EMC Test Report
Application for Grant of Equipment Authorization
Industry Canada RSS-Gen Issue 2 / RSS 210 Issue 7
FCC Part 15 Subpart C

Model: BCM943227HM4L

IC CERTIFICATION #:	QDS-BRCM1053
FCC ID:	4324A-BRCM1053
APPLICANT:	Broadcom Corporation 190 Mathilda Ave Sunnyvale, CA 94086
TEST SITE(S):	Elliott Laboratories 41039 Boyce Road. Fremont, CA. 94538-2435
IC SITE REGISTRATION #:	2845B-3; 2845B-4, 2845B-5, 2845B-7
REPORT DATE:	October 28, 2010
FINAL TEST DATES:	September 24, 29, 30, October 7, 12, 14, 18, 19, 20 and 21, 2010

AUTHORIZED SIGNATORY:

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Elliott Laboratories

Testing Cert #2016.01

REVISION HISTORY

Rev#	Date	Comments	Modified By
-	10-28-2010	First release	

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SCOPE

An electromagnetic emissions test has been performed on the Broadcom Corporation model BCM943227HM4L, pursuant to the following rules:

Industry Canada RSS-Gen Issue 2
RSS 210 Issue 7 "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
FCC UNII test procedure 2002-08 DA-02-2138, August 2002

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 BCM943227HM4L complied with the requirements of the following regulations:

Industry Canada RSS-Gen Issue 2
RSS 210 Issue 7 "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 BCM943227HM4L and therefore apply only to the tested sample. The sample was selected and prepared by Anne Liang of Broadcom Corporation.

DEVIATIONS FROM THE STANDARDS

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

TEST RESULTS SUMMARY

DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHz)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 210 A8.2	Digital Modulation	Systems uses OFDM / DSSS techniques	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth	g mode: 14.9MHz b mode: 8.1 MHz n20 mode: 15.8 MHz n40 mode: 36.7 MHz	>500kHz	Complies
15.247 (b) (3)	RSS 210 A8.2 (4)	Output Power (multipoint systems)	g mode: 17.3 dBm (0.054 Watts) EIRP = 0.132 W Note 1 b mode: 18.7 dBm (0.074 Watts) EIRP = 0.182 W Note n20 mode: 19.4 dBm (0.087 Watts) EIRP = 0.429W Note n40 mode: 14.5 dBm (0.028 Watts) EIRP = 0.138 W Note	1Watt, EIRP limited to 4 Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	g mode: -4.1 dBm / 3kHz b mode: 2.1 dBm / 3kHz n20 mode: -2.3 dBm / 3kHz n40 mode: -9.7 dBm / 3kHz	8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	All emissions more than 30dBc	< -30dBc Note 2	Complies
15.247(c) / 15.209	RSS 210 A8.5	Radiated Spurious Emissions 30MHz – 25 GHz	54.0dBµV/m @ 2485.0MHz (-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).

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	The EUT has u.FL connectors	Unique or integral antenna required	Complies
15.207	RSS GEN Table 2	AC Conducted Emissions	48.9dBµV @ 0.195MHz (-14.9dB)	Refer to page 18	Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	47.7dBµV/m @ 2437.0MHz (-6.3dB)	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	g mode: 17.4 MHz b mode: 11.4 MHz n20 mode: 18.1 MHz n40 mode: 37.3 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 BCM943227HM4L is a WLAN PCI-E Minicard, that is designed to enable WLAN connections when installed in PCs. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 3.3Vdc, 800mA.

The sample was received on August 24, 2010 and tested on September 24, 29, 30, October 7, 12, 14, 18, 19, 20 and 21, 2010. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Broadcom	BCM943227HM4L	WLAN PCI-E Minicard	-	QDS-BRCM1053

ANTENNA SYSTEM

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	4446	Laptop	-	-
Catalyst	-	Extender Board	-	-

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

EUT OPERATION

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

802.11b and 802.11g operation is limited to the main chain only.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission and with industry Canada.

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

ANSI C63.4:2003 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement. The test site(s) contain separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4:2003.

CONDUCTED EMISSIONS CONSIDERATIONS

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

RADIATED EMISSIONS CONSIDERATIONS

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

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

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

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

INSTRUMENT CONTROL COMPUTER

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

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

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

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

FILTERS/ATTENUATORS

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

ANTENNAS

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

ANTENNA MAST AND EQUIPMENT TURNTABLE

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

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

INSTRUMENT CALIBRATION

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

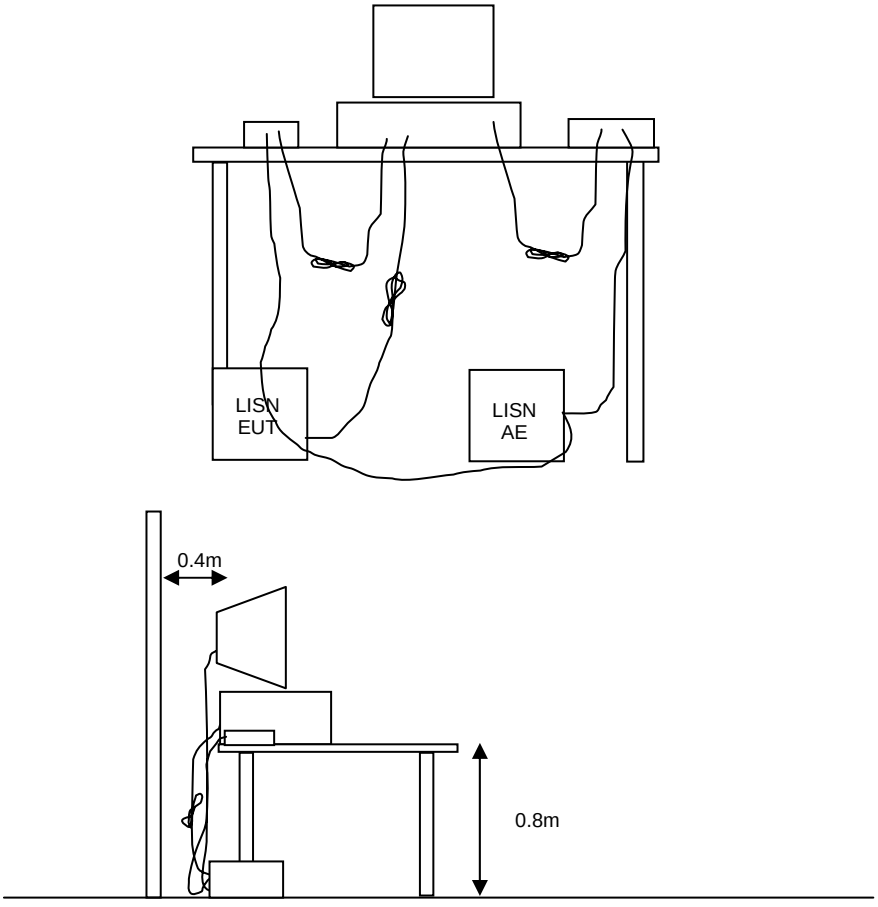
TEST PROCEDURES

EUT AND CABLE PLACEMENT

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

CONDUCTED EMISSIONS

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



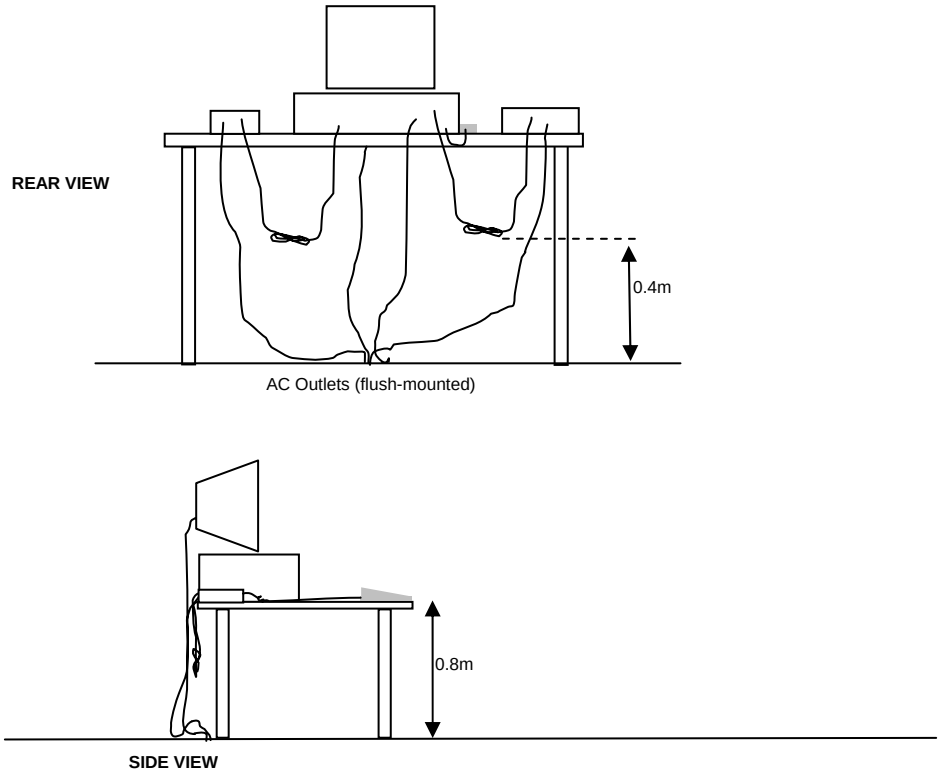
RADIATED EMISSIONS

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.

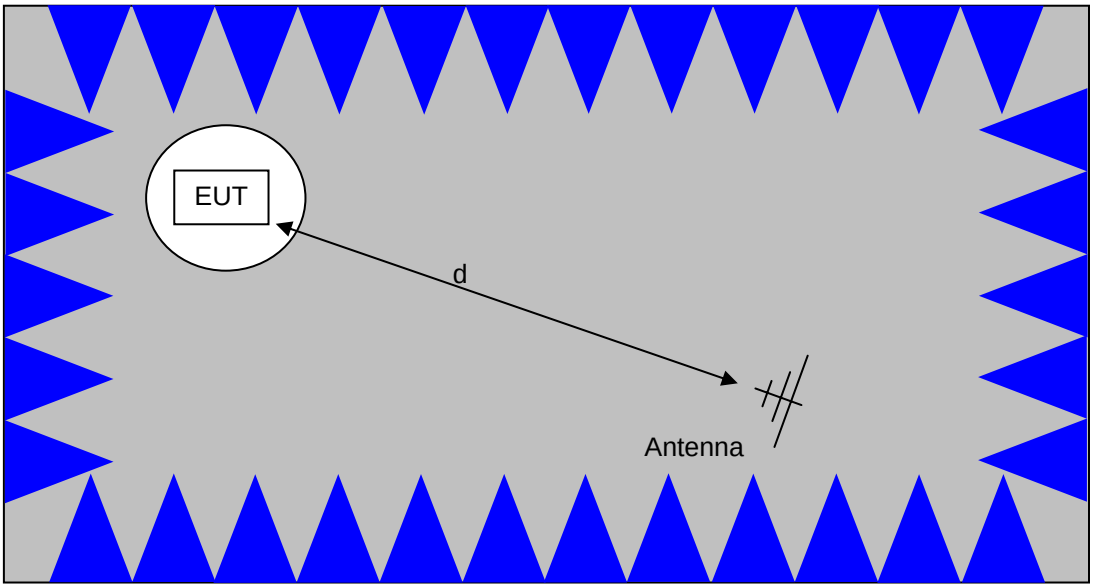
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

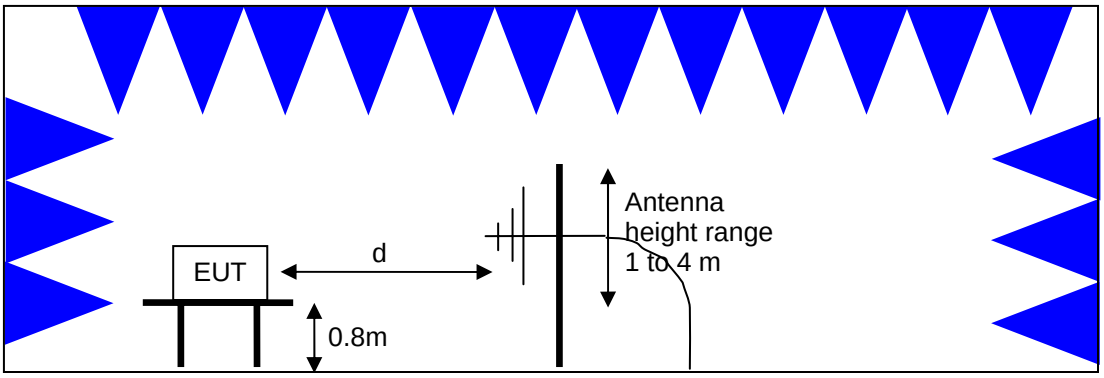


Typical Test Configuration for Radiated Field Strength Measurements



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.

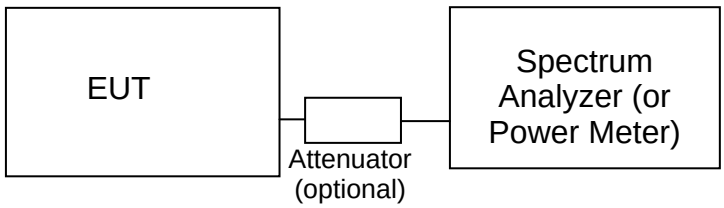
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



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
2400 – 2483.5	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

Manufacturer	Description	Model	Asset #	Cal Due
Radiated Emissions, 1 - 10 GHz, 24-Aug-10				
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	3/31/2011

Radiated Emissions, Bandedge, 25-Aug-10				
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	1630	3/31/2011

Band edge measurements, 27-Aug-10				
Manufacturer	**Description**	**Model**	**Asset #**	**Cal Due**
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	8/2/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	3/16/2011

DTS Bandedge, 31-Aug-10				
Manufacturer	**Description**	**Model**	**Asset #**	**Cal Due**
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/6/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	10/15/2010

TX Spurious Emissions, 31-Aug-10				
Manufacturer	**Description**	**Model**	**Asset #**	**Cal Due**
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/15/2010
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/6/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	4/14/2011
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1731	11/4/2010

Radiated Emissions, 30 - 1,000 MHz & DTS Bandedge, 14-Sep-10				
Manufacturer	**Description**	**Model**	**Asset #**	**Cal Due**
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/6/2012
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	6/4/2011
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	3/31/2011
Com-Power Corp.	Preamplifier, 30-1000 MHz	PA-103	1632	4/23/2011

DTS Bandedges, 24-Sep-10				
Manufacturer	**Description**	**Model**	**Asset #**	**Cal Due**
Hewlett Packard	SpecAn 9 KHz-26.5 GHz, Non-Program	8563E	284	1/29/2011
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/8/2012
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	8/10/2011
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	3/16/2011
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	2199	1/11/2011

Radiated Emissions, 1000 - 26,500 MHz, 29-Sep-10				
Manufacturer	**Description**	**Model**	**Asset #**	**Cal Due**
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	6/25/2011
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	8/10/2011

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	1771	8/26/2011

TX Spurious Emissions, 30-Sep-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	5/26/2011
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	8/2/2012
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	7/12/2011
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	8/10/2011
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	3/16/2011

Radiated Emissions, 30 - 1,000 MHz, 30-Sep-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447E	1606	4/29/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1657	5/28/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	3/16/2011

Conducted Emissions - AC Power Ports, 30-Sep-10

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	LISN, 10 kHz-100 MHz	3825/2	1292	3/12/2011
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1401	4/20/2011
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	3/16/2011

DTS RE, 01-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/15/2010
EMCO	Antenna, Horn, 1-18 GHz	3115	786	12/11/2011
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	4/14/2011
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447E	1606	4/29/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1657	5/28/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	3/16/2011

DTS Spurious, 06-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	5/26/2011
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	8/2/2012
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	7/12/2011
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	8/10/2011

Radiated Emissions, 07-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	10/15/2010
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012

Radiated Emissions, 08-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/15/2010

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	786	12/11/2011
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	4/14/2011
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	8/10/2011

Radiated Spurious , DTS , 12-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	SpecAn 9 KHz-26.5 GHz, Non-Program	8563E	284	1/29/2011
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/8/2012
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	8/10/2011
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	3/16/2011
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	2199	1/11/2011

DTS Spurious 2.4GHz, 14-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/15/2010
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	8/2/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	4/14/2011
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	8/10/2011

DTS n40 band edge, 18-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/15/2010
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	8/2/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	4/14/2011

Radio Antenna Port , 19-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1290	10/22/2010
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	11/15/2010
Rohde & Schwarz	Attenuator, 20 dB, 10W, DC-18 GHz	20dB, 10W, Type N	1795	6/2/2011
Rohde & Schwarz	Power Sensor 100 uW - 10 Watts	NRV-Z53	1796	6/2/2011

Radiated Emissions, 1000 - 7,500 MHz, 19-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/15/2010
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	8/2/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	1771	8/26/2011

Manufacturer	Description	Model	Asset #	Cal Due

Radiated Spurious Emissions, 1000 - 26,500 MHz, 19-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	5/26/2011
EMCO	Antenna, Horn, 1-18 GHz	3115	786	12/11/2011
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	7/12/2011
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2249	10/11/2011

Radio Antenna Port (Power and Spurious Emissions), 22-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	4/14/2011
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	3/16/2011

Appendix B Test Data

T80300 104 Pages

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		-
Emissions Standard(s):	FCC 15.247	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Broadcom Corporation

Model

BCM943227HM4L

Date of Last Test: 11/4/2010

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

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

Date of Test: 10/20/2010
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #4

Config. Used: 1
Config Change: none
EUT Voltage: Powered from host laptop

General Test Configuration

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

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

Ambient Conditions:

Temperature: 20.9 °C
Rel. Humidity: 41 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	-		Output Power	15.247(b)	Pass	17.3 dBm (0.054W)
2	-		Power spectral Density (PSD)	15.247(d)	Pass	-4.1 dBm/3kHz
3	-		Minimum 6dB Bandwidth	15.247(a)	Pass	14.9 MHz
3	-		99% Bandwidth	RSS GEN	-	17.4 MHz
4	-		Spurious emissions	15.247(b)	Pass	All emissions below -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 Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run #1: Output Power

Power Setting	Frequency (MHz)	Output Power (dBm) [1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP dBm	EIRP W	Output Power (dBm) [3]	Output Power mW
-	2412	14.9	30.9	3.9	Pass	18.8	0.076		
-	2437	17.3	53.7	3.9	Pass	21.2	0.132		
-	2462	15.7	37.2	3.9	Pass	19.6	0.091		

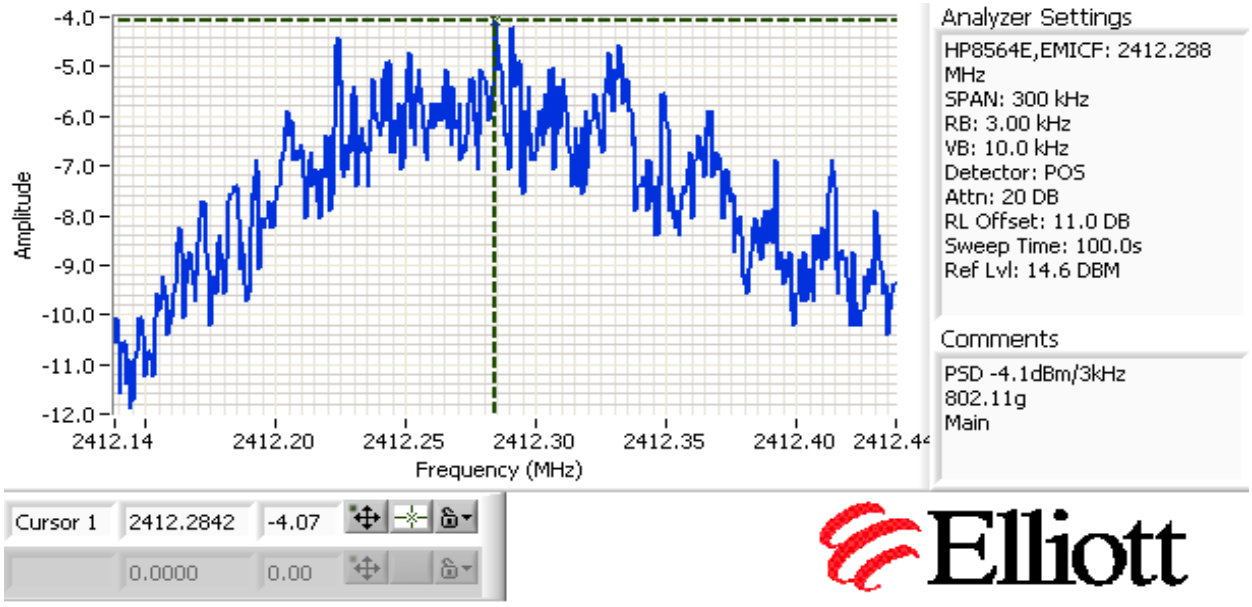
Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was not continuous but the ESI analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting) 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 3:	Power measured using average power meter and is included for reference only.

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
-	2412	-4.1	8.0	Pass
-	2437	-4.7	8.0	Pass
-	2462	-4.1	8.0	Pass

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

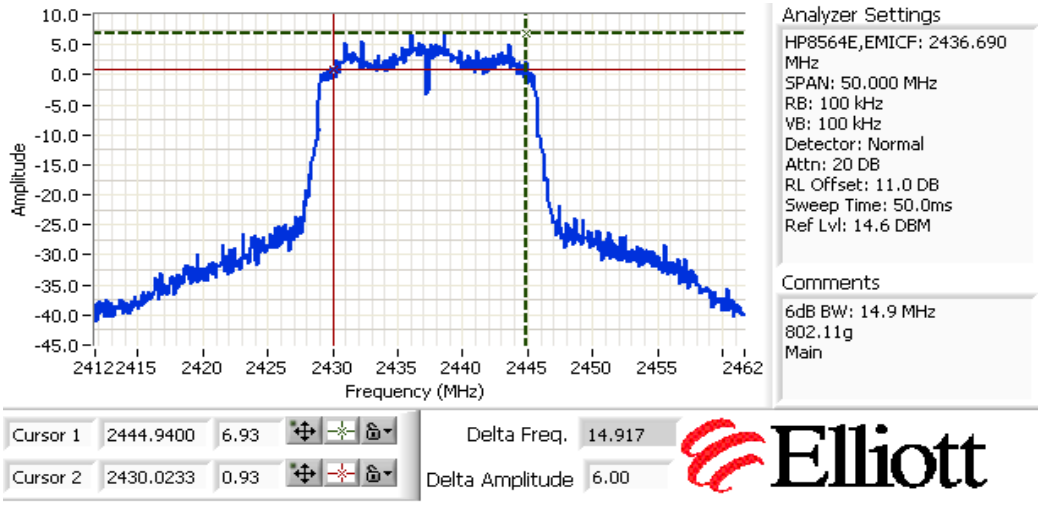


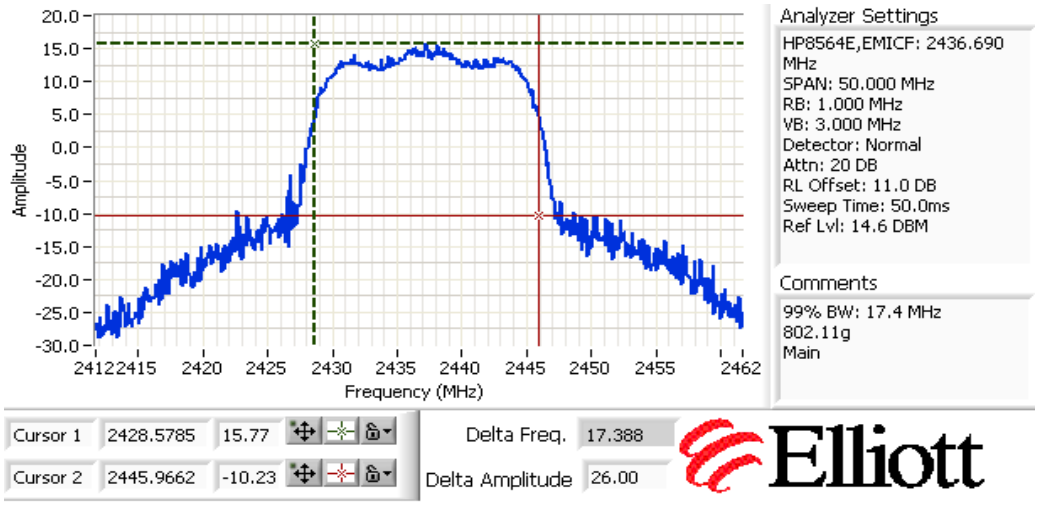
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
-	2412	100kHz	15.2	17.4
-	2437	100kHz	14.9	17.4
-	2462	100kHz	15.3	17.4

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



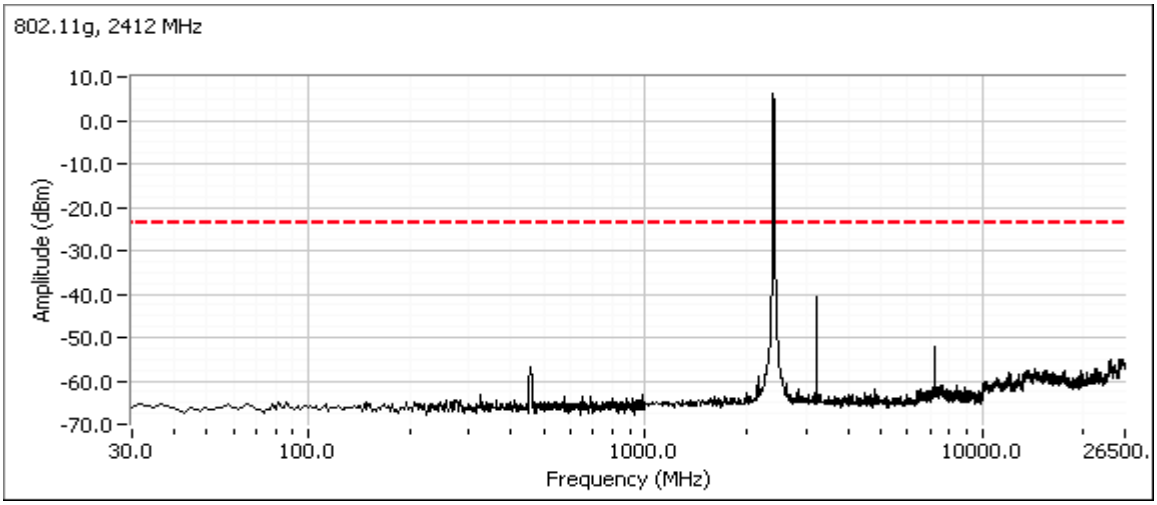


Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

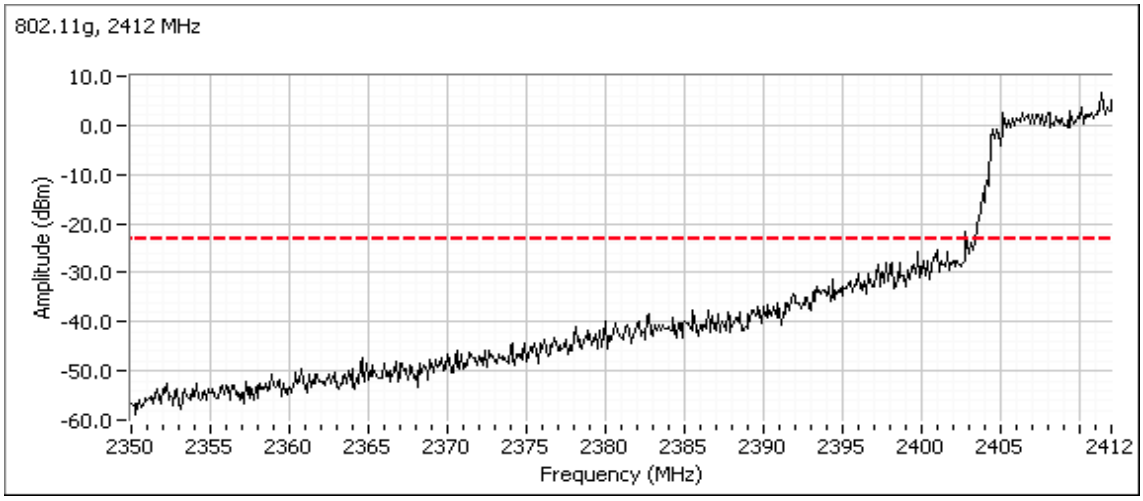
Run #4: Out of Band Spurious Emissions
Scans performed with RBW=VBW=100kHz

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

Plots for low channel

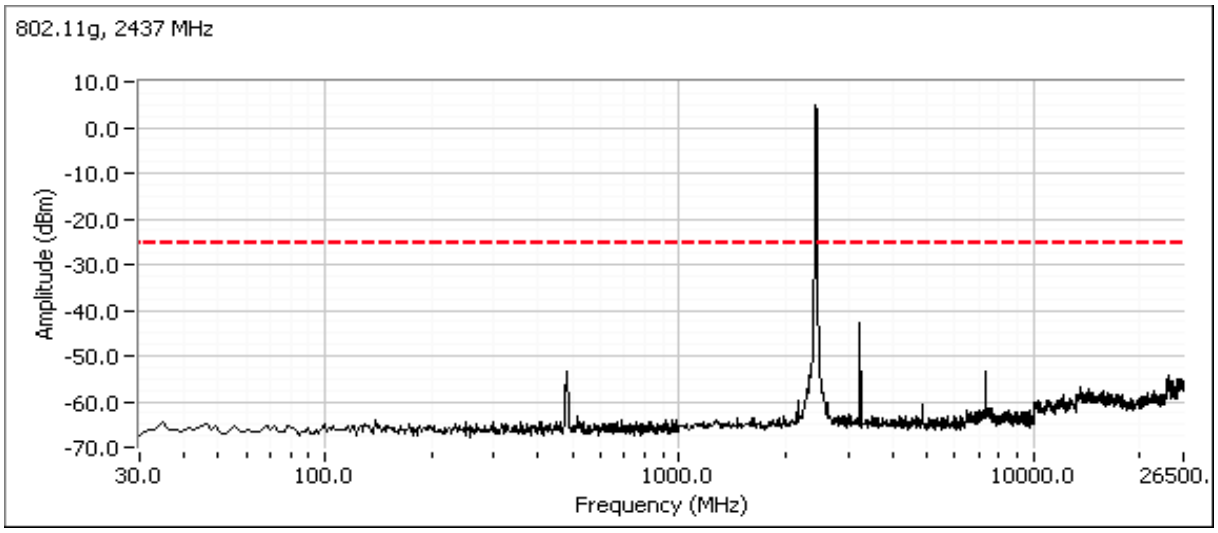


Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

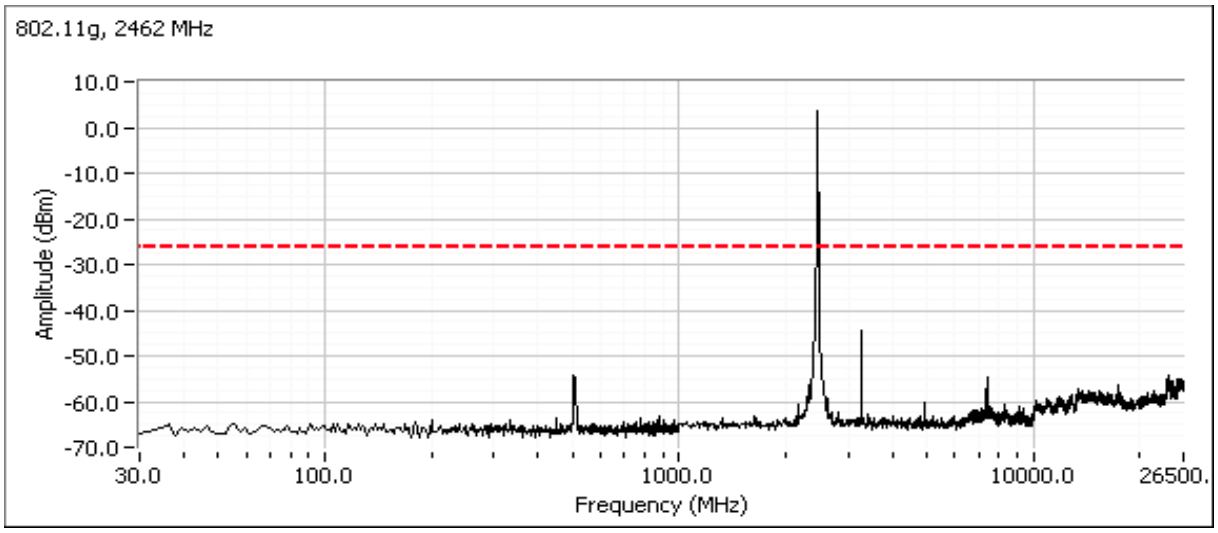


Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Plots for center channel



Plots for high channel



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

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

Date of Test: 10/19/2010
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #4

Config. Used: 1
Config Change: none
EUT Voltage: Powered from host laptop

General Test Configuration

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

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

Ambient Conditions:

Temperature: 21.4 °C
Rel. Humidity: 39 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	-		Output Power	15.247(b)	Pass	18.7 dBm (0.074mW)
2	-		Power spectral Density (PSD)	15.247(d)	Pass	2.1 dBm/3kHz
3	-		Minimum 6dB Bandwidth	15.247(a)	Pass	8.1 MHz
3	-		99% Bandwidth	RSS GEN	-	11.4 MHz
4	-		Spurious emissions	15.247(b)	Pass	All emissions below -30dBc

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

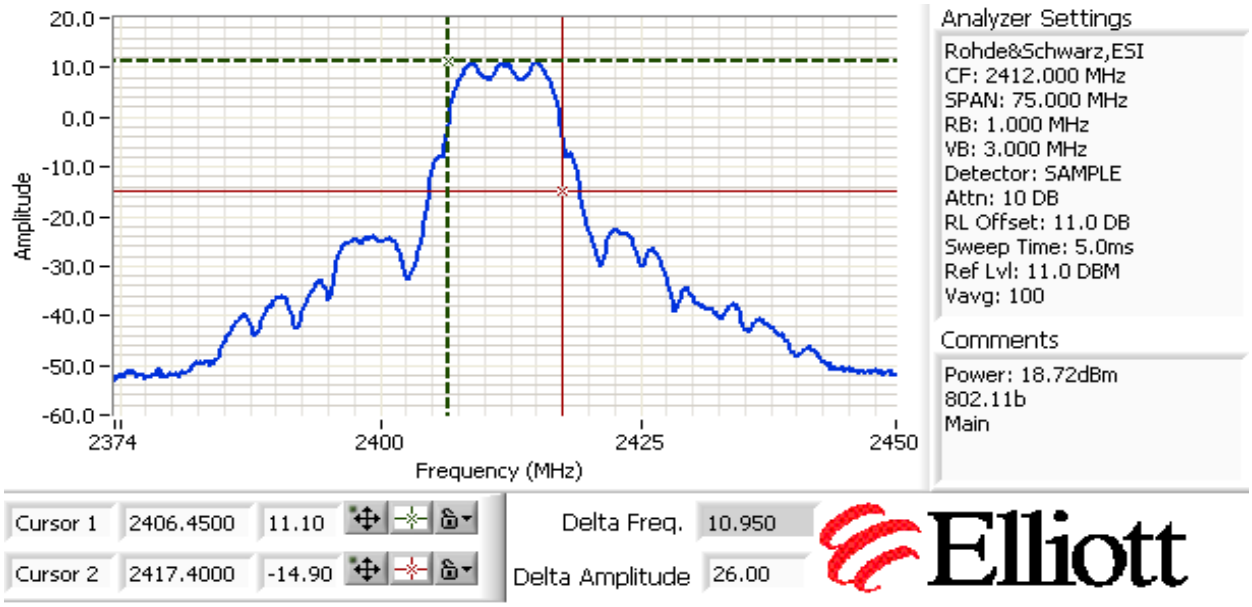
No deviations were made from the requirements of the standard.

