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: BCM943142HM

IC CERTIFICATION #:	4324A-BRCM1063
FCC ID:	QDS-BRCM1063
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
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Testing Cert #2016.01

REVISION HISTORY

Rev#	Date	Comments	Modified By
-	10-31-2011	First release	

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SCOPE

An electromagnetic emissions test has been performed on the Broadcom Corporation model BCM943142HM, 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 BCM943142HM 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 BCM943142HM 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) – 802.11bgn operation

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 210 A8.2	Digital Modulation	Systems uses OFDM / DSSS techniques	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth	802.11b: 7.2 MHz 802.11g: 16.0 MHz 802.11n40: 34.8 MHz BLE: 0.63 MHz	>500kHz	Complies
15.247 (b) (3)	RSS 210 A8.2 (4)	Output Power (multipoint systems)	802.11b: 15.5 dBm 802.11g: 14.9 dBm 802.11n40: 13.2 dBm BLE:-1.2dBm EIRP = 0.087 W Note 1	1Watt, EIRP limited to 4 Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	802.11b: -2.3 dBm / 3kHz 802.11g: -4.8 dBm / 3kHz 802.11n40: -9.3 dBm / 3kHz BLE:-15.4 dBm / 3kHz	8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	All emissions < 30dBc	< -30dBc Note 2	Complies
15.247(c) / 15.209	RSS 210 A8.5	Radiated Spurious Emissions 30MHz – 25 GHz	74.0dBµV/m @ 2388.4MHz (0.0dB)	15.207 in restricted bands, all others <-30dBc Note 2	Complies

Note 1: EIRP calculated using antenna gain of 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). For BLE mode, limit of -20dBc was used because peak power was measured.

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	EUT uses u.FL connectors	Unique or integral antenna required	Complies
15.207	RSS GEN Table 2	AC Conducted Emissions	50.3dBµV @ 1.295MHz (-5.7dB)	Refer to page 18	Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	42.4dBµV/m @ 1297.4MHz (-11.6dB)	Refer to page 19	Complies
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations in Exhibit 11, RSS 102 declaration and User Manual statements.	Refer to OET 65, FCC Part 1 and RSS 102	Complies
-	RSP 100 RSS GEN 7.1.5	User Manual		Statement required regarding non-interference	Complies
-	RSP 100 RSS GEN 7.1.5	User Manual		Statement for products with detachable antenna	Complies
-	RSP 100 RSS GEN 4.4.1	99% Bandwidth	802.11b: 13.1 MHz 802.11g: 16.8 MHz 802.11n40: 36.2 MHz BLE:1.098 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 BCM943142HM is a 802.11bgn WLAN + Bluetooth PCI-E Mini Card. The EUT would be installed within a table top host product during normal operation, therefore, the EUT was treated as table-top equipment. The electrical rating of the EUT is powered from 3.3V from the host system.

The sample was received on September 27, 2011 and tested on September 27 and 29, and October 14, 15 and 18, 2011. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Broadcom	BCM943142HM	802.11bgn WLAN + Bluetooth PCI-E Mini Card	561	QDS-BRCM1063

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 R85236.

ANTENNA SYSTEM

The EUT antenna is a 3.9dBi WLAN antenna.

The antenna connects to the EUT via a non-standard u.FL antenna connector, 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	G560	Laptop Computer	CBU4495773	-
Lenovo	ADP-65Y	AC/DC Adapter	11S42T4458Z1 ZF4K96V9S9	-

No remote support equipment was used during testing.

EUT INTERFACE PORTS

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Laptop - DC Power In	AC/DC Adapter	Multiconductor	Unshielded	1.5
AC/DC Adapter	AC Mains	3Wire	Unshielded	1.5

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 802.11n40, the data rate was set to MCS0. These data rates represent worse case, as they resulted in the highest output power.

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	

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.

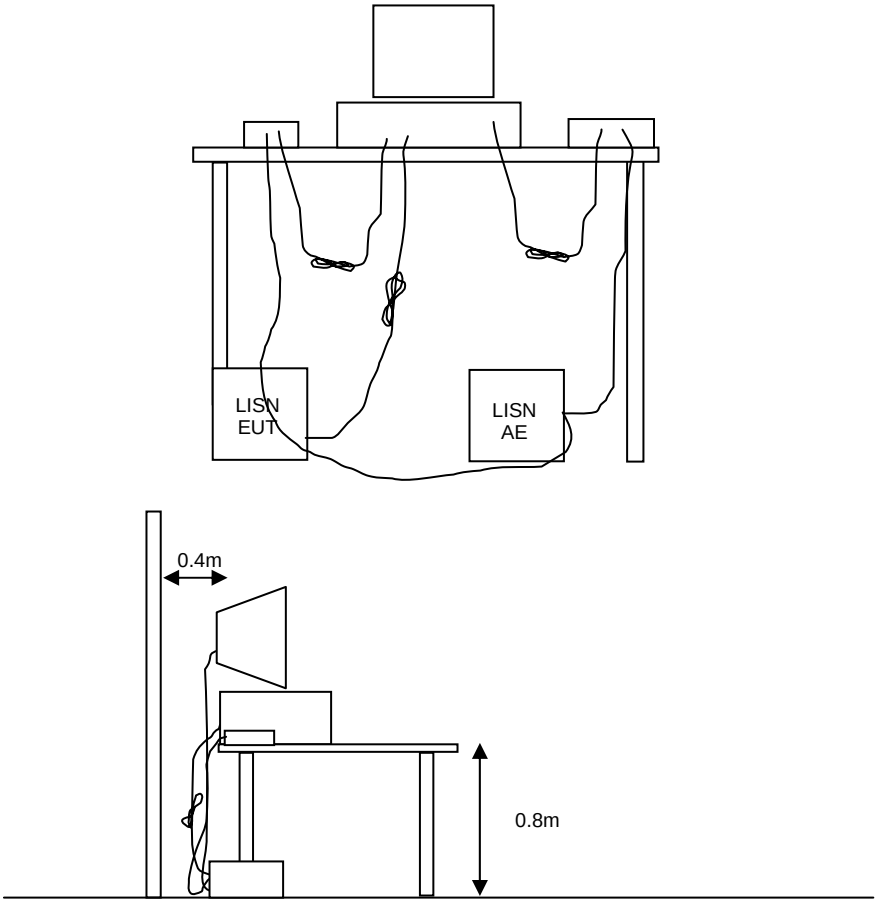


Figure 1 Typical Conducted Emissions Test Configuration

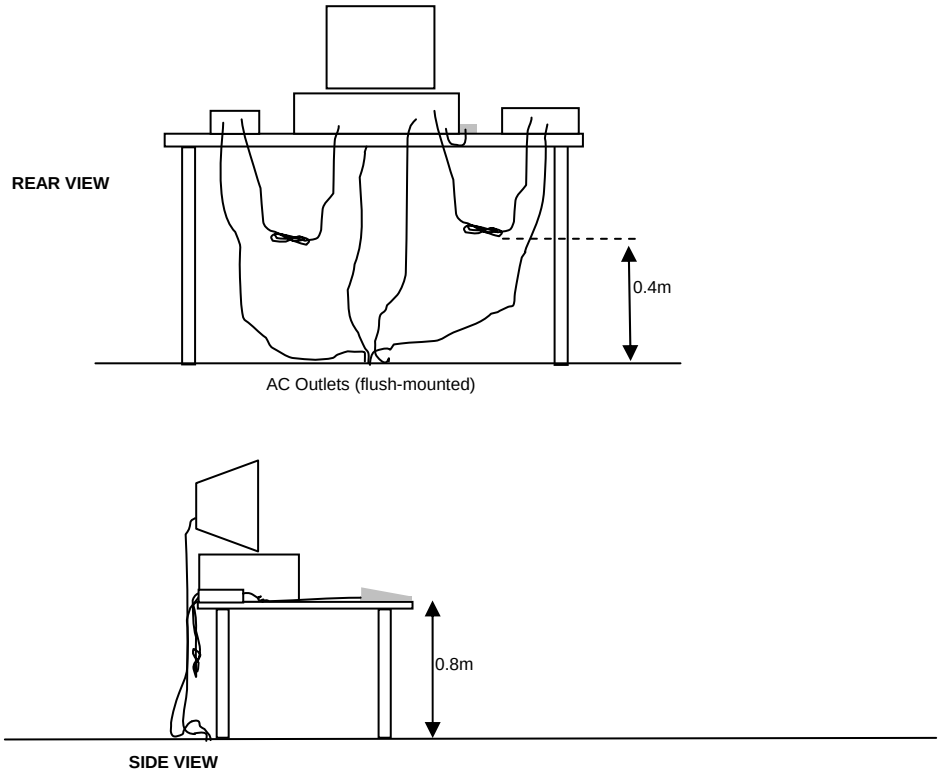
RADIATED EMISSIONS

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.

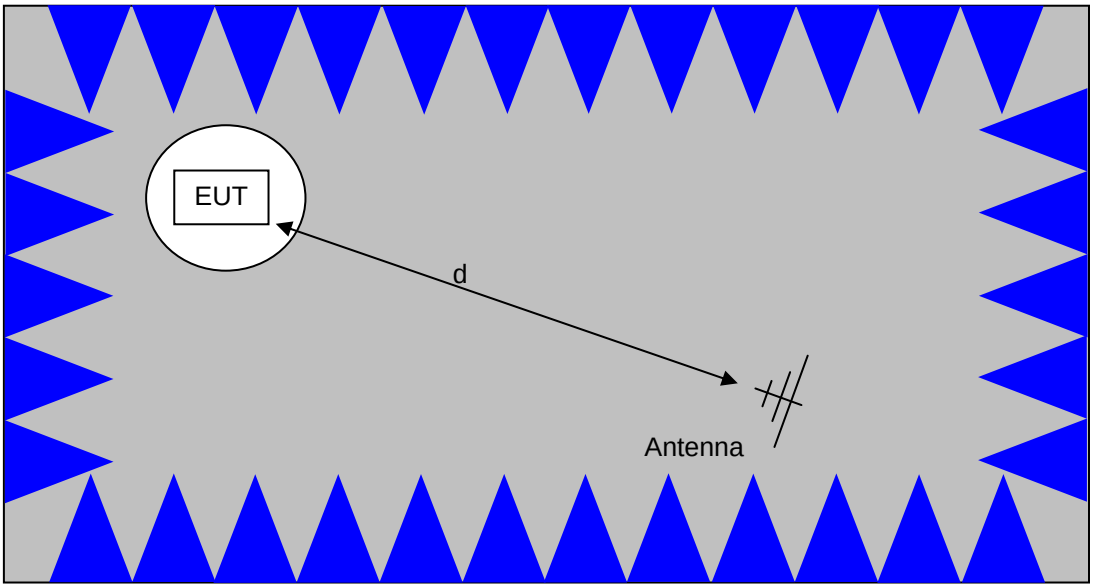
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

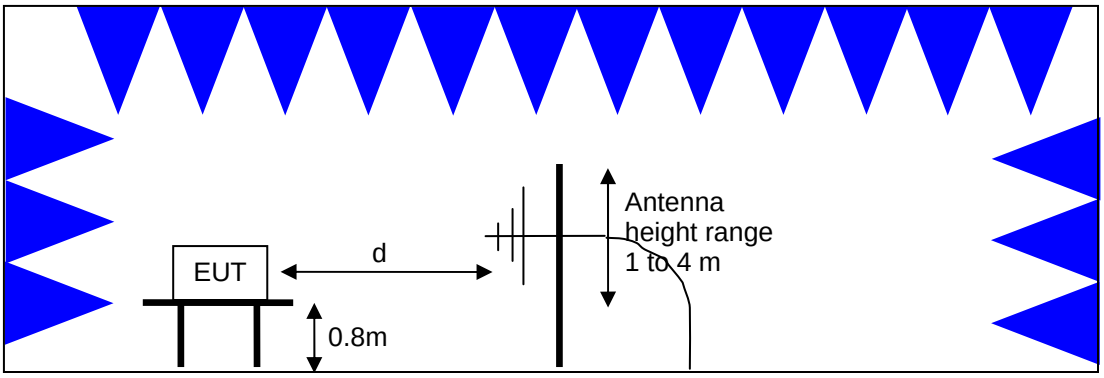


Typical Test Configuration for Radiated Field Strength Measurements



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.

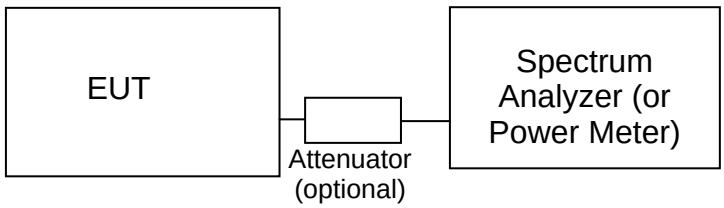
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



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

DTS Bandedges, 27-Sep-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

Radiated Spurious Emissions, 1000 - 18,000 MHz, 29-Sep-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/8/2011
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/6/2012
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	8/15/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	4/6/2012
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2249	10/11/2011

Radiated Emissions, 1000 - 26,500 MHz, 14-Oct-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/8/2011
Hewlett Packard	Head (Inc flex cable, 1143, 2198) Red	84125C	1145	2/17/2012
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	8/15/2012
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
A.H. Systems	Purple System Horn, 18-40GHz	SAS-574, p/n: 2581	2160	2/9/2012

Radio Antenna Port (Power and Spurious Emissions), 14-Oct-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	8/9/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	11/2/2011

Radiated Emissions, 30 - 1,000 MHz, 15-Oct-11

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	11/2/2011
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447D OPT 010	1826	5/17/2012
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	2197	12/29/2011

Conducted Emissions - AC Power Ports, 15-Oct-11

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	812	1/18/2012
EMCO	LISN, 10 kHz-100 MHz, 25A	3825/2	1292	3/1/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	11/2/2011

Radiated Emissions, 30 - 1,000 MHz, 18-Oct-11

Manufacturer	Description	Model	Asset #	Cal Due
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
Com-Power Corp.	Preamplifier, 30-1000 MHz	PA-103A	2359	2/15/2012

Radiated Emissions, 30 - 1,000 MHz, 18-Oct-11

Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	08-Dec-11
Hewlett Packard	Head (Inc flex cable, 1143, 2198) Red	84125C	1145	17-Feb-12
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	15-Aug-12
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	21-Sep-12
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	03-Aug-12
A.H. Systems	Purple System Horn, 18-40GHz	SAS-574, p/n: 2581	2160	09-Feb-12

Radio Antenna Port (Power and Spurious Emissions), 26-Oct-11

Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	09-Aug-12
Rohde & Schwarz	Power Sensor 100 uW - 2 Watts use with 20dB attenuator sn:100059 only	NRV-Z32	1423	01-Sep-12
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1539	09-Sep-12

Appendix B Test Data

T84936 Pages 26 - 94

Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		-
Emissions Standard(s):	FCC 15.247, 15.E, RSS-210	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Broadcom

Model

BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)

Date of Last Test: 10/28/2011

Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, 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: 10/14/2011
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #4
Config. Used: 2
Config Change: Added Mouse and Remote Hub
EUT Voltage: 120V/60Hz

General Test Configuration

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

Ambient Conditions:

Temperature: 21.2 °C
Rel. Humidity: 41 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power,120V/60Hz	Class B	Pass	50.3dBµV @ 1.295MHz (-5.7dB)

Modifications Made During Testing

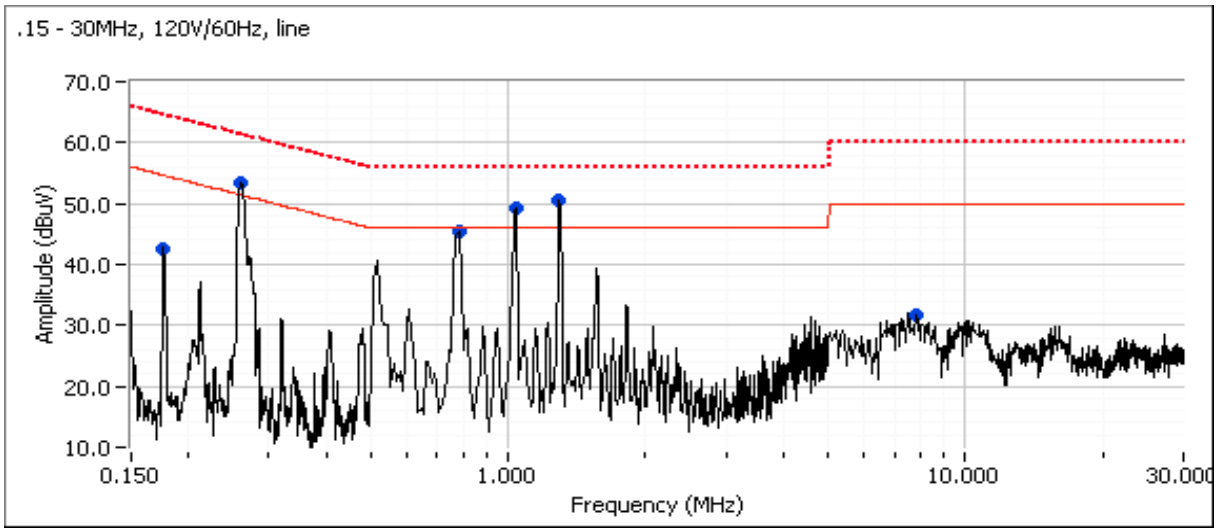
No modifications were made to the EUT during testing

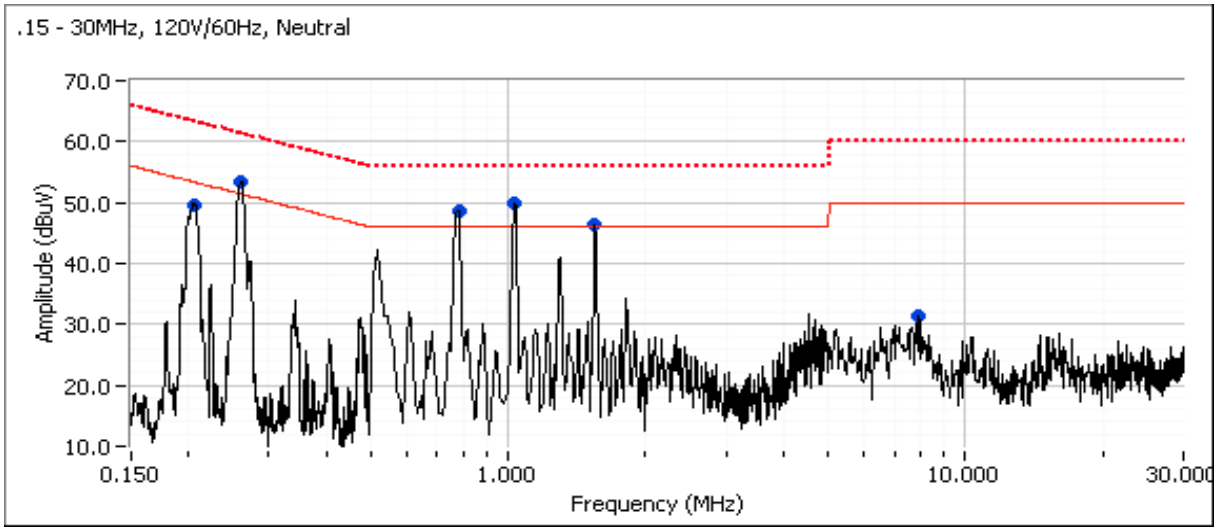
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	-

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





Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	-

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	
0.175	42.6	Line 1	54.7	-12.1	Peak	
0.259	53.3	Line 1	51.4	1.9	Peak	
0.778	45.4	Line 1	46.0	-0.6	Peak	
1.038	49.3	Line 1	46.0	3.3	Peak	
1.295	50.4	Line 1	46.0	4.4	Peak	
7.858	31.6	Line 1	50.0	-18.4	Peak	
0.205	49.7	Neutral	53.3	-3.6	Peak	
0.259	53.3	Neutral	51.4	1.9	Peak	
0.776	48.6	Neutral	46.0	2.6	Peak	
1.034	49.8	Neutral	46.0	3.8	Peak	
1.551	46.4	Neutral	46.0	0.4	Peak	
7.933	31.5	Neutral	50.0	-18.5	Peak	

Final quasi-peak and average readings

Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
1.295	50.3	Line 1	56.0	-5.7	QP	QP (1.00s)
0.777	39.8	Line 1	46.0	-6.2	AVG	AVG (0.10s)
0.776	39.7	Neutral	46.0	-6.3	AVG	AVG (0.10s)
1.034	49.5	Neutral	56.0	-6.5	QP	QP (1.00s)
1.038	48.5	Line 1	56.0	-7.5	QP	QP (1.00s)
1.295	38.4	Line 1	46.0	-7.6	AVG	AVG (0.10s)
0.777	48.1	Line 1	56.0	-7.9	QP	QP (1.00s)
0.259	53.2	Line 1	61.5	-8.3	QP	QP (1.00s)
0.776	47.7	Neutral	56.0	-8.3	QP	QP (1.00s)
0.259	53.0	Neutral	61.5	-8.5	QP	QP (1.00s)
1.034	36.3	Neutral	46.0	-9.7	AVG	AVG (0.10s)
1.038	35.3	Line 1	46.0	-10.7	AVG	AVG (0.10s)
0.259	40.6	Neutral	51.5	-10.9	AVG	AVG (0.10s)
0.259	40.5	Line 1	51.5	-11.0	AVG	AVG (0.10s)
1.551	35.0	Neutral	46.0	-11.0	AVG	AVG (0.10s)
1.551	41.9	Neutral	56.0	-14.1	QP	QP (1.00s)
0.205	47.6	Neutral	63.4	-15.8	QP	QP (1.00s)
0.205	33.7	Neutral	53.4	-19.7	AVG	AVG (0.10s)

Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions (WiFi Operation)

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: 21.9 °C
Rel. Humidity: 42 %

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

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
Run #1	802.11b Aux	#1 2412MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	45.8dBµV/m @ 4824.1MHz (-8.2dB)
		#6 2437MHz	-	-			52.2dBµV/m @ 7310.3MHz (-1.8dB)
		#11 2462MHz	-	-			51.4dBµV/m @ 7385.2MHz (-2.6dB)
Run # 2	802.11g Aux	#1 2412MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	62.2dBµV/m @ 3741.0MHz (-11.8dB)
		#6 2437MHz	-	-			44.8dBµV/m @ 7312.2MHz (-9.2dB)
		#11 2462MHz	-	-			45.3dBµV/m @ 7386.4MHz (-8.7dB)
Run # 3	802.11n40 Aux	#3 2422MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	46.8dBµV/m @ 1293.3MHz (-23.2dB)
		#6 2437MHz	-	-			41.3dBµV/m @ 7302.8MHz (-12.7dB)
		#9 2452MHz	-	-			41.8dBµV/m @ 7353.3MHz (-12.2dB)
Run # 4	RX Aux	#6 2437MHz	-	-	Radiated Emissions, 1 - 8 GHz	RSS-GEN	42.4dBµV/m @ 1297.4MHz (-11.6dB)

Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, 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.

Note - preliminary testing showed no radio related emissions (Tx or Rx) below 1 GHz.

Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #1, Radiated Spurious Emissions, 1-26GHz, 802.11b, Aux

Date of Test: 10/13/2011 Test Location: FT Chamber #3

Test Engineer: Rafael Varelas Config Change: None

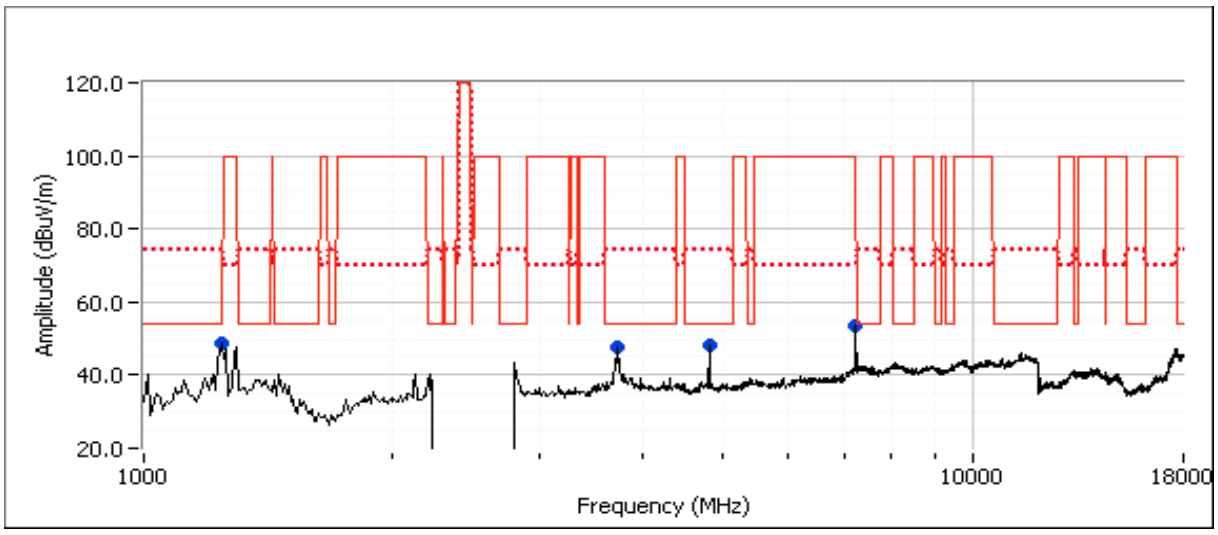
Run #1a, EUT on Channel #1 2412MHz - 802.11b, Aux

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4824.060	45.8	H	54.0	-8.2	AVG	158	1.0	RB 1 MHz;VB 10 Hz;Pk
4824.100	50.1	H	74.0	-23.9	PK	158	1.0	RB 1 MHz;VB 3 MHz;Pk
1227.680	33.0	H	54.0	-21.0	AVG	84	1.1	RB 1 MHz;VB 10 Hz;Pk
1228.160	55.4	H	74.0	-18.6	PK	84	1.1	RB 1 MHz;VB 3 MHz;Pk
3736.780	34.7	V	54.0	-19.3	AVG	91	1.0	RB 1 MHz;VB 10 Hz;Pk
3741.270	59.7	V	74.0	-14.3	PK	91	1.0	RB 1 MHz;VB 3 MHz;Pk
7236.240	53.5	V	-	-	Peak	351	1.3	Note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.
Note 2:	Emission in non restricted band, refer to antenna port conducted measurements.



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

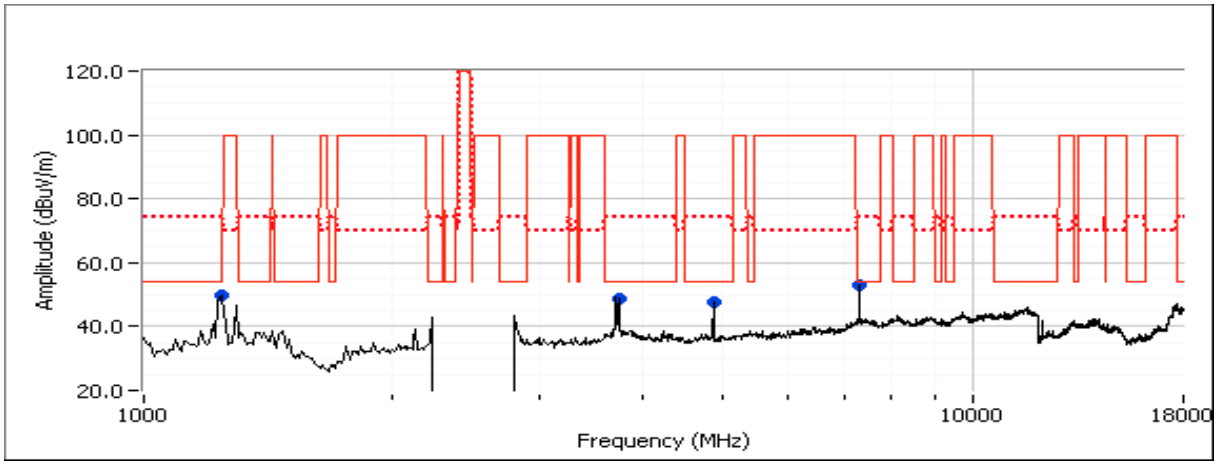
Run #1b: , EUT on Channel #6 2437MHz - 802.11b, Aux

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7310.290	52.2	V	54.0	-1.8	AVG	28	1.0	RB 1 MHz;VB 10 Hz;Pk
7309.890	58.2	V	74.0	-15.8	PK	28	1.0	RB 1 MHz;VB 3 MHz;Pk
1234.190	28.4	H	54.0	-25.6	AVG	253	1.0	RB 1 MHz;VB 10 Hz;Pk
1232.110	44.6	H	74.0	-29.4	PK	253	1.0	RB 1 MHz;VB 3 MHz;Pk
4874.010	45.6	H	54.0	-8.4	AVG	204	1.8	RB 1 MHz;VB 10 Hz;Pk
4873.930	50.1	H	74.0	-23.9	PK	204	1.8	RB 1 MHz;VB 3 MHz;Pk
3731.560	33.5	V	54.0	-20.5	AVG	199	1.0	RB 1 MHz;VB 10 Hz;Pk
3743.490	50.6	V	74.0	-23.4	PK	199	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 is -30dBc for peak measurements in a measurement bandwidth of 100kHz.
Note 2:	Scans made between 18 - 26GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no signifcant emissions in this frequency range



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

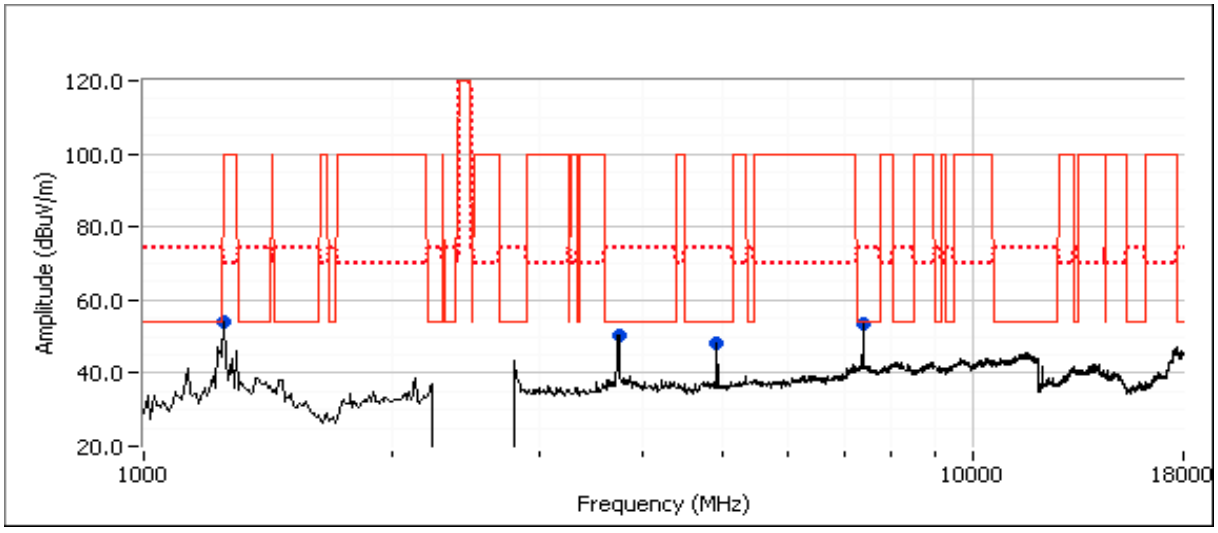
Run #1c: , EUT on Channel #11 2462MHz - 802.11b, Aux

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7385.240	51.4	V	54.0	-2.6	AVG	37	1.1	RB 1 MHz;VB 10 Hz;Pk
7387.180	57.0	V	74.0	-17.0	PK	37	1.1	RB 1 MHz;VB 3 MHz;Pk
4924.050	47.9	H	54.0	-6.1	AVG	340	1.0	RB 1 MHz;VB 10 Hz;Pk
4924.140	51.4	H	74.0	-22.6	PK	340	1.0	RB 1 MHz;VB 3 MHz;Pk
3757.460	33.3	V	54.0	-20.7	AVG	306	1.0	RB 1 MHz;VB 10 Hz;Pk
3757.030	49.5	V	74.0	-24.5	PK	306	1.0	RB 1 MHz;VB 3 MHz;Pk
1231.850	53.8	V	-	-	Peak	187	1.9	Note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.
Note 2:	Emission in non restricted band, refer to antenna port conducted measurements.



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run # 2, Radiated Spurious Emissions, 1-26GHz, 802.11g, Aux

Date of Test: 10/13/2011 Test Location: FT Chamber #3

Test Engineer: Rafael Varelas Config Change: None

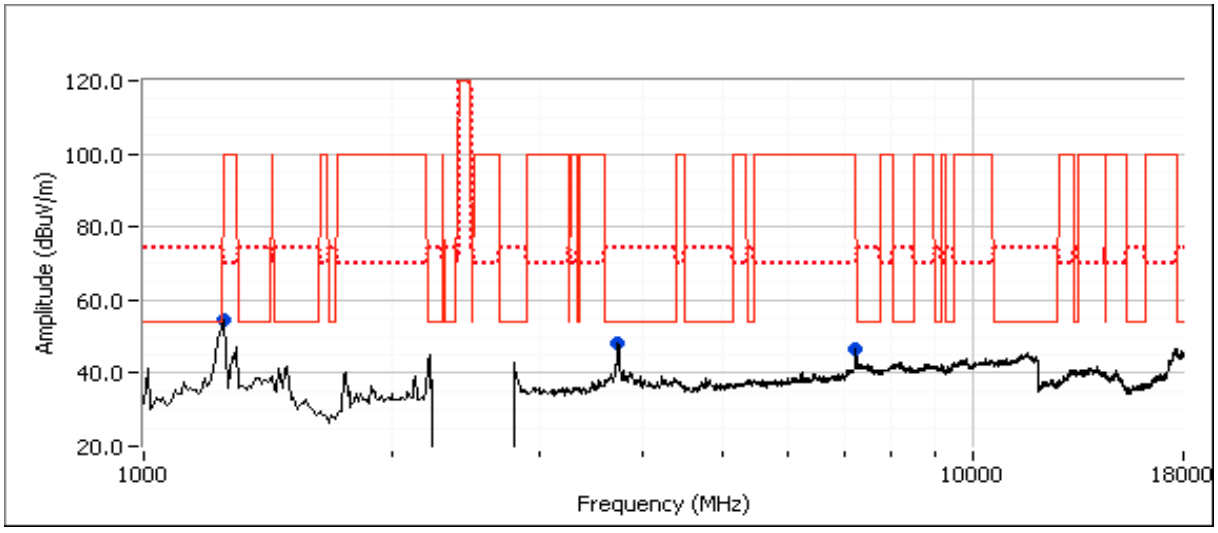
Run # 2a, EUT on Channel #1 2412MHz - 802.11g, Aux

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3740.970	62.2	V	74.0	-11.8	PK	290	1.2	RB 1 MHz;VB 3 MHz;Pk
3713.310	37.5	V	54.0	-16.5	AVG	290	1.2	RB 1 MHz;VB 10 Hz;Pk
1232.770	54.8	H	-	-	Peak	161	1.6	Note 2
7236.350	46.5	V	-	-	Peak	173	1.9	Note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.
Note 2:	Emission in non restricted band, refer to antenna port conducted measurements.



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

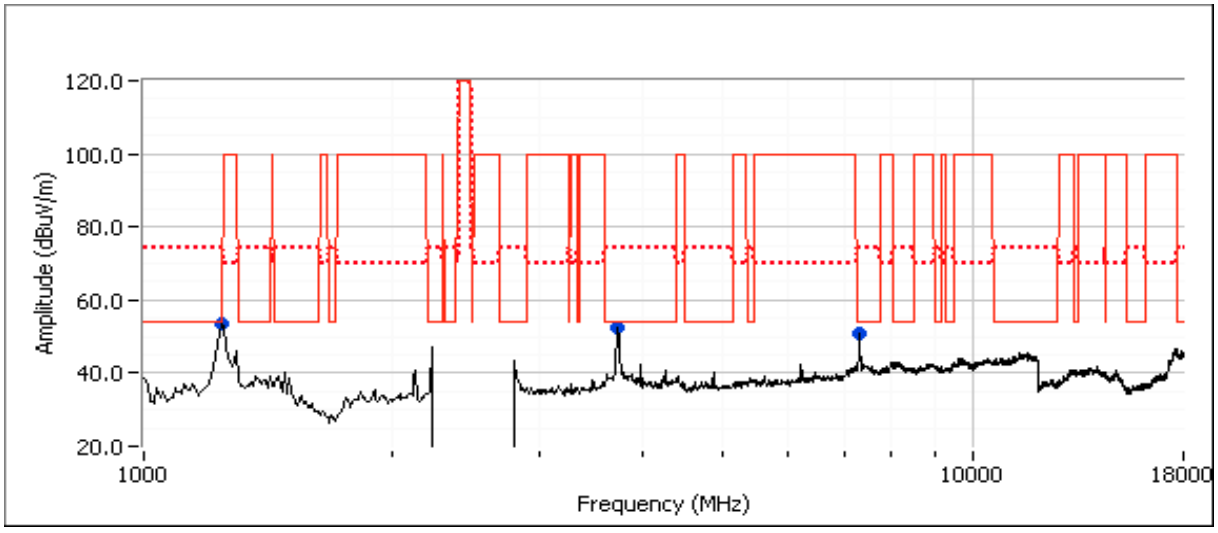
Run # 2b: , EUT on Channel #6 2437MHz - 802.11g, Aux

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7312.230	44.8	V	54.0	-9.2	AVG	350	1.1	RB 1 MHz;VB 10 Hz;Pk
7315.030	57.9	V	74.0	-16.1	PK	350	1.1	RB 1 MHz;VB 3 MHz;Pk
1232.030	33.3	H	54.0	-20.7	AVG	197	1.0	RB 1 MHz;VB 10 Hz;Pk
1230.840	55.2	H	74.0	-18.8	PK	197	1.0	RB 1 MHz;VB 3 MHz;Pk
3738.250	35.2	V	54.0	-18.8	AVG	279	1.0	RB 1 MHz;VB 10 Hz;Pk
3740.850	59.4	V	74.0	-14.6	PK	279	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 is -30dBc for peak measurements in a measurement bandwidth of 100kHz.
Note 2:	Scans made between 18 - 26GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no signifcant emissions in this frequency range



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

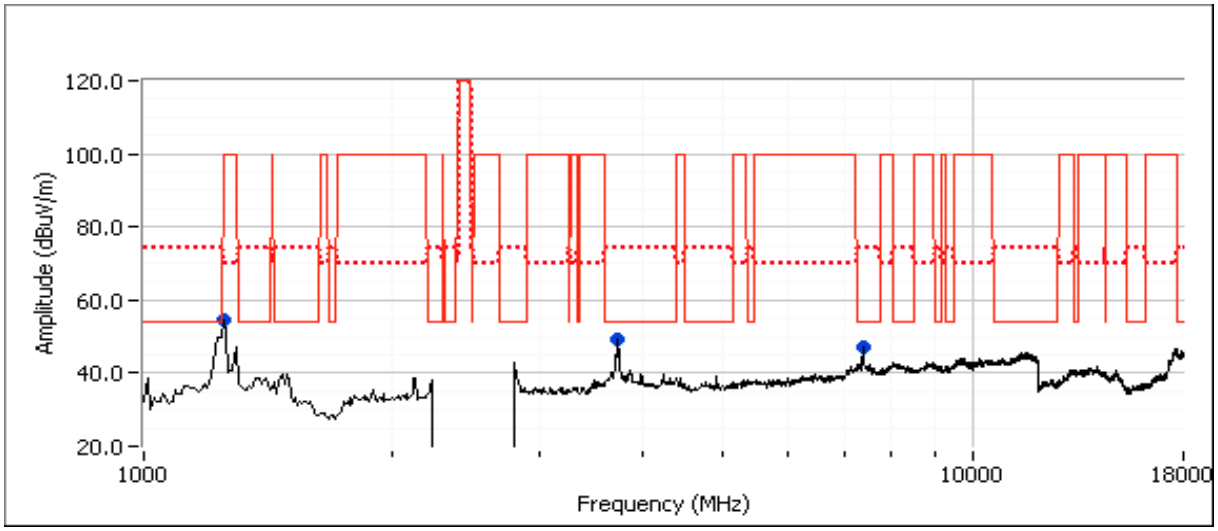
Run # 2c: , EUT on Channel #11 2462MHz - 802.11g, Aux

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7386.440	45.3	V	54.0	-8.7	AVG	360	1.7	RB 1 MHz;VB 10 Hz;Pk
7387.510	58.8	V	74.0	-15.2	PK	360	1.7	RB 1 MHz;VB 3 MHz;Pk
3743.800	34.1	V	54.0	-19.9	AVG	59	1.0	RB 1 MHz;VB 10 Hz;Pk
3742.760	56.3	V	74.0	-17.7	PK	59	1.0	RB 1 MHz;VB 3 MHz;Pk
1231.670	54.8	V	-	-	Peak	195	1.6	Note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.
Note 2:	Emission in non restricted band, refer to antenna port conducted measurements.



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run # 3, Radiated Spurious Emissions, 1-26GHz, 802.11n40, Aux

Date of Test: 10/13/2011 Test Location: FT Chamber #3

Test Engineer: Rafael Varelas Config Change: None

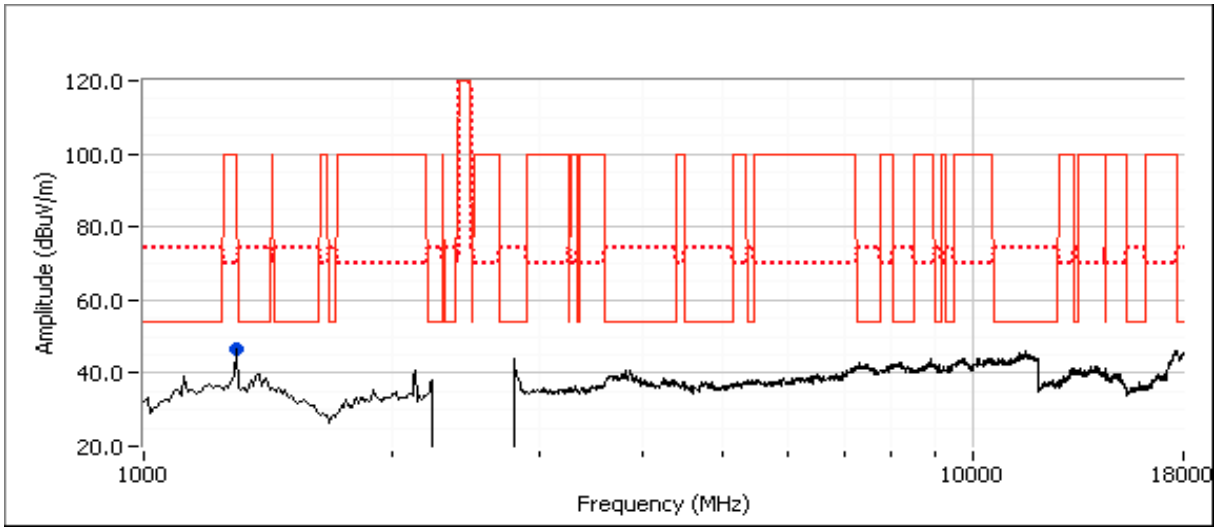
Run # 3a, EUT on Channel #3 2422MHz - 802.11n40, Aux

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1293.330	46.8	H	-	-	Peak	170	1.0	Note 2

Note 2:	Emission in non restricted band, refer to antenna port conducted measurements.



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

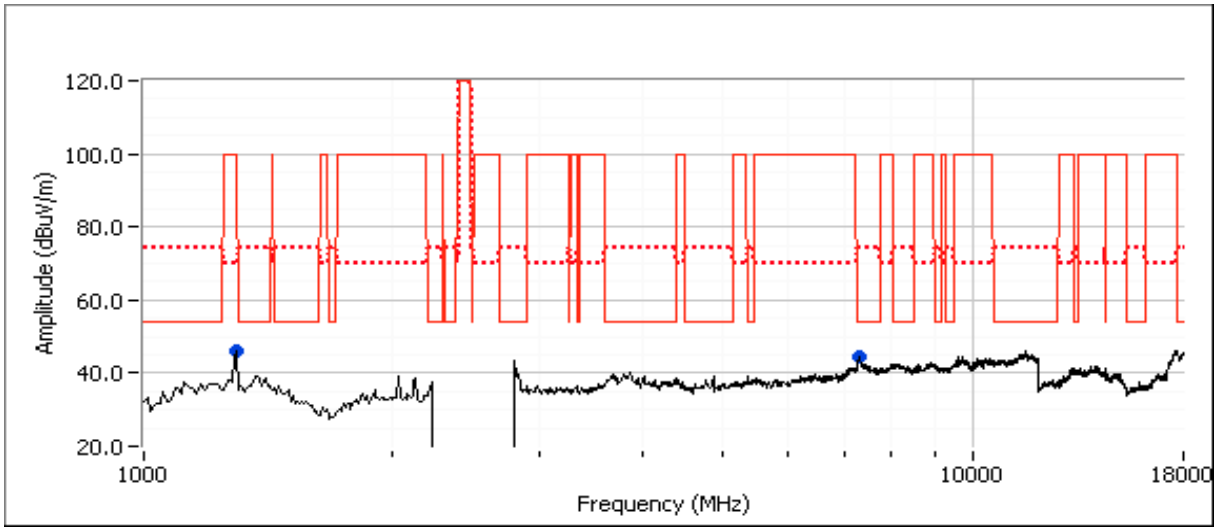
Run # 3b: , EUT on Channel #6 2437MHz - 802.11n40, Aux

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7302.800	41.3	V	54.0	-12.7	AVG	25	1.8	RB 1 MHz;VB 10 Hz;Pk
7304.540	53.0	V	74.0	-21.0	PK	25	1.8	RB 1 MHz;VB 3 MHz;Pk
1293.330	46.3	V	-	-	Peak	195	2.2	Note 3

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.
Note 2:	Scans made between 18 - 26GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no signifcant emissions in this frequency range
Note 3:	Emission in non restricted band, refer to antenna port conducted measurements.



