

*Electromagnetic Emissions Test Report  
Application for Grant of Equipment Authorization  
Class II Permissive Change  
pursuant to  
Industry Canada RSS-Gen Issue 2 / RSS 210 Issue 7  
FCC Part 15, Subpart E  
on the  
Broadcom Corporation  
Transmitter  
Model: BCM94322HM8L*

UPN: 4324A-BRCM1031  
FCC ID: QDS-BRCM1031

GRANTEE: Broadcom Corporation  
190 Mathilda Avenue  
Sunnyvale, CA 94086

TEST SITE: Elliott Laboratories  
41039 Boyce Road  
Fremont, CA. 94538

REPORT DATE: July 31, 2008

FINAL TEST DATE: July 7, July 9, July 12, July 14, July 16, July 18,  
July 21, July 23 and July 28, 2008

AUTHORIZED SIGNATORY:



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Mark E. Hill  
Staff Engineer



Testing Cert #2016-01

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***REVISION HISTORY***

Rev #	Date	Comments	Modified By
1	8/6/08	Initial Release	

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***SCOPE***

An electromagnetic emissions test has been performed on the Broadcom Corporation model BCM94322HM8L 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 E requirements for UNII Devices (using FCC DA 02-2138, August 30, 2002)

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 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.

The test results recorded herein are based on a single type test of the Broadcom Corporation model BCM94322HM8L and therefore apply only to the tested sample. The sample was selected and prepared by Anne Liang of Broadcom Corporation.

***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 BCM94322HM8L complied with the requirements of the following regulations:

RSS 210 Issue 7 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"  
FCC Part 15, Subpart E requirements for UNII Devices

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

**TEST RESULTS SUMMARY****UNII / LELAN DEVICES****Operation in the 5.15 – 5.25 GHz Band**

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.407(e)		Indoor operation only	Refer to user's manual	N/A	Note 1
15.407(a) (1)		26dB Bandwidth	-	N/A – limits output power if < 20MHz	Note 1
15.407 (a) (1)	A9.2(1)	Output Power	-	17dBm	Note 1
15.407 (a) (1)		Power Spectral Density	-	4 dBm/MHz	Note 1
	A9.5 (2)		-	5 dBm/MHz	Note 1

**Note 1 - Change to include new antenna would not change previously reported results.**

**Operation in the 5.25 – 5.35 GHz Band**

Note: The device is restricted to indoor use only, therefore the spectral density of spurious emissions in the 5.15 – 5.25 GHz band were limited to the power spectral limits for intentional signals detailed in FCC 15.407(a)(1) and RSS 210 6.2.2 q1 (i)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(a) (2)		26dB Bandwidth	-	N/A – limits output power if < 20MHz	Note 1
15.407(a) (2)	A9.2(2)	Output Power	-	Refer to standards	Note 1
15.407(a) (2))		Power Spectral Density	-	Refer to standards	Note 1
	A9.2(2) / A9.5 (2)	Power Spectral Density	-	Refer to standards	Note 1
	A9.5 (2)	Peak Spectral Density	-	Shall not exceed the average value by more than 3dB	Note 1

**Note 1 - Change to include new antenna would not change previously reported results.**

**Operation in the 5.47 – 5.725 GHz Band**

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(a) (2)		26dB Bandwidth	-	N/A – limits output power if < 20MHz	Note 1
15.407(a) (2)	A9.2(2)	Output Power	-	24 dBm / 250mW (eirp < 30dBm)	Note 1
15.407(a) (2))		Power Spectral Density	-	Refer to standards	Note 1
	A9.2(2) / A9.5 (2)	Power Spectral Density	-	Refer to standards	Note 1
N/A	A9.4	Non-operation in 5600 – 5650 MHz sub band	Device cannot operate in the 5600 – 5650 MHz band –refer to Operational Description		Note 1

**Note 1 - Change to include new antenna would not change previously reported results.**

**General requirements for all bands**

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
	A9.5a	Modulation	OFDM modulation is used.	Digital modulation is required	Complies
	RSP 100	99% bandwidth		Information only	Note 1
15.407(b) (5) / 15.209	A9.3	Spurious Emissions below 1GHz	No emissions below 1 GHz detected		Complies
15.407(b) (2)	A9.3	Spurious Emissions above 1GHz	53.9dB $\mu$ V/m @ 5350.0MHz	Refer to standard	Complies (- 0.1 dB)
15.407(a)(6)	-	Peak Excursion Ratio	-	< 13dB	Note 1
	A9.5 (3)	Channel Selection	Spurious emissions tested at outermost channels in each band	Device was tested on the top, bottom and center channels in each band	N/A
15			Measurements on three channels in each band		N/A
15.407 (c)	A9.5(4)	Operation in the absence of information to transmit	-	Device shall automatically discontinue operation in the absence of information to transmit	Note 1
15.407 (g)	A9.5 (5)	Frequency Stability	-		Note 1
15.407 (h1)	A9.4	Transmit Power Control	TPC is not required as the device operates at below 500mW eirp	The U-NII device shall have the capability to operate with a mean EIRP value lower than 24dBm (250mW)	Note 1
15.407 (h2)	A9.4	Dynamic frequency Selection (device without radar detection)	-	Channel move time < 10s Channel closing transmission time < 260ms	Note 1
	A9.9g	User Manual information	-		Note 1

**Note 1 - Change to include new antenna would not affect previously reported results.**

**GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS**

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Device uses a unique connector type		Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	49.2dB $\mu$ V/m @ 1500.1MHz	Refer to standard	Complies (- 4.8 dB) Note 2
15.207	RSS GEN Table 2	AC Conducted Emissions	-	Refer to standard	Note 1
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	Note 1
	RSP 100 RSS GEN 7.1.5	User Manual		Statement required regarding detachable antenna	Note 1

**Note 1 - Change to include new antenna would not affect previously reported results.**

**Note 2 – Only the worse case channel/mode combinations from the original certification testing was performed with the new antenna.**

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

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

The Broadcom Corporation model BCM94322HM8L is an 802.11ag/Draft 802.11n WLAN PCI-E Minicard that is designed to enable wireless data transmission 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 from the host.

The sample was received on July 7, 2008 and tested on July 7, July 9, July 12, July 14, July 16, July 18, July 21, July 23 and July 28, 2008. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number	FCC ID
Broadcom	BCM94322HM8L	802.11ag/Draft 802.11n WLAN PCI-E Minicard	-	QDS- BRCM1031

**ANTENNA SYSTEM**

The EUT antenna is a dipole antenna. The antenna connects to the EUT via a hirose 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**

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

**SUPPORT EQUIPMENT**

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

Manufacturer	Model	Description	Serial Number	FCC ID
HP	-	Laptop Computer	-	DoC
Dell*	Inspiron 0000	Laptop Computer	901014-70166- 57K-01JT	DoC
HP*	C6490A	Printer	MY3883K42P	DoC

\* - Dell laptop and printer used for conducted emissions testing only

**EUT INTERFACE PORTS**

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Main RF Port	Antenna	coax	shielded	0.15
Aux RF Port	Antenna	coax	shielded	0.15
PCMCIA Buss	Extender Card with EUT	Direct Connection	-	-
DC Power on Computer	AC/DC Adapter	multiconductor	shielded	1.5
AC/DC Adapter	AC Mains	3 wire	unshielded	1.5
USB on Computer	Printer	multiconductor	shielded	1.5

**EUT OPERATION**

During testing, the EUT was configured to either transmit continuously on the desired channel or set into a receive mode at the desired channel, as noted on the test data sheets.

All transmitter spurious emissions testing (radiated or conducted) was done at the highest power setting within the band. All band edge, power and other measurements were taken at the maximum power allowed by the EUT's power table for that particular channel.

**TEST SITE****GENERAL INFORMATION**

Final test measurements were taken on July 7, July 9, July 12, July 14, July 16, July 18, July 21, July 23 and July 28, 2008 at the Elliott Laboratories semi anechoic chamber 3, 4 and 5 located at 41039 Boyce Road, Fremont, California. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission.

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

**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 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.

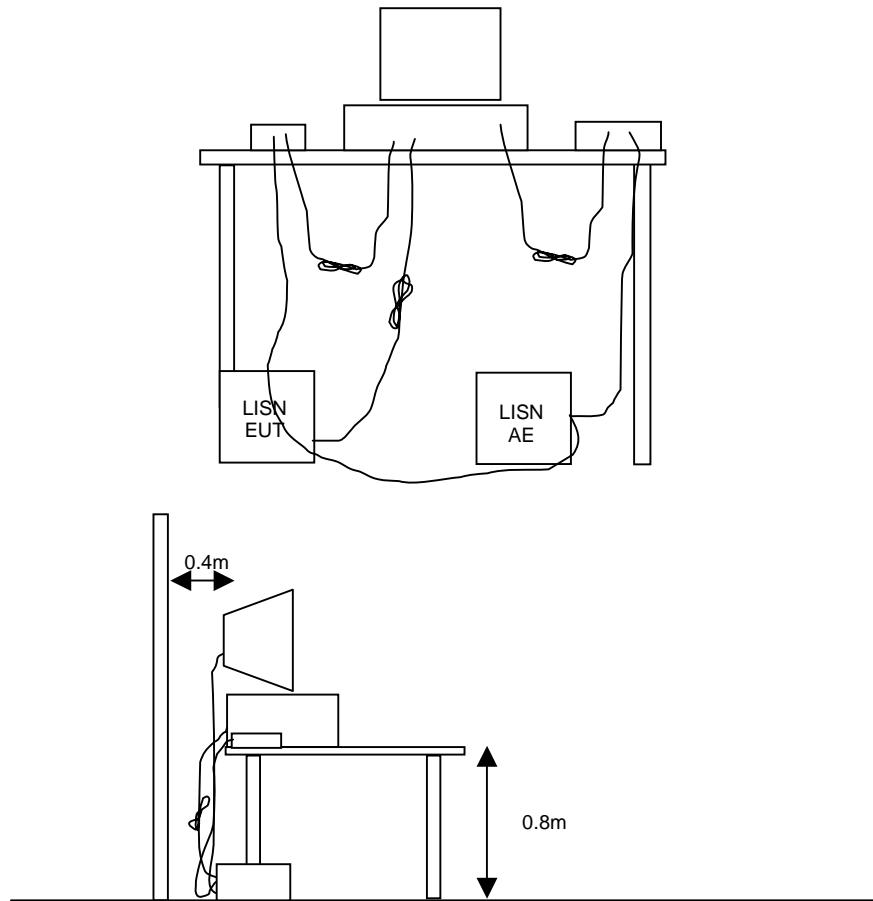
ANSI C63.4:2003 specifies that the test height above ground for table mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if 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.



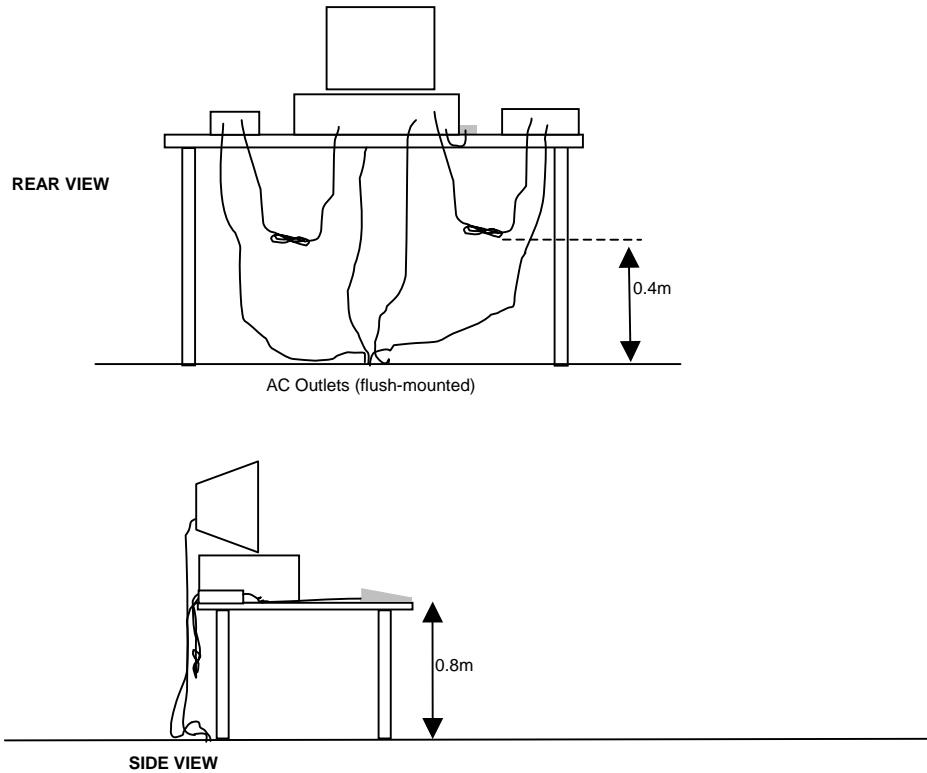
**RADIATED EMISSIONS**

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.

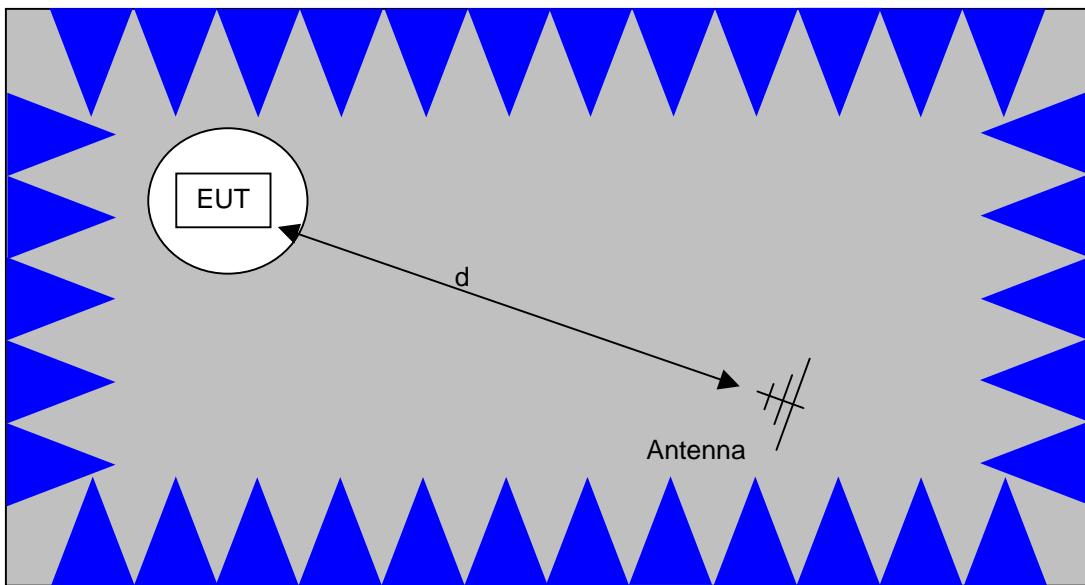
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

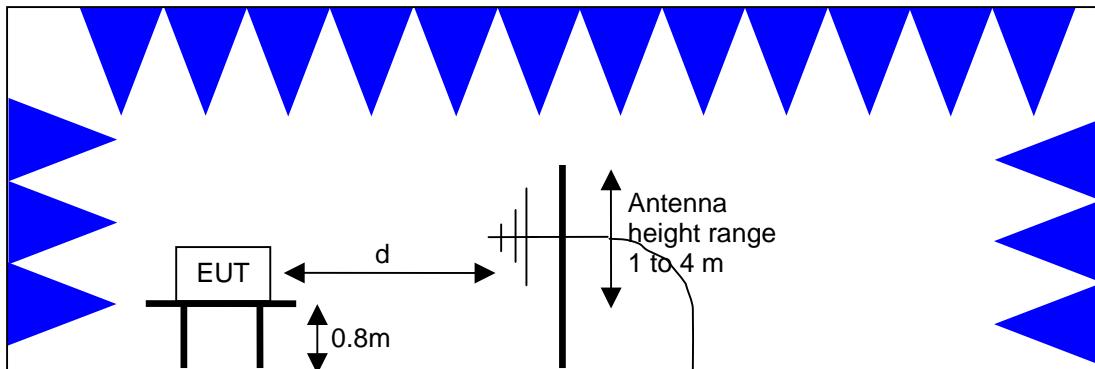


Typical Test Configuration for Radiated Field Strength Measurements



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

**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:

**GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS**

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands<sup>1</sup> (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 <sub>KHz</sub> @ 300m	67.6-20*log <sub>10</sub> (F <sub>KHz</sub> ) @ 300m
0.490-1.705	24000/F <sub>KHz</sub> @ 30m	87.6-20*log <sub>10</sub> (F <sub>KHz</sub> ) @ 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

**FCC 15.407 (a) OUTPUT POWER LIMITS**

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
5150 - 5250	50mW (17 dBm)	4 dBm/MHz
5250 - 5350	250 mW (24 dBm)	11 dBm/MHz
5725 – 5825	1 Watts (30 dBm)	17 dBm/MHz

For system using antennas with gains exceeding 6dBi, the output power and power spectral density limits are reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5825 MHz band may use antennas with gains of up to 23dBi without this limitation. If the gain exceeds 23dBi then the output power limit of 1 Watt is reduced by 1dB for every dB the gain exceeds 23dBi.

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

**OUTPUT POWER AND SPURIOUS LIMITS -LE-LAN DEVICES**

The table below shows the limits for output power and output power density defined by RSS 210. 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
5150 - 5250	200mW (23 dBm) eirp	10 dBm/MHz eirp
5250 - 5350	250 mW (24 dBm) <sup>1</sup> 1W (30dBm) eirp	11 dBm/MHz
5470 - 5725	250 mW (24 dBm) <sup>2</sup> 1W (30dBm) eirp	11 dBm/MHz
5725 – 5825	1 Watts (30 dBm) 4W eirp	17 dBm/MHz

In addition, the power spectral density limit shall be reduced by 1dB for every dB the highest power spectral density exceeds the “average” power spectral density, determined by dividing the output power by  $10\log(99\% \text{ bandwidth})$ , by more than 3dB.

Fixed point-to-point applications using the 5725 – 5825 MHz band may use antennas with gains of up to 23dBi without this limitation. If the gain exceeds 23dBi then the output power limit of 1 Watt is reduced by 1dB for every dB the gain exceeds 23dBi.

**OUTPUT POWER AND SPURIOUS LIMITS -UNII DEVICES**

The table below shows the limits for output power and output power density defined by FCC Part 15 Subpart E. 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
5150 - 5250	50mW (17 dBm)	10 dBm/MHz
5250 - 5350	250 mW (24 dBm)	11 dBm/MHz
5470 - 5725	250 mW (24 dBm)	11 dBm/MHz
5725 – 5825	1 Watts (30 dBm)	17 dBm/MHz

The peak excursion envelope is limited to 13dB.

For system using antennas with gains exceeding 6dBi, the output power and power spectral density limits are reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5825 MHz band may use antennas with gains of up to 23dBi without this limitation. If the gain exceeds 23dBi then the output power limit of 1 Watt is reduced by 1dB for every dB the gain exceeds 23dBi.

<sup>1</sup> If EIRP exceeds 500mW the device must employ TPC

<sup>2</sup> If EIRP exceeds 500mW the device must employ TPC

**SAMPLE CALCULATIONS - CONDUCTED EMISSIONS**

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

$$R_T - S = M$$

where:

$R_T$  = Receiver Reading in dBuV

$S$  = Specification Limit in dBuV

$M$  = Margin to Specification in +/- dB

**SAMPLE CALCULATIONS - RADIATED EMISSIONS**

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

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

$$F_d = 20 * \text{LOG10} (D_m/D_s)$$

where:

$F_d$  = Distance Factor in dB

$D_m$  = Measurement Distance in meters

$D_s$  = Specification Distance in meters

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

$$F_d = 40 * \text{LOG10} (D_m/D_s)$$

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 3m from the equipment under test:

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

where P is the eirp (Watts)

*EXHIBIT 1: Test Equipment Calibration Data*

1 Page

**Radiated Emissions, 2.4 GHz, Bandedges, 07-May-08****Engineer: Conrad Chu**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	22-Feb-09
EMCO	Antenna, Horn, 1-18 GHz (SA40-Purple)	3115	1779	19-Mar-10

**Radiated Emissions, 1-10 GHz, Spurious Emissions, 07-May-08****Engineer: Conrad Chu**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	16-May-08
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz - 22 GHz	8593EM	1319	18-May-08
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1731	17-Oct-08
EMCO	Antenna, Horn, 1-18 GHz (SA40-Purple)	3115	1779	19-Mar-10

**Radiated Emissions, UNII 802.11n-20 Band-edge test, 09-Jul-08****Engineer: Ben Jing**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	SpecAn 9 KHz-26.5 GHz, Non-Program	8563E	284	21-Aug-08
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1290	12-Jul-08
EMCO	Antenna, Horn, 1-18 GHz (SA40-Purple)	3115	1779	19-Mar-10
Rohde & Schwarz	Power Sensor, 1 uW-100 mW, DC-18 GHz, 50ohms	NRV-Z51	1797	21-Aug-08

**Radio Spurious Emissions, 09-Jul-08****Engineer: Suhaila Khushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	SpecAn 9 KHz-26.5 GHz, Non-Program	8563E	284	21-Aug-08
EMCO	Antenna, Horn, 1-18 GHz	3115	786	07-Dec-08

**Radio Spurious Emissions, 11-Jul-08****Engineer: Suhaila Khushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	SpecAn 9 KHz-26.5 GHz, Non-Program	8563E	284	21-Aug-08
EMCO	Antenna, Horn, 1-18 GHz	3115	786	07-Dec-08

**Radiated Emissions, 30 - 26,500 MHz, 12-Jul-08****Engineer: rvarelas**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18GHz	3115	868	10-Jun-10
Hewlett Packard	Spectrum Analyzer 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1731	17-Oct-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	06-Nov-08

**Radio Spurious Emissions, 14-Jul-08****Engineer: Suhaila Khushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18GHz	3115	868	10-Jun-10
Hewlett Packard	Spectrum Analyzer 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08

**Radiated Emissions, 30 - 26,500 MHz, 15-Jul-08****Engineer: rvarelas**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18GHz	3115	868	10-Jun-10
Hewlett Packard	Spectrum Analyzer 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1731	17-Oct-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	06-Nov-08

**Radio Spurious Emissions, 15-Jul-08****Engineer: Suhaila Khushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18GHz	3115	868	10-Jun-10

Hewlett Packard

Spectrum Analyzer 30 Hz -40 GHz, SV (SA40) Red 8564E (84125C) 1148 24-Aug-08

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Radiated Emissions, 1000 - 18,000 MHz, 16-Jul-08

Engineer: Joseph Cadigal

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	SpecAn 9 KHz-26.5 GHz, Non-Program	8563E	284	21-Aug-08
EMCO	Antenna, Horn, 1-18 GHz	3115	786	07-Dec-08
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	1729	17-Oct-08
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1730	17-Oct-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	06-Nov-08

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Radiated Emissions, 1000 - 18,000 MHz, 17-Jul-08

Engineer: Ben Jing

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18GHz	3115	868	10-Jun-10
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-02	1728	17-Oct-08
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	1729	17-Oct-08
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1730	17-Oct-08
Hewlett Packard	Microwave Preamplifier, 1.26-26.5GHz	8449B	1780	06-Nov-08

Radio Spurious Emissions, 17-Jul-08

Radio Services Emissions,  
Engineer: Suhaila Khushzad

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	SpecAn 9 KHz-26.5 GHz, Non-Program	8563E	284	21-Aug-08
Miteq	Preamplifier, 1-18 GHz	AFS44	1346	13-Nov-08
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	1729	17-Oct-08
EMCO	Antenna, Horn, 1-18 GHz (SA40-Purple)	3115	1779	19-Mar-10

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Radio Spurious Emissions. 18-Jul-08

## Radio Spurious Emissions, Part 1

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	SpecAn 9 KHz-26.5 GHz, Non-Program	8563E	284	21-Aug-08
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-02	1728	17-Oct-08
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1730	17-Oct-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	06-Nov-08
Fischer Custom Comm.	150-50 ohm adapter, 1/2, 0.15-80 MHz	FCC-801-150-50	1799	03-Jun-09

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Radiated Emissions, 1000 - 18,000 MHz, 19-Jul-08

Engineer: Ben Jing

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	786	07-Dec-08
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	1729	17-Oct-08
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1730	17-Oct-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	06-Nov-08

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Radiated Emissions, 1000 - 18,000 MHz, 21-Jul-08

Engineer: Ben Jing

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	SpecAn 9 KHz-26.5 GHz, Non-Program	8563E	284	21-Aug-08
Miteq	Preamplifier, 1-18 GHz	AFS44	1346	13-Nov-08
EMCO	Antenna, Horn, 1-18 GHz (SA40-Purple)	3115	1779	19-Mar-10

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Radiated Emissions, 1000 - 12,000 MHz, 23-Jul-08

Engineer: Ben Jing

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	SpecAn 9 KHz-26.5 GHz, Non-Program	8563E	284	21-Aug-08
EMCO	Antenna, Horn, 1-18 GHz	3115	786	07-Dec-08
Miteq	Preamplifier, 1-18 GHz	AFS44	1346	13-Nov-08
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1731	17-Oct-08

***EXHIBIT 2: Test Measurement Data***

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## *EMC Test Data*

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Emissions Standard(s):	FCC 15.E	Class:	-
Immunity Standard(s):	-	Environment:	-

## **EMC Test Data**

For The

## **Broadcom Corporation**

Model

**BCM94322HM8L (Dipole C2PC)**

Date of Last Test: 7/28/2008



## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manger:	Dean Eriksen
Contact:	Anna Liang		
Emissions Standard(s):	FCC 15.E	Class:	-
Immunity Standard(s):	-	Environment:	-

## EUT INFORMATION

### General Description

The EUT is an 802.11ag/Draft 802.11n WLAN PCI-E Minicard that is designed to enable wireless data transmission 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 from the host.

### Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
Broadcom	BCM94322HM8L	802.11ag/Draft 802.11n WLAN PCI-E Minicard	-	QDS-BRCM1031

### EUT Antenna (Intentional Radiators Only)

The EUT antenna is a dipole antenna. The antenna connects to the EUT via a hirose connector, thereby meeting the requirements of FCC 15.203.

### EUT Enclosure

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

### Modification History

Mod. #	Test	Date	Modification
1			
2			
3			

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



## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manger:	Dean Eriksen
Contact:	Anna Liang		
Emissions Standard(s):	FCC 15.E	Class:	-
Immunity Standard(s):	-	Environment:	-

### Test Configuration #1

#### Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
HP	-	Laptop Computer	-	Doc

#### Remote Support Equipment

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

#### Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Main RF Port	Antenna	coax	shielded	0.15
Aux RF Port	Antenna	coax	shielded	0.15
PCMCIA Buss	Extender Card with EUT	Direct Connection	-	-
DC Power on Computer	AC/DC Adapter	multiconductor	shielded	1.5
AC/DC Adapter	AC Mains	3 wire	unshielded	1.5

#### EUT Operation During Emissions Tests

During testing, the EUT was configured to either transmit continuously on the desired channel or set into a receive mode at the desired channel, as noted on the test data sheets.

All transmitter spurious emissions testing (radiated or conducted) was done at the highest power setting within the band. All band edge, power and other measurements were taken at the maximum power allowed by the EUTs power table for that particular channel.



## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

### RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions

#### Test Specific Details

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

Date of Test: 7/11/2008 8:28

Config. Used: 1

Test Engineer: Suhaila Khushzad/Rafael

Config Change: None

Test Location: Fremont Chamber #4

EUT Voltage: Powered From Host System

#### General Test Configuration

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

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

Ambient Conditions: Temperature: 22 °C  
Rel. Humidity: 45 %

#### Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1	802.11a Chain A	5150-5250 36 @ 5180	-	-	Restricted Band Edge at 5150 MHz	15.209	51.3dB $\mu$ V/m @ 5150.0MHz (-2.7dB)
2a	802.11a Chain A	5250-5350 60 @ 5300	-	-	Restricted Band Edge at 5350 MHz	15.209	53.9dB $\mu$ V/m @ 5350.0MHz (-0.1dB)
2b	802.11a Chain A	5250-5350 64 @ 5320	-	-	Restricted Band Edge at 5350 MHz	15.209	52.9dB $\mu$ V/m @ 5350.0MHz (-1.1dB)
3b	802.11a Chain A	5470-5725 104@5520	-	-	Restricted Band Edge at 5460 MHz	15.209	51.6dB $\mu$ V/m @ 5458.5MHz (-2.4dB)
	802.11a Chain A	5470-5725 104@5520	-	-	Band Edge 5460 - 5470 MHz	15E	52.1dB $\mu$ V/m @ 5469.8MHz (-16.2dB)
4	802.11a Chain A	5470-5725 140@5700	-	-	Band Edge 5460 - 5470 MHz	15E	60.9dB $\mu$ V/m @ 5725.0MHz (-7.4dB)
5	802.11a Chain A	5470-5725 100@5500	-	-	Restricted Band Edge at 5460 MHz	15.209	51.8dB $\mu$ V/m @ 5458.5MHz (-2.2dB)
	802.11a Chain A	5470-5725 100@5500	-	-	Band Edge 5460 - 5470 MHz	15E	55.7dB $\mu$ V/m @ 5470.0MHz (-12.6dB)



## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

### Modifications Made During Testing

No modifications were made to the EUT during testing

### Deviations From The Standard

No deviations were made from the requirements of the standard.

### Run #1, Radiated Spurious Emissions, Band Edges, Operation in the 5150-5250 MHz Band

Run #1a: Channel 36 @ 5180 MHz

#### Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5175.970	105.9	V	-	-	AVG	138	1.4	RB 1.000 MHz; VB: 10 Hz
5176.550	113.8	V	-	-	PK	138	1.4	RB 1.000 MHz; VB: 1.000 MHz
5175.260	88.2	H	-	-	AVG	93	1.0	RB 1.000 MHz; VB: 10 Hz
5176.000	96.7	H	-	-	PK	93	1.0	RB 1.000 MHz; VB: 1.000 MHz
5173.730	93.6	H	-	-	PK	93	1.0	RB 100 kHz; VB: 100 kHz
5176.080	105.6	V	-	-	PK	138	1.4	RB 100 kHz; VB: 100 kHz

#### 5150 MHz Band Edge Signal Radiated Field Strength

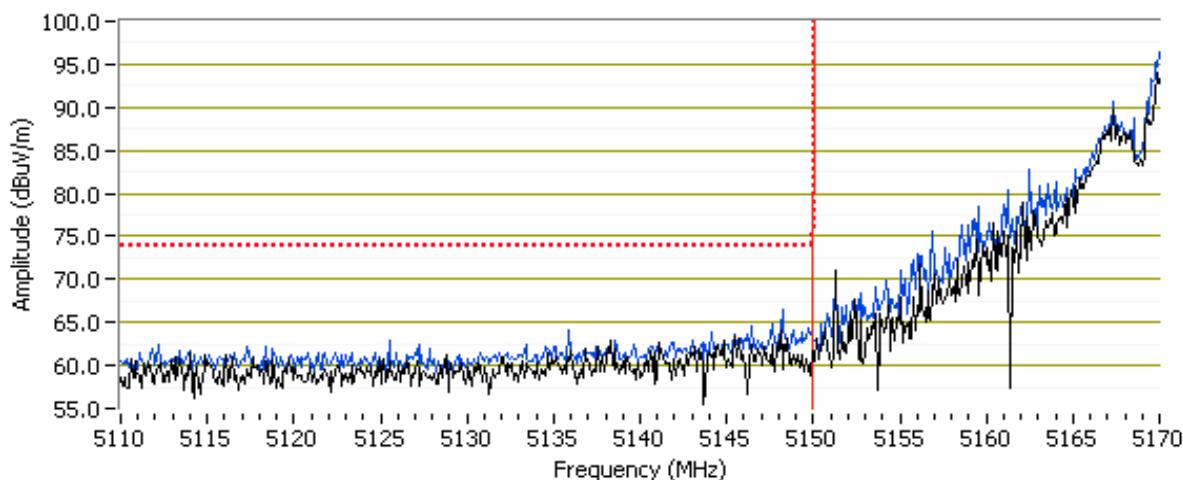
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.980	51.3	V	54.0	-2.7	Avg	138	1.4	RB 1.000 MHz; VB: 10 Hz
5148.570	70.4	V	74.0	-3.6	Pk	138	1.4	RB 1.000 MHz; VB: 1.000 MHz
5148.560	48.2	H	54.0	-5.8	Avg	93	1.0	RB 1.000 MHz; VB: 10 Hz
5148.750	64.3	H	74.0	-9.7	Pk	93	1.0	RB 1.000 MHz; VB: 1.000 MHz

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dB $\mu$ V/m).