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run #1: Output Power

Power Setting	Frequency (MHz)	Output Power (dBm) [1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP [Note 2] dBm	EIRP [Note 2] W	Output Power (dBm) [3]	Output Power mW
-	2412	18.7	74.1	3.9	Pass	22.6	0.182		
-	2437	18.5	70.8	3.9	Pass	22.4	0.174		
-	2462	18.6	72.4	3.9	Pass	22.5	0.178		

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

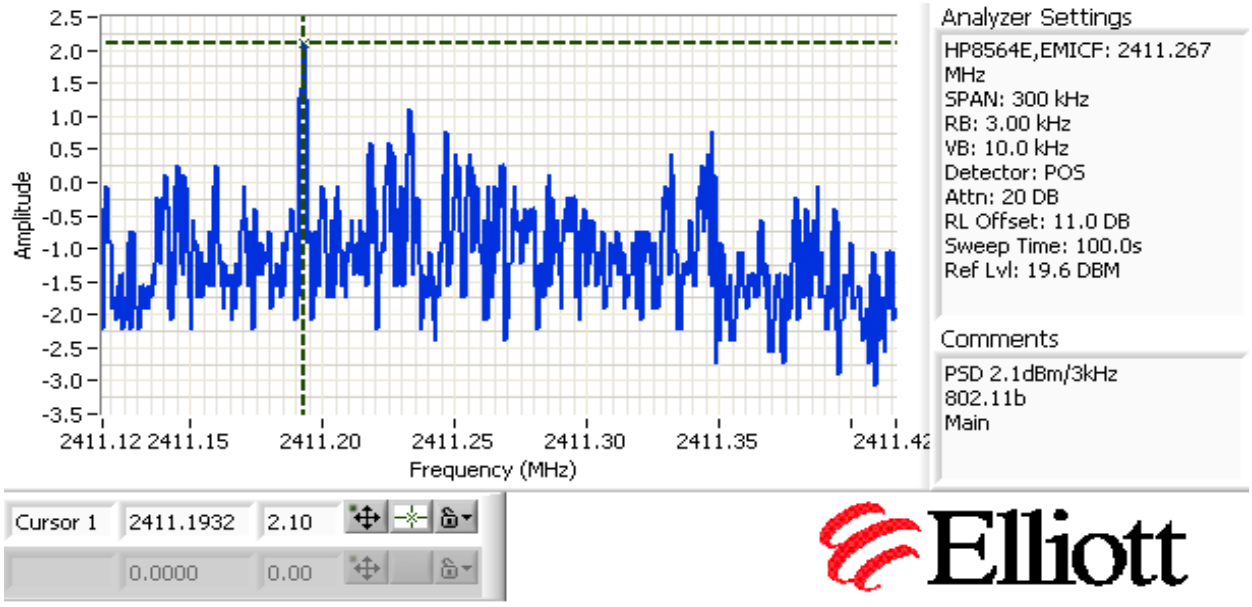


Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
-	2412	2.1	8.0	Pass
-	2437	1.6	8.0	Pass
-	2462	0.6	8.0	Pass

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

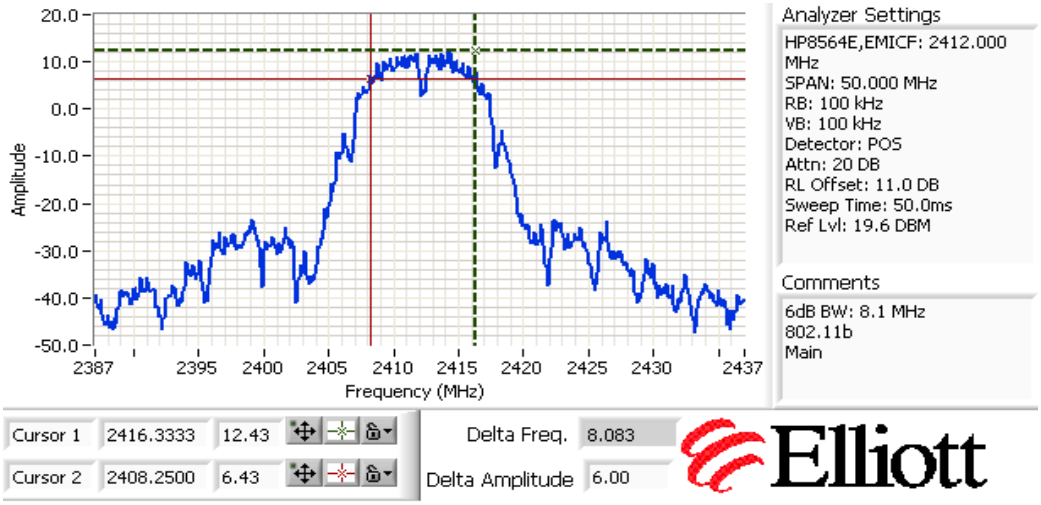


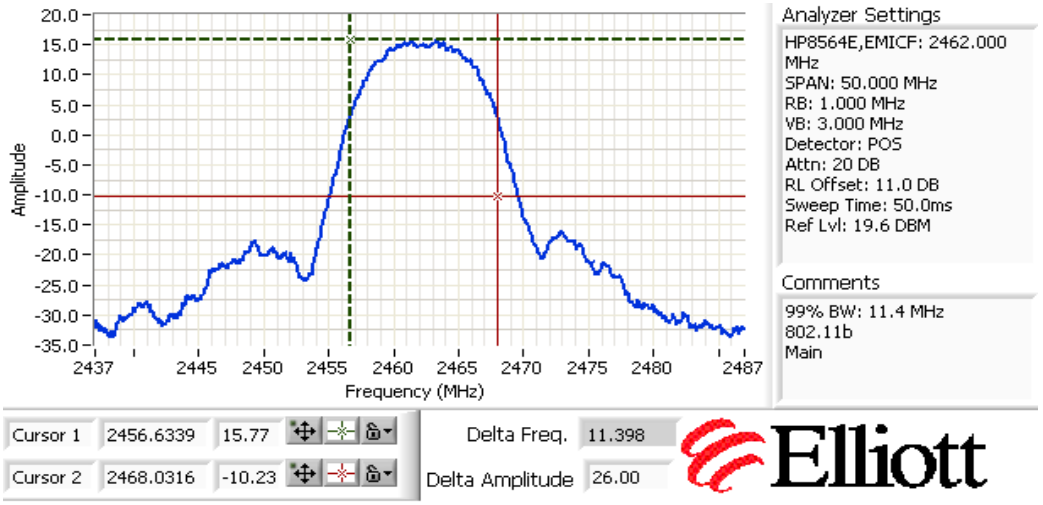
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
-	2412	100kHz	8.1	11.3
-	2437	100kHz	8.6	11.2
-	2462	100kHz	8.1	11.4

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



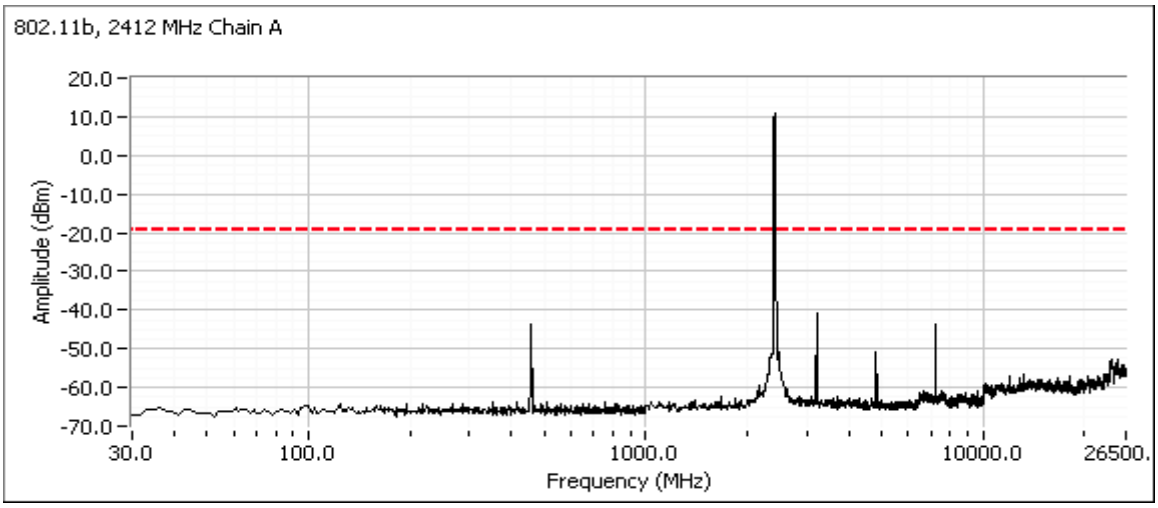


Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

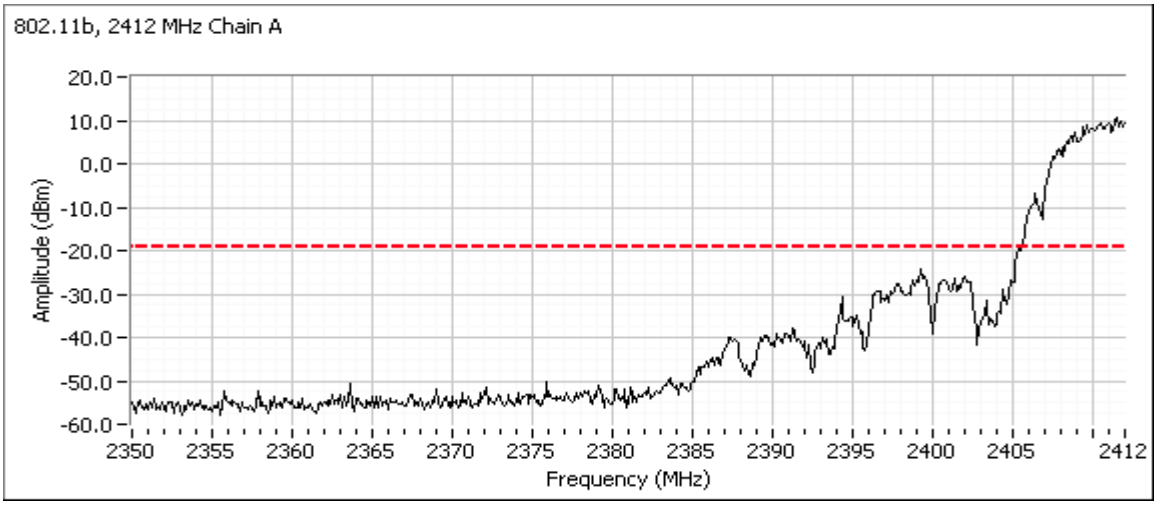
Run #4: Out of Band Spurious Emissions
Scans performed with RBW=VBW=100kHz

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

Plots for low channel

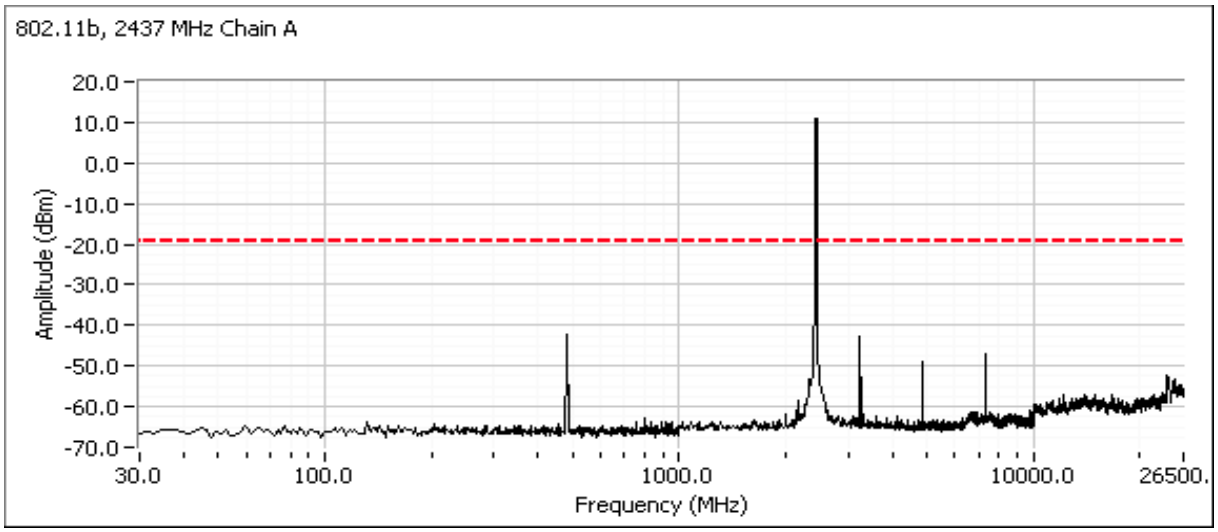


Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

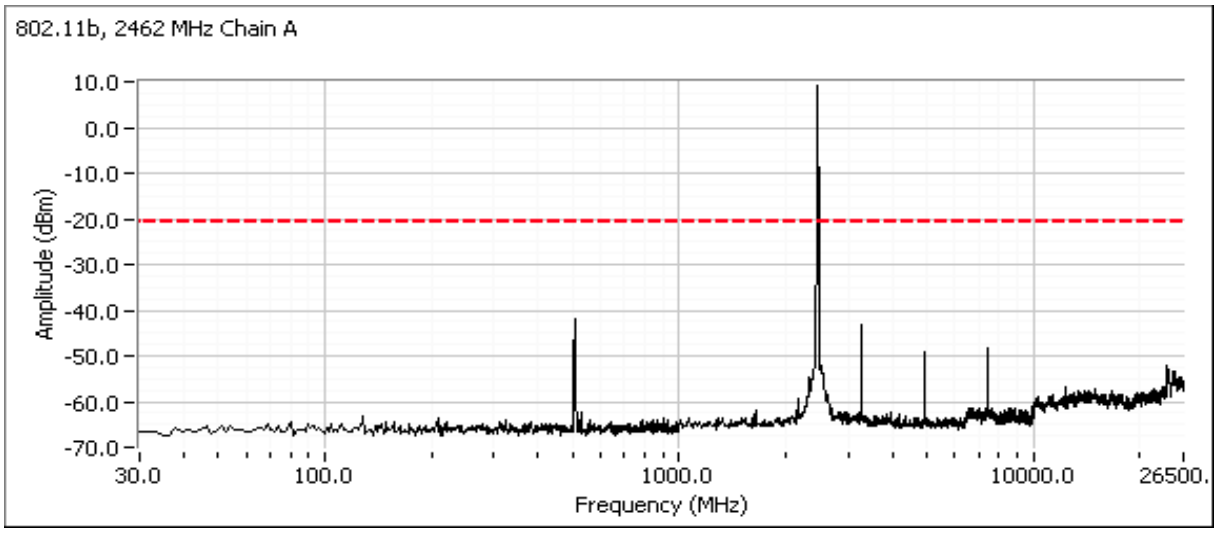


Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Plots for center channel



Plots for high channel



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements
MIMO and Smart Antenna Systems
Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

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

Date of Test: 10/21/2010
Test Engineer: Mark Hill/R. Varelas
Test Location: Fremont Chamber #5

Config. Used: 1
Config Change: None
Host Unit Voltage 120V/60Hz

General Test Configuration

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

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

Ambient Conditions:

Temperature: 20.5 °C
Rel. Humidity: 39 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
Chain A + B						
1	-		Output Power	15.247(b)	Pass	19.4 dBm (0.087W)
2	-		Power spectral Density (PSD)	15.247(d)	Pass	-2.3 dBm/3kHz
3	-		Minimum 6dB Bandwidth	15.247(a)	Pass	15.83 MHz
3	-		99% Bandwidth	RSS GEN	Pass	18.14 MHz
4	-		Spurious emissions	15.247(b)	Pass	All emissions more than -30dBc

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run #1: Output Power - Chain A + B

Operating Mode: n20

Transmitted signal on chain is coherent ? yes

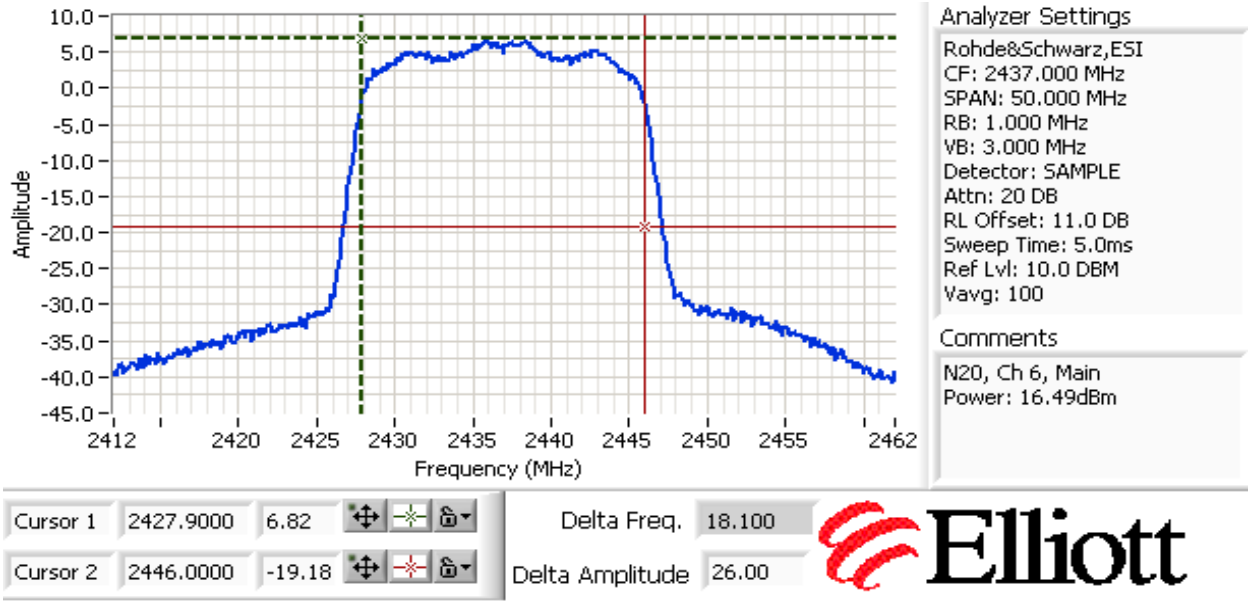
2412 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting	-	-						
Output Power (dBm) Note 1	12.8	12.8			15.8 dBm	0.038 W	29.1 dBm	0.811 W
Antenna Gain (dBi) Note 2	3.9	3.9			6.9 dBi		Pass	
eirp (dBm) Note 2	16.7	16.7			22.7 dBm	0.187 W		

2437 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting	-	-						
Output Power (dBm) Note 1	16.5	16.3			19.4 dBm	0.087 W	29.1 dBm	0.811 W
Antenna Gain (dBi) Note 2	3.9	3.9			6.9 dBi		Pass	
eirp (dBm) Note 2	20.4	20.2			26.3 dBm	0.429 W		

2462 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting	-	-						
Output Power (dBm) Note 1	12.9	12.9			15.9 dBm	0.039 W	29.1 dBm	0.811 W
Antenna Gain (dBi) Note 2	3.9	3.9			6.9 dBi		Pass	
eirp (dBm) Note 2	16.8	16.8			22.8 dBm	0.191 W		

Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was not continuous but the ESI analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting) and power integration over 50 MHz (option #2, method 1 in KDB 558074, equivalent to method 1 of DA-02-2138A1 for U-NII devices). Spurious limit becomes -30dBc.
Note 2:	As there is coherency between chains the effective antenna gain is the sum of the individual antenna gains and the eirp is the product of the total power and the effective antenna gain

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

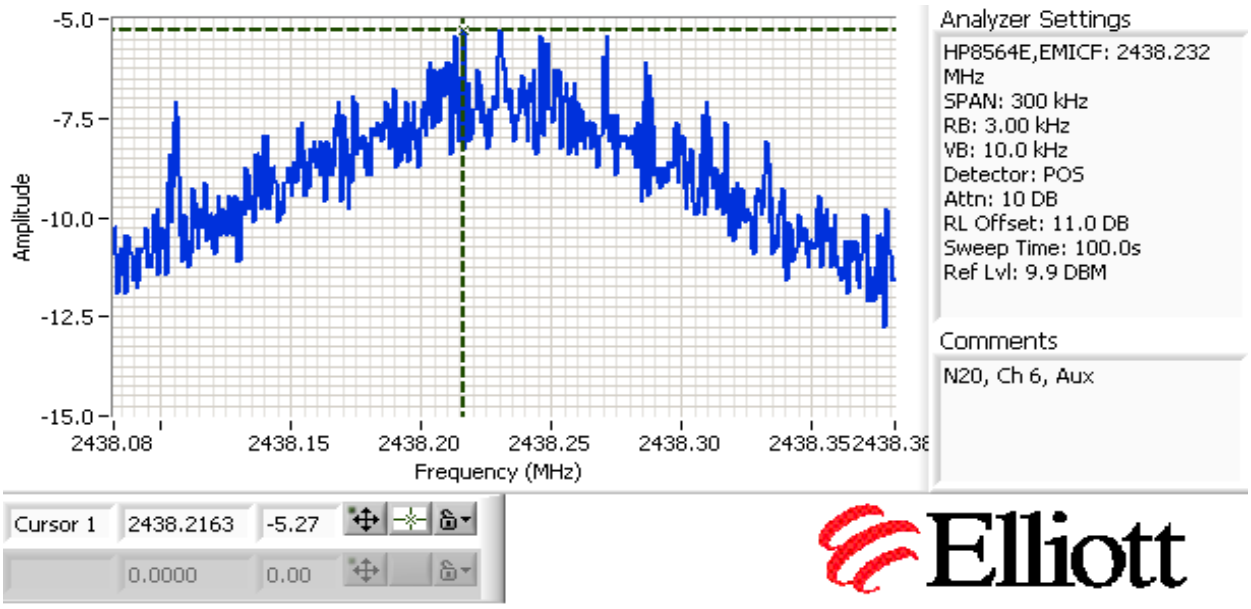


Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1 Chain 1	Chain 2	Chain 3	Chain 4	Total	Limit dBm/3kHz	Result
-	2412	-9.3	-8.3			-5.7	8.0	Pass
-	2437	-5.3	-5.3			-2.3	8.0	Pass
-	2467	-9.4	-9.3			-6.3	8.0	Pass

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

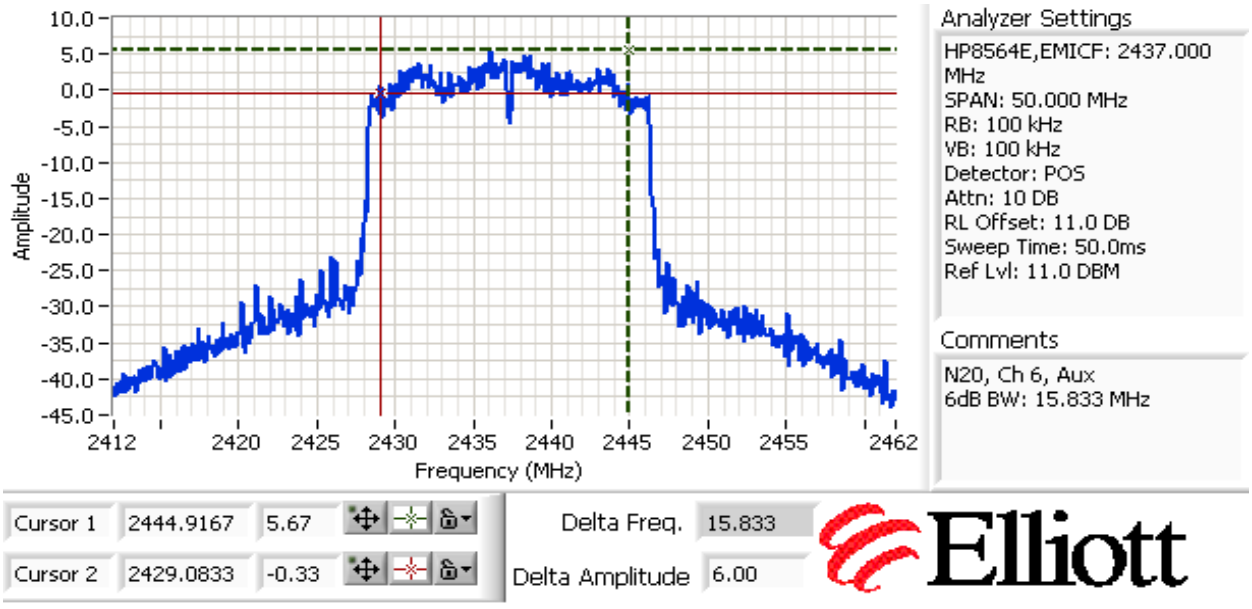


Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

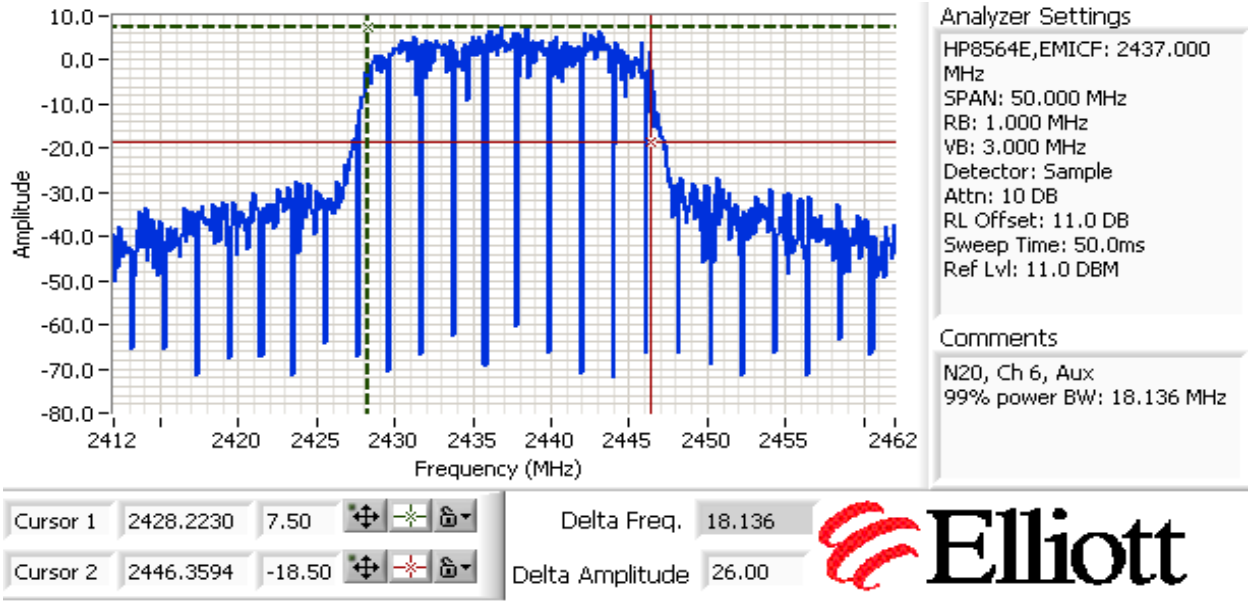
Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
-	2412	100kHz	15.92	17.97
-	2437	100kHz	15.83	18.14
-	2467	100kHz	15.83	18.05

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



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



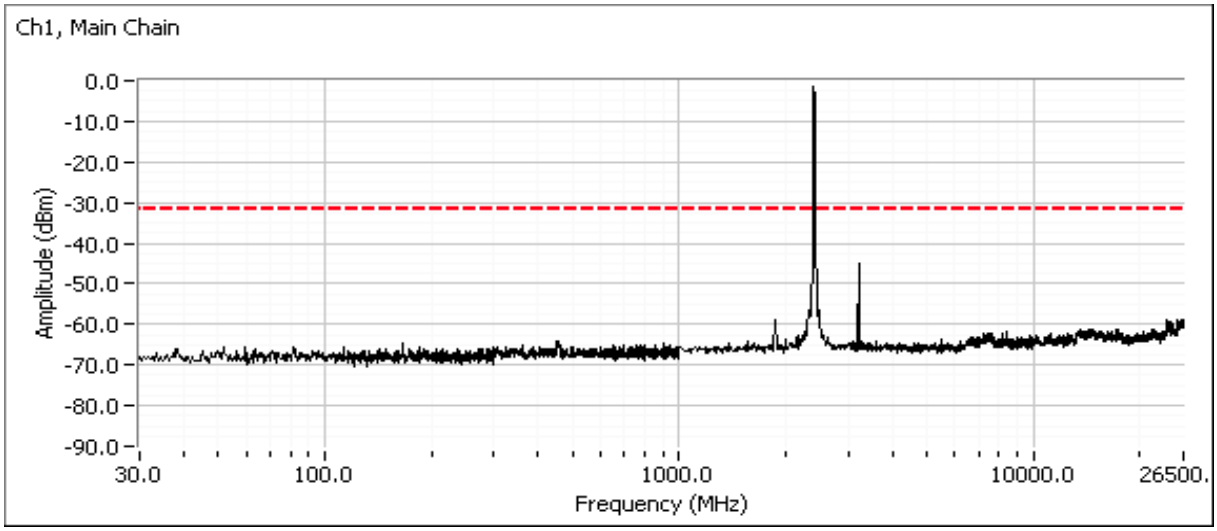
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

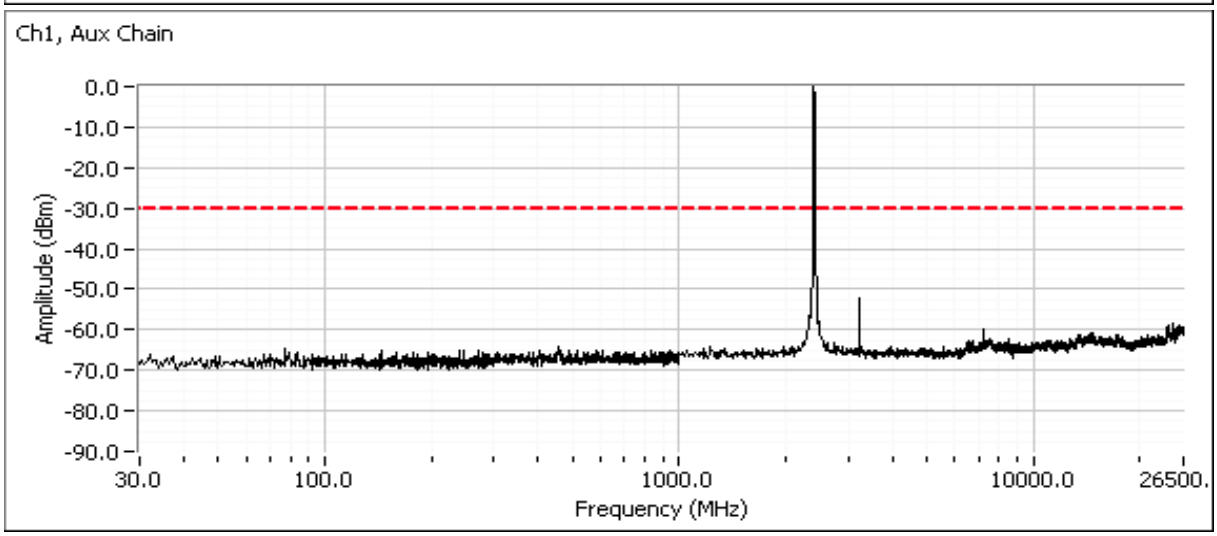
Run #4: Out of Band Spurious Emissions
Scans performed with RBW=VBW=100kHz

Power Setting Per Chain				Frequency (MHz)	Limit	Result
#1	#2	#3	#4			
-				2412	-30dBc	Pass
-				2437	-30dBc	Pass
-				2467	-30dBc	Pass

Note 1:	Measured on each chain individually

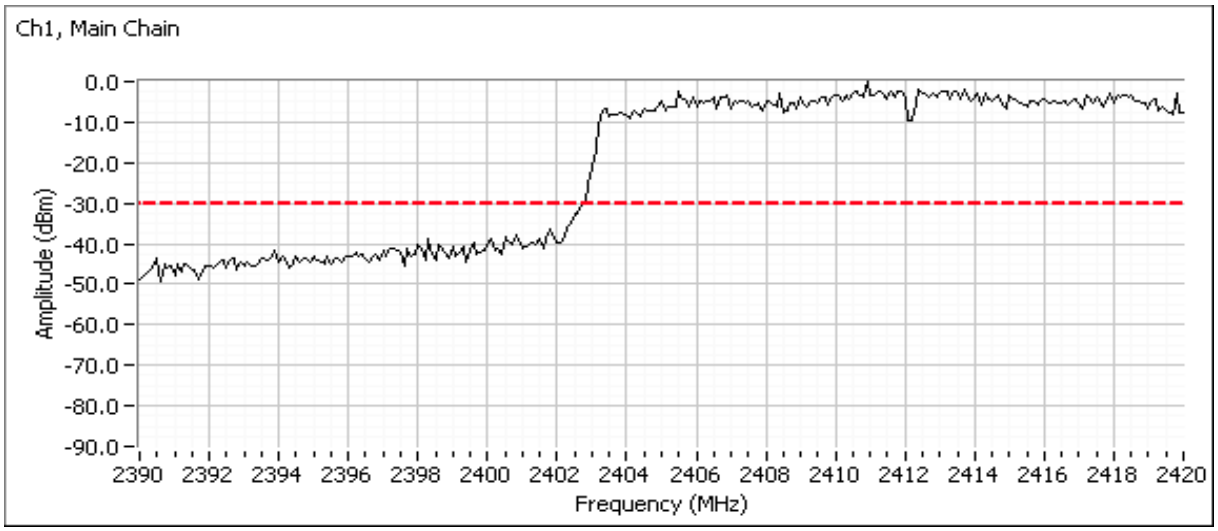
Plots for low channel

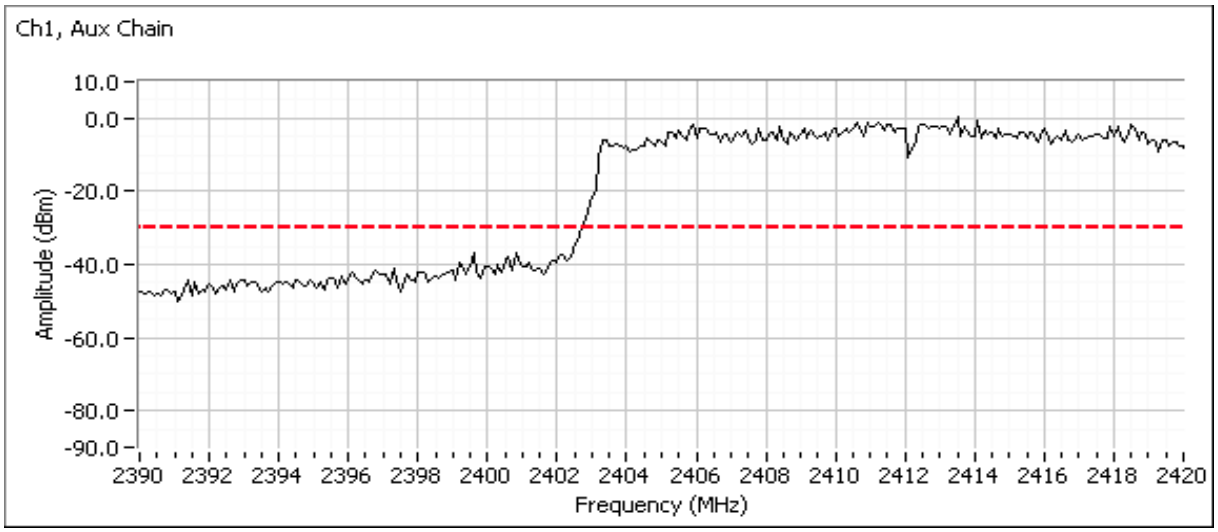




Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

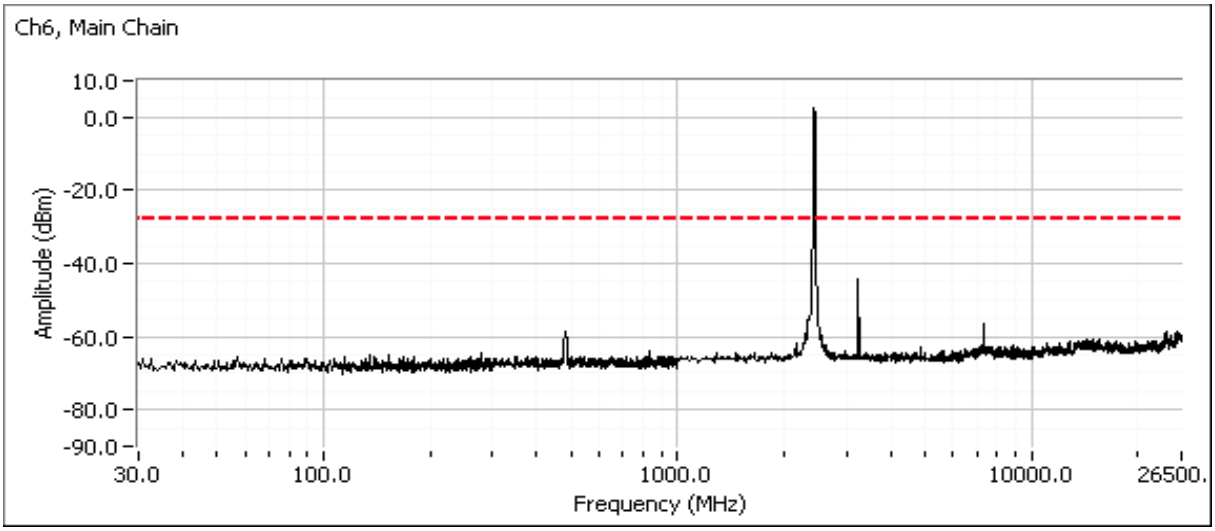
Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

