



*EMC Test Report
Application for Grant of Equipment Authorization
Class II Permissive Change/Reassessment
pursuant to
Industry Canada RSS-Gen Issue 2 / RSS 210 Issue 7
FCC Part 15, Subpart E*

Model: BCM94322HM8L

IC CERTIFICATION #: 4324A-BRCM1031
FCC ID: QDS-BRCM1031

APPLICANT: Broadcom Corporation
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Sunnyvale, CA 94086, USA

TEST SITE(S): Elliott Laboratories
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IC SITE REGISTRATION #: 2845B-3; 2845B-4

REPORT DATE: May 21, 2010

FINAL TEST DATES: May 10 thru May 14, 2010

AUTHORIZED SIGNATORY:

A handwritten signature in blue ink, appearing to read "Mark Hill", written over a horizontal line.

Mark Hill
Staff Engineer
Elliott Laboratories



Testing Cert #2016-01

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REVISION HISTORY

Rev#	Date	Comments	Modified By
-	May 21, 2010	First 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.

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

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

DEVIATIONS FROM THE STANDARDS

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

TEST RESULTS SUMMARY**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	N/A – Unchanged from original filing		
15.407(a)(1)		26dB Bandwidth	N/A – Unchanged from original filing		
15.407(a)(1)	A9.2(1)	Output Power	Power was confirmed to be consistent with original filing		
15.407(a)(1)	-	Power Spectral Density	N/A – Unchanged from original filing		
-	A9.5 (2)				
15.407(b)(5) / 15.209	A9.3	Spurious Emissions below 1GHz	No emissions below 1 GHz observed	Refer to Standard	Complies
15.407(b)(2)	A9.3	Spurious Emissions above 1GHz	52.3dB μ V/m @ 5149.9MHz (-1.7dB)	Refer to Standard	Complies
15.407(a)(6)	-	Peak Excursion Ratio	N/A – Unchanged from original filing		

Operation in the 5.25 – 5.35 GHz Band

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(a)(2)		26dB Bandwidth	N/A – Unchanged from original filing		
15.407(a)(2)	A9.2(2)	Output Power	Power was confirmed to be consistent with original filing		
15.407(a)(2)	-	Power Spectral Density	N/A – Unchanged from original filing		
-	A9.2(2) / A9.5 (2)	Power Spectral Density			
15.407(b)(5) / 15.209	A9.3	Spurious Emissions below 1GHz	No emissions below 1 GHz observed	Refer to Standard	Complies
15.407(b)(2)	A9.3	Spurious Emissions above 1GHz	52.3dB μ V/m @ 5350.1MHz (-1.7dB)	Refer to Standard	Complies
15.407(a)(6)	-	Peak Excursion Ratio	N/A – Unchanged from original filing		

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 – Unchanged from original filing		
15.407(a)(2)	A9.2(2)	Output Power	Power was confirmed to be consistent with original filing		
15.407(a)(2)		Power Spectral Density	N/A – Unchanged from original filing		
	A9.2(2) / A9.5 (2)	Power Spectral Density			
	A9	Non-operation in 5600 – 5650 MHz sub band	N/A – Unchanged from original filing		
15.407(b)(5) / 15.209	A9.3	Spurious Emissions below 1GHz	No emissions below 1 GHz observed	Refer to Standard	Complies
15.407(b)(2)	A9.3	Spurious Emissions above 1GHz	53.7dB μ V/m @ 5459.1MHz (-0.3dB)	Refer to Standard	Complies
15.407(a)(6)	-	Peak Excursion Ratio	N/A – Unchanged from original filing		

Requirements for all U-NII/LELAN bands

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.407	A9.5a	Modulation	N/A – Unchanged from original filing		
	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		Complies
15.407 (c)	A9.5(4)	Operation in the absence of information to transmit	N/A – Unchanged from original filing		
15.407 (g)	A9.5 (5)	Frequency Stability	N/A – Unchanged from original filing		
15.407 (h1)	A9.4	Transmit Power Control	N/A – Unchanged from original filing		
15.407 (h2)	A9.4	Dynamic frequency Selection (device with radar detection)	N/A – EUT is a client device without radar detection. New antennas would not affect original filing results.		
	A9.9g	User Manual information	N/A – Unchanged from original filing		

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	N/A – Unchanged from original filing		
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	63.2dB μ V/m @ 1595.4MHz (-10.8dB)	Refer to standard	Complies
15.207	RSS GEN Table 2	AC Conducted Emissions	N/A – Unchanged from original filing		
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations in Exhibit 11, RSS 102 declaration.	Refer to OET 65, FCC Part 1 and RSS 102	Complies
-	RSP 100 RSS GEN 7.1.5	User Manual	N/A – Unchanged from original filing		
-	RSP 100 RSS GEN 7.1.5	User Manual	N/A – Unchanged from original filing		
-	RSP 100 RSS GEN 4.4.1	99% Bandwidth	N/A – Unchanged from original filing		