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

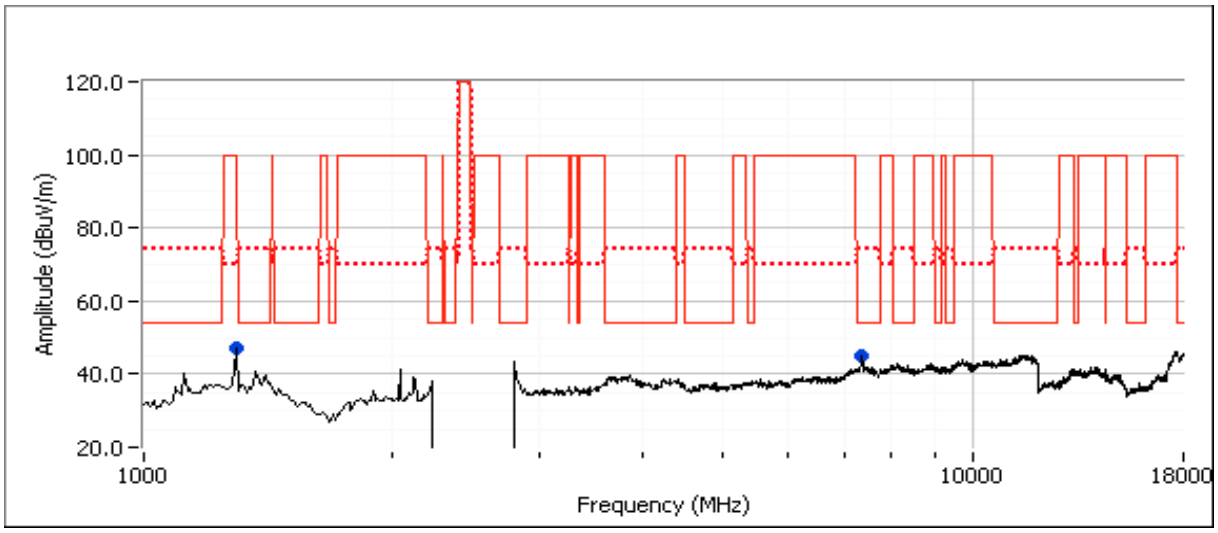
Run # 3c: , EUT on Channel #9 2452MHz - 802.11n40, Aux

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7353.300	41.8	V	54.0	-12.2	AVG	176	1.7	RB 1 MHz;VB 10 Hz;Pk
7352.300	53.8	V	74.0	-20.2	PK	176	1.7	RB 1 MHz;VB 3 MHz;Pk
1293.330	47.3	V	-	-	Peak	203	1.6	Note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.
Note 2:	Emission in non restricted band, refer to antenna port conducted measurements.



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run # 4, Radiated Spurious Emissions, 1-8GHz, RX, Aux

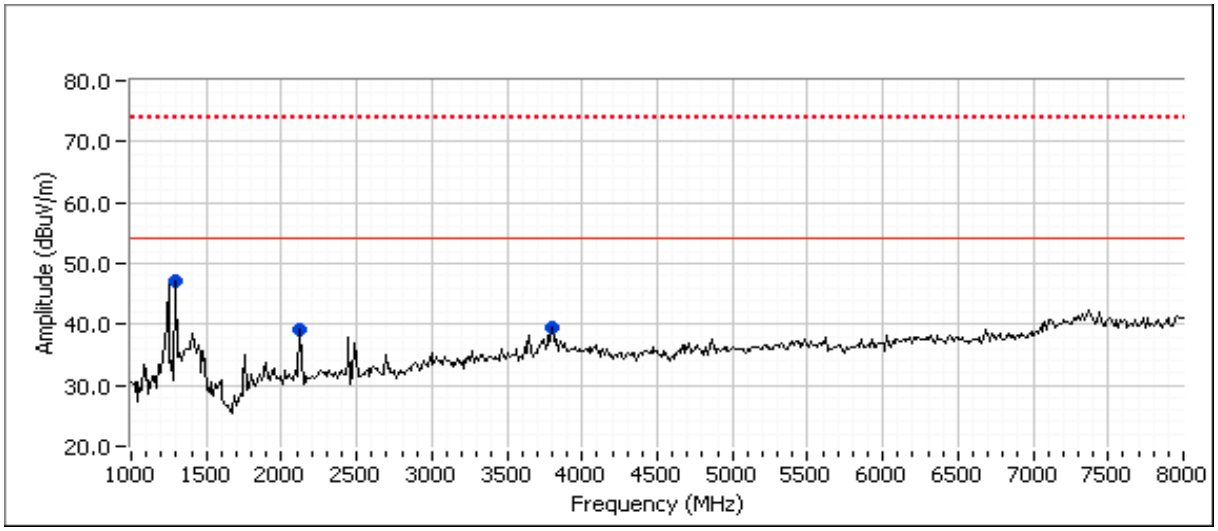
Date of Test: 10/13/2011 Test Location: FT Chamber #3

Test Engineer: Rafael Varelas Config Change: None

Run # 4a, EUT on Channel #6 2437MHz - RX, Aux

Spurious Radiated Emissions:

Frequency	Level	Pol	RSS-GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1297.420	42.4	H	54.0	-11.6	AVG	151	1.0	RB 1 MHz;VB 10 Hz;Pk
1298.420	52.1	H	74.0	-21.9	PK	151	1.0	RB 1 MHz;VB 3 MHz;Pk
2124.710	32.0	H	54.0	-22.0	AVG	69	1.0	RB 1 MHz;VB 10 Hz;Pk
2126.410	44.4	H	74.0	-29.6	PK	69	1.0	RB 1 MHz;VB 3 MHz;Pk
3786.620	35.0	V	54.0	-19.0	AVG	324	1.0	RB 1 MHz;VB 10 Hz;Pk
3786.360	44.0	V	74.0	-30.0	PK	324	1.0	RB 1 MHz;VB 3 MHz;Pk



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions (WiFi Operation - Bandedge)

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: 21.9 °C
Rel. Humidity: 42 %

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

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
Run #1	802.11b Aux	#1 2412MHz	-	-	Restricted Band Edge at 2390 MHz	15.209	52.1dBµV/m @ 2385.3MHz (-1.9dB)
		#11 2462MHz	-	-	Restricted Band Edge at 2483.5 MHz	15.209	53.7dBµV/m @ 2484.8MHz (-0.3dB)
Run # 2	802.11g Aux	#1 2412MHz	-	-	Restricted Band Edge at 2390 MHz	15.209	53.9dBµV/m @ 2389.9MHz (-0.1dB)
		#11 2462MHz	-	-	Restricted Band Edge at 2483.5 MHz	15.209	73.8dBµV/m @ 2483.8MHz (-0.3dB)
		#10 2457MHz	-	-	Restricted Band Edge at 2483.5 MHz	15.209	70.4dBµV/m @ 2483.8MHz (-3.6dB)
Run # 3	802.11n40 Aux	#3 2422MHz	-	-	Restricted Band Edge at 2390 MHz	15.209	74.0dBµV/m @ 2388.4MHz (0.0dB)
		#9 2452MHz	-	-	Restricted Band Edge at 2483.5 MHz	15.209	73.8dBµV/m @ 2489.6MHz (-0.3dB)
		#4 2427MHz	-	-	Restricted Band Edge at 2390 MHz	15.209	51.9dBµV/m @ 2390.1MHz (-2.1dB)
		#8 2447MHz	-	-	Restricted Band Edge at 2483.5 MHz	15.209	53.8dBµV/m @ 2483.6MHz (-0.2dB)

Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, 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, Band Edge Field Strength - 802.11b, Aux

Date of Test: 9/29/2011 Test Location: FT5

Test Engineer: John Caizzi Config Change: none

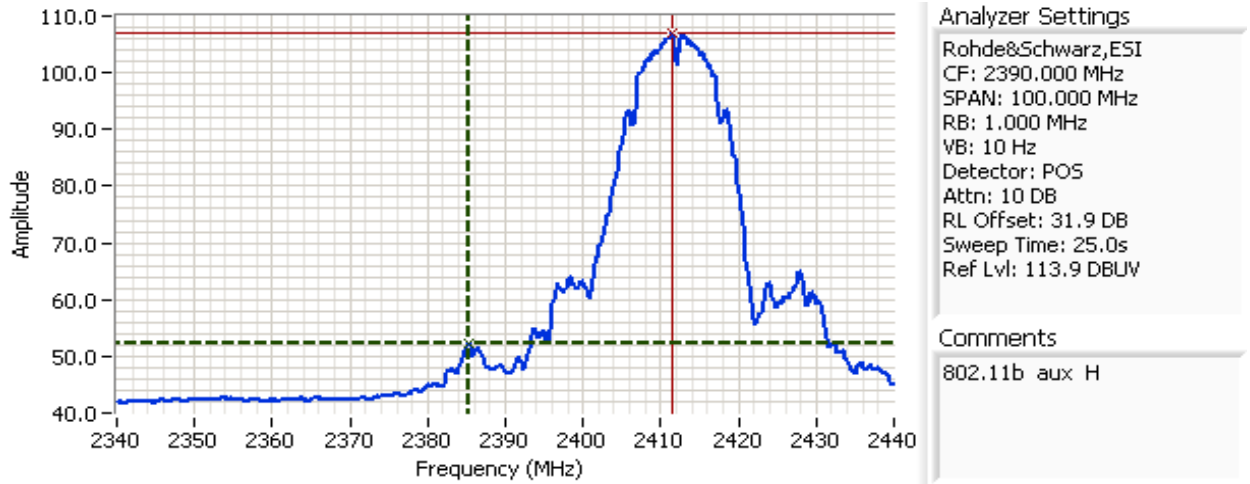
Run #1a, EUT on Channel #1 2412MHz - 802.11b, Aux

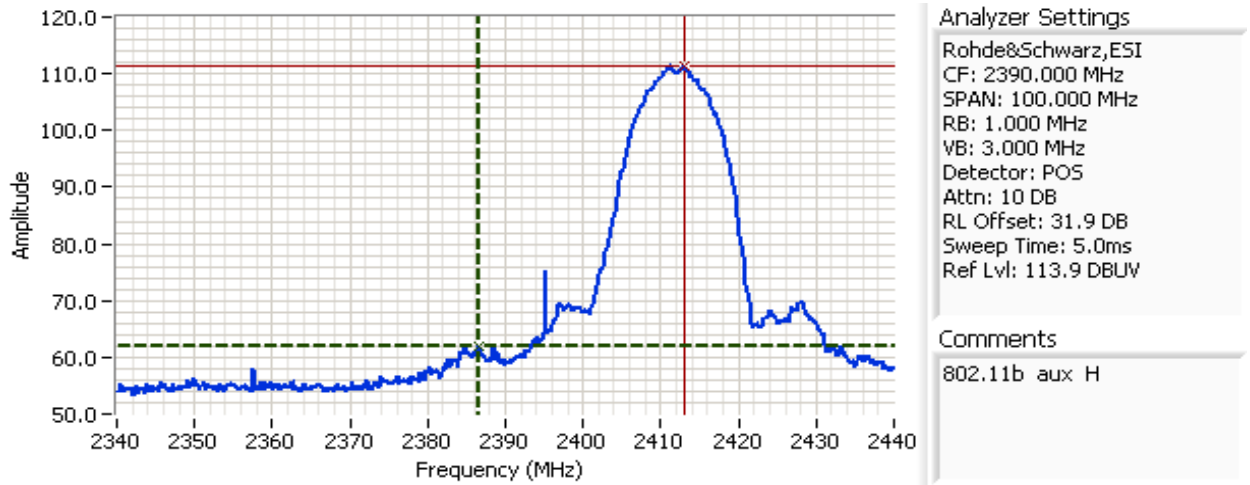
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

2390 MHz 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	
2385.291	52.1	H	54.0	-1.9	Avg	293	1.02	
2386.693	61.9	H	74.0	-12.1	Pk	293	1.02	

Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A





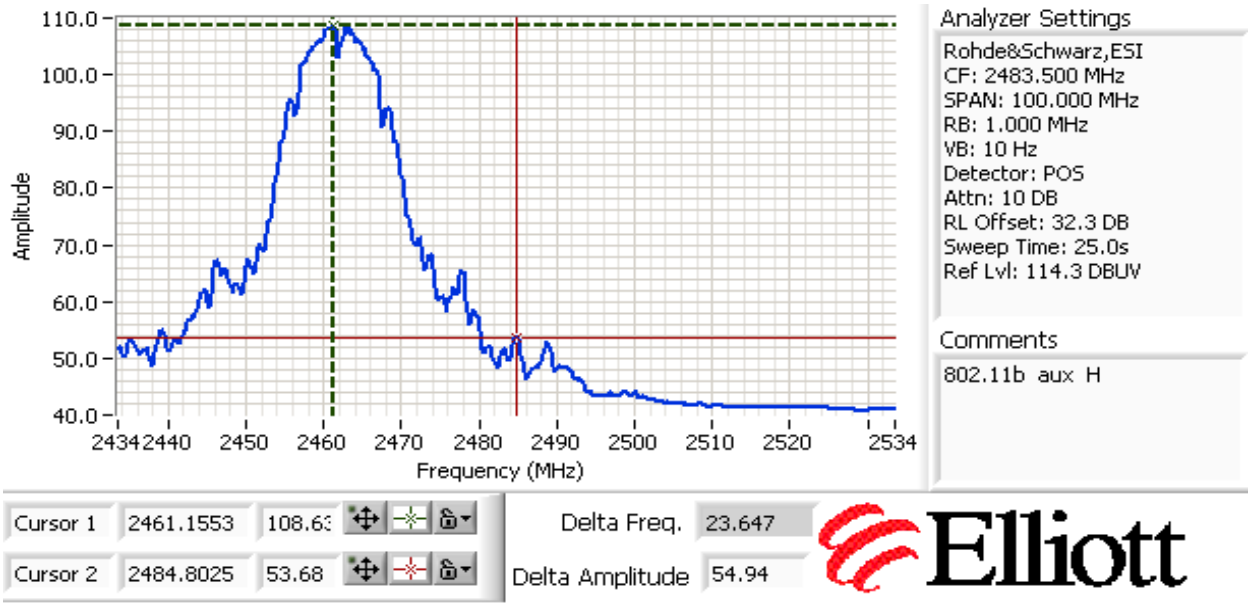
Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #1b, EUT on Channel #11 2462MHz - 802.11b, Aux

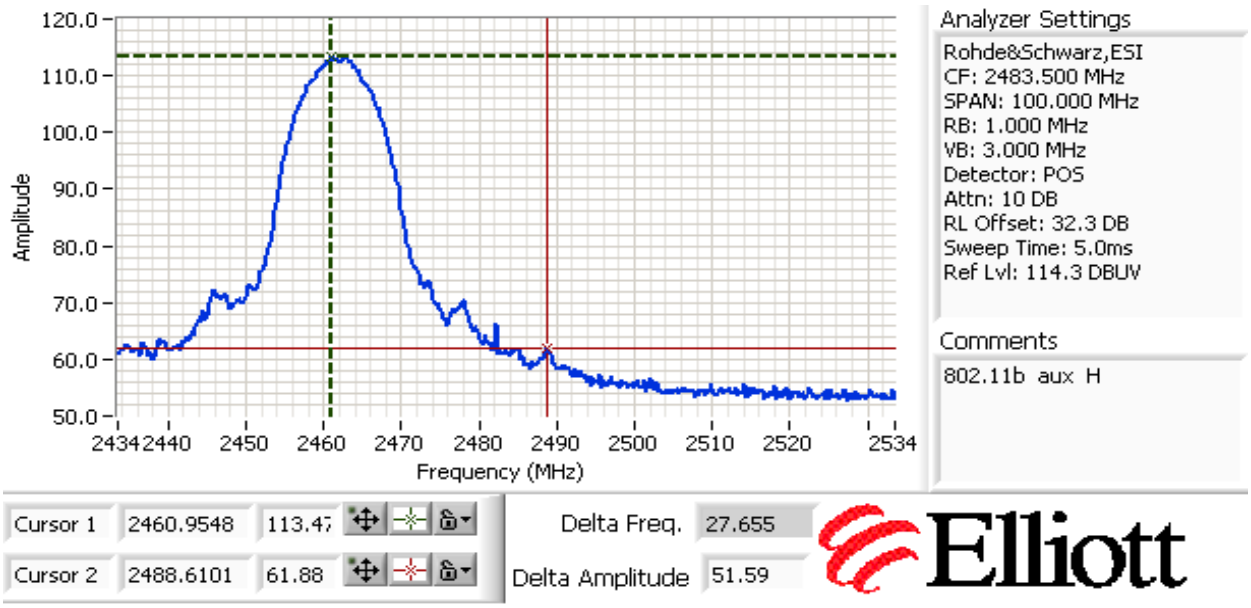
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

2483.5 MHz Band Edge Signal Radiated 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	
2484.803	53.7	H	54.0	-0.3	Avg	306	1.00	
2488.610	61.9	H	74.0	-12.1	Pk	306	1.00	



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run # 2, Band Edge Field Strength - 802.11g, Aux

Date of Test: 9/27/2011 Test Location: FT5

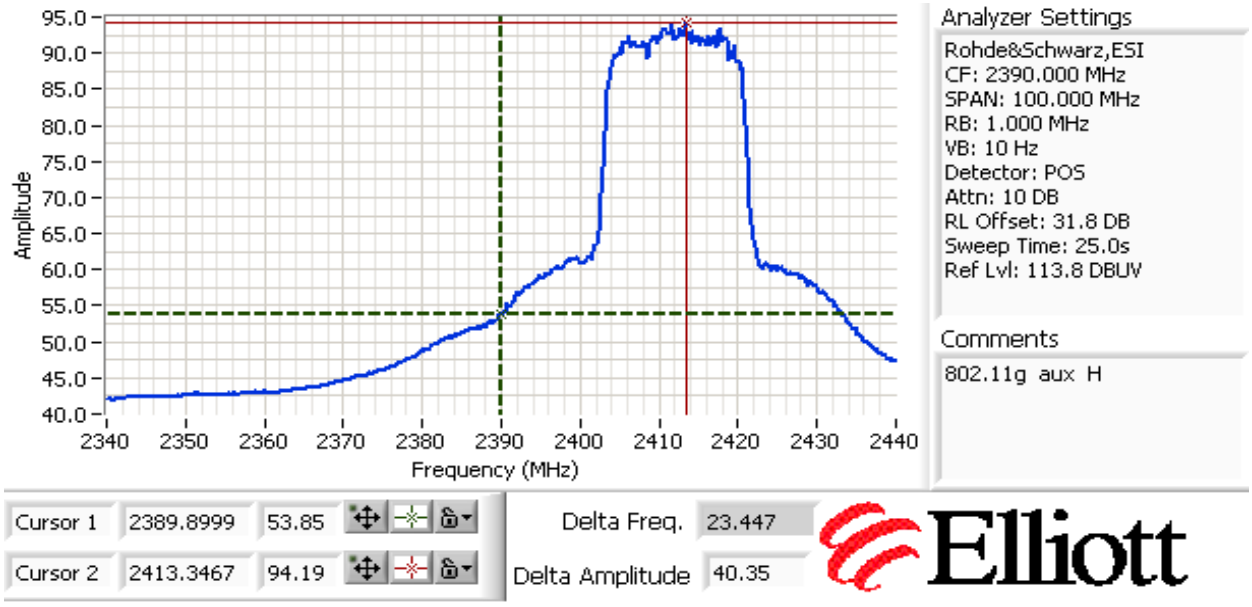
Test Engineer: John Caizi Config Change: none

Run # 2a, EUT on Channel #1 2412MHz - 802.11g, Aux (taken from J84116/T84806)

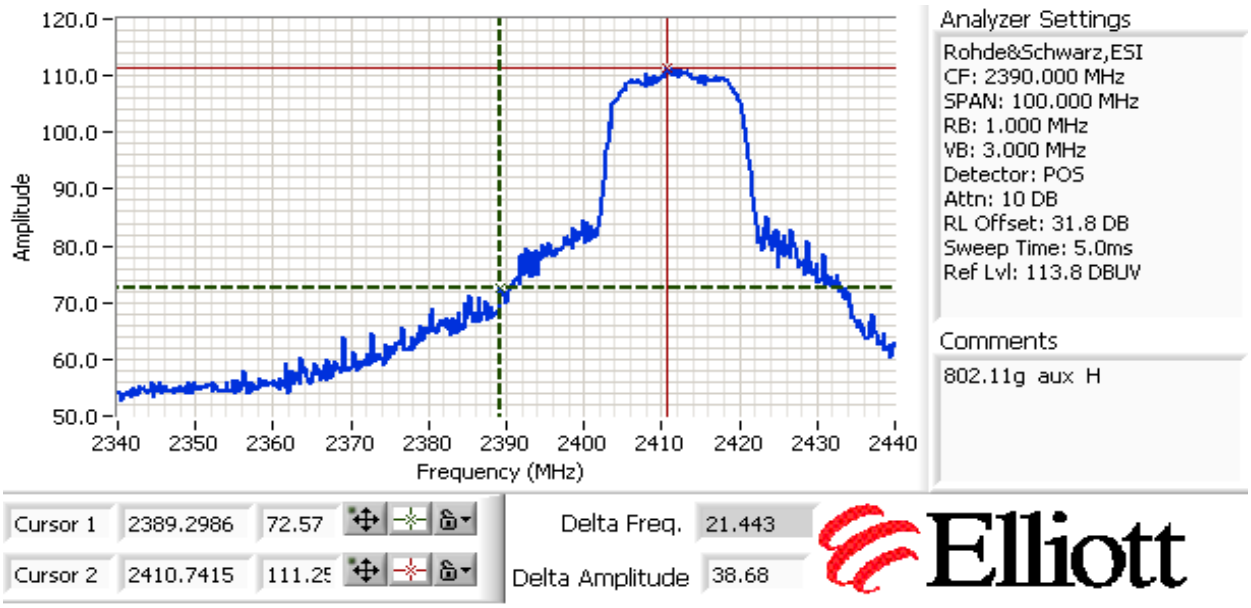
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

2390 MHz 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	
2389.900	53.9	H	54.0	-0.1	Avg	293	1.06	
2389.299	72.6	H	74.0	-1.4	Pk	293	1.06	



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A



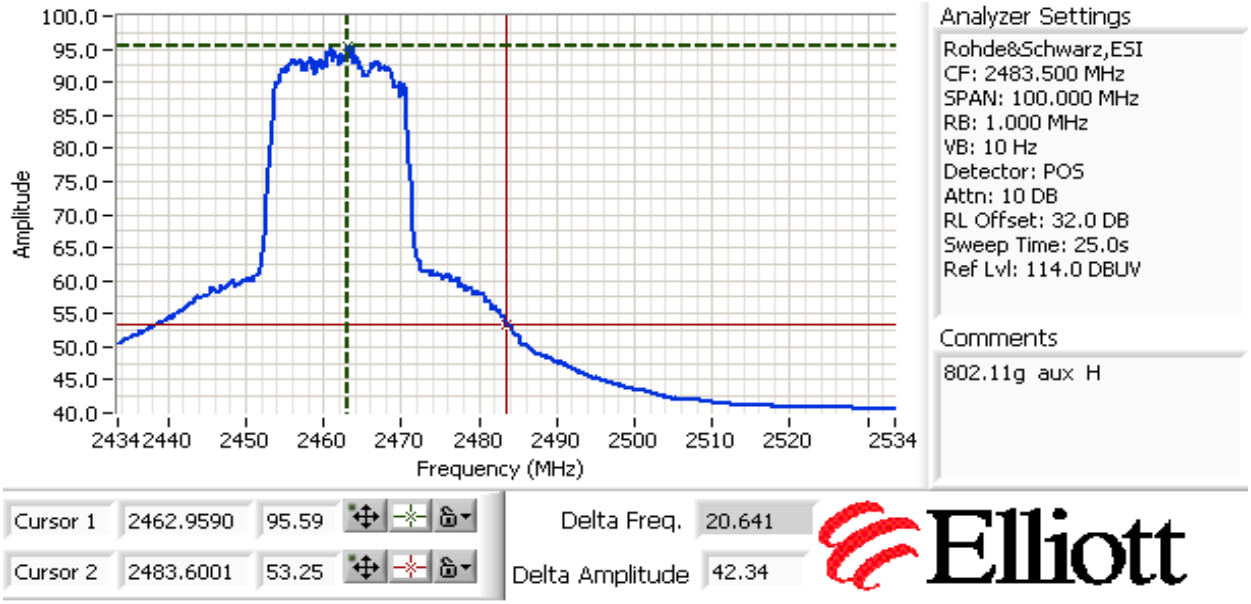
Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run # 2b, EUT on Channel #11 2462MHz - 802.11g, Aux (taken from J84116/T84806)