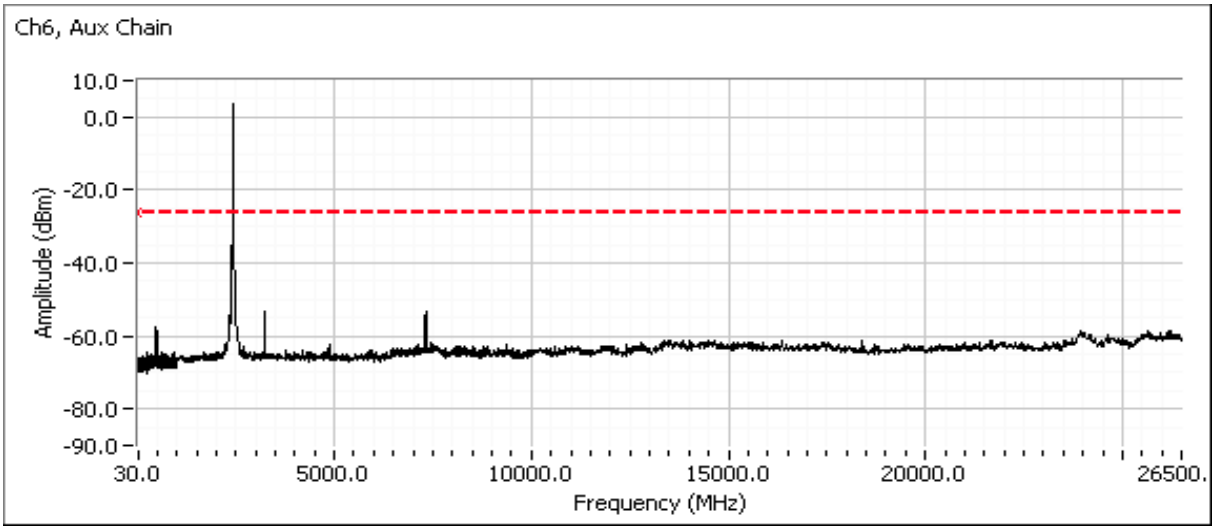




Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

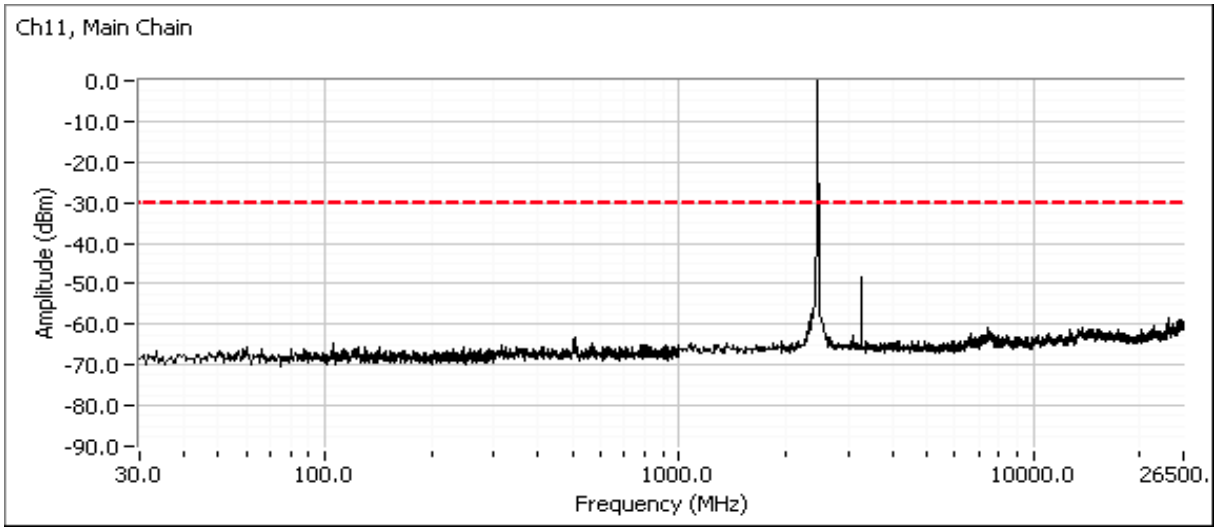
Plots for center channel

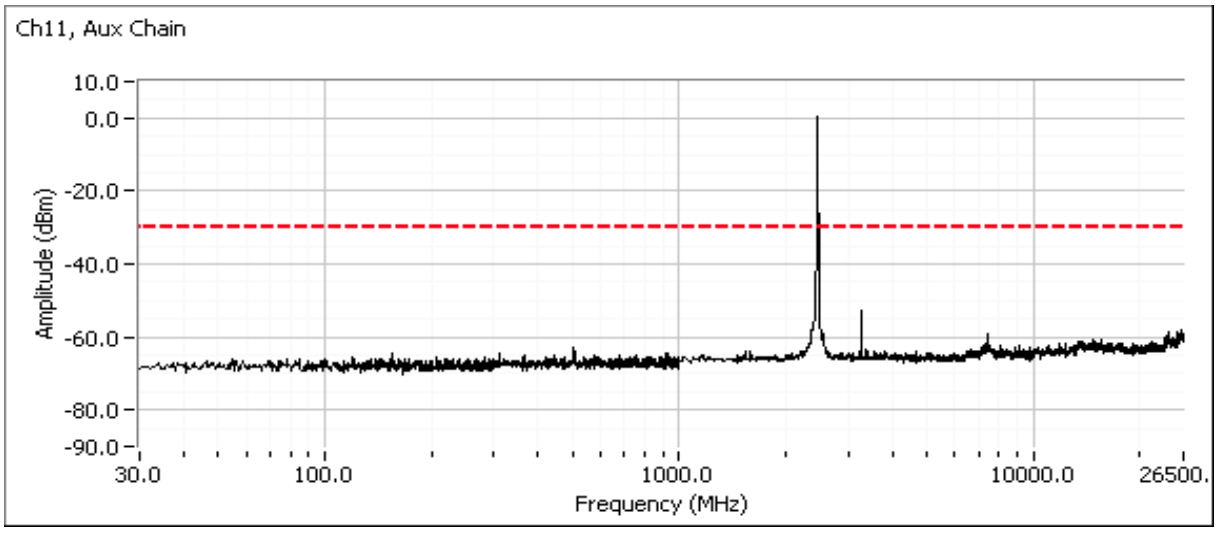




Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Plots for high channel





Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements
MIMO and Smart Antenna Systems
Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

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

Date of Test: 10/21/2010
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #5

Config. Used: 1
Config Change: none
Host Unit Voltage 120V/60Hz

General Test Configuration

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

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

Ambient Conditions:

Temperature: 20.5 °C
Rel. Humidity: 39 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
Chain A + B						
1	-		Output Power	15.247(b)	Pass	14.5 dBm (0.028W)
2	-		Power spectral Density (PSD)	15.247(d)	Pass	-9.7 dBm/3kHz
3	-		Minimum 6dB Bandwidth	15.247(a)	Pass	36.7 MHz
3	-		99% Bandwidth	RSS GEN	Pass	37.3 MHz
4	-		Spurious emissions	15.247(b)	Pass	All emissions below -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 Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run #1: Output Power - Chain A + B

Operating Mode: n40

Transmitted signal on chain is coherent ? yes

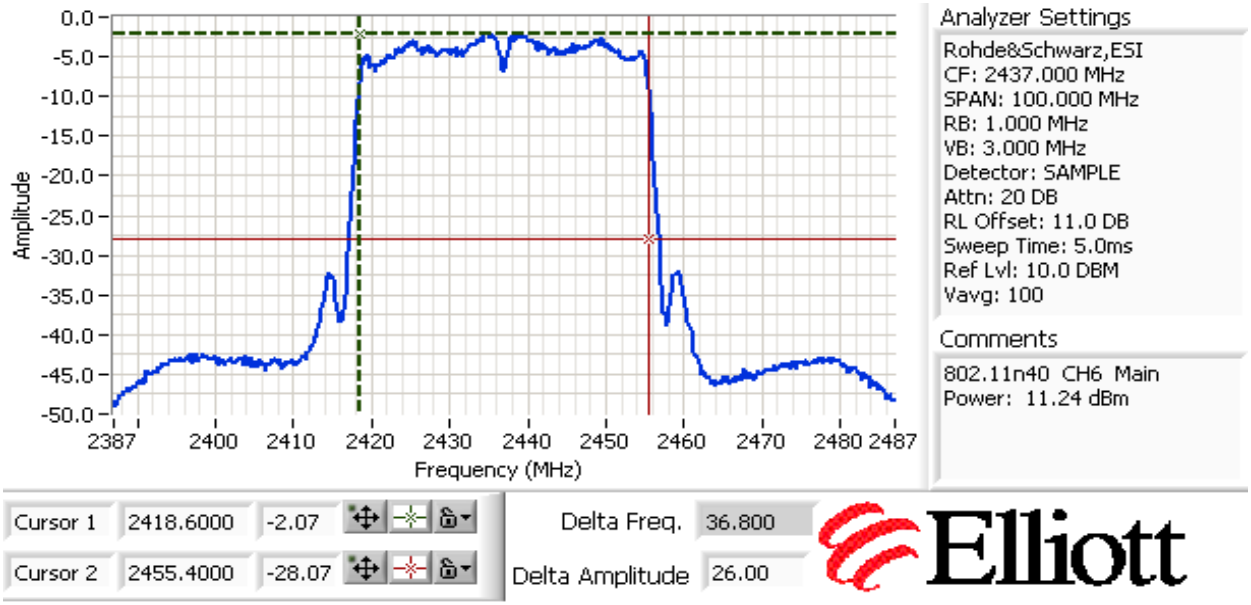
2422 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting	-	-						
Output Power (dBm) Note 1	8.46	9.41			12.0 dBm	0.016 W	29.1 dBm	0.811 W
Antenna Gain (dBi) Note 2	3.9	3.9			6.9 dBi		Pass	
eirp (dBm) Note 2	12.36	13.31			18.9 dBm	0.077 W		

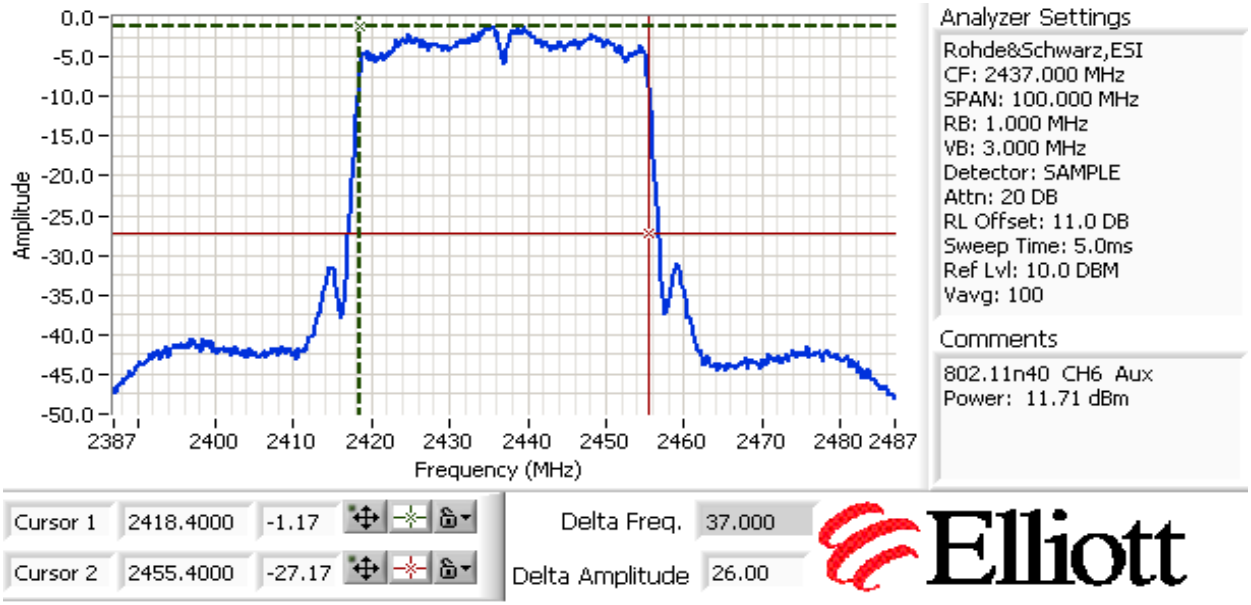
2437 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting	-	-						
Output Power (dBm) Note 1	11.24	11.71			14.5 dBm	0.028 W	29.1 dBm	0.811 W
Antenna Gain (dBi) Note 2	3.9	3.9			6.9 dBi		Pass	
eirp (dBm) Note 2	15.14	15.61			21.4 dBm	0.138 W		

2452 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting	-	-						
Output Power (dBm) Note 1	10.18	11.09			13.7 dBm	0.023 W	29.1 dBm	0.811 W
Antenna Gain (dBi) Note 2	3.9	3.9			6.9 dBi		Pass	
eirp (dBm) Note 2	14.08	14.99			20.6 dBm	0.114 W		

Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was not continuous but the ESI analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting) and power integration over 47 **MHz** (option #2, method 1 in KDB 558074, equivalent to method 1 of DA-02-2138A1 for U-NII devices). Spurious limit becomes **-30dBc.**
Note 2:	As there is coherency between chains the effective antenna gain is the sum of the individual antenna gains and the eirp is the product of the total power and the effective antenna gain

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



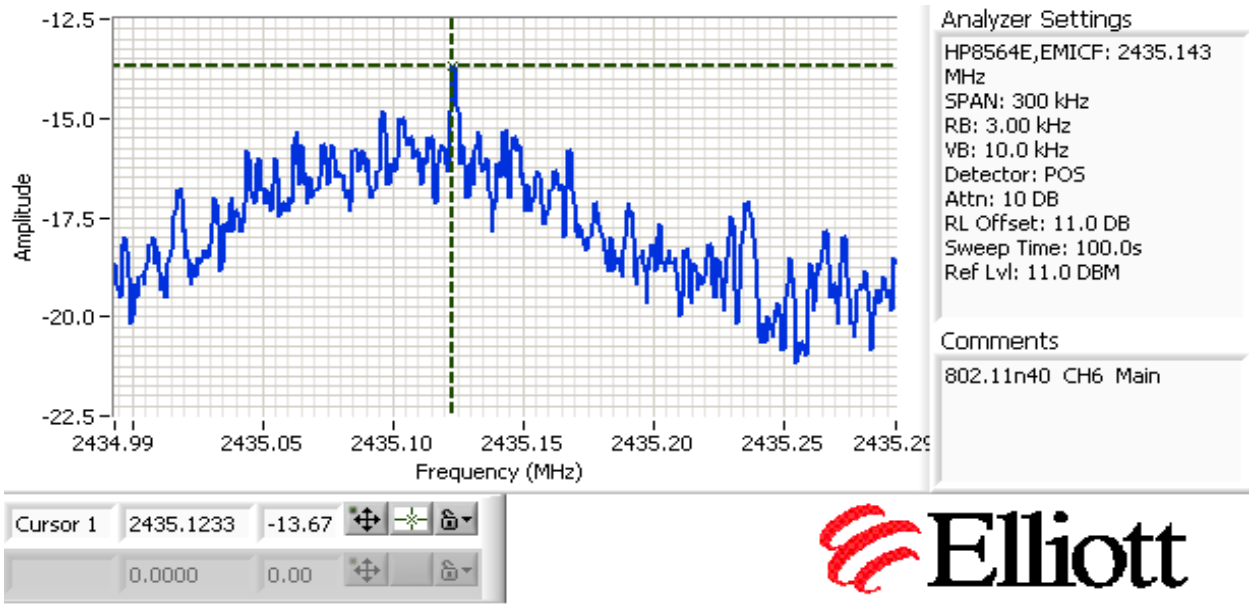


Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

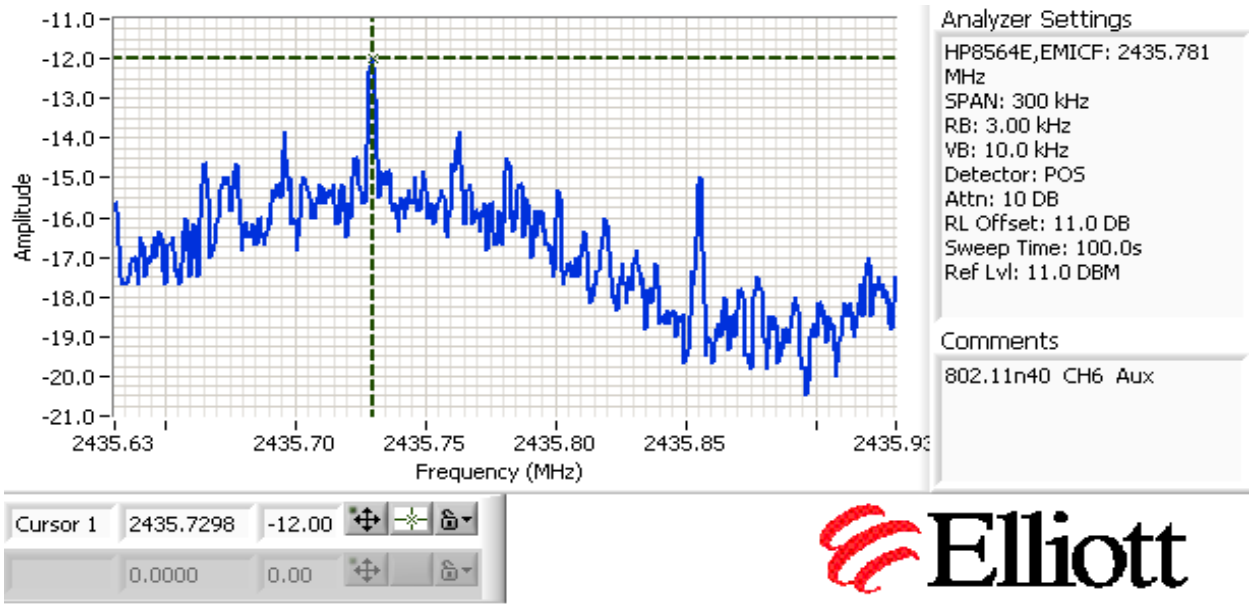
Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1 Chain 1	Chain 2	Chain 3	Chain 4	Total	Limit dBm/3kHz	Result
-	2422	-17.7	-15.2			-13.2	8.0	Pass
-	2437	-13.7	-12.0			-9.7	8.0	Pass
-	2452	-15.2	-12.7			-10.7	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 Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

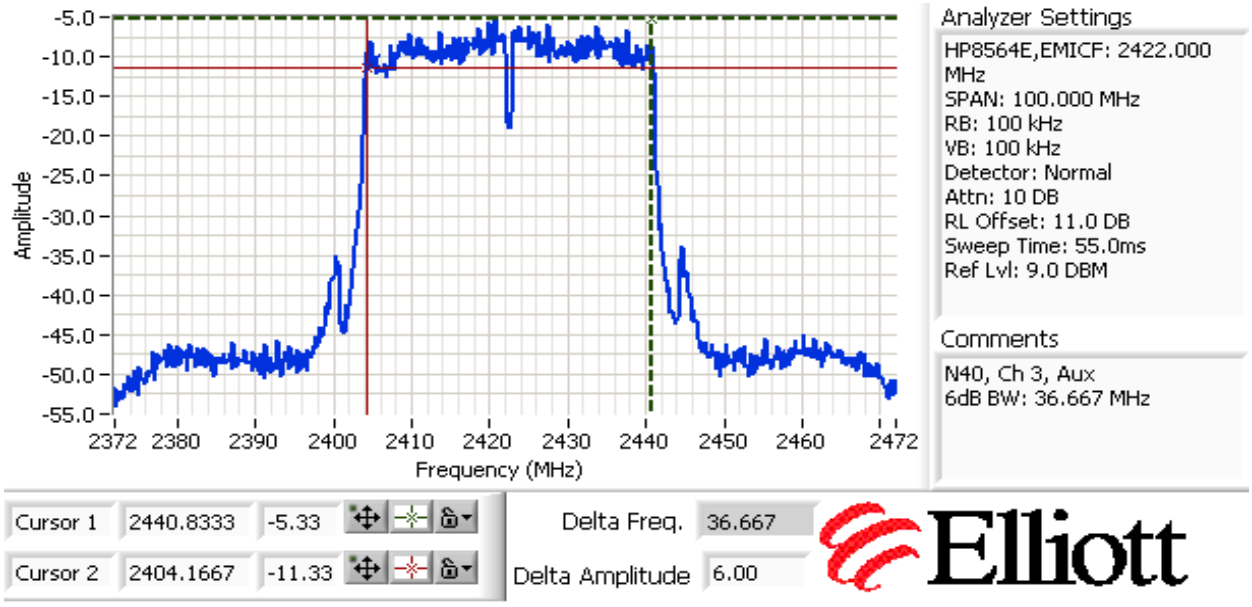


Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

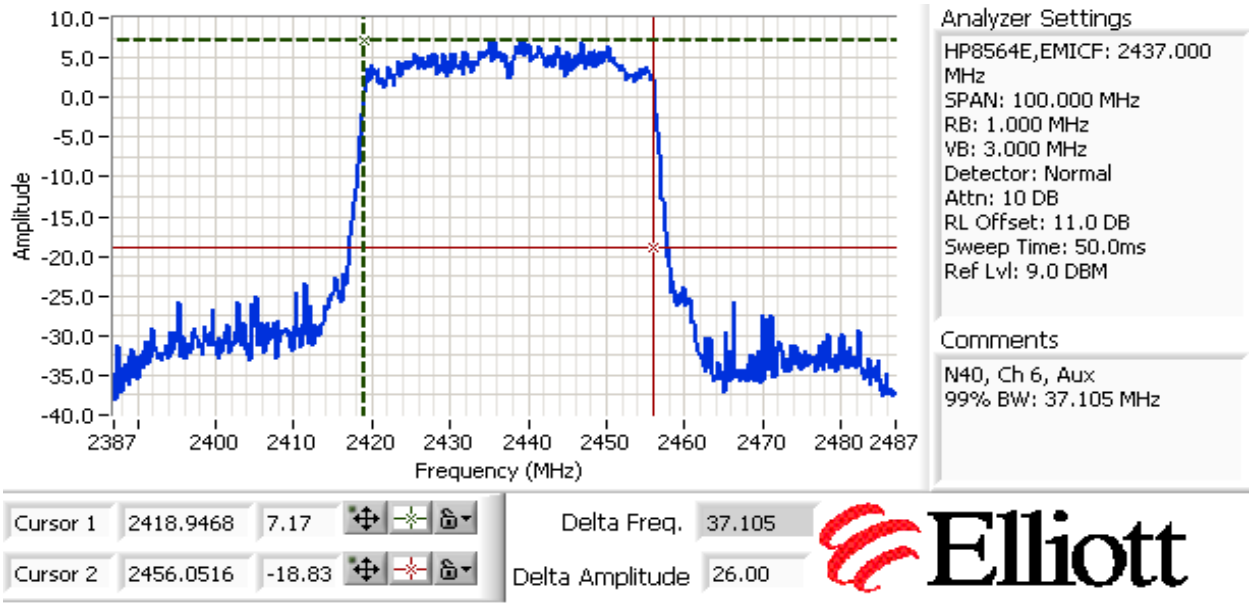
Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
-	2422	100kHz	36.7	37.1
-	2437	100kHz	36.8	37.3
-	2452	100kHz	36.7	37.3

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



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



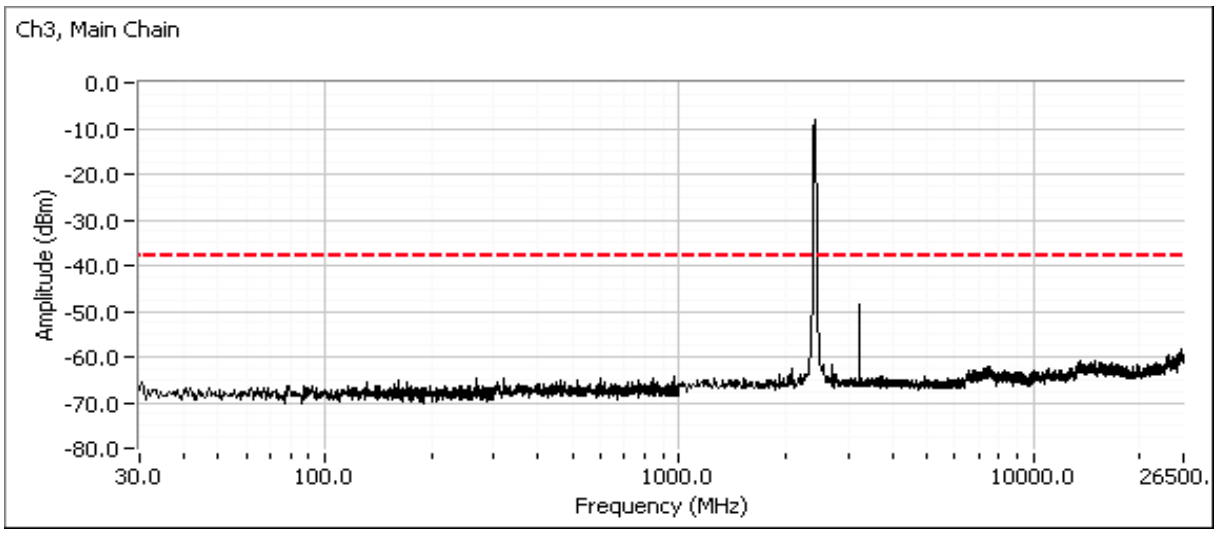
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

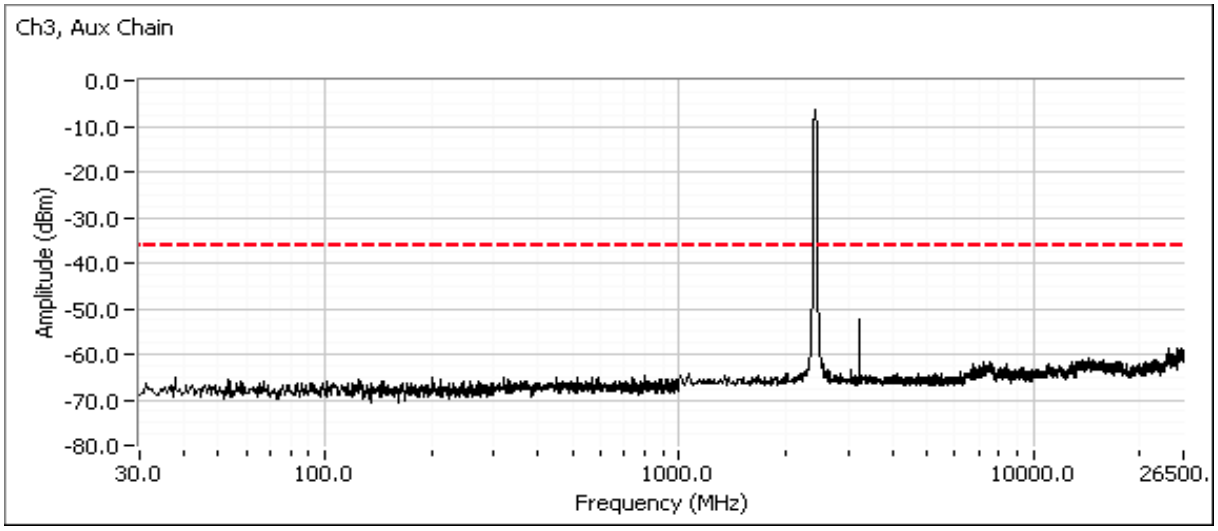
Run #4: Out of Band Spurious Emissions
Scans performed with RBW=VBW=100kHz

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

Note 1:	Measured on each chain individually

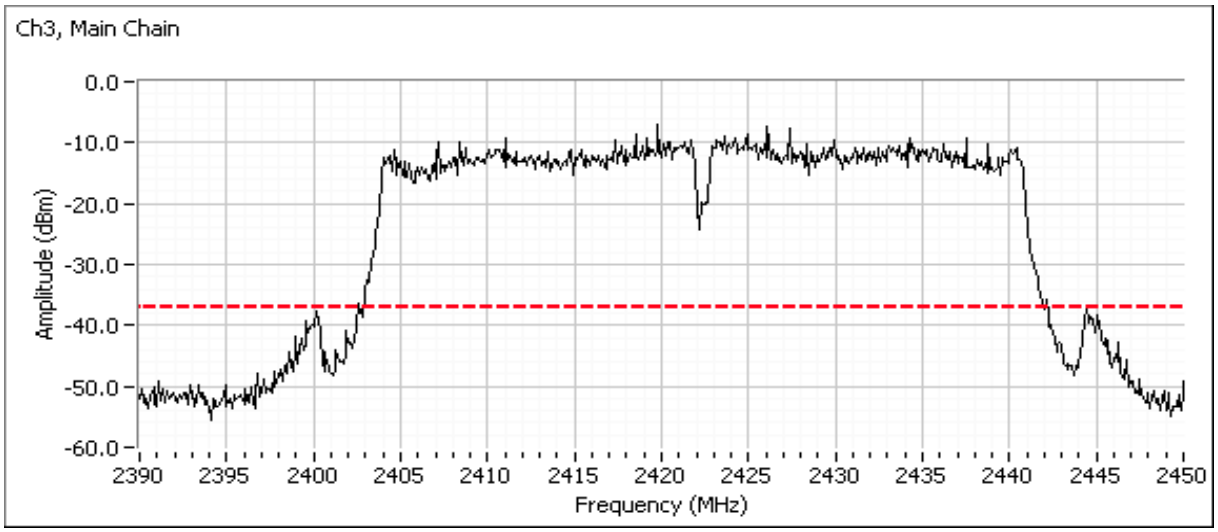
Plots for low channel

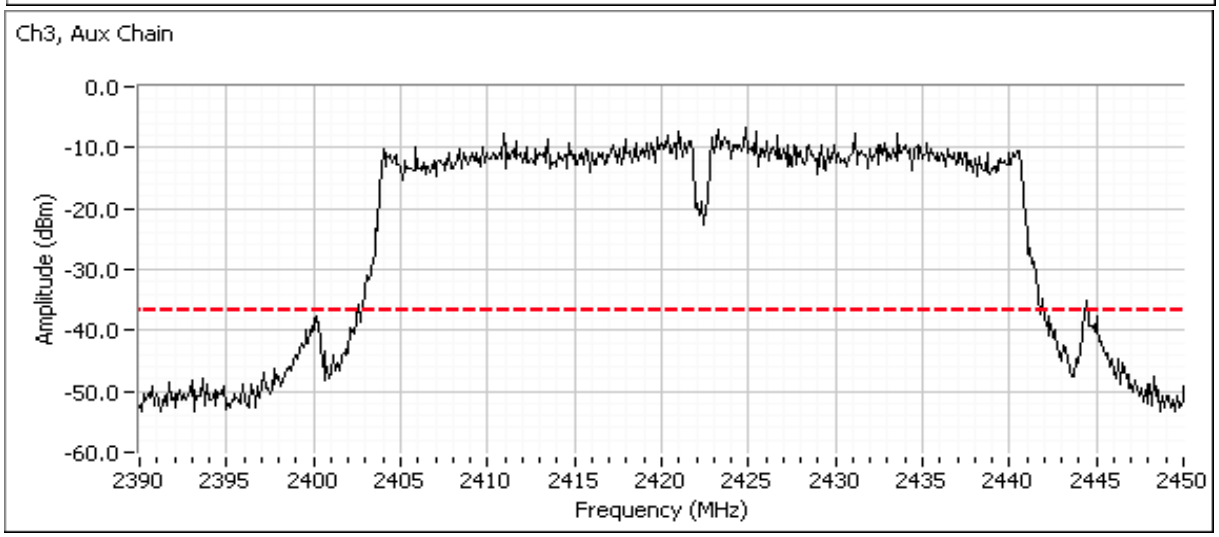




Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

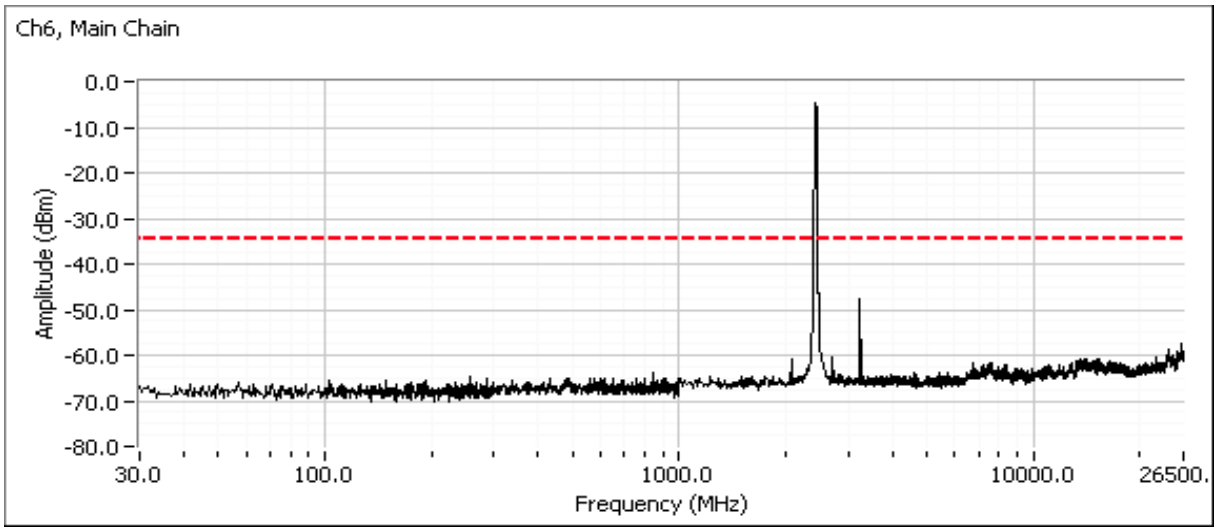
Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

