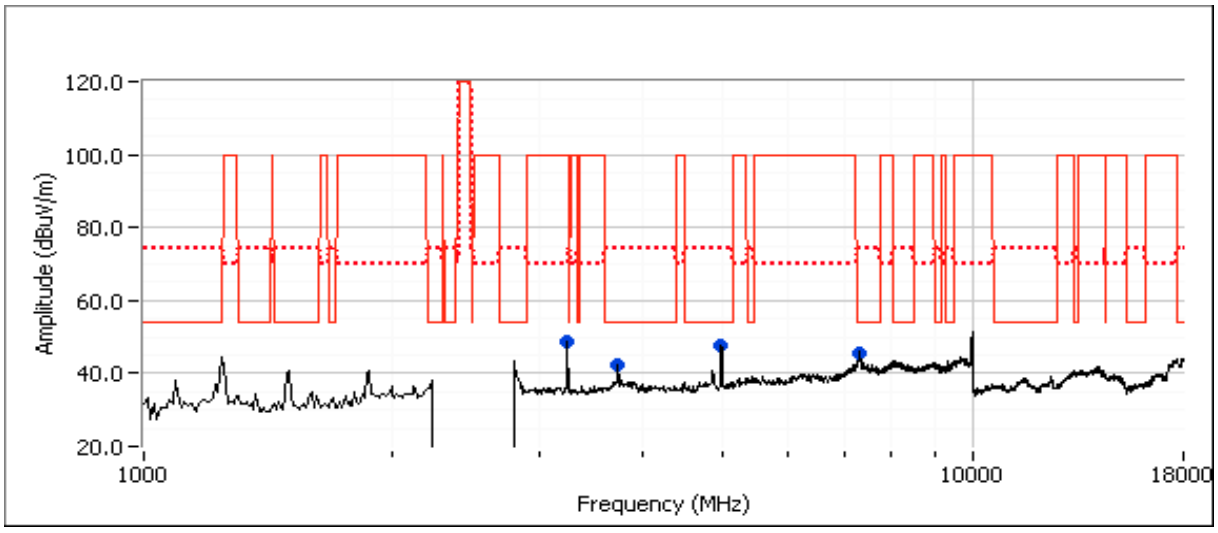
Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #4b: Center Channel @ 2437 MHz
Date of Test: 7/21/2011
Test Engineer: Rafael Varelas
Test Location: FT Chamber #5
Orientation: X

Antenna	Power Settings Target (dBm)	Measured (dBm)	Software Setting
Main/ Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3249.370	48.6	H	54.0	-5.4	Peak	15	1.0	Note 2
7337.230	43.5	V	54.0	-10.5	AVG	118	1.5	RB 1 MHz;VB 10 Hz;Pk
4987.710	39.6	V	54.0	-14.4	AVG	42	1.0	RB 1 MHz;VB 10 Hz;Pk
4988.110	56.5	V	74.0	-17.5	PK	42	1.0	RB 1 MHz;VB 3 MHz;Pk
7327.100	55.7	V	74.0	-18.3	PK	118	1.5	RB 1 MHz;VB 3 MHz;Pk
3759.240	33.1	H	54.0	-20.9	AVG	76	1.8	RB 1 MHz;VB 10 Hz;Pk
3745.710	51.8	H	74.0	-22.2	PK	76	1.8	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. Peak reading vs average limit



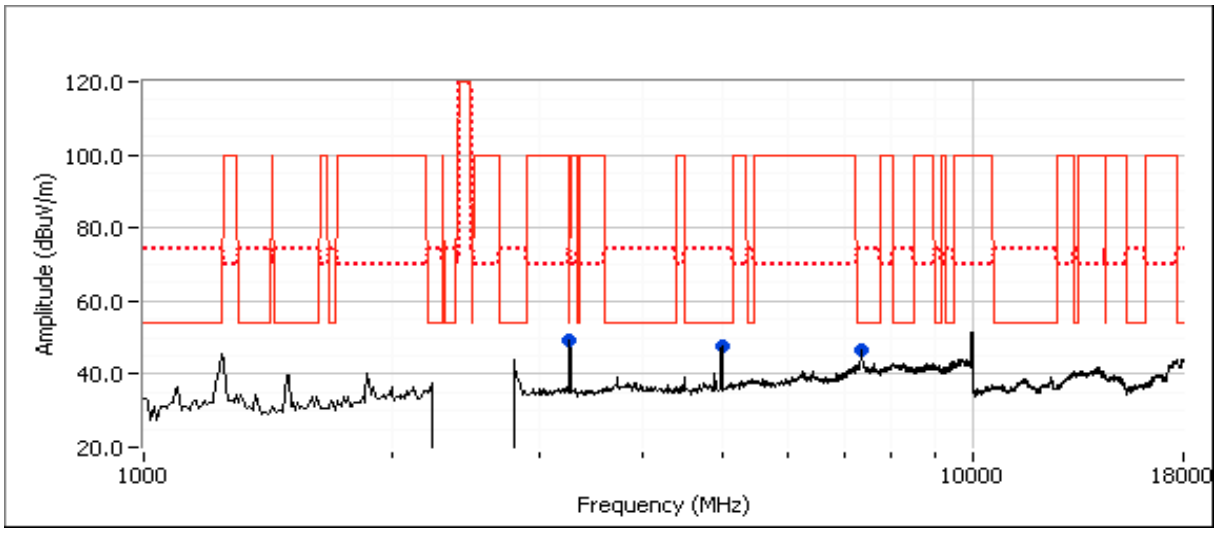
Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #4c: High Channel @ 2452 MHz
Orientation: X

Antenna	Power Settings Target (dBm)	Measured (dBm)	Software Setting
Main/ Aux	-	-	-

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3269.290	49.4	H	54.0	-4.6	Peak	164	1.0	Note 2
7348.630	42.8	V	54.0	-11.2	AVG	112	1.1	RB 1 MHz;VB 10 Hz;Pk
4987.190	38.3	V	54.0	-15.7	AVG	66	1.0	RB 1 MHz;VB 10 Hz;Pk
4987.260	55.9	V	74.0	-18.1	PK	66	1.0	RB 1 MHz;VB 3 MHz;Pk
7343.370	55.5	V	74.0	-18.5	PK	112	1.1	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. Peak reading vs average limit

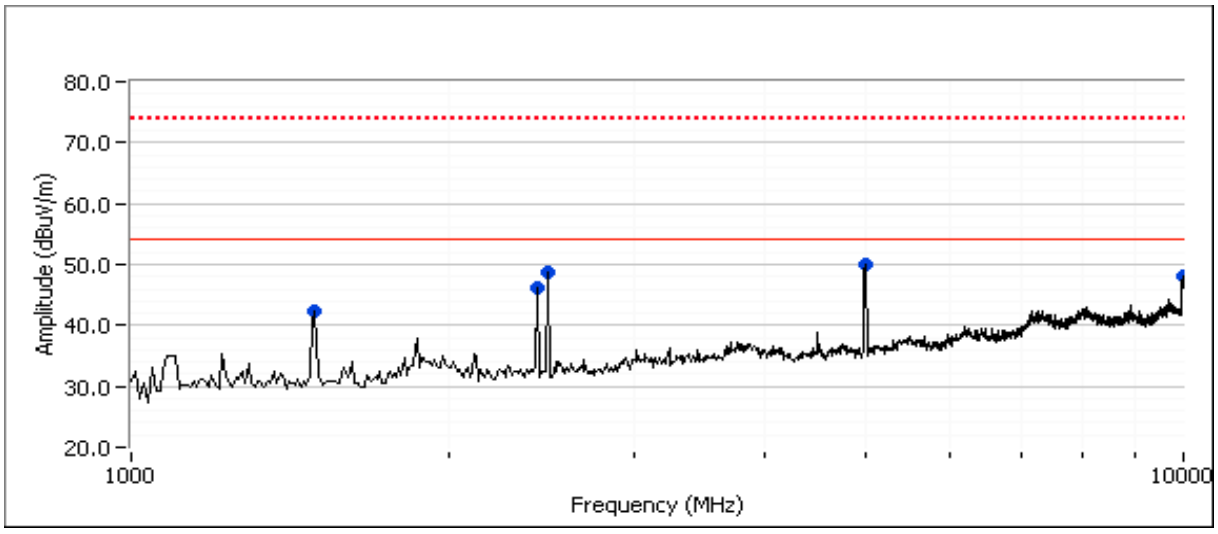


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #6: Radiated Spurious Emissions, 1000-10000 MHz. Receive Mode
Date of Test: 7/21/2011
Test Engineer: Rafael Varelas
Test Location: FT Chamber #5