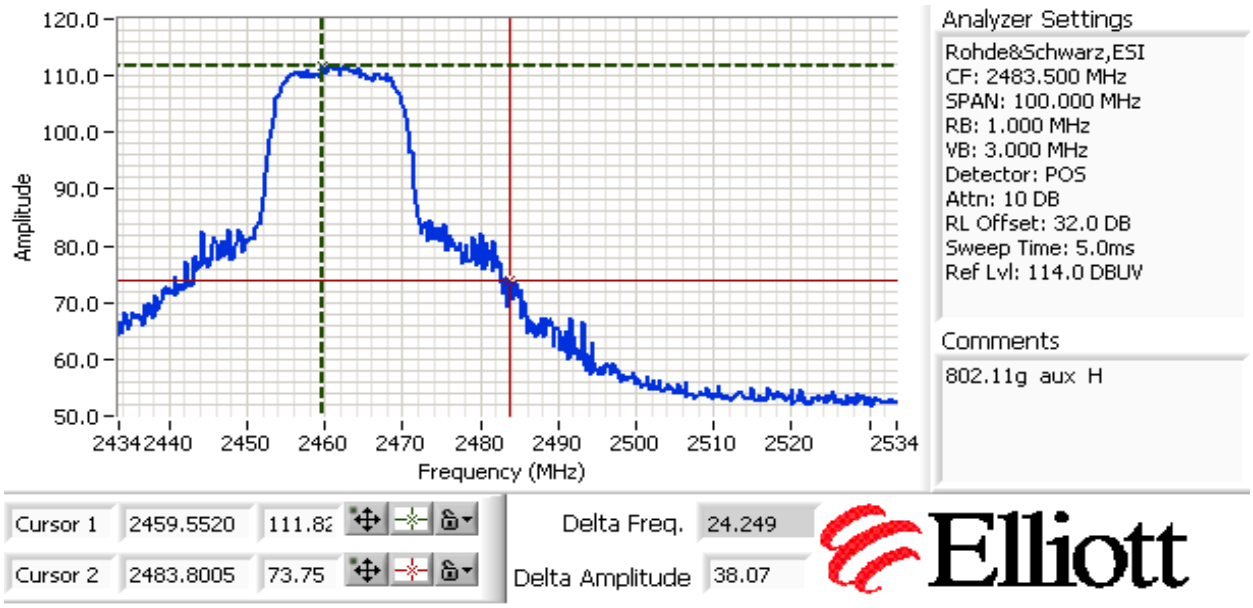
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

2483.5 MHz Band Edge Signal Radiated 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	
2483.600	53.3	H	54.0	-0.8	Avg	300	1.00	
2483.801	73.8	H	74.0	-0.3	Pk	300	1.00	



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run # 2c, EUT on Channel #10 2457MHz - 802.11g, Aux

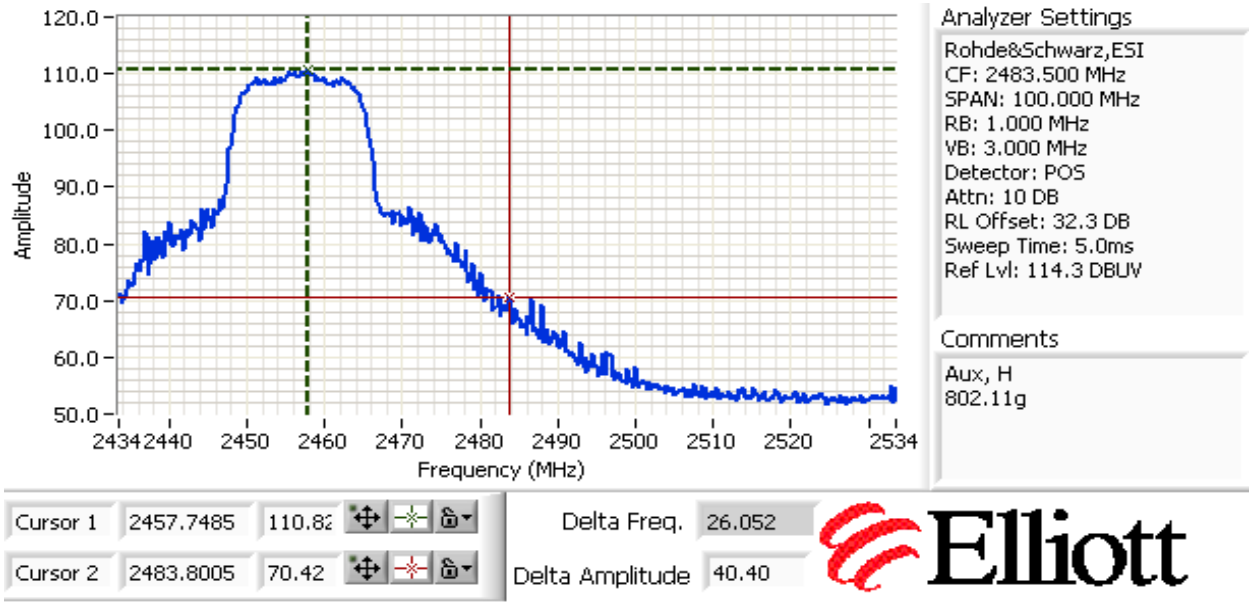
Date of Test: 10/13/2011 Test Location: FT Chamber #3

Test Engineer: Rafael Varelas Config Change: None

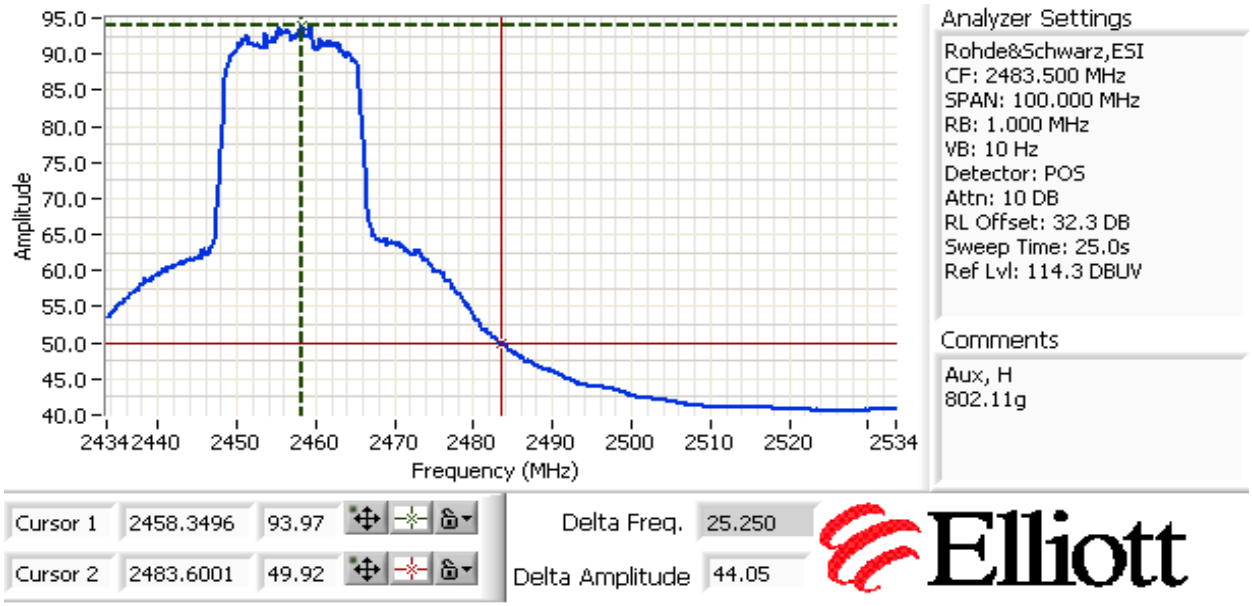
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

2483.5 MHz Band Edge Signal Radiated 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	
2483.801	70.4	H	74.0	-3.6	Pk	30	1.00	
2483.600	49.9	H	54.0	-4.1	Avg	30	1.00	
2483.600	62.9	V	74.0	-11.1	Pk	112	1.00	
2483.600	45.8	V	54.0	-8.2	Avg	112	1.00	



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run # 3, Band Edge Field Strength - 802.11n40, Aux

Date of Test: 9/29/2011 Test Location: FT5

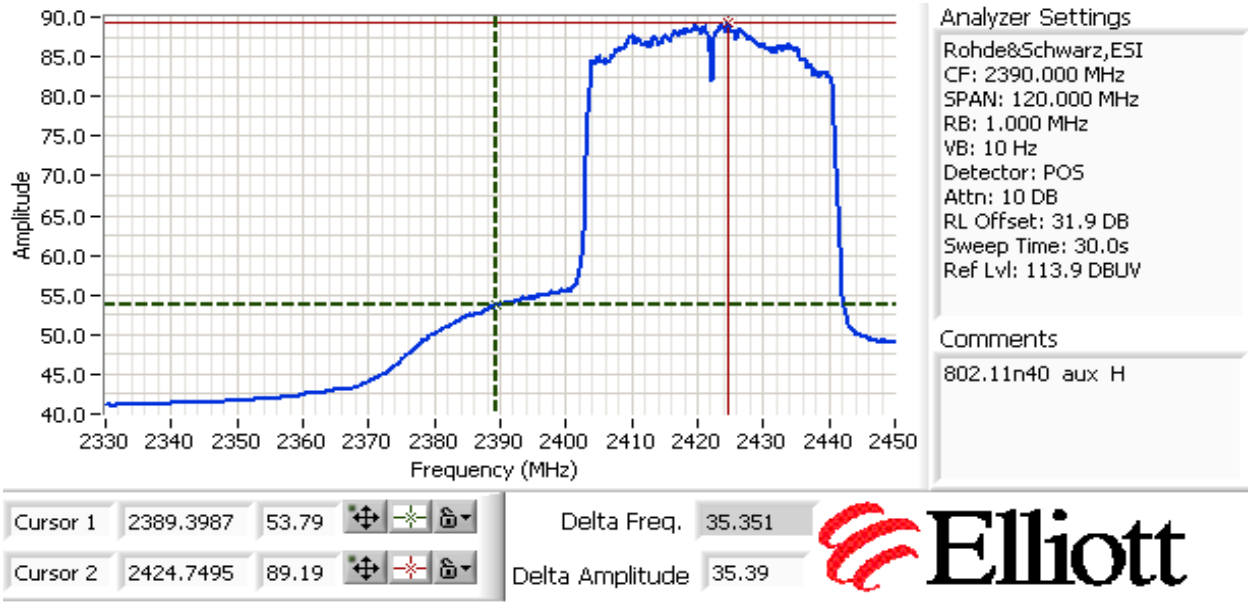
Test Engineer: John Caizi Config Change: none

Run # 3a, EUT on Channel #3 2422MHz - 802.11n40, Aux (taken from J84116/T84806)

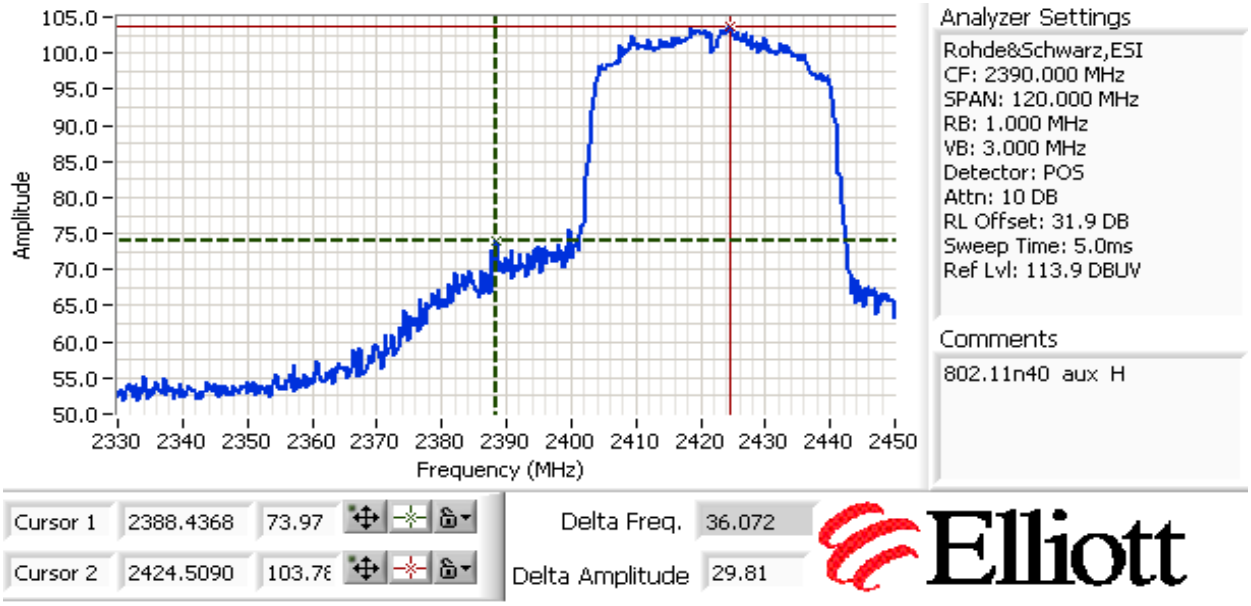
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

2390 MHz 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	
2389.399	53.8	H	54.0	-0.2	Avg	292	1.00	
2388.437	74.0	H	74.0	0.0	Pk	292	1.00	



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A



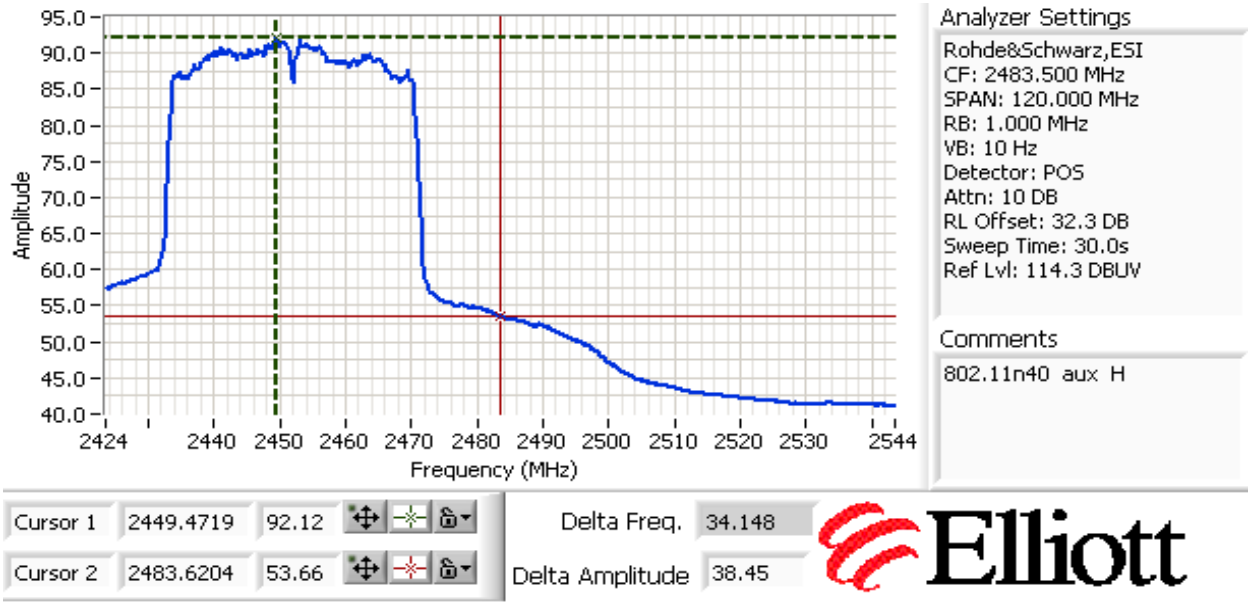
Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run # 3b, EUT on Channel #9 2452MHz - 802.11n40, Aux (taken from J84116/T84806)

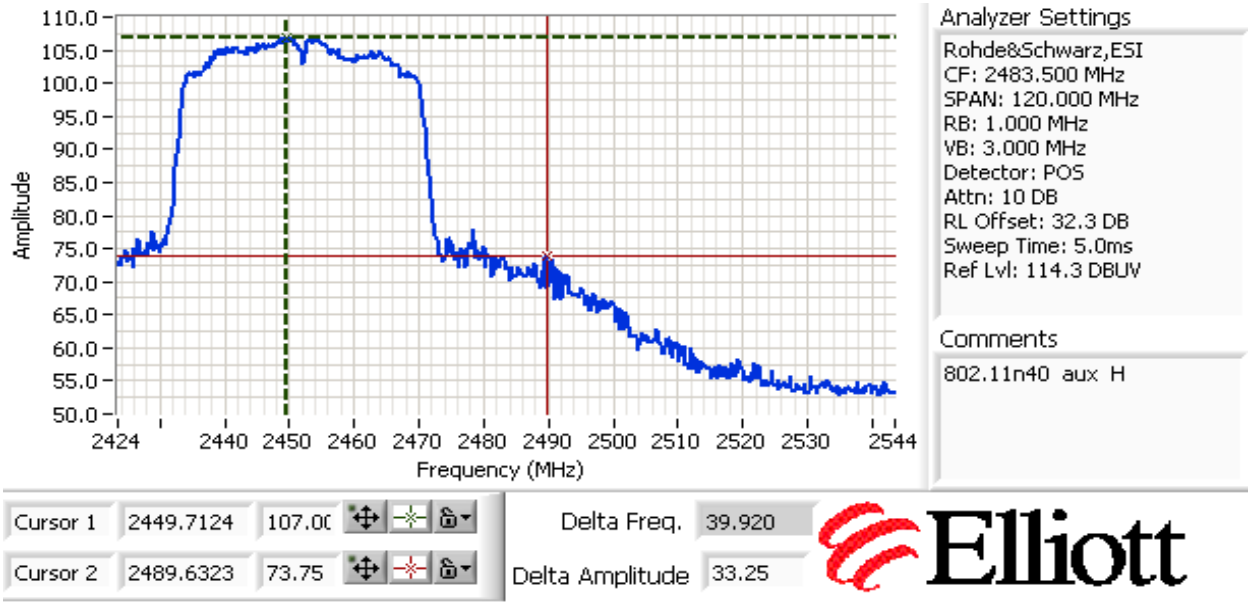
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

2483.5 MHz Band Edge Signal Radiated 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	
2483.620	53.7	H	54.0	-0.3	Avg	304	1.19	
2489.632	73.8	H	74.0	-0.3	Pk	304	1.19	



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

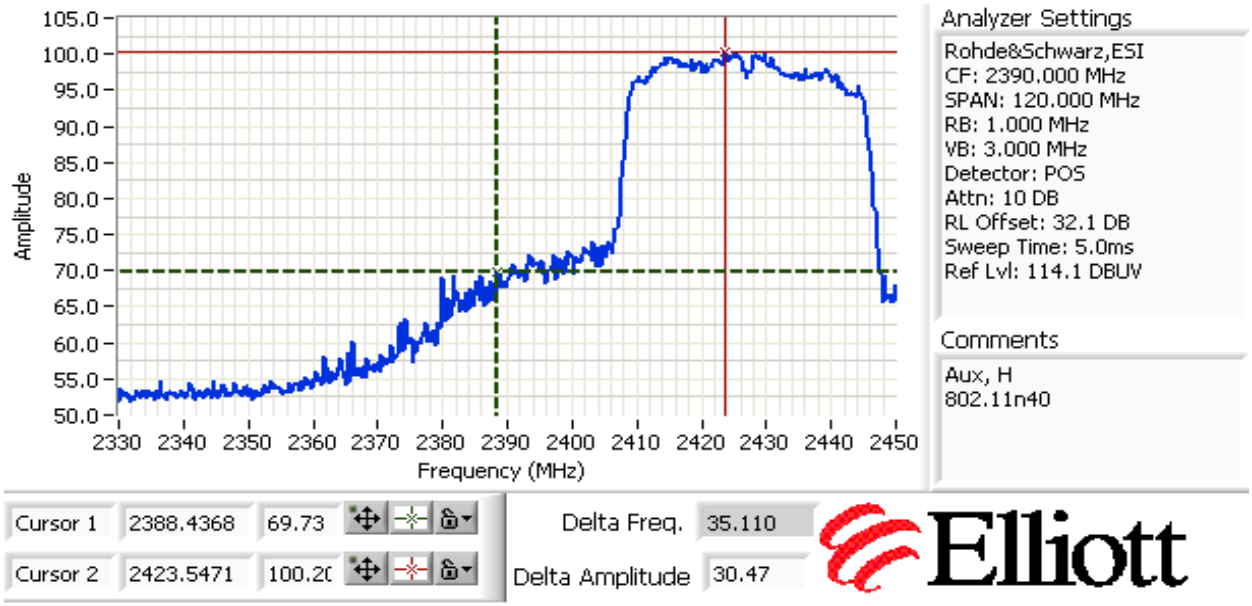
Run # 3c, EUT on Channel #4 2427MHz - 802.11n40, Aux

Date of Test: 10/13/2011 Test Location: FT Chamber #3
Test Engineer: Rafael Varelas Config Change: None