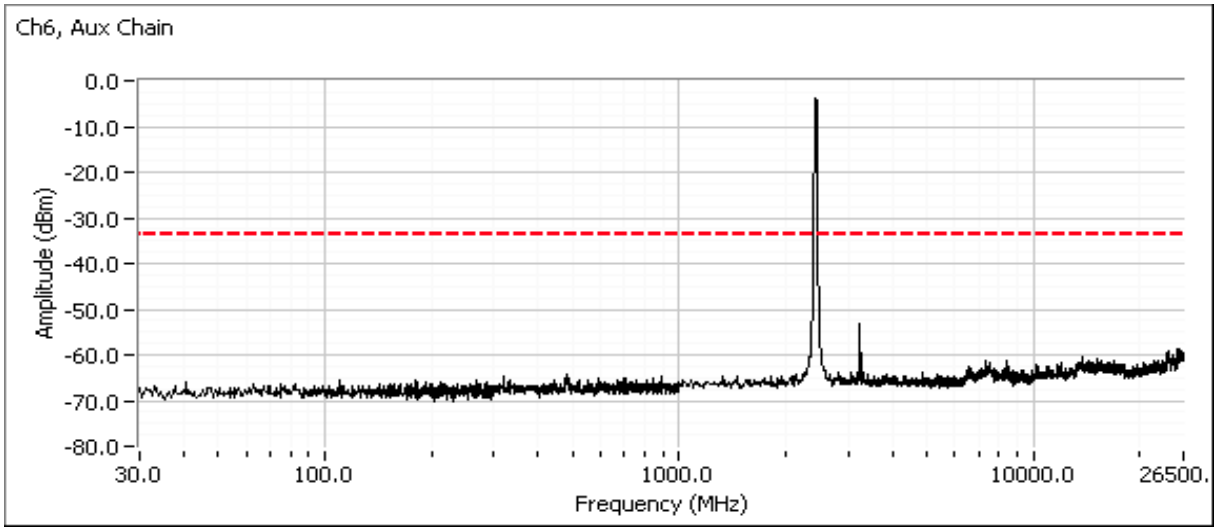




Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

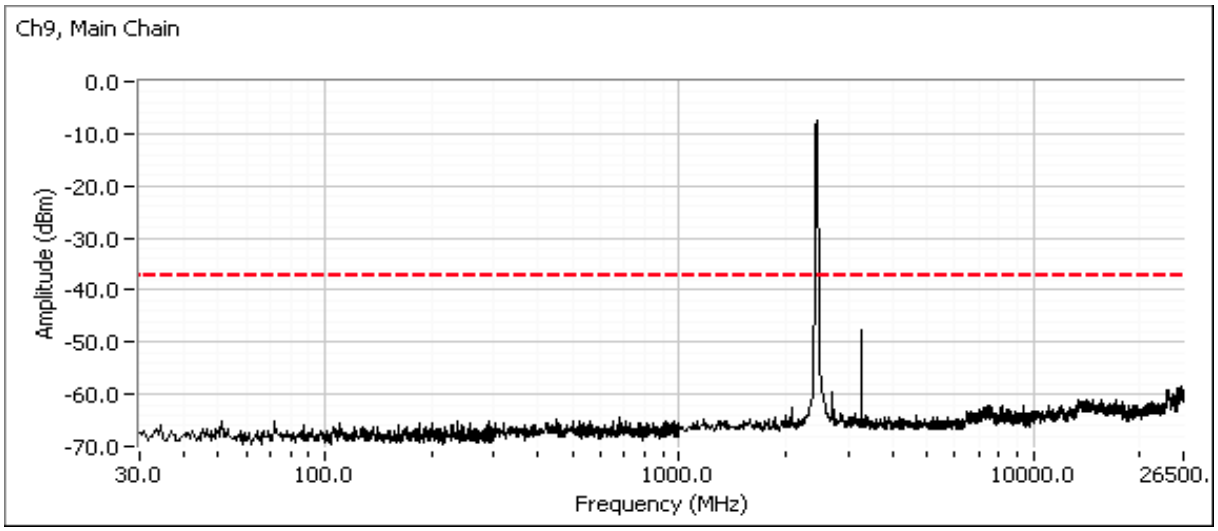
Plots for center channel

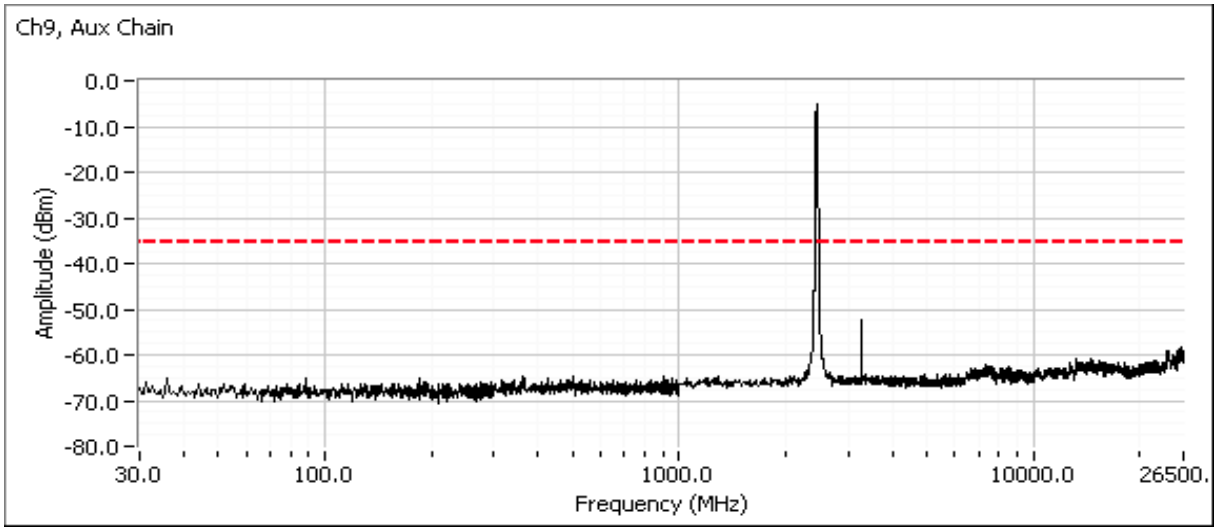




Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Plots for high channel





Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions

Summary of Results

Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
Run #1	802.11b Main	#1 2412MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	44.7dBµV/m @ 4823.9MHz (-9.3dB)
		#6 2437MHz	-	-			53.2dBµV/m @ 7311.7MHz (-0.8dB)
		#11 2462MHz	-	-			52.2dBµV/m @ 7386.7MHz (-1.8dB)
Run # 2	802.11g Main	#6 2437MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	53.4dBµV/m @ 7311.9MHz (-0.6dB)
	802.11n20 Main+Aux	#6 2437MHz	-	-			50.8dBµV/m @ 7309.0MHz (-3.2dB)
	802.11n40 Main+Aux	#6 2437MHz	-	-			48.4dBµV/m @ 4894.1MHz (-5.6dB)
Run # 3	802.11g Main	#1 2412MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	46.3dBµV/m @ 4824.1MHz (-7.7dB)
		#11 2462MHz	-	-			53.2dBµV/m @ 7385.2MHz (-0.8dB)
Run # 4	802.11n20 Main+Aux	#1 2412MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	53.3dBµV/m @ 4823.1MHz (-0.7dB)
		#11 2462MHz	-	-			53.2dBµV/m @ 4925.2MHz (-0.8dB)
Run # 5	802.11n40 Main+Aux	#3 2422MHz	-	-	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	40.3dBµV/m @ 4843.1MHz (-13.7dB)
		#9 2452MHz	-	-			37.7dBµV/m @ 4903.0MHz (-16.3dB)
Receiver Spurious Emissions							
Run # 6	Receive Main, Aux, Main+Aux	#6, Main	-	-	Radiated Emissions, 1 - 7.5 GHz	RSS 210	47.5dBµV/m @ 2437.0MHz (-6.5dB)
		#6, Aux	-	-			47.7dBµV/m @ 2437.0MHz (-6.3dB)
		#6, Main+Aux	-	-			46.9dBµV/m @ 2437.0MHz (-7.1dB)

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

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 ws installed into a test fixture such that the EUT was exposed (i.e. outside of a host PC).
For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Rel. Humidity:	15 - 55 %
Temperature:	18 - 25 °C

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

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

Date of Test: 9/24/2010 Test Location: FT #5

Test Engineer: Suresh K Config Change: -

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

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

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	
4823.920	44.7	H	54.0	-9.3	AVG	27	1.1	RB 1 MHz;VB 10 Hz;Pk
4823.810	49.6	H	74.0	-24.4	PK	27	1.1	RB 1 MHz;VB 3 MHz;Pk
4823.930	44.7	V	54.0	-9.3	AVG	360	2.1	RB 1 MHz;VB 10 Hz;Pk
4824.130	49.0	V	74.0	-25.0	PK	360	2.1	RB 1 MHz;VB 3 MHz;Pk
7257.500	36.0	H	54.0	-18.0	AVG	357	1.0	RB 1 MHz;VB 10 Hz;Pk
7256.940	47.3	H	74.0	-26.7	PK	357	1.0	RB 1 MHz;VB 3 MHz;Pk
7256.200	36.1	V	54.0	-17.9	AVG	0	1.0	RB 1 MHz;VB 10 Hz;Pk
7256.040	48.1	V	74.0	-25.9	PK	0	1.0	RB 1 MHz;VB 3 MHz;Pk

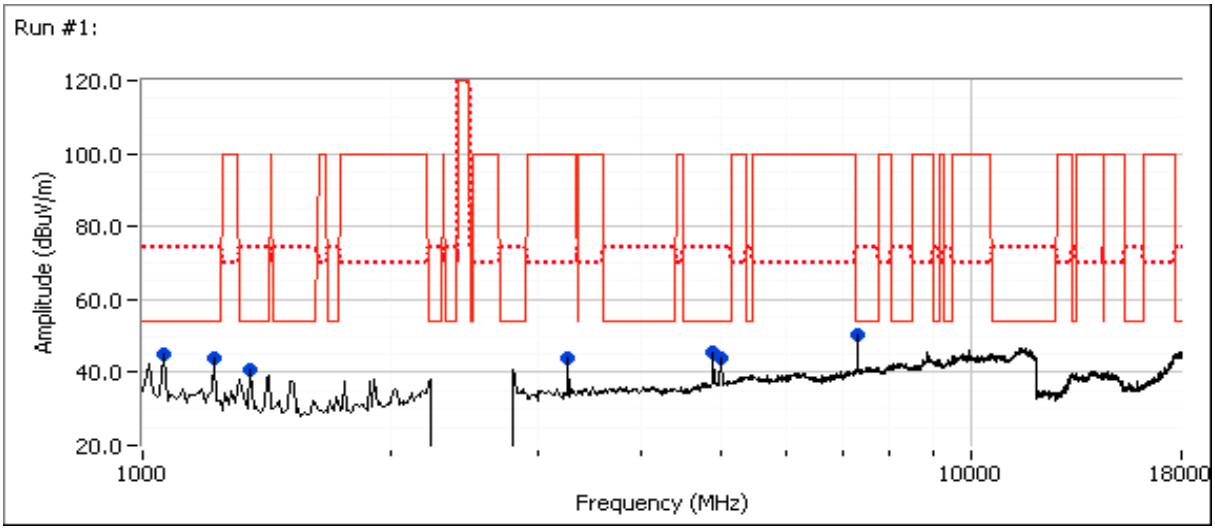
Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

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

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

Spurious Radiated Emissions:



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7311.730	53.2	V	54.0	-0.8	AVG	3	1.5	RB 1 MHz;VB 10 Hz;Pk
7312.230	58.5	V	74.0	-15.5	PK	3	1.5	RB 1 MHz;VB 3 MHz;Pk
4873.970	42.8	H	54.0	-11.2	AVG	37	1.3	RB 1 MHz;VB 10 Hz;Pk
4874.100	48.1	H	74.0	-25.9	PK	37	1.3	RB 1 MHz;VB 3 MHz;Pk
4873.920	42.3	V	54.0	-11.7	AVG	15	2.0	RB 1 MHz;VB 10 Hz;Pk
4873.940	48.0	V	74.0	-26.0	PK	15	2.0	RB 1 MHz;VB 3 MHz;Pk
7310.100	48.8	H	54.0	-5.2	AVG	359	1.0	RB 1 MHz;VB 10 Hz;Pk
7310.300	55.6	H	74.0	-18.4	PK	359	1.0	RB 1 MHz;VB 3 MHz;Pk
1060.000	33.8	H	54.0	-20.2	AVG	192	1.0	RB 1 MHz;VB 10 Hz;Pk
1060.240	38.7	H	74.0	-35.3	PK	192	1.0	RB 1 MHz;VB 3 MHz;Pk
1219.990	30.4	V	54.0	-23.6	AVG	166	1.0	RB 1 MHz;VB 10 Hz;Pk
1219.860	40.7	V	74.0	-33.3	PK	166	1.0	RB 1 MHz;VB 3 MHz;Pk
1359.800	26.5	V	54.0	-27.5	AVG	352	1.3	RB 1 MHz;VB 10 Hz;Pk
1359.690	38.2	V	74.0	-35.8	PK	352	1.3	RB 1 MHz;VB 3 MHz;Pk
3281.210	31.0	H	54.0	-23.0	AVG	86	1.3	RB 1 MHz;VB 10 Hz;Pk Note2
3281.150	42.2	H	74.0	-31.8	PK	86	1.3	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.
Note 2:	Emission not in restricted band but the limit of 15.209 was used.
Note 3:	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 Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

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

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

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	
7386.710	52.2	V	54.0	-1.8	AVG	164	1.6	RB 1 MHz;VB 10 Hz;Pk
7387.120	58.0	V	74.0	-16.0	PK	164	1.6	RB 1 MHz;VB 3 MHz;Pk
4923.870	36.6	H	54.0	-17.4	AVG	37	1.0	RB 1 MHz;VB 10 Hz;Pk
4923.990	46.0	H	74.0	-28.0	PK	37	1.0	RB 1 MHz;VB 3 MHz;Pk
4923.960	41.4	V	54.0	-12.6	AVG	8	1.4	RB 1 MHz;VB 10 Hz;Pk
4924.350	48.0	V	74.0	-26.0	PK	8	1.4	RB 1 MHz;VB 3 MHz;Pk
7386.800	48.2	H	54.0	-5.8	AVG	0	1.1	RB 1 MHz;VB 10 Hz;Pk
7387.060	55.1	H	74.0	-18.9	PK	0	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 Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 2, Radiated Spurious Emissions, 1-26GHz, 802.11g, n20 and n40, Main

Date of Test: 9/29/2010 Test Location: FT Chamber #4

Test Engineer: Rafael Varelas Config Change: none

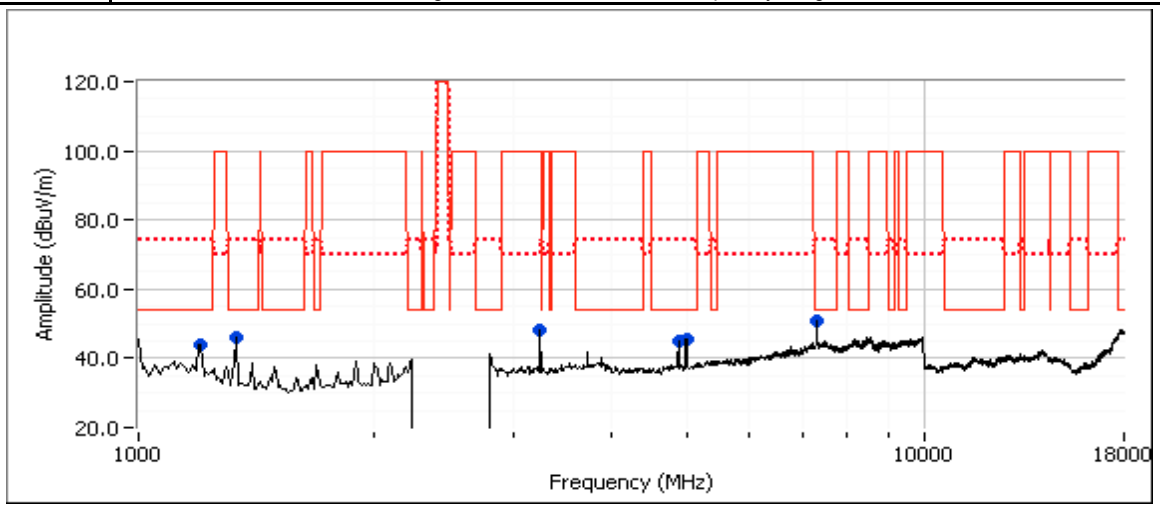
Run # 2a, EUT on Channel #6 2437MHz - 802.11g Main

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

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	
7311.920	53.4	V	54.0	**-0.6**	AVG	265	2.0	RB 1 MHz;VB 10 Hz;Pk
7315.980	60.6	V	74.0	-13.4	PK	265	2.0	RB 1 MHz;VB 3 MHz;Pk
4874.120	49.6	V	54.0	-4.4	AVG	272	1.1	RB 1 MHz;VB 10 Hz;Pk
4875.460	52.6	V	74.0	-21.4	PK	272	1.1	RB 1 MHz;VB 3 MHz;Pk
1333.330	30.6	V	54.0	-23.4	AVG	47	1.4	RB 1 MHz;VB 10 Hz;Pk
1349.400	37.2	V	74.0	-36.8	PK	47	1.4	RB 1 MHz;VB 3 MHz;Pk
1199.940	42.2	V	54.0	-11.8	AVG	314	1.3	RB 1 MHz;VB 10 Hz;Pk
1198.670	47.4	V	74.0	-26.6	PK	314	1.3	RB 1 MHz;VB 3 MHz;Pk
4978.890	34.5	V	54.0	-19.5	AVG	331	1.5	RB 1 MHz;VB 10 Hz;Pk
4981.030	49.8	V	74.0	-24.2	PK	331	1.5	RB 1 MHz;VB 3 MHz;Pk
3249.460	48.0	H	70.0	-22.0	Peak	24	1.3	

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



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 2b: , EUT on Channel #6 2437MHz - 802.11n20, Main+Aux

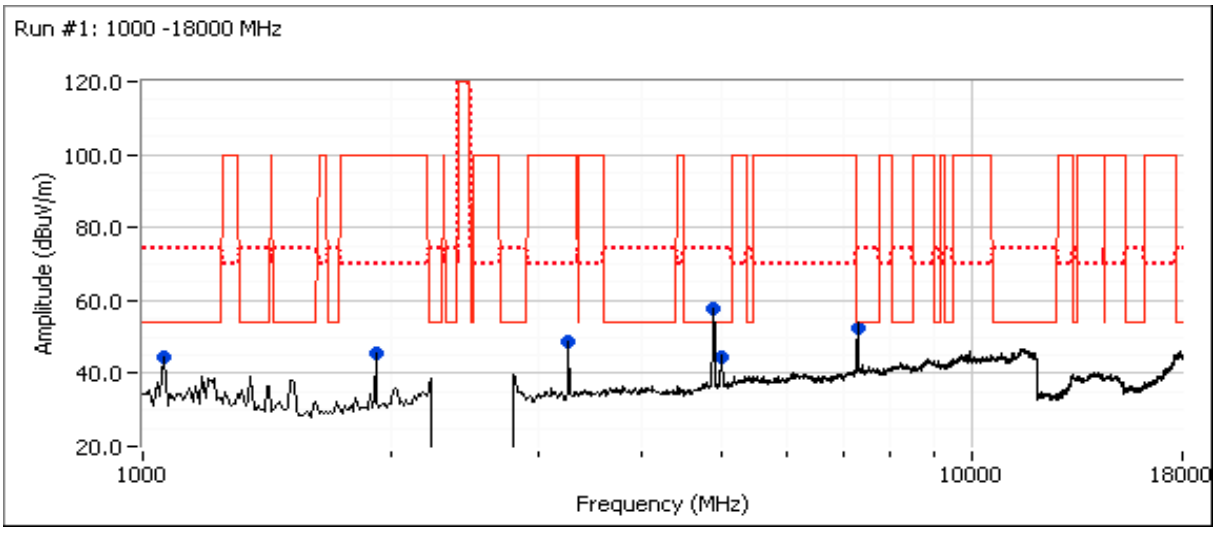
Date of Test: 10/12/2010 Test Location: FT Chamber #5

Test Engineer: Suresh Kondapali Config Change: none

	Power Settings								
	Target (dBm)				Measured (dBm)				Software Setting
Chain	A	B	C	Total	A	B	C	Total	
	-	-		-	-	-		-	

main = aux = 18 dBm. CH#6 Alternate Script commands used.

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7309.000	**50.8**	V	54.0	**-3.2**	AVG	360	1.7	RB 1 MHz;VB 10 Hz;Pk
4873.330	48.4	V	54.0	-5.6	AVG	285	2.3	RB 1 MHz;VB 10 Hz;Pk
4875.800	48.1	V	54.0	-5.9	AVG	293	2.2	RB 1 MHz;VB 10 Hz;Pk
7314.270	63.3	V	74.0	-10.7	PK	360	1.7	RB 1 MHz;VB 3 MHz;Pk
1040.000	43.1	H	54.0	-10.9	AVG	137	1.0	RB 1 MHz;VB 10 Hz;Pk
4874.460	61.4	V	74.0	-12.6	PK	285	2.3	RB 1 MHz;VB 3 MHz;Pk
4873.460	61.2	V	74.0	-12.8	PK	293	2.2	RB 1 MHz;VB 3 MHz;Pk
4981.580	39.7	V	54.0	-14.3	AVG	89	1.0	RB 1 MHz;VB 10 Hz;Pk
4979.180	56.4	V	74.0	-17.6	PK	89	1.0	RB 1 MHz;VB 3 MHz;Pk
3249.330	50.9	H	74.0	-19.1	PK	120	1.4	RB 1 MHz;VB 3 MHz;Pk
1906.760	26.9	V	54.0	-27.1	AVG	334	1.3	RB 1 MHz;VB 10 Hz;Pk
1039.930	46.2	H	74.0	-27.8	PK	137	1.0	RB 1 MHz;VB 3 MHz;Pk
1908.310	38.1	V	74.0	-35.9	PK	334	1.3	RB 1 MHz;VB 3 MHz;Pk
3249.200	48.2	H	54.0	-51.8	AVG	120	1.4	RB 1 MHz;VB 10 Hz;Pk



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 2c: , EUT on Channel #6 2437MHz - 802.11n40, Main+Aux

Date of Test: 9/29/2010 Test Location: FT Chamber #4

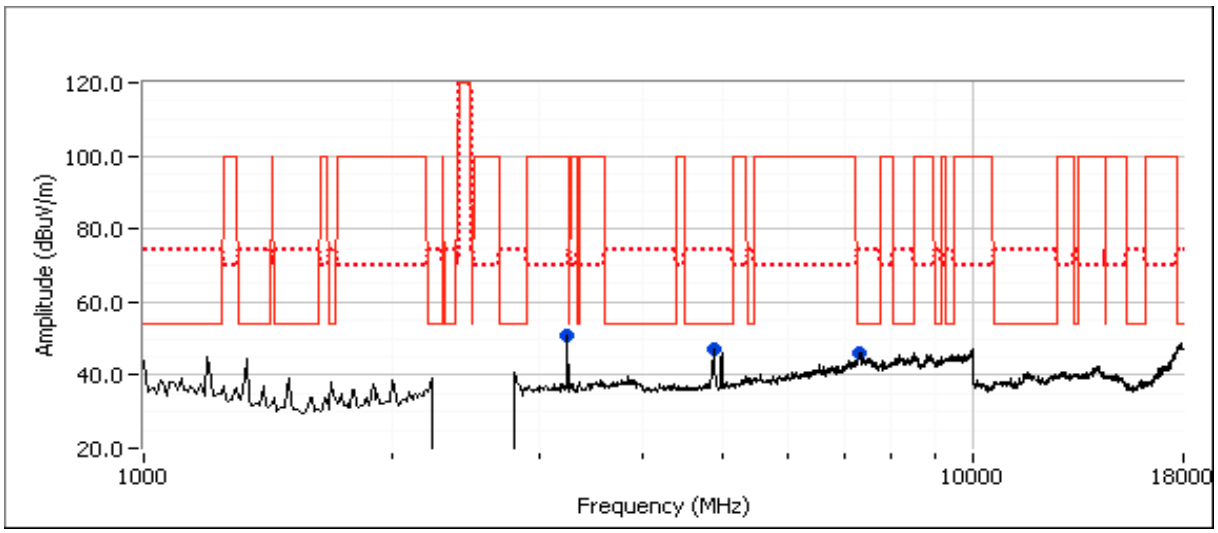
Test Engineer: Rafael Varelas Config Change: none

	Power Settings								
	Target (dBm)				Measured (dBm)				Software Setting
Chain	A	B	C	Total	A	B	C	Total	
	-	-		-	-	-		-	-

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	
4894.090	48.4	H	54.0	**-5.6**	AVG	360	1.0	RB 1 MHz;VB 10 Hz;Pk
4880.490	51.1	H	74.0	-22.9	PK	360	1.0	RB 1 MHz;VB 3 MHz;Pk
7305.360	40.6	V	54.0	-13.4	AVG	53	1.4	RB 1 MHz;VB 10 Hz;Pk
7308.420	52.3	V	74.0	-21.7	PK	53	1.4	RB 1 MHz;VB 3 MHz;Pk
3249.460	50.9	H	-	-	Peak	0	2.2	Not in restricted band, see antenna conducted

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.



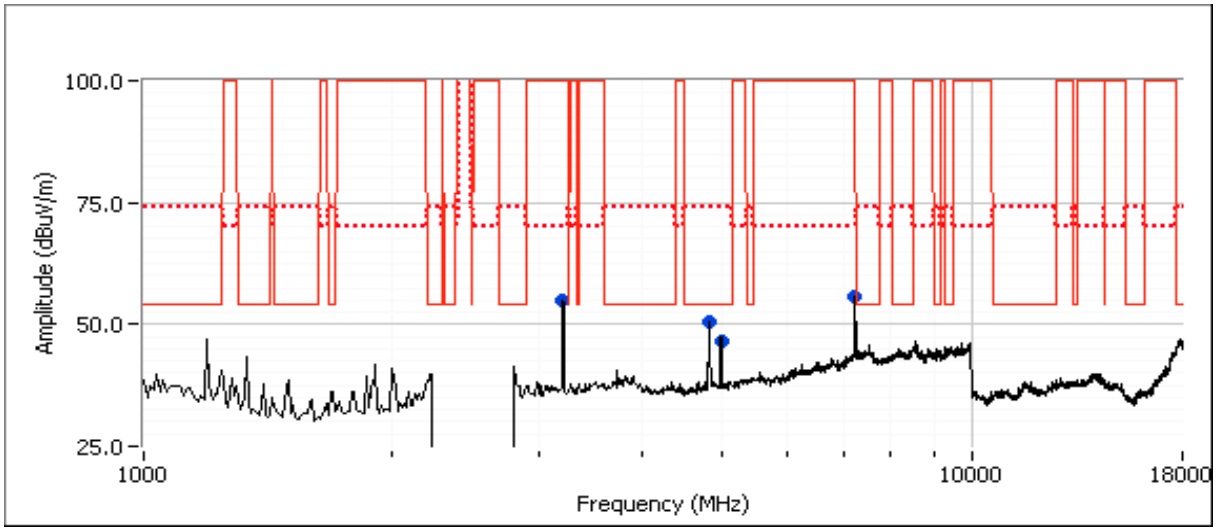
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 3, Radiated Spurious Emissions, 1-26GHz, 802.11g, Main

Date of Test: 10/7/2010 Test Location: Chamber #4
Test Engineer: Mehran Birgani Config Change: None

Run # 3a, EUT on Channel #1 2412MHz - 802.11g, Main

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



Spurious Radiated Emissions:

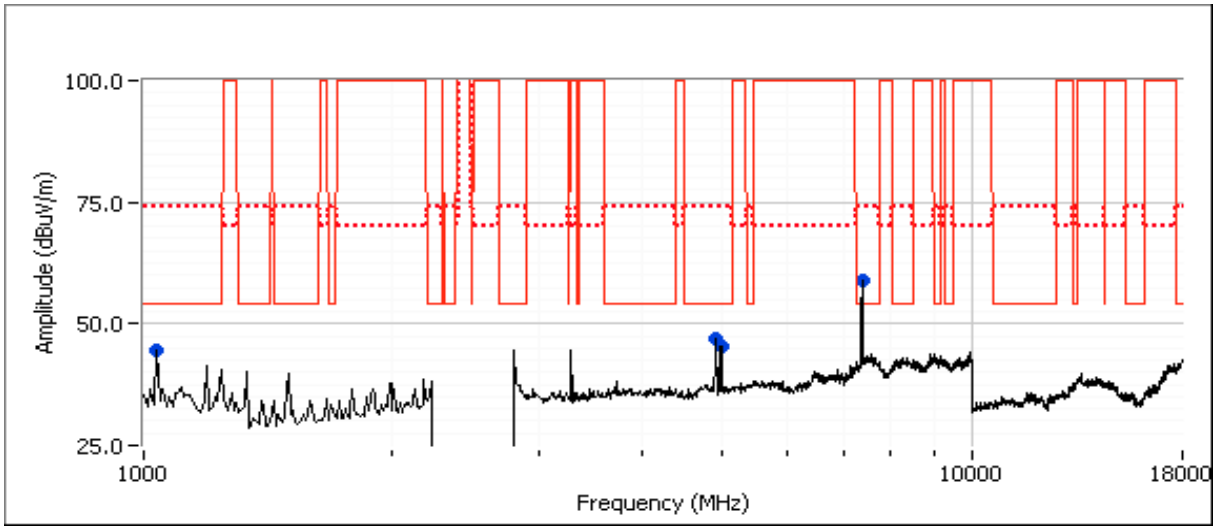
Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4824.140	**46.3**	V	54.0	**-7.7**	AVG	51	1.0	RB 1 MHz;VB 10 Hz;Pk
4987.410	37.5	V	54.0	-16.5	AVG	83	2.4	RB 1 MHz;VB 10 Hz;Pk
4823.700	49.4	V	74.0	-24.6	PK	51	1.0	RB 1 MHz;VB 3 MHz;Pk
7235.310	58.3	H	-	-	AVG	357	1.0	RB 1 MHz;VB 10 Hz;Pk, note 2
3216.000	55.2	H	-	-	AVG	63	1.3	RB 1 MHz;VB 10 Hz;Pk, note 2
7233.310	64.4	H	-	-	PK	357	1.0	RB 1 MHz;VB 3 MHz;Pk, note 2
3216.090	57.5	H	-	-	PK	63	1.3	RB 1 MHz;VB 3 MHz;Pk, note 2
4997.410	55.1	V	-	-	PK	83	2.4	RB 1 MHz;VB 3 MHz;Pk, note 2

Note 1	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.
Note 2	Emissions located in restricted bands, see antenna conducted measurements.