Run #6a: Center Channel @ 2437 MHz
Orientation: X

Frequency	Level	Pol	RSS-GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2437.030	46.2	H	54.0	-7.8	AVG	31	1.0	RB 1 MHz;VB 10 Hz;Pk
2437.120	49.0	H	74.0	-25.0	PK	31	1.0	RB 1 MHz;VB 3 MHz;Pk
1494.590	34.3	H	54.0	-19.7	AVG	41	1.3	RB 1 MHz;VB 10 Hz;Pk
1493.540	47.2	H	74.0	-26.8	PK	41	1.3	RB 1 MHz;VB 3 MHz;Pk
2499.350	39.8	H	54.0	-14.2	AVG	76	1.0	RB 1 MHz;VB 10 Hz;Pk
2498.050	55.2	H	74.0	-18.8	PK	76	1.0	RB 1 MHz;VB 3 MHz;Pk
4991.220	39.9	H	54.0	-14.1	AVG	73	1.0	RB 1 MHz;VB 10 Hz;Pk
4986.020	56.9	H	74.0	-17.1	PK	73	1.0	RB 1 MHz;VB 3 MHz;Pk
9988.410	39.4	V	54.0	-14.6	AVG	88	1.6	RB 1 MHz;VB 10 Hz;Pk
10001.210	55.3	V	74.0	-18.7	PK	88	1.6	RB 1 MHz;VB 3 MHz;Pk



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	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: 8/4/2011 0:45
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #4

Config. Used: 1
Config Change: -
Host Unit 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: 22.3 °C
Rel. Humidity: 38 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	-	-	Output Power	15.247(b)	Pass	2.7 dBm
2	-	-	Power spectral Density (PSD)	15.247(d)	Pass	-11.2 dBm/3kHz
3	-	-	Minimum 6dB Bandwidth	15.247(a)	Pass	565 kHz
3	-	-	99% Bandwidth	RSS GEN	-	1.96 MHz
4	-	-	Spurious emissions	15.247(b)	Pass	All emissions >30dB below limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

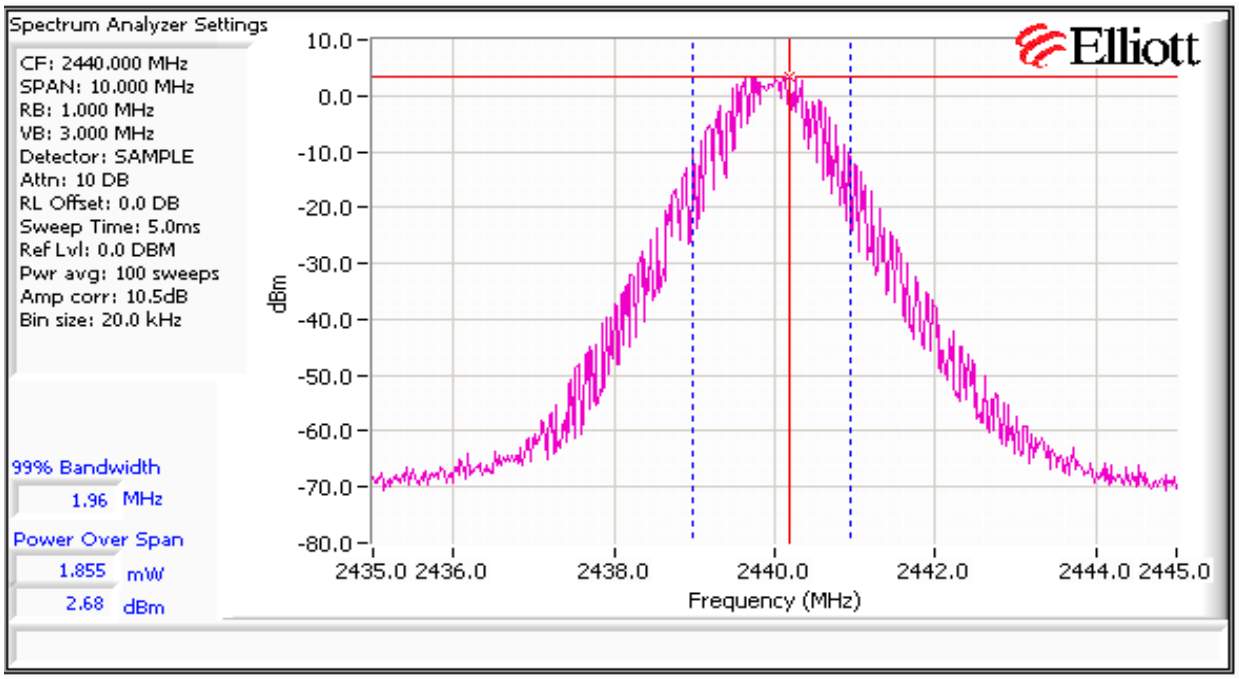
No deviations were made from the requirements of the standard.

Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #1: Output Power

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP dBm	EIRP W	Output Power (dBm)[3]	Output Power mW
-	2402	2.3	1.7	3.9	Pass	6.2	0.004		
-	2440	2.7	1.9	3.9	Pass	6.6	0.005		
-	2480	2.7	1.9	3.9	Pass	6.6	0.005		

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 not continuous but the ESI analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting) and power integration over 10 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.
Note 3:	Power measured using average power meter and is included for reference only.

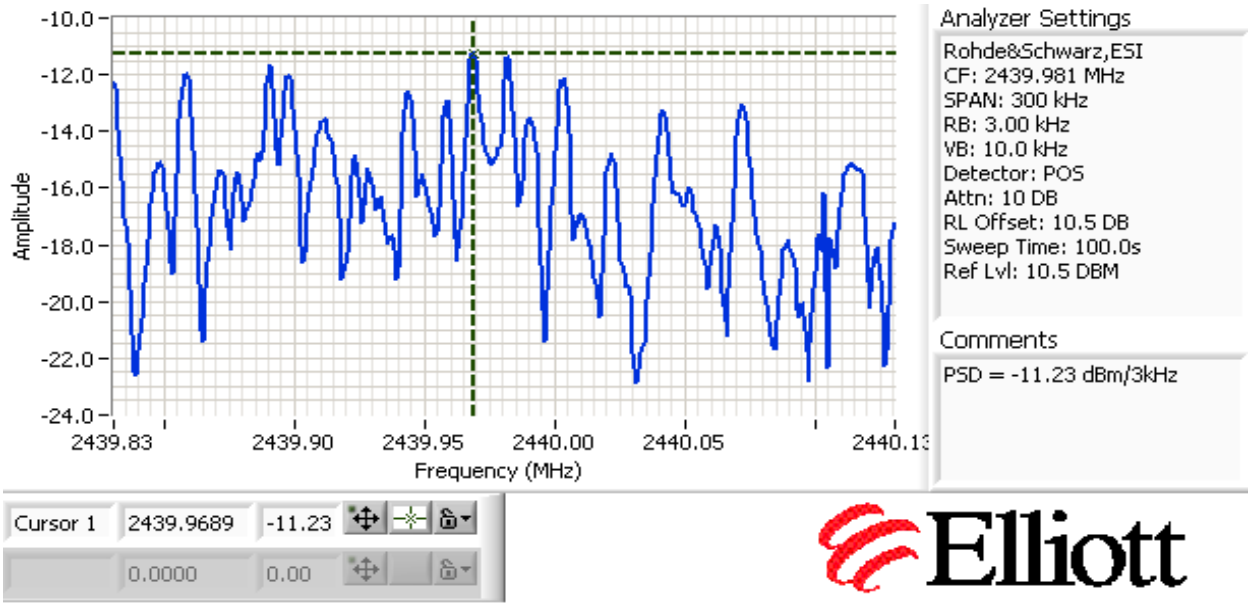


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
-	2402	-11.7	8.0	Pass
-	2440	-11.2	8.0	Pass
-	2480	-11.2	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.