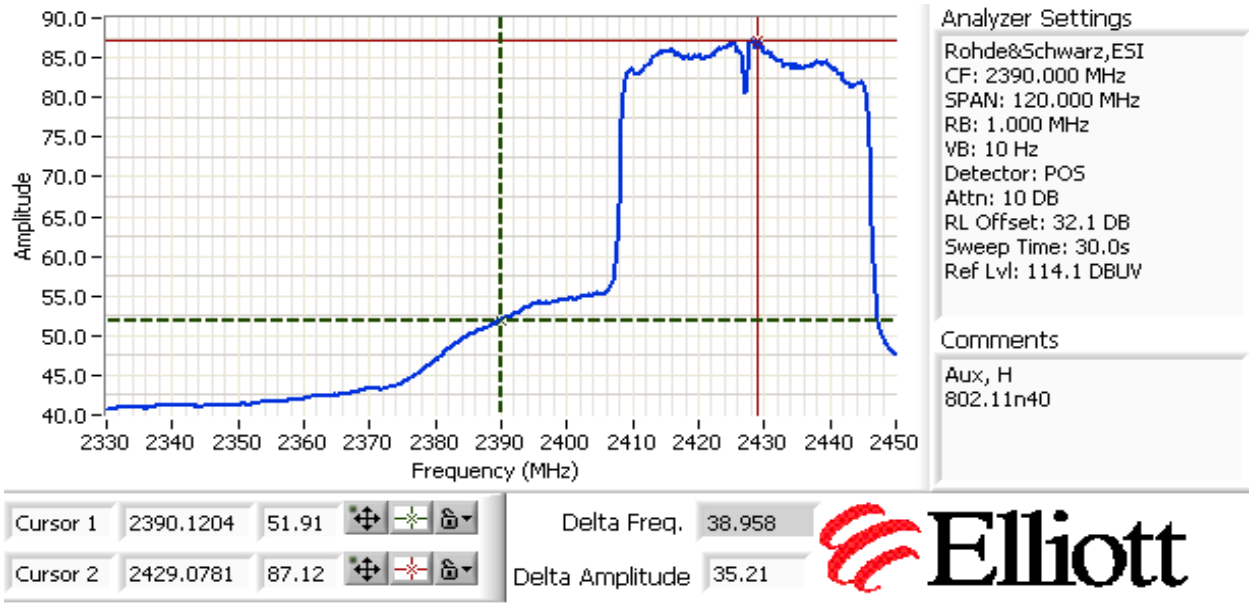
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

2390 MHz 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	
2390.120	51.9	H	54.0	-2.1	Avg	24	1.0	
2388.437	69.7	H	74.0	-4.3	Pk	24	1.0	
2389.399	50.9	V	54.0	-3.1	Avg	95	1.2	
2385.311	70.1	V	74.0	-3.9	Pk	95	1.2	



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run # 3d, EUT on Channel #8 2447 - 802.11n40, Aux

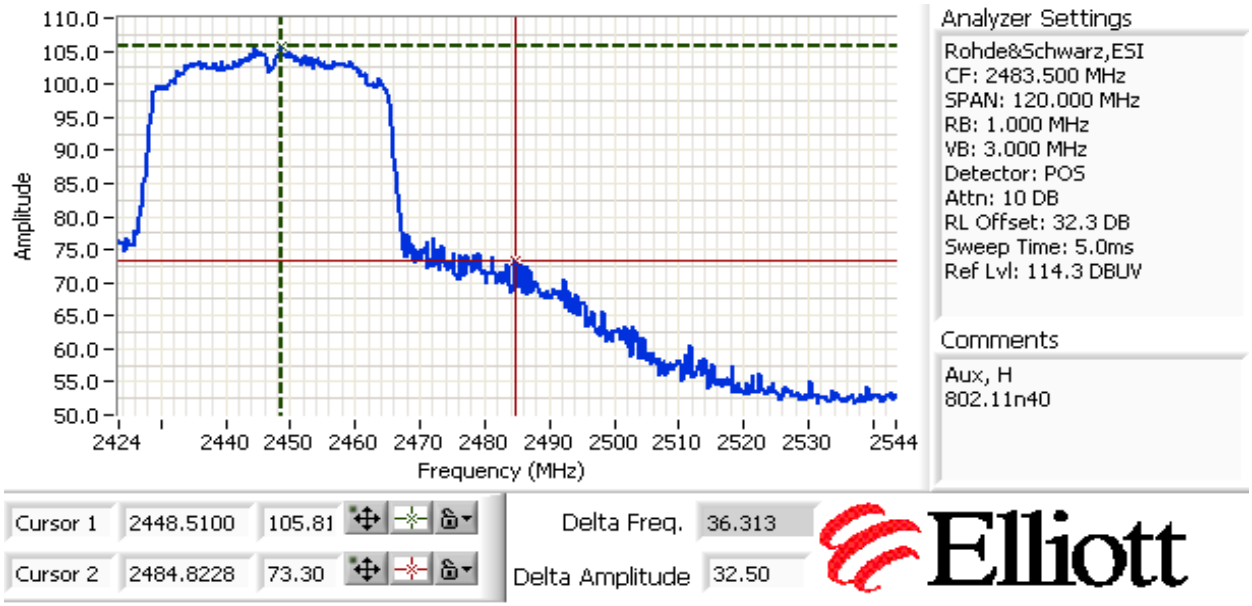
Date of Test: 10/13/2011 Test Location: FT Chamber #3

Test Engineer: Rafael Varelas Config Change: None

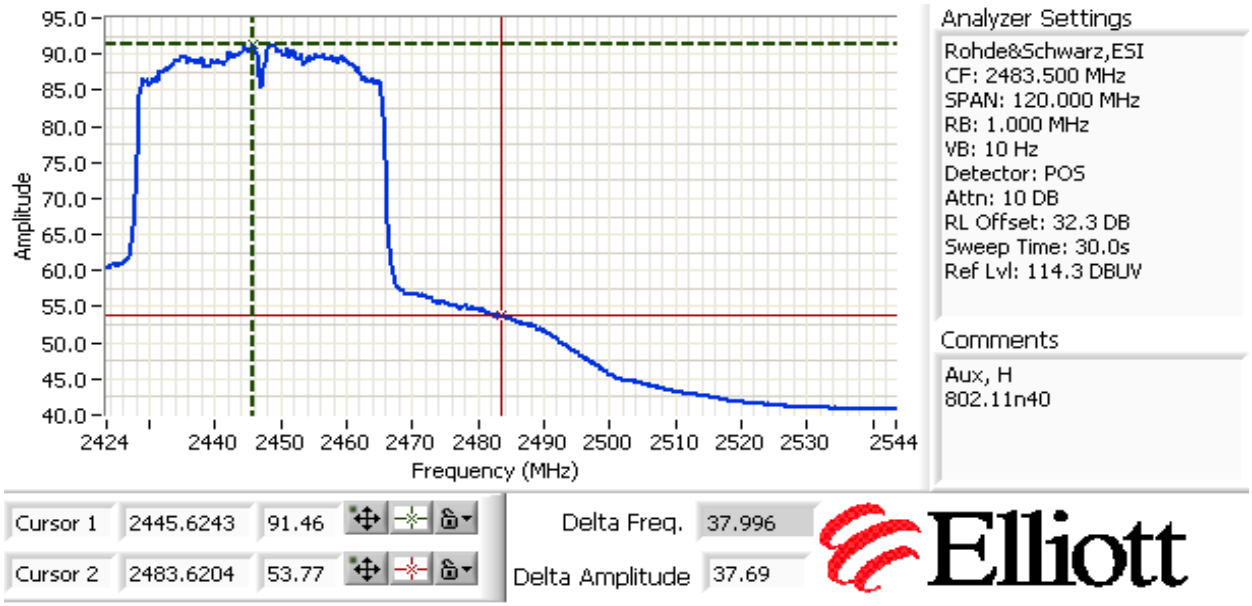
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Aux	-	-	-

2483.5 MHz 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	
2483.620	53.8	H	54.0	-0.2	Avg	159	1.00	
2484.823	73.3	H	74.0	-0.7	Pk	159	1.00	
2484.342	49.8	V	54.0	-4.3	Avg	98	1.00	
2485.063	69.5	V	74.0	-4.5	Pk	98	1.00	



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions

(802.11b Operation)

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: 10/14/2011
Test Engineer: J Liu, J Caizzi
Test Location: FT4

Config. Used: 1
Config Change: No
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: 25 °C
Rel. Humidity: 40 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	-	-	Output Power	15.247(b)	Pass	15.5 dBm
2	-	-	Power spectral Density (PSD)	15.247(d)	Pass	-2.3 dBm/3kHz
3	-	-	Minimum 6dB Bandwidth	15.247(a)	Pass	7.167 MHz
3	-	-	99% Bandwidth	RSS GEN	-	13.1 MHz
4	-	-	Spurious emissions	15.247(b)	Pass	All emissions < 30dBc

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

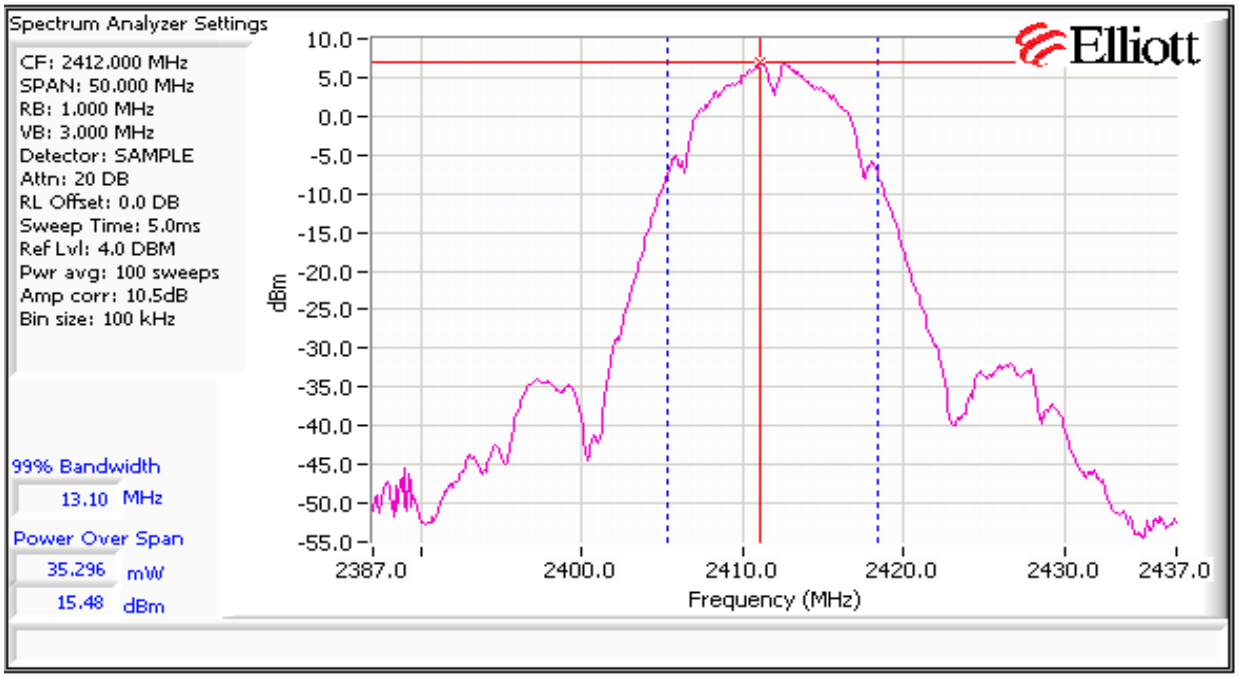
No deviations were made from the requirements of the standard.

Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, 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		
	2412	15.5	35.3	3.9	Pass	19.4	0.087		
	2437	14.9	31.1	3.9	Pass	18.8	0.076		
	2462	14.8	30.0	3.9	Pass	18.7	0.074		

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:	Power setting - the software power setting used during testing, included for reference only.

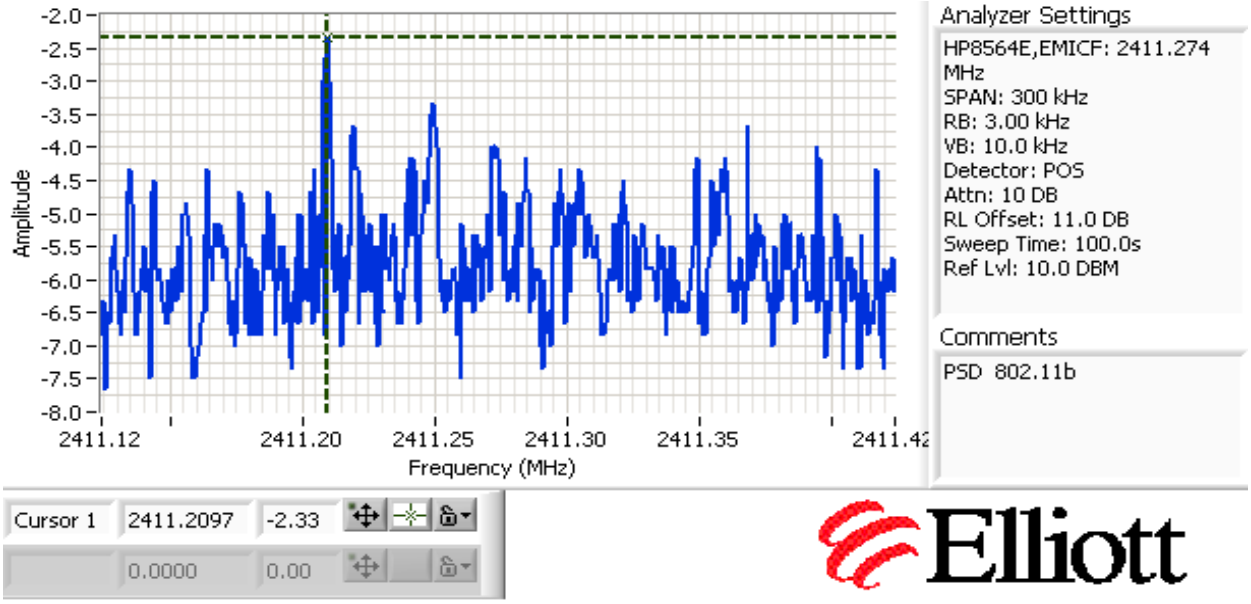


Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
	2412	-2.3	8.0	Pass
	2437	-3.0	8.0	Pass
	2462	-4.7	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.

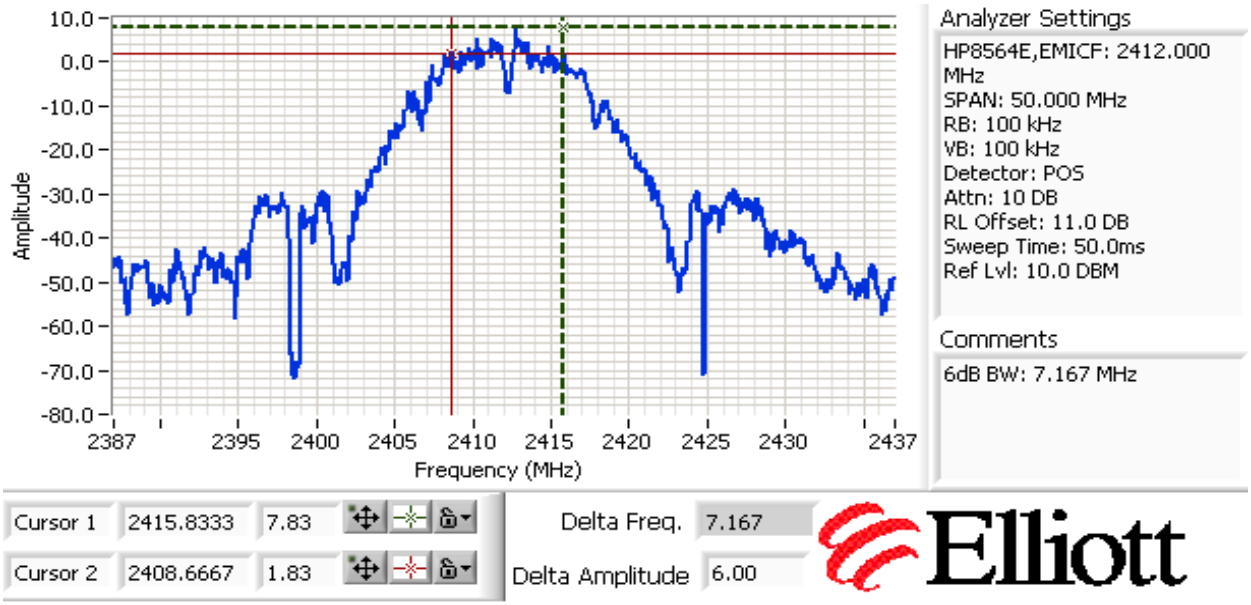


Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
	2412	100 kHz	7.167	13.10
	2437	100 kHz	7.167	13.00
	2462	100 kHz	9.083	12.90

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

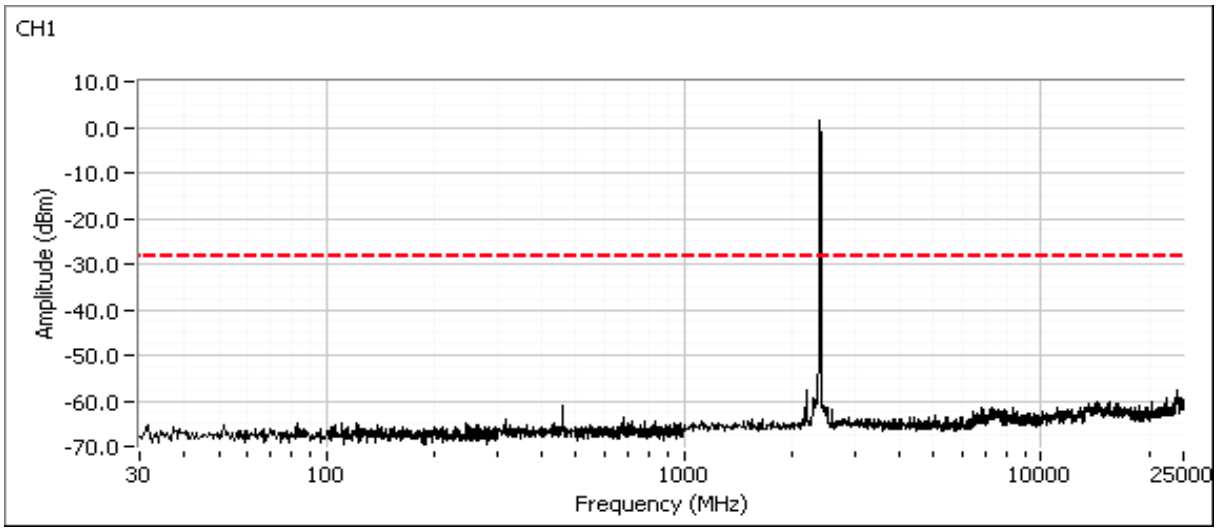


Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #4: Out of Band Spurious Emissions

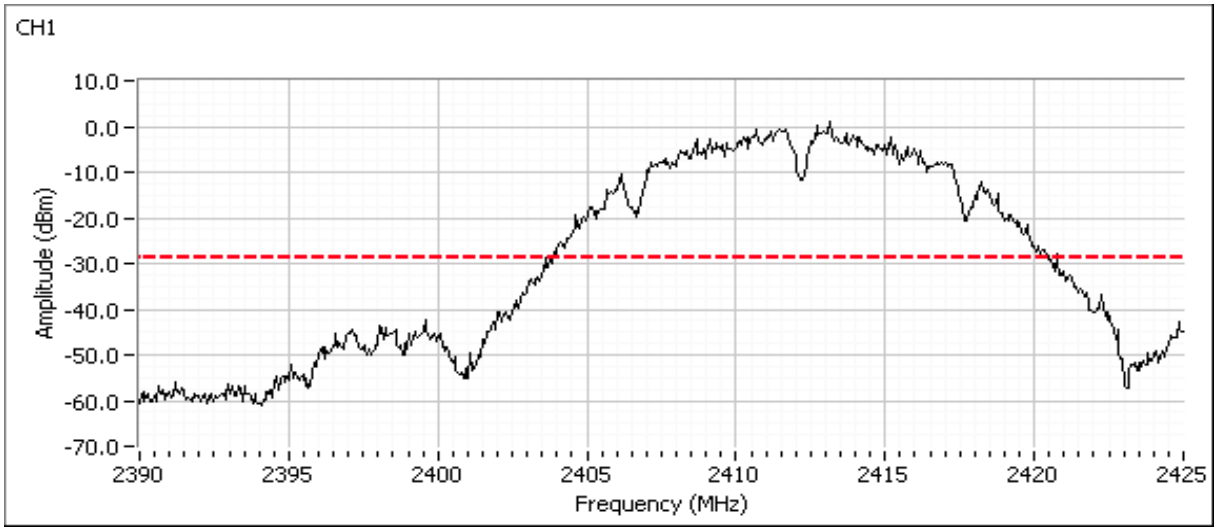
Frequency (MHz)	Limit	Result
2412	-30dBc	Pass
2437	-30dBc	Pass
2462	-30dBc	Pass

Plots for low channel

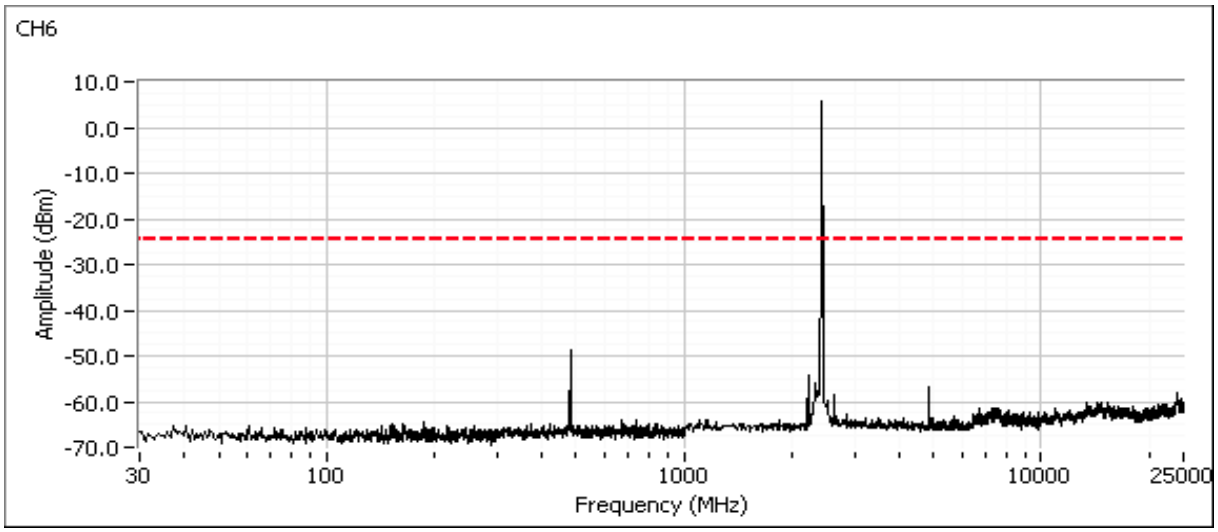


Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

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.