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 3b , EUT on Channel #11 2462MHz - 802.11g, Main

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



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	
4924.030	47.6	H	54.0	-6.4	AVG	16	1.0	RB 1 MHz;VB 10 Hz;Pk
4922.860	50.0	H	74.0	-24.0	PK	16	1.0	RB 1 MHz;VB 3 MHz;Pk
1020.110	33.8	H	54.0	-20.2	AVG	170	1.0	RB 1 MHz;VB 10 Hz;Pk
1020.010	39.3	H	74.0	-34.7	PK	170	1.0	RB 1 MHz;VB 3 MHz;Pk
4990.610	36.6	V	54.0	-17.4	AVG	241	1.0	RB 1 MHz;VB 10 Hz;Pk
4988.410	54.4	V	74.0	-19.6	PK	241	1.0	RB 1 MHz;VB 3 MHz;Pk
7385.150	**53.2**	V	54.0	**-0.8**	AVG	158	1.0	RB 1 MHz;VB 10 Hz;Pk
7390.850	60.5	V	74.0	-13.5	PK	158	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 Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 4, Radiated Spurious Emissions, 1-26GHz, 802.11n20, Main+Aux

Date of Test: 10/14/2010 Test Location: Ch#3
Test Engineer: Suresh Kondapalli Config Change: None

Run # 4a: , EUT on Channel #1 2412MHz - 802.11n20, Main+Aux

	Power Settings								
	Target (dBm)				Measured (dBm)				Software Setting
Chain	A	B	C	Total	A	B	C	Total	
	-	-		-	-	-		-	

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	
4823.070	**53.3**	H	54.0	**-0.7**	AVG	45	1.0	RB 1 MHz;VB 10 Hz;Pk
4823.000	53.1	H	54.0	-0.9	AVG	85	1.0	RB 1 MHz;VB 10 Hz;Pk
4822.850	50.1	V	54.0	-3.9	AVG	26	1.0	RB 1 MHz;VB 10 Hz;Pk
7238.670	48.3	H	54.0	-5.7	AVG	348	1.0	RB 1 MHz;VB 10 Hz;Pk
7235.610	48.0	V	54.0	-6.0	AVG	0	1.0	RB 1 MHz;VB 10 Hz;Pk
4818.400	65.3	H	74.0	-8.7	PK	45	1.0	RB 1 MHz;VB 3 MHz;Pk
4823.330	64.6	H	74.0	-9.4	PK	85	1.0	RB 1 MHz;VB 3 MHz;Pk
4823.910	62.2	V	74.0	-11.8	PK	26	1.0	RB 1 MHz;VB 3 MHz;Pk
7243.600	60.5	H	74.0	-13.5	PK	348	1.0	RB 1 MHz;VB 3 MHz;Pk
7235.740	60.5	V	74.0	-13.5	PK	0	1.0	RB 1 MHz;VB 3 MHz;Pk
3249.520	29.5	H	54.0	-24.5	AVG	2	1.0	RB 1 MHz;VB 10 Hz;Pk
3250.010	41.3	V	74.0	-28.7	PK	110	1.0	RB 1 MHz;VB 3 MHz;Pk
3247.910	41.2	H	74.0	-32.8	PK	2	1.0	RB 1 MHz;VB 3 MHz;Pk
3249.000	29.6	V	54.0	-70.4	AVG	110	1.0	RB 1 MHz;VB 10 Hz;Pk

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 4b: , EUT on Channel #11 2462MHz - 802.11n20, Main+Aux

	Power Settings								
	Target (dBm)				Measured (dBm)				Software Setting
Chain	A	B	C	Total	A	B	C	Total	
	-	-		-	-	-		-	

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	
4925.180	**53.2**	V	54.0	**-0.8**	AVG	91	1.0	RB 1 MHz;VB 10 Hz;Pk
7386.350	50.1	V	54.0	-3.9	AVG	2	1.9	RB 1 MHz;VB 10 Hz;Pk
7383.470	47.4	H	54.0	-6.6	AVG	120	1.5	RB 1 MHz;VB 10 Hz;Pk
4925.030	66.7	V	74.0	-7.3	PK	91	1.0	RB 1 MHz;VB 3 MHz;Pk
7386.540	62.5	V	74.0	-11.5	PK	2	1.9	RB 1 MHz;VB 3 MHz;Pk
7380.930	59.0	H	74.0	-15.0	PK	120	1.5	RB 1 MHz;VB 3 MHz;Pk
3282.500	48.9	H	74.0	-21.1	PK	52	1.0	RB 1 MHz;VB 3 MHz;Pk
3282.660	46.5	V	74.0	-23.5	PK	155	1.0	RB 1 MHz;VB 3 MHz;Pk
3282.700	46.8	H	54.0	-53.2	AVG	52	1.0	RB 1 MHz;VB 10 Hz;Pk
3282.660	43.1	V	54.0	-56.9	AVG	155	1.0	RB 1 MHz;VB 10 Hz;Pk

Note 1	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 5, Radiated Spurious Emissions, 1-26GHz, 802.11n40, Main+Aux

Date of Test: 10/19/2010 Test Location: FT5
Test Engineer: Rafael Varelas Config Change: None

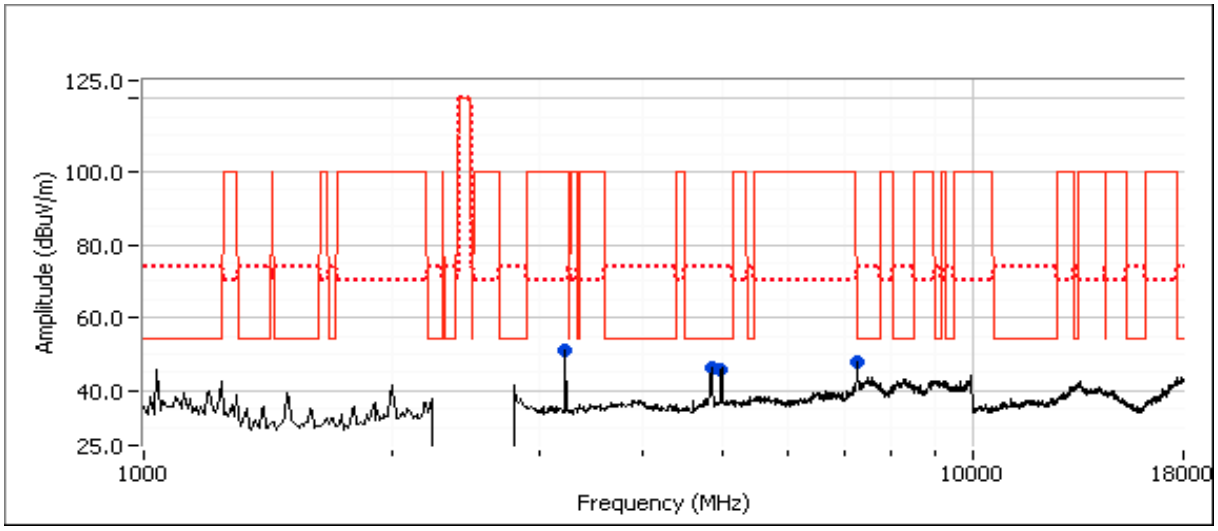
Run # 5a: , EUT on Channel #3 2422MHz - 802.11n40, Main+Aux

	Power Settings								
	Target (dBm)				Measured (dBm)				Software Setting
Chain	A	B	C	Total	A	B	C	Total	
	-	-		-	-	-		-	

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	
4843.140	40.3	H	54.0	-13.7	AVG	302	1.0	RB 1 MHz;VB 10 Hz;Pk
4845.210	51.5	H	74.0	-22.5	PK	302	1.0	RB 1 MHz;VB 3 MHz;Pk
4994.290	35.0	V	54.0	-19.0	AVG	360	1.0	RB 1 MHz;VB 10 Hz;Pk
4997.060	50.7	V	74.0	-23.3	PK	360	1.0	RB 1 MHz;VB 3 MHz;Pk
7270.240	38.4	V	54.0	-15.6	AVG	236	1.7	RB 1 MHz;VB 10 Hz;Pk
7269.700	49.9	V	74.0	-24.1	PK	236	1.7	RB 1 MHz;VB 3 MHz;Pk
3229.330	50.8	H	-	-	Peak	115	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	Emissions located in restricted bands, see antenna conducted measurements.



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

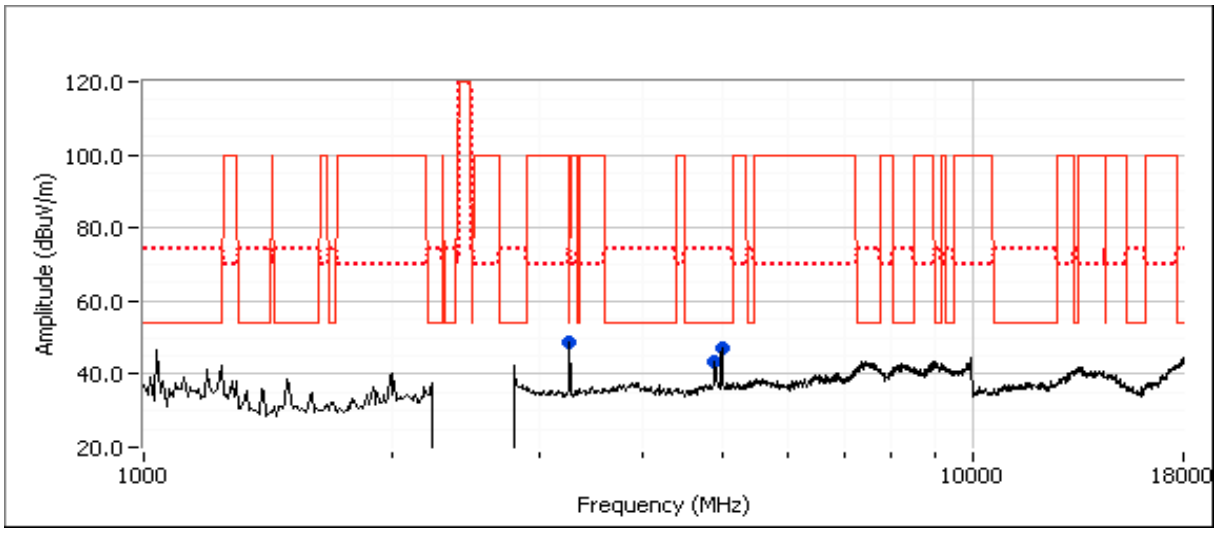
Run # 5b: , EUT on Channel #11 2452MHz - 802.11n40, Main+Aux

	Power Settings								
	Target (dBm)				Measured (dBm)				Software Setting
Chain	A	B	C	Total	A	B	C	Total	
	-	-		-	-	-		-	

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	
4903.030	37.7	V	54.0	-16.3	AVG	27	1.6	RB 1 MHz;VB 10 Hz;Pk
4904.670	50.8	V	74.0	-23.2	PK	27	1.6	RB 1 MHz;VB 3 MHz;Pk
3269.430	51.9	H	-	-	PK	133	1.0	RB 1 MHz;VB 3 MHz;Pk, note 2
4990.750	35.7	V	54.0	-18.3	AVG	360	1.0	RB 1 MHz;VB 10 Hz;Pk
4994.250	52.5	V	74.0	-21.5	PK	360	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	Emissions located in restricted bands, see antenna conducted measurements.



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

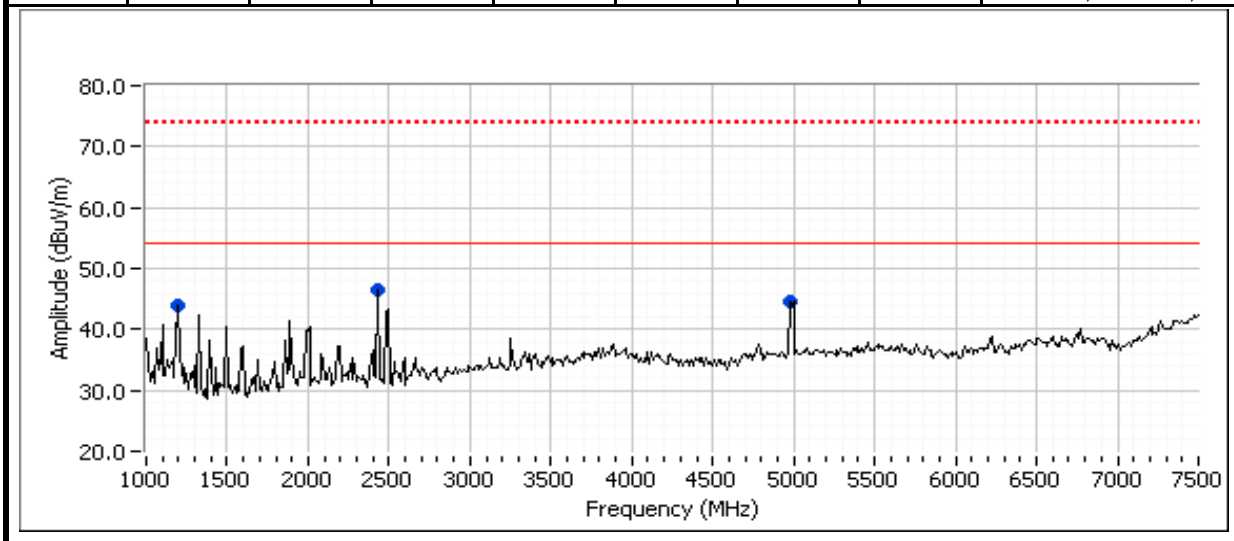
Run # 6, Radiated Spurious Emissions, 1-7.5GHz, Receive, Main, Aux, Main+Aux

Date of Test: 10/18/2010 Test Location: FT Chamber #4

Test Engineer: Rafael Varelas Config Change: None

Run # 6a, EUT on Channel #6 2437MHz - Receive, Main

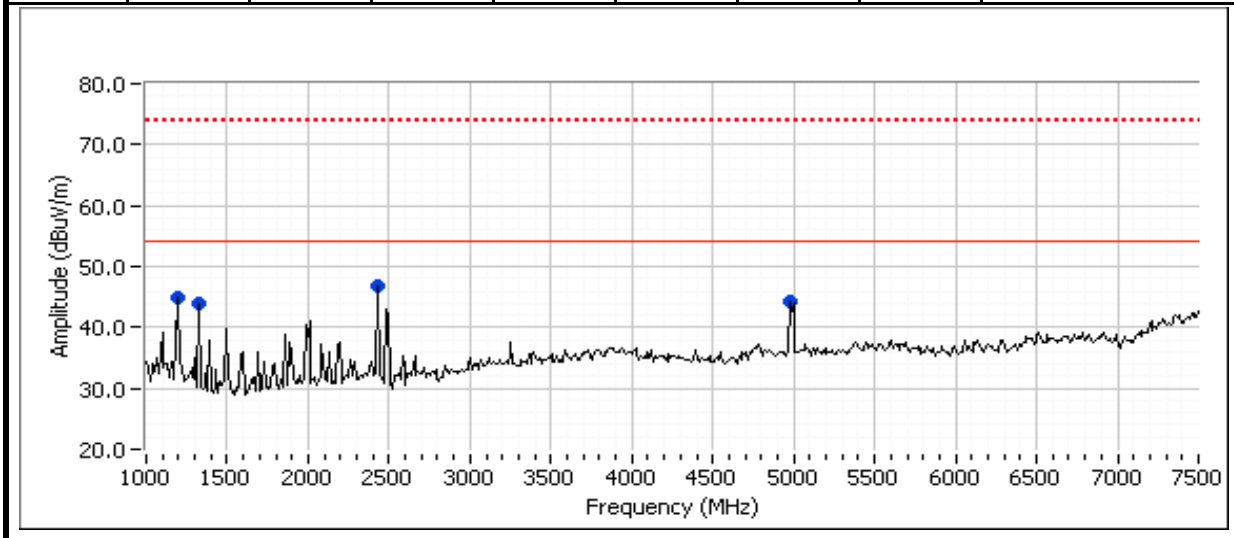
Frequency	Level	Pol	RSS 210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2437.010	47.5	H	54.0	-6.5	AVG	26	1.7	RB 1 MHz;VB 10 Hz;Pk
2437.080	49.0	H	74.0	-25.0	PK	26	1.7	RB 1 MHz;VB 3 MHz;Pk
4991.840	37.0	H	54.0	-17.0	AVG	319	1.0	RB 1 MHz;VB 10 Hz;Pk
4992.340	54.5	H	74.0	-19.5	PK	319	1.0	RB 1 MHz;VB 3 MHz;Pk
1199.960	38.7	V	54.0	-15.3	AVG	315	1.1	RB 1 MHz;VB 10 Hz;Pk
1194.570	43.6	V	74.0	-30.4	PK	315	1.1	RB 1 MHz;VB 3 MHz;Pk



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

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

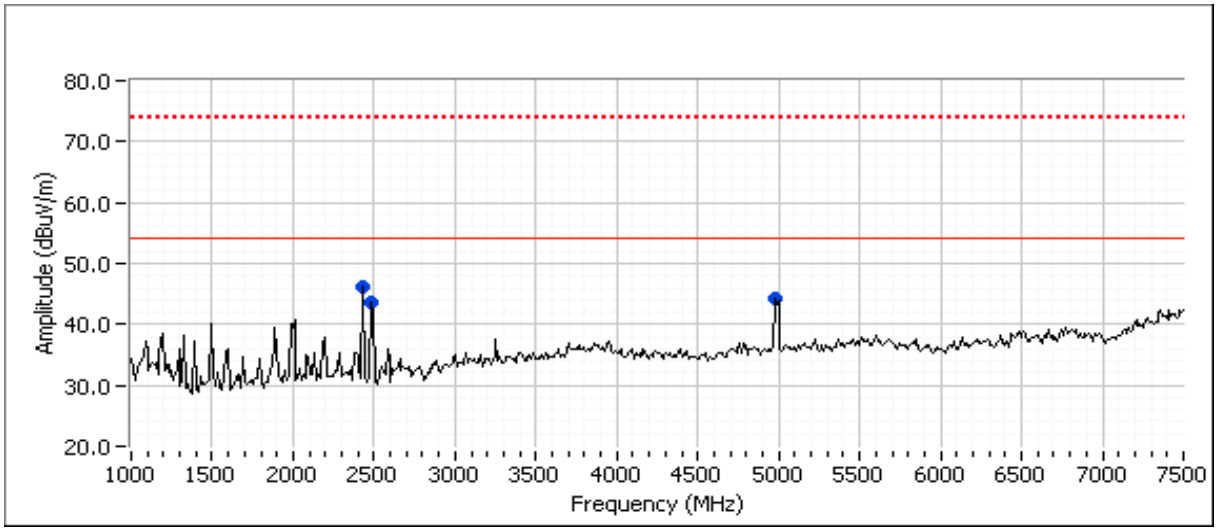
Frequency	Level	Pol	RSS 210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2437.030	47.7	H	54.0	-6.3	AVG	32	1.7	RB 1 MHz;VB 10 Hz;Pk
2437.000	49.1	H	74.0	-24.9	PK	32	1.7	RB 1 MHz;VB 3 MHz;Pk
4989.150	36.7	H	54.0	-17.3	AVG	317	1.0	RB 1 MHz;VB 10 Hz;Pk
4989.350	54.3	H	74.0	-19.7	PK	317	1.0	RB 1 MHz;VB 3 MHz;Pk
1195.530	31.4	V	54.0	-22.6	AVG	246	1.0	RB 1 MHz;VB 10 Hz;Pk
1195.530	42.8	V	74.0	-31.2	PK	246	1.0	RB 1 MHz;VB 3 MHz;Pk
1312.930	31.5	V	54.0	-22.5	AVG	249	1.0	RB 1 MHz;VB 10 Hz;Pk
1312.770	38.1	V	74.0	-35.9	PK	249	1.0	RB 1 MHz;VB 3 MHz;Pk



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 6c: EUT on Channel #6 2437MHz - Receive, Main+Aux

Frequency	Level	Pol	RSS 210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2436.990	46.9	H	54.0	-7.1	AVG	31	1.7	RB 1 MHz;VB 10 Hz;Pk
2437.000	48.7	H	74.0	-25.3	PK	31	1.7	RB 1 MHz;VB 3 MHz;Pk
4989.510	36.0	V	54.0	-18.0	AVG	357	1.8	RB 1 MHz;VB 10 Hz;Pk
4996.710	53.3	V	74.0	-20.7	PK	357	1.8	RB 1 MHz;VB 3 MHz;Pk
2495.500	34.8	V	54.0	-19.2	AVG	318	1.0	RB 1 MHz;VB 10 Hz;Pk
2495.850	50.3	V	74.0	-23.7	PK	318	1.0	RB 1 MHz;VB 3 MHz;Pk



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions

Summary of Results

Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
Run # 1	802.11g Main	#1 2412MHz	-	-	Restricted Band Edge at 2390 MHz	15.209	52.5dBµV/m @ 2390.0MHz (-1.5dB)
		#11 2462MHz	-	-	Restricted Band Edge at 2483.5 MHz	15.209	52.9dBµV/m @ 2483.6MHz (-1.1dB)
Run # 2	802.11g Main	#2 2412MHz	-	-	Restricted Band Edge at 2390 MHz	15.209	53.7dBµV/m @ 2390.1MHz (-0.3dB)
		#10 2457MHz	-	-	Restricted Band Edge at 2483.5 MHz	15.209	52.3dBµV/m @ 2483.6MHz (-1.7dB)
Run # 3	802.11b Main	#1 2412MHz	-	-	Restricted Band Edge at 2400 MHz	15.209	49.4dBµV/m @ 2390.0MHz (-4.6dB)
		#11 2462MHz	-	-	Restricted Band Edge at 2483.5 MHz	15.209	49.5dBµV/m @ 2483.6MHz (-4.5dB)

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 ws installed into a test fixture such that the EUT was exposed (i.e. outside of a host PC).
For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Rel. Humidity: 15 - 55 %
Temperature: 18 - 25 °C

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 that horizontal polarity was the worse case for all modes and channels for bandedge measurements

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 1, Band Edge Field Strength - 802.11g, Main

Date of Test: 9/24/2010 Test Location: FT#5

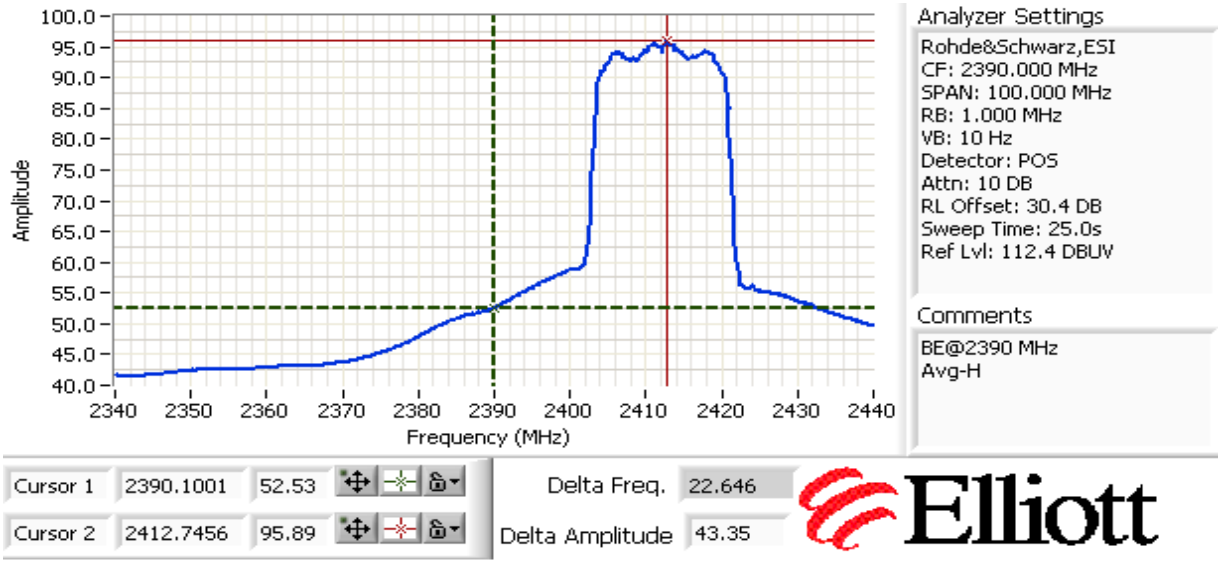
Test Engineer: Suresh K Config Change: none

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

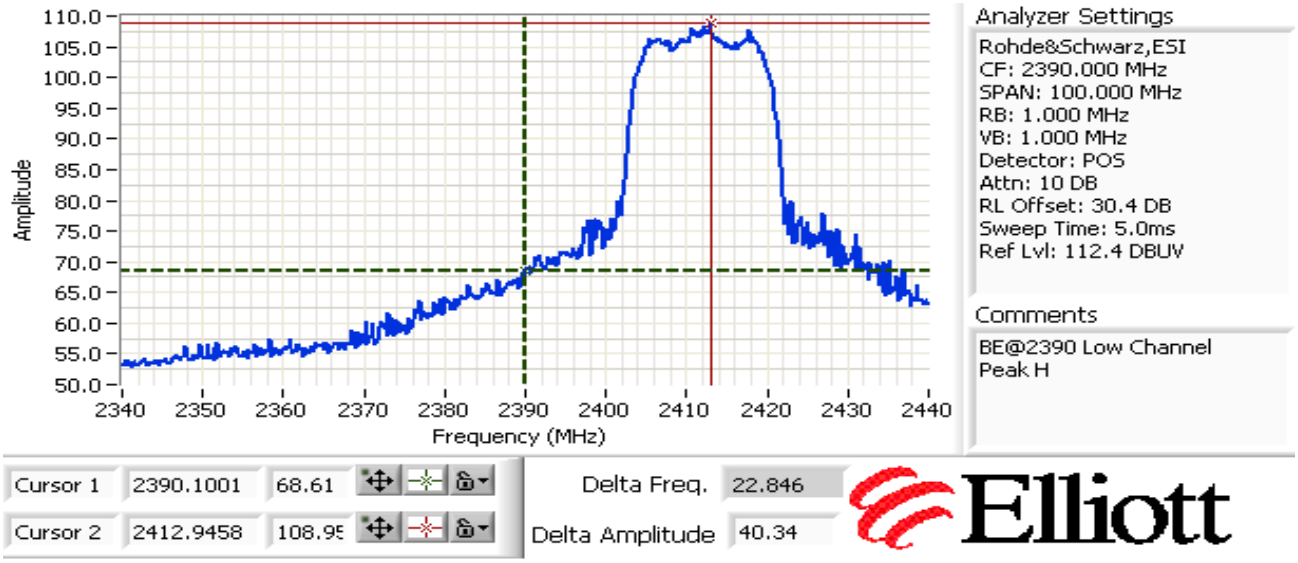
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Main	-	-	-

Direct Measurement of Field Strength at the Bandedge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	52.5	H	54.0	-1.5	Avg	239	1.0	
2388.890	68.6	H	74.0	-5.4	Pk	239	1.0	



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



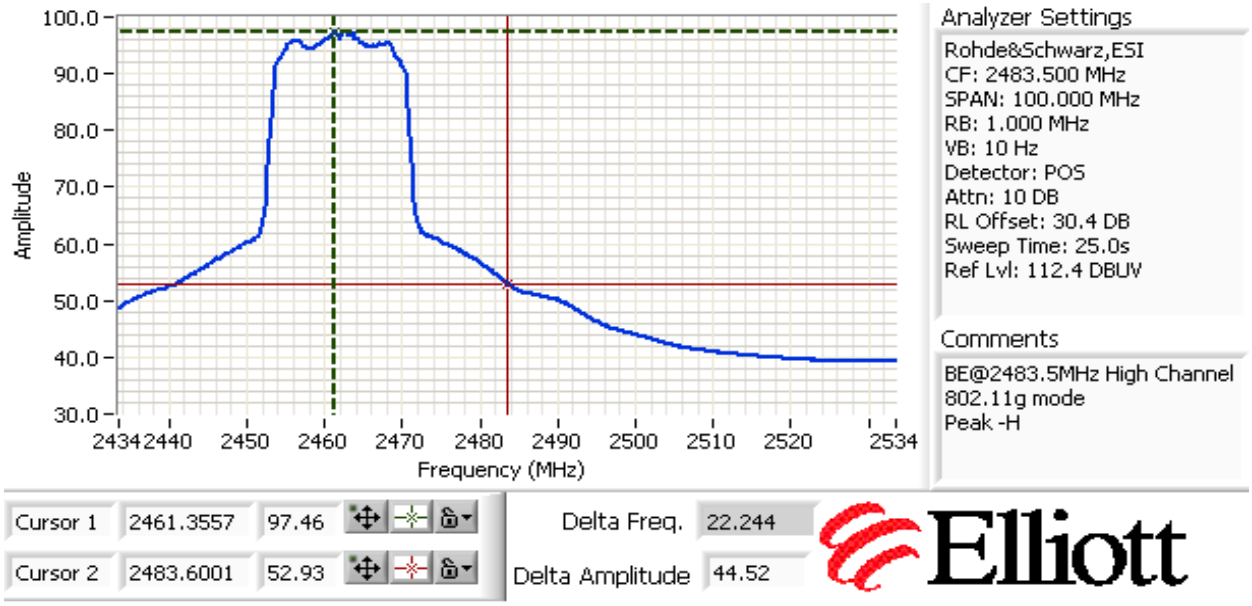
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

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

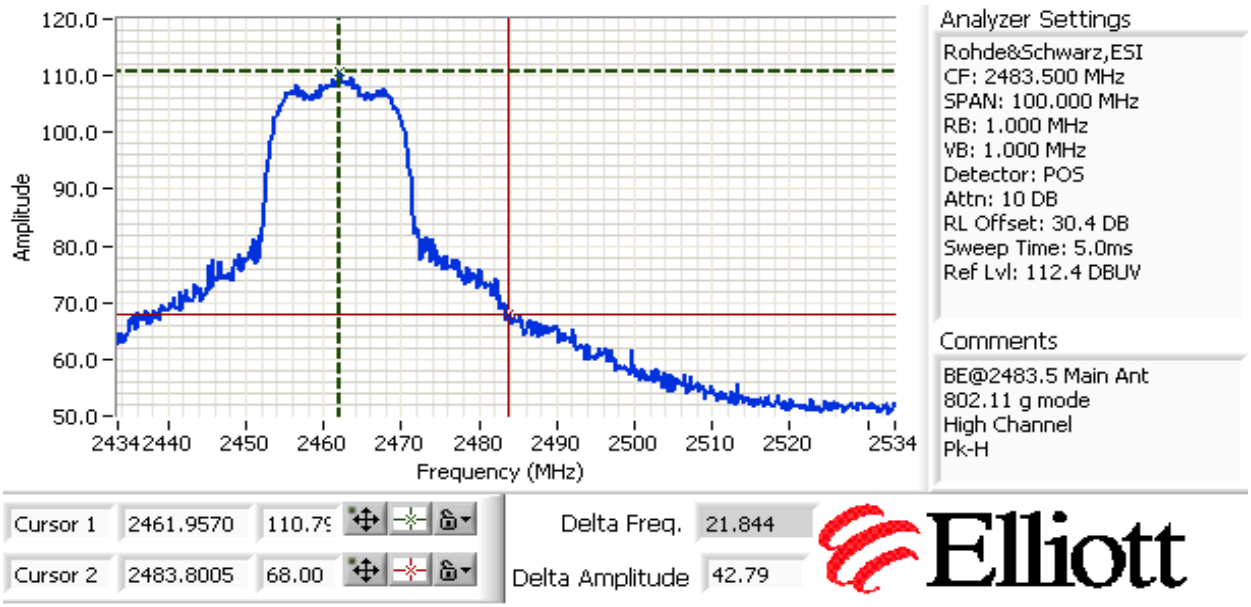
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Main	-	-	-

Direct Measurement of Field Strength at the Bandedge

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	**52.9**	H	54.0	**-1.1**	Avg	117	2.0	
2483.800	68.0	H	74.0	-6.0	Pk	122	2.0	



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

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

Date of Test: 10/18/2010 Test Location: FT Chamber #4

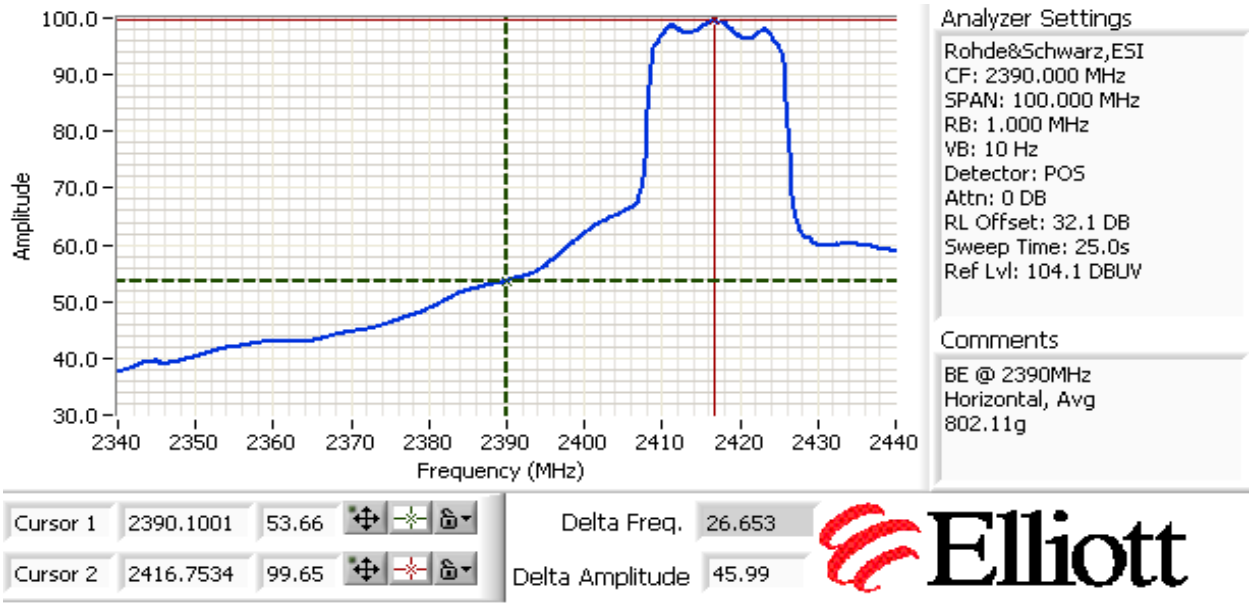
Test Engineer: Rafael Varelas Config Change: none

Run # 2a, EUT on Channel #1 2417MHz - 802.11g, Main

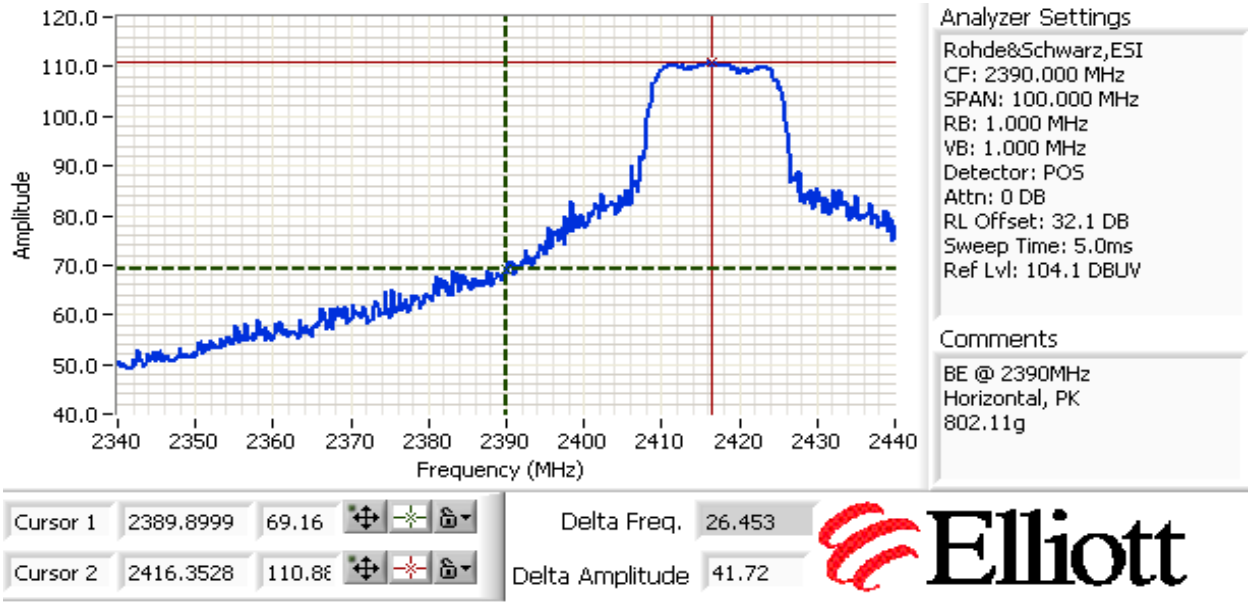
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Main	-	-	-

Direct Measurement of Field Strength at the Bandedge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.100	53.7	H	54.0	-0.3	Avg	35	1.3	
2389.900	69.2	H	74.0	-4.8	Pk	35	1.3	
2390.000	51.6	V	54.0	-2.4	Avg	127	1.0	
2387.695	68.6	V	74.0	-5.4	Pk	127	1.0	



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



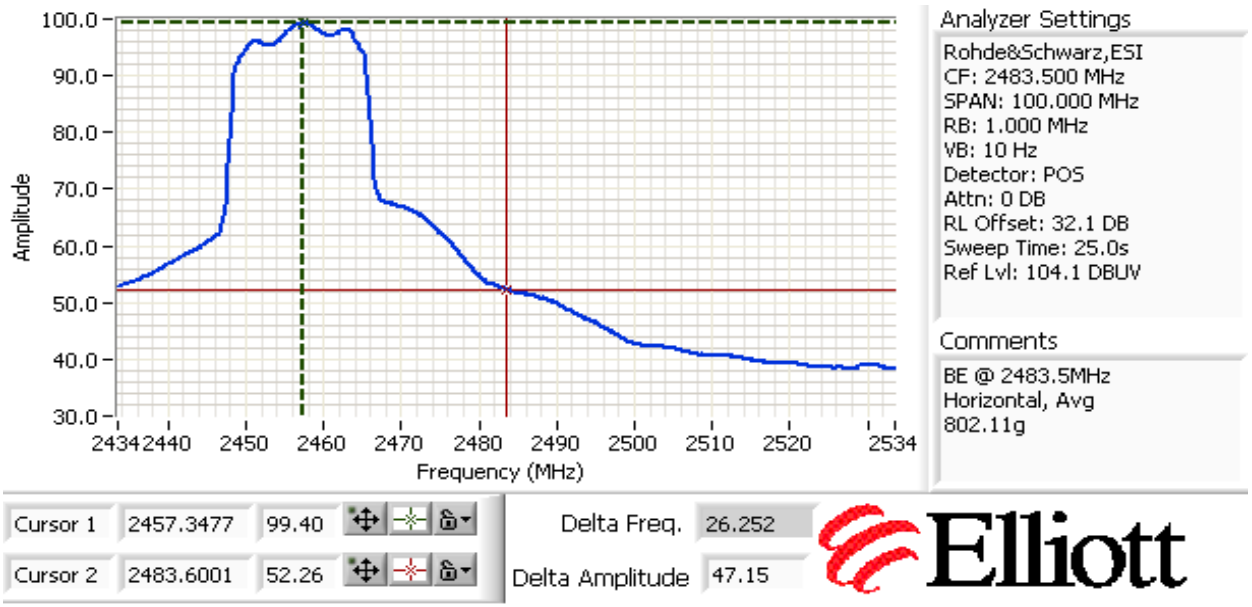
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 2b, EUT on Channel #10 2457MHz - 802.11g, Main