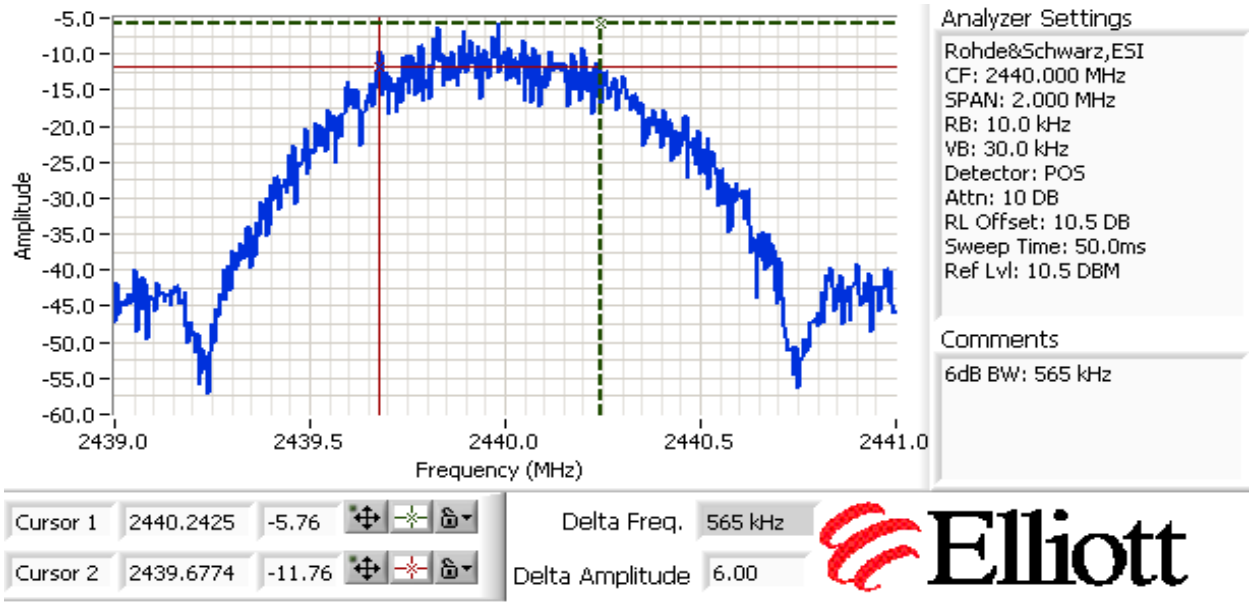


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
-	2402	1 MHz	0.569	1.96
-	2440	1 MHz	0.565	1.96
-	2480	1 MHz	0.573	1.96