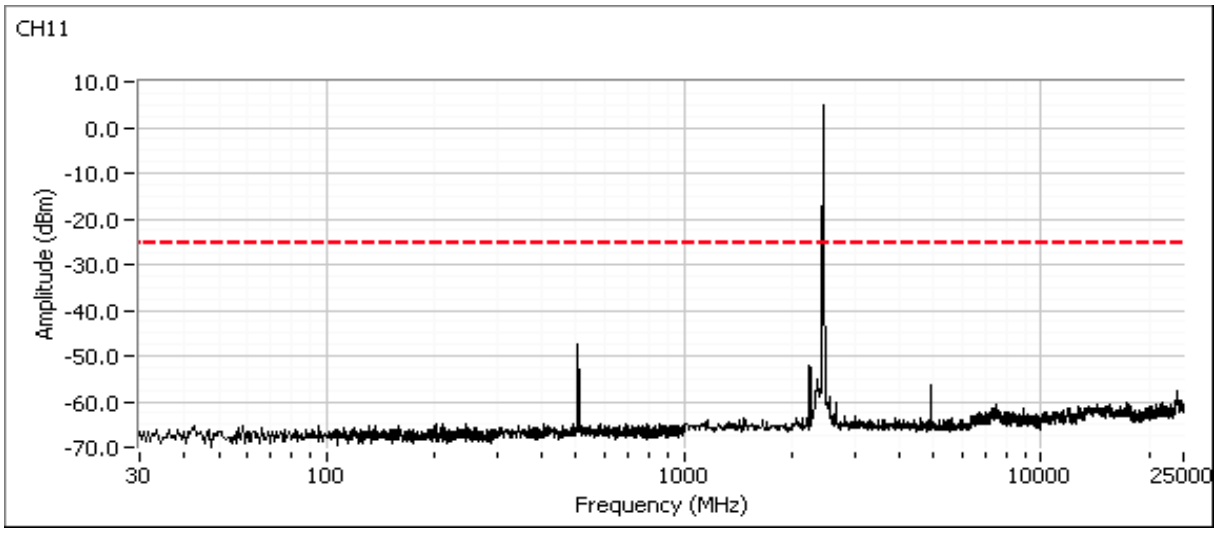


Plots for center channel



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Plots for high channel



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions

(802.11g Operation)

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: 10/14/2011
Test Engineer: J Liu, J Caizzi
Test Location: FT4

Config. Used: 1
Config Change: No
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: 25 °C
Rel. Humidity: 40 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	-	-	Output Power	15.247(b)	pass	14.9 dBm
2	-	-	Power spectral Density (PSD)	15.247(d)	pass	-4.8 dBm/3kHz
3	-	-	Minimum 6dB Bandwidth	15.247(a)	pass	16.042 MHz
3	-	-	99% Bandwidth	RSS GEN	-	16.8 MHz
4	-	-	Spurious emissions	15.247(b)	pass	All emissions < 30dBc

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

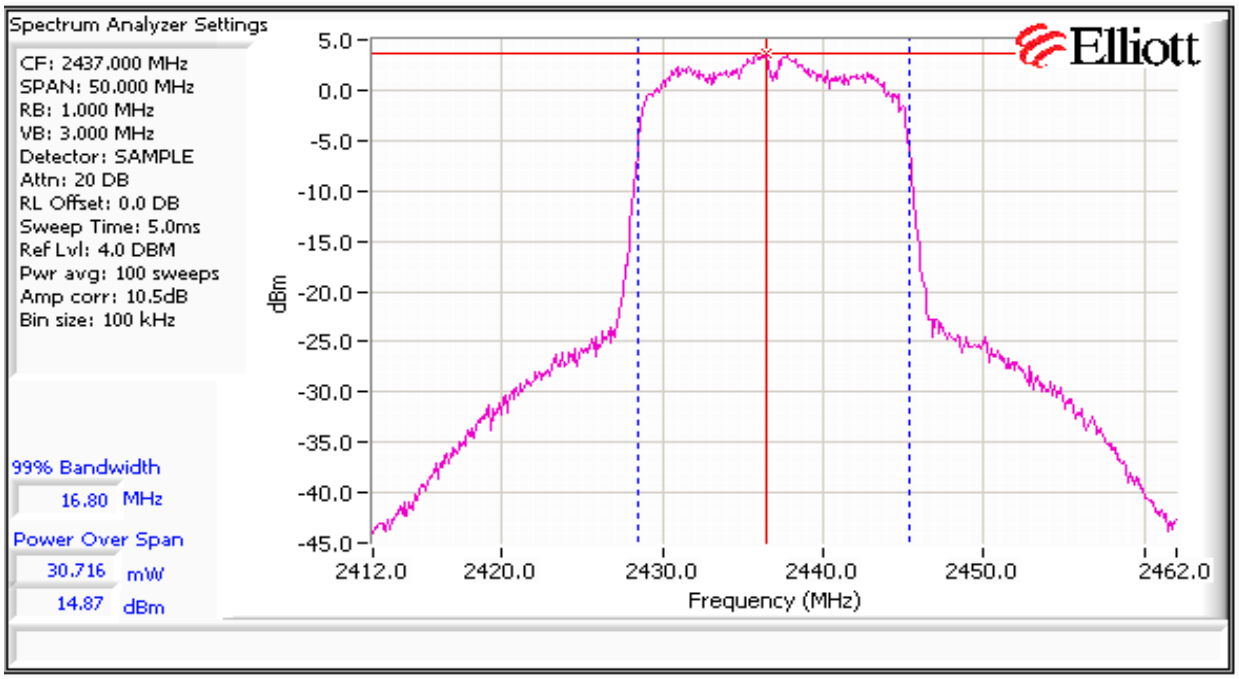
No deviations were made from the requirements of the standard.

Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, 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
	2412	14.7	29.3	3.9	Pass	18.6	0.072
	2437	14.9	30.7	3.9	Pass	18.8	0.075
	2462	13.4	22.1	3.9	Pass	17.3	0.054

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:	Power setting - the software power setting used during testing, included for reference only.

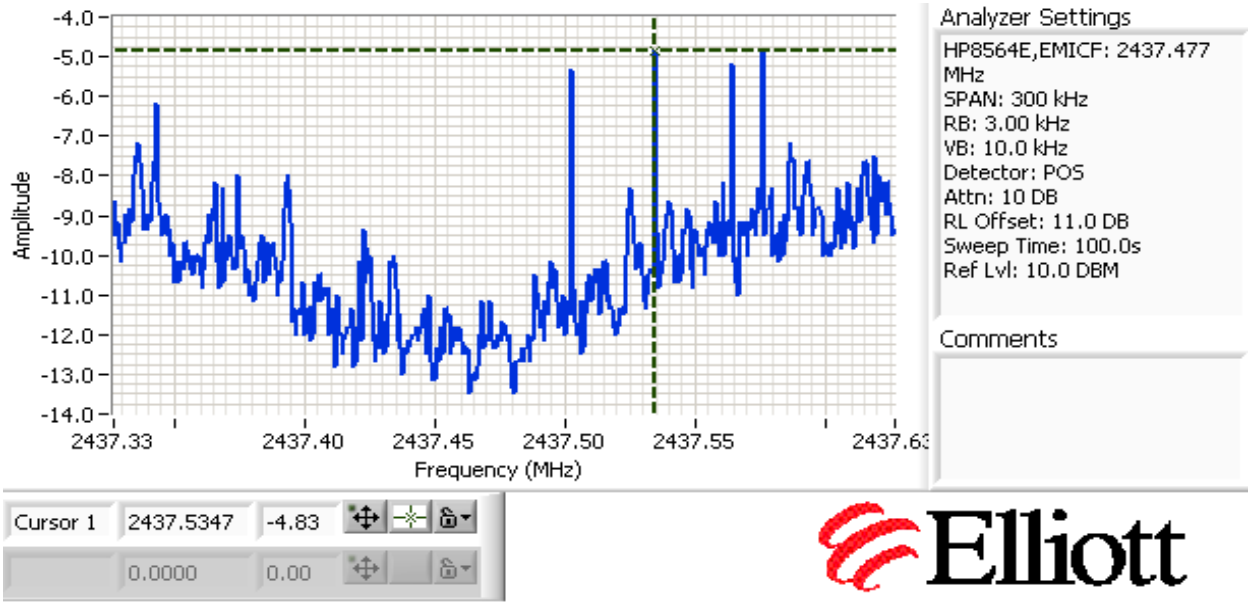


Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
	2412	-5.3	8.0	Pass
	2437	-4.8	8.0	Pass
	2462	-5.2	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.

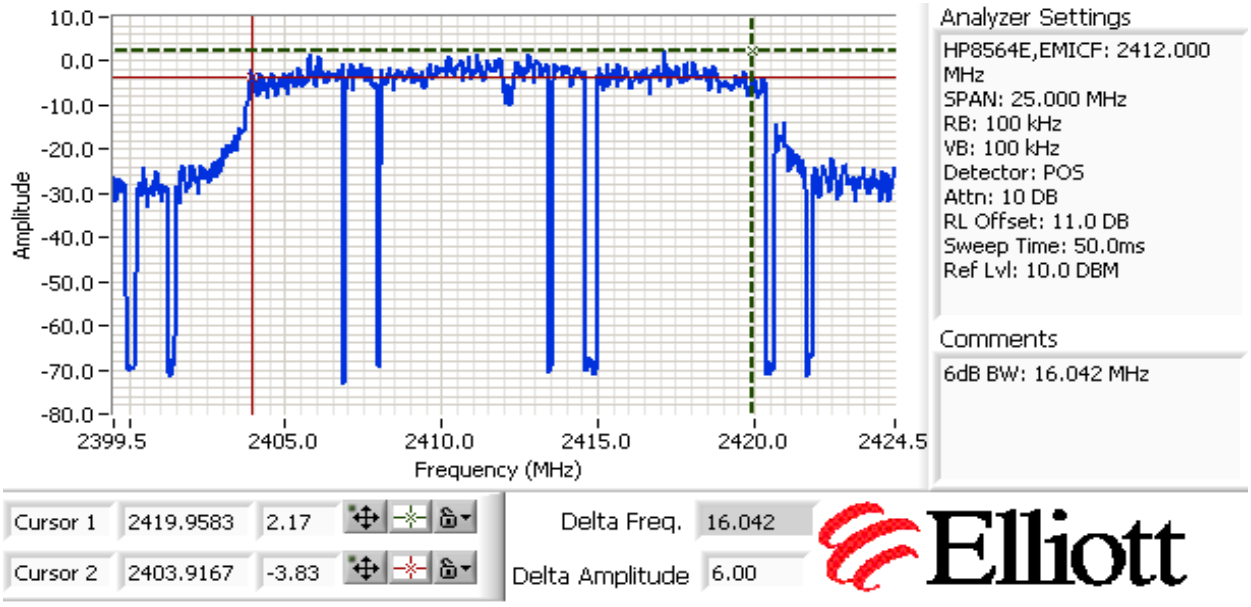


Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
	2412	100kHz	16.042	16.7
	2437	100kHz	16.458	16.8
	2462	100kHz	16.458	16.76

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

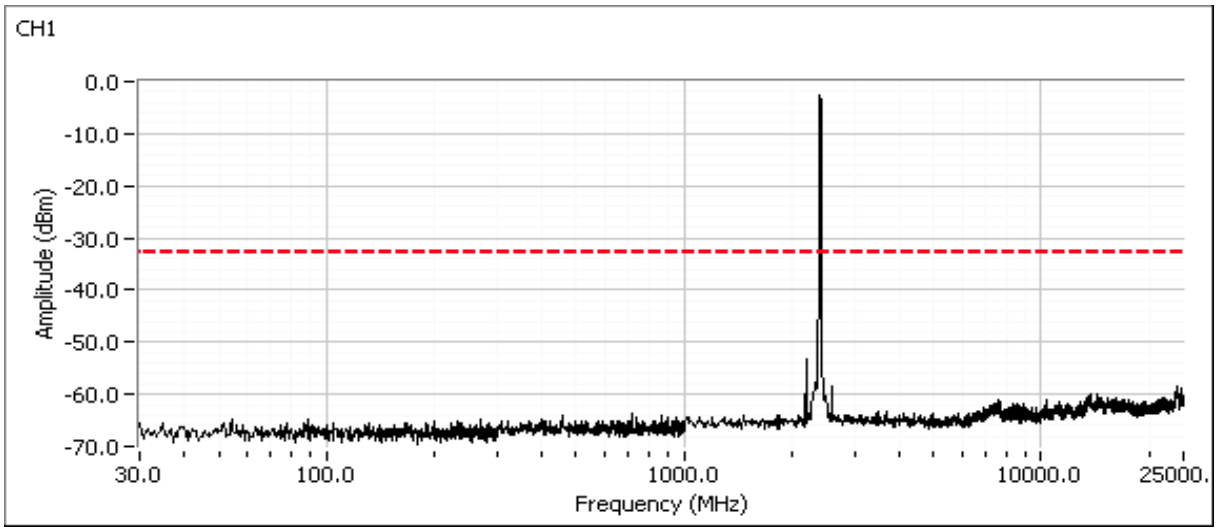


Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #4: Out of Band Spurious Emissions

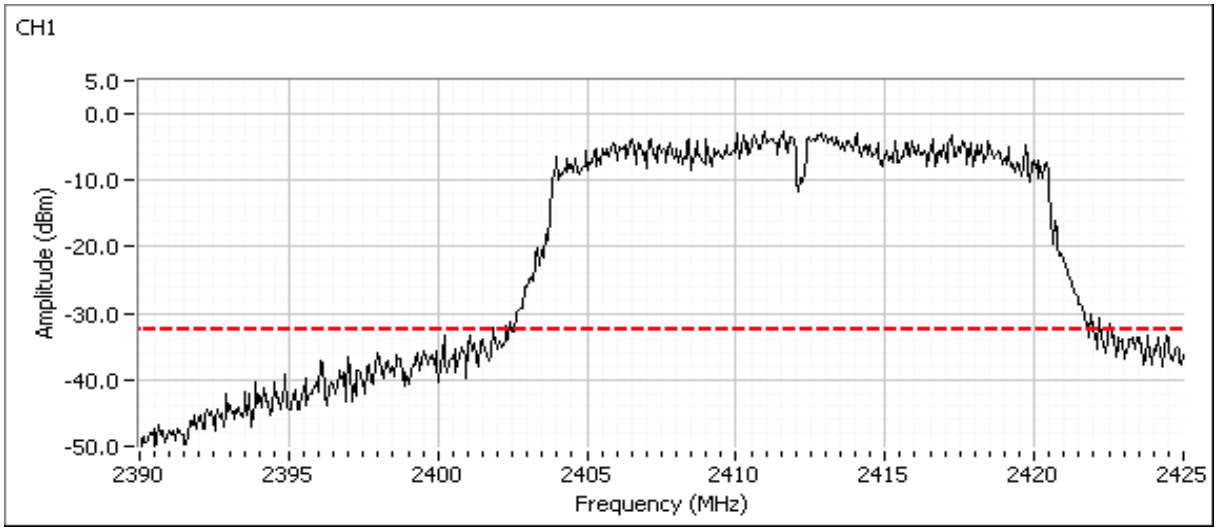
Frequency (MHz)	Limit	Result
2422	-30dBc	PASS
2437	-30dBc	PASS
2452	-30dBc	PASS

Plots for low channel

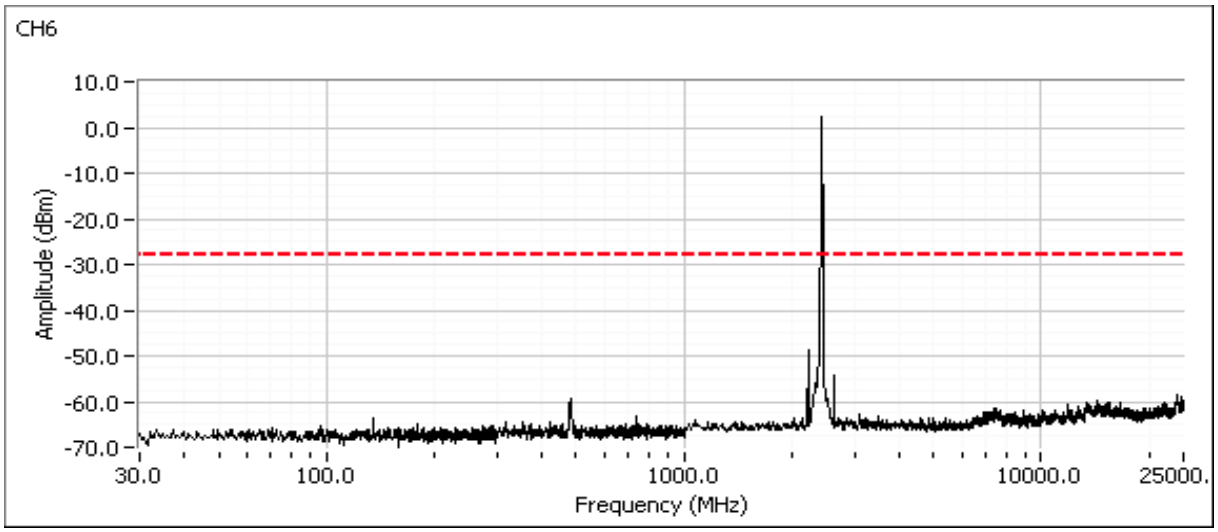


Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

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.

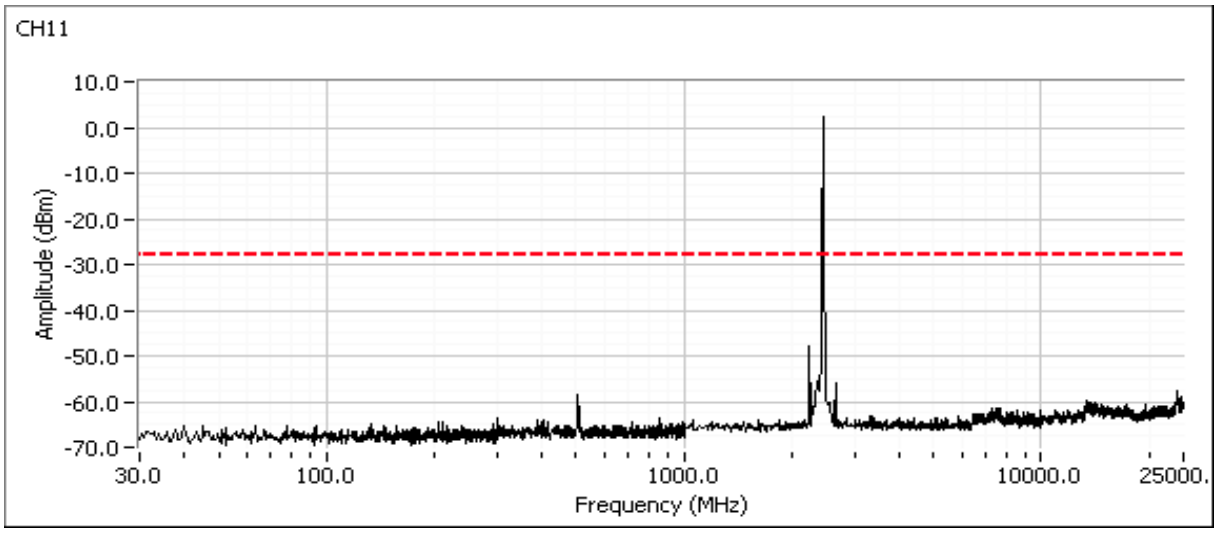


Plots for center channel



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Plots for high channel



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions

(802.11n40 Operation)

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: 10/14/2011
Test Engineer: J Liu, J Caizzi
Test Location: FT4

Config. Used: 1
Config Change: No
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: 25 °C
Rel. Humidity: 40 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	-	-	Output Power	15.247(b)	pass	13.2dBm
2	-	-	Power spectral Density (PSD)	15.247(d)	pass	-9.3dBm/3kHz
3	-	-	Minimum 6dB Bandwidth	15.247(a)	pass	34.83 MHz
3	-	-	99% Bandwidth	RSS GEN	-	36.2 MHz
4	-	-	Spurious emissions	15.247(b)	pass	All emissions < 30dBc

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

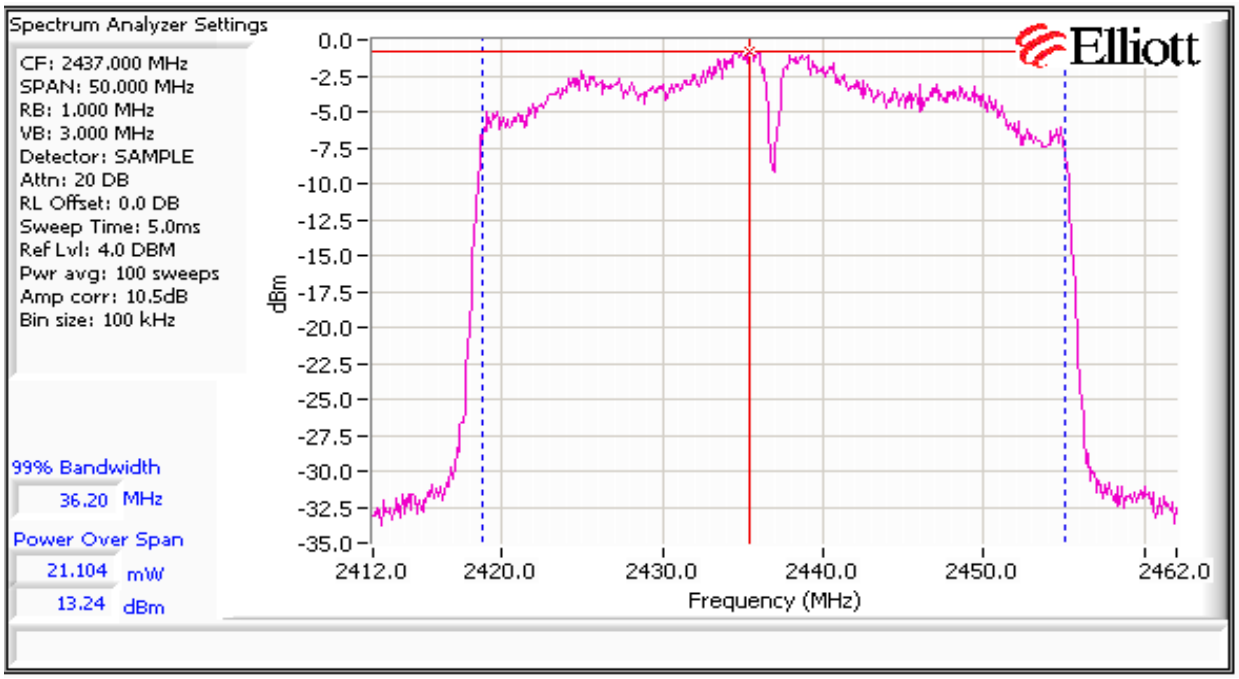
No deviations were made from the requirements of the standard.

Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, 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		
	2422	9.04	8.02	3.9	Pass	12.9	0.020		
	2437	13.2	21.1	3.9	Pass	17.1	0.052		
	2452	12.0	16.0	3.9	Pass	15.9	0.039		

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:	Power setting - the software power setting used during testing, included for reference only.