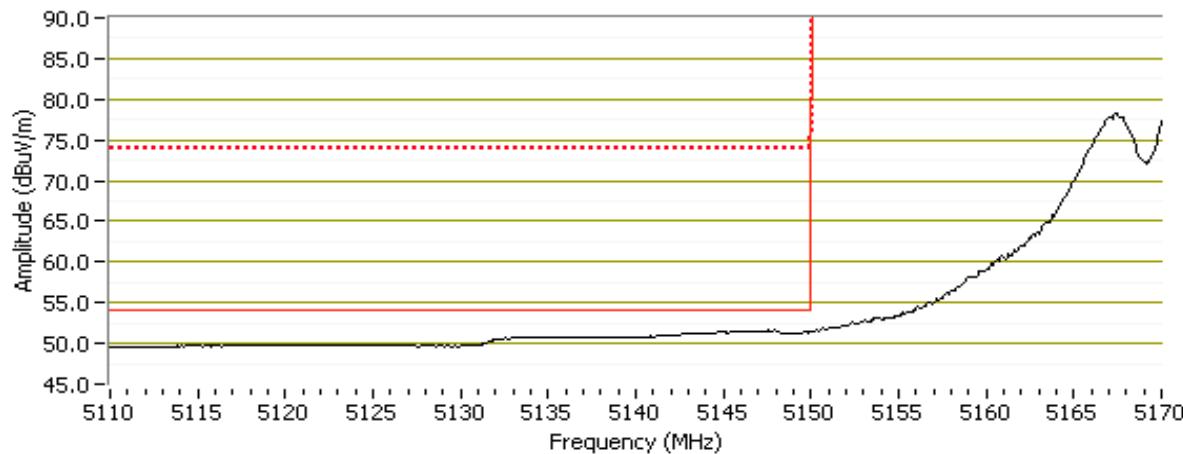
Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #1a: Continued

RB 1.000 MHz; VB 1.000 MHz Band Edge @ 5150 MHz, Peak - Vertical



RB 1.000 MHz; VB 10 Hz Band Edge @ 5150 MHz, Avg - Vertical





## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run # 2a: Channel 60 @ 5300 MHz

### Fundamental Signal Field Strength

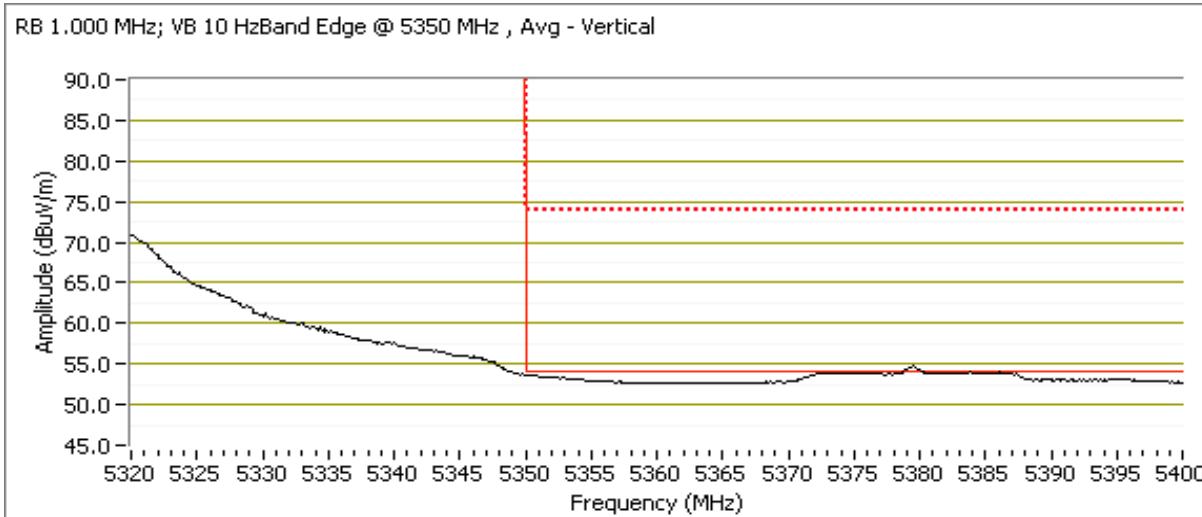
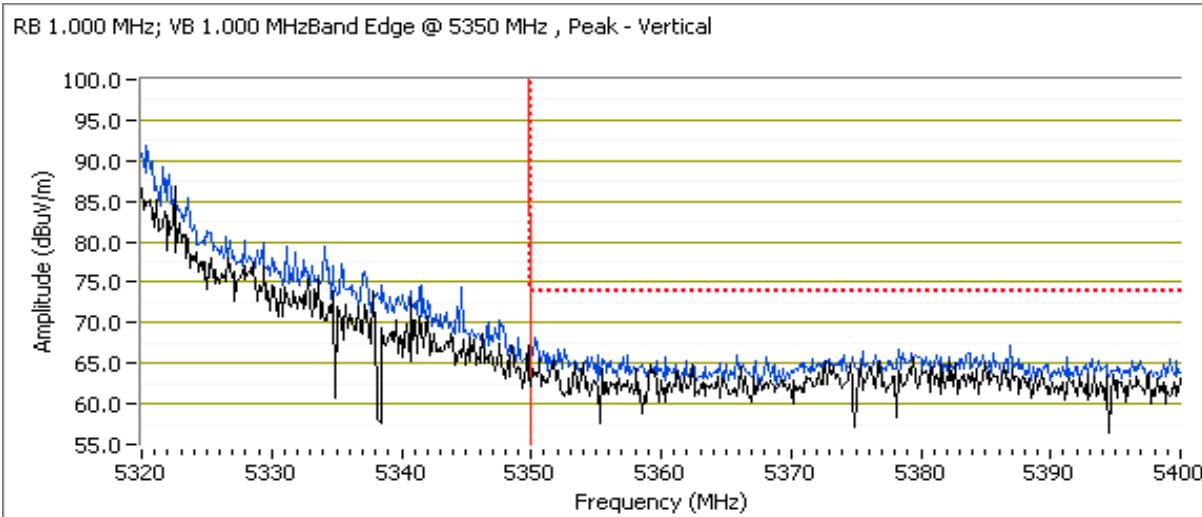
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5295.330	111.0	V	-	-	AVG	146	1.2	RB 1.000 MHz; VB: 10 Hz
5303.000	120.1	V	-	-	PK	146	1.2	RB 1.000 MHz; VB: 1.000 MHz
5303.330	92.8	H	-	-	AVG	89	1.0	RB 1.000 MHz; VB: 10 Hz
5303.580	100.9	H	-	-	PK	89	1.0	RB 1.000 MHz; VB: 1.000 MHz

### 5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.000	53.9	V	54.0	-0.1	AVG	146	1.2	RB 1.000 MHz; VB: 10 Hz
5350.220	69.8	V	74.0	-4.2	PK	146	1.2	RB 1.000 MHz; VB: 1.000 MHz
5350.050	48.6	H	54.0	-5.4	AVG	89	1.0	RB 1.000 MHz; VB: 10 Hz
5350.730	62.5	H	74.0	-11.5	PK	89	1.0	RB 1.000 MHz; VB: 1.000 MHz

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run # 2a: Continued



Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

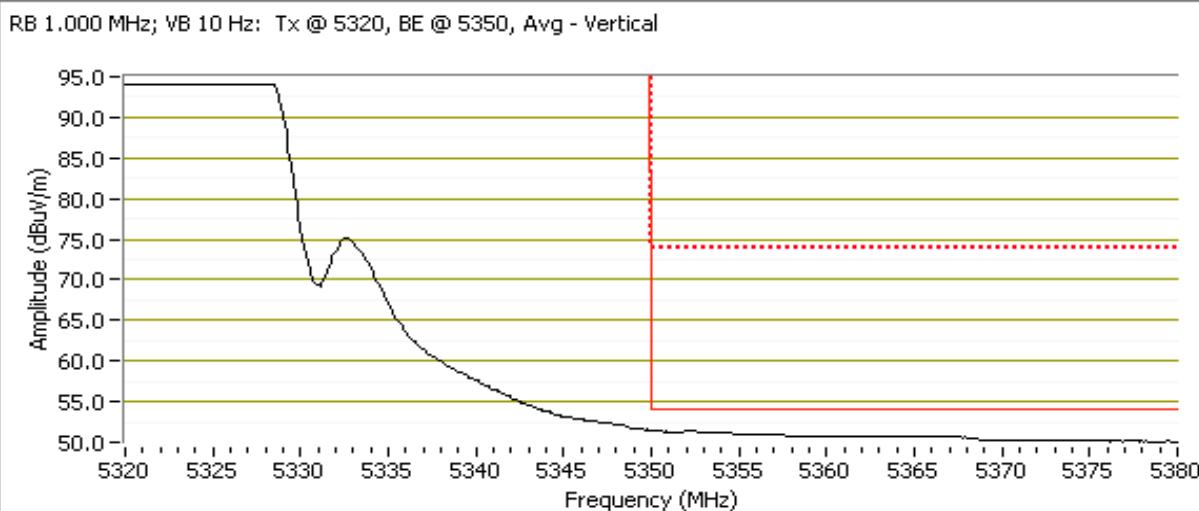
Run # 2b: Channel 64 @ 5320 MHz

**Fundamental Signal Field Strength**

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5316.100	103.5	V	-	-	AVG	133	1.0	RB 1.000 MHz; VB: 10 Hz
5317.930	112.0	V	-	-	PK	133	1.0	RB 1.000 MHz; VB: 1.000 MHz
5315.730	91.3	H	-	-	AVG	104	1.0	RB 1.000 MHz; VB: 10 Hz
5320.130	108.5	H	-	-	PK	104	1.0	RB 1.000 MHz; VB: 1.000 MHz

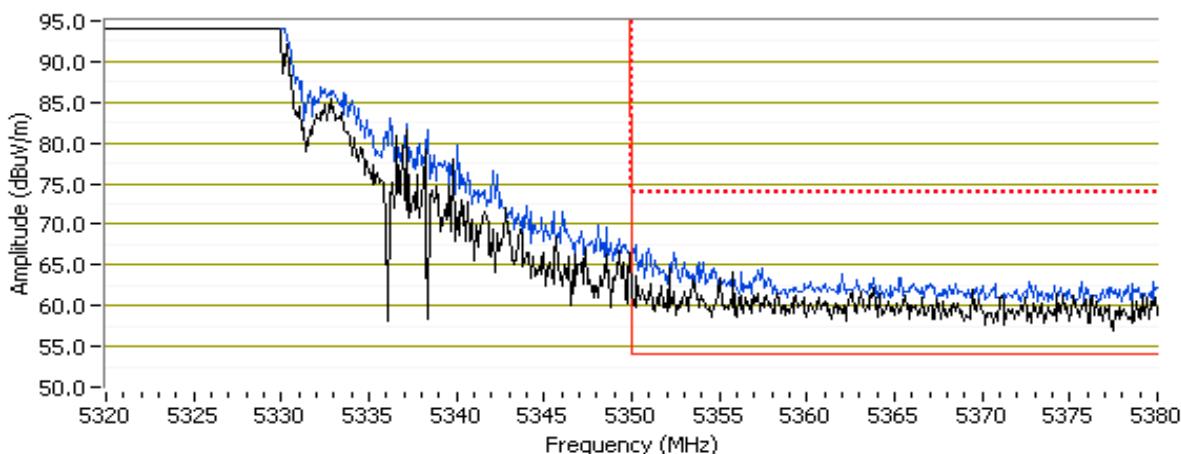
**5350 MHz Band Edge Signal Radiated Field Strength**

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.000	52.9	V	54.0	-1.1	AVG	133	1.0	
5351.660	69.3	V	74.0	-4.7	PK	133	1.0	
5350.000	50.6	H	54.0	-3.4	AVG	104	1.0	
5351.080	64.0	H	74.0	-10.0	PK	104	1.0	



Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

RB 1.000 MHz; VB 1.000 MHz: Tx @ 5320, BE @ 5350, PK - Vertical



Run # 3 Radiated Spurious Emissions, Band Edges, Operation in the 5470-5725 MHz Band

Run # 3b: Channel 104 @ 5520 MHz

#### Fundamental Signal Field Strength

Frequency	Level	Pol	FCC 15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5516.400	105.3	V	-	-	AVG	179	1.0	RB 1.000 MHz; VB: 10 Hz
5523.270	114.1	V	-	-	PK	179	1.0	RB 1.000 MHz; VB: 1.000 MHz
5516.030	98.0	H	-	-	AVG	78	1.0	RB 1.000 MHz; VB: 10 Hz
5517.800	110.7	H	-	-	PK	78	1.0	RB 1.000 MHz; VB: 1.000 MHz

#### 5460 MHz Band Edge Signal Radiated Field Strength

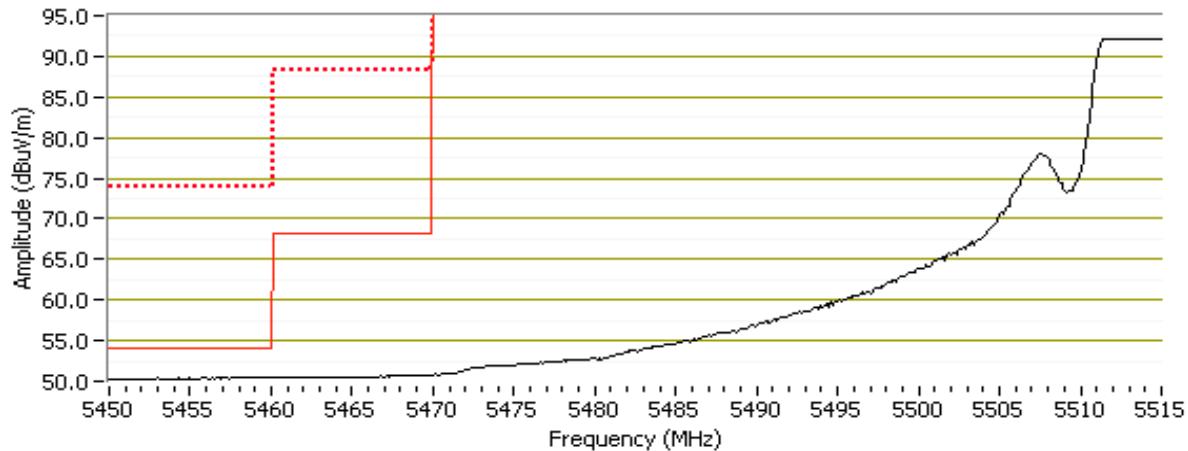
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5458.520	51.6	V	54.0	-2.4	AVG	179	1.0	RB 1.000 MHz; VB: 10 Hz
5458.810	62.7	V	74.0	-11.3	PK	179	1.0	RB 1.000 MHz; VB: 1.000 MHz
5457.000	50.7	H	54.0	-3.3	AVG	78	1.0	RB 1.000 MHz; VB: 10 Hz
5458.170	61.8	H	74.0	-12.2	PK	78	1.0	RB 1.000 MHz; VB: 1.000 MHz

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

**5470 MHz Band Edge Signal Radiated Field Strength**

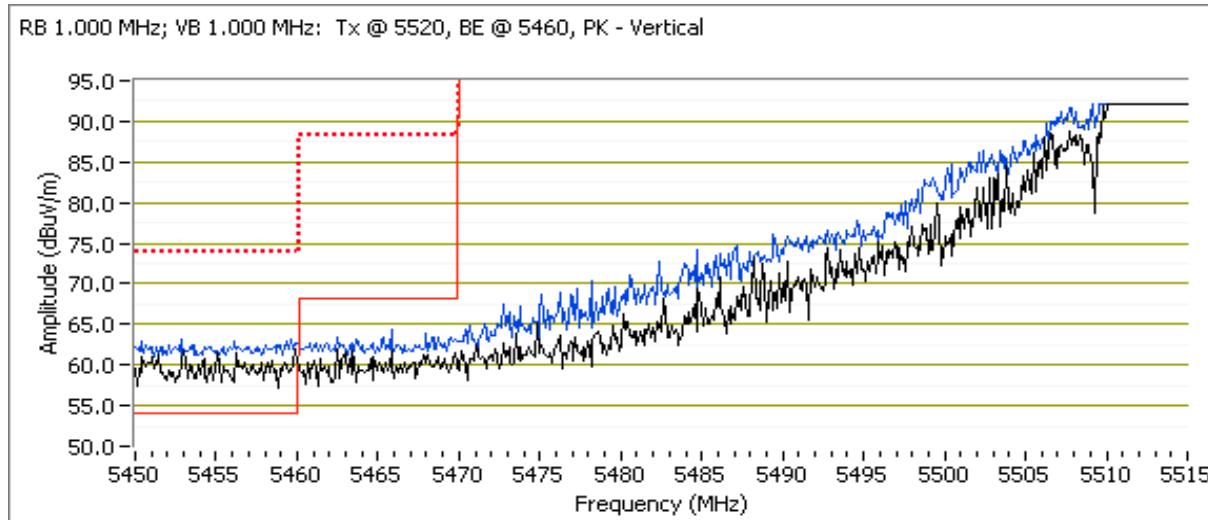
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5469.830	52.1	V	68.3	-16.2	AVG	179	1.0	RB 1.000 MHz; VB: 10 Hz
5469.960	63.6	V	88.3	-24.7	PK	179	1.0	RB 1.000 MHz; VB: 1.000 MHz
5467.280	50.8	H	68.3	-17.5	AVG	78	1.0	RB 1.000 MHz; VB: 10 Hz
5468.940	62.4	H	88.3	-25.9	PK	78	1.0	RB 1.000 MHz; VB: 1.000 MHz

RB 1.000 MHz; VB 10 Hz: Tx @ 5520, BE @ 5460, Avg - Vertical



Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run # 3b: Continued



Run # 4: Radiated Spurious Emissions, Band Edges, Operation in the 5470-5725 MHz Band

Channel 140 @ 5700 MHz

#### Fundamental Signal Field Strength

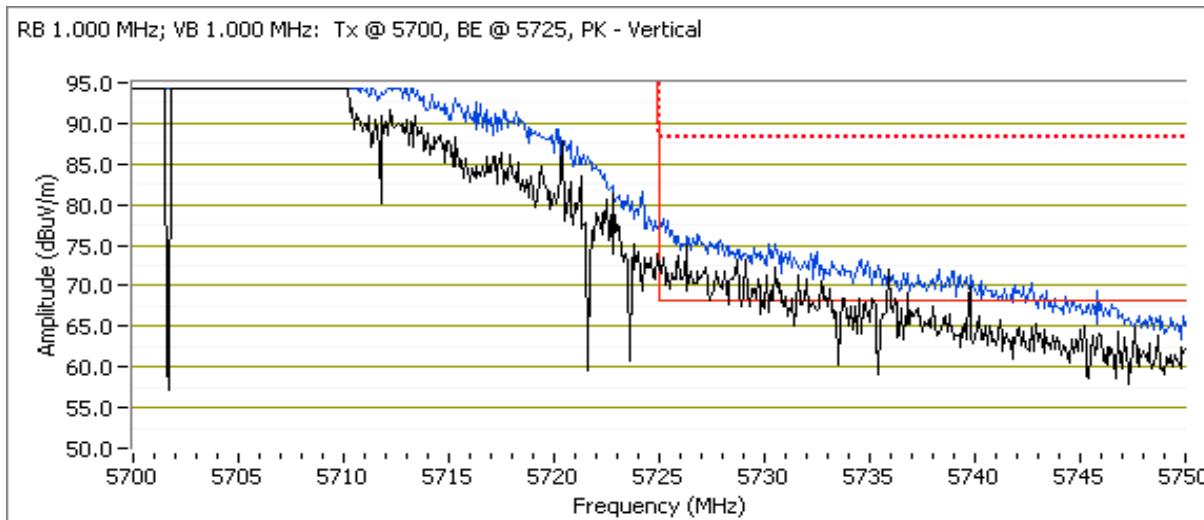
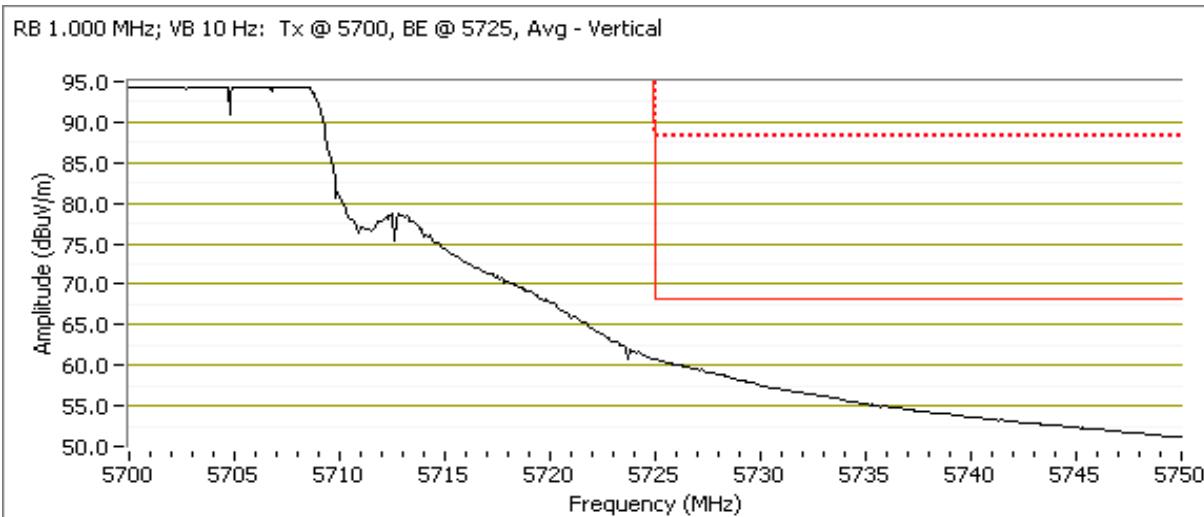
Frequency MHz	Level dB $\mu$ V/m	Pol v/h	15.209 / 15.247 Limit	Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
5703.930	107.0	V	-	AVG	187	1.0	RB 1.000 MHz; VB: 10 Hz
5695.670	115.4	V	-	PK	187	1.0	RB 1.000 MHz; VB: 1.000 MHz
5705.100	96.0	H	-	AVG	123	1.0	RB 1.000 MHz; VB: 10 Hz
5702.130	105.1	H	-	PK	123	1.0	RB 1.000 MHz; VB: 1.000 MHz

#### 5725 MHz Band Edge Radiated Field Strength

Frequency MHz	Level dB $\mu$ V/m	Pol v/h	15 E Limit	Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
5725.010	60.9	V	68.3	Avg	187	1.0	RB 1.000 MHz; VB: 10 Hz
5725.320	76.8	V	88.3	PK	187	1.0	RB 1.000 MHz; VB: 1.000 MHz
5725.020	59.8	V	68.3	Avg	123	1.0	RB 1.000 MHz; VB: 10 Hz
5725.020	74.7	V	88.3	PK	123	1.0	RB 1.000 MHz; VB: 1.000 MHz

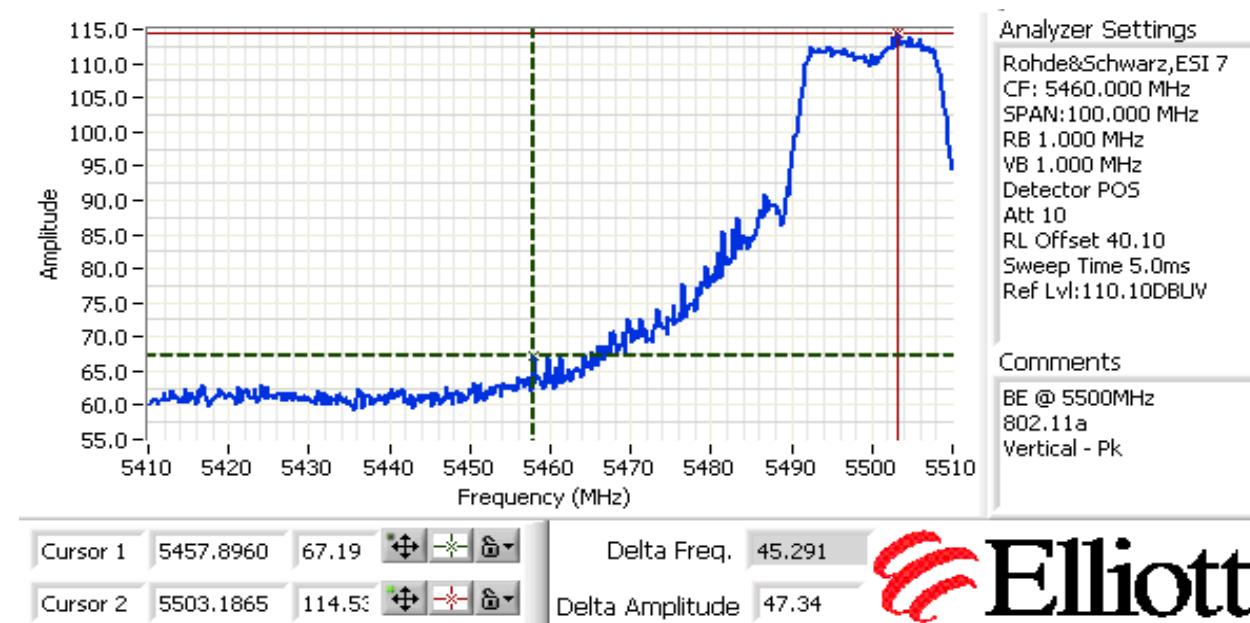
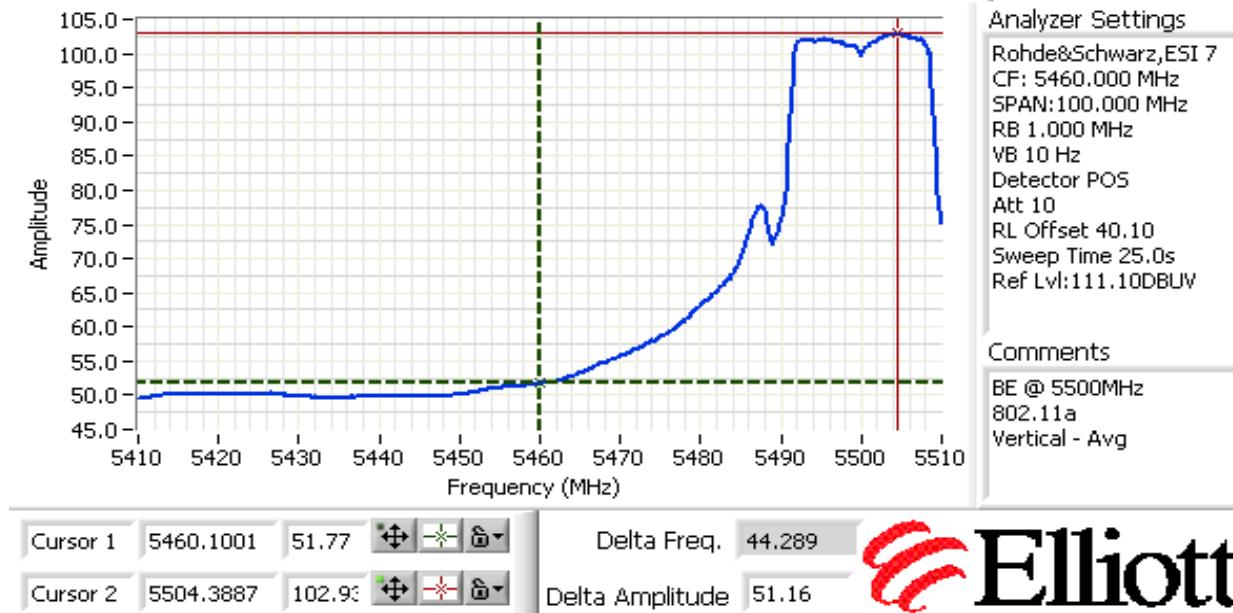
Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run # 4: Continued



Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

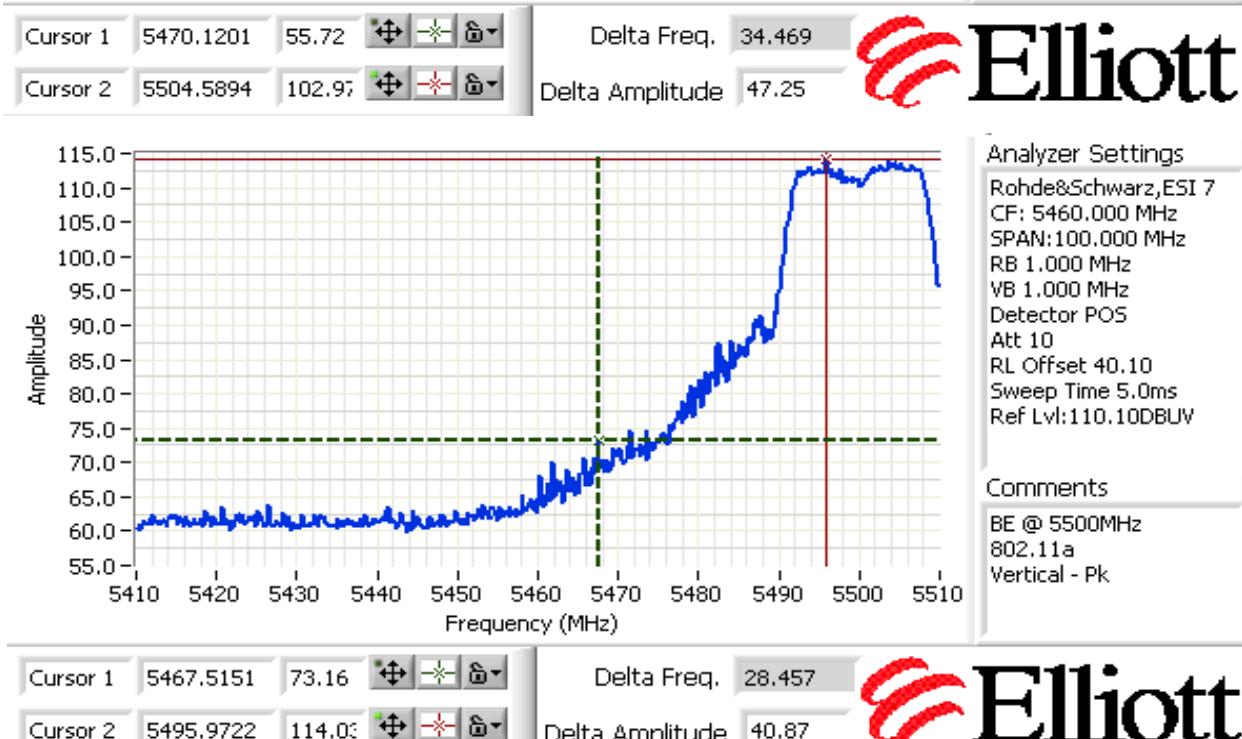
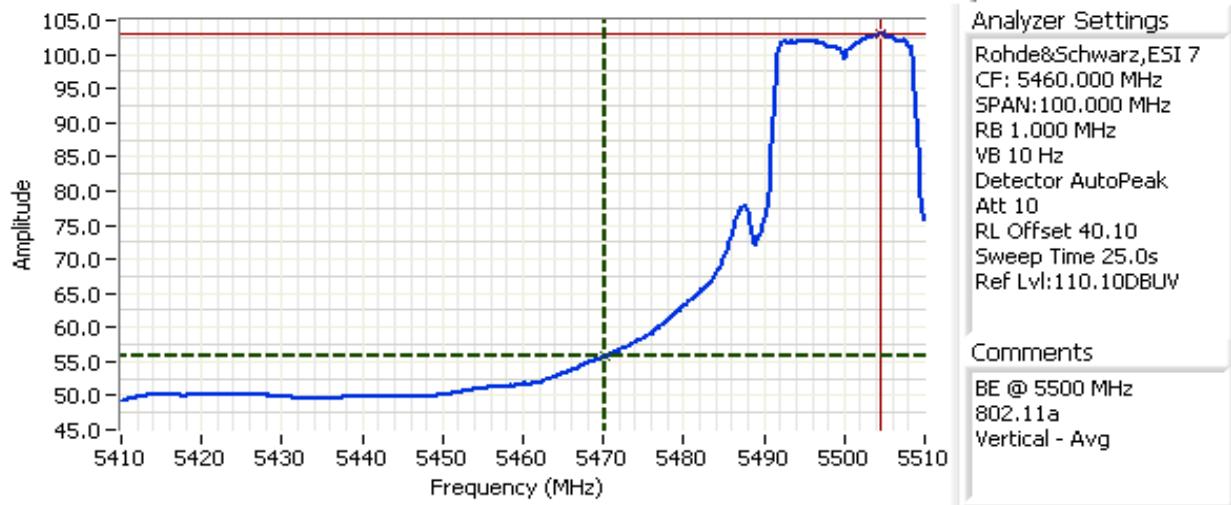
Run # 5 Radiated Spurious Emissions, Band Edges, Operation in the 5470-5725 MHz Band  
 Channel 100 @ 5500 MHz



Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

**5460 MHz Band Edge Signal Radiated Field Strength**

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5458.520	51.8	V	54.0	-2.2	AVG	234	1.0	RB 1.000 MHz; VB: 10 Hz
5458.810	67.2	V	74.0	-6.8	PK	234	1.0	RB 1.000 MHz; VB: 1.000 MHz





## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

### 5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5469.980	55.7	V	68.3	-12.6	AVG	234	1.0	RB 1.000 MHz; VB: 10 Hz
5469.440	73.2	V	88.3	-15.1	PK	234	1.0	RB 1.000 MHz; VB: 1.000 MHz



## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

### RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions

#### Test Specific Details

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

Config. Used: 1

Config Change: None

EUT Voltage: Powered From Host System

#### General Test Configuration

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

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

Ambient Conditions: Temperature: 21.5 °C

#### Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1	802.11a Chain A	36 5180	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	40.2dB $\mu$ V/m @ 2488.4MHz (-13.8dB)
	802.11a Chain A	40 5200	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	40.1dB $\mu$ V/m @ 2488.5MHz (-13.9dB)
	802.11a Chain A	48 5240	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	40.4dB $\mu$ V/m @ 2488.4MHz (-13.6dB)
2	802.11a Chain A	52 5260	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	47.6dB $\mu$ V/m @ 15777.4MHz (-6.4dB)
	802.11a Chain A	60 5300	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.4dB $\mu$ V/m @ 5459.9MHz (-0.6dB)
	802.11a Chain A	64 5320	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	43.5dB $\mu$ V/m @ 15958.0MHz (-10.5dB)
3	802.11a Chain A	100 5500	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	39.1dB $\mu$ V/m @ 2498.7MHz (-14.9dB)
	802.11a Chain A	104 5520	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	42.7dB $\mu$ V/m @11039.6 MHz (-11.3dB)
	802.11a Chain A	120 5600	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	43.0 dB $\mu$ V/m @ 1500.6 MHz (-11.0dB)
	802.11a Chain A	140 5700	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	44.8dB $\mu$ V/m @ 1500.0MHz (-9.2dB)

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

### Modifications Made During Testing

No modifications were made to the EUT during testing

### Deviations From The Standard

No deviations were made from the requirements of the standard.