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

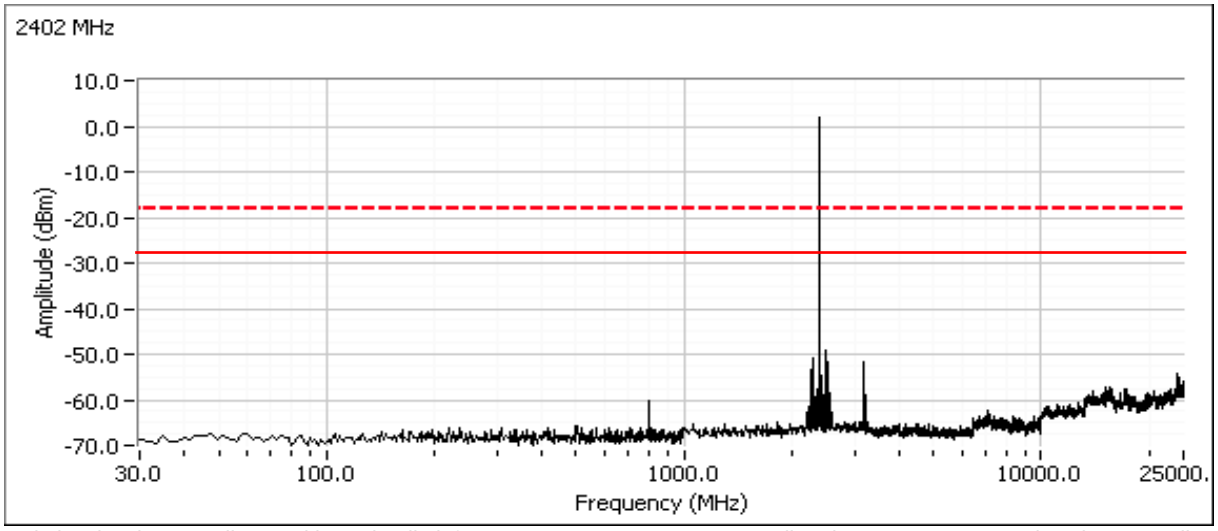


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

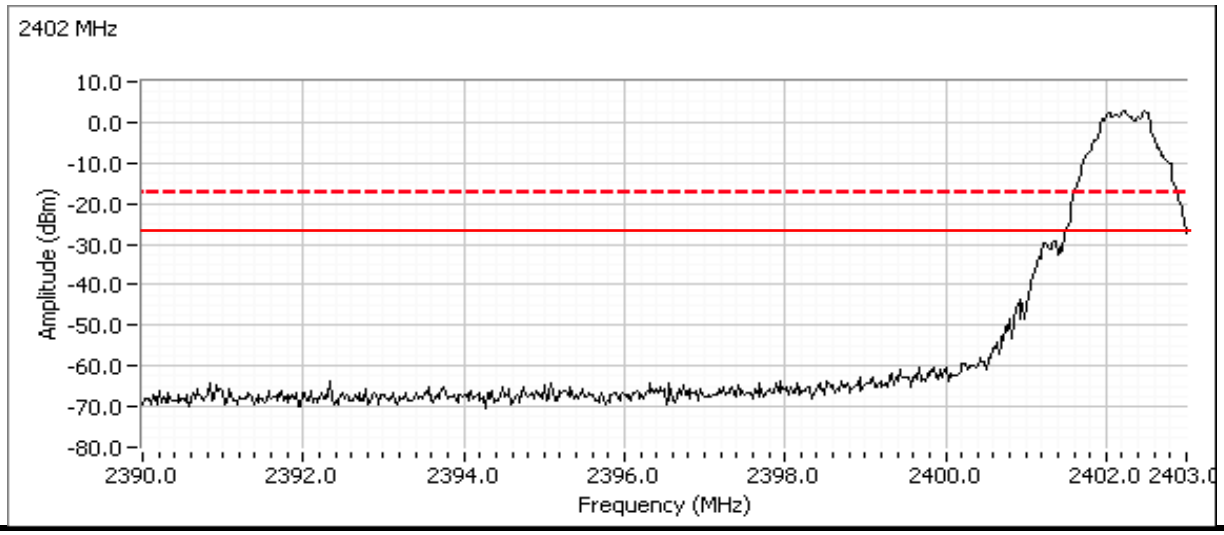
Run #4: Out of Band Spurious Emissions

Frequency (MHz)	Limit	Result
2402	-30dBc	Pass
2441	-30dBc	Pass
2480	-30dBc	Pass

Plots for low channel

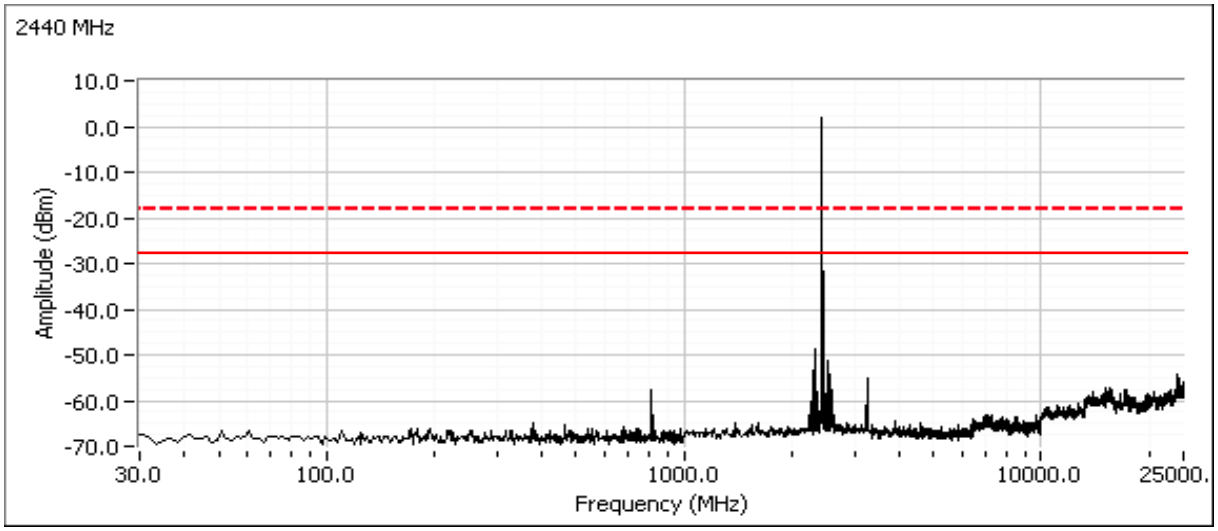


Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

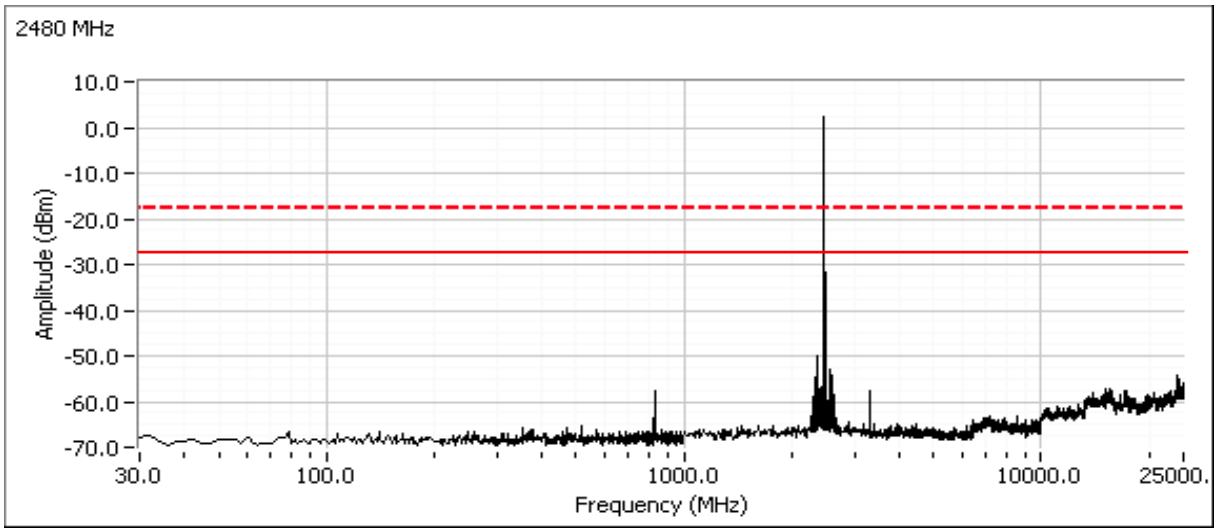


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Plots for center channel

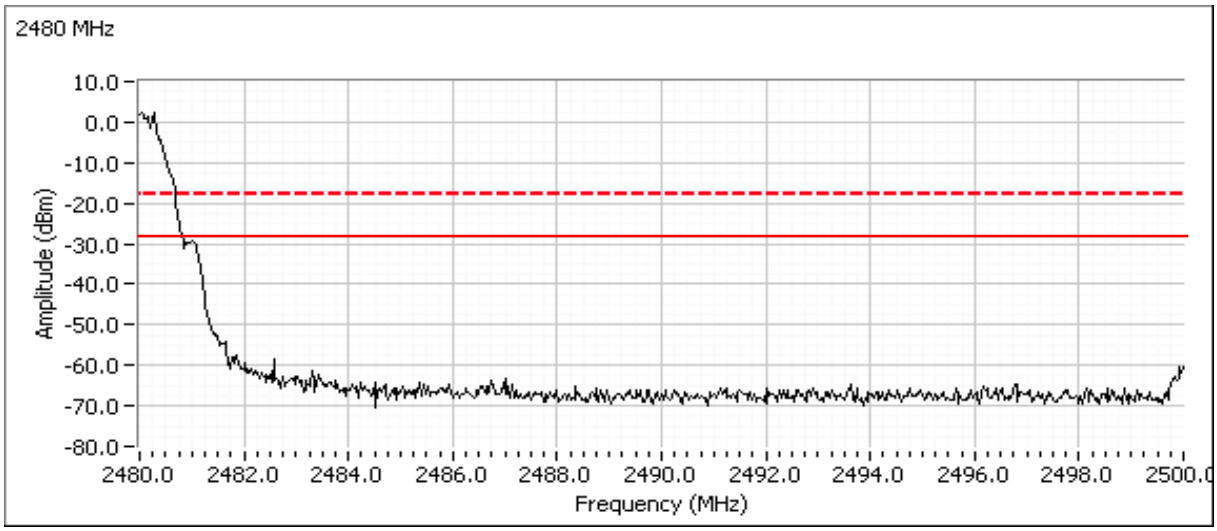


Plots for high channel



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Plot showing -20dBc at the upper band edge



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

FCC 15.247 DTS - Power, 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: 8/4/2011 0:45
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #4
Config. Used: 1
Config Change: none
EUT Voltage: 120V/60Hz

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.

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators used.

Unless stated otherwise the EUT was operating such that it constantly hopped on either the low, center or high channels.

Ambient Conditions:

Temperature: 22.3 °C
Rel. Humidity: 38 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	30 - 18,000 MHz - Transmitter Radiated Spurious Emissions	FCC Part 15.209 / 15.247(c)	Pass	49.2dBµV/m @ 1908.3MHz (-4.8dB)
2	30 - 7500 MHz - Receiver Radiated Spurious Emissions	RSS GEN	Pass	39.6dBµV/m @ 2489.8MHz (-14.4dB)

Not e - Preliminary scans showed no emissions below 1 GHz and above 18GHz from the radio

Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

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.

Run #1: Radiated Spurious Emissions, 30 - 18,000 MHz.