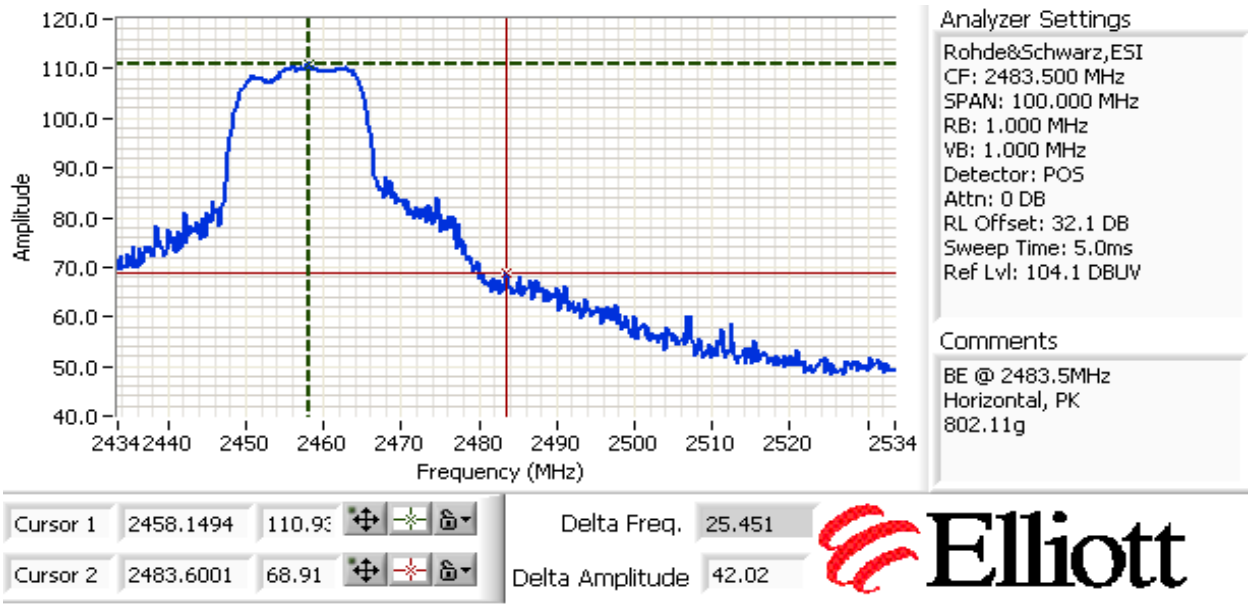
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Main	-	-	-

Direct Measurement of Field Strength at the Bandedge

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	52.3	H	54.0	-1.7	Avg	32	1.4	RB 1 MHz; VB: 10 Hz
2483.600	68.9	H	74.0	-5.1	Pk	32	1.4	RB 1 MHz; VB: 1 MHz
2483.600	49.9	V	54.0	-4.1	Avg	341	1.0	RB 1 MHz; VB: 10 Hz
2485.604	65.5	V	74.0	-8.5	Pk	341	1.0	RB 1 MHz; VB: 1 MHz



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 3, Band Edge Field Strength - 802.11b, Main

Date of Test: 9/24/2010 Test Location: FT#5

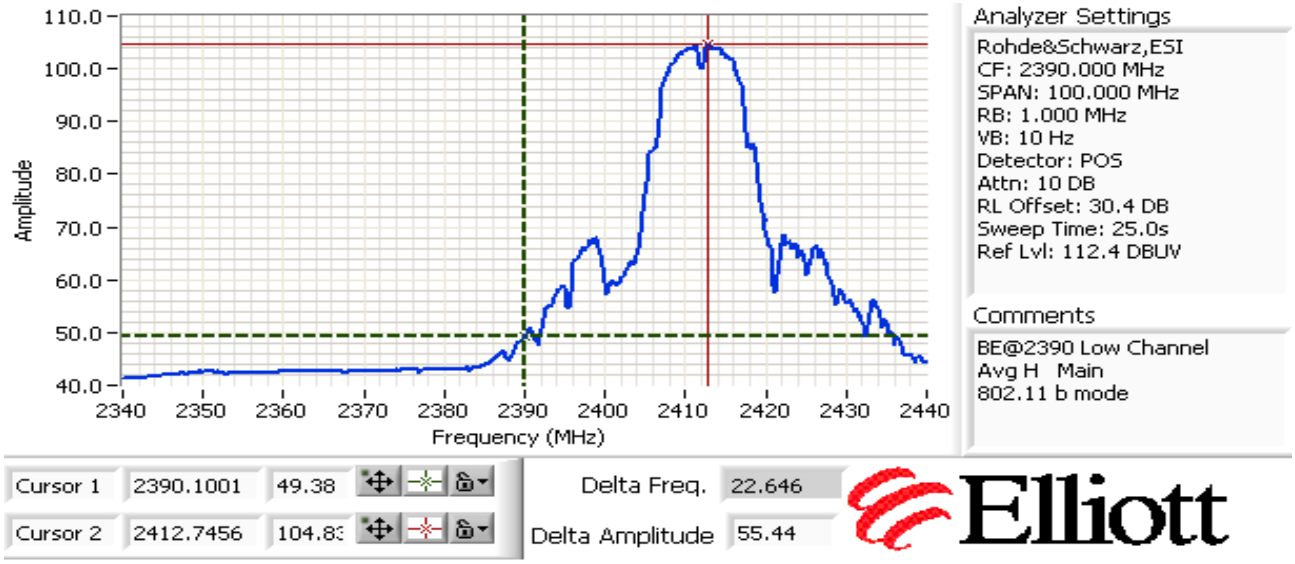
Test Engineer: Suresh K Config Change: none

Run # 3a, EUT on Channel #1 2412MHz - 802.11b, Main

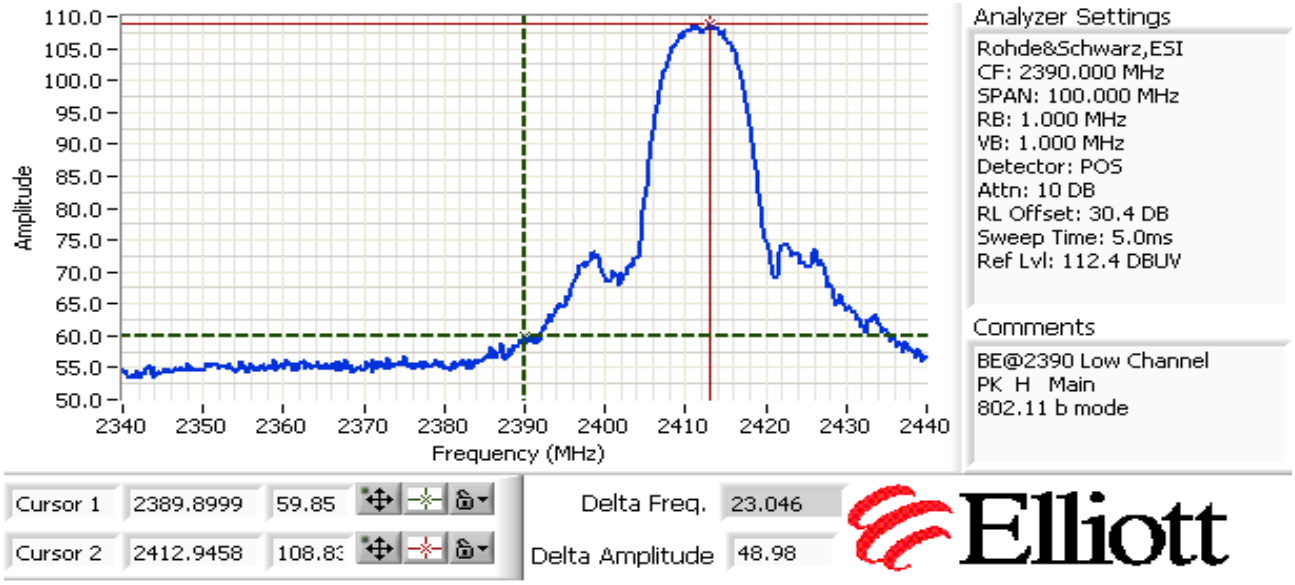
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Main	-	-	-

Direct Measurement of Field Strength at the Bandedge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	49.4	H	54.0	-4.6	Avg	241	1.0	
2389.899	59.9	H	74.0	-14.2	Pk	241	1.0	



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



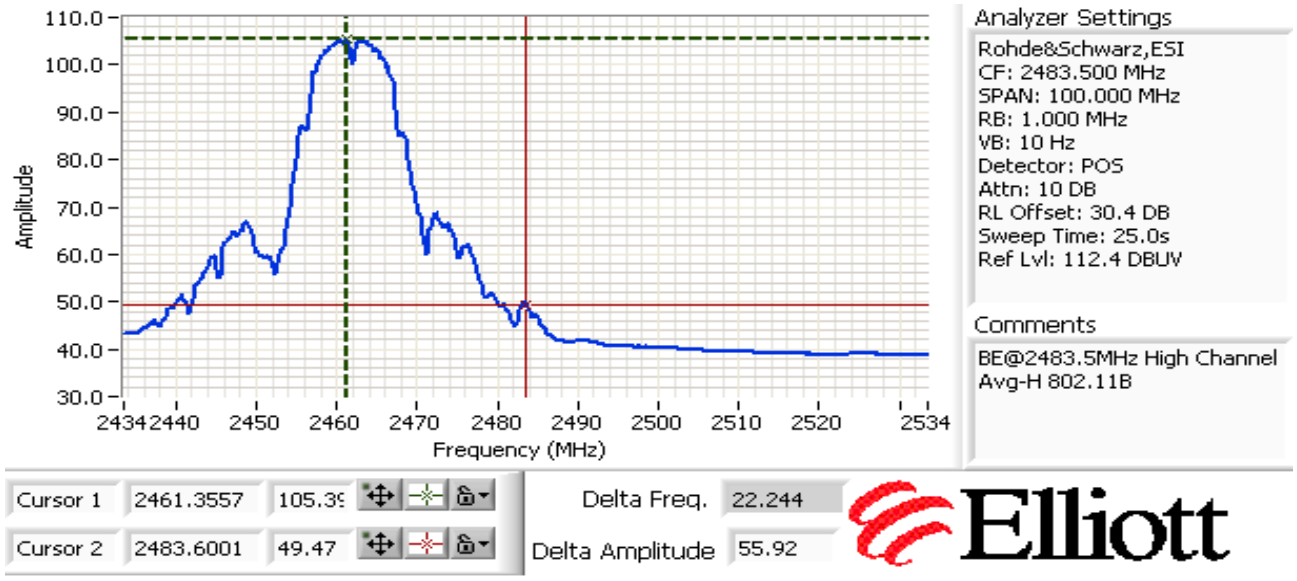
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 3b, EUT on Channel #11 2462MHz - 802.11b, Main

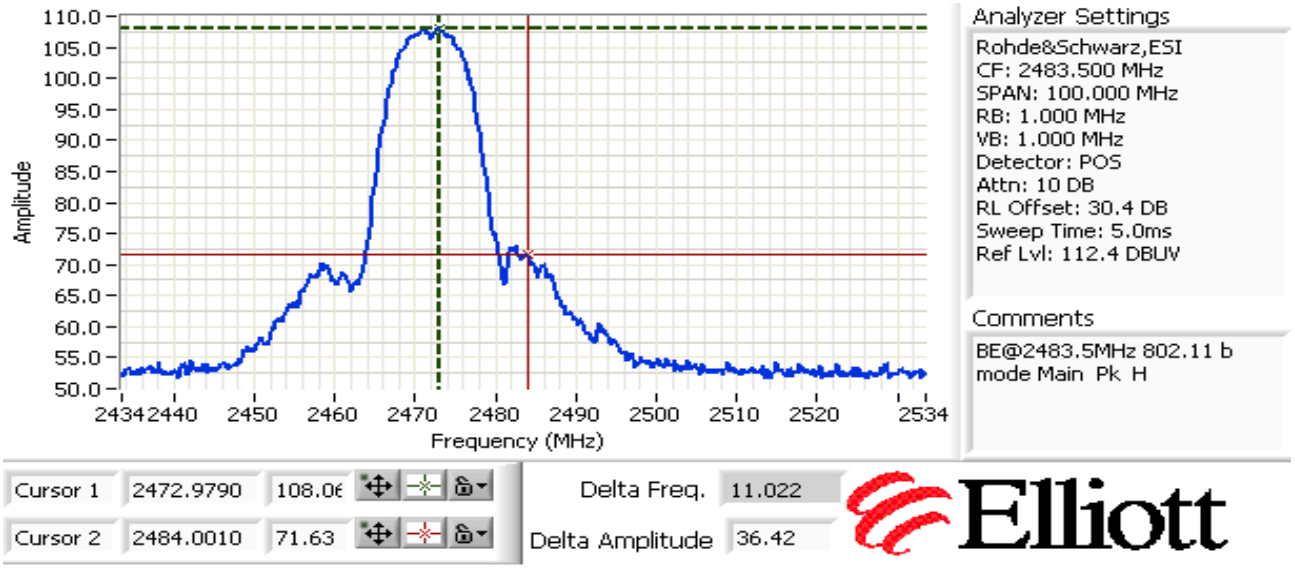
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Main	-	-	-

Direct Measurement of Field Strength at the Bandedge

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	49.5	H	54.0	-4.5	Avg	117	2.0	
2884.000	57.8	H	74.0	-16.2	Pk	122	2.0	



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions

Summary of Results

Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
Run # 1	n40 Main+Aux	#3 2422MHz	-	-	Restricted Band Edge at 2390 MHz	15.209	52.1dBµV/m @ 2380.7MHz (-1.9dB)
		#9 2452Hz	-	-	Restricted Band Edge at 2483.5 MHz	15.209	53.5dBµV/m @ 2493.6MHz (-0.5dB)
Run # 2	n40 Main+Aux	#4 2427MHz	-	-	Restricted Band Edge at 2390 MHz	15.209	53.4dBµV/m @ 2388.7MHz (-0.6dB)
		#8 2447MHz	-	-	Restricted Band Edge at 2483.5 MHz	15.209	53.6dBµV/m @ 2485.2MHz (-0.4dB)
Run # 3	n40 Main+Aux	#5 2432MHz	-	-	Restricted Band Edge at 2390 MHz	15.209	53.6dBµV/m @ 2389.5MHz (-0.4dB)
		#7 2442MHz	-	-	Restricted Band Edge at 2483.5 MHz	15.209	53.9dBµV/m @ 2485.0MHz (-0.1dB)
Run # 4	n40 Main+Aux	#6 2437MHz	-	-	Restricted Band Edge at 2390 MHz	15.209	53.7dBµV/m @ 2390.1MHz (-0.3dB)
			-	-	Restricted Band Edge at 2483.5 MHz	15.209	52.4dBµV/m @ 2484.8MHz (-1.6dB)
Run # 5	n20 Main+Aux	#1 2412MHz	-	-	Restricted Band Edge at 2390 MHz	15.209	53.9dBµV/m @ 2390.0MHz (-0.1dB)
		#2 2417MHz	-	-	Restricted Band Edge at 2390 MHz	15.209	53.6dBµV/m @ 2390.0MHz (-0.4dB)
		#3 2422MHz	-	-	Restricted Band Edge at 2390 MHz	15.209	54.0dBµV/m @ 2390.0MHz (-0.0dB)
		#4 2427MHz	-	-	Restricted Band Edge at 2390 MHz	15.209	53.7dBµV/m @ 2390.0MHz (-0.3dB)
		#5 2432MHz	-	-	Restricted Band Edge at 2390 MHz	15.209	54.0dBµV/m @ 2388.6MHz (-0.0dB)
		#8 2447MHz	-	-	Restricted Band Edge at 2483.5 MHz	15.209	53.7dBµV/m @ 2485.0MHz (-0.3dB)
		#9 2452MHz	-	-	Restricted Band Edge at 2483.5 MHz	15.209	54.0dBµV/m @ 2483.6MHz (-0.0dB)
		#10 2457MHz	-	-	Restricted Band Edge at 2483.5 MHz	15.209	53.5dBµV/m @ 2483.6MHz (-0.5dB)
		#11 2462MHz	-	-	Restricted Band Edge at 2483.5 MHz	15.209	73.7dBµV/m @ 2483.7MHz (-0.3dB)

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Note - the target and measured power are average powers (measured with average power sensor) and are used for reference purposes only.

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 ws installed into a test fixture such that the EUT was exposed (i.e. outside of a host PC).
For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Rel. Humidity:	15 - 55 %
Temperature:	18 - 25 °C

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 that horizontal polarity was the worse case for all modes and channels for bandedge measurements

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

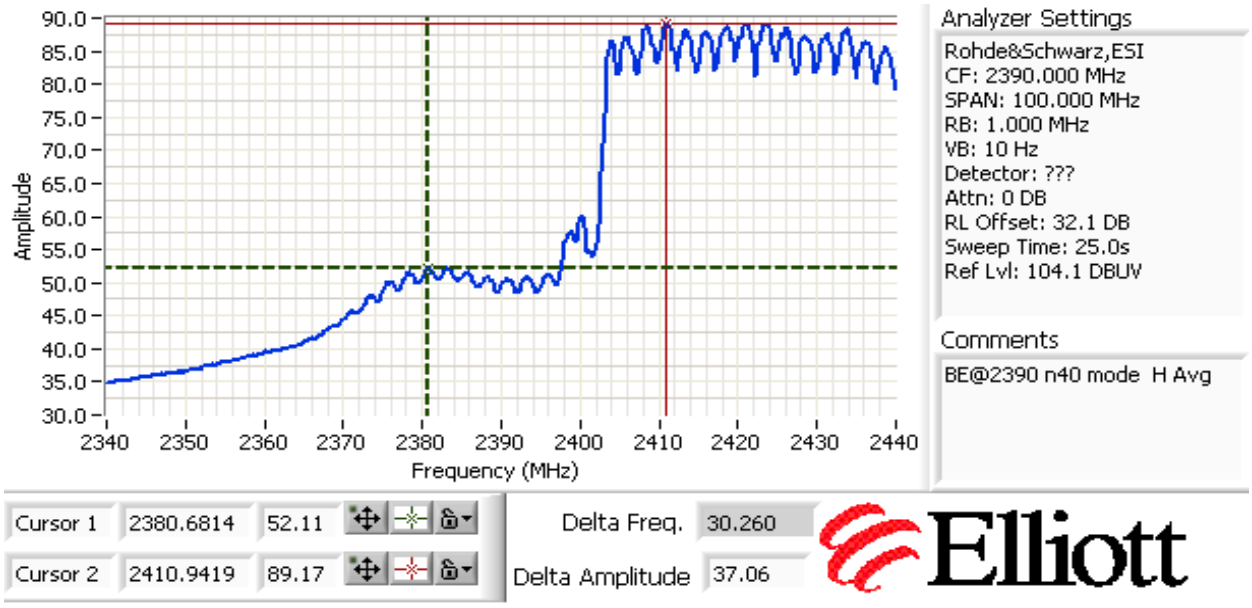
Run # 1, Band Edge Field Strength - n40, Main+Aux
Run # 1a, EUT on Channel #3 2422MHz - n40, Main+Aux

Date of Test: 10/18/2010 Test Location: CH#4
Test Engineer: Suresh Kondapalli Config Change: none

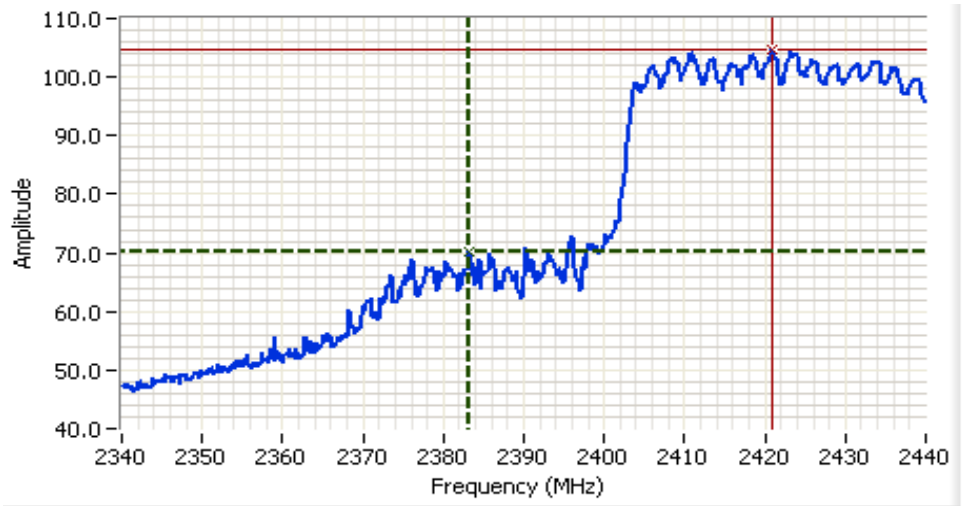
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Direct Measurement of Field Strength at the Bandedge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2380.680	52.1	H	54.0	-1.9	Avg	109	1.1	
2383.280	70.2	H	74.0	-3.8	Pk	109	1.1	



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



Analyzer Settings

Rohde&Schwarz,ESI
CF: 2390.000 MHz
SPAN: 100.000 MHz
RB: 1.000 MHz
VB: 1.000 MHz
Detector: POS
Attn: 0 DB
RL Offset: 32.1 DB
Sweep Time: 5.0ms
Ref Lvl: 104.1 DBUV

Comments

BE@2390 n40 mode H Pk

Cursor 1	2383.2866	70.20	Delta Freq.	37.475	Elliott
Cursor 2	2420.7615	104.57	Delta Amplitude	34.37	

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 1b, EUT on Channel #9 2452MHz - n40, Main+Aux

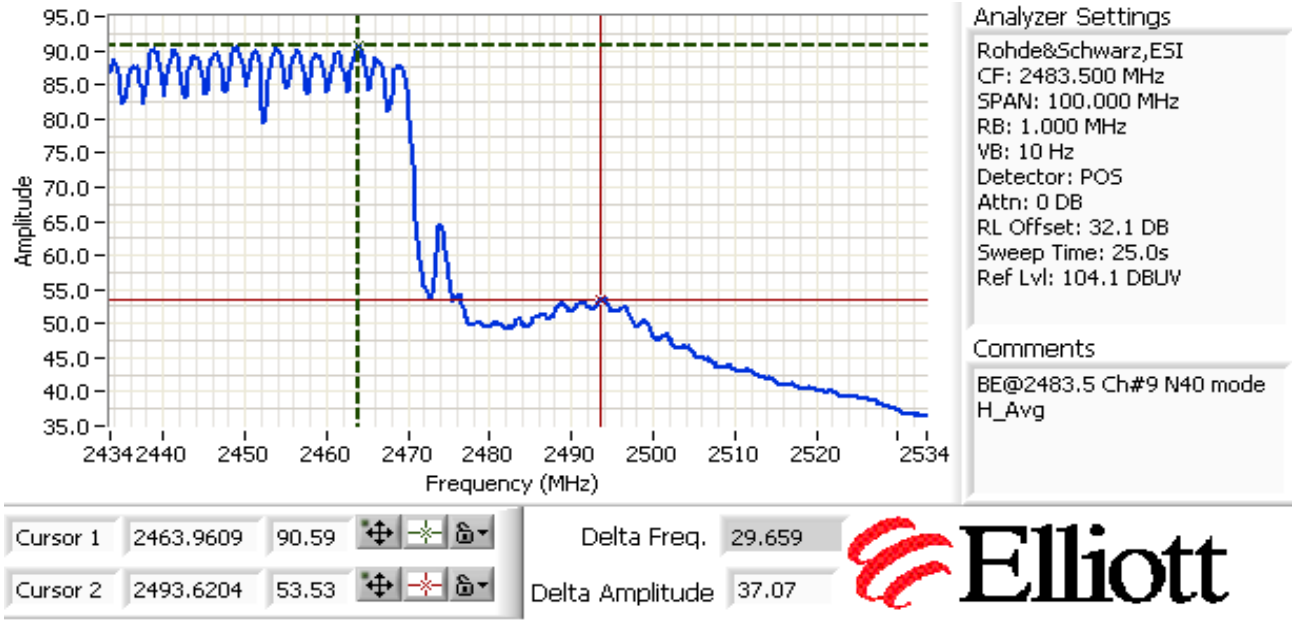
Date of Test: 10/18/2010 Test Location: CH#4

Test Engineer: Suresh Kondapalli Config Change: none

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

Direct Measurement of Field Strength at the Bandedge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2493.620	**53.5**	H	54.0	**-0.5**	Avg	116	1.1	
2495.820	69.6	H	74.0	-4.4	Pk	116	1.1	



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Analyzer Settings

Rohde&Schwarz,ESI
CF: 2483.500 MHz
SPAN: 100.000 MHz
RB: 1.000 MHz
VB: 1.000 MHz
Detector: POS
Attn: 0 DB
RL Offset: 32.1 DB
Sweep Time: 5.0ms
Ref Lvl: 104.1 DBUV

Comments

BE@2483.5 n40 mode H Pk

Cursor 1	2453.1392	104.66	Delta Freq.	42.686
Cursor 2	2495.8247	69.56	Delta Amplitude	35.10

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

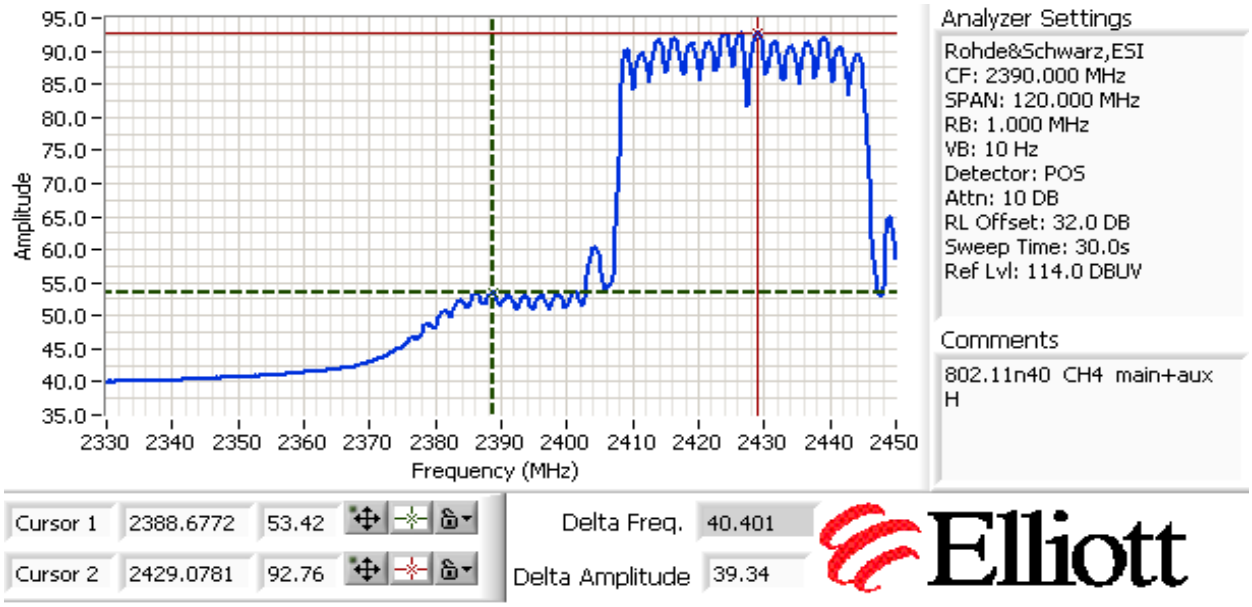
Run # 2, Band Edge Field Strength - n40, Main+Aux
Run # 2a, EUT on Channel #4 2427MHz - n40, Main+Aux

Date of Test: 10/19/2010 Test Location: FT5
Test Engineer: John Caizzi Config Change: none

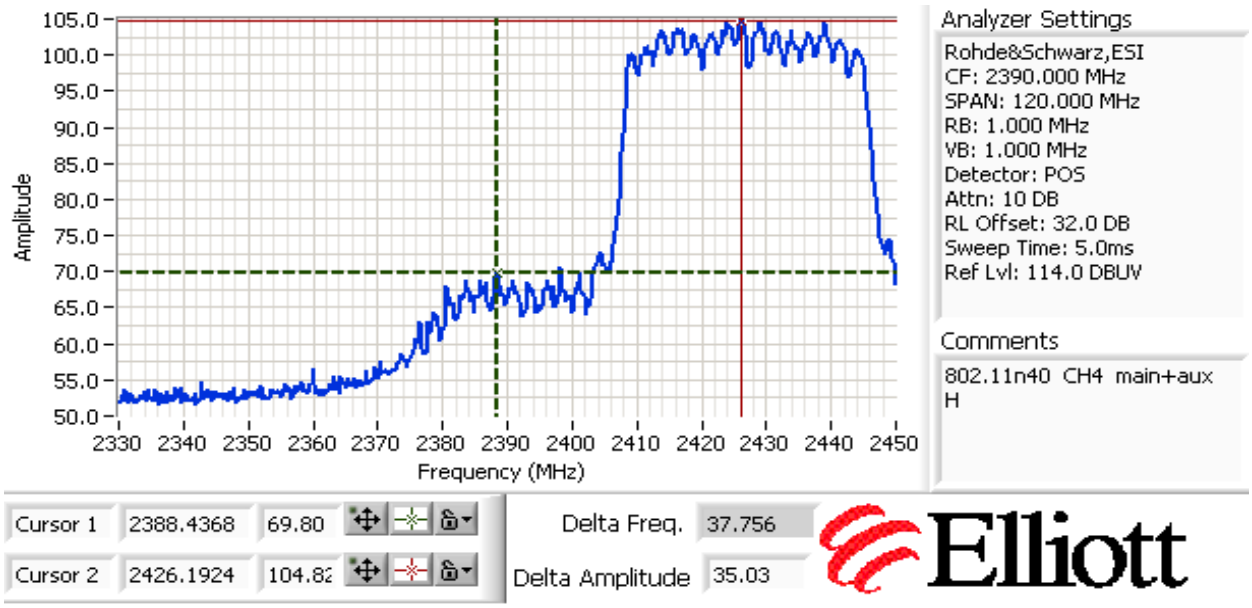
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Direct Measurement of Field Strength at the Bandedge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2388.677	53.4	H	54.0	-0.6	Avg	228	1.04	
2388.437	69.8	H	74.0	-4.2	Pk	228	1.04	



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

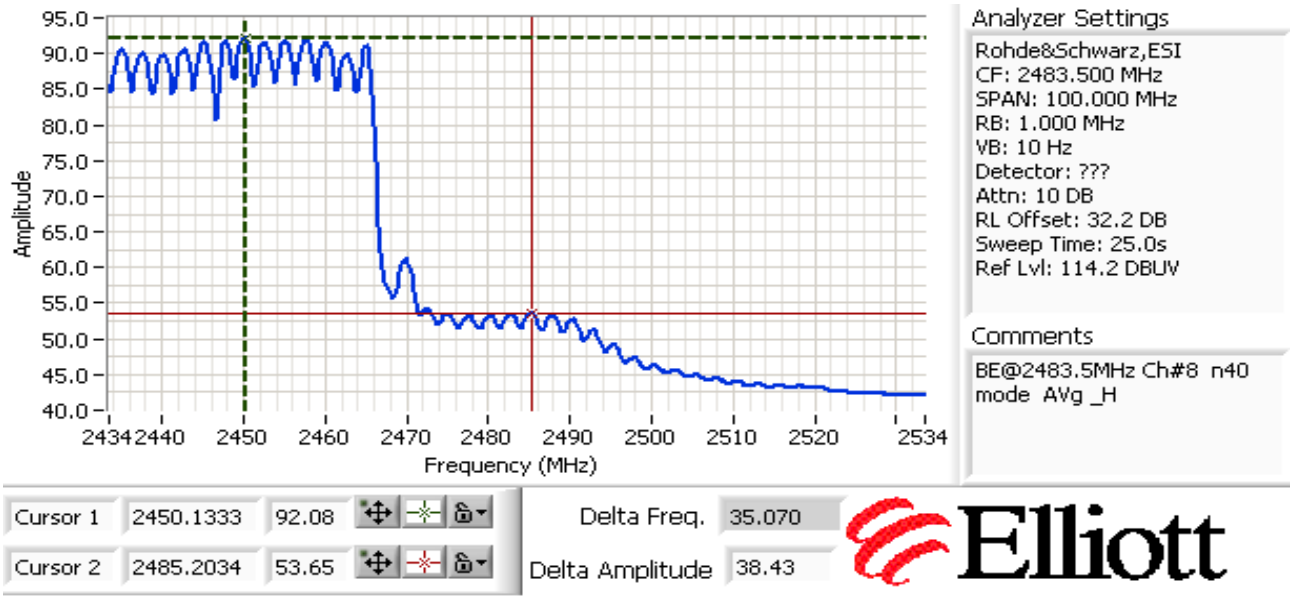
Run # 2b, EUT on Channel #8 2447MHz - n40, Main+Aux

Date of Test: 10/21/2010 Test Location: FT5
Test Engineer: Suresh Kondapalli Config Change: none

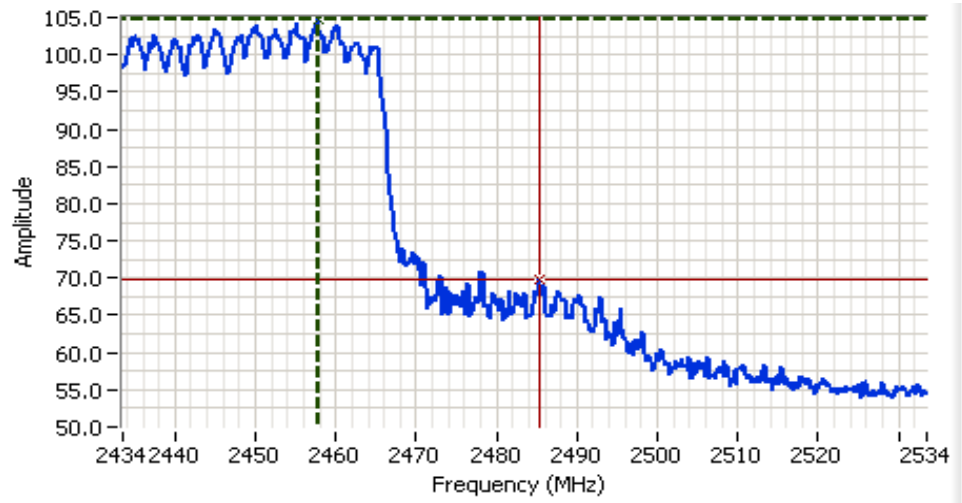
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Direct Measurement of Field Strength at the Bandedge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2485.200	53.6	H	54.0	**-0.4**	Avg	43	1.5	
2485.200	69.8	H	74.0	**-4.2**	Pk	43	1.5	