Date of Test: 7/15/2008 17:49

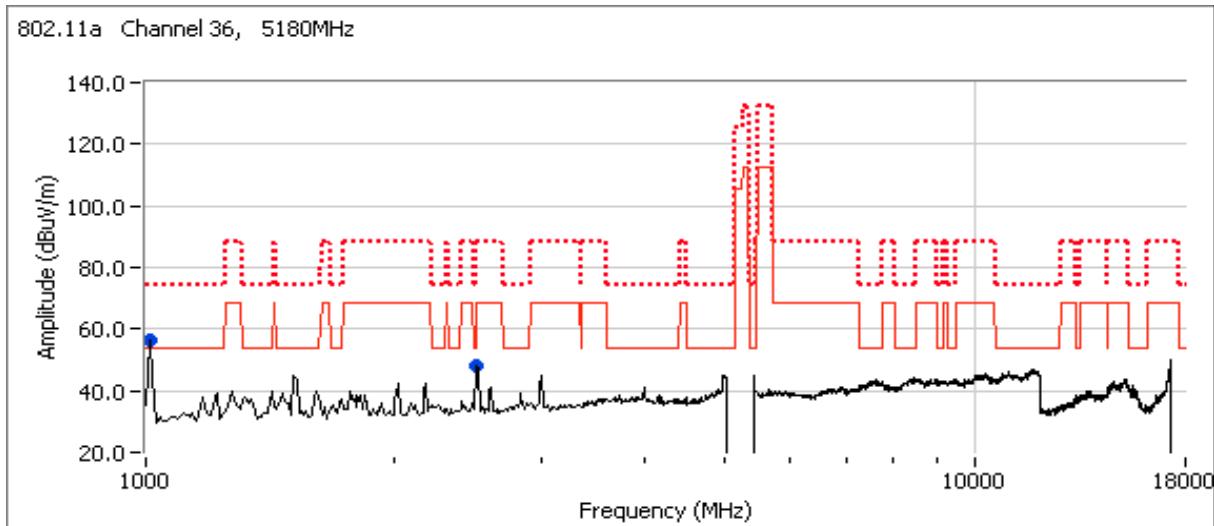
Test Engineer: Joseph Cadigal/ Ben Jing

Test Location: Fremont Chamber #3

NOTE: Preliminary testing showed no emissions above 18GHz. Only final data below 18GHz is presented.

Run #1, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5180MHz Band

Run #1a: Channel 36, 5180MHz



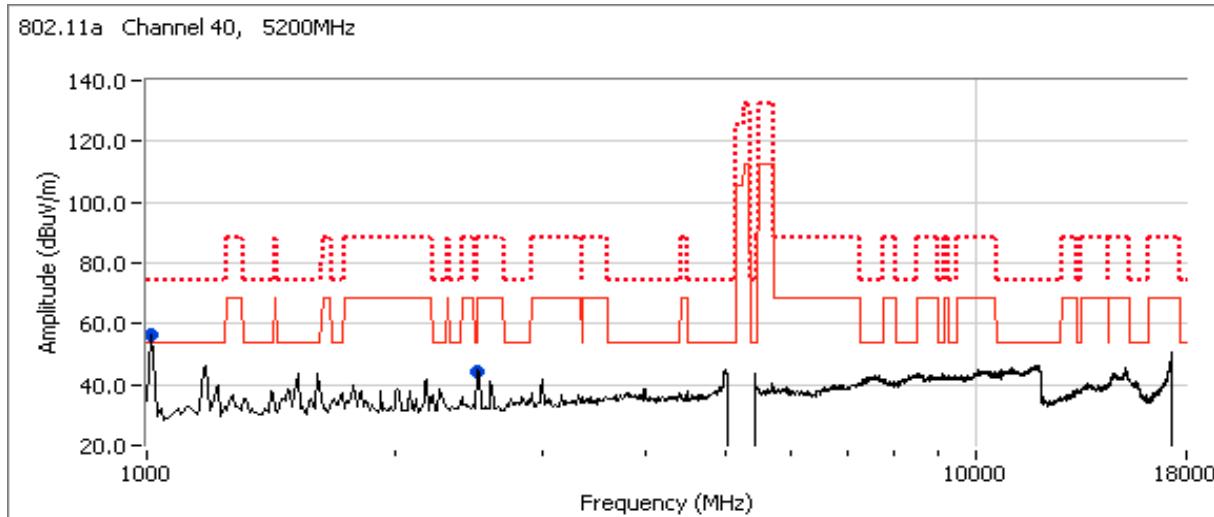
#### Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2488.400	40.2	V	54.0	-13.8	AVG	68	1.7	
1000.003	36.5	V	54.0	-17.5	AVG	198	1.8	
2488.140	56.3	V	74.0	-17.7	PK	68	1.7	
1000.401	48.6	V	74.0	-25.4	PK	198	1.8	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #1b: Channel 40 , 5200 MHz

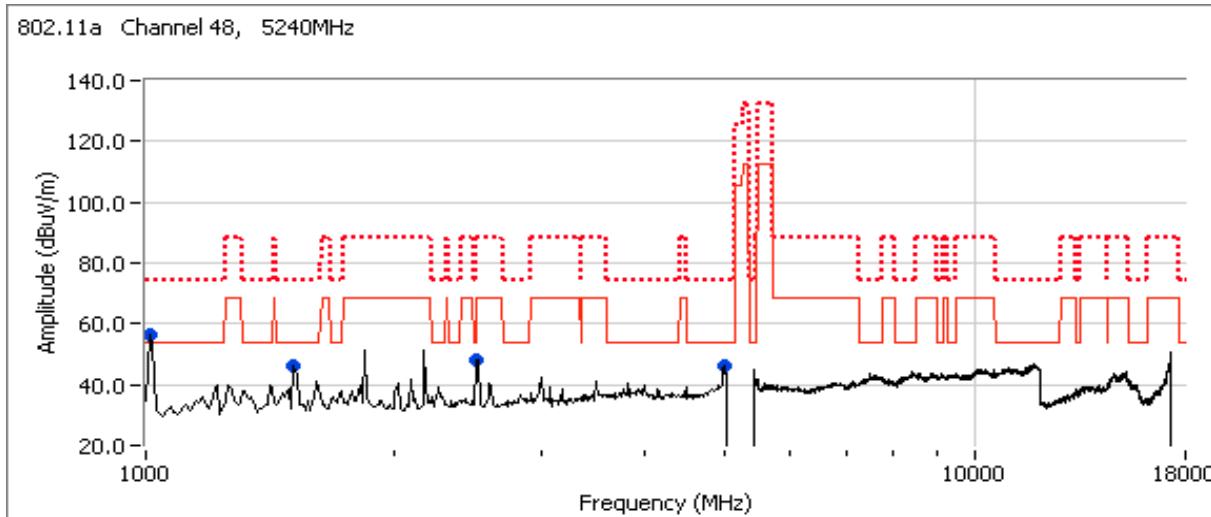

**Spurious Radiated Emissions:**

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2488.530	40.1	V	54.0	-13.9	AVG	69	1.8	
2488.730	56.1	V	74.0	-17.9	PK	69	1.8	
1000.042	36.0	V	54.0	-18.0	AVG	338	1.3	
1000.058	49.0	V	74.0	-25.0	PK	338	1.3	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dB $\mu$ V/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

Run #1c: Channel 48 , 5240 MHz


**Spurious Radiated Emissions:**

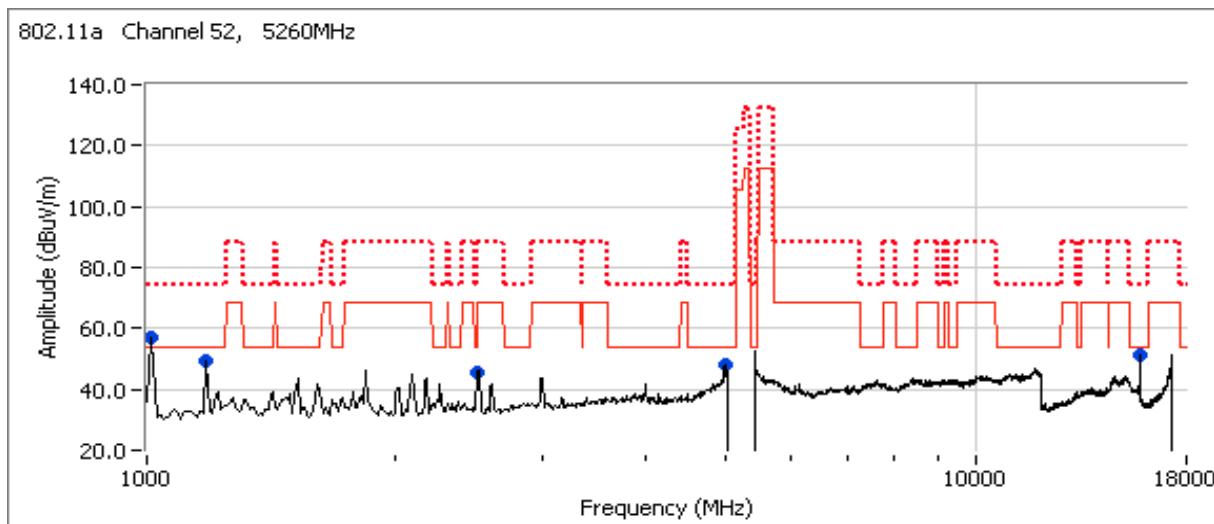
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2488.410	40.4	V	54.0	-13.6	AVG	68	2.0	
4975.030	40.1	V	54.0	-13.9	AVG	215	1.3	
1499.150	38.9	V	54.0	-15.1	AVG	67	1.2	
2488.860	56.6	V	74.0	-17.4	PK	68	2.0	
1000.009	35.2	V	54.0	-18.8	AVG	337	1.4	
4974.810	53.7	V	74.0	-20.3	PK	215	1.3	
1499.270	50.6	V	74.0	-23.4	PK	67	1.2	
1000.072	48.8	V	74.0	-25.2	PK	337	1.4	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dB $\mu$ V/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #2, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5250-5350 MHz Band

Run #2a: Channel 52 , 5260 MHz



**Spurious Radiated Emissions:**

Frequency MHz	Level dB $\mu$ V/m	Pol v/h	15.209 / 15E Limit	Margin	Detector	Azimuth degrees	Height meters	Comments
15777.440	47.6	V	54.0	-6.4	AVG	95	1.0	
4975.840	43.5	V	54.0	-10.5	AVG	165	1.0	
15777.230	63.5	V	74.0	-10.5	PK	95	1.0	
2498.940	39.3	V	54.0	-14.7	AVG	204	1.2	
1000.003	38.3	V	54.0	-15.7	AVG	198	2.0	
4975.940	56.5	V	74.0	-17.5	PK	165	1.0	
1195.820	35.8	H	54.0	-18.2	AVG	192	1.1	
2498.210	54.6	V	74.0	-19.4	PK	204	1.2	
1000.021	49.9	V	74.0	-24.1	PK	198	2.0	
1196.170	44.8	H	74.0	-29.2	PK	192	1.1	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

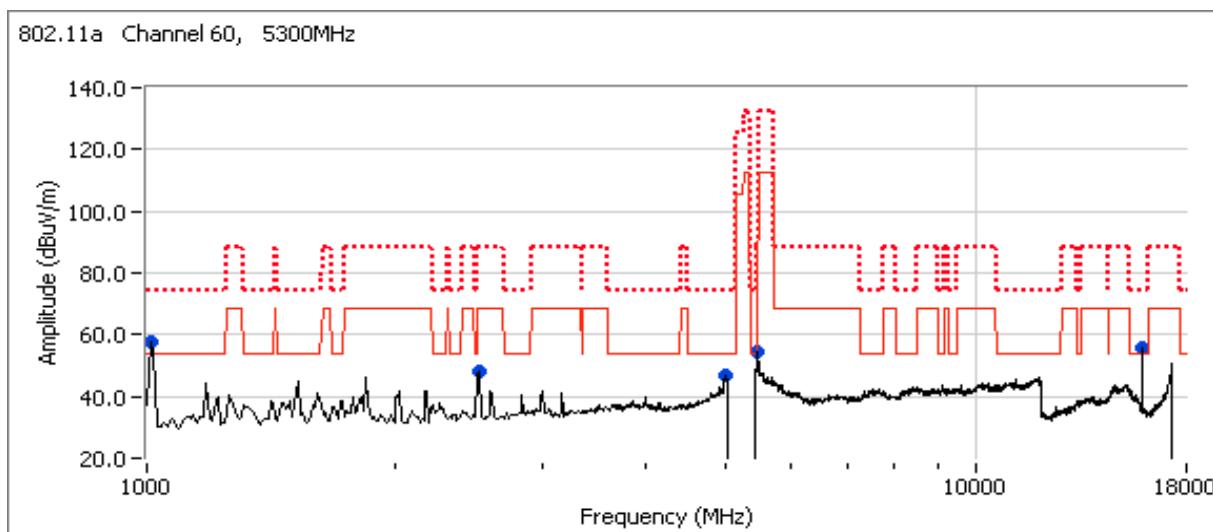
Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

Date of Test: 7/15/2008 21:30

Test Engineer: Ben Jing

Test Location: Fremont Chamber #3

Run #2b: Channel 60 , 5300 MHz

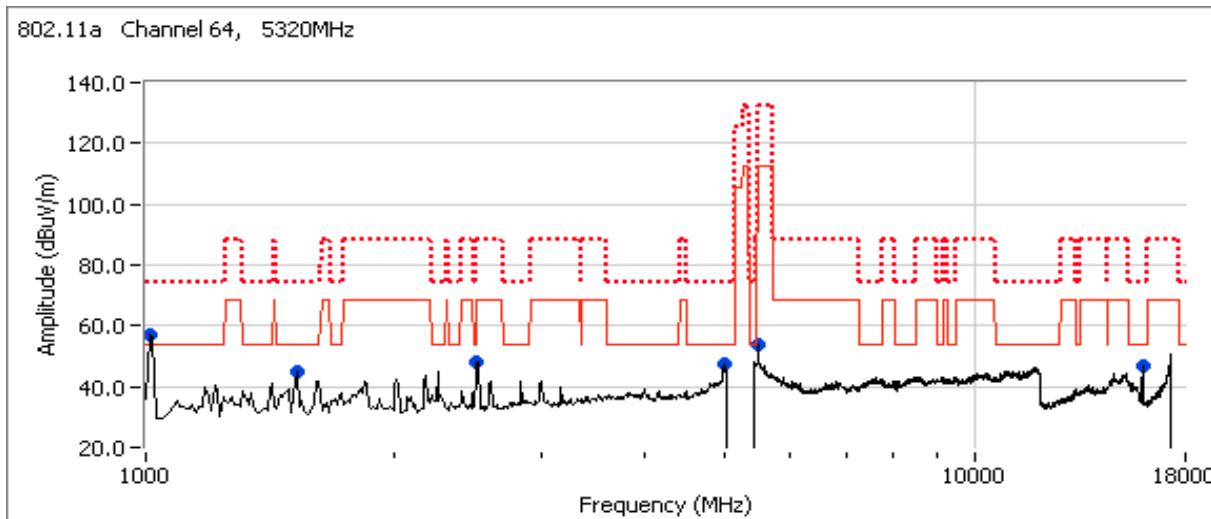

**Spurious Radiated Emissions:**

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.870	53.4	V	54.0	-0.6	AVG	5	1.5	
15897.590	51.5	V	54.0	-2.5	AVG	82	1.0	
15897.610	66.0	V	74.0	-8.0	PK	82	1.0	
4977.060	43.3	V	54.0	-10.7	AVG	158	1.0	
5459.860	62.5	V	74.0	-11.5	PK	5	1.5	
2498.800	38.6	V	54.0	-15.4	AVG	217	1.2	
1000.003	38.3	V	54.0	-15.7	AVG	201	1.1	
4977.140	56.8	V	74.0	-17.2	PK	158	1.0	
2498.560	53.7	V	74.0	-20.3	PK	217	1.2	
1000.015	50.4	V	74.0	-23.6	PK	201	1.1	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the **average** limit was set to -27dBm/MHz (~68dB $\mu$ V/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #2c: Channel 64 , 5320 MHz



**Spurious Radiated Emissions:**

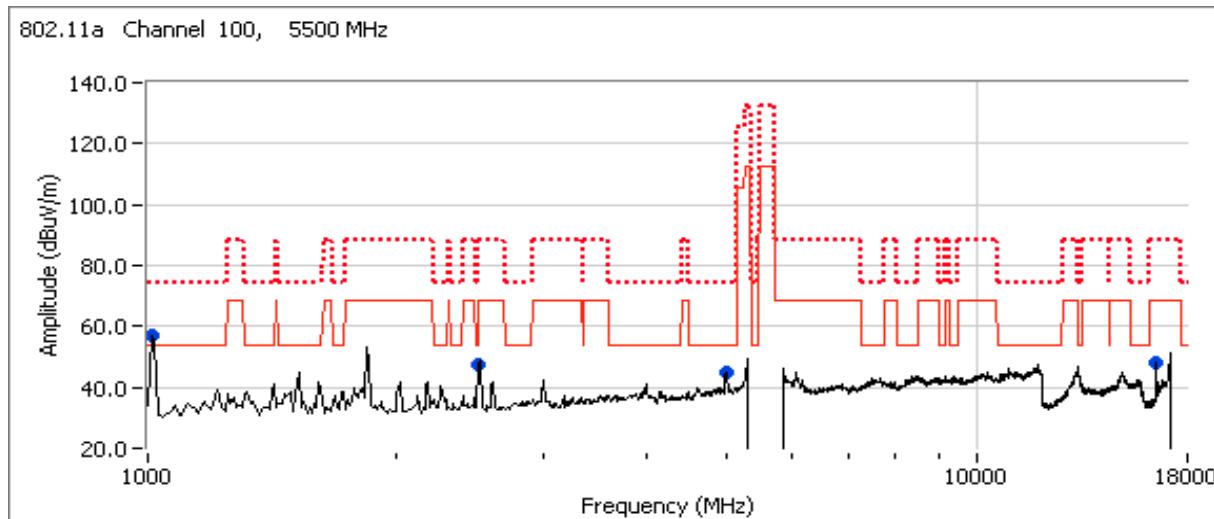
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
15957.950	43.5	V	54.0	-10.5	AVG	84	1.0	
1499.310	41.9	V	54.0	-12.1	AVG	172	1.6	
4975.540	41.8	V	54.0	-12.2	AVG	163	1.4	
2496.090	39.9	V	54.0	-14.1	AVG	204	1.4	
15957.950	58.5	V	74.0	-15.5	PK	84	1.0	
1000.005	38.2	V	54.0	-15.8	AVG	203	1.1	
1499.250	55.4	V	74.0	-18.6	PK	172	1.6	
2497.850	55.1	V	74.0	-18.9	PK	204	1.4	
4975.840	54.8	V	74.0	-19.2	PK	163	1.4	
1000.086	50.2	V	74.0	-23.8	PK	203	1.1	
5479.870	50.8	V	112.3	-61.5	AVG	357	1.8	
5479.990	60.0	V	132.3	-72.3	PK	357	1.8	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dB $\mu$ V/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #3, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5470-5725 MHz Band

Run #3a: Channel 100, 5500 MHz



*Spurious Radiated Emissions:*

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2498.670	39.1	V	54.0	-14.9	AVG	204	1.2	
1000.001	38.1	V	54.0	-15.9	AVG	204	1.1	
4996.920	35.1	V	54.0	-18.9	AVG	355	2.0	
2499.300	54.2	V	74.0	-19.8	PK	204	1.2	
16502.490	45.4	V	68.3	-22.9	AVG	77	1.0	
1000.004	50.4	V	74.0	-23.6	PK	204	1.1	
4996.940	48.9	V	74.0	-25.1	PK	355	2.0	
16503.100	60.7	V	88.3	-27.6	PK	77	1.0	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dB $\mu$ V/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

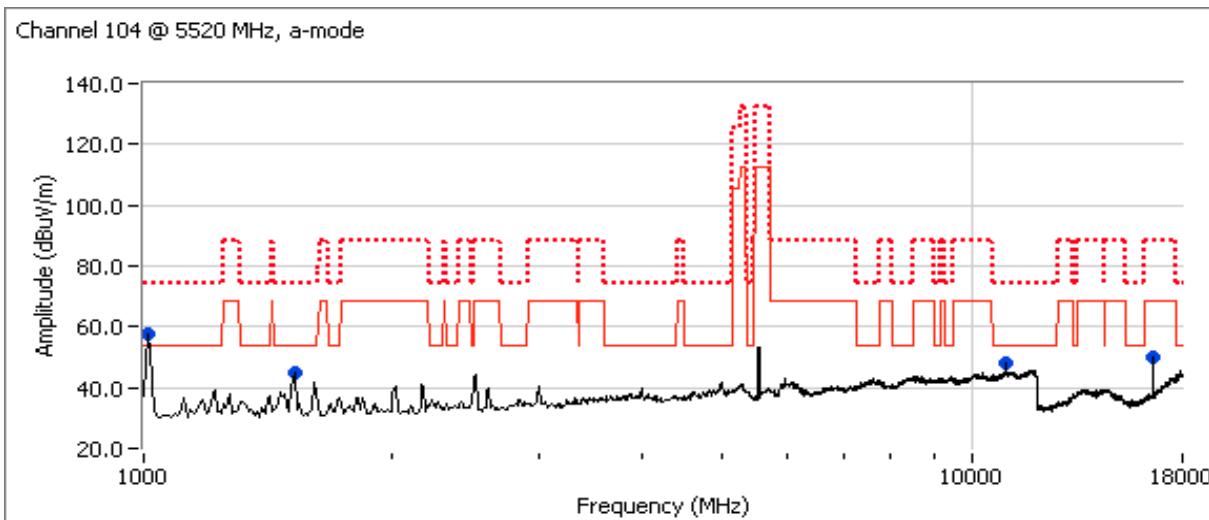
Run #3, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5470-5725 MHz Band

Date of Test: 7/16/2008 0:00

Test Engineer: Suhaila Khushzad

Test Location: Chamber # 5

Run #3b: Channel 104 @ 5520 MHz



Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	PK/QP/Avg	degrees	meters	
11039.600	42.7	V	54.0	-11.3	AVG	0	1.0	RB 1.000 MHz; VB: 10 Hz
1000.733	39.3	V	54.0	-14.7	AVG	0	1.2	RB 1.000 MHz; VB: 10 Hz
1499.070	38.0	V	54.0	-16.0	AVG	0	1.2	RB 1.000 MHz; VB: 10 Hz
11042.300	54.4	V	74.0	-19.6	PK	0	1.0	RB 1.000 MHz; VB: 1.000 MHz
1500.530	51.2	V	74.0	-22.8	PK	0	1.2	RB 1.000 MHz; VB: 1.000 MHz
1000.743	49.2	V	74.0	-24.8	PK	0	1.2	RB 1.000 MHz; VB: 1.000 MHz

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the **average** limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

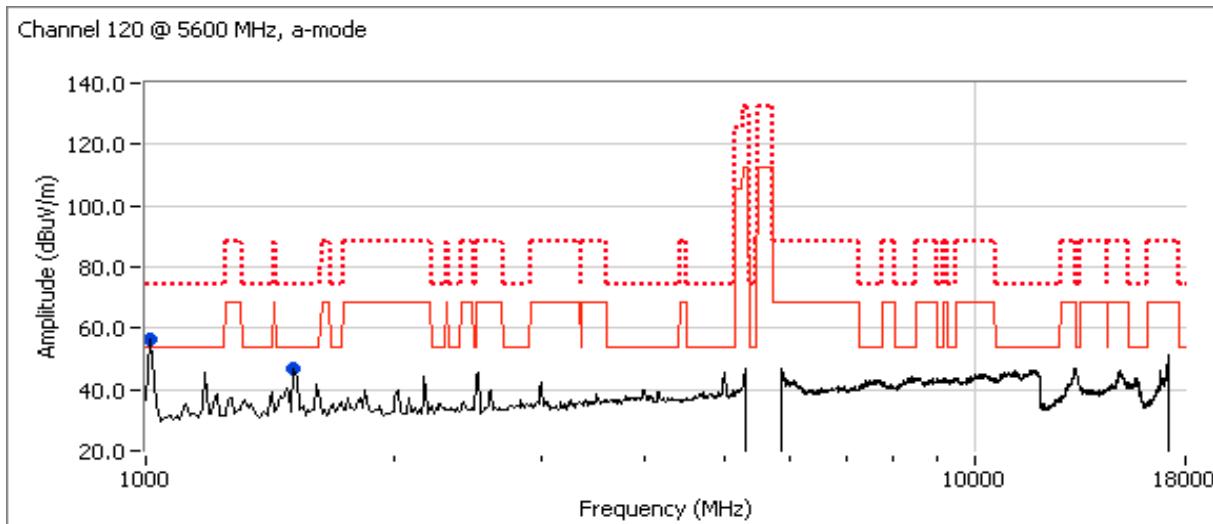
Date of Test: 7/16/2008 17:30

Test Engineer: Ben Jing

Test Location: Chamber # 4

Run #3, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5470-5725 MHz Band

Run #3c: Channel 120 @ 5600 MHz

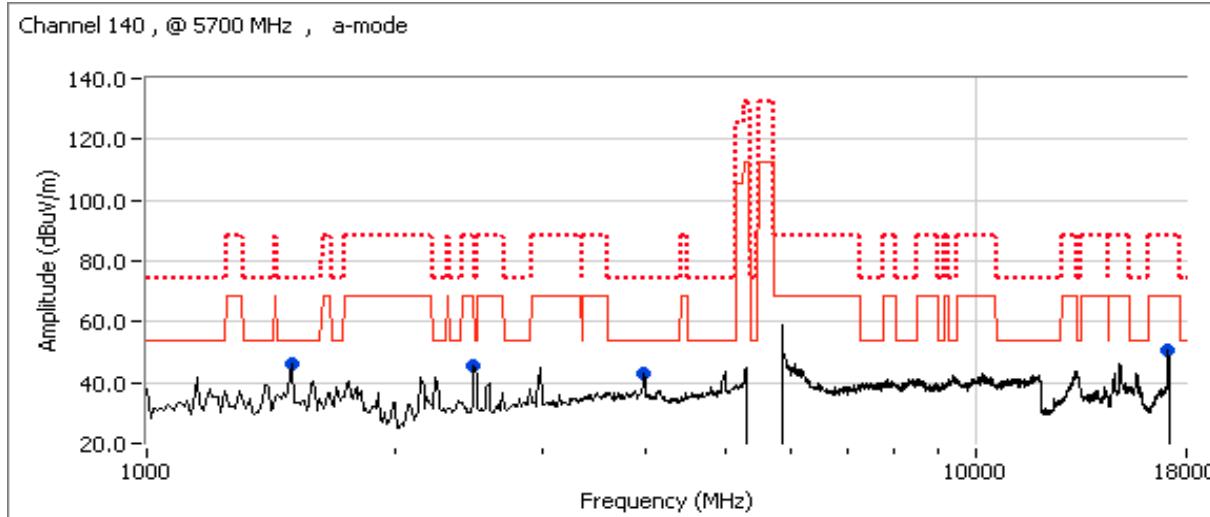

**Spurious Radiated Emissions:**

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.570	43.0	V	54.0	-11.0	AVG	138	1.0	RB 1.000 MHz; VB: 10 Hz
1000.239	38.4	V	54.0	-15.6	AVG	177	1.1	RB 1.000 MHz; VB: 10 Hz
1500.510	53.8	V	74.0	-20.2	PK	138	1.0	RB 1.000 MHz; VB: 1.000 MHz
1000.026	49.2	V	74.0	-24.8	PK	177	1.1	RB 1.000 MHz; VB: 1.000 MHz

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

Run #3d : Channel 140 , 5700 MHz


**Spurious Radiated Emissions:**

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1499.970	44.8	V	54.0	-9.2	AVG	185	1.6	RB 1.000 MHz; VB: 10 Hz
2498.970	37.1	H	54.0	-16.9	AVG	281	1.6	RB 1.000 MHz; VB: 10 Hz
1499.990	56.3	V	74.0	-17.7	PK	185	1.6	RB 1.000 MHz; VB: 1.000 MHz
3985.150	34.7	V	54.0	-19.3	AVG	180	1.2	RB 1.000 MHz; VB: 10 Hz
2498.850	52.9	H	74.0	-21.1	PK	281	1.6	RB 1.000 MHz; VB: 1.000 MHz
17098.000	46.7	V	68.3	-21.6	AVG	78	1.0	RB 1.000 MHz; VB: 10 Hz
3985.470	49.4	V	74.0	-24.6	PK	180	1.2	RB 1.000 MHz; VB: 1.000 MHz
17098.380	62.8	V	88.3	-25.5	PK	78	1.0	RB 1.000 MHz; VB: 1.000 MHz

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dB $\mu$ V/m).



## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

### RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions ( Band-edge 802.11n 20 MHz Mode )

#### Test Specific Details

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

Date of Test: 7/8/2008 17:30

Config. Used: 1

Test Engineer: Ben Jing

Config Change: None

Test Location: Fremont Chamber #3

EUT Voltage: Powered From Host System

#### General Test Configuration

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

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

#### Ambient Conditions:

Temperature: 21 °C

Rel. Humidity: 42 %

#### Summary of Results

Run #1	TX Mode	Channel	Power Setting	Pass/Fail	Result / Margin
1a	802.11 n20	36	-	Pass	49.8dB $\mu$ V/m @ 5149.6MHz (-4.2dB)
1b	802.11 n20	60	-	Pass	51.1dB $\mu$ V/m @ 5350.2MHz (-2.9dB)
1c	802.11 n20	64	-	Pass	53.0dB $\mu$ V/m @ 5350.2MHz (-1.0dB)
2a	802.11 n20	100	-	Pass	52.5dB $\mu$ V/m @ 5459.6MHz (-1.5dB)
2b	802.11 n20	140	-	Pass	65.9dB $\mu$ V/m @ 5725.2MHz (-2.4dB)
3	802.11 n20	104	-	Pass	50.1dB $\mu$ V/m @ 5442.0MHz (-3.9dB)

#### 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.

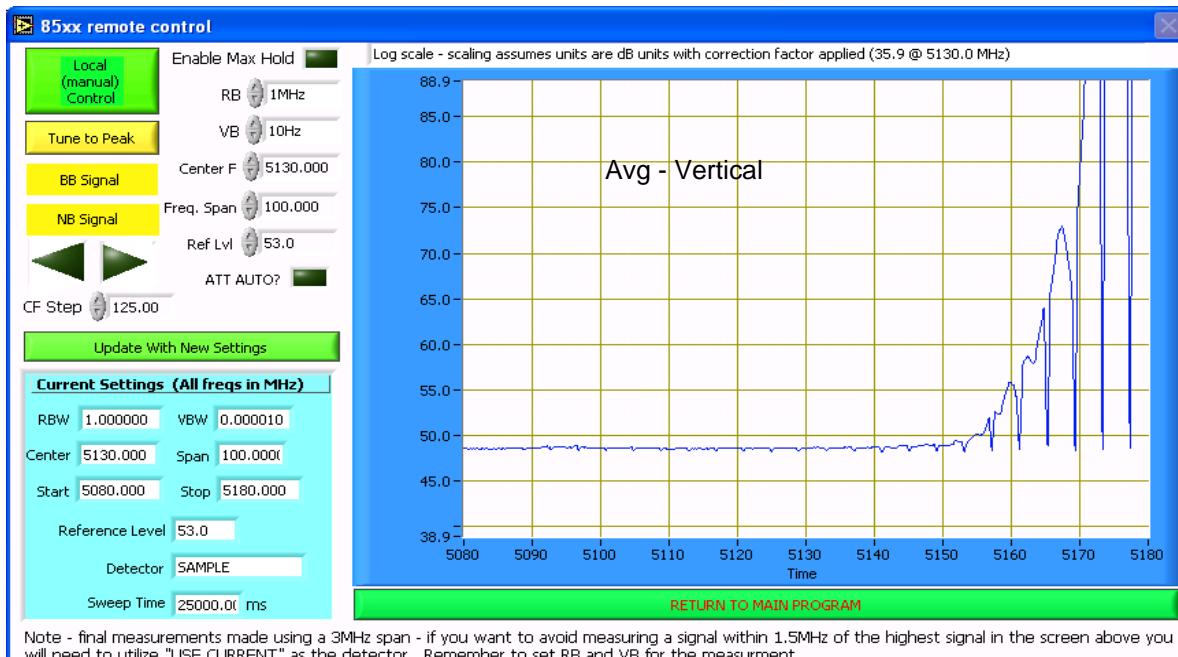
Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

**Run #1a: Radiated Spurious Emissions, Channel @ 5180 MHz**
**Fundamental Signal Field Strength:** Peak and average values measured in 1 MHz, and peak value measured in 100kHz

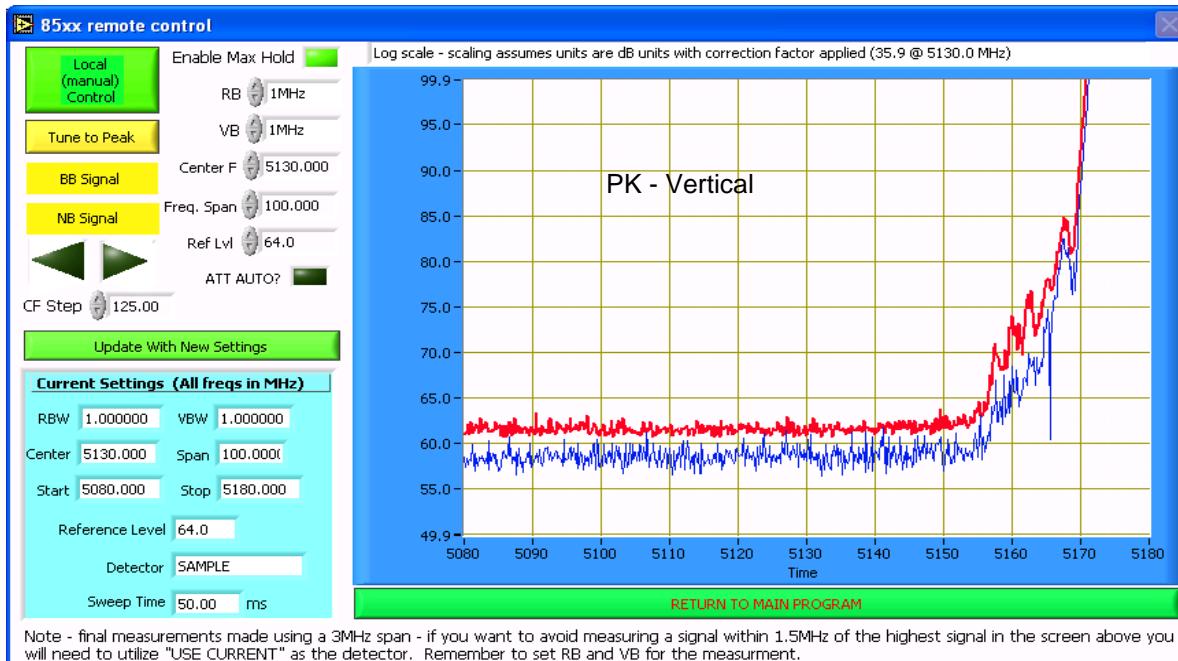
Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
5179.310	99.0	V	-	-	AVG	351	1.0
5179.310	108.2	V	-	-	PK	351	1.0
5178.850	97.7	H	-	-	AVG	278	1.0
5178.850	107.2	H	-	-	PK	278	1.0

**Band Edge Signal Radiated Field Strength at 5150 MHz**

Frequency	Level	Pol	15.209 / 15E	Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
5149.620	49.8	V	54.0	-4.2	AVG	348	1.0
5149.750	61.9	V	74.0	-12.1	PK	349	1.0
5149.550	49.0	H	54.0	-5.0	AVG	278	1.0
5149.630	61.4	H	74.0	-12.6	PK	278	1.0



Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:		Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A



### Run #1b: Radiated Spurious Emissions, Channel @ 5300 MHz

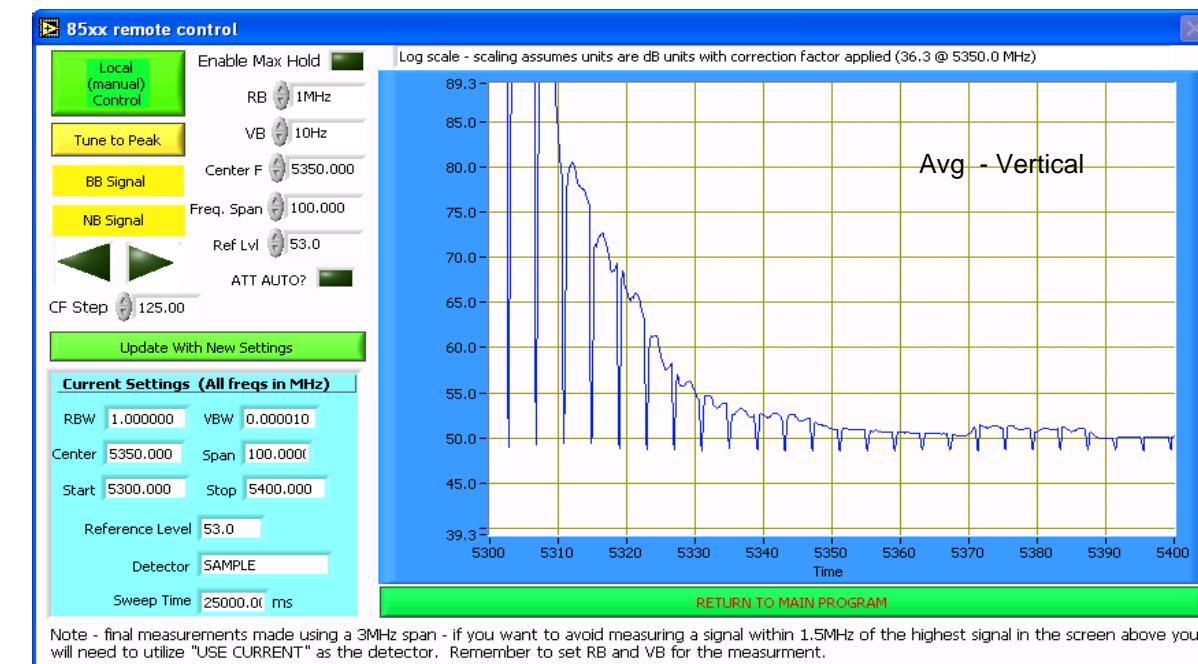
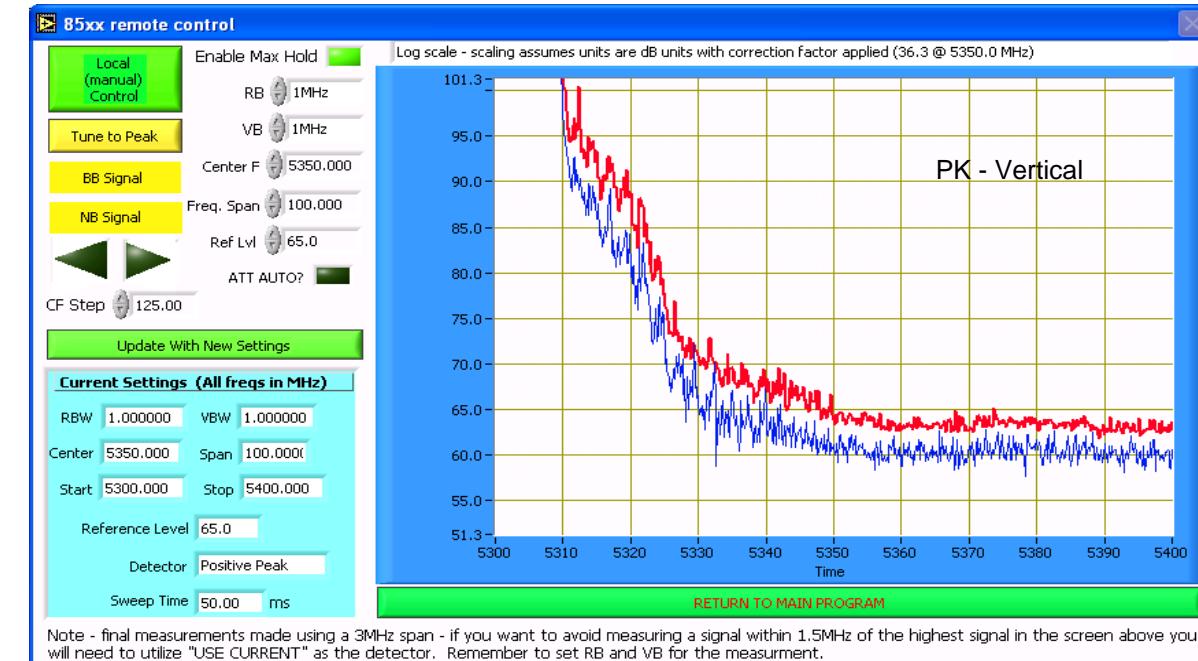
**Fundamental Signal Field Strength:** Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5301.400	106.4	V	-	-	AVG	267	1.0	
5301.400	115.0	V	-	-	PK	267	1.0	
5298.700	103.7	H	-	-	AVG	309	1.0	
5298.700	113.0	H	-	-	PK	309	1.0	

### Band Edge Signal Radiated Field Strength at 5350 MHz

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.160	51.1	V	54.0	-2.9	AVG	264	1.0	
5350.260	64.3	V	74.0	-9.7	PK	272	1.0	
5350.150	49.9	H	54.0	-4.1	AVG	287	1.0	
5350.290	63.7	H	74.0	-10.3	PK	294	1.0	

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A



Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

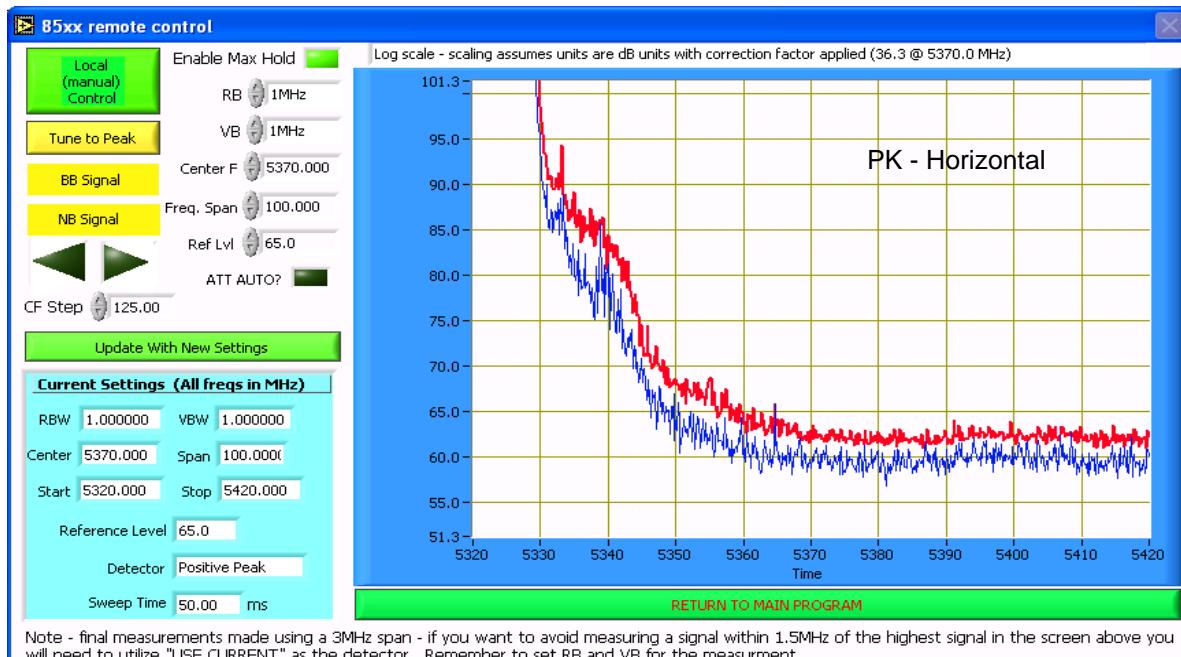
Run #1c: Radiated Spurious Emissions, High Channel @ 5320 MHz

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

Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
5319.410	102.8	V	-	-	AVG	350	1.0
5319.410	112.6	V	-	-	PK	350	1.0
5318.520	104.0	H	-	-	AVG	285	1.0
5318.520	113.4	H	-	-	PK	285	1.0

**Band Edge Signal Radiated Field Strength at 5350 MHz**

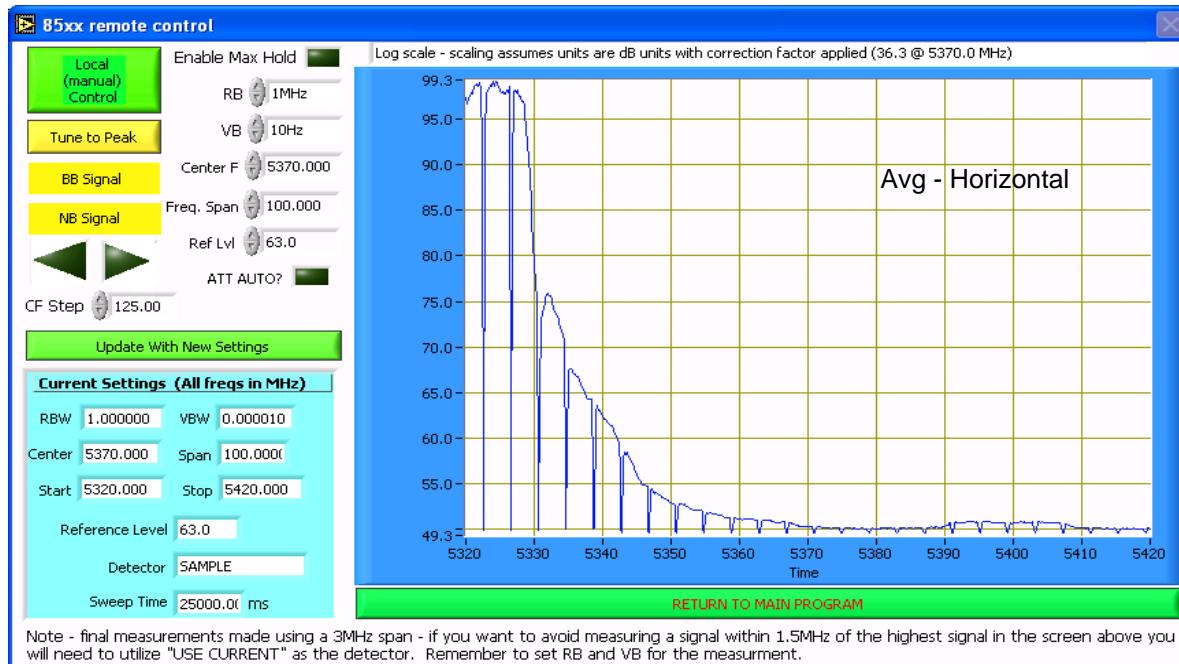
Frequency	Level	Pol	15.209 / 15E	Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
5350.150	53.0	H	54.0	-1.0	AVG	291	1.0
5350.150	69.1	H	74.0	-4.9	PK	291	1.0
5350.200	52.8	V	54.0	-1.2	AVG	358	1.0
5350.220	66.6	V	74.0	-7.4	PK	357	1.0





## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A



## Run #2a: Radiated Spurious Emissions, Channel @ 5500 MHz

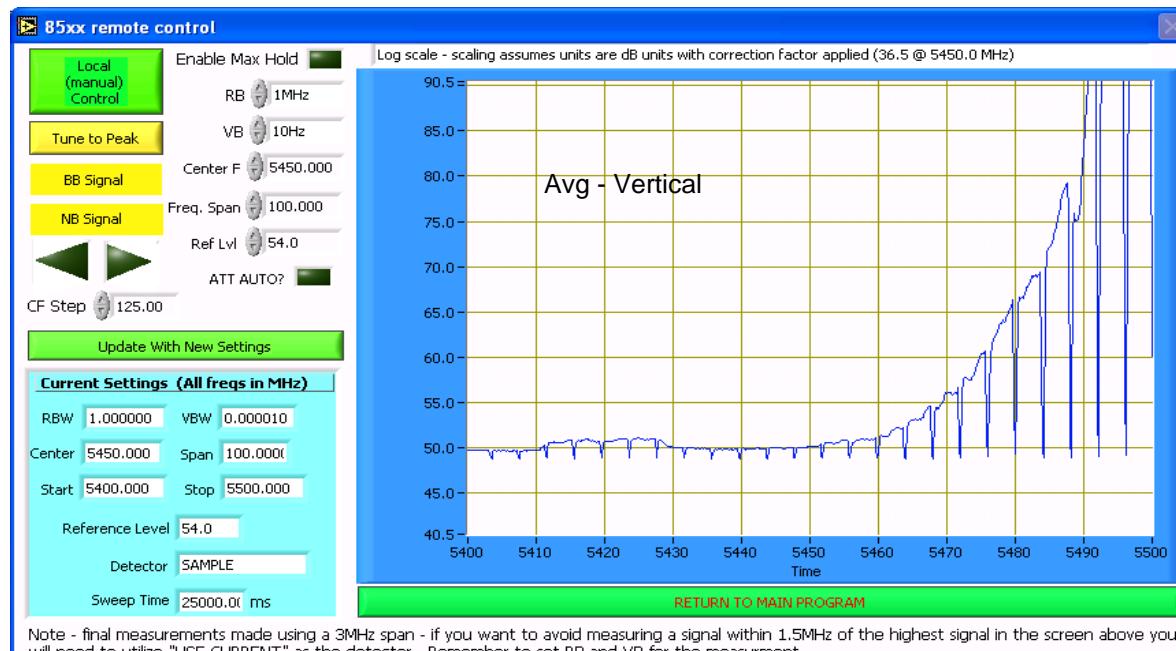
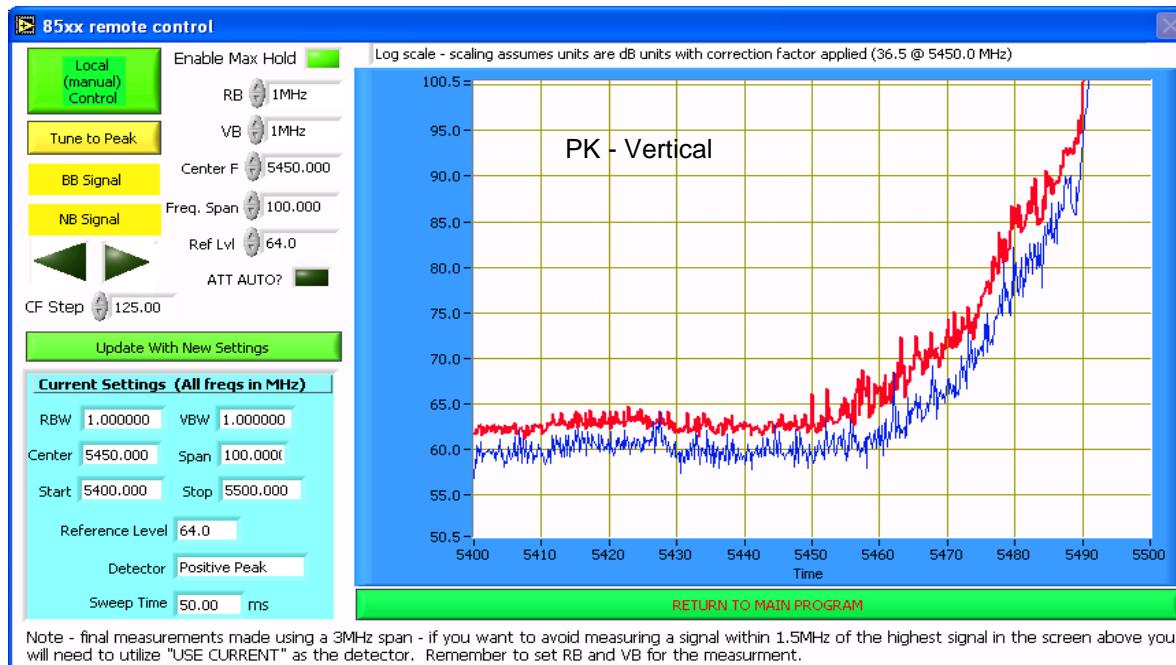
**Fundamental Signal Field Strength:** Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5499.120	105.7	V	-	-	AVG	354	1.0	
5499.120	114.2	V	-	-	PK	354	1.0	
5498.870	102.7	H	-	-	AVG	71	1.0	
5498.870	111.9	H	-	-	PK	71	1.0	

## Band Edge Signal Radiated Field Strength at 5460 MHz

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.580	52.5	V	54.0	-1.5	AVG	347	1.3	
5459.660	70.5	V	74.0	-3.5	PK	349	1.3	
5459.560	51.2	H	54.0	-2.8	AVG	87	1.0	
5459.560	68.6	H	74.0	-5.4	PK	94	1.0	

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A



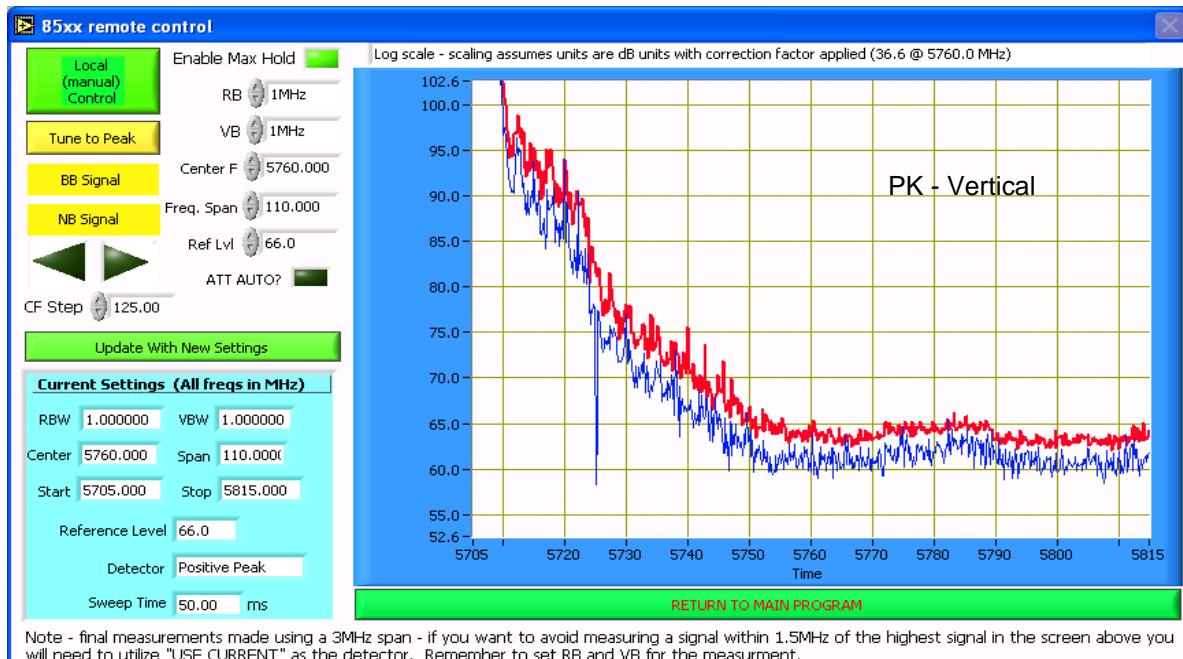
Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

**Run #2b: Radiated Spurious Emissions, Channel @ 5700 MHz**
**Fundamental Signal Field Strength:** Peak and average values measured in 1 MHz, and peak value measured in 100kHz

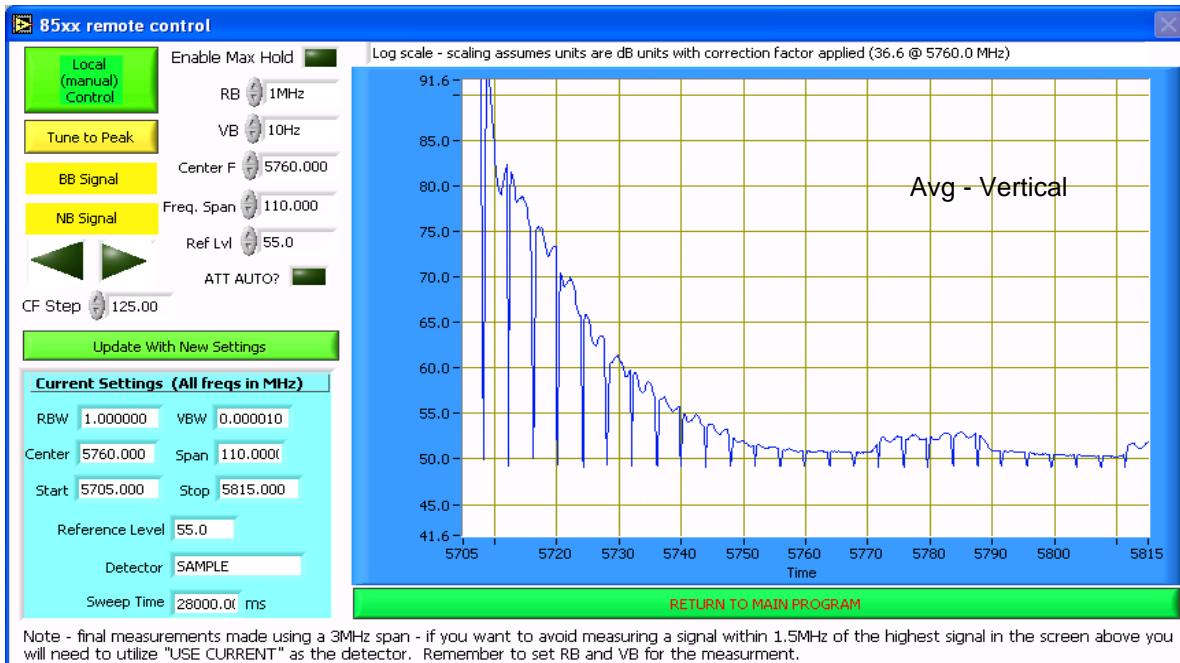
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5701.470	106.3	V	-	-	AVG	300	1.0	
5701.470	114.9	V	-	-	PK	300	1.0	
5701.160	104.7	H	-	-	AVG	91	1.0	
5701.160	114.3	H	-	-	PK	91	1.0	

**Band Edge Signal Radiated Field Strength at 5725 MHz**

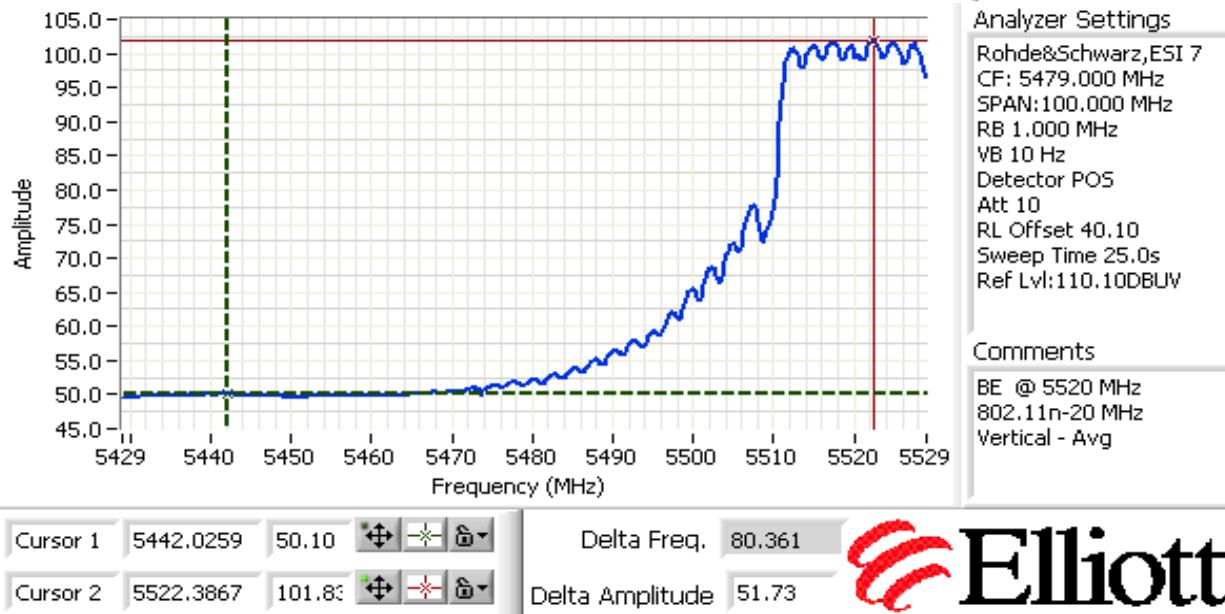
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5725.160	65.9	V	68.3	-2.4	AVG	304	1.0	
5725.320	81.2	V	88.3	-7.1	PK	305	1.1	
5725.150	62.3	H	68.3	-6.0	AVG	77	1.0	
5725.450	79.1	H	88.3	-9.2	PK	80	1.0	