Date of Test: 8/4/2011
Test Engineer: Rafael Varelas
Test Location: FT Chamber#4

Run #1a: Radiated Spurious Emissions, 30 - 18000 MHz. Low Channel @ 2402 MHz

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

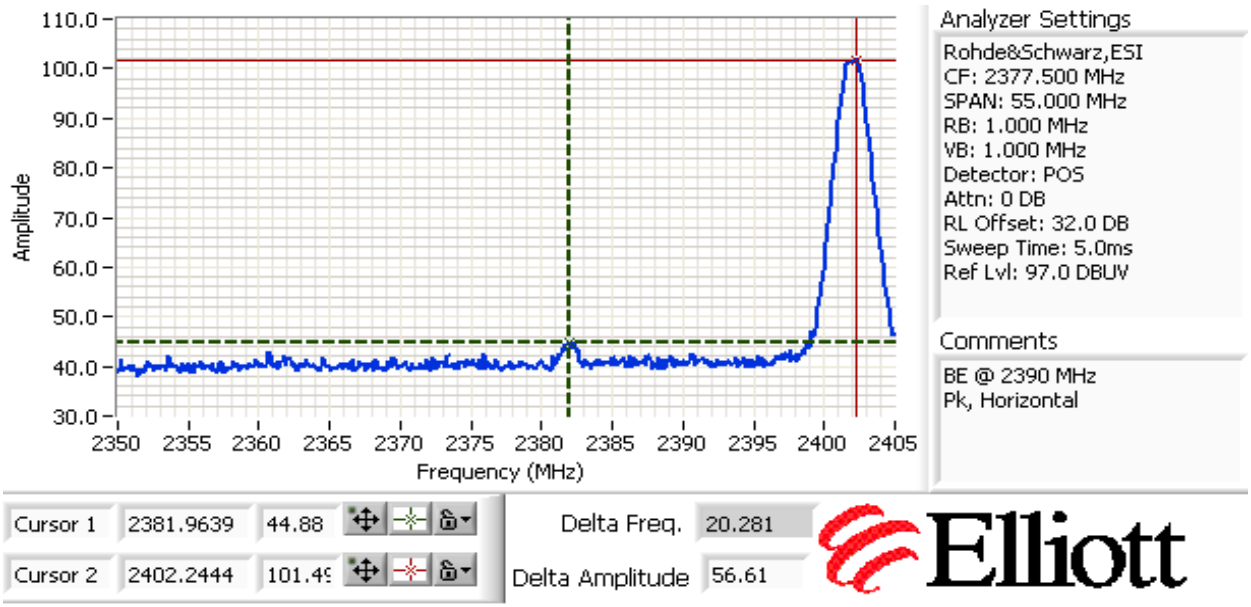
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2402.010	99.8	H	-	-	AVG	360	1.0	RB 1 MHz;VB 10 Hz;Pk
2401.780	102.8	H	-	-	PK	360	1.0	RB 1 MHz;VB 3 MHz;Pk
2402.030	102.1	H	-	-	PK	360	1.0	RB 100 kHz;VB 100 kHz;Pk
2402.030	96.8	V	-	-	AVG	117	0.9	RB 1 MHz;VB 10 Hz;Pk
2401.820	99.8	V	-	-	PK	117	0.9	RB 1 MHz;VB 3 MHz;Pk

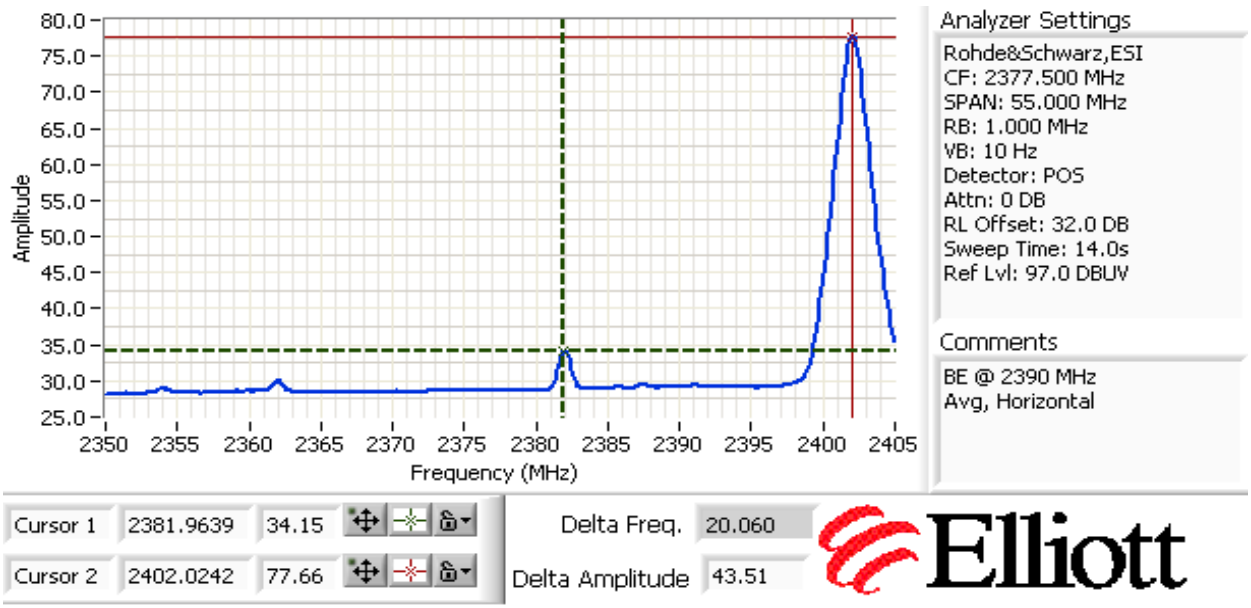
Fundamental emission level @ 3m in 100kHz RBW:	102.1		
Limit for emissions outside of restricted bands:	72.1	dBµV/m	Limit is -30dBc

Band Edge Signal 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	
2381.964	34.2	H	54.0	-19.9	Avg	360	1.2	
2381.964	44.9	H	74.0	-29.1	Pk	360	1.2	
2381.964	34.0	V	54.0	-20.0	Avg	92	1.0	
2382.295	44.6	V	74.0	-29.4	Pk	92	1.0	

Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A



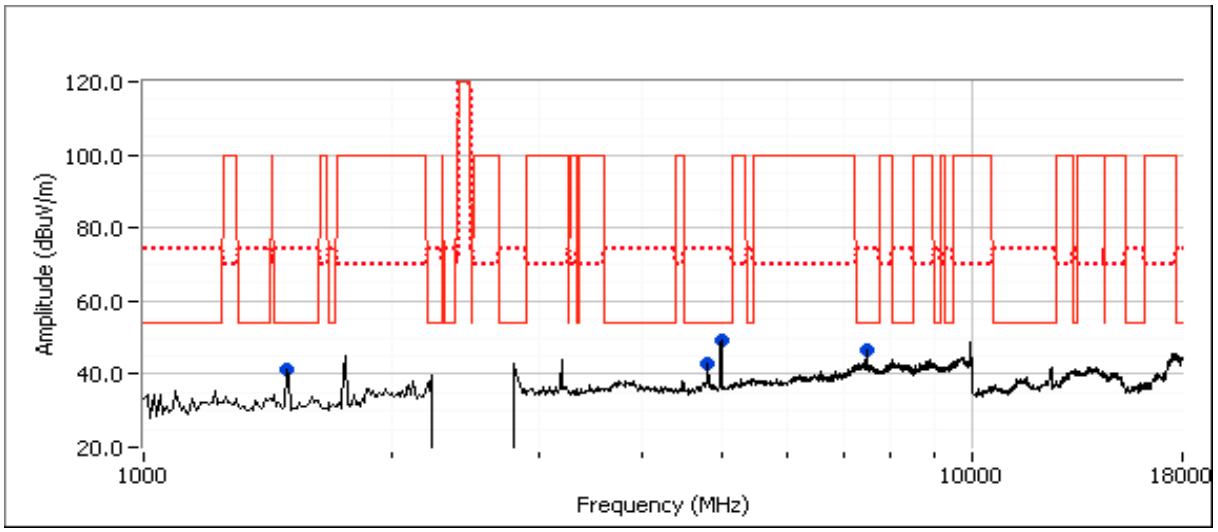


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.200	41.3	H	54.0	-12.7	Peak	275	1.0	
4992.050	36.4	V	54.0	-17.6	AVG	20	1.0	RB 1 MHz;VB 10 Hz;Pk
4992.540	52.3	V	74.0	-21.7	PK	20	1.0	RB 1 MHz;VB 3 MHz;Pk
4803.970	40.7	V	54.0	-13.3	AVG	13	1.0	RB 1 MHz;VB 10 Hz;Pk
4803.780	48.5	V	74.0	-25.5	PK	13	1.0	RB 1 MHz;VB 3 MHz;Pk
7495.890	37.6	V	54.0	-16.4	AVG	345	1.0	RB 1 MHz;VB 10 Hz;Pk
7498.320	50.9	V	74.0	-23.1	PK	345	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.