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



Analyzer Settings

Rohde&Schwarz,ESI
CF: 2483.500 MHz
SPAN: 100.000 MHz
RB: 1.000 MHz
VB: 1.000 MHz
Detector: POS
Attn: 10 DB
RL Offset: 32.2 DB
Sweep Time: 5.0ms
Ref Lvl: 114.2 DBUV

Comments

BE@2483.5MHz Ch#8 n40 mode Pk _H

Cursor 1	2457.7485	104.67	Delta Freq.	27.455	Elliott
Cursor 2	2485.2034	69.84	Delta Amplitude	34.83	

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

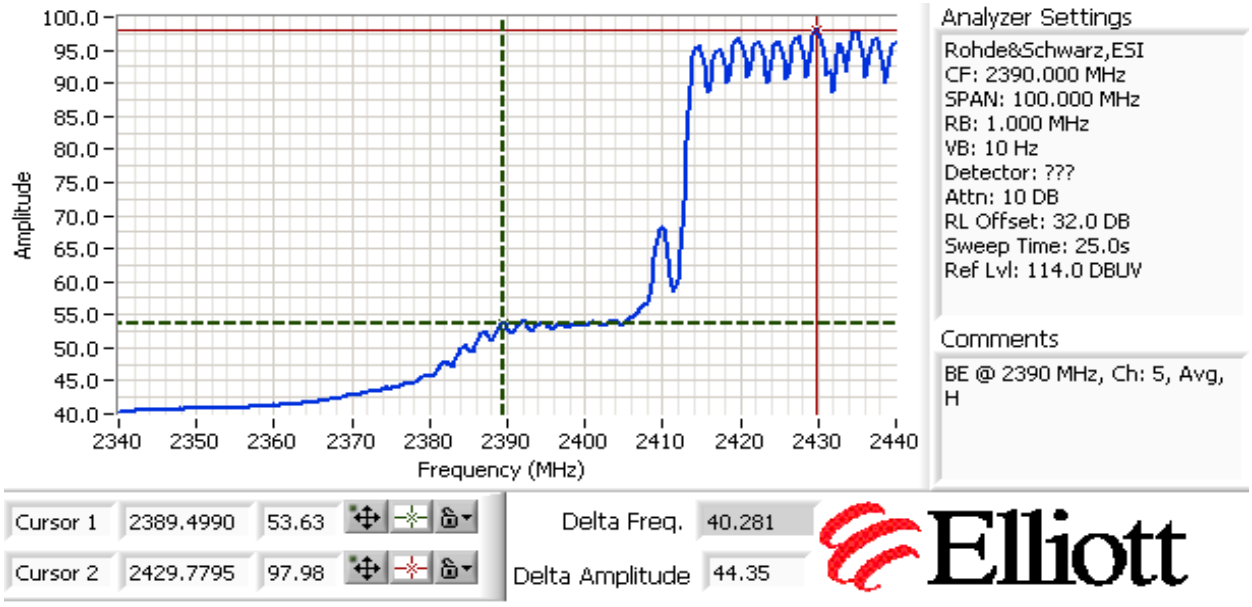
Run # 3, Band Edge Field Strength - n40, Main+Aux
Run # 3a, EUT on Channel #5 2432MHz - n40, Main+Aux

Date of Test: 10/21/2010 Test Location: FT #5
Test Engineer: Mark Hill Config Change: -

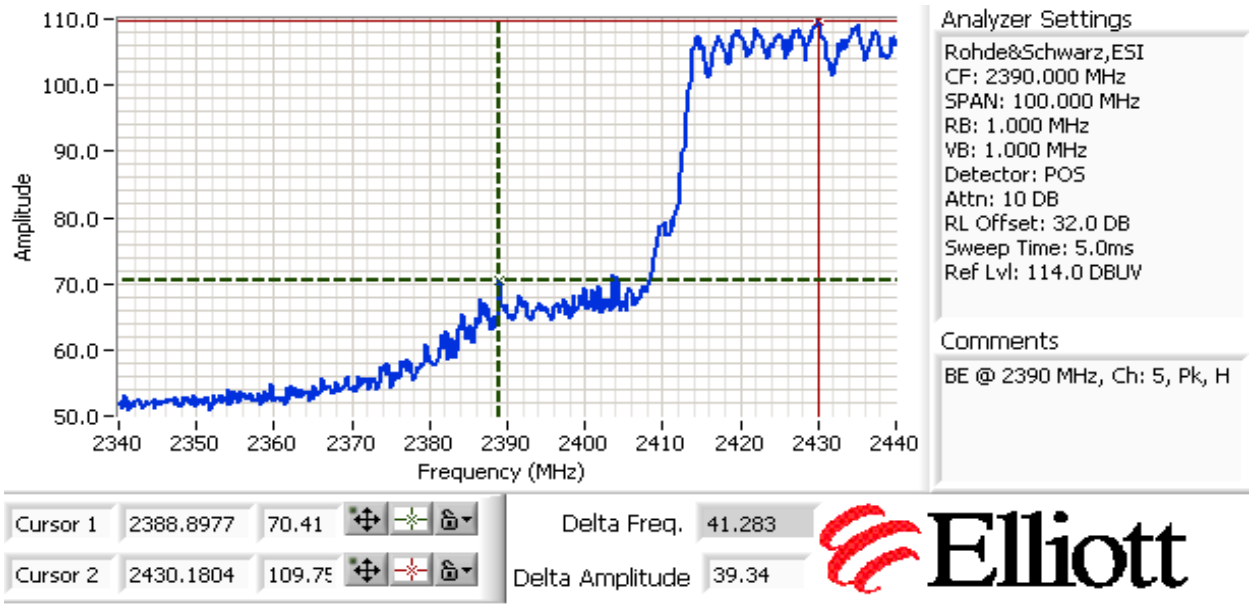
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Direct Measurement of Field Strength at the Bandedge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.500	53.6	H	54.0	**-0.4**	Avg	102	1.0	
2388.900	70.4	H	74.0	**-3.6**	Pk	102	1.0	



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



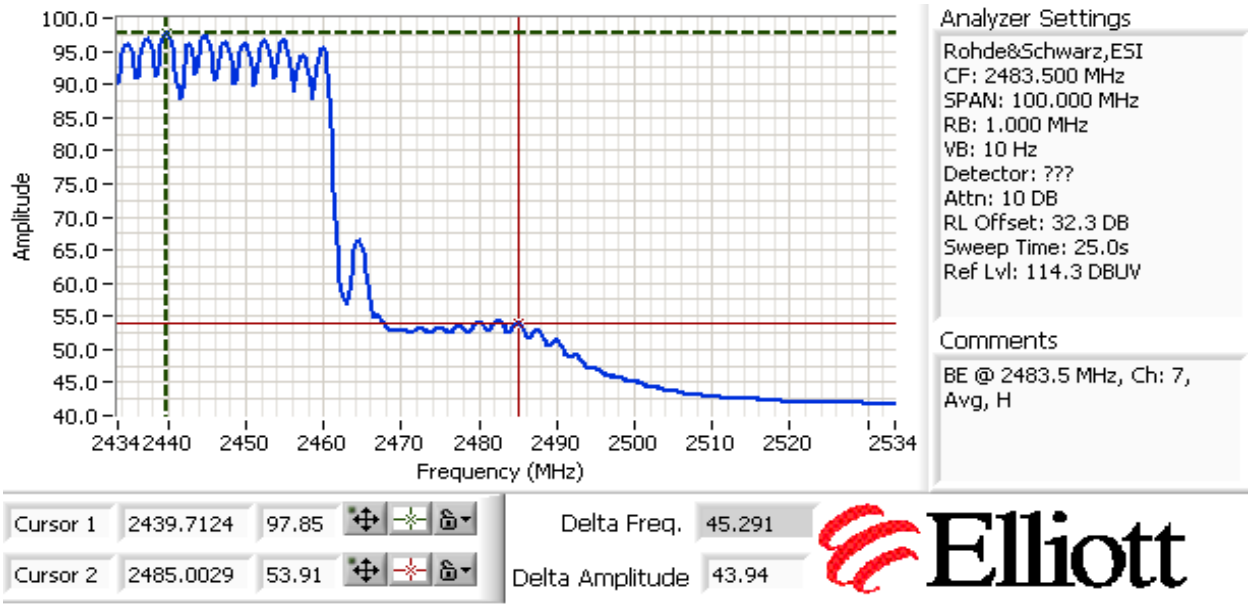
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 3b, EUT on Channel #7 2442MHz - n40, Main+Aux

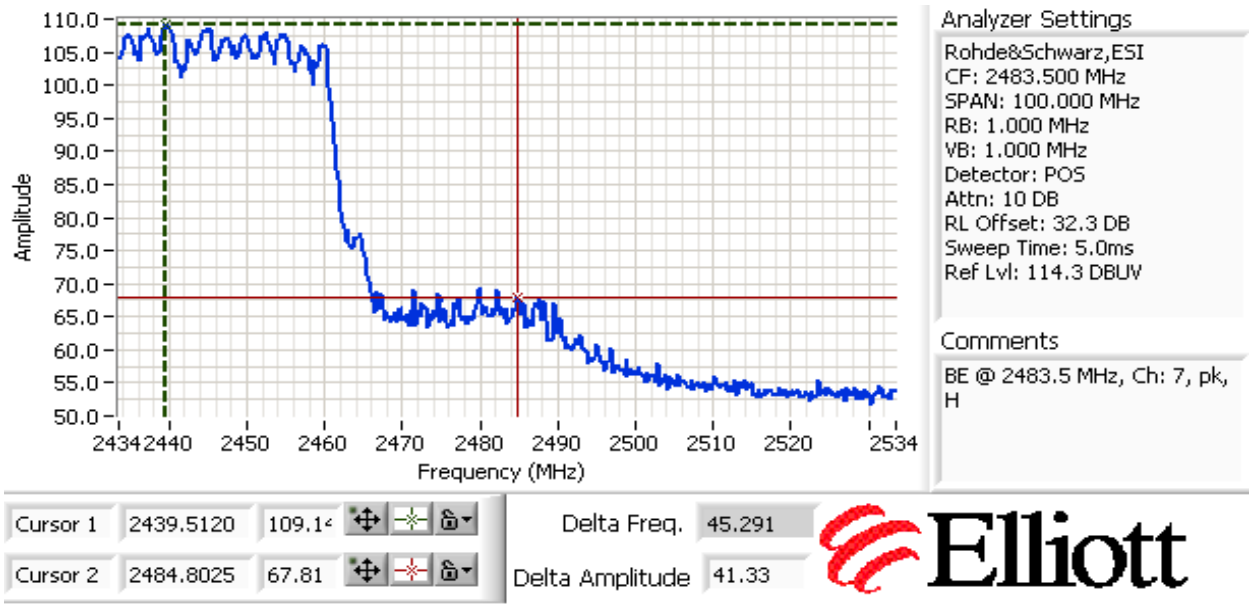
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Direct Measurement of Field Strength at the Bandedge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2485.000	**53.9**	H	54.0	**-0.1**	Avg	97	1.0	
2484.800	67.8	H	74.0	-6.2	Pk	97	1.0	



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 4, Band Edge Field Strength - n40, Main+Aux

Date of Test: 10/21/2010 Test Location: FT #5

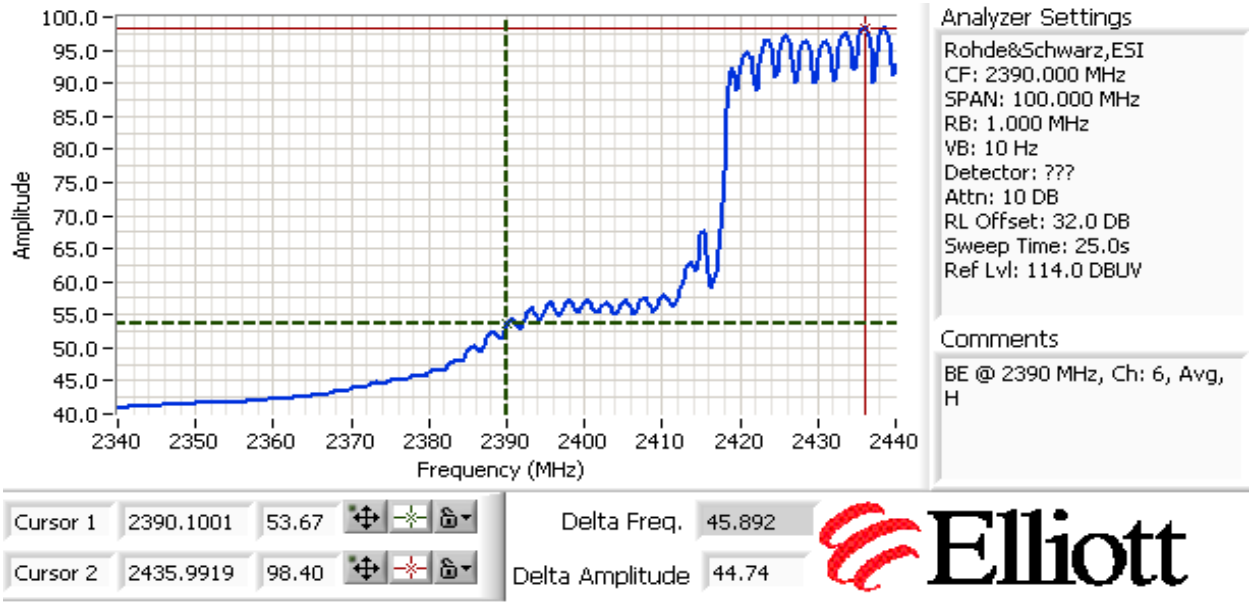
Test Engineer: Mark Hill Config Change: none

Run # 4b, EUT on Channel #6 2437MHz - n40, Main+Aux

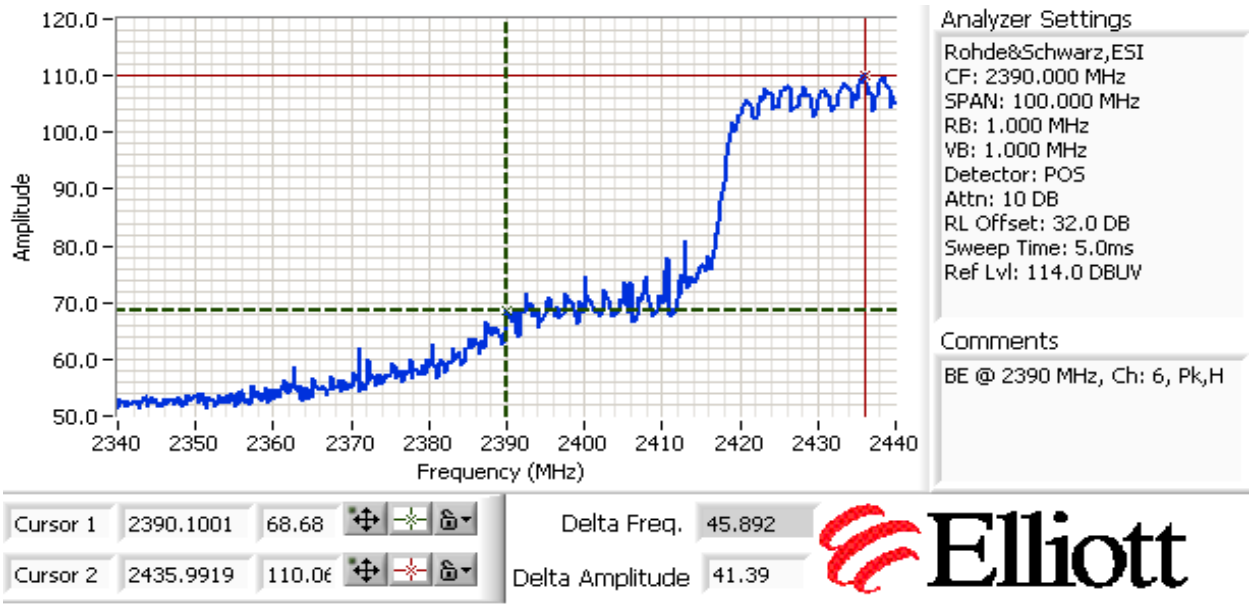
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Direct Measurement of Field Strength at the Bandedge @ 2390 MHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.100	53.7	H	54.0	-0.3	Avg	113	1.0	
2390.100	68.7	H	74.0	-5.3	Pk	113	1.0	



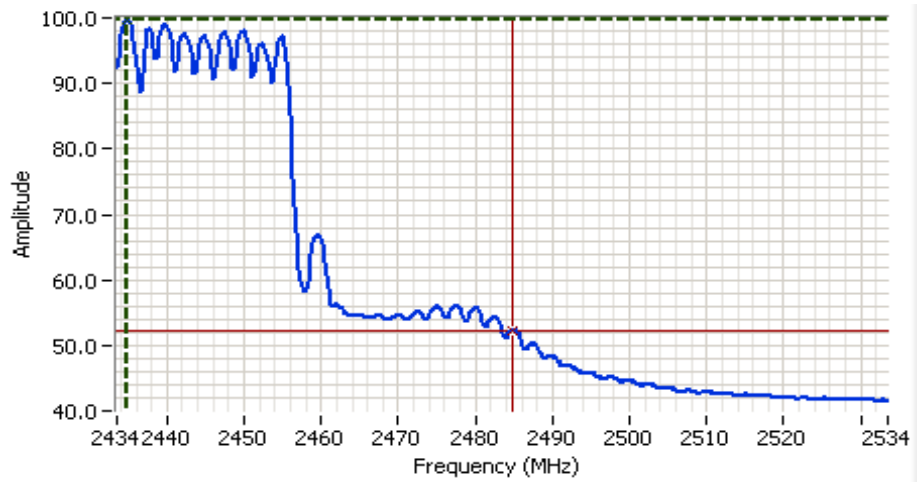
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



Direct Measurement of Field Strength at the Bandedge @ 2483.5 MHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2484.800	52.4	H	54.0	-1.6	Avg	94	1.0	
2485.000	68.6	H	74.0	-5.5	Pk	94	1.0	

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

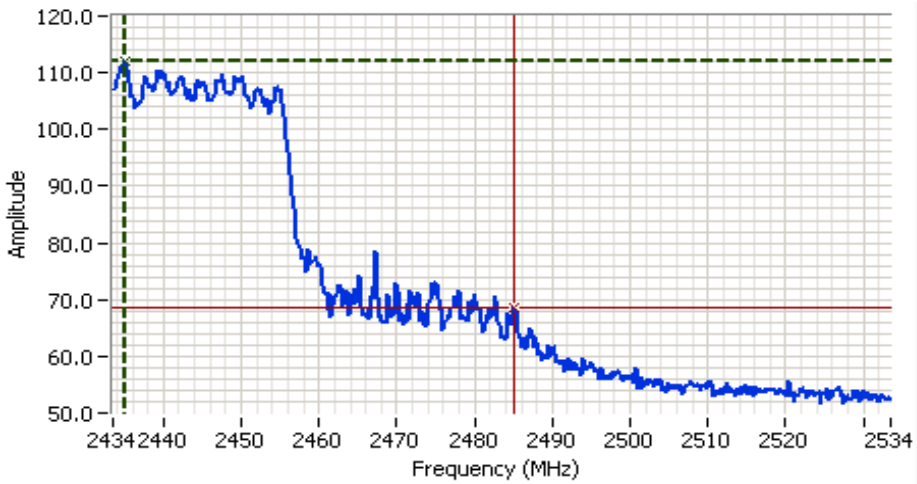


Analyzer Settings
Rohde&Schwarz,ESI
CF: 2483.500 MHz
SPAN: 100.000 MHz
RB: 1.000 MHz
VB: 10 Hz
Detector: ???
Attn: 10 DB
RL Offset: 32.3 DB
Sweep Time: 25.0s
Ref Lvl: 114.3 DBUV

Comments
BE @ 2483.5 MHz, Ch: 6, avg, H

Cursor 1	2434.9028	99.74	Delta Freq.	49.900
Cursor 2	2484.8025	52.37	Delta Amplitude	47.37

Elliott



Analyzer Settings
Rohde&Schwarz,ESI
CF: 2483.500 MHz
SPAN: 100.000 MHz
RB: 1.000 MHz
VB: 1.000 MHz
Detector: POS
Attn: 10 DB
RL Offset: 32.3 DB
Sweep Time: 5.0ms
Ref Lvl: 114.3 DBUV

Comments
BE @ 2483.5 MHz, Ch: 6, Pk, H

Cursor 1	2435.1033	111.92	Delta Freq.	49.900
Cursor 2	2485.0029	68.55	Delta Amplitude	43.37

Elliott

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 5, Band Edge Field Strength - n20, Main+Aux

Date of Test: 10/7/2010 Test Location: Chamber #4

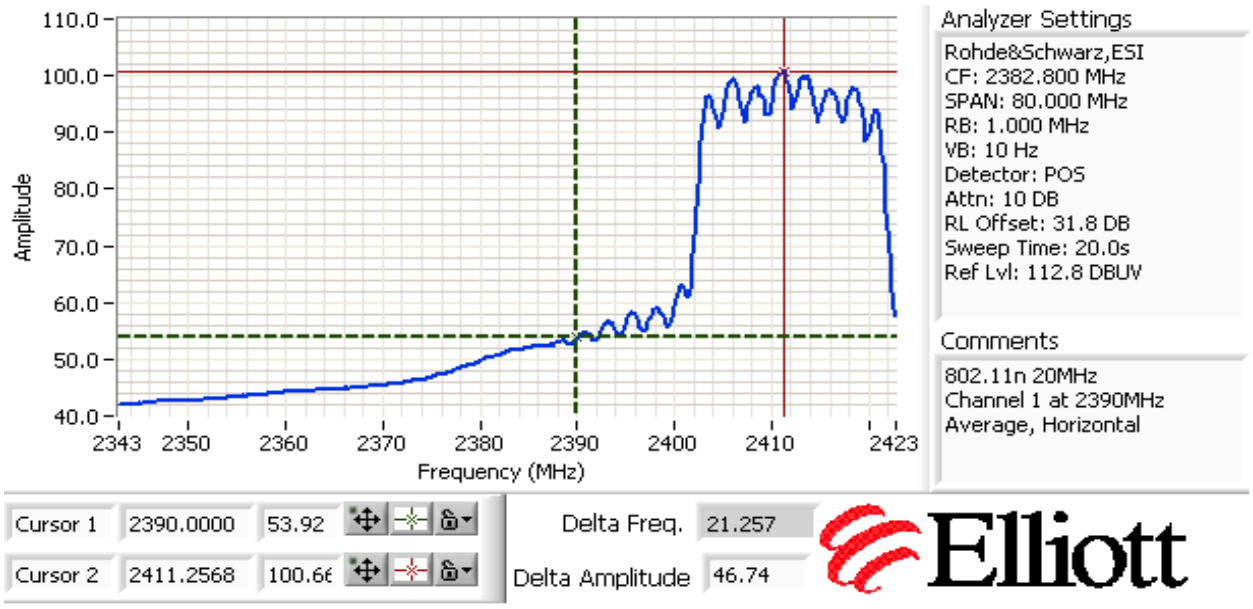
Test Engineer: Mehran Birgani Config Change: none

Run # 5a, EUT on Channel #1 2412MHz - n20, Main+Aux

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

Direct Measurement of Field Strength at the Bandedge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	**53.9**	H	54.0	**-0.1**	AVG	120	1.3	
2388.972	72.6	H	74.0	-1.4	PK	120	1.3	
2390.000	49.4	V	54.0	-4.6	AVG	227	1.0	
2388.011	68.4	V	74.0	-5.6	PK	227	1.0	



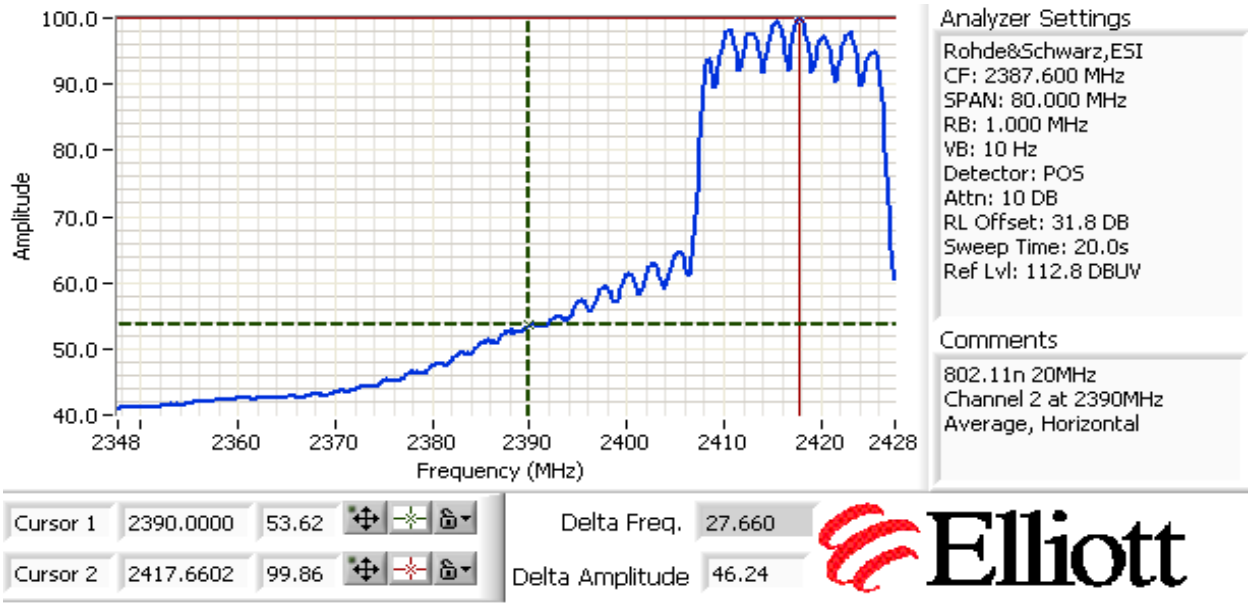
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 5b, EUT on Channel #2 2417MHz - n20, Main+Aux

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

Direct Measurement of Field Strength at the Bandedge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	**53.6**	H	54.0	**-0.4**	AVG	68	1.1	
2390.000	69.5	H	74.0	-4.5	PK	68	1.1	



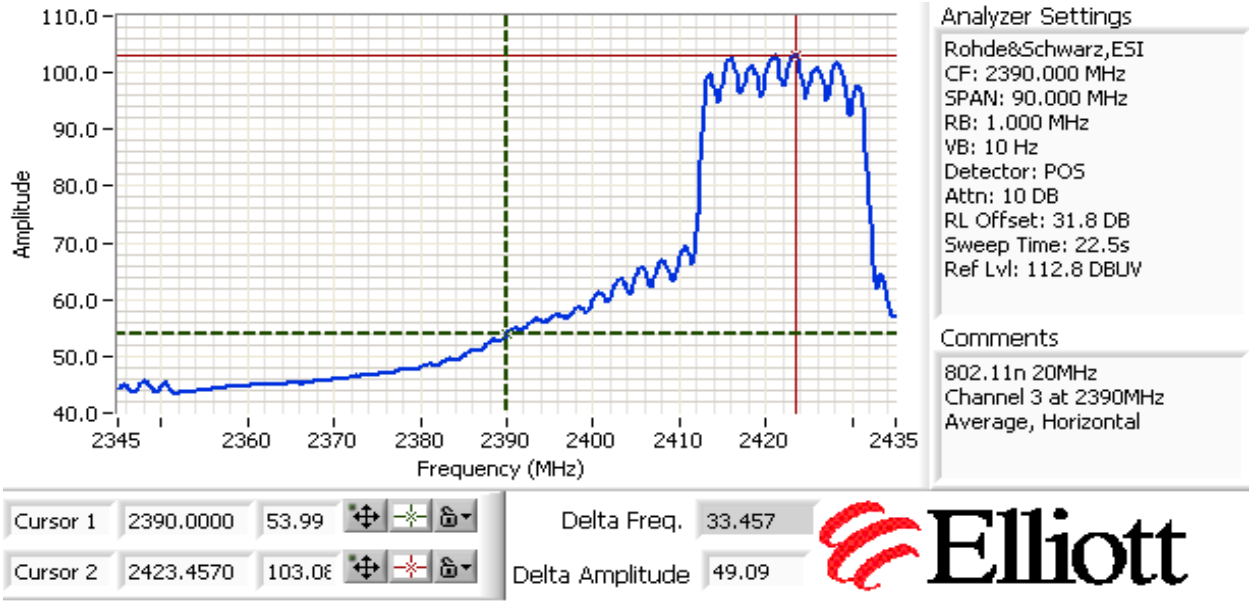
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 5c, EUT on Channel #3 2422MHz - n20, Main+Aux

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

Direct Measurement of Field Strength at the Bandedge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	**54.0**	H	54.0	**0.0**	AVG	242	1.1	
2390.000	70.1	H	74.0	-3.9	PK	242	1.1	



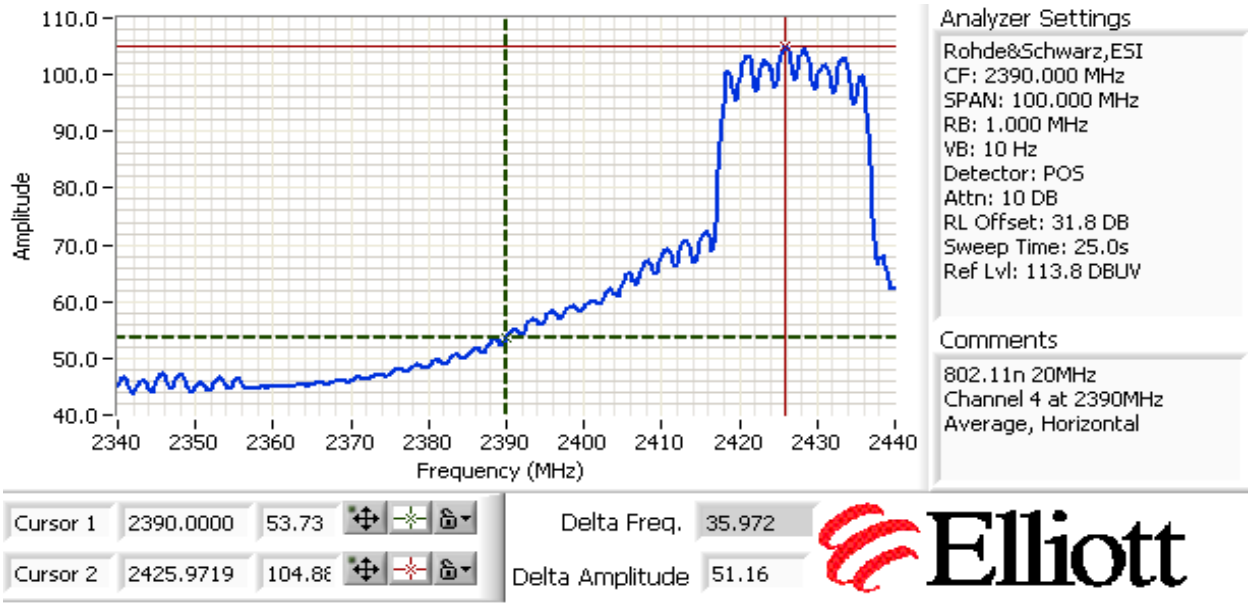
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 5d, EUT on Channel #4 2427MHz - n20, Main+Aux

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

Direct Measurement of Field Strength at the Bandedge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	**53.7**	H	54.0	**-0.3**	AVG	238	1.1	
2390.000	70.4	H	74.0	-3.6	PK	238	1.1	



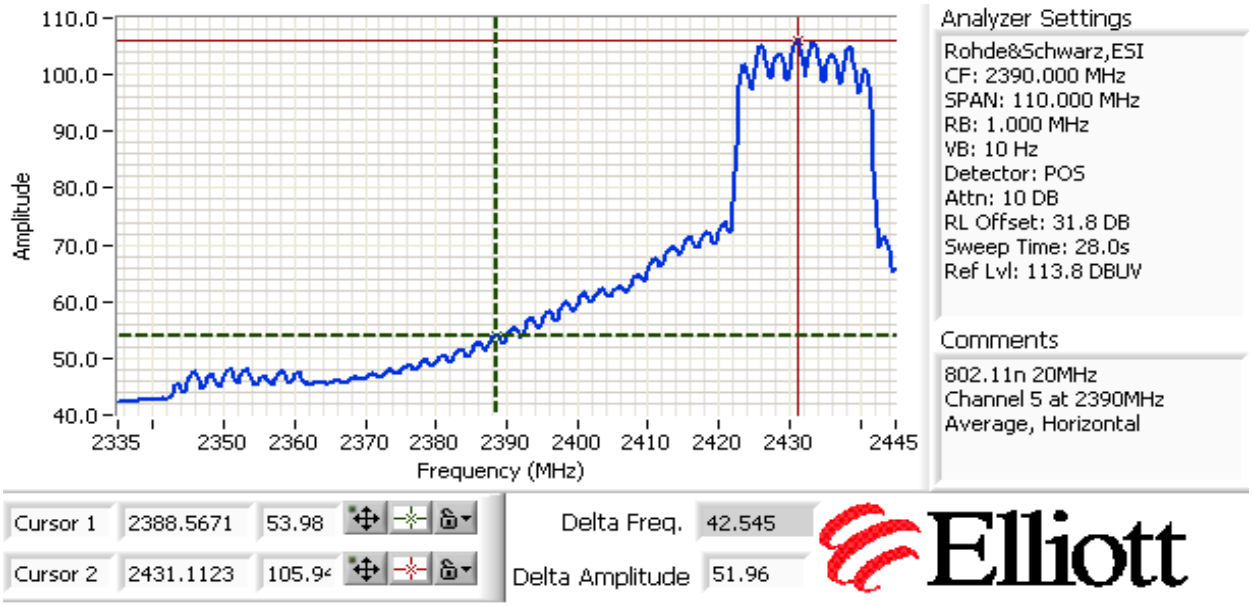
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 5e, EUT on Channel #5 2432MHz - n20, Main+Aux

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

Direct Measurement of Field Strength at the Bandedge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2388.567	**54.0**	H	54.0	**0.0**	AVG	237	1.1	
2383.277	73.6	H	74.0	-0.4	PK	237	1.1	