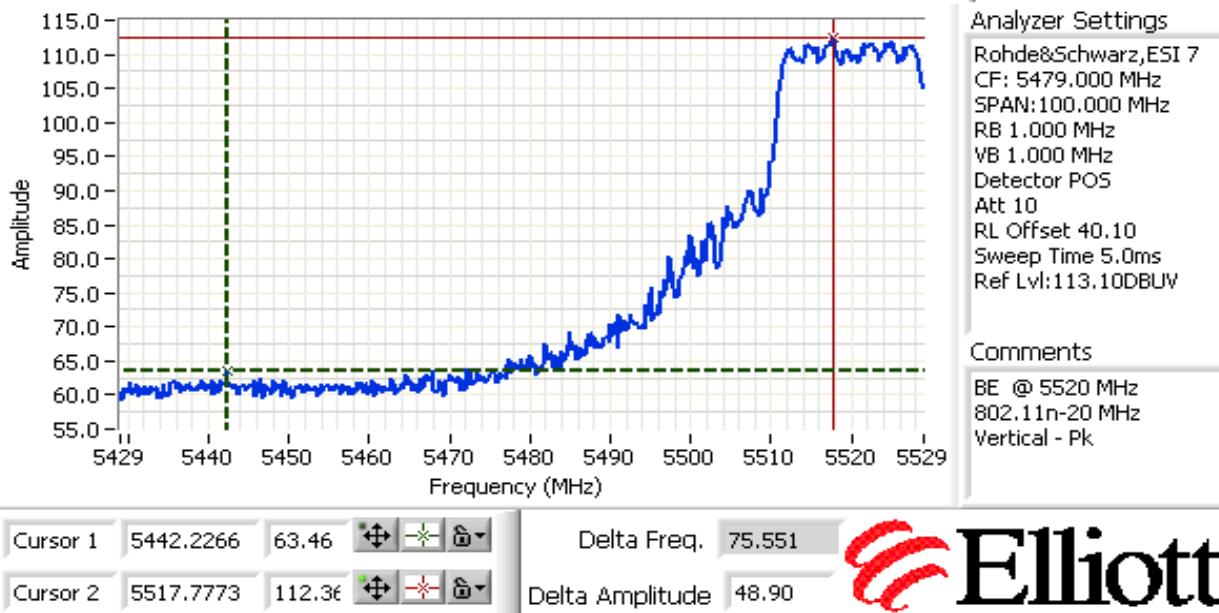
Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A



Run #3: Radiated Spurious Emissions. Operation in the 5470-5725 MHz Band  
Channel 104 @ 5520 MHz

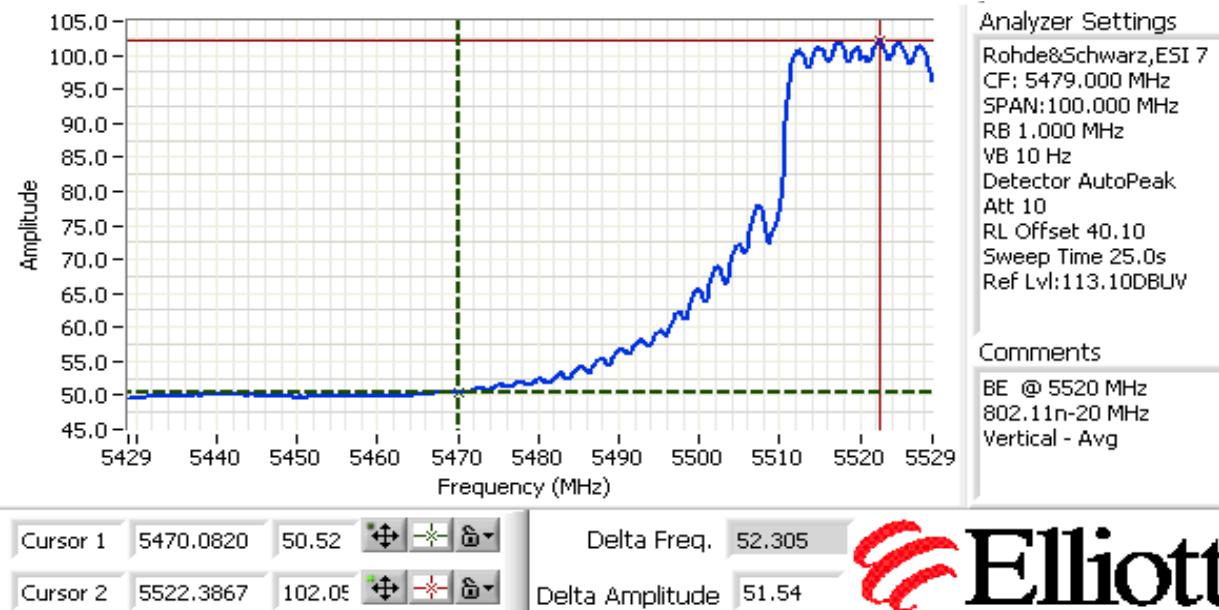


Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

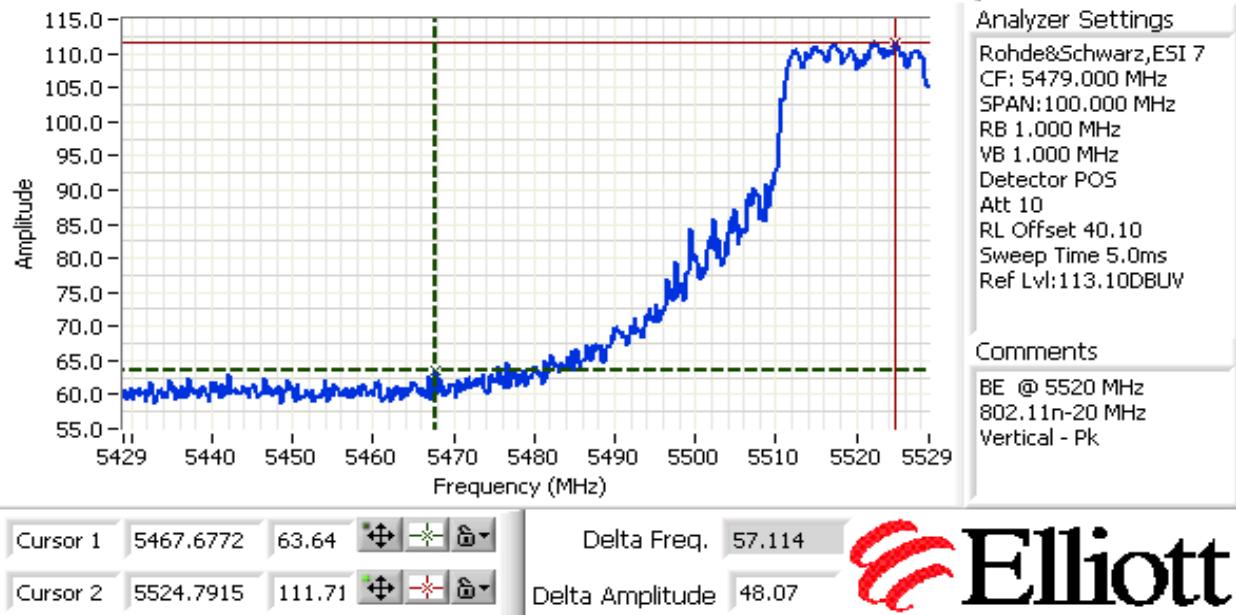


#### 5460 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5442.026	50.1	V	54.0	-3.9	AVG	233	1.0	RB 1.000 MHz; VB: 10 Hz
5442.226	63.5	V	74.0	-10.5	PK	233	1.0	RB 1.000 MHz; VB: 1.000 MHz



Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A



#### 5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209	Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
5470.082	50.5	V	68.3	-17.8	AVG	233	1.0
5467.677	63.6	V	88.3	-24.7	PK	233	1.0



## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

### RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions

#### Test Specific Details

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

Config. Used: 1  
Config Change: None  
EUT Voltage: Powered From Host System

#### General Test Configuration

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

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

Ambient Conditions: Temperature: 21.5 °C  
Rel. Humidity: 49 %

#### Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1	802.11n20 Chain A	36 5180 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	43.5dB $\mu$ V/m @ 1500.5MHz (-10.5dB)
	802.11n20 Chain A	40 5200 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	42.9dB $\mu$ V/m @ 1500.6MHz (-11.1dB)
	802.11n20 Chain A	48 5240 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	41.9dB $\mu$ V/m @ 1500.6MHz (-12.1dB)
2	802.11n20 Chain A	60 5300 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.5dB $\mu$ V/m @ 5459.9MHz (-0.5dB)
	802.11n20 Chain A	64 5320 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	50.0dB $\mu$ V/m @ 5439.8MHz (-4.0dB)
3	802.11n20 Chain A	100 5500 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	45.5dB $\mu$ V/m @ 1500.6MHz (-8.5dB)
	802.11n20 Chain A	120 5600 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	43.2dB $\mu$ V/m @ 1500.7MHz (-10.8dB)
	802.11n20 Chain A	140 5700 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	44.5dB $\mu$ V/m @ 1500.7MHz (-9.5dB)
Remeasured on 7/28/08							
4	802.11n20 Chain A	52 5260 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	45.7dB $\mu$ V/m @ 15786.4MHz (-8.3dB)

NOTE: Preliminary testing showed no emissions above 18GHz. Only final data below 18GHz is presented.

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

### Modifications Made During Testing

No modifications were made to the EUT during testing

### Deviations From The Standard

No deviations were made from the requirements of the standard.

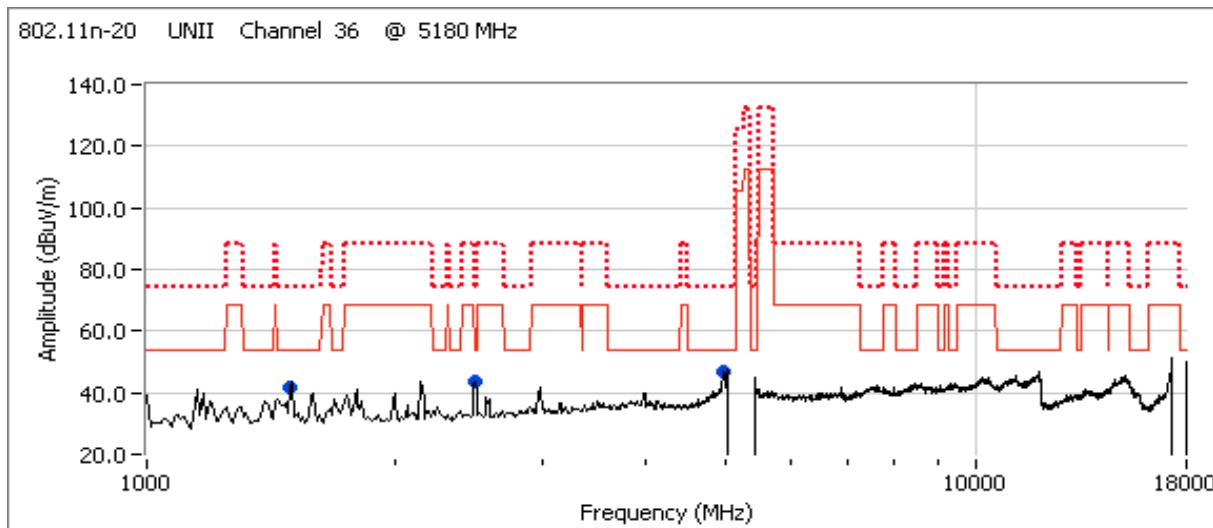
Date of Test: 7/16/2008 23:30

Test Engineer: Ben Jing

Test Location: Fremont Chamber # 4

### Run #1, Radiated Spurious Emissions, Operation in the 5180MHz Band

#### Run #1a: Channel 36, 5180MHz



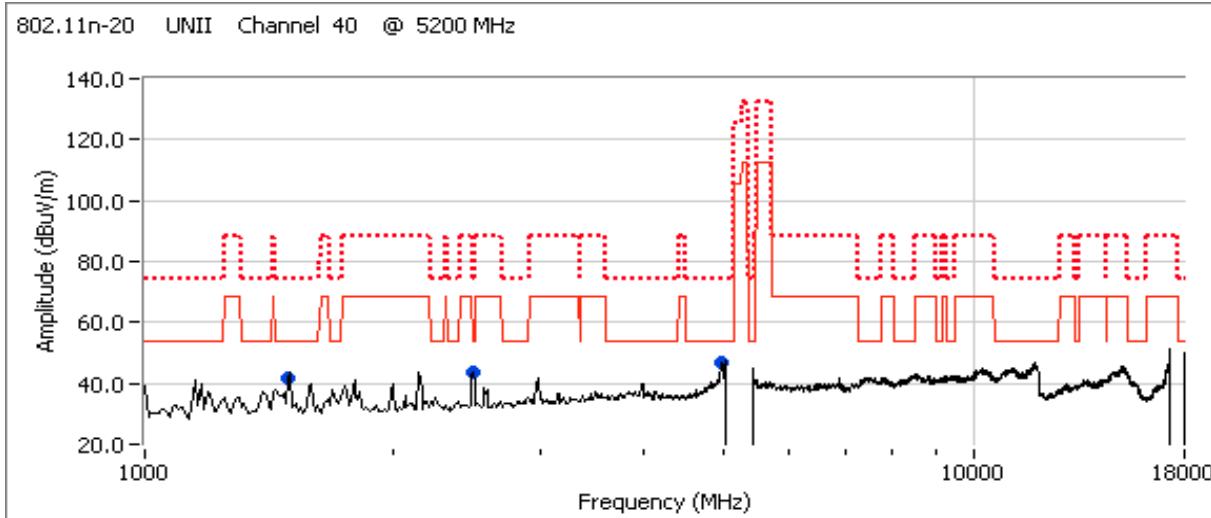
#### Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.490	43.5	V	54.0	-10.5	AVG	187	1.6	
4976.750	41.8	V	54.0	-12.2	AVG	167	1.2	
1500.170	54.9	V	74.0	-19.1	PK	187	1.6	
4976.820	54.8	V	74.0	-19.2	PK	167	1.2	
2489.000	34.3	H	54.0	-19.7	AVG	290	1.6	
2489.360	50.1	H	74.0	-23.9	PK	290	1.6	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the **average** limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #1b: Channel 40 , 5200 MHz


**Spurious Radiated Emissions:**

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.560	42.9	V	54.0	-11.1	AVG	189	1.6	RB 1.000 MHz; VB: 10 Hz
4974.720	41.7	V	54.0	-12.3	AVG	169	1.0	RB 1.000 MHz; VB: 10 Hz
2491.220	36.2	H	54.0	-17.8	AVG	278	1.6	RB 1.000 MHz; VB: 10 Hz
4974.770	55.6	V	74.0	-18.4	PK	169	1.0	RB 1.000 MHz; VB: 1.000 MHz
1500.400	54.9	V	74.0	-19.1	PK	189	1.6	RB 1.000 MHz; VB: 1.000 MHz
2491.000	51.5	H	74.0	-22.5	PK	278	1.6	RB 1.000 MHz; VB: 1.000 MHz

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

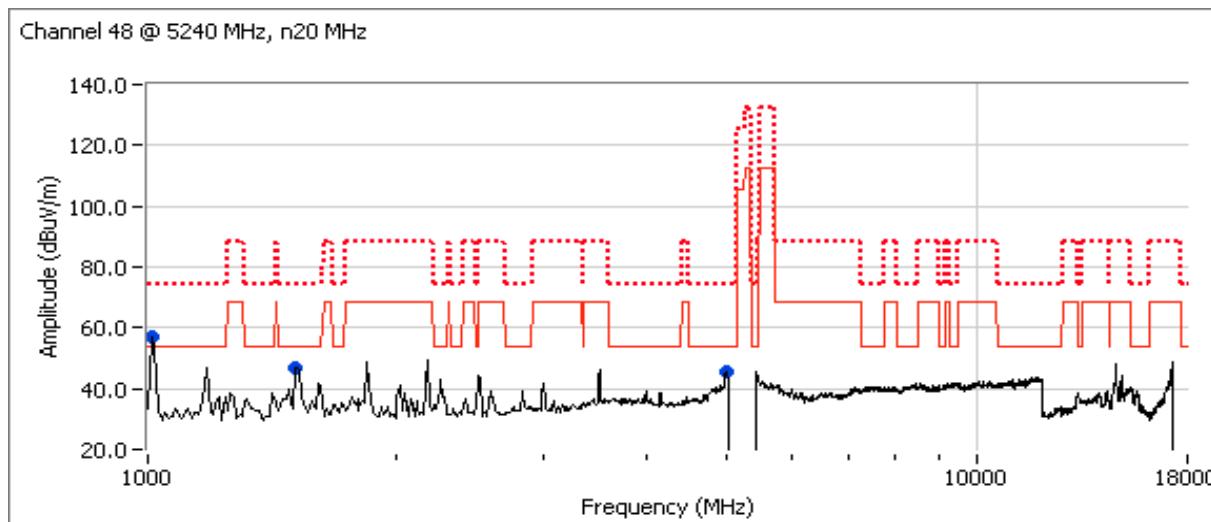
Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

**Run #1, Radiated Spurious Emissions, Operation in the 5150 - 5250 MHz Band**

Date of Test: 7/17/2008 0:00

Test Engineer: Suhaila Khushzad

Test Location: Fremont Chamber # 4

**Run #1c: Channel 48 @ 5240 MHz**

**Spurious Radiated Emissions:**

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.600	41.9	V	54.0	-12.1	AVG	113	1.6	RB 1.000 MHz; VB: 10 Hz
4976.000	40.3	V	54.0	-13.7	AVG	359	1.5	RB 1.000 MHz; VB: 10 Hz
1000.267	38.8	V	54.0	-15.2	AVG	0	1.1	RB 1.000 MHz; VB: 10 Hz
4976.810	53.6	V	74.0	-20.4	PK	359	1.5	RB 1.000 MHz; VB: 1.000 MHz
1501.050	50.9	V	74.0	-23.1	PK	113	1.6	RB 1.000 MHz; VB: 1.000 MHz
999.933	49.3	V	74.0	-24.7	PK	0	1.1	RB 1.000 MHz; VB: 1.000 MHz

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

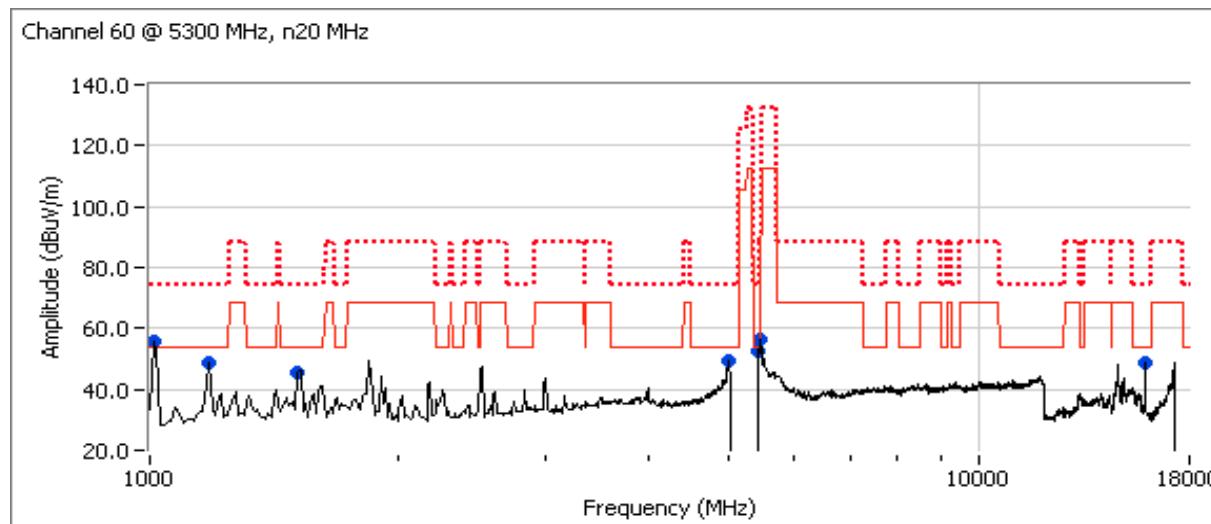
Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

**Run #2, Radiated Spurious Emissions, Operation in the 5250-5350 MHz Band**

Date of Test: 7/17/2008 0:00

Test Engineer: Suhaila Khushzad

Test Location: Fremont Chamber # 4

**Run #2b: Channel 60 @ 5300 MHz**

**Spurious Radiated Emissions:**

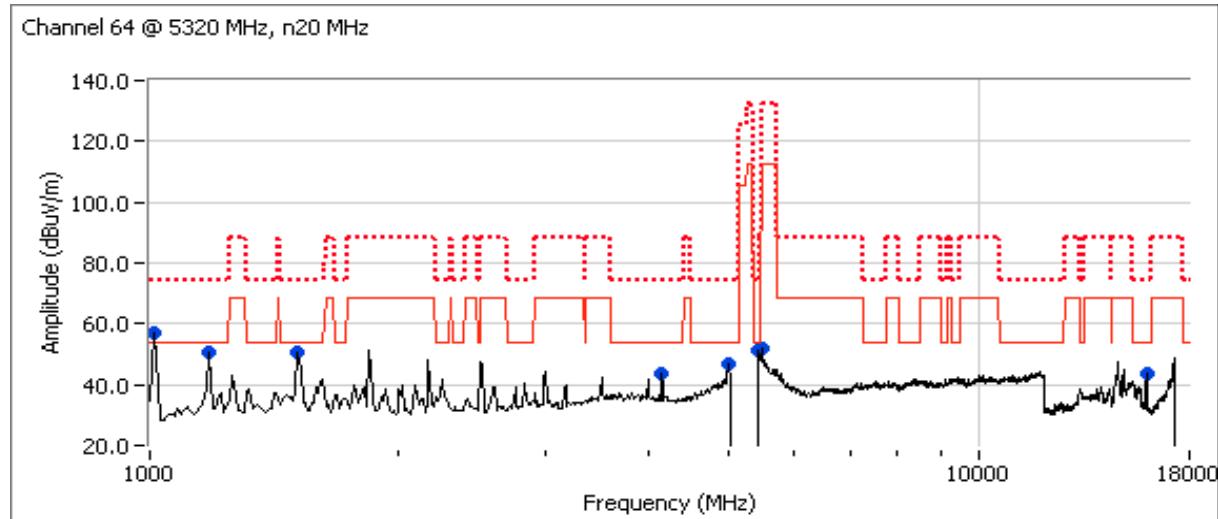
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.920	53.5	V	54.0	-0.5	AVG	162	1.1	RB 1.000 MHz; VB: 10 Hz
5424.680	52.8	V	54.0	-1.2	AVG	163	1.4	RB 1.000 MHz; VB: 10 Hz
5421.610	64.6	V	74.0	-9.4	PK	163	1.4	RB 1.000 MHz; VB: 1.000 MHz
15896.340	44.1	V	54.0	-9.9	AVG	289	1.0	RB 1.000 MHz; VB: 10 Hz
5459.970	61.7	V	74.0	-12.3	PK	162	1.1	RB 1.000 MHz; VB: 1.000 MHz
15899.250	57.4	V	74.0	-16.6	PK	289	1.0	RB 1.000 MHz; VB: 1.000 MHz
1159.600	55.7	V	74.0	-18.3	PK	350	1.0	RB 1.000 MHz; VB: 1.000 MHz
4974.150	35.2	V	54.0	-18.8	AVG	346	1.0	RB 1.000 MHz; VB: 10 Hz
1500.420	31.6	V	54.0	-22.4	AVG	167	2.2	RB 1.000 MHz; VB: 10 Hz
1159.900	30.8	V	54.0	-23.2	AVG	350	1.0	RB 1.000 MHz; VB: 10 Hz
4977.950	47.8	V	74.0	-26.2	PK	346	1.0	RB 1.000 MHz; VB: 1.000 MHz
999.536	25.8	V	54.0	-28.2	AVG	60	1.3	RB 100 kHz; VB: 10 Hz
1498.320	44.6	V	74.0	-29.4	PK	167	2.2	RB 1.000 MHz; VB: 1.000 MHz
999.943	35.6	V	74.0	-38.4	PK	60	1.3	RB 100 kHz; VB: 100 kHz

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

Run #2, Radiated Spurious Emissions. Operation in the 5250-5350 MHz Band

Run #2c: Channel 64 @ 5320 MHz



#### Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5439.820	50.0	V	54.0	-4.0	AVG	167	1.4	RB 1.000 MHz; VB: 10 Hz
1500.700	43.9	V	54.0	-10.1	AVG	360	1.2	RB 1.000 MHz; VB: 10 Hz
4976.440	43.3	V	54.0	-10.7	AVG	359	1.0	RB 1.000 MHz; VB: 10 Hz
5446.700	60.6	V	74.0	-13.4	PK	167	1.4	RB 1.000 MHz; VB: 1.000 MHz
1000.174	39.8	V	54.0	-14.2	AVG	0	1.1	RB 1.000 MHz; VB: 10 Hz
4977.250	57.5	V	74.0	-16.5	PK	359	1.0	RB 1.000 MHz; VB: 1.000 MHz
1500.240	55.5	V	74.0	-18.5	PK	360	1.2	RB 1.000 MHz; VB: 1.000 MHz
4183.850	32.3	V	54.0	-21.7	AVG	262	1.2	RB 1.000 MHz; VB: 10 Hz
1159.120	31.2	V	54.0	-22.8	AVG	12	1.6	RB 1.000 MHz; VB: 10 Hz
1000.227	49.5	V	74.0	-24.5	PK	0	1.1	RB 1.000 MHz; VB: 1.000 MHz
4193.650	43.1	V	74.0	-30.9	PK	262	1.2	RB 1.000 MHz; VB: 1.000 MHz
1170.670	40.0	V	74.0	-34.0	PK	12	1.6	RB 1.000 MHz; VB: 1.000 MHz

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

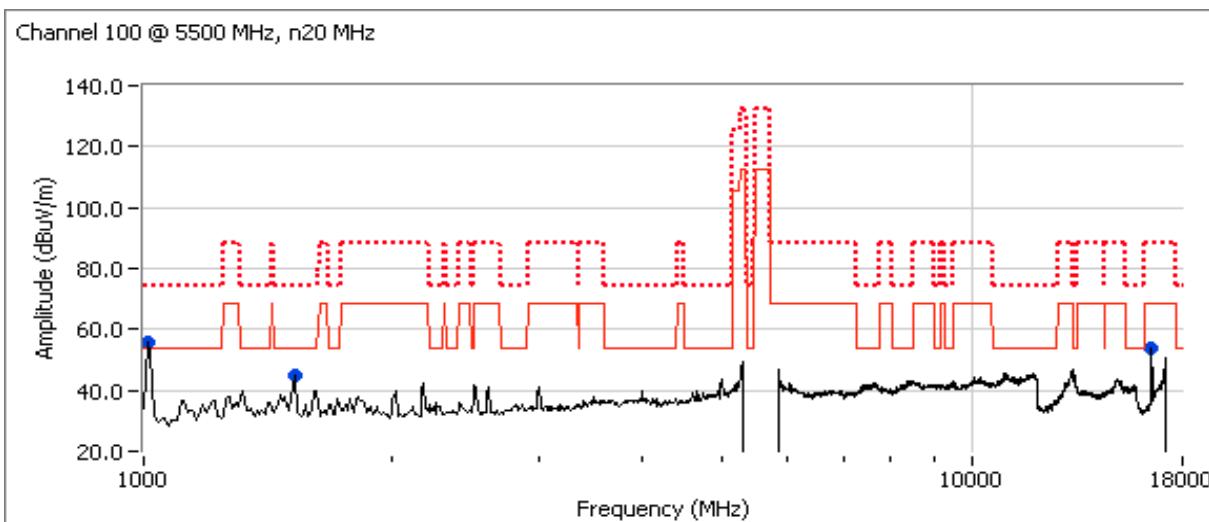
Run #3, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5470-5725 MHz Band

Date of Test: 7/18/2008 0:00

Test Engineer: Suhaila Khushzad

Test Location: Fremont Chamber # 5

Run #3a: Channel 100 @ 5500 MHz



**Spurious Radiated Emissions:**

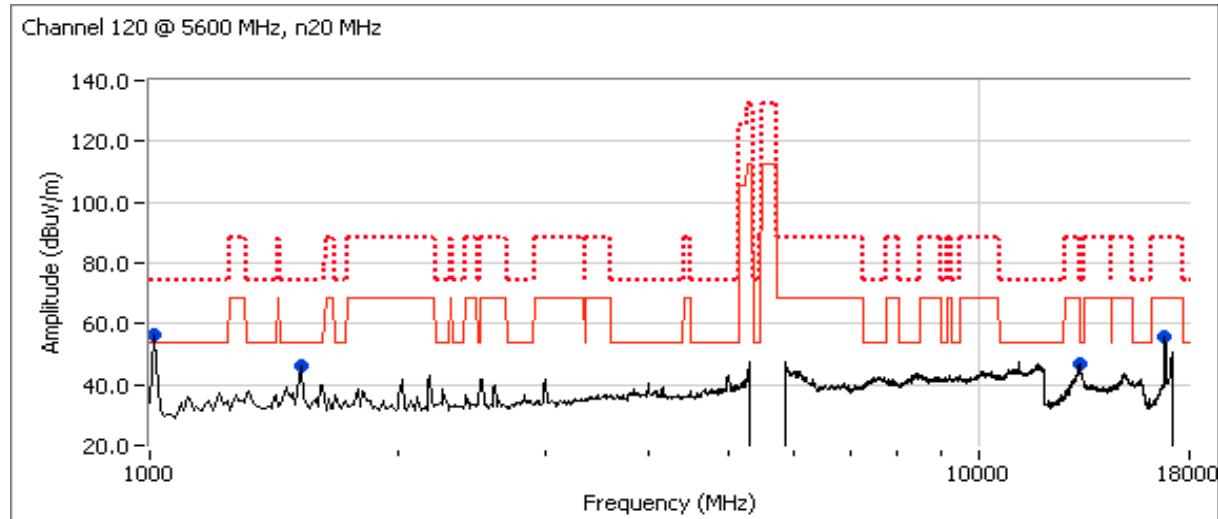
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.570	45.5	V	54.0	-8.5	AVG	89	1.0	RB 1.000 MHz; VB: 10 Hz
999.975	39.4	V	54.0	-14.6	AVG	7	1.1	RB 1.000 MHz; VB: 10 Hz
16501.250	49.8	V	68.3	-18.5	AVG	251	1.0	RB 1.000 MHz; VB: 10 Hz
1500.270	53.2	V	74.0	-20.8	PK	89	1.0	RB 1.000 MHz; VB: 1.000 MHz
1000.158	50.8	V	74.0	-23.2	PK	7	1.1	RB 1.000 MHz; VB: 1.000 MHz
16506.240	63.3	V	88.3	-25.0	PK	251	1.0	RB 1.000 MHz; VB: 1.000 MHz

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dB $\mu$ V/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #3, Radiated Spurious Emissions. Operation in the 5470-5725 MHz Band