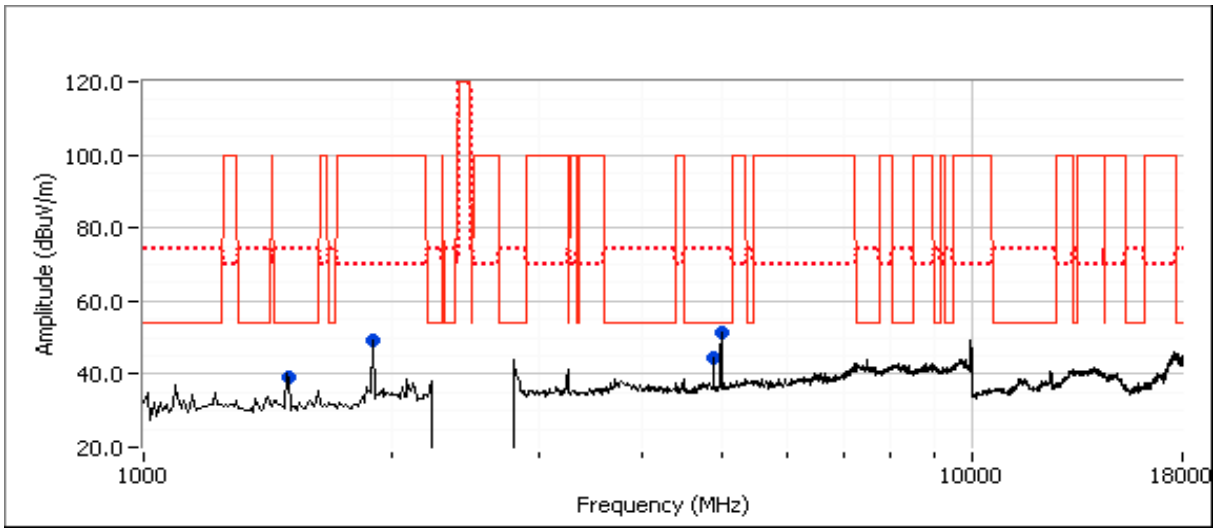


Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #1b: Radiated Spurious Emissions, 30 - 18,000 MHz. Center Channel @ 2440 MHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1908.300	49.2	V	54.0	-4.8	Peak	359	1.5	Note 2
4880.000	42.8	V	54.0	-11.2	AVG	12	1.1	RB 1 MHz;VB 10 Hz;Pk
4978.100	39.8	V	54.0	-14.2	AVG	334	0.9	RB 1 MHz;VB 10 Hz;Pk
1500.030	39.4	H	54.0	-14.6	Peak	263	1.0	
4976.580	56.8	V	74.0	-17.2	PK	334	0.9	RB 1 MHz;VB 3 MHz;Pk
4880.350	49.9	V	74.0	-24.1	PK	12	1.1	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.
Note 2:	Signal is not in a restricted band but the more stringent restricted band limit was used. Peak reading vs average limit



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #1c: Radiated Spurious Emissions, 30 - 18,000 MHz. High Channel @ 2480 MHz

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

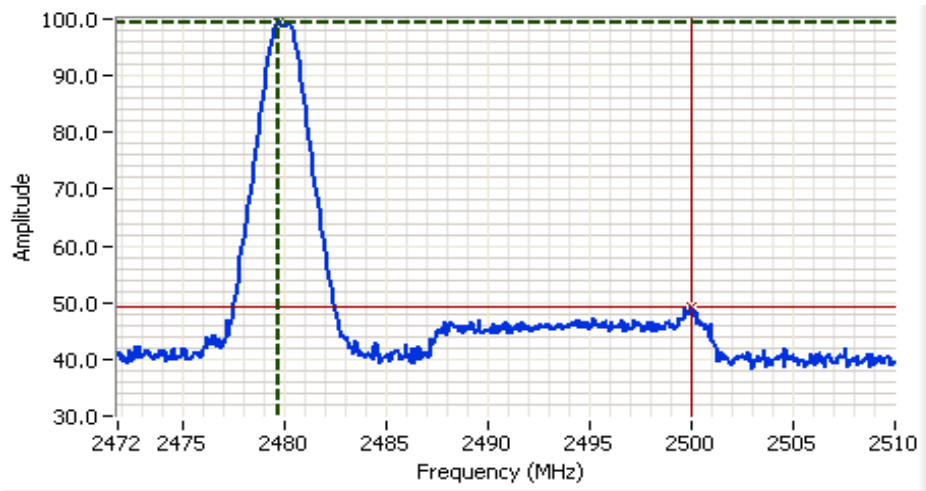
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2480.000	94.4	V	-	-	AVG	260	1.0	RB 1 MHz;VB 10 Hz;Pk
2479.820	97.6	V	-	-	PK	260	1.0	RB 1 MHz;VB 3 MHz;Pk
2480.000	97.8	H	-	-	AVG	136	1.0	RB 1 MHz;VB 10 Hz;Pk
2480.260	100.9	H	-	-	PK	136	1.0	RB 1 MHz;VB 3 MHz;Pk
2480.020	100.1	H	-	-	PK	136	1.0	RB 100 kHz;VB 100 kHz;Pk

Fundamental emission level @ 3m in 100kHz RBW:	100.1		
Limit for emissions outside of restricted bands:	70.1	dBµV/m	Limit is -30dBc

Band Edge Signal 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	
2499.975	34.9	H	54.0	-19.1	Avg	140	1.0	
2500.051	49.3	H	74.0	-24.7	Pk	140	1.0	
2500.051	31.9	V	54.0	-22.1	Avg	260	1.0	
2499.592	46.2	V	74.0	-27.8	Pk	260	1.0	

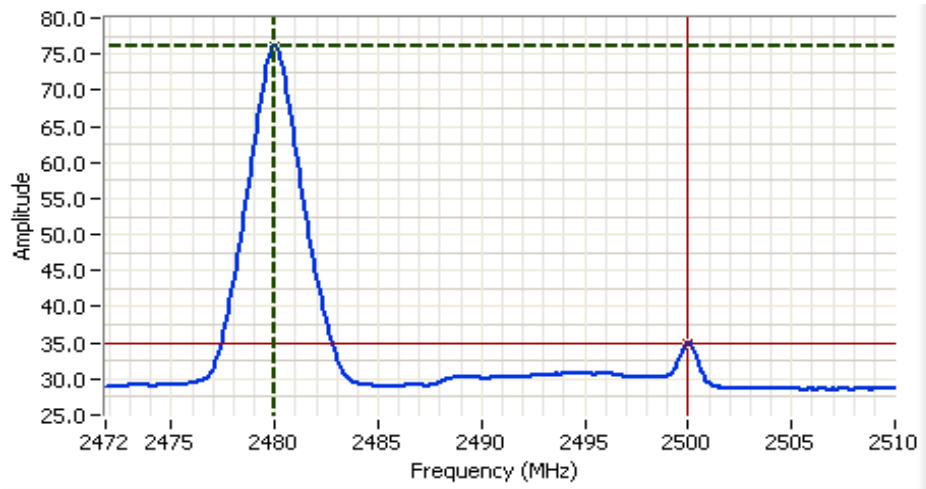
Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A