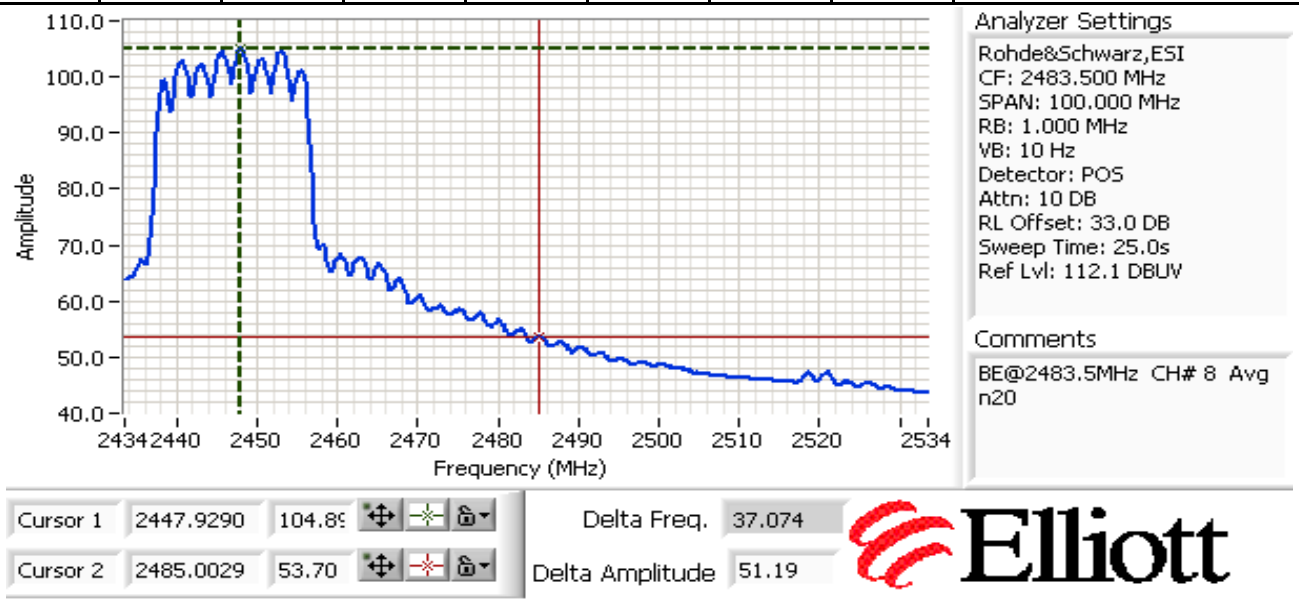
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 5g, EUT on Channel #8 2447MHz - n20, Main+Aux

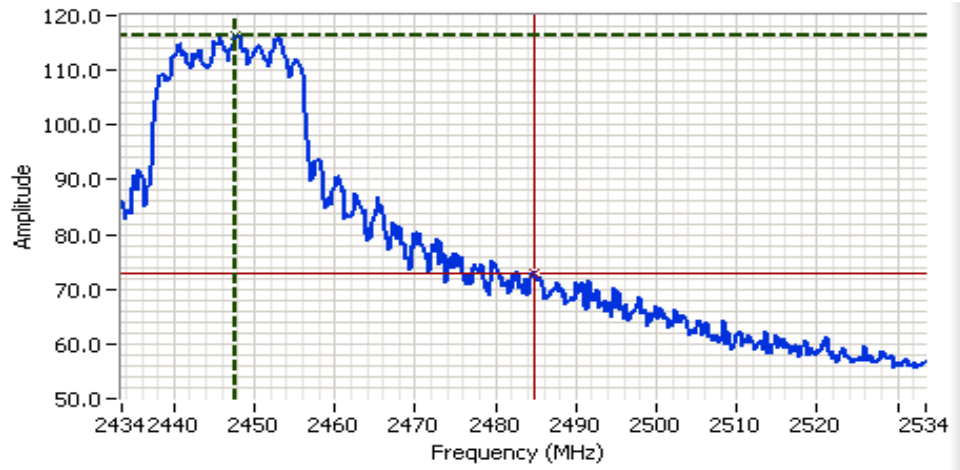
Date of Test: 10/12/2010 Test Location: FT Chamber #5
Test Engineer: Suresh Kondapali Config Change: none

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

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2485.000	53.7	H	54.0	-0.3	Avg	113	1.00	
2484.800	72.8	H	74.0	-1.2	Pk	116	1.00	



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



Analyzer Settings

Rohde&Schwarz,ESI
CF: 2483.500 MHz
SPAN: 100.000 MHz
RB: 1.000 MHz
VB: 1.000 MHz
Detector: POS
Attn: 10 DB
RL Offset: 33.0 DB
Sweep Time: 5.0ms
Ref Lvl: 112.1 DBUV

Comments

BE@2483.5MHz CH# 8 Pk
n20

Cursor 1	2447.7285	116.27	Delta Freq.	37.074	Elliott
Cursor 2	2484.8025	72.79	Delta Amplitude	43.47	

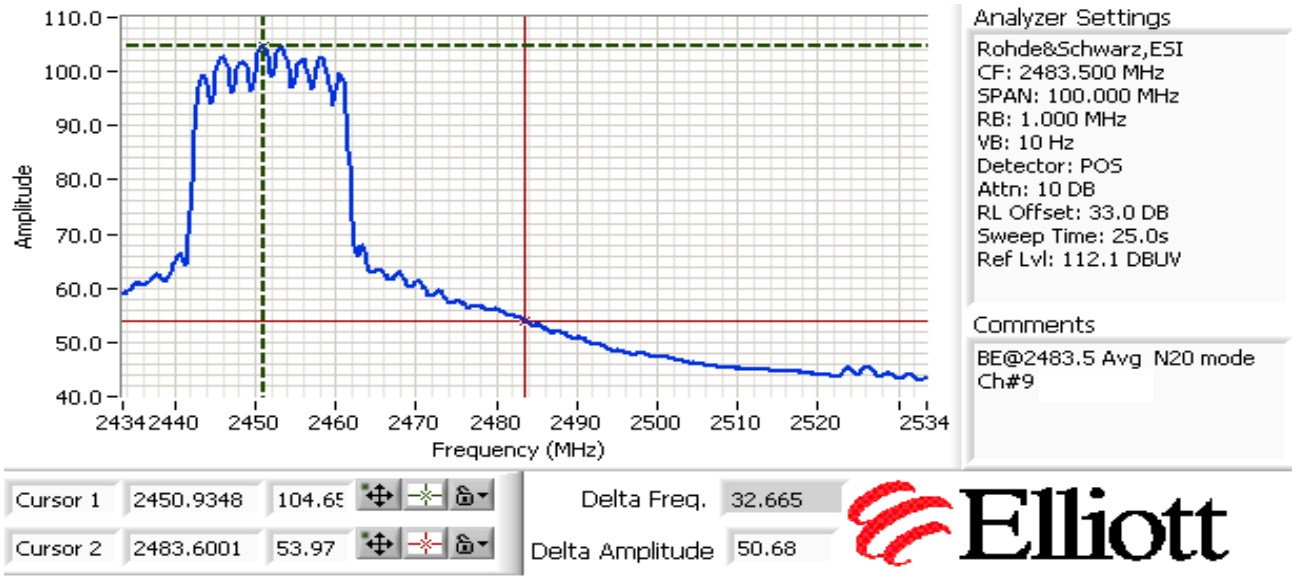
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 5h, EUT on Channel #9 2452MHz - n20, Main+Aux

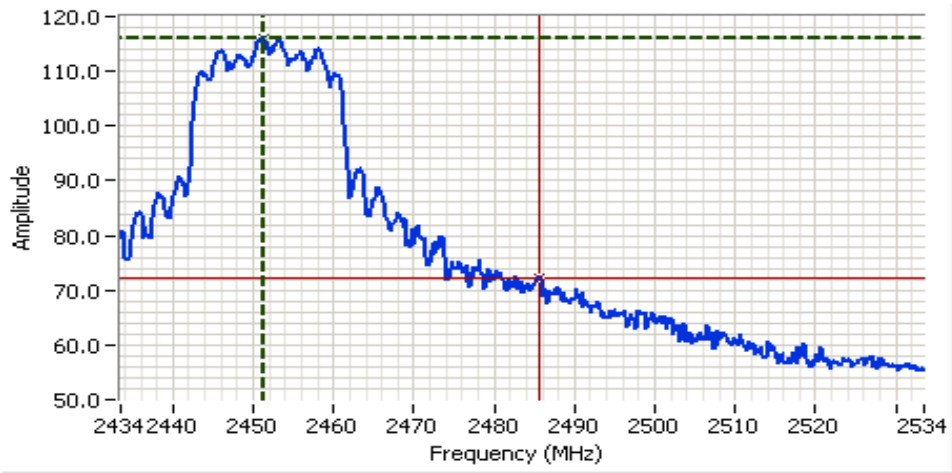
Date of Test: 10/12/2010 Test Location: FT Chamber #5
Test Engineer: Suresh Kondapali Config Change: none

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

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.600	54.0	H	54.0	0.0	Avg	116	1.00	
2485.600	72.4	H	74.0	-1.6	Pk	116	1.00	



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



Analyzer Settings

Rohde&Schwarz,ESI
CF: 2483.500 MHz
SPAN: 100.000 MHz
RB: 1.000 MHz
VB: 1.000 MHz
Detector: POS
Attn: 10 DB
RL Offset: 33.0 DB
Sweep Time: 5.0ms
Ref Lvl: 112.1 DBUV

Comments

BE@2483.5 PK N20 mode
Ch#9

Cursor 1	2451.3357	115.9	Delta Freq.	34.269	
Cursor 2	2485.6042	72.37	Delta Amplitude	43.56	

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

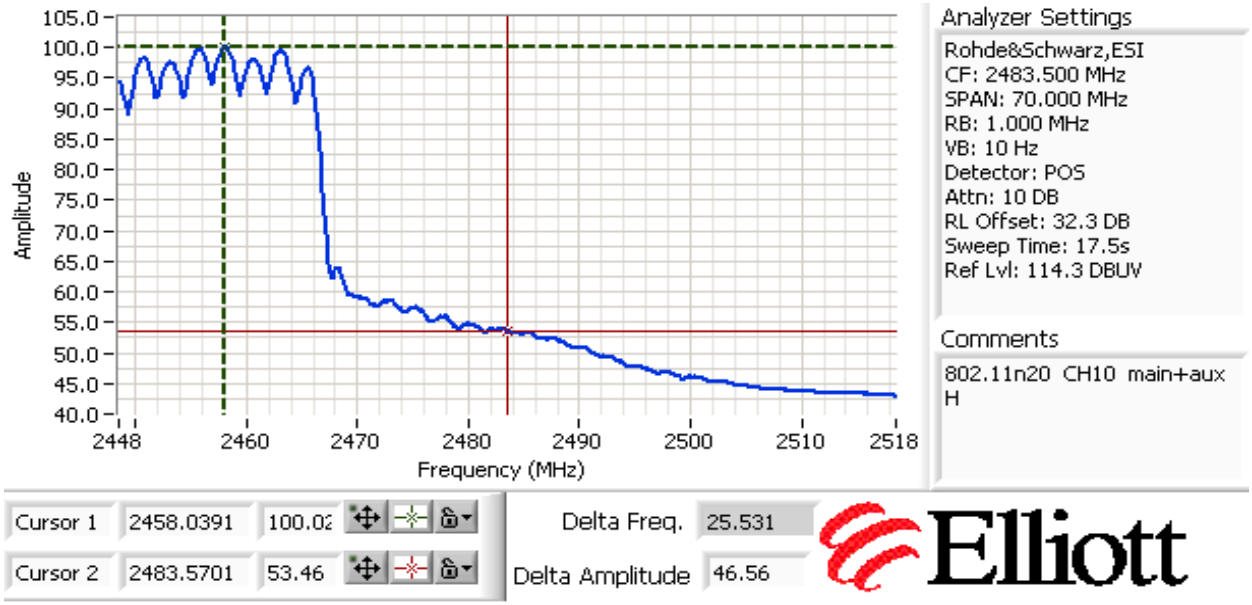
Run # 5i, EUT on Channel #10 2457MHz - n20, Main+Aux

Date of Test: 10/19/2010 Test Location: FT Chamber #5
Test Engineer: John Caizzi Config Change: none

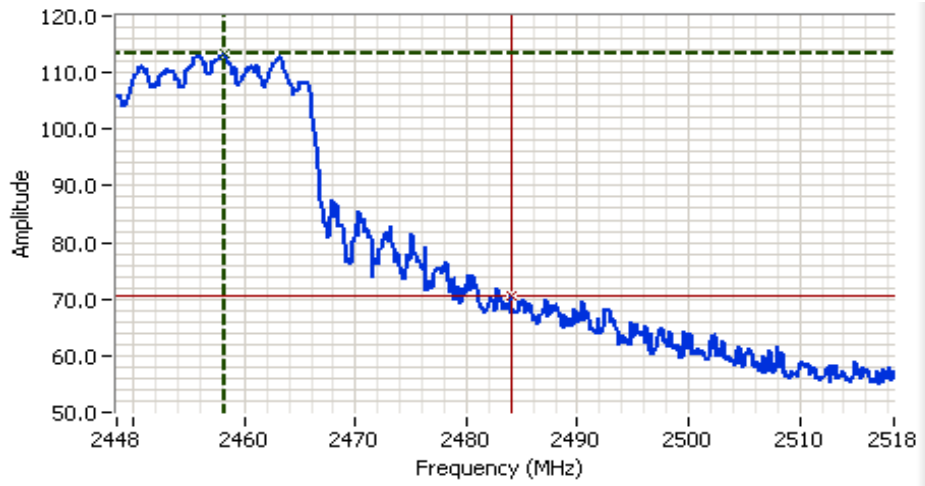
	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Main+Aux	-	-	-

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.570	53.5	H	54.0	-0.5	Avg	239	1.10	16.2 / 16.0 dBm
2483.991	70.7	H	74.0	-3.3	Pk	239	1.10	16.2 / 16.0 dBm



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A



Analyzer Settings

Rohde&Schwarz,ESI
CF: 2483.500 MHz
SPAN: 70.000 MHz
RB: 1.000 MHz
VB: 1.000 MHz
Detector: POS
Attn: 10 DB
RL Offset: 32.3 DB
Sweep Time: 5.0ms
Ref Lvl: 114.3 DBUV

Comments

802.11n20 CH10 main+aux
H

Cursor 1	2458.1794	113.42	Delta Freq.	25.812	Elliott
Cursor 2	2483.9910	70.65	Delta Amplitude	42.76	

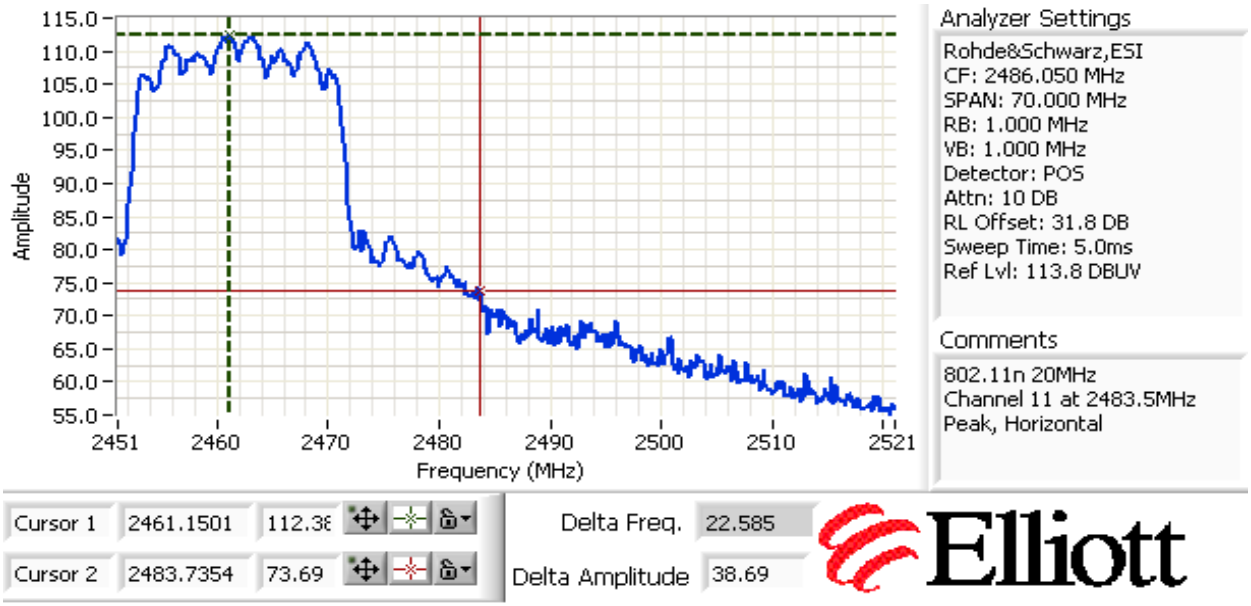
Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Run # 5j, EUT on Channel #11 2462MHz - n20, Main+Aux

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

Direct Measurement of Field Strength at the Bandedge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.735	**73.7**	H	74.0	**-0.3**	PK	235	1.0	
2483.595	53.5	H	54.0	-0.5	AVG	235	1.0	



Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	-

Radiated 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:	9/30/2010	Config. Used:	1
Test Engineer:	Rafael Varelas	Config Change:	none
Test Location:	FT Chamber #5	Host Unit Voltage	120V/60Hz

General Test Configuration

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

The test distance and extrapolation factor (if applicable) are detailed under each run description.

Note, preliminary testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. Maximized testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature:	21.4 °C
Rel. Humidity:	39 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1 - Baseline	Radiated Emissions 30 - 1000 MHz	FCC 15.209 / RSS 210	Eval	37.1dBµV/m @ 144.01MHz (-6.4dB)
3	Radiated Emissions 30 - 1000 MHz	FCC 15.209 / RSS 210	Pass	41.7dBµV/m @ 322.93MHz (-4.3dB)

Note - preliminary measurements indicated that the radiated emissions from the combination of test fixture and EUT were not affected by the modules operating frequency or mode (transmit versus receive mode). The system was therefore evaluated against the most stringent set of limits from FCC 15.247, FCC 15E and RSS 210 with the device operating at max power on Main at 2437MHz, 802.11b mode.

Modifications Made During Testing

No modifications were made to the EUT during testing

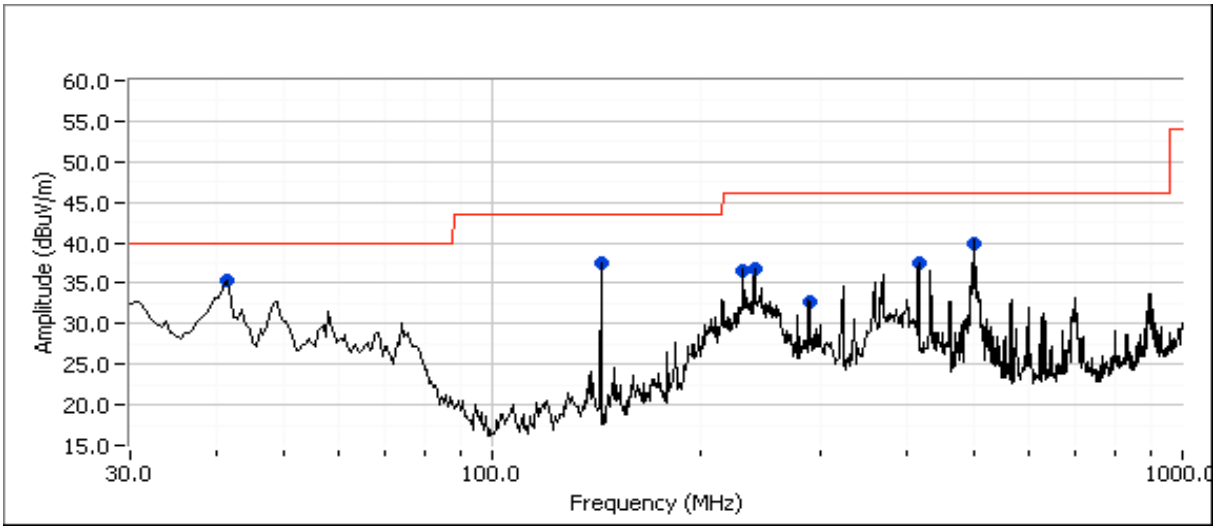
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	-

Run #1: Preliminary Radiated Emissions, 30 - 1000 MHz. Baseline
Laptop and extender board only, card removed for baseline

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	3	3	0.0



Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	FCC B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
41.480	35.3	V	40.0	-4.7	Peak	13	1.0	
144.005	37.5	H	43.5	-6.0	Peak	197	2.0	
230.491	36.5	H	46.0	-9.5	Peak	80	1.5	
240.008	36.9	H	46.0	-9.1	Peak	178	1.0	
287.070	32.7	V	46.0	-13.3	Peak	207	1.5	
415.040	37.5	H	46.0	-8.5	Peak	160	1.0	
498.481	40.0	H	46.0	-6.0	Peak	152	1.5	

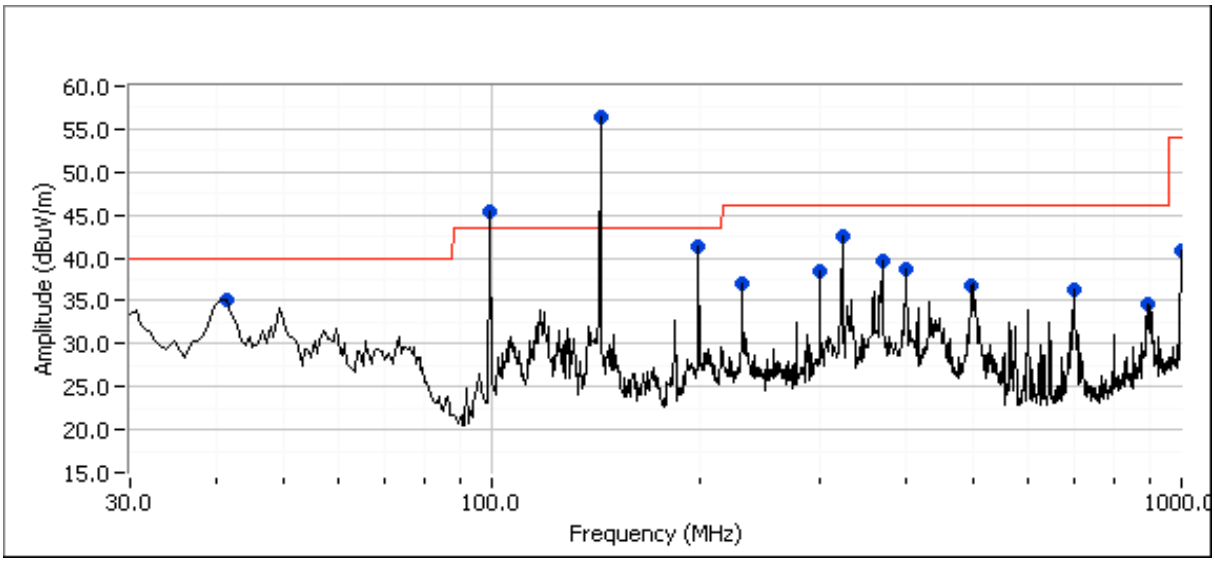
Maximized quasi-peak readings (includes manipulation of EUT interface cables)

Frequency	Level	Pol	FCC B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
144.005	37.1	H	43.5	-6.4	QP	202	2.0	QP (1.00s)
240.008	36.9	H	46.0	-9.1	QP	178	1.0	QP (1.00s)
415.040	36.4	H	46.0	-9.6	QP	155	1.0	QP (1.00s)
498.481	32.9	H	46.0	-13.1	QP	151	1.9	QP (1.00s)
230.491	35.2	H	46.0	-10.8	QP	69	1.4	QP (1.00s)
41.480	31.3	V	40.0	-8.7	QP	13	1.0	QP (1.00s)

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	-

Run #2: Preliminary Radiated Emissions, 30 - 1000 MHz
802.11b, main antenna, 19dBm

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	3	3	0.0



Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	FCC B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
41.018	35.0	V	40.0	-5.0	Peak	34	1.0	
99.895	45.4	H	43.5	1.9	Peak	201	3.0	
144.005	56.4	H	43.5	12.9	Peak	201	2.0	
199.386	41.4	H	43.5	-2.1	Peak	59	1.5	
230.722	37.1	V	46.0	-8.9	Peak	31	2.0	
298.970	38.4	H	46.0	-7.6	Peak	177	1.0	
322.926	42.6	H	46.0	-3.4	Peak	163	1.0	
369.218	39.6	H	46.0	-6.4	Peak	165	1.0	
398.391	38.6	H	46.0	-7.4	Peak	165	1.0	
498.151	36.9	V	46.0	-9.1	Peak	256	1.0	
697.700	36.2	V	46.0	-9.8	Peak	356	1.0	
895.439	34.7	V	46.0	-11.3	Peak	60	2.0	
996.741	40.9	V	54.0	-13.1	Peak	340	1.0	

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	-

Run #2: Continued

Preliminary quasi-peak readings (no manipulation of EUT interface cables)

Frequency	Level	Pol	FCC B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
41.018	30.8	V	40.0	-9.2	QP	35	1.0	QP (1.00s)
199.386	38.5	H	43.5	-5.0	QP	68	1.5	QP (1.00s)
322.926	41.7	H	46.0	-4.3	QP	163	1.0	QP (1.00s)
369.218	36.4	H	46.0	-9.6	QP	155	1.0	QP (1.00s)
398.391	38.1	H	46.0	-7.9	QP	160	1.0	QP (1.00s)
99.895	45.3	H	43.5	1.8	QP	191	3.0	Note 1
144.005	55.6	H	43.5	12.1	QP	189	2.0	Note 1

Run #3: Maximized Readings From Run #2
Maximized quasi-peak readings (includes manipulation of EUT interface cables)

Frequency	Level	Pol	FCC B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
144.005	55.6	H	43.5	12.1	QP	189	2.0	Note 1
99.895	45.3	H	43.5	1.8	QP	191	3.0	Note 1
322.926	41.7	H	46.0	-4.3	QP	163	1.0	QP (1.00s)
199.386	38.5	H	43.5	-5.0	QP	68	1.5	QP (1.00s)
398.391	38.1	H	46.0	-7.9	QP	160	1.0	QP (1.00s)
41.018	30.8	V	40.0	-9.2	QP	35	1.0	QP (1.00s)
369.218	36.4	H	46.0	-9.6	QP	155	1.0	QP (1.00s)

Note 1	These emissions do not come from the radio, but are related to the test fixture. See Run 4, Note 2.

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	-

Run #4: Preliminary Radiated Emissions, 30 - 1000 MHz, re-check on 10/1.
802.11b, main antenna

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	3	3	0.0

Preliminary quasi-peak readings (no manipulation of EUT interface cables)

Frequency	Level	Pol	FCC B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
143.997	56.0	H	43.5	12.5	QP	220	2.08	Channel 6, Note 2
99.879	46.1	H	43.5	2.6	QP	221	2.89	Channel 6, Note 2
143.994	56.3	H	43.5	12.8	QP	226	2.07	Channel 1, Note 2
99.882	46.2	H	43.5	2.7	QP	218	2.88	Channel 1, Note 2

Note 2	This shows that the emissions over limit in Runs 2 & 3 did not come fom the radio, but are related to the test fixture. A note referring to this data was inserted into the tables for Runs 2 & 3.

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Maximum Permissible Exposure

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: 10/26/2010
Test Engineer: Mark Hill

General Test Configuration

Calculation uses the free space transmission formula:

$$S = (PG)/(4 \pi d^2)$$

Where: S is power density (W/m^2), P is output power (W), G is antenna gain relative to isotropic, d is separation distance from the transmitting antenna (m).

Summary of Results

Device complies with Power Density requirements at 20cm separation:	Yes
Maximum Power Density at 20cm (mW/cm^2):	0.085

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	N/A

Use: General
Antenna: 3.9dBi (single chain modes), 6.9 dBi (MIMO modes)

802.11g

Freq. MHz	EUT Power dBm	EUT Power mW*	Cable Loss dB	Ant Gain dBi	Power at Ant dBm	EIRP mW	Power Density (S) at 20 cm mW/cm^2	MPE Limit at 20 cm mW/cm^2
2412	14.9	30.9	0	3.9	14.9	75.86	0.015	1.000
2437	17.3	53.7	0	3.9	17.3	131.83	0.026	1.000
2462	15.7	37.2	0	3.9	15.7	91.20	0.018	1.000

802.11b

Freq. MHz	EUT Power dBm	EUT Power mW*	Cable Loss dB	Ant Gain dBi	Power at Ant dBm	EIRP mW	Power Density (S) at 20 cm mW/cm^2	MPE Limit at 20 cm mW/cm^2
2412	18.7	74.1	0	3.9	18.7	181.97	0.036	1.000
2437	18.5	70.8	0	3.9	18.5	173.78	0.035	1.000
2462	18.6	72.4	0	3.9	18.6	177.83	0.035	1.000

802.11n20

Freq. MHz	EUT Power dBm	EUT Power mW*	Cable Loss dB	Ant Gain dBi	Power at Ant dBm	EIRP mW	Power Density (S) at 20 cm mW/cm^2	MPE Limit at 20 cm mW/cm^2
2412	15.8	38.0	0	6.9	15.8	186.21	0.037	1.000
2437	19.4	87.1	0	6.9	19.4	426.58	0.085	1.000
2462	15.9	38.9	0	6.9	15.9	190.55	0.038	1.000

802.11n40

Freq. MHz	EUT Power dBm	EUT Power mW*	Cable Loss dB	Ant Gain dBi	Power at Ant dBm	EIRP mW	Power Density (S) at 20 cm mW/cm^2	MPE Limit at 20 cm mW/cm^2
2422	12.0	15.8	0	6.9	12.0	77.62	0.015	1.000
2437	14.5	28.2	0	6.9	14.5	138.04	0.027	1.000
2452	13.7	23.4	0	6.9	13.7	114.82	0.023	1.000

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	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: 9/30/2010
Test Engineer: Rafael Varelas
Test Location: FT Chamber #5

Config. Used: 1
Config Change: none
Host Unit Voltage 120V/60Hz

General Test Configuration

For tabletop equipment, the EUTs host system was located on a wooden table inside the semi-anechoic chamber, 40 cm from a vertical coupling plane and 80cm from the LISN.

Ambient Conditions:

Temperature: 21.4 °C
Rel. Humidity: 39 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power,120V/60Hz	RSS 210 / 15.207	Pass	48.9dBµV @ 0.195MHz (-14.9dB)

Modifications Made During Testing

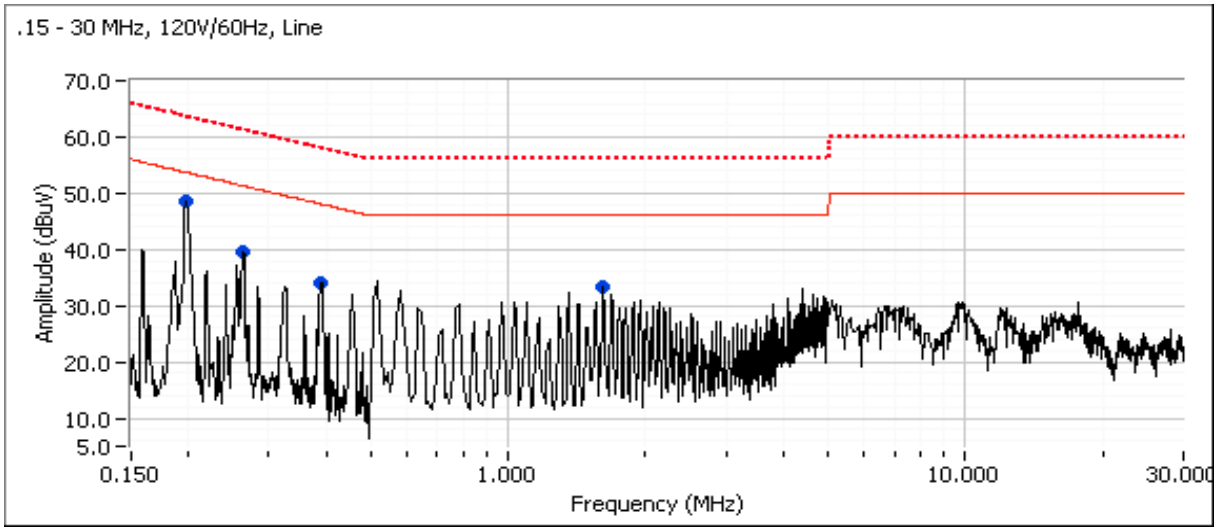
No modifications were made to the EUT during testing

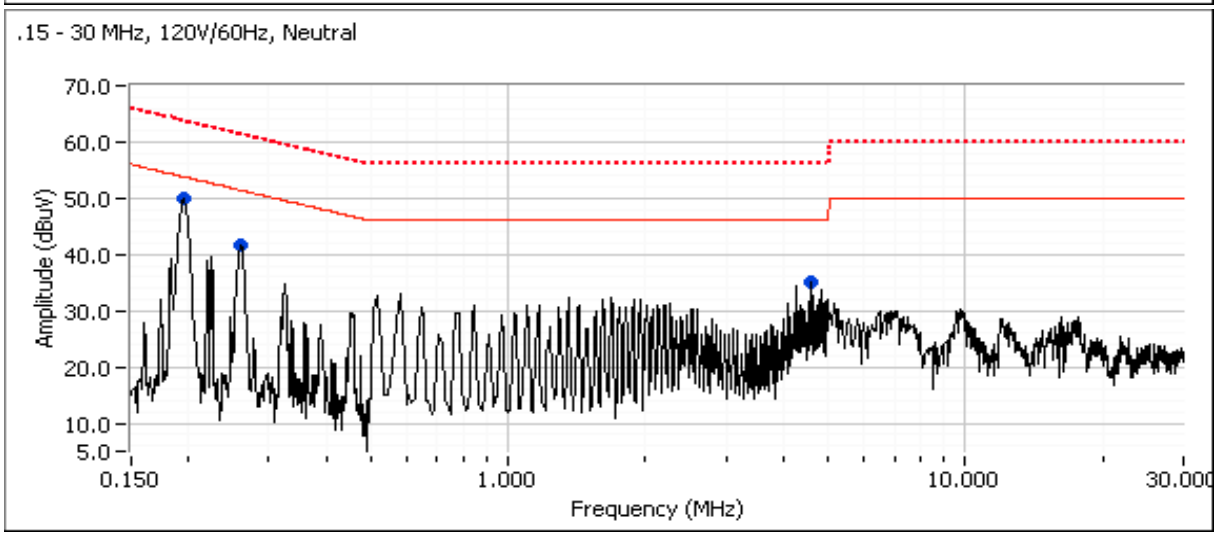
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	-

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
EUT configured: 802.11b, center channel, 19dBm, Main antenna





Client:	Broadcom Corporation	Job Number:	J80250
Model:	BCM943227HM4L	T-Log Number:	T80300
		Account Manager:	Sheareen Washington
Contact:	Anne Liang/Pete Krebill		
Standard:	FCC 15.247	Class:	-

Run #1: Continued

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	
0.196	48.5	Line 1	53.7	-5.2	Peak	
0.261	39.6	Line 1	51.3	-11.7	Peak	
0.389	34.0	Line 1	48.0	-14.0	Peak	
1.618	33.2	Line 1	46.0	-12.8	Peak	
0.195	50.0	Neutral	53.8	-3.8	Peak	
0.260	41.5	Neutral	51.4	-9.9	Peak	
4.595	35.0	Neutral	46.0	-11.0	Peak	

Final quasi-peak and average readings

Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.195	**48.9**	Neutral	63.8	**-14.9**	QP	QP (1.00s)
0.196	48.7	Line 1	63.8	-15.1	QP	QP (1.00s)
1.618	28.6	Line 1	46.0	-17.4	AVG	AVG (0.10s)
0.195	35.8	Neutral	53.8	-18.0	AVG	AVG (0.10s)
4.595	27.5	Neutral	46.0	-18.5	AVG	AVG (0.10s)
0.196	34.7	Line 1	53.8	-19.1	AVG	AVG (0.10s)
0.259	40.7	Neutral	61.5	-20.8	QP	QP (1.00s)
0.259	30.1	Neutral	51.5	-21.4	AVG	AVG (0.10s)
0.261	39.4	Line 1	61.4	-22.0	QP	QP (1.00s)
0.261	28.3	Line 1	51.4	-23.1	AVG	AVG (0.10s)
4.595	32.3	Neutral	56.0	-23.7	QP	QP (1.00s)
1.618	31.1	Line 1	56.0	-24.9	QP	QP (1.00s)