Run #3b: Channel 120 @ 5600 MHz


**Spurious Radiated Emissions:**

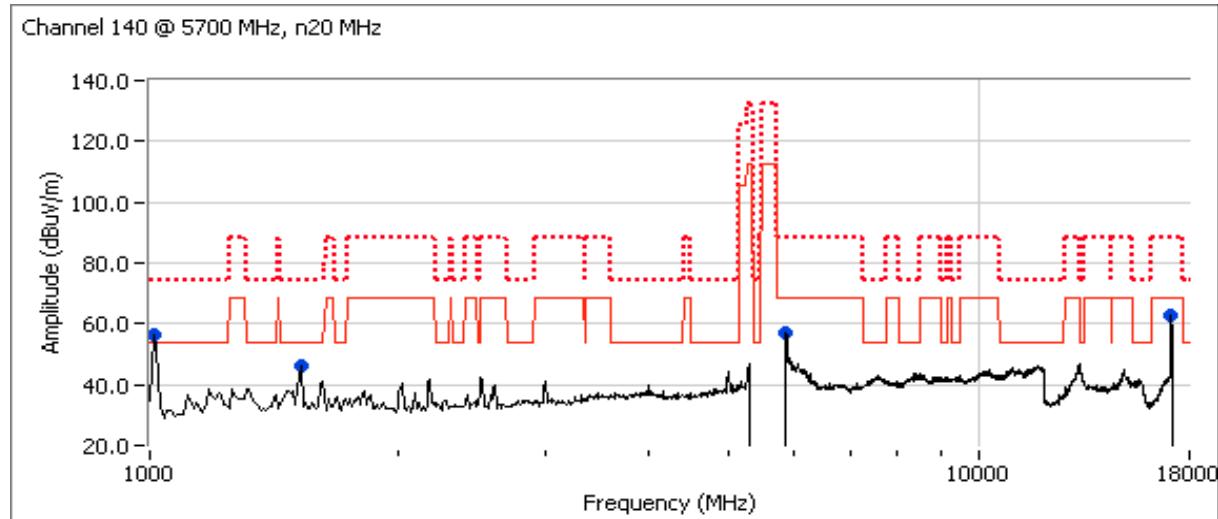
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.700	43.2	V	54.0	-10.8	AVG	95	1.0	RB 1.000 MHz; VB: 10 Hz
1000.291	39.1	V	54.0	-14.9	AVG	0	1.1	RB 1.000 MHz; VB: 10 Hz
16801.160	50.7	H	68.3	-17.6	AVG	262	1.0	RB 1.000 MHz; VB: 10 Hz
1501.100	54.5	V	74.0	-19.5	PK	95	1.0	RB 1.000 MHz; VB: 1.000 MHz
13247.600	46.7	V	68.3	-21.6	Peak	315	1.9	Pk vs avg limit
999.691	49.1	V	74.0	-24.9	PK	0	1.1	RB 1.000 MHz; VB: 1.000 MHz
16806.220	62.7	H	88.3	-25.6	PK	262	1.0	RB 1.000 MHz; VB: 1.000 MHz

**Note 1:** For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dB $\mu$ V/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

Run #3, Radiated Spurious Emissions. Operation in the 5470-5725 MHz Band

Run #3c : Channel 140 , 5700 MHz



**Spurious Radiated Emissions:**

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.670	44.5	V	54.0	-9.5	AVG	94	1.0	RB 1.000 MHz; VB: 10 Hz
17096.590	56.6	V	68.3	-11.7	AVG	250	1.0	RB 1.000 MHz; VB: 10 Hz
5859.910	55.8	V	68.3	-12.5	AVG	150	1.0	RB 1.000 MHz; VB: 10 Hz
1000.474	39.7	V	54.0	-14.3	AVG	0	1.2	RB 1.000 MHz; VB: 10 Hz
1499.890	55.0	V	74.0	-19.0	PK	94	1.0	RB 1.000 MHz; VB: 1.000 MHz
17094.130	68.9	V	88.3	-19.4	PK	250	1.0	RB 1.000 MHz; VB: 1.000 MHz
5860.020	65.1	V	88.3	-23.2	PK	150	1.0	RB 1.000 MHz; VB: 1.000 MHz
1000.133	49.6	V	74.0	-24.4	PK	0	1.2	RB 1.000 MHz; VB: 1.000 MHz

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dB $\mu$ V/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

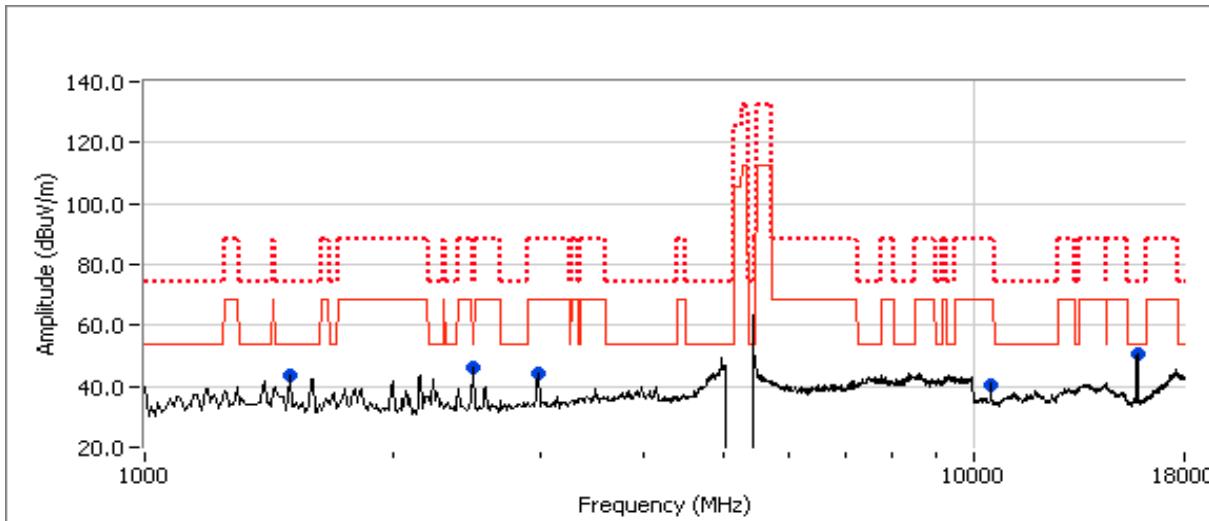
**Run #4, Radiated Spurious Emissions. Operation in the 5250-5350 MHz Band**

Date of Test: 7/28/2008 0:00

Test Engineer: Rafael Varelas

Test Location: Fremont Chamber # 5

Channel 52 @ 5260 MHz


**Spurious Radiated Emissions:**

Note: If device is not for indoor use only then measure 5250 MHz band edge to comply with -68.3dBuV/m limit

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
15786.420	45.7	V	54.0	-8.3	AVG	93	1.1	RB 1.000 MHz; VB: 10 Hz
1500.750	43.2	V	54.0	-10.8	AVG	161	1.3	RB 1.000 MHz; VB: 10 Hz
15786.250	58.1	V	74.0	-15.9	PK	93	1.1	RB 1.000 MHz; VB: 1.000 MHz
2488.440	36.5	V	54.0	-17.5	AVG	113	1.0	RB 1.000 MHz; VB: 10 Hz
1499.850	53.4	V	74.0	-20.6	PK	161	1.3	RB 1.000 MHz; VB: 1.000 MHz
2487.830	51.2	V	74.0	-22.8	PK	113	1.0	RB 1.000 MHz; VB: 1.000 MHz
2989.170	44.0	V	68.3	-24.3	Peak	159	1.6	
10520.000	40.6	V	68.3	-27.7	Peak	272	1.0	

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

## RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions

### Test Specific Details

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

### General Test Configuration

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

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

**Ambient Conditions:** Temperature: 23 °C  
Rel. Humidity: 45 %

### Summary of Results

Run #1	TX Mode	Channel	Power Setting	Pass/Fail	Result / Margin
1a	802.11n (n40 MHz)	38 5190 MHz	-	Pass	53.8dB $\mu$ V/m @ 5150.0MHz (-0.2dB)
2a	802.11n (n40 MHz)	54 5270 MHz	-	Pass	52.7dB $\mu$ V/m @ 5350.0MHz (-1.3dB)
2b	802.11n (n40 MHz)	62 5310 MHz	-	Pass	53.9dB $\mu$ V/m @ 5350.5MHz (-0.1dB)
3a	802.11n (n40 MHz)	102 5510 MHz	-	Pass	53dB $\mu$ V/m @ 5459.9MHz (-1.0dB)
3b	802.11n (n40 MHz)	110 5550 MHz	-	Pass	53.6dB $\mu$ V/m @ 5457.7MHz (-0.4dB)
3c	802.11n (n40 MHz)	134 5670 MHz	-	Pass	66dB $\mu$ V/m @ 5725.0MHz (-2.3dB)
4	802.11n (n40 MHz)	46 5230 MHz	-	Pass	48.0dB $\mu$ V/m @ 5132.2MHz (-6.0dB)

### Modifications Made During Testing

No modifications were made to the EUT during testing

### Deviations From The Standard

No deviations were made from the requirements of the standard.



## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Date of Test: 7/9/2008 0:00

Config. Used: 1

Test Engineer: Suhaila Khushzad

Config Change: None

Test Location: Chamber # 4

EUT Voltage: Powered From Host System

### Run #1a: Radiated Spurious Emissions. Low Channel @ 5190 MHz, n40MHz

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

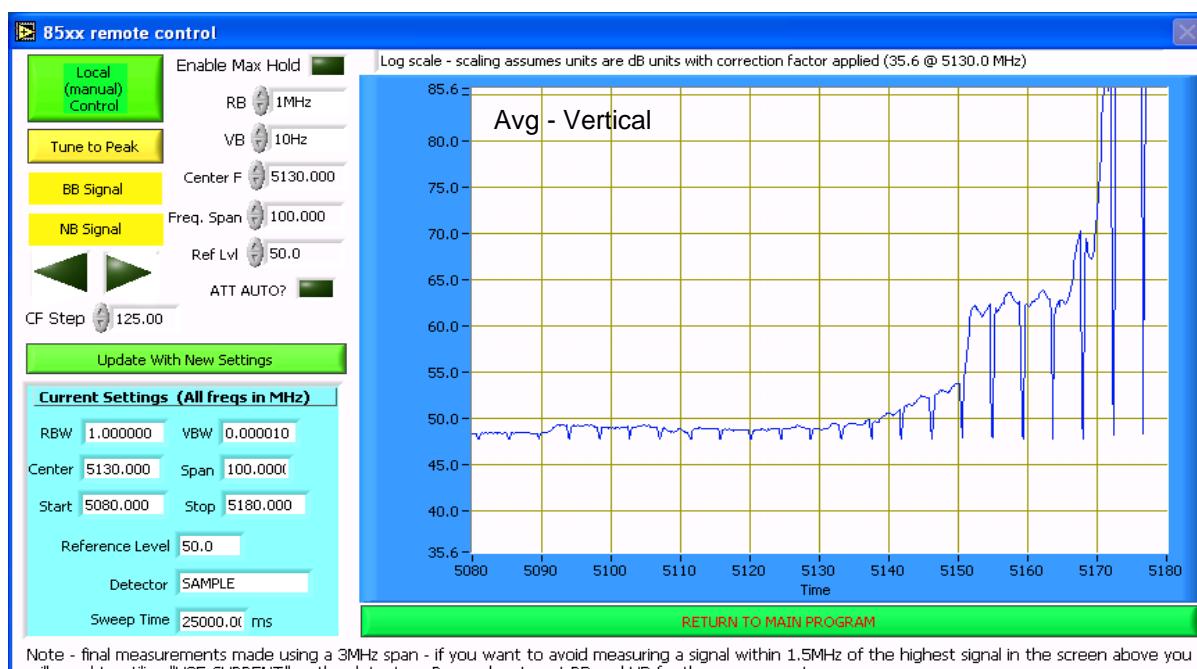
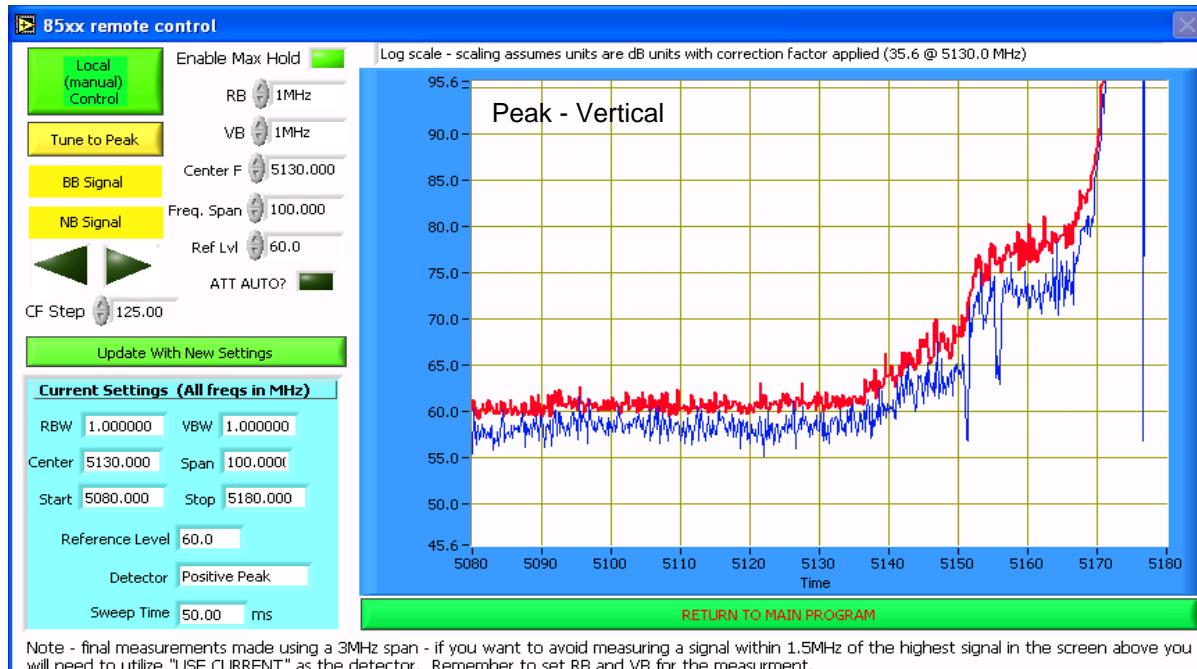
Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
5184.750	99.0	V	-	-	AVG	310	1.2
5184.750	107.0	V	-	-	PK	310	1.2
5194.780	97.0	H	-	-	AVG	263	1.0
5194.780	106.8	H	-	-	PK	263	1.0

#### Band Edge Signal Radiated Field Strength at 5150 MHz

Frequency	Level	Pol	15.209 / 15E	Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
5150.000	53.8	V	54.0	-0.2	AVG	310	1.2
5147.040	71.7	V	74.0	-2.3	PK	310	1.2
5149.250	53.8	H	54.0	-0.2	AVG	263	1.0
5149.040	71.6	H	74.0	-2.4	PK	263	1.0

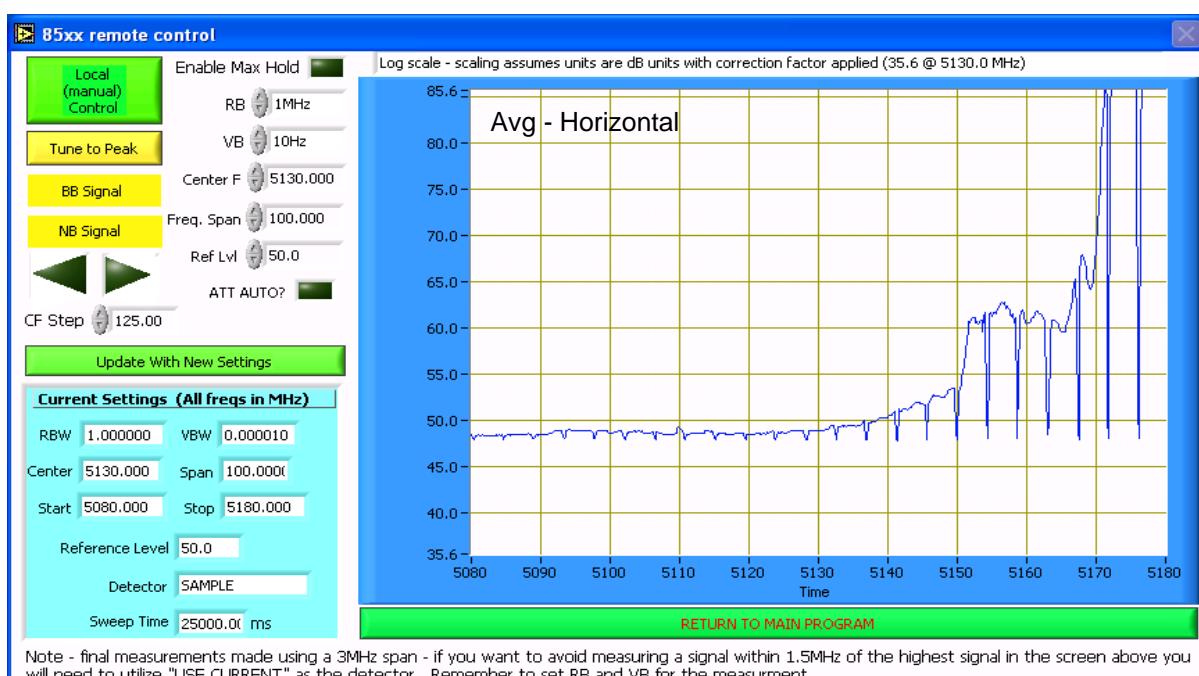
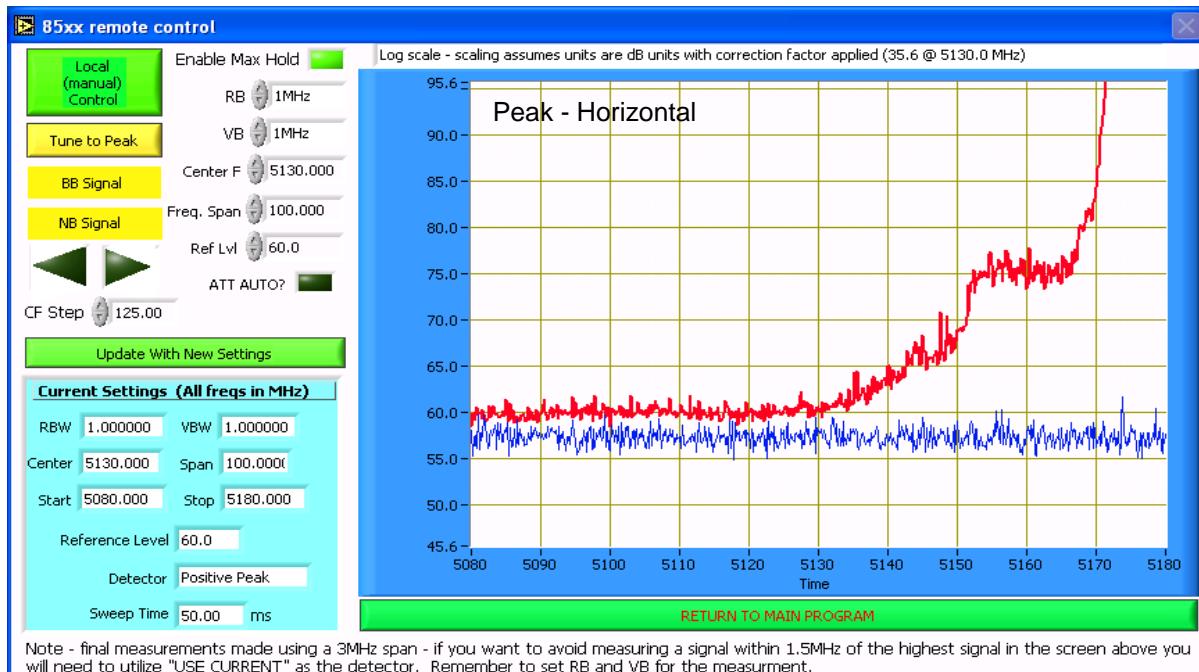
Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #1a: Radiated Spurious Emissions. Low Channel @ 5190 MHz, n40MHz



Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #1a: Radiated Spurious Emissions. Low Channel @ 5190 MHz, n40MHz





## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #2a: Radiated Spurious Emissions. High Channel @ 5270 MHz, n40MHz

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

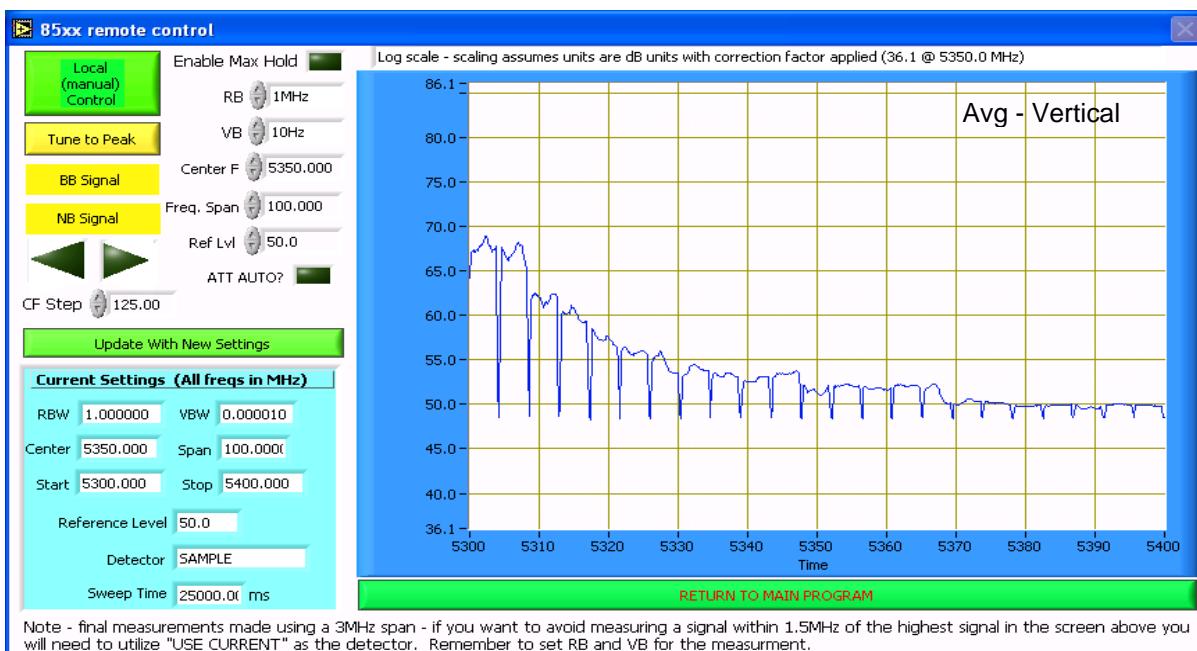
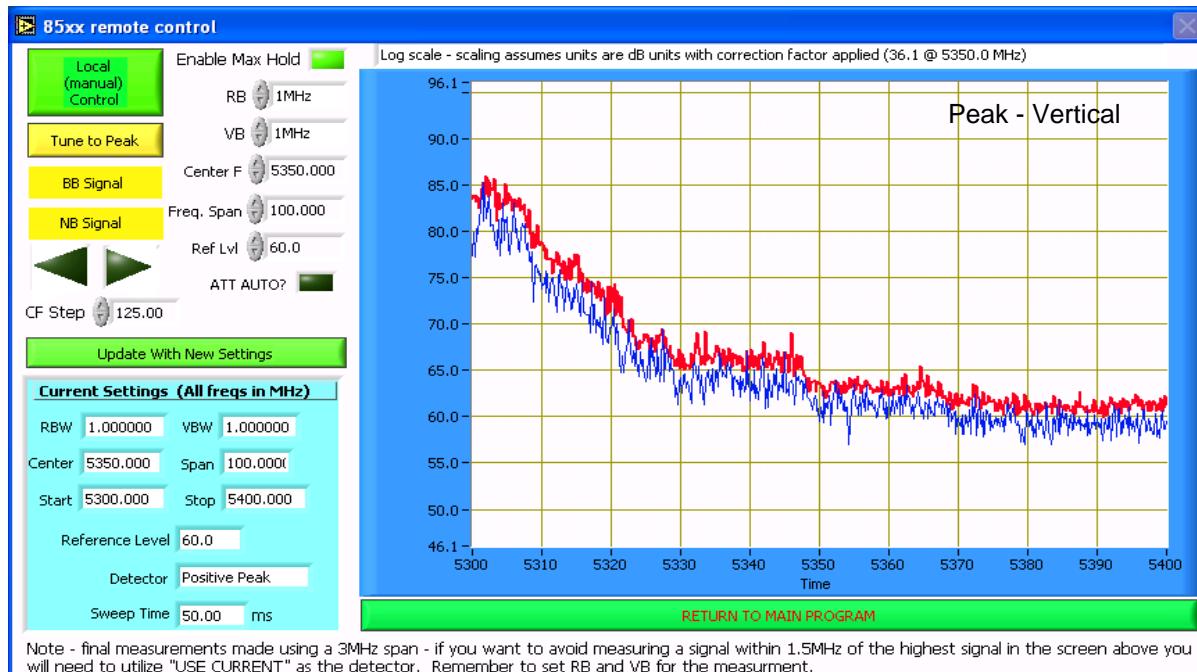
Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
5275.250	101.9	V	-	-	AVG	349	1.0
5275.250	112.3	V	-	-	PK	349	1.0
5265.170	100.8	H	-	-	AVG	272	1.0
5265.170	110.6	H	-	-	PK	272	1.0

**Band Edge Signal Radiated Field Strength at 5350 MHz**

Frequency	Level	Pol	15.209 / 15E	Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
5350.010	52.7	H	54.0	-1.3	AVG	272	1.0
5352.680	65.7	H	74.0	-8.3	PK	272	1.0
5352.520	52.4	V	54.0	-1.6	AVG	349	1.0
5352.560	65.8	V	74.0	-8.2	PK	349	1.0

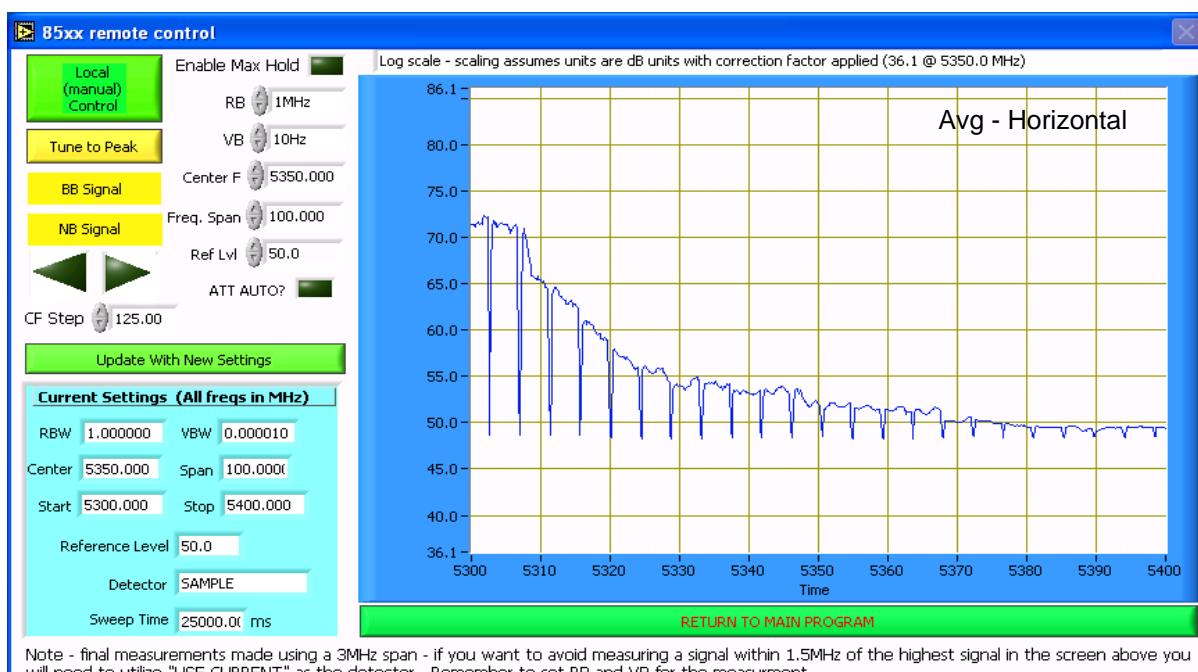
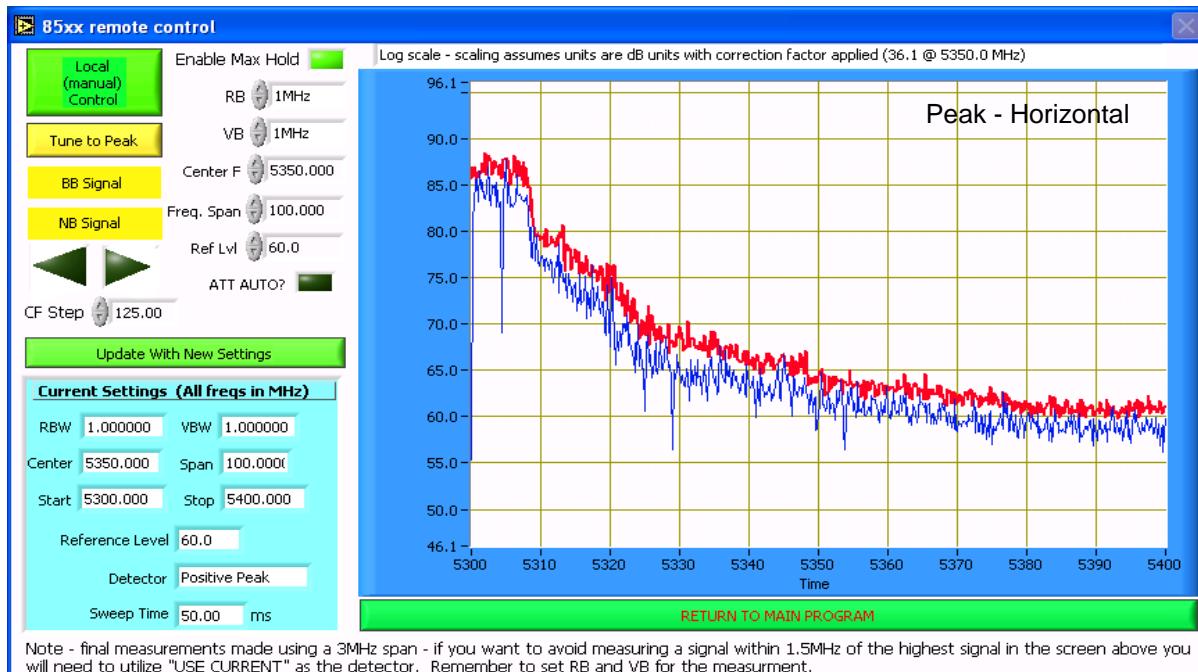
Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #2a: Radiated Spurious Emissions. High Channel @ 5270 MHz, n40MHz



Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #2a: Radiated Spurious Emissions. High Channel @ 5270 MHz, n40MHz





## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #2b: Radiated Spurious Emissions. High Channel @ 5310 MHz, n40MHz