Analyzer Settings
Rohde&Schwarz,ESI
CF: 2490.906 MHz
SPAN: 38.187 MHz
RB: 1.000 MHz
VB: 1.000 MHz
Detector: POS
Attn: 0 DB
RL Offset: 32.0 DB
Sweep Time: 5.0ms
Ref Lvl: 97.0 DBUV

Comments
BE @ 2483.5 MHz
Pk, Horizontal

Cursor 1	2479.6948	99.24	Delta Freq.	20.356	Elliott
Cursor 2	2500.0513	49.30	Delta Amplitude	49.94	



Analyzer Settings
Rohde&Schwarz,ESI
CF: 2490.906 MHz
SPAN: 38.187 MHz
RB: 1.000 MHz
VB: 10 Hz
Detector: POS
Attn: 0 DB
RL Offset: 32.0 DB
Sweep Time: 9.6s
Ref Lvl: 97.0 DBUV

Comments
BE @ 2483.5 MHz
Avg, Horizontal

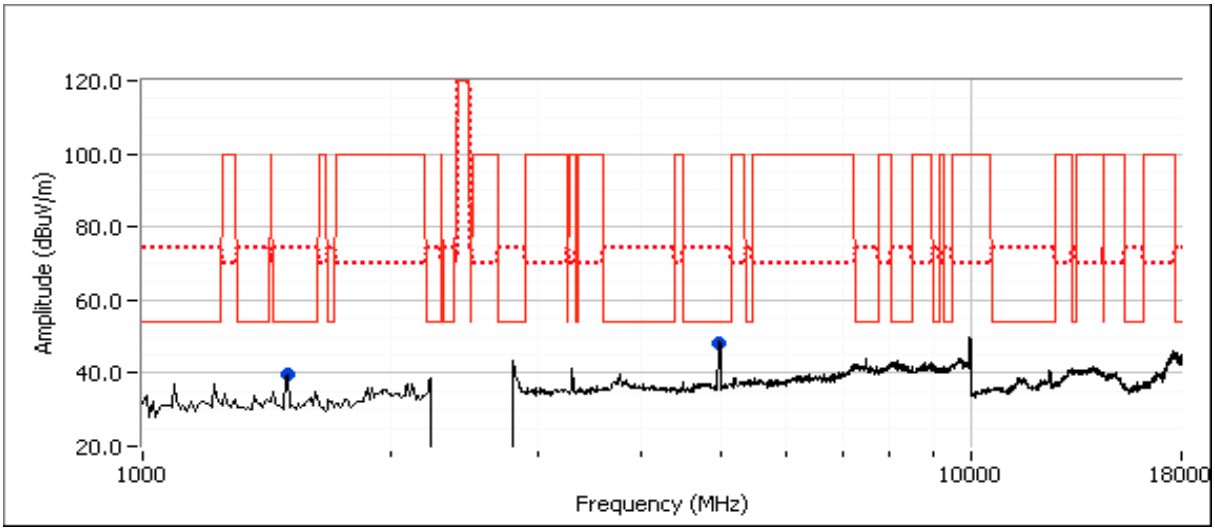
Cursor 1	2480.0010	76.03	Delta Freq.	19.974	Elliott
Cursor 2	2499.9749	34.90	Delta Amplitude	41.13	

Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4959.920	41.3	V	54.0	-12.7	AVG	16	1.0	RB 1 MHz;VB 10 Hz;Pk
4960.220	49.0	V	74.0	-25.0	PK	16	1.0	RB 1 MHz;VB 3 MHz;Pk
1499.210	31.9	H	54.0	-22.1	AVG	279	1.4	RB 1 MHz;VB 10 Hz;Pk
1499.460	44.6	H	74.0	-29.4	PK	279	1.4	RB 1 MHz;VB 3 MHz;Pk
4977.410	39.2	V	54.0	-14.8	AVG	1	1.0	RB 1 MHz;VB 10 Hz;Pk
4976.550	56.7	V	74.0	-17.3	PK	1	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.



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	N/A

Run #2: Receiver Radiated Spurious Emissions, 30 - 7500 MHz.

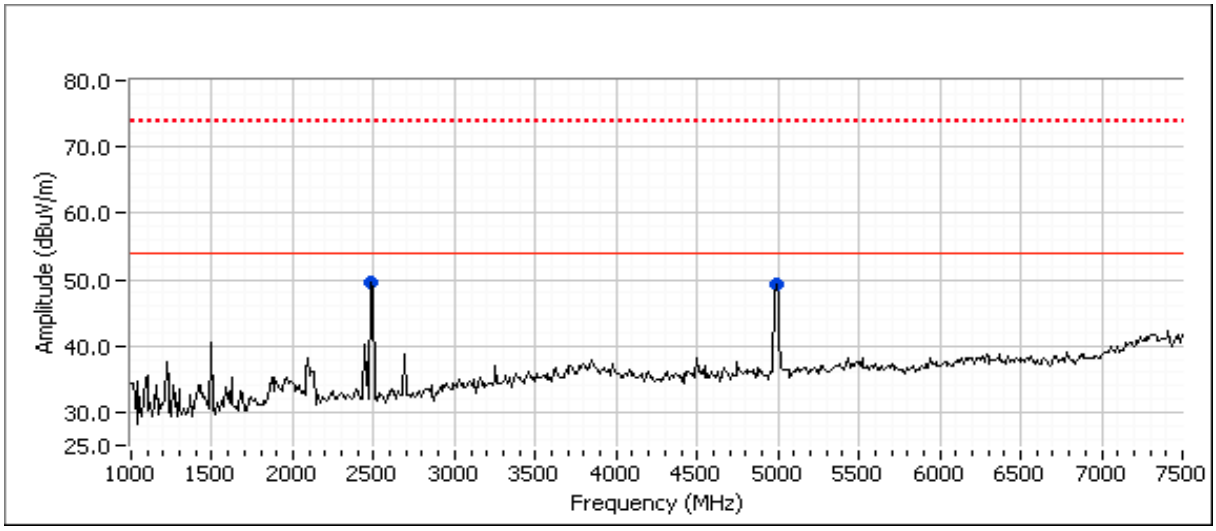
Date of Test: 8/4/2011

Test Engineer: Rafael Varelas

Test Location: FT Chamber#4

Run #2a: Receiver Radiated Spurious Emissions, 30 - 7500 MHz. Center Channel @ 2440 MHz

Frequency	Level	Pol	15.109 / RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2489.760	39.6	H	54.0	-14.4	AVG	68	1.0	RB 1 MHz;VB 10 Hz;Pk
2487.870	55.0	H	74.0	-19.0	PK	68	1.0	RB 1 MHz;VB 3 MHz;Pk
4990.270	39.4	V	54.0	-14.6	AVG	0	1.2	RB 1 MHz;VB 10 Hz;Pk
4992.620	55.9	V	74.0	-18.1	PK	0	1.2	RB 1 MHz;VB 3 MHz;Pk



Client:	Broadcom Corporation	Job Number:	J83157
Model:	BCM943227HMB 802.11bgn WLAN + Bluetooth Mini Card	T-Log Number:	T83863
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247/RSS-210	Class:	-

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: 5/23/2011
Test Engineer: Suresh Kondapalli
Test Location: Fremont Chamber #5
Config. Used: 1
Config Change: None
EUT Voltage: Refer to individual run

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: 22 °C
Rel. Humidity: 35 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power, 120V/60Hz	Class B	PASS	54.8dBµV @ 0.151MHz (-11.1dB)

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.