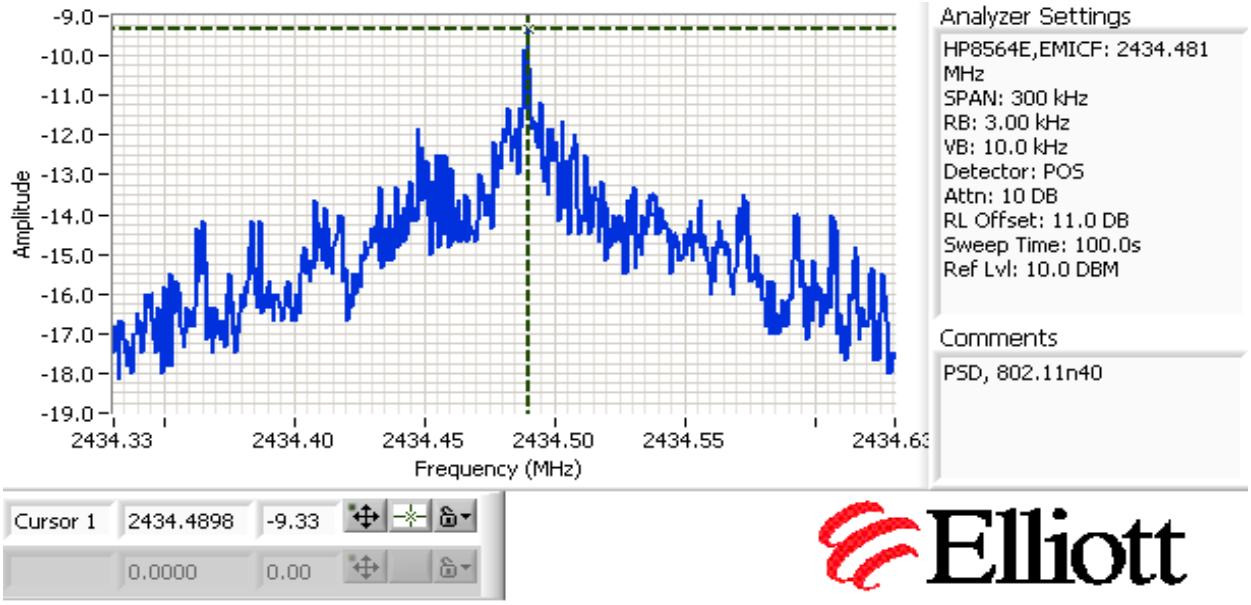


Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
	2422	-15.3	8.0	Pass
	2437	-9.3	8.0	Pass
	2452	-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.

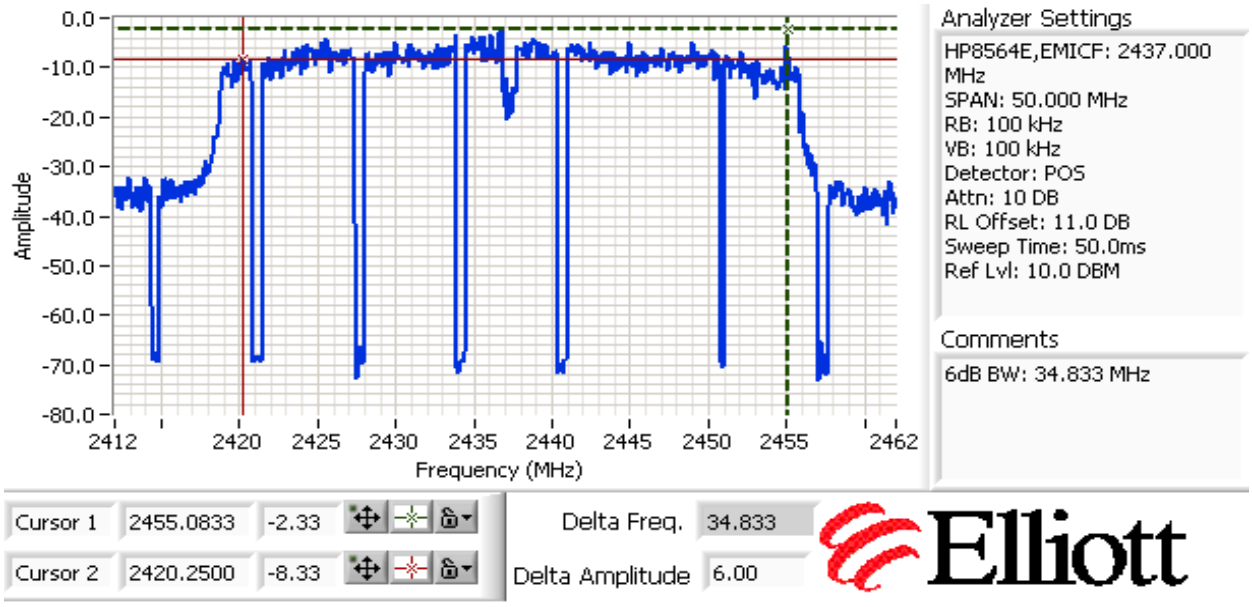


Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
	2422	100 kHz	35.5	36.1
	2437	100 kHz	34.83	36.2
	2452	100 kHz	35.83	36.1

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

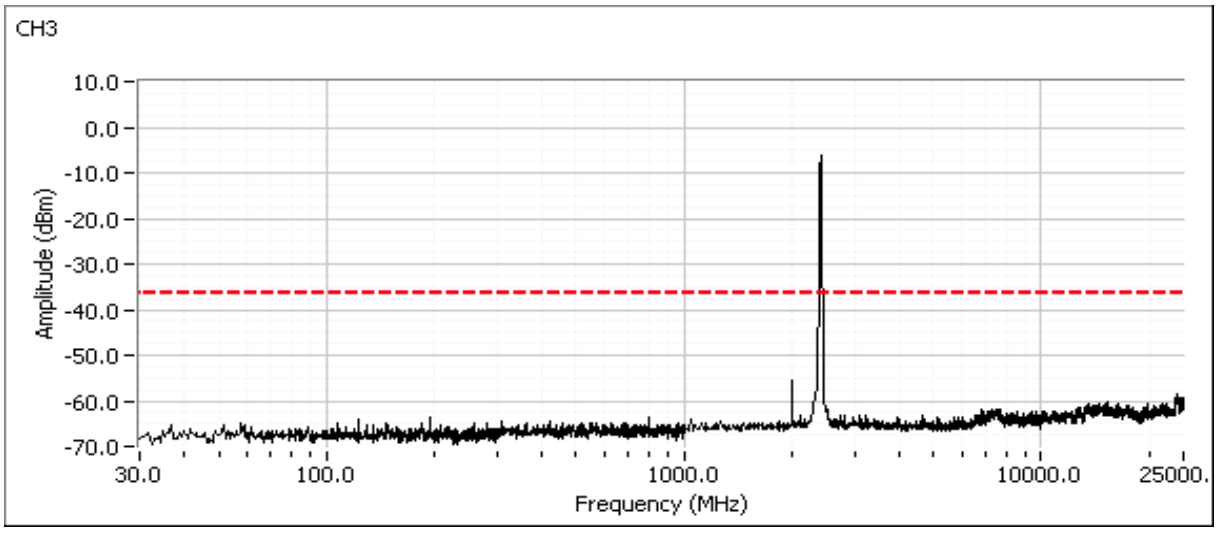


Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #4: Out of Band Spurious Emissions

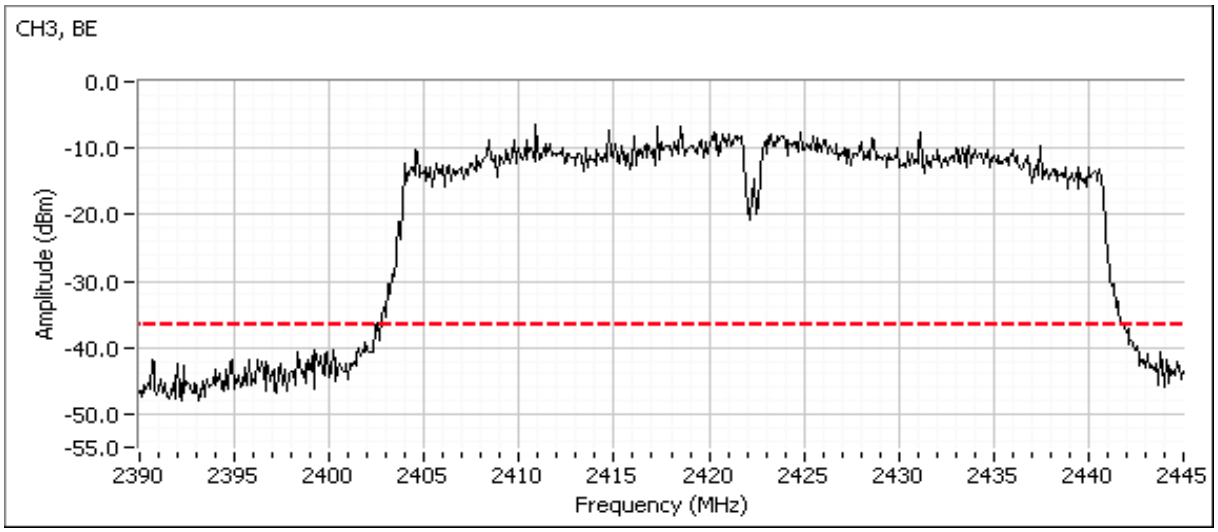
Frequency (MHz)	Limit	Result
2422	-30dBc	PASS
2437	-30dBc	PASS
2452	-30dBc	PASS

Plots for low channel

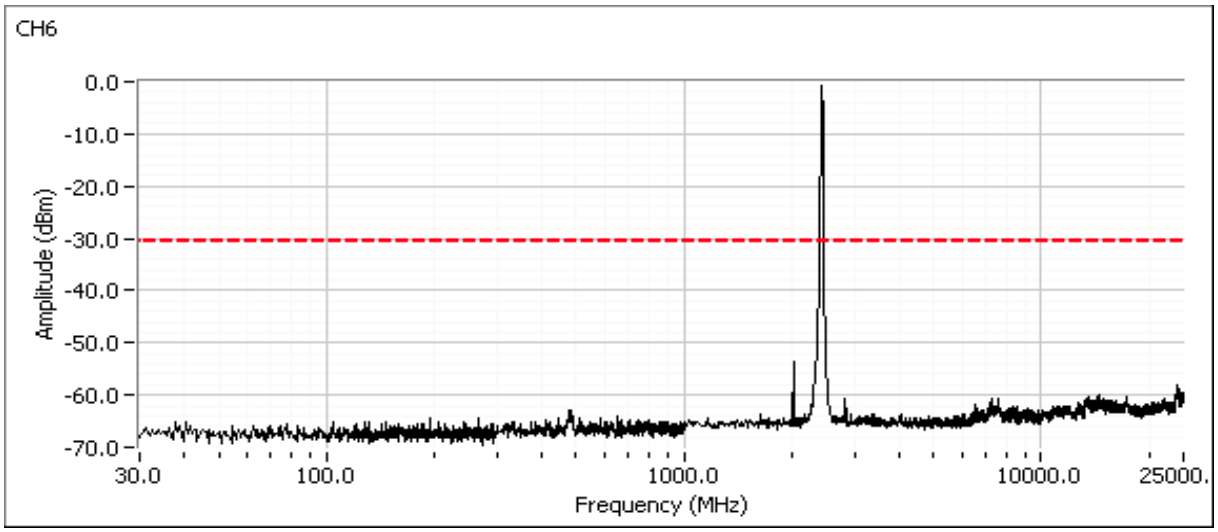


Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

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.

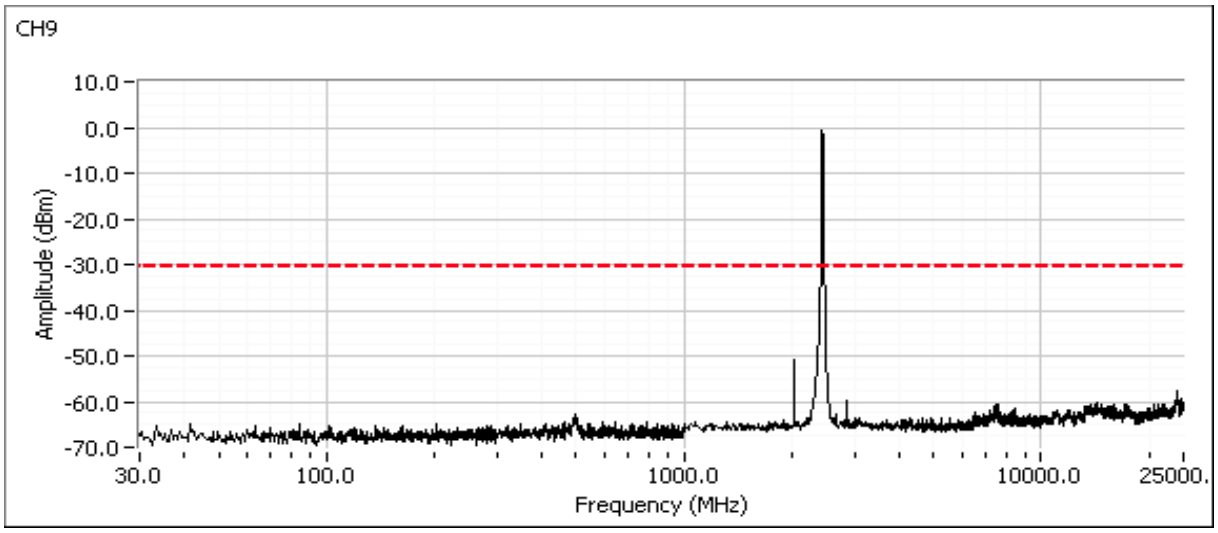


Plots for center channel



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Plots for high channel



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions (Bluetooth - BLE Operation)

Test Specific Details

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

General Test Configuration

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

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

Ambient Conditions:

Temperature: 20.4 °C
Rel. Humidity: 37 %

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

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
Run #1	BLE Chain A	2402MHz	37.0	6.4	Restricted Band Edge at 2390 MHz	15.209	47.4dBµV/m @ 2387.2MHz (-6.6dB)
		2480MHz	37.0	0.2	Restricted Band Edge at 2483.5 MHz	15.209	48.5dBµV/m @ 2483.5MHz (-5.5dB)
Run # 2	BLE Chain A	2402MHz	37.0	6.4	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	53.2dBµV/m @ 4804.0MHz (-0.8dB)
		2441MHz	37.0	0.4			50.6dBµV/m @ 4884.0MHz (-3.4dB)
		2480MHz	37.0	0.2			49.4dBµV/m @ 4960.1MHz (-4.6dB)
Run # 3	BLE - RX Chain A	2441MHz	-	-	Radiated Emissions, 1 - 8 GHz	RSS-GEN	43.1dBµV/m @ 7502.6MHz (-10.9dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #1, Band Edge Field Strength - BLE, Chain A

Date of Test: 10/25/2011 Test Location: FT Chamber #4

Test Engineer: Rafael Varelas Config Change: none

Run #1a, EUT on Channel 2402MHz - BLE, Chain A

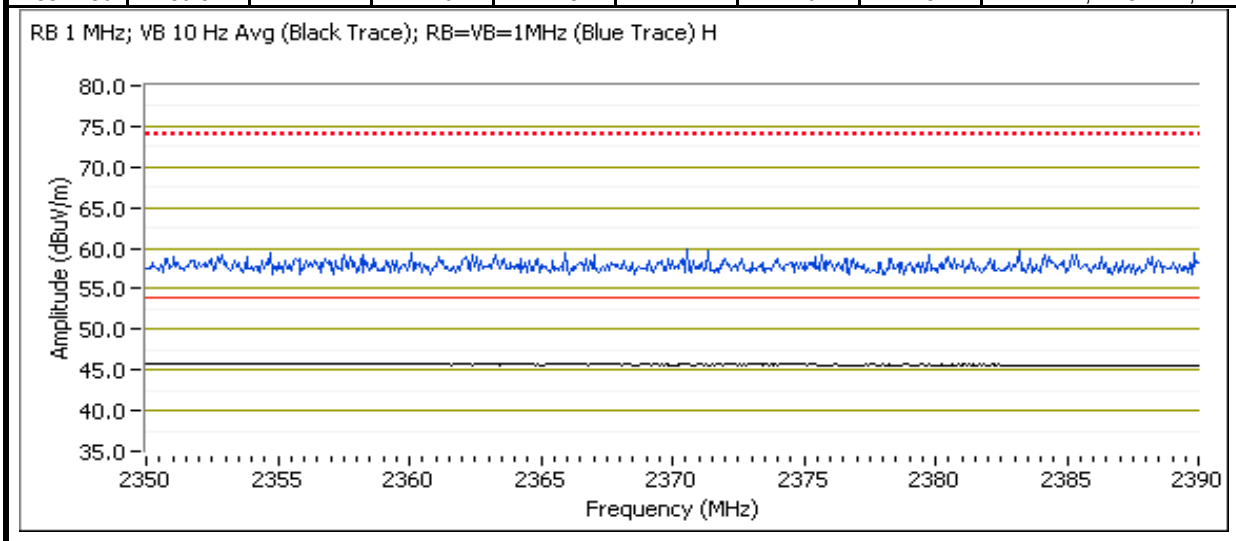
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	-	6.4	37.0

Fundamental 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	
2402.020	96.4	H	-	-	AVG	57	1.1	RB 1 MHz;VB 10 Hz;Pk
2402.320	99.7	H	-	-	PK	57	1.1	RB 1 MHz;VB 3 MHz;Pk
2402.070	98.7	H	-	-	PK	57	1.1	RB 100 kHz;VB 100 kHz;Pk
2402.040	91.1	V	-	-	AVG	91	1.0	RB 1 MHz;VB 10 Hz;Pk
2402.250	94.2	V	-	-	PK	91	1.0	RB 1 MHz;VB 3 MHz;Pk

2390 MHz 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	
2387.220	47.4	H	54.0	-6.6	AVG	160	1.0	RB 1 MHz;VB 10 Hz;Pk
2387.090	58.7	H	74.0	-15.3	PK	160	1.0	RB 1 MHz;VB 3 MHz;Pk
2387.670	47.3	V	54.0	-6.7	AVG	116	1.3	RB 1 MHz;VB 10 Hz;Pk
2387.430	59.5	V	74.0	-14.5	PK	116	1.3	RB 1 MHz;VB 3 MHz;Pk



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #1b, EUT on Channel 2480MHz - BLE, Chain A

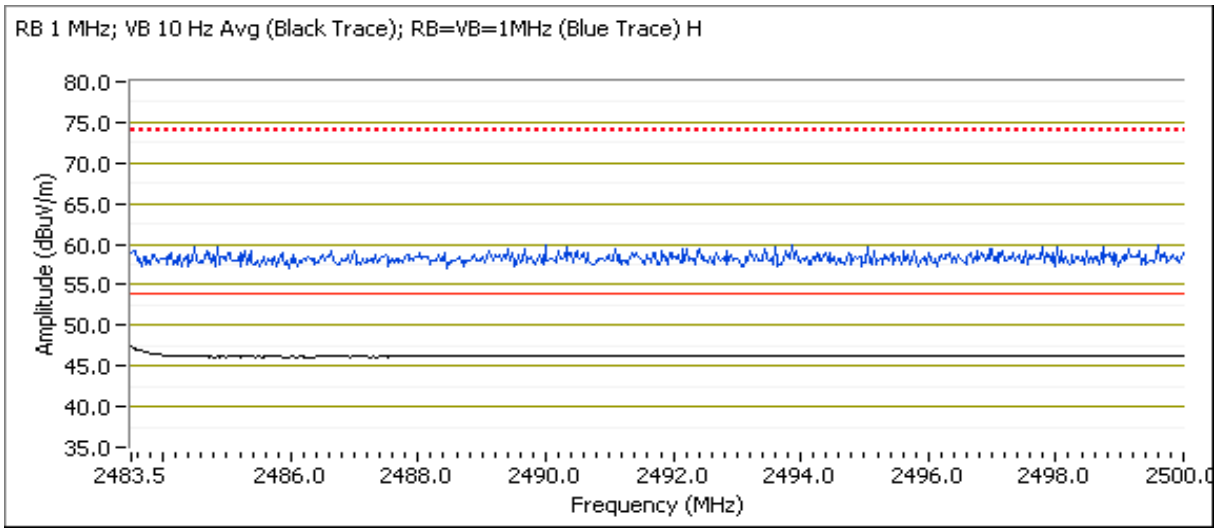
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	-	0.2	37.0

Fundamental 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	
2480.030	92.3	H	-	-	AVG	55	1.0	RB 1 MHz;VB 10 Hz;Pk
2479.820	95.5	H	-	-	PK	55	1.0	RB 1 MHz;VB 3 MHz;Pk
2480.040	94.6	H	-	-	PK	55	1.0	RB 100 kHz;VB 100 kHz;Pk
2480.010	84.9	V	-	-	AVG	157	1.1	RB 1 MHz;VB 10 Hz;Pk
2480.290	88.1	V	-	-	PK	157	1.1	RB 1 MHz;VB 3 MHz;Pk

2483.5 MHz Band Edge Signal Radiated 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	
2483.500	48.5	H	54.0	-5.5	AVG	52	1.0	RB 1 MHz;VB 10 Hz;Pk
2485.260	59.1	H	74.0	-14.9	PK	52	1.0	RB 1 MHz;VB 3 MHz;Pk
2485.320	47.8	V	54.0	-6.2	AVG	284	1.0	RB 1 MHz;VB 10 Hz;Pk
2484.950	58.8	V	74.0	-15.2	PK	284	1.0	RB 1 MHz;VB 3 MHz;Pk



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run # 2, Radiated Spurious Emissions, 1-26GHz, BLE, Chain A

Date of Test: 10/25/2011 Test Location: FT Chamber #4

Test Engineer: Rafael Varelas Config Change: none

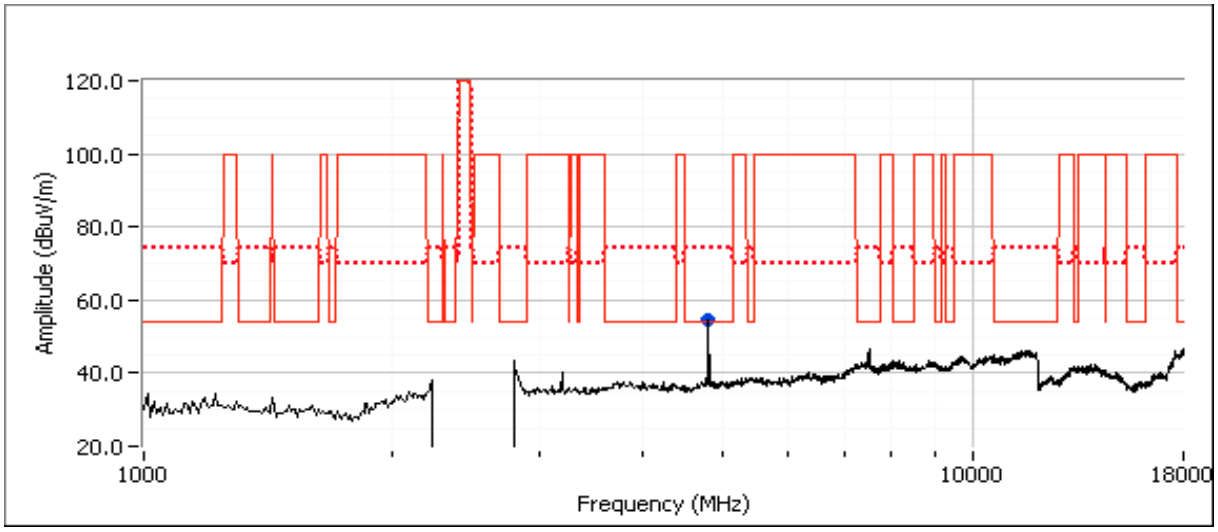
Run # 2a, EUT on Channel 2402MHz - BLE, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	-	6.4	37.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4803.990	53.2	V	54.0	-0.8	AVG	278	1.0	RB 1 MHz;VB 10 Hz;Pk
4803.680	58.8	V	74.0	-15.2	PK	278	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 is -30dBc for peak measurements in a measurement bandwidth of 100kHz.