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

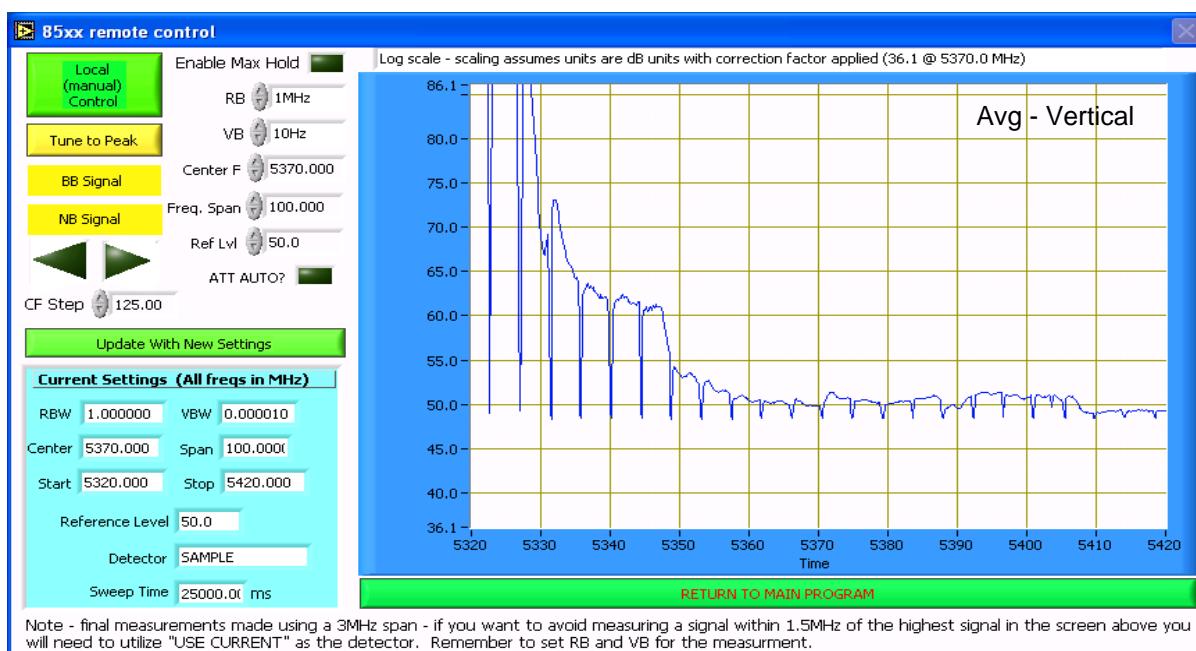
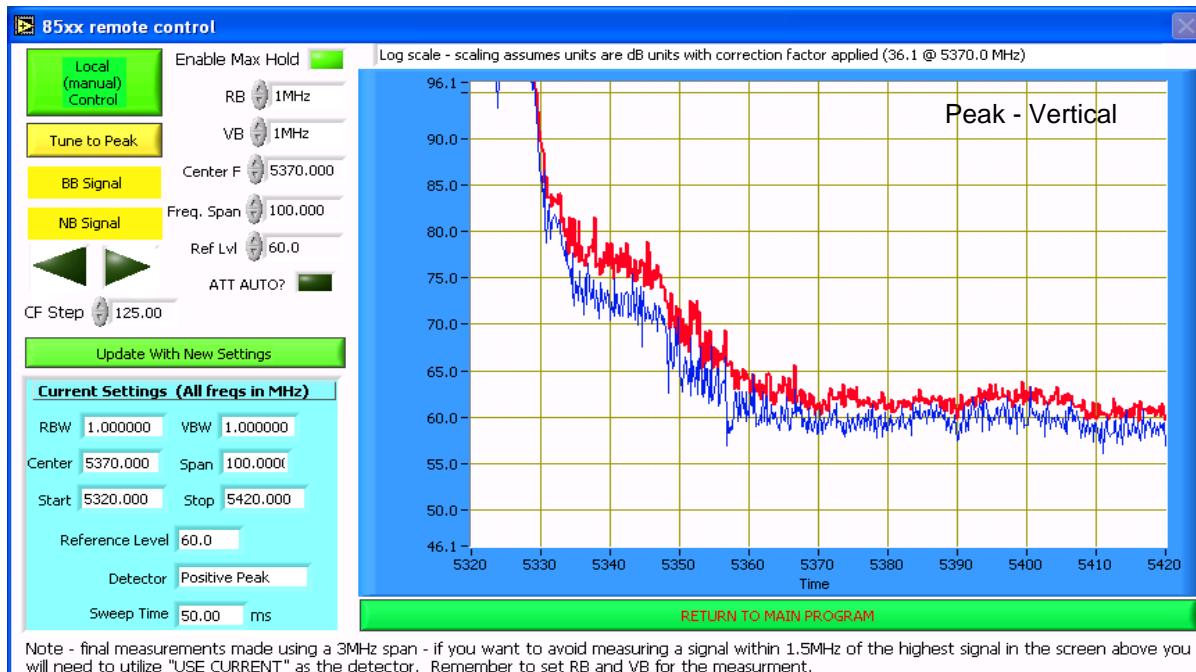
Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
5315.250	100.0	V	-	-	AVG	349	1.0
5315.250	109.6	V	-	-	PK	349	1.0
5315.600	96.3	H	-	-	AVG	103	1.0
5315.600	107.6	H	-	-	PK	103	1.0

**Band Edge Signal Radiated Field Strength at 5350 MHz**

Frequency	Level	Pol	15.209 / 15E	Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
5350.540	53.9	H	54.0	-0.1	AVG	103	1.0
5350.180	72.6	H	74.0	-1.4	PK	103	1.0
5350.040	53.8	V	54.0	-0.2	AVG	349	1.0
5351.400	73.6	V	74.0	-0.4	PK	349	1.0

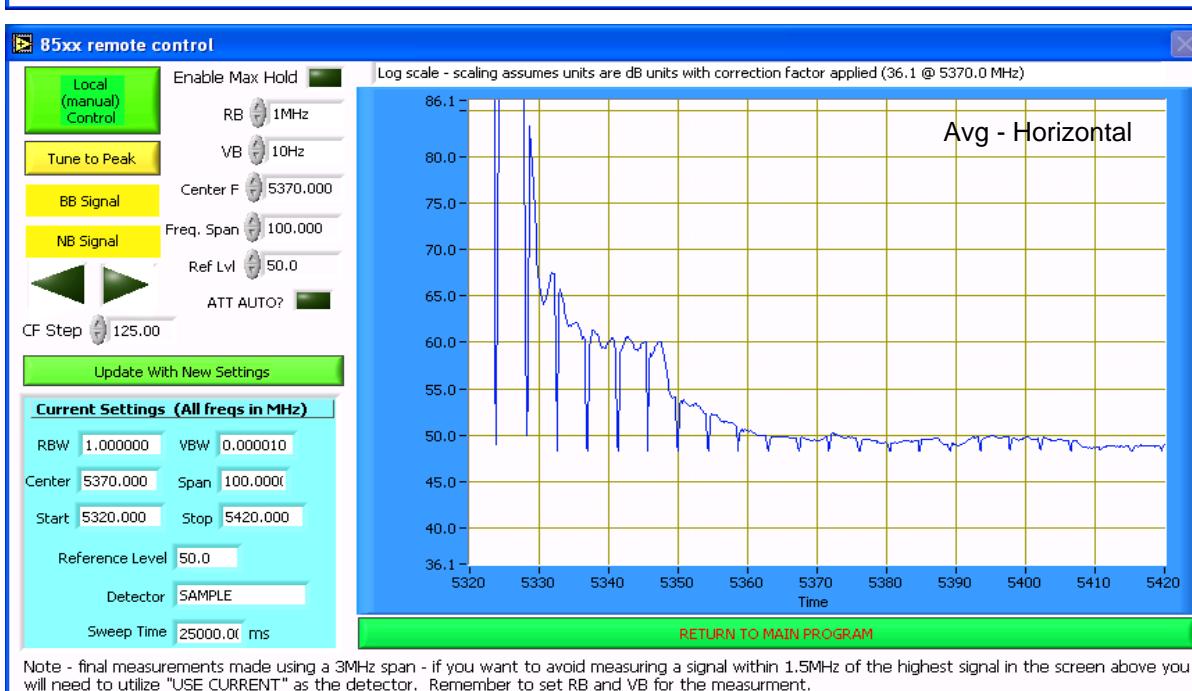
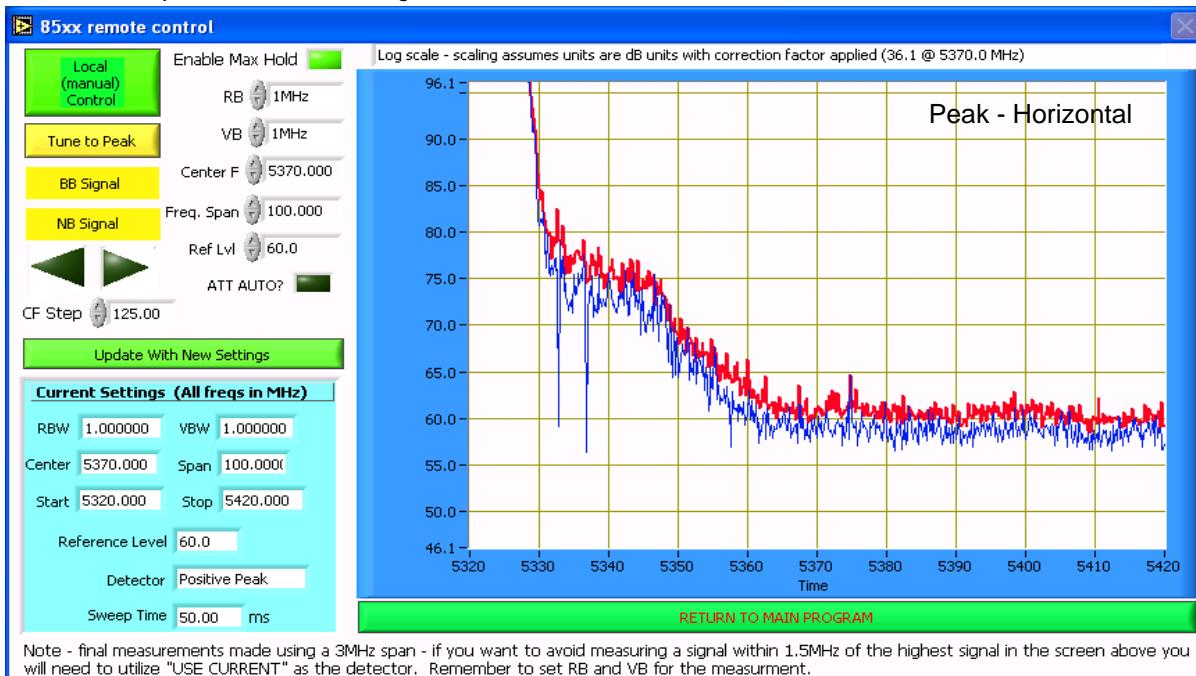
Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #2b: Radiated Spurious Emissions. High Channel @ 5310 MHz, n40MHz



Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

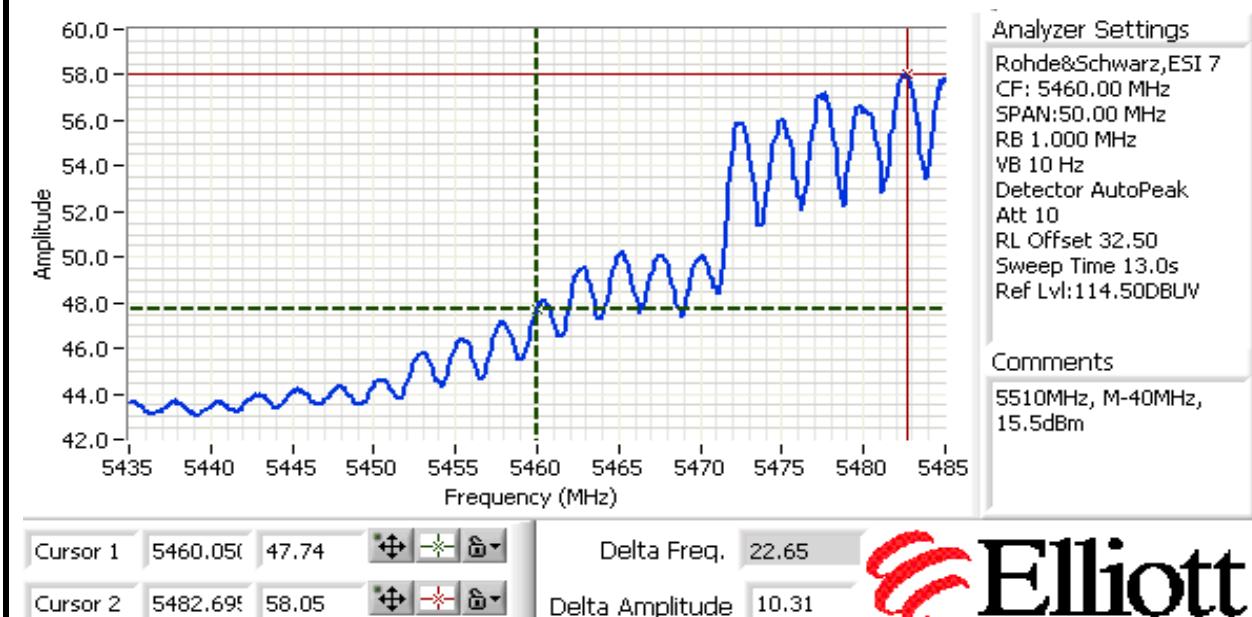
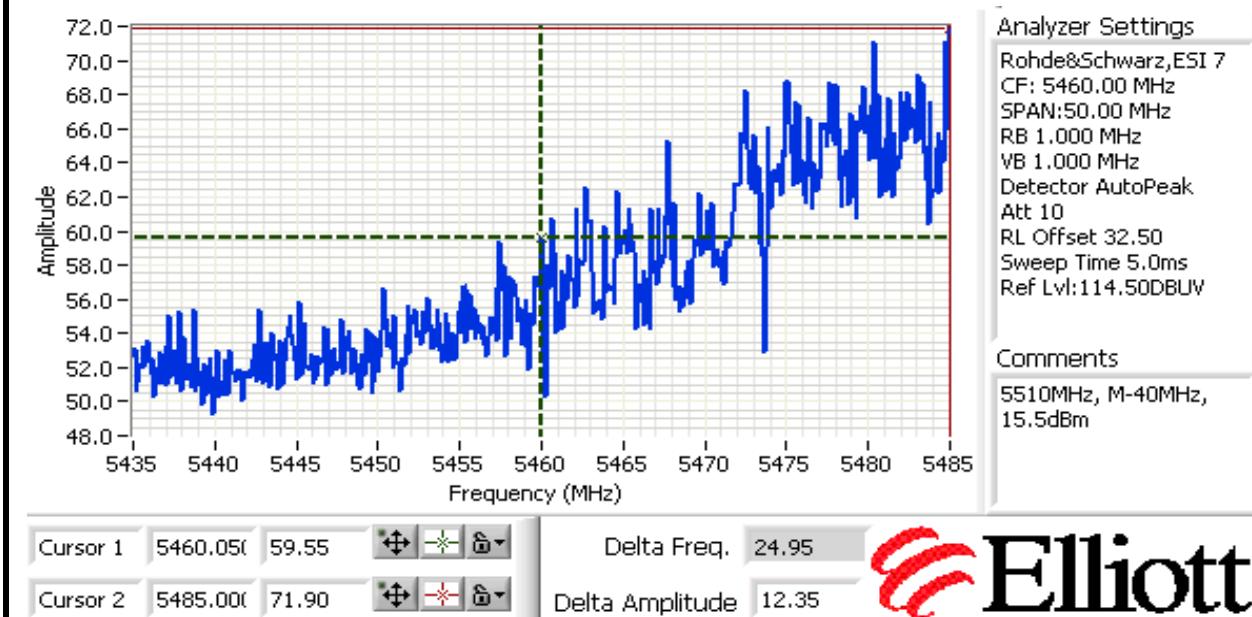
Run #2b: Radiated Spurious Emissions. High Channel @ 5310 MHz, n40MHz



Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

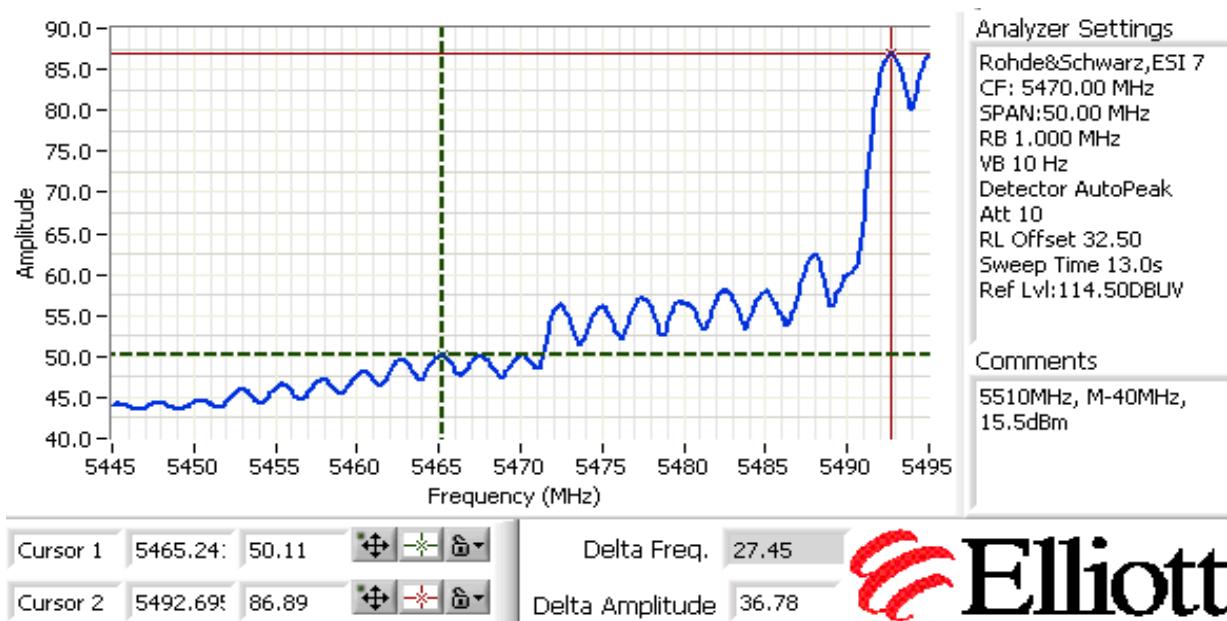
Run #3a: Radiated Spurious Emissions. Low Channel @ 5510 MHz, n40MHz

*5460 MHz Band Edge Signal Radiated Field Strength*



Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #3a: Low Channel

*Unrestricted band*


Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5460.000	71.9	V	74.0	-2.1	Pk	239	1.0	
5460.000	47.7	V	54.0	-6.3	Avg	239	1.0	
5470.000	50.1	V	68.0	-17.9	Avg	243	1.0	unrestricted band

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dB $\mu$ V/m).



## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #3b: Radiated Spurious Emissions, 1000 - 18000 MHz. Low Channel @ 5550 MHz, n40MHz

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

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5545.070	104.6	V	-	-	AVG	0	1.3	
5545.070	113.0	V	-	-	PK	0	1.3	
5536.670	99.2	H	-	-	AVG	286	1.0	
5536.670	109.4	H	-	-	PK	286	1.0	

**Band Edge Signal Radiated Field Strength at 5460 MHz**

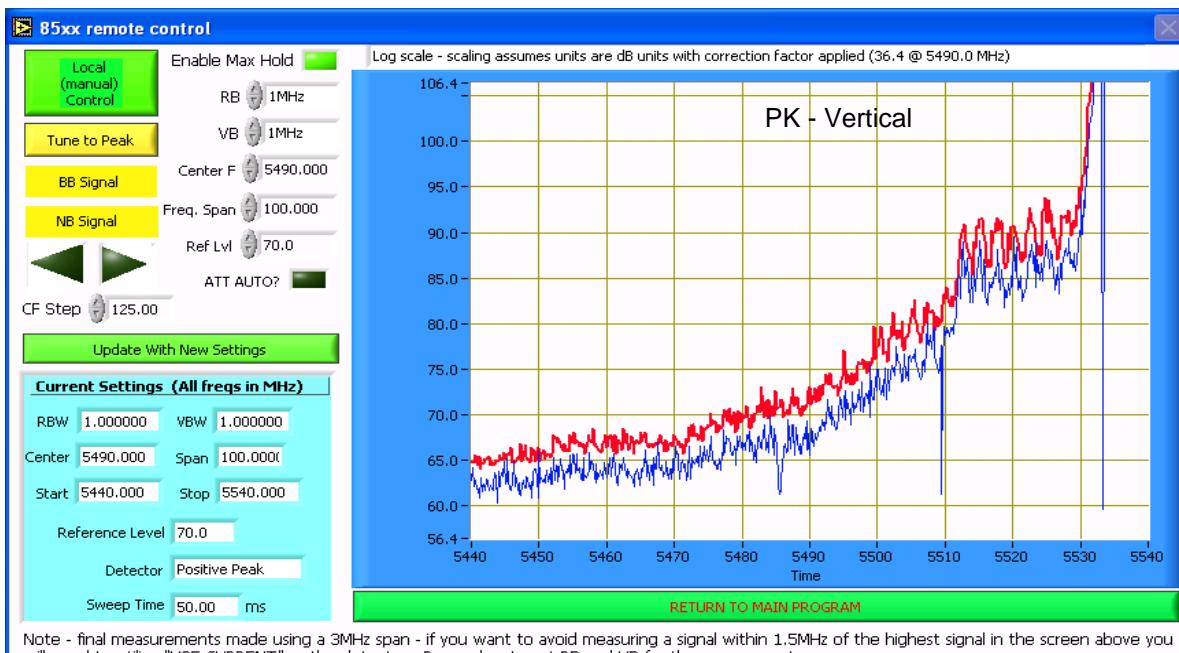
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5457.710	53.6	V	54.0	-0.4	Avg	1	1.3	
5457.390	67.2	V	74.0	-6.8	PK	1	1.3	
5459.020	53.0	H	54.0	-1.0	Avg	286	1.0	
5459.000	67.3	H	74.0	-6.7	PK	286	1.0	

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #3b: Continued

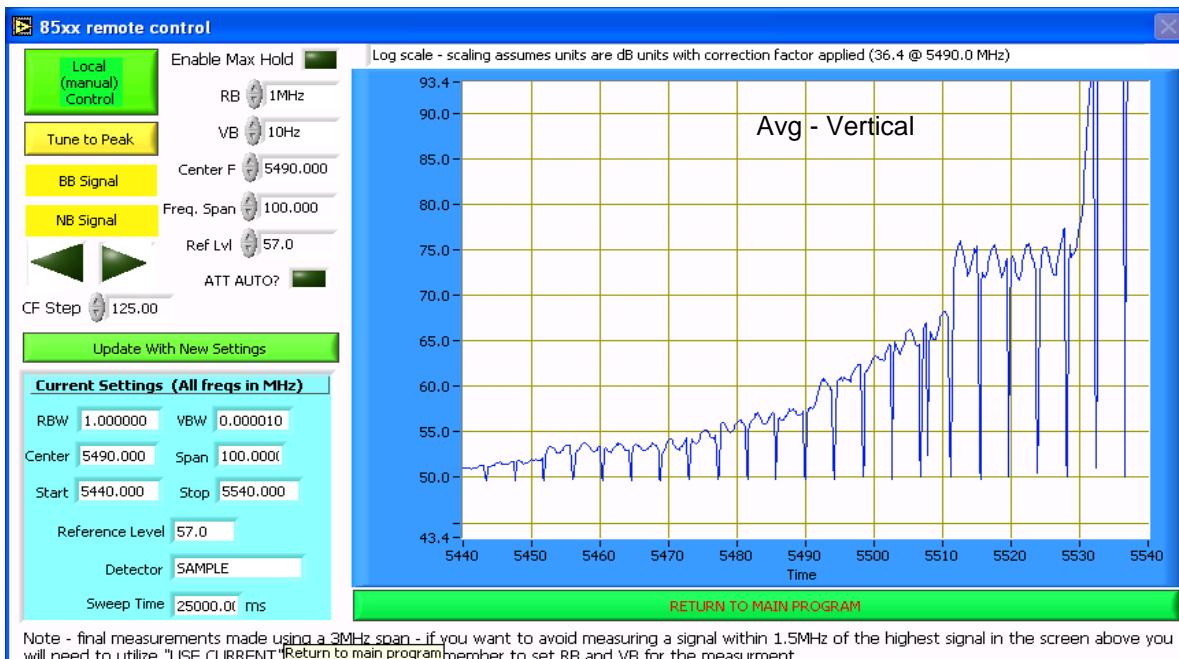
#### Band Edge Signal Radiated Field Strength at 5470 MHz

Frequency	Level	Pol	15.209 / 15E	Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
5469.980	54.0	V	68.3	-14.3	Avg	1	1.3
5467.040	66.8	V	88.3	-21.5	PK	1	1.3
5469.900	53.9	H	68.3	-14.4	Avg	286	1.0
5469.360	67.0	H	88.3	-21.3	PK	286	1.0



Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #3b: Continued



Run #3c: Radiated Spurious Emissions, 1000 - 18000 MHz. High Channel @ 5670 MHz, n40MHz

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

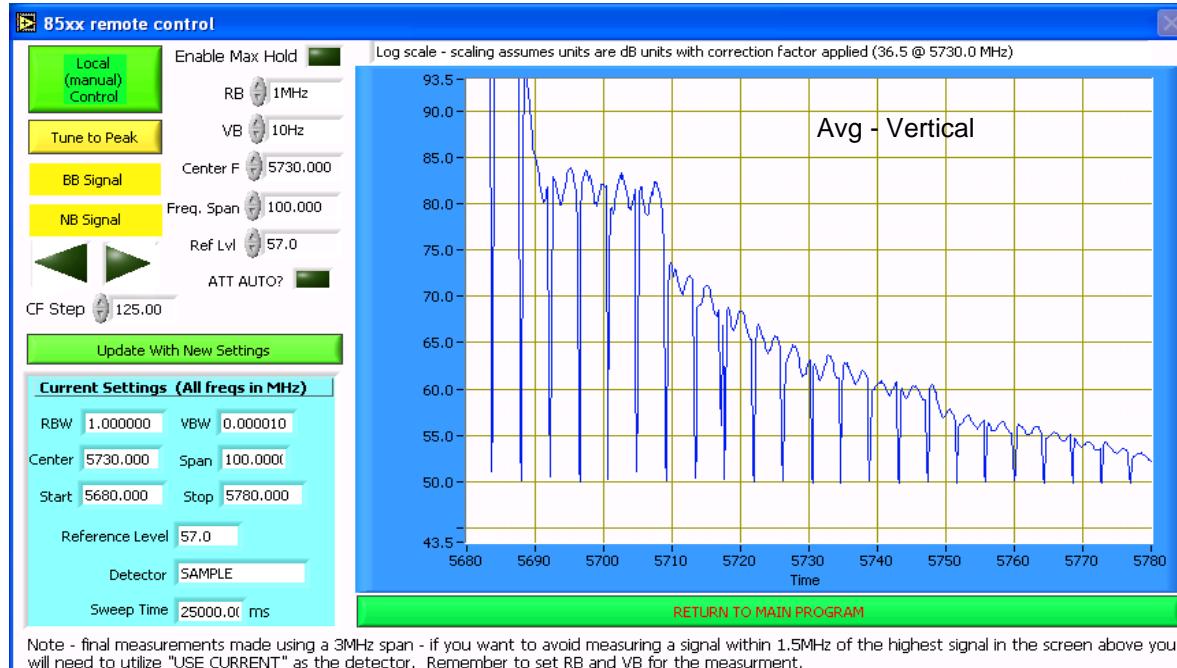
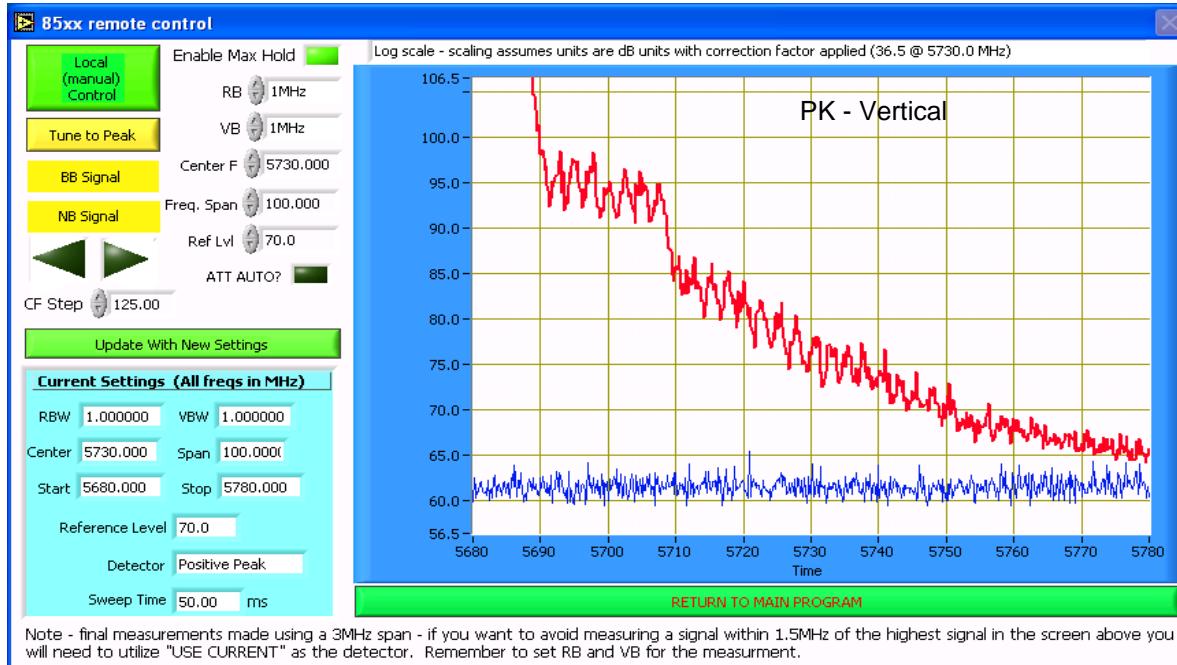
Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
5687.470	106.0	V	-	-	AVG	345	1.3
5687.470	114.5	V	-	-	PK	345	1.3
5668.590	99.7	H	-	-	AVG	78	1.0
5668.590	109.0	H	-	-	PK	78	1.0

**Band Edge Signal Radiated Field Strength at 5725 MHz**

Frequency	Level	Pol	15.209 / 15E	Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
5725.000	66.0	V	68.3	-2.3	Avg	345	1.2
5725.280	82.5	V	88.3	-5.8	PK	345	1.2
5725.320	63.3	H	68.3	-5.0	Avg	78	1.0
5726.270	79.4	H	88.3	-8.9	PK	78	1.0

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #3c: Continued

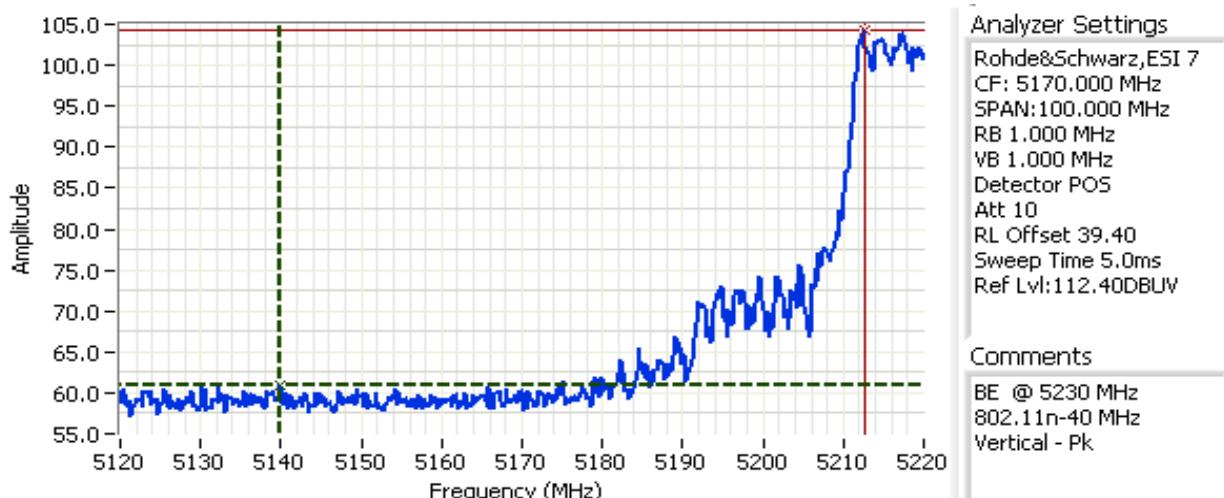
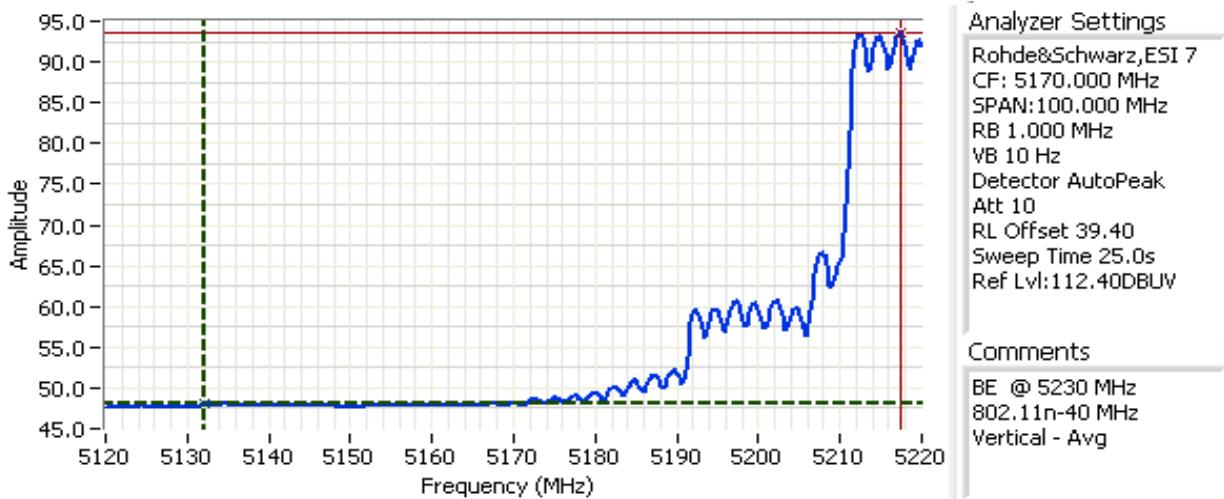


Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run # 4: Radiated Spurious Emissions, 1000 - 18000 MHz. Channel @ 5230 MHz, n40MHz

Band Edge Signal Radiated Field Strength at 5150 MHz

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5132.225	48.0	V	54.0	-6.0	AVG	252	1.0	RB 1.000 MHz; VB: 10 Hz
5139.840	60.9	V	74.0	-13.2	PK	252	1.0	RB 1.000 MHz; VB: 1.000 MHz





## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

### RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions

#### Test Specific Details

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

Date of Test: 7/18/2008 17:30:00 PM

Config. Used: 1

Test Engineer: Ben Jing

Config Change: None

Test Location: Fremont Chamber # 4

EUT Voltage: Powered From Host System

#### General Test Configuration

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

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

#### Ambient Conditions:

Temperature: 21.5 °C

Rel. Humidity: 49 %

#### Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1	802.11n40 Chain A	38 5190 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	43.8dB $\mu$ V/m @ 1500.5MHz (-10.2dB)
	802.11n40 Chain A	46 5230 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	40.6 dB $\mu$ V/m @ 4974.8 MHz (-13.4dB)
2	802.11n40 Chain A	54 5270 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	43.3 dB $\mu$ V/m @15801.2 MHz (-10.7dB)
	802.11n40 Chain A	62 5310 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	44.4dB $\mu$ V/m @ 1500.3MHz (-9.6dB)
3	802.11n40 Chain A	102 5510 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	43.1dB $\mu$ V/m @ 1500.6MHz (-10.9dB)
	802.11n40 Chain A	118 5590 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	44.2dB $\mu$ V/m @ 1500.6MHz (-9.8dB)
	802.11n40 Chain A	134 5670 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	42.1 dB $\mu$ V/m @ 11340.9 MHz (-11.9dB)

#### Modifications Made During Testing

No modifications were made to the EUT during testing

#### Deviations From The Standard

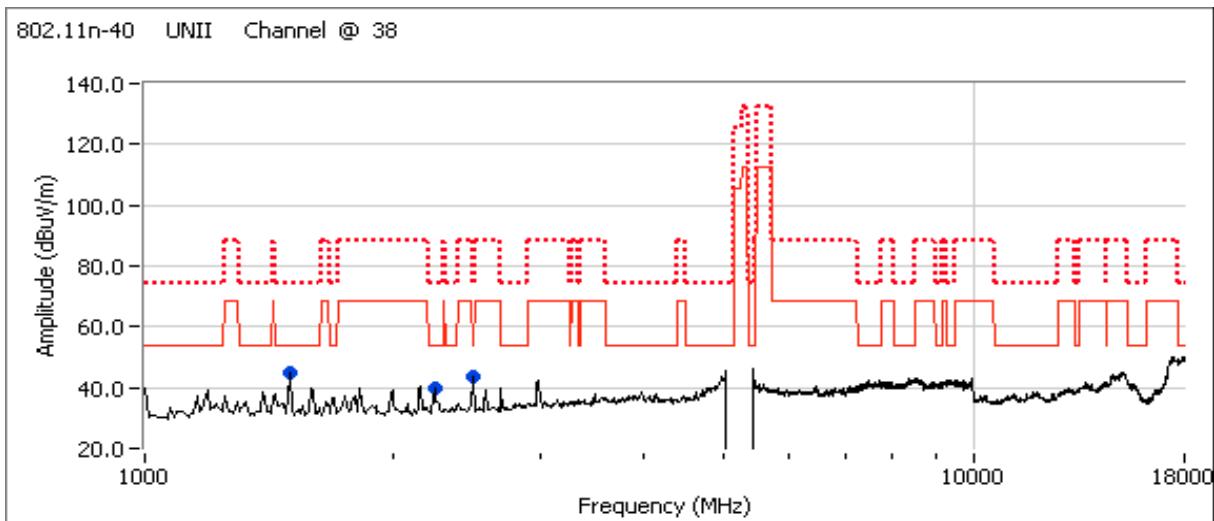
No deviations were made from the requirements of the standard.