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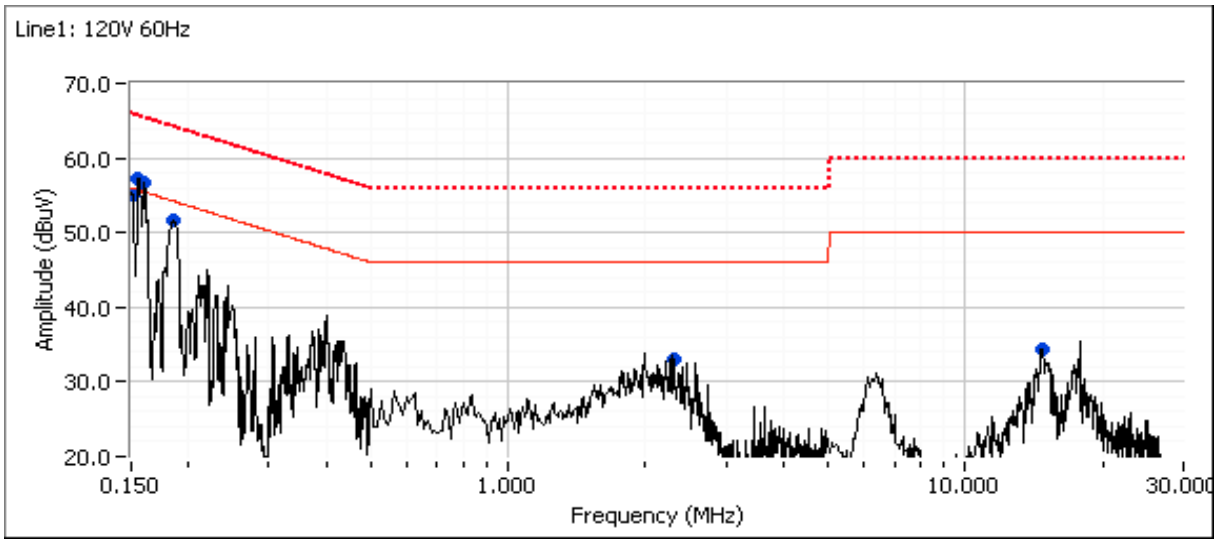
Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz

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

Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.151	*55.1*	*Line 1*	*55.9*	*-0.8*	*Peak*	
0.156	*57.2*	*Line 1*	*55.7*	*1.5*	*Peak*	
0.161	*56.7*	*Line 1*	*55.4*	*1.3*	*Peak*	
0.185	*51.6*	*Line 1*	*54.3*	*-2.7*	*Peak*	
2.304	*33.0*	*Line 1*	*46.0*	*-13.0*	*Peak*	
14.719	*34.3*	*Line 1*	*50.0*	*-15.7*	*Peak*	
0.195	48.7	Neutral	53.8	-5.1	Peak	
0.151	57.1	Neutral	56.0	1.1	Peak	
0.195	48.7	Neutral	53.8	-5.1	Peak	
0.182	51.3	Neutral	54.4	-3.1	Peak	
2.150	33.2	Neutral	46.0	-12.8	Peak	
14.845	33.9	Neutral	50.0	-16.1	Peak	



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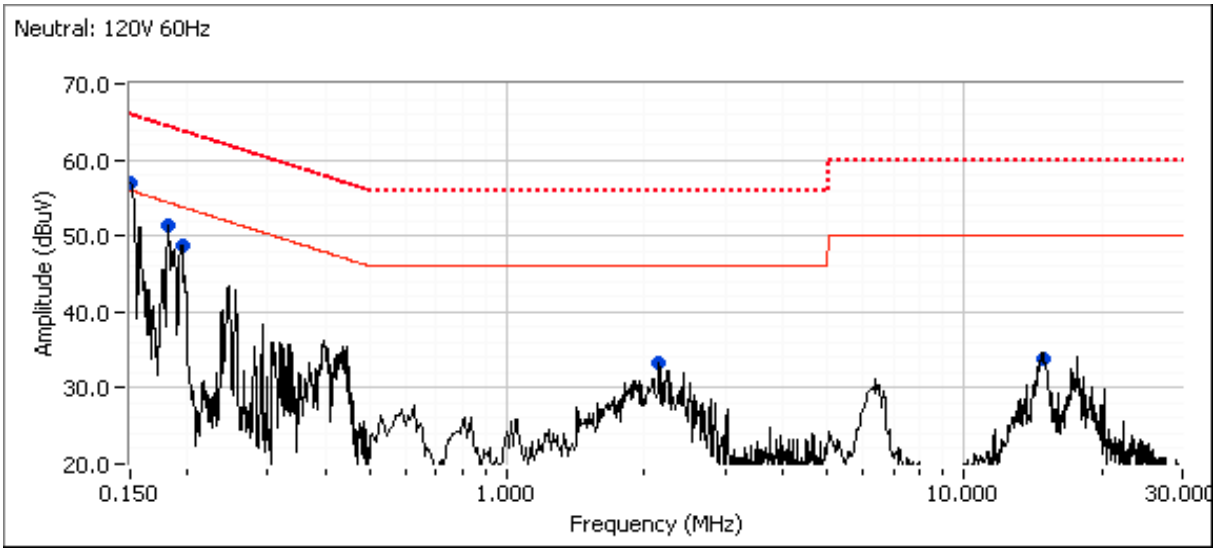

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Standard:	FCC 15.247/RSS-210	Class:	-

Final quasi-peak and average readings

Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.151	54.8	Neutral	65.9	-11.1	QP	QP (1.00s)
0.151	54.5	Line 1	65.9	-11.4	QP	QP (1.00s)
0.160	52.9	Line 1	65.5	-12.6	QP	QP (1.00s)
0.156	52.9	Line 1	65.7	-12.8	QP	QP (1.00s)
0.186	49.6	Line 1	64.2	-14.6	QP	QP (1.00s)
0.182	48.9	Neutral	64.4	-15.5	QP	QP (1.00s)
0.195	47.0	Neutral	63.8	-16.8	QP	QP (1.00s)
0.195	47.0	Neutral	63.8	-16.8	QP	QP (1.00s)
0.151	35.3	Line 1	55.9	-20.6	AVG	AVG (0.10s)
0.156	35.0	Line 1	55.7	-20.7	AVG	AVG (0.10s)
0.160	34.7	Line 1	55.5	-20.8	AVG	AVG (0.10s)
0.186	33.2	Line 1	54.2	-21.0	AVG	AVG (0.10s)
0.151	34.5	Neutral	55.9	-21.4	AVG	AVG (0.10s)
0.182	32.2	Neutral	54.4	-22.2	AVG	AVG (0.10s)
0.195	31.1	Neutral	53.8	-22.7	AVG	AVG (0.10s)
2.150	22.4	Neutral	46.0	-23.6	AVG	AVG (0.10s)
0.195	29.9	Neutral	53.8	-23.9	AVG	AVG (0.10s)
2.296	21.2	Line 1	46.0	-24.8	AVG	AVG (0.10s)
14.845	24.0	Neutral	50.0	-26.0	AVG	AVG (0.10s)
14.678	23.7	Line 1	50.0	-26.3	AVG	AVG (0.10s)
2.150	28.3	Neutral	56.0	-27.7	QP	QP (1.00s)
2.296	27.6	Line 1	56.0	-28.4	QP	QP (1.00s)
14.845	31.5	Neutral	60.0	-28.5	QP	QP (1.00s)
14.678	31.2	Line 1	60.0	-28.8	QP	QP (1.00s)

End of Report

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