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

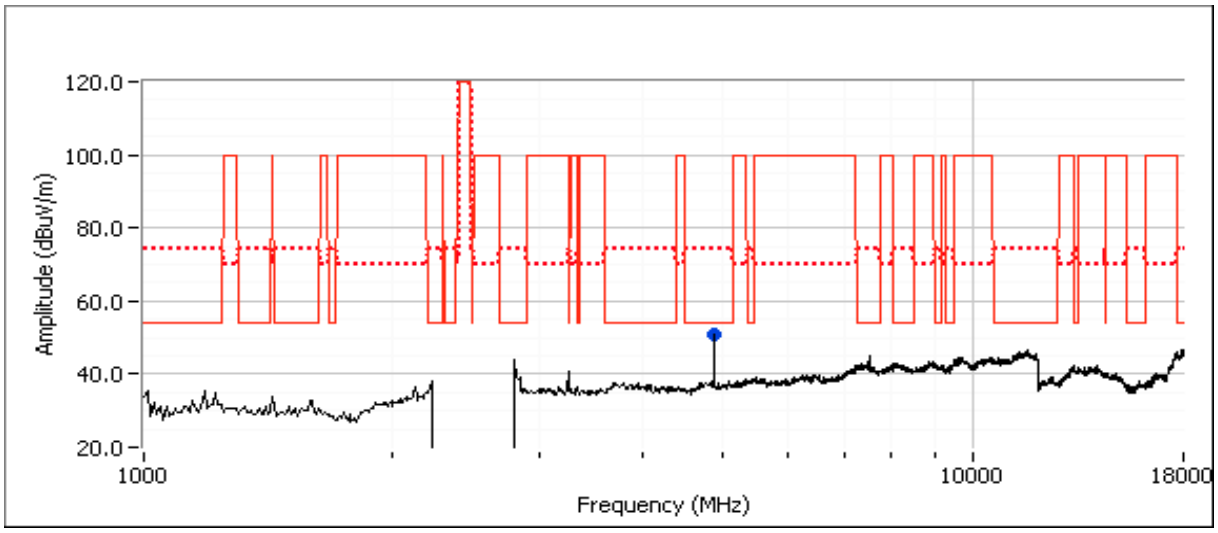
Run # 2b: , EUT on Channel 2441MHz - BLE, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	-	0.4	37.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4883.990	50.6	V	54.0	-3.4	AVG	271	1.0	RB 1 MHz;VB 10 Hz;Pk
4883.550	56.6	V	74.0	-17.4	PK	271	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 is -30dBc for peak measurements in a measurement bandwidth of 100kHz.
Note 2:	Scans made between 18 - 26GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no signifcant emissions in this frequency range



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

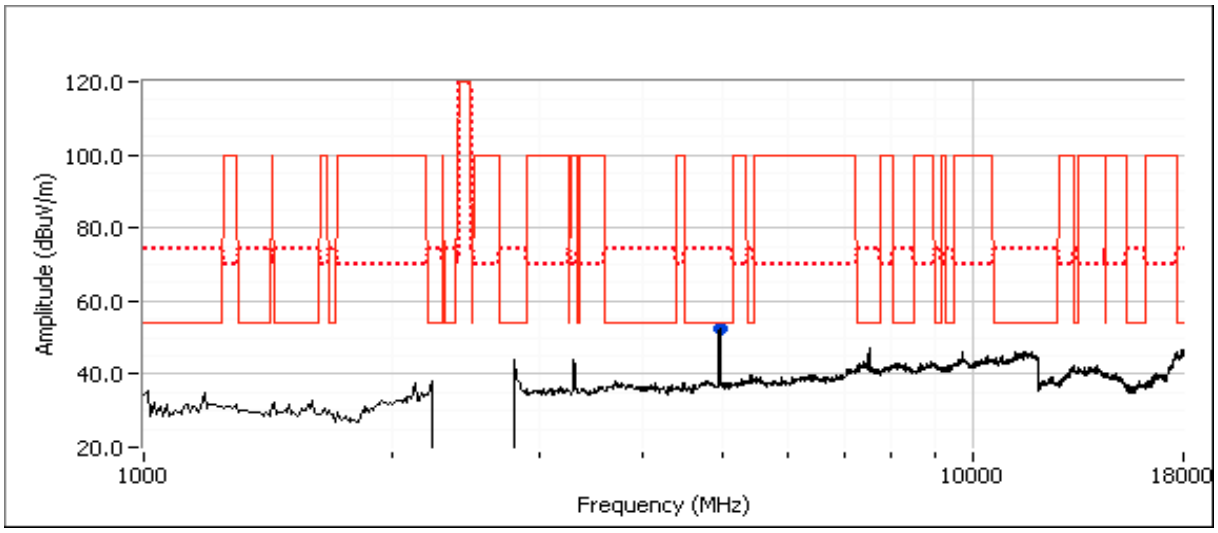
Run # 2c: , EUT on Channel 2480MHz - BLE, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	-	0.2	37.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4960.080	49.4	V	54.0	-4.6	AVG	282	1.1	RB 1 MHz;VB 10 Hz;Pk
4959.650	55.6	V	74.0	-18.4	PK	282	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 is -30dBc for peak measurements in a measurement bandwidth of 100kHz.



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run # 3, Radiated Spurious Emissions, 1-8GHz, BLE - RX, Chain A

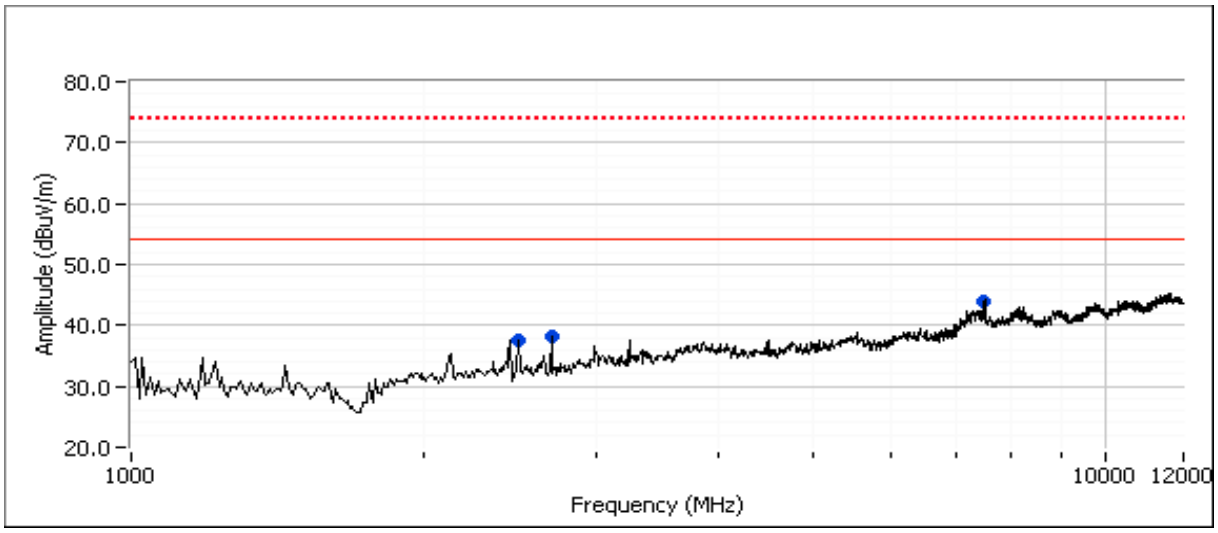
Date of Test: 10/25/2011 Test Location: FT Chamber #4

Test Engineer: Rafael Varelas Config Change: none

Run # 3a, EUT on Channel 2441MHz - BLE - RX, Chain A

Spurious Radiated Emissions:

Frequency	Level	Pol	RSS-GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7502.580	43.1	H	54.0	-10.9	AVG	184	1.1	RB 1 MHz;VB 10 Hz;Pk
7503.050	51.9	H	74.0	-22.1	PK	184	1.1	RB 1 MHz;VB 3 MHz;Pk
2500.570	36.4	H	54.0	-17.6	AVG	175	1.2	RB 1 MHz;VB 10 Hz;Pk
2500.300	43.5	H	74.0	-30.5	PK	175	1.2	RB 1 MHz;VB 3 MHz;Pk
2700.060	34.8	H	54.0	-19.2	AVG	184	1.2	RB 1 MHz;VB 10 Hz;Pk
2699.800	42.6	H	74.0	-31.4	PK	184	1.2	RB 1 MHz;VB 3 MHz;Pk



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions

(Bluetooth - BLE Operation)

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: 10/26/2011
Test Engineer: Jack Liu & John Caizzi
Test Location: FT4

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: 22 °C
Rel. Humidity: 40 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	default	-	Output Power	15.247(b)	Pass	-1.2 dBm
2	default	-	Power spectral Density (PSD)	15.247(d)	Pass	-15.4dBm/3kHz
3	default	-	Minimum 6dB Bandwidth	15.247(a)	Pass	0.625 MHz
3	default	-	99% Bandwidth	RSS GEN	-	1.098 MHz
4	default	-	Spurious emissions	15.247(b)	Pass	All emissions < 20dBc

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	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #1: Output Power

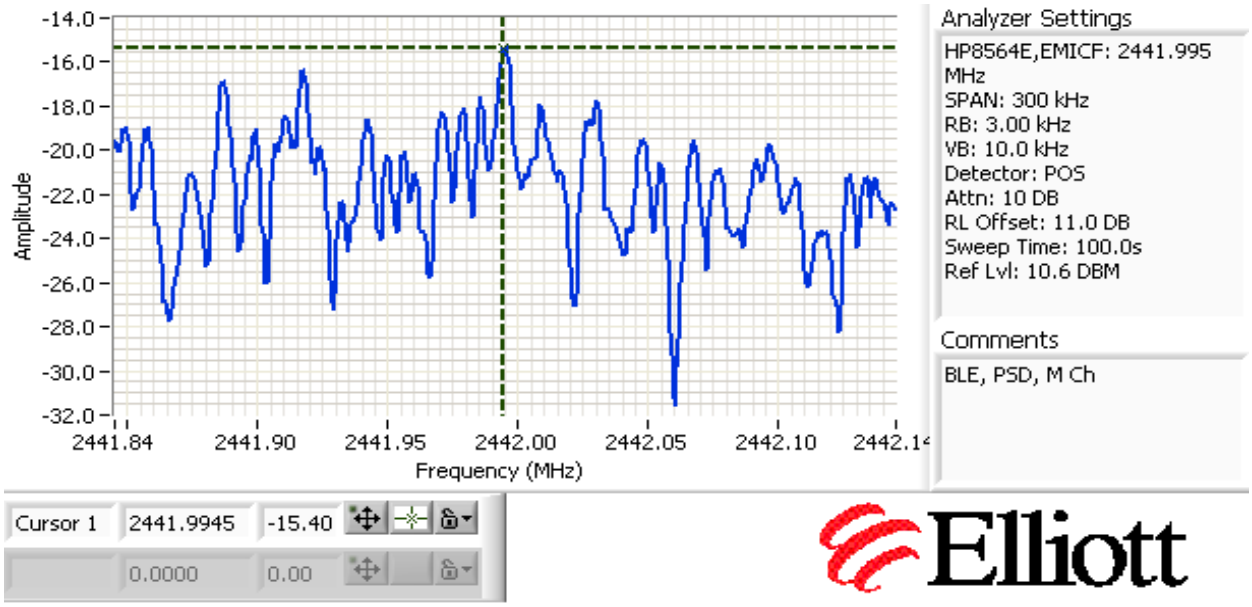
Power Setting[2]	Frequency (MHz)	Output Power (dBm) [1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP [Note 2] dBm	EIRP W
default	2402	-1.5	0.7	3.9	Pass	2.4	0.002
default	2442	-1.2	0.8	3.9	Pass	2.7	0.002
default	2480	-1.8	0.7	3.9	Pass	2.1	0.002

Note 1:	Output power measured using a peak power meter, spurious limit is -20dBc.
Note 2:	Power setting - the software power setting used during testing, included for reference only.

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) [Note 1]	Limit dBm/3kHz	Result
default	2402	-15.9	8.0	Pass
default	2442	-15.4	8.0	Pass
default	2480	-16.2	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.

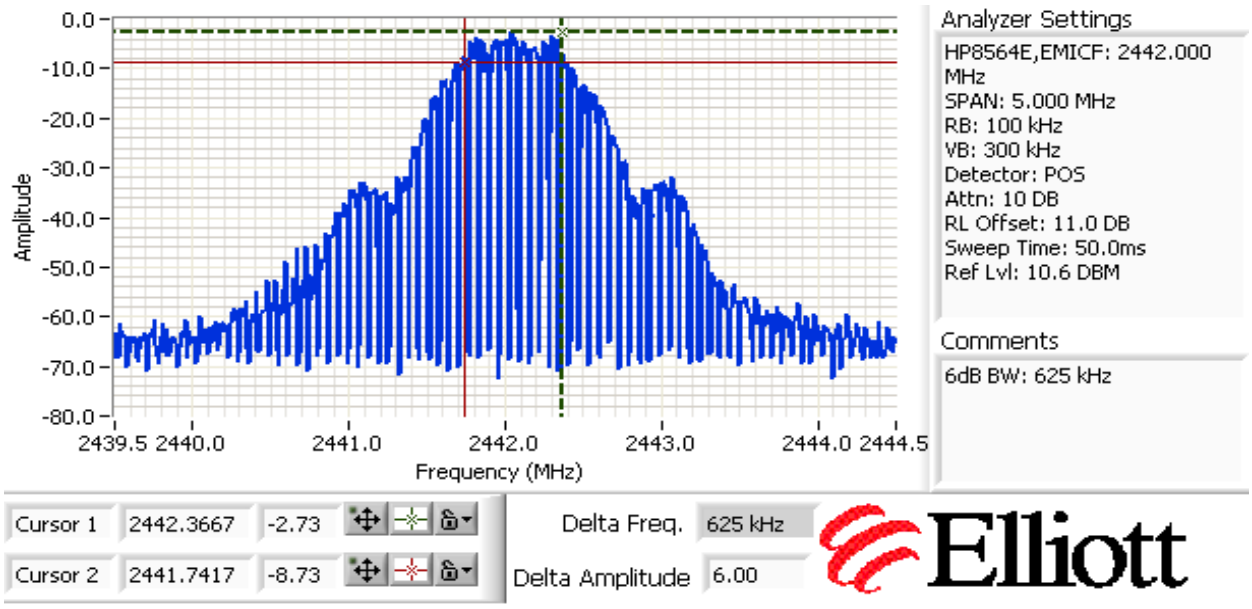


Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
			6dB	99%
default	2402	100KHz	0.658	1.090
default	2442	100KHz	0.625	1.098
default	2480	100KHz	0.633	1.073

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

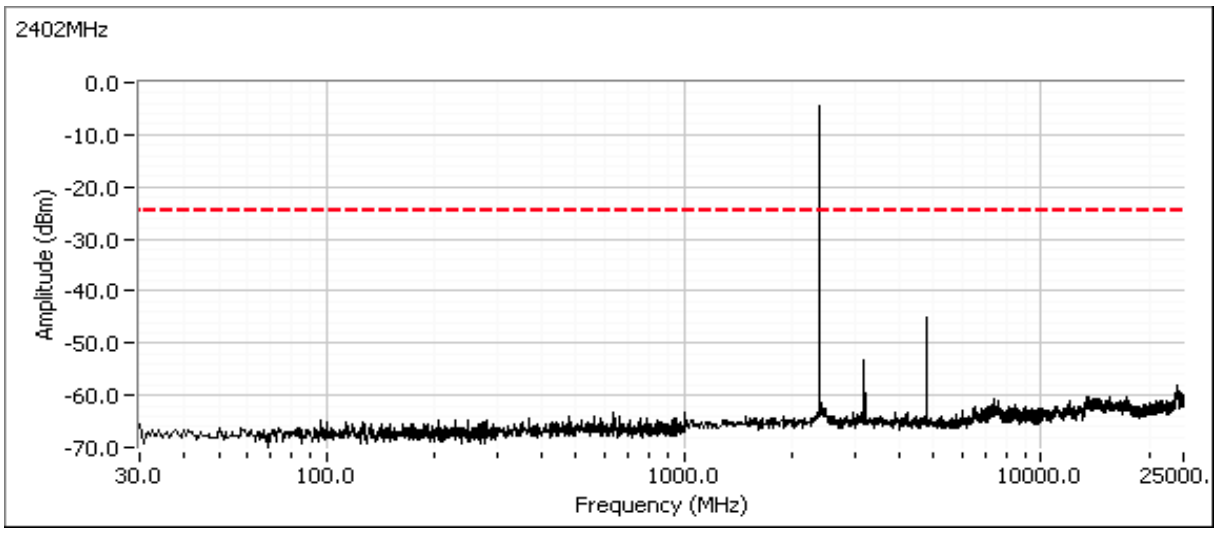


Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Run #4: Out of Band Spurious Emissions

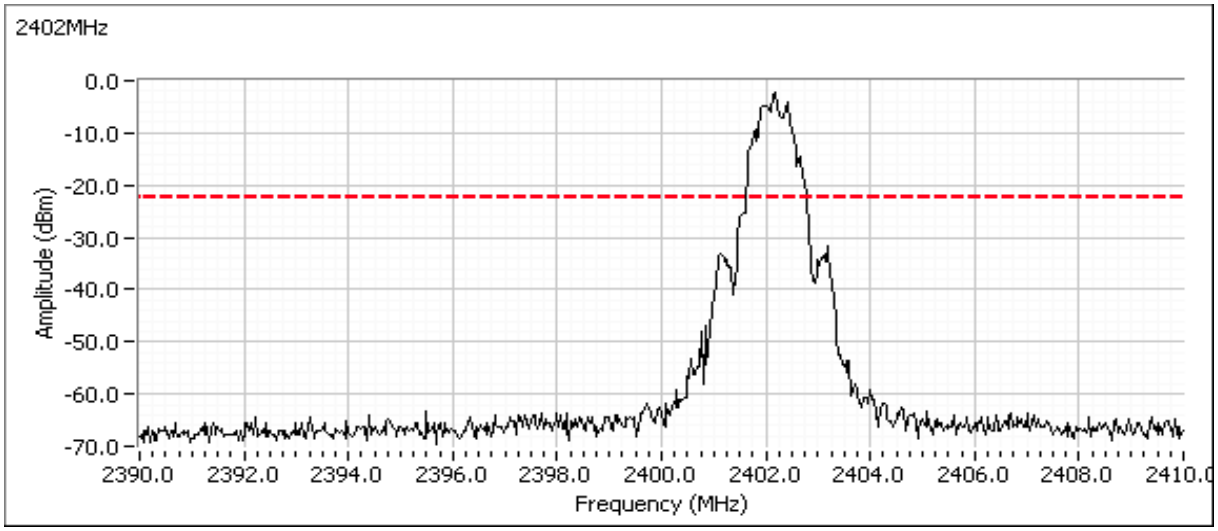
Frequency (MHz)	Limit	Result
2402	-20dBc	Pass
2441	-20dBc	Pass
2480	-20dBc	Pass

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

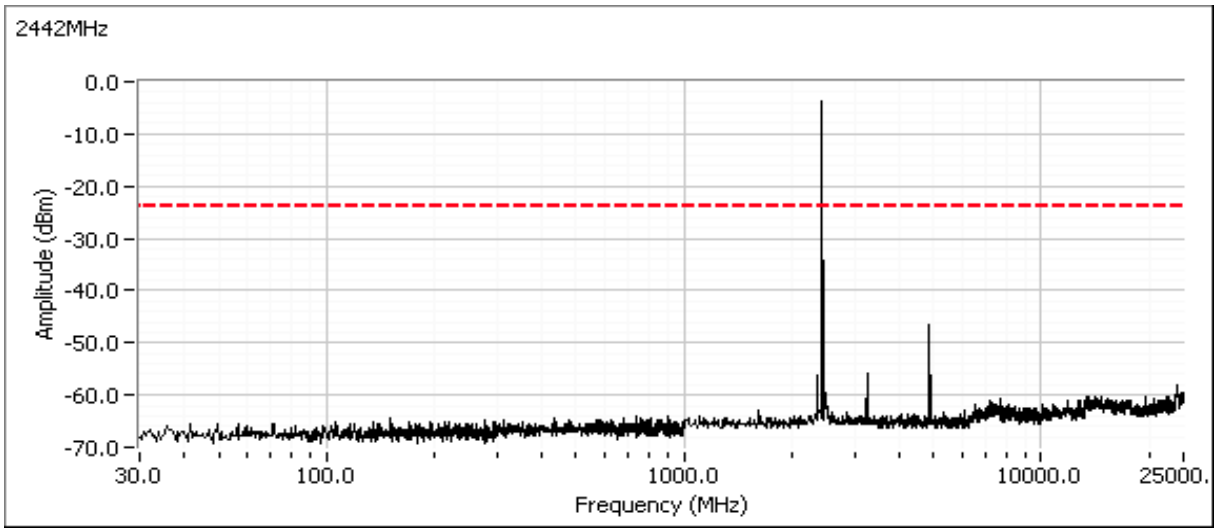


Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

Additional plot showing compliance with -20dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

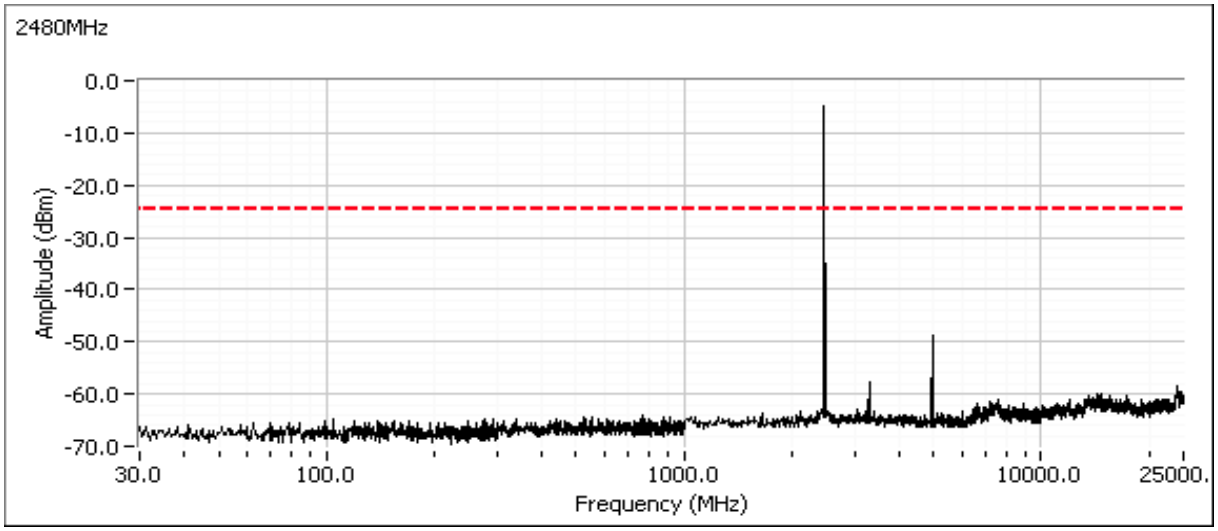


Plots for center channel, power setting(s) = default



Client:	Broadcom	Job Number:	J84866
Model:	BCM943142HM 802.11bgn (20 and 40MHz SISO only + BT 4.0)	T-Log Number:	T84936
		Account Manager:	Sheareen Washington
Contact:	Anne Liang		
Standard:	FCC 15.247, 15.E, RSS-210	Class:	N/A

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



End of Report

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marks the last page of this test report.