NOTE: Preliminary testing showed no emissions above 18GHz. Only final data below 18GHz is presented.

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #1, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5150 - 5250 MHz Band

Run #1a: Channel 38 @ 5190MHz



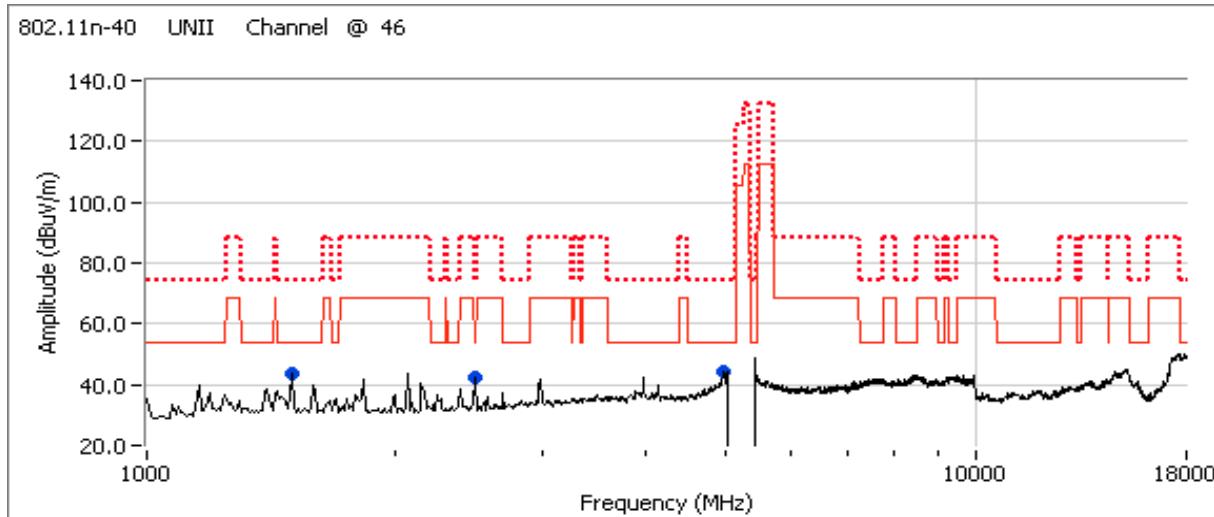
*Spurious Radiated Emissions:*

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.460	43.8	V	54.0	-10.2	AVG	270	1.0	
1500.460	52.6	V	74.0	-21.4	PK	270	1.0	
2499.150	36.6	V	54.0	-17.4	AVG	197	1.2	
2499.030	51.7	V	74.0	-22.3	PK	197	1.2	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dB $\mu$ V/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #1b: Channel 46 @ 5230 MHz


**Spurious Radiated Emissions:**

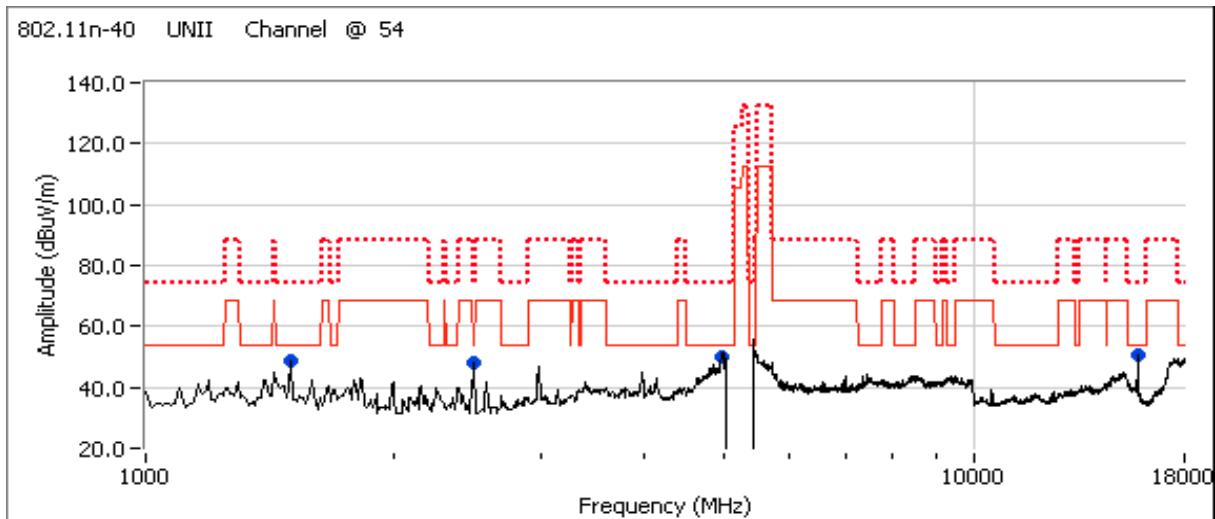
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4974.800	40.6	V	54.0	-13.4	AVG	163	1.0	
4974.810	55.0	V	74.0	-19.0	PK	163	1.0	
2488.100	34.8	H	54.0	-19.2	AVG	185	1.2	
2488.190	50.9	H	74.0	-23.1	PK	185	1.2	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dB $\mu$ V/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #2, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5250-5350 MHz Band

Run #2a: Channel 54 @ 5270 MHz

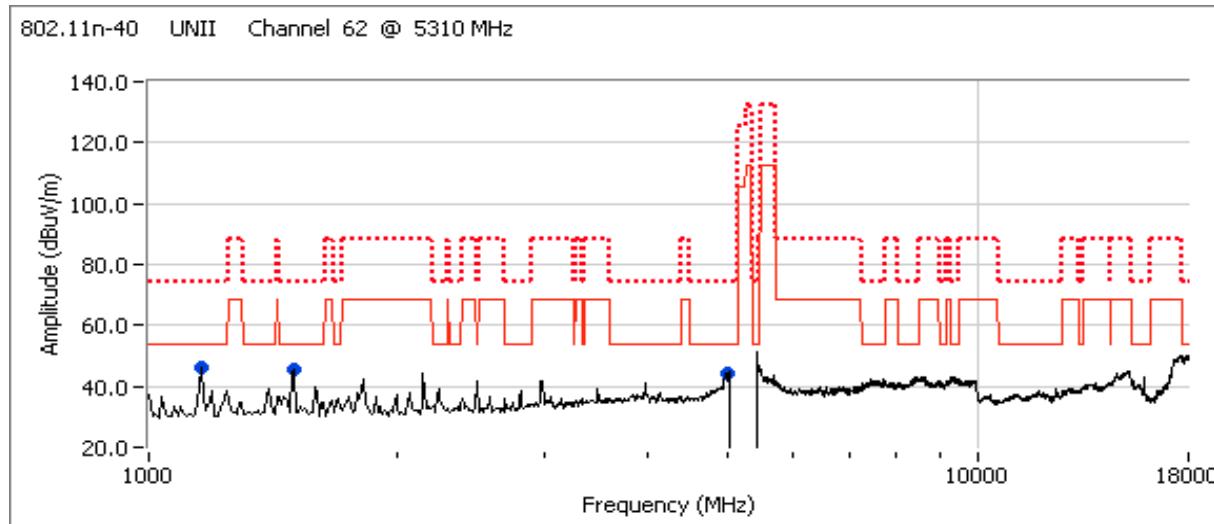


**Spurious Radiated Emissions:**

Frequency MHz	Level dB $\mu$ V/m	Pol v/h	15.209 / 15E Limit	Margin	Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
15801.170	43.3	V	54.0	-10.7	AVG	91	1.0	
1500.590	43.2	V	54.0	-10.8	AVG	268	1.0	
4976.070	40.5	V	54.0	-13.5	AVG	162	1.0	
15801.210	57.6	V	74.0	-16.4	PK	91	1.0	
1498.910	54.1	V	74.0	-19.9	PK	268	1.0	
4976.670	54.1	V	74.0	-19.9	PK	162	1.0	
2488.500	34.0	H	54.0	-20.0	AVG	360	1.8	
2488.780	49.1	H	74.0	-24.9	PK	360	1.8	

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #2b: Channel 62 @ 5310 MHz


**Spurious Radiated Emissions:**

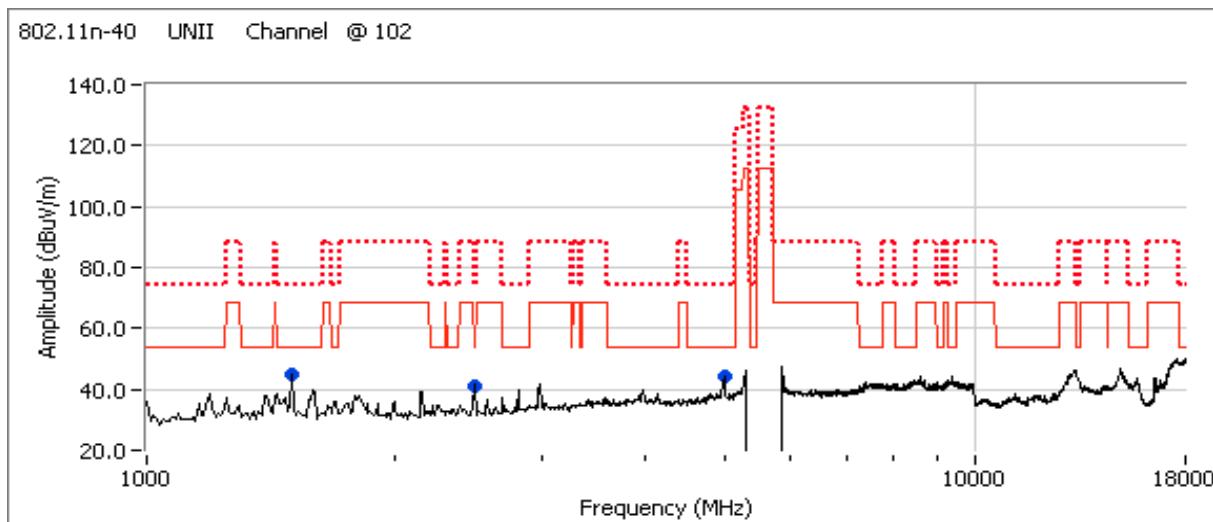
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.270	44.4	V	54.0	-9.6	AVG	191	1.2	
1500.050	55.7	V	74.0	-18.3	PK	191	1.2	
4975.210	54.4	V	74.0	-19.6	PK	166	1.0	
4975.710	40.7	V	54.0	-13.3	AVG	166	1.0	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #3, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5470-5725 MHz Band

Run #3a: Channel 102 @ 5510 MHz



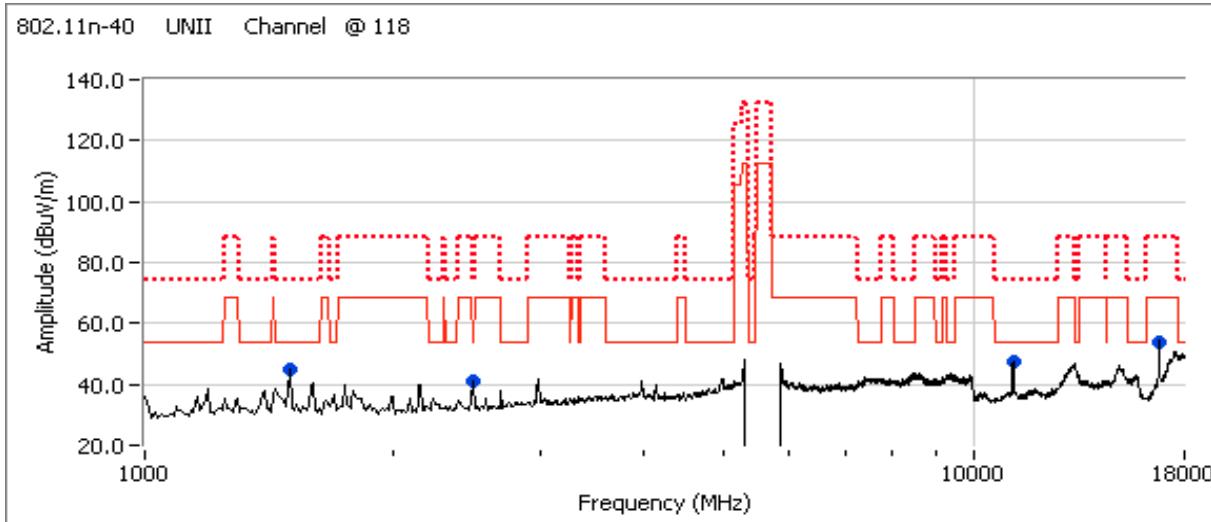
#### Spurious Radiated Emissions:

Frequency MHz	Level dB $\mu$ V/m	Pol v/h	15.209 / 15E Limit	Margin	Detector	Azimuth degrees	Height meters	Comments
1500.620	43.1	V	54.0	-10.9	AVG	270	1.0	RB 1.000 MHz; VB: 10 Hz
4983.050	38.8	V	54.0	-15.2	AVG	163	1.0	RB 1.000 MHz; VB: 10 Hz
2499.200	34.8	H	54.0	-19.2	AVG	184	1.2	RB 1.000 MHz; VB: 10 Hz
1500.670	54.4	V	74.0	-19.6	PK	270	1.0	RB 1.000 MHz; VB: 1.000 MHz
4983.060	52.3	V	74.0	-21.7	PK	163	1.0	RB 1.000 MHz; VB: 1.000 MHz
2499.240	50.0	H	74.0	-24.0	PK	184	1.2	RB 1.000 MHz; VB: 1.000 MHz

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dB $\mu$ V/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #3b: Channel 118 @ 5590 MHz

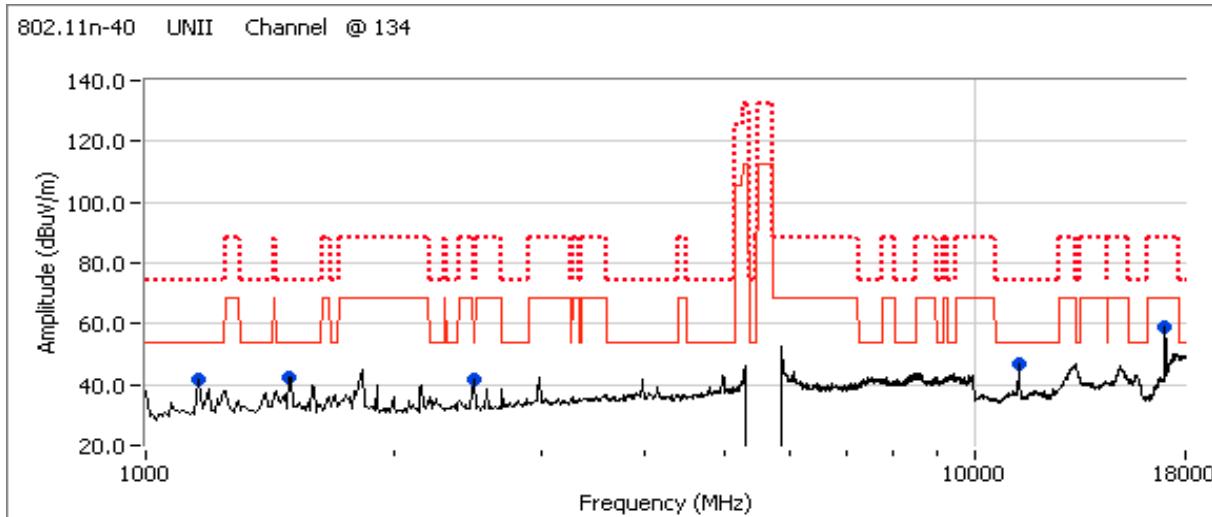

**Spurious Radiated Emissions:**

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.640	44.2	V	54.0	-9.8	AVG	190	1.2	RB 1.000 MHz; VB: 10 Hz
11179.910	42.6	V	54.0	-11.4	AVG	137	1.0	RB 1.000 MHz; VB: 10 Hz
11180.910	55.7	V	74.0	-18.3	PK	137	1.0	RB 1.000 MHz; VB: 1.000 MHz
2488.620	35.6	V	54.0	-18.4	AVG	114	1.8	RB 1.000 MHz; VB: 10 Hz
1500.330	55.5	V	74.0	-18.5	PK	190	1.2	RB 1.000 MHz; VB: 1.000 MHz
16773.660	49.0	V	68.3	-19.3	AVG	78	1.0	RB 1.000 MHz; VB: 10 Hz
2488.620	50.5	V	74.0	-23.5	PK	114	1.8	RB 1.000 MHz; VB: 1.000 MHz
16773.690	62.2	V	88.3	-26.1	PK	78	1.0	RB 1.000 MHz; VB: 1.000 MHz

*Note 1:* For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #3c : Channel 134 @ 5670 MHz


**Spurious Radiated Emissions:**

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11340.890	42.1	V	54.0	-11.9	AVG	114	1.0	RB 1.000 MHz; VB: 10 Hz
17011.590	55.4	V	68.3	-12.9	AVG	72	1.0	RB 1.000 MHz; VB: 10 Hz
1500.480	37.6	H	54.0	-16.4	AVG	72	1.6	RB 1.000 MHz; VB: 10 Hz
11341.170	55.3	V	74.0	-18.7	PK	114	1.0	RB 1.000 MHz; VB: 1.000 MHz
2490.990	33.8	H	54.0	-20.2	AVG	356	1.8	RB 1.000 MHz; VB: 10 Hz
17011.220	67.6	V	88.3	-20.7	PK	72	1.0	RB 1.000 MHz; VB: 1.000 MHz
2490.890	48.4	H	74.0	-25.6	PK	356	1.8	RB 1.000 MHz; VB: 1.000 MHz
1500.420	47.9	H	74.0	-26.1	PK	72	1.6	RB 1.000 MHz; VB: 1.000 MHz

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dB $\mu$ V/m).



## EMC Test Data

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

### RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions

#### Test Specific Details

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

Date of Test: 7/21/2008 17:49

Config. Used: 1

Test Engineer: Ben Jing

Config Change: None

Test Location: Fremont Chamber # 5

EUT Voltage: Powered From Host System

#### General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane or rou

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

Ambient Conditions: Temperature: 21.2 °C  
Rel. Humidity: 41 %

#### Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1	802.11a RX	40 5200 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	48.5dB $\mu$ V/m @ 1500.2MHz (-5.5dB)
	802.11a RX	60 5300 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	49.2dB $\mu$ V/m @ 1500.1MHz (-4.8dB)
	802.11a RX	120 5600 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	48.1dB $\mu$ V/m @ 1500.2MHz (-5.9dB)

#### Modifications Made During Testing

No modifications were made to the EUT during testing

#### Deviations From The Standard

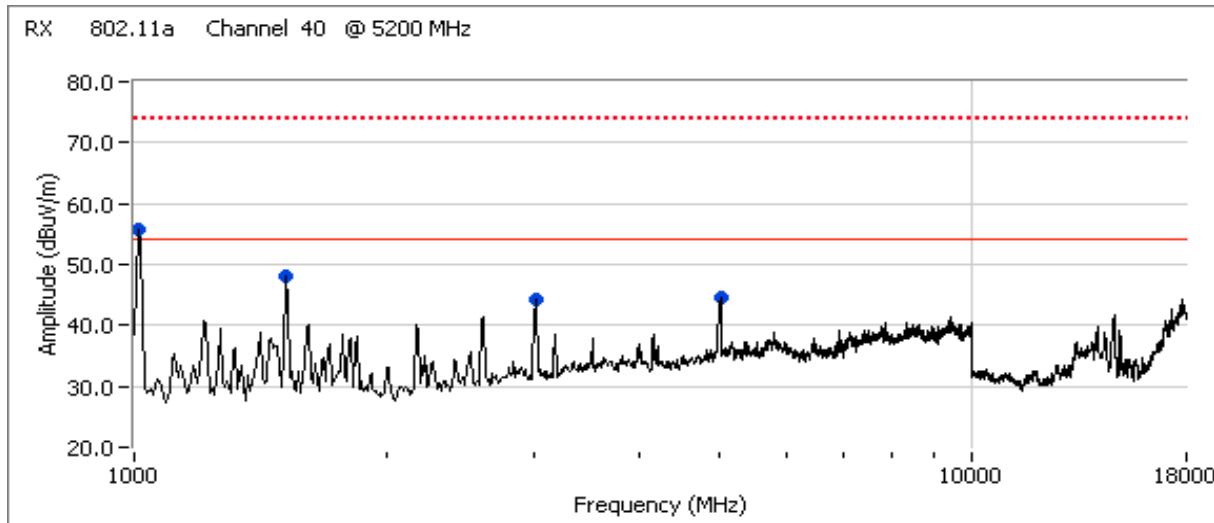
No deviations were made from the requirements of the standard.

Tested Using HP Laptop and P310 Card

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
Contact:	Anna Liang	Account Manager:	Dean Eriksen
Standard:	FCC 15.E	Class:	N/A

Run #1, Radiated Spurious Emissions, 30 - 40,000 MH. Receive Mode in the UNII 5 GHz Band

Run #1a: Channel 40 @ 5200 MHz



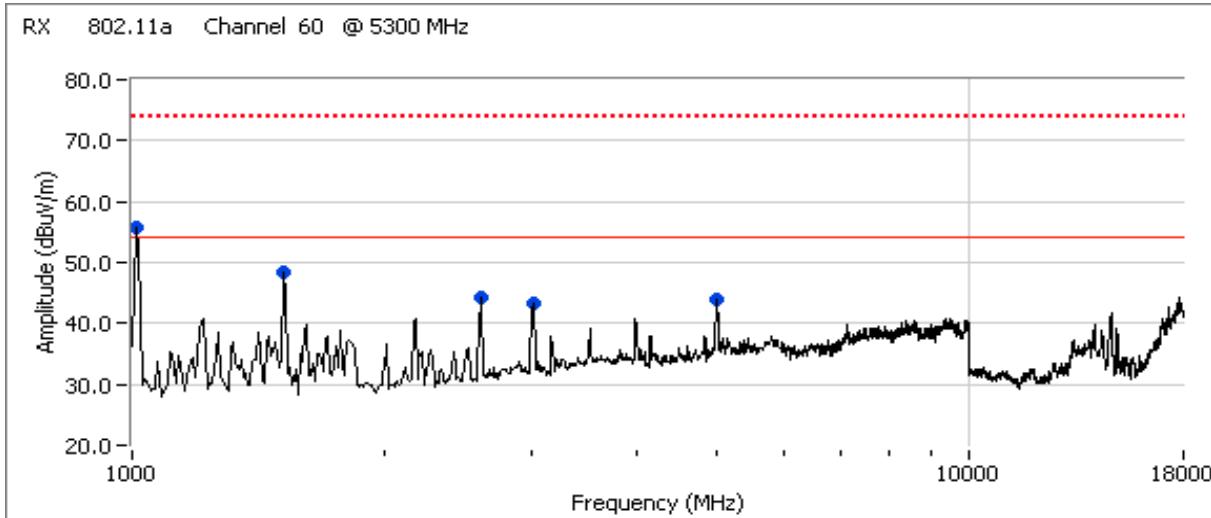
*Spurious Radiated Emissions:*

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1000.049	38.4	V	54.0	-15.6	AVG	213	1.1	
1000.130	49.6	V	74.0	-24.4	PK	213	1.1	
1500.120	56.2	V	74.0	-17.8	PK	195	1.7	
1500.170	48.5	V	54.0	-5.5	AVG	195	1.7	
2991.120	36.4	V	54.0	-17.6	AVG	215	1.2	
2991.280	52.6	V	74.0	-21.4	PK	215	1.2	
4981.000	38.8	V	54.0	-15.2	AVG	172	1.6	
4981.920	54.2	V	74.0	-19.8	PK	172	1.6	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

Run #1b: Channel 60 @ 5300 MHz

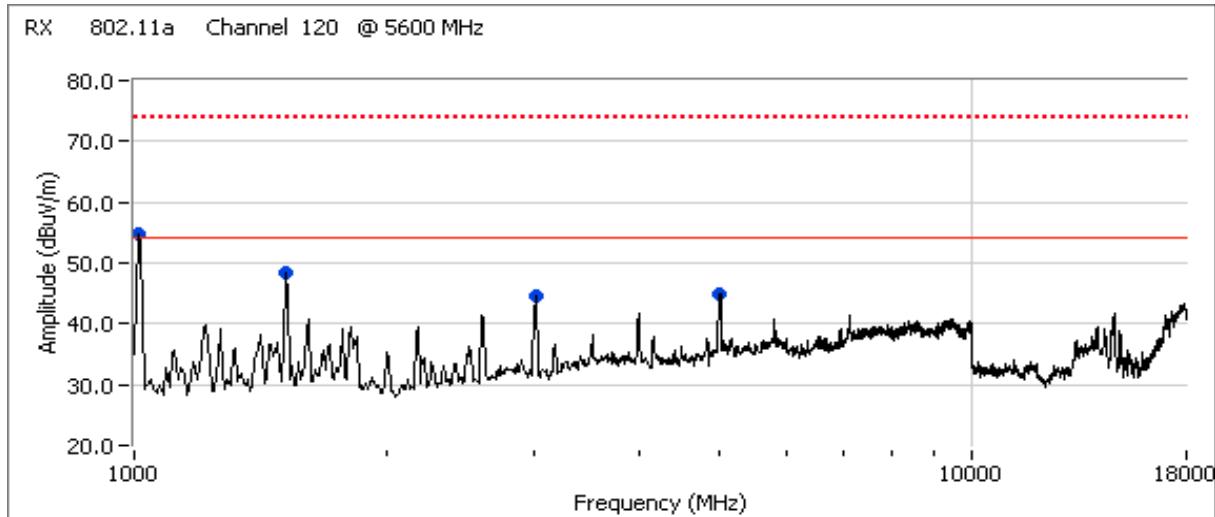

**Spurious Radiated Emissions:**

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1000.000	36.9	V	54.0	-17.1	AVG	334	1.3	
1000.143	48.8	V	74.0	-25.2	PK	334	1.3	
1500.080	49.2	V	54.0	-4.8	AVG	193	1.1	
1500.080	56.2	V	74.0	-17.8	PK	193	1.1	
2589.000	38.7	V	54.0	-15.3	AVG	172	1.0	
2589.010	51.8	V	74.0	-22.2	PK	172	1.0	
2989.180	53.5	V	74.0	-20.5	PK	207	1.2	
2989.340	37.5	V	54.0	-16.5	AVG	207	1.2	
4974.000	38.8	V	54.0	-15.2	AVG	162	1.8	
4974.020	54.2	V	74.0	-19.8	PK	162	1.8	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the **average** limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Broadcom Corporation	Job Number:	J72137
Model:	BCM94322HM8L (Dipole C2PC)	T-Log Number:	T72240_UNII
		Account Manager:	Dean Eriksen
Contact:	Anna Liang		
Standard:	FCC 15.E	Class:	N/A

Run #1c: Channel 120 , 5600 MHz


**Spurious Radiated Emissions:**

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1000.014	37.8	V	54.0	-16.2	AVG	225	1.1	
1000.091	49.4	V	74.0	-24.6	PK	225	1.1	
1500.160	48.1	V	54.0	-5.9	AVG	278	1.0	
1500.160	54.9	V	74.0	-19.1	PK	278	1.0	
2991.060	36.2	V	54.0	-17.8	AVG	154	1.0	
2991.110	52.3	V	74.0	-21.7	PK	154	1.0	
4975.000	39.2	V	54.0	-14.8	AVG	167	1.0	
4975.070	54.4	V	74.0	-19.6	PK	167	1.0	
Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dB $\mu$ V/m).							

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***EXHIBIT 3: Photographs of Test Configurations***

***EXHIBIT 4: RF Exposure Information***