MEASUREMENT UNCERTAINTIES

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

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

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 May 10, 2010 and tested on May 10 thru May 13, 2010. The EUT consisted of the following component(s):

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

OTHER EUT DETAILS

The following EUT details should be noted: Testing for a permissive change for a new antenna type with higher gain in the 5.4-5.7GHz band. Worse case modes for band edge and spurious emissions was performed in all other bands. Bandedge and Spurious was performed in the 5.4GHz band.

ANTENNA SYSTEM

The new antennas being evaluated:

- (1) Laird, 802.11abgn Bluetooth antenna, model MAF 94449. Gain: 3.81 dBi (2400-2483.5 MHz), 5.58 dBi (5150-5350 MHz), 5.67 dBi (5470-5825 MHz), 5.67 dBi (5725-5850 MHz)
- (2) Amphenol, 802.11abgn Bluetooth antenna, model CI1693-15-000-R. Gain: 3.2 dBi (2400-2483.5 MHz), 4.9 dBi (5150-5350 MHz), 5.5 dBi (5470-5825 MHz), 5.5 dBi (5725-5850 MHz)

Note, as the Laird antenna has the higher gain, all testing was performed with the Laird antenna.

ENCLOSURE

The EUT has no enclosure. It is designed to be installed within the enclosure of a host computer.

MODIFICATIONS

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

SUPPORT EQUIPMENT

The following equipment was used as support equipment for testing:

Company	Model	Description	Serial Number	FCC ID
Dell	Inspiron 1526	Laptop Computer	-	DoC

No equipment was used as remote support equipment for emissions testing.

EUT INTERFACE PORTS

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

Port	Connected To	Description	Cable(s) 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 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 at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission and with industry Canada.

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

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

RADIATED EMISSIONS CONSIDERATIONS

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

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

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

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

INSTRUMENT CONTROL COMPUTER

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

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

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.

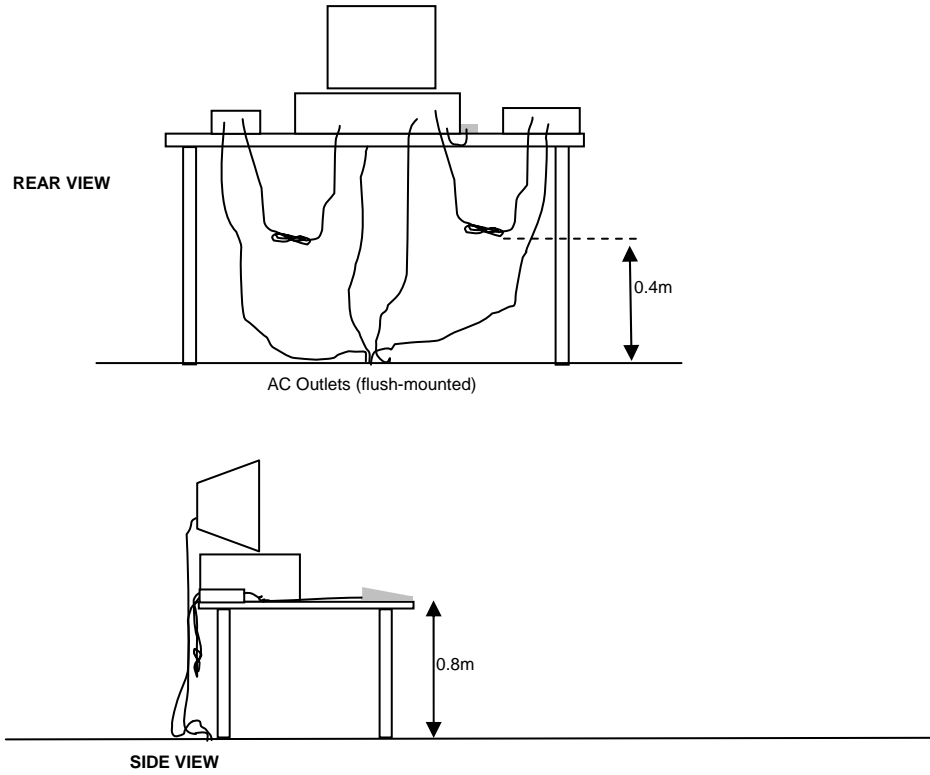
RADIATED EMISSIONS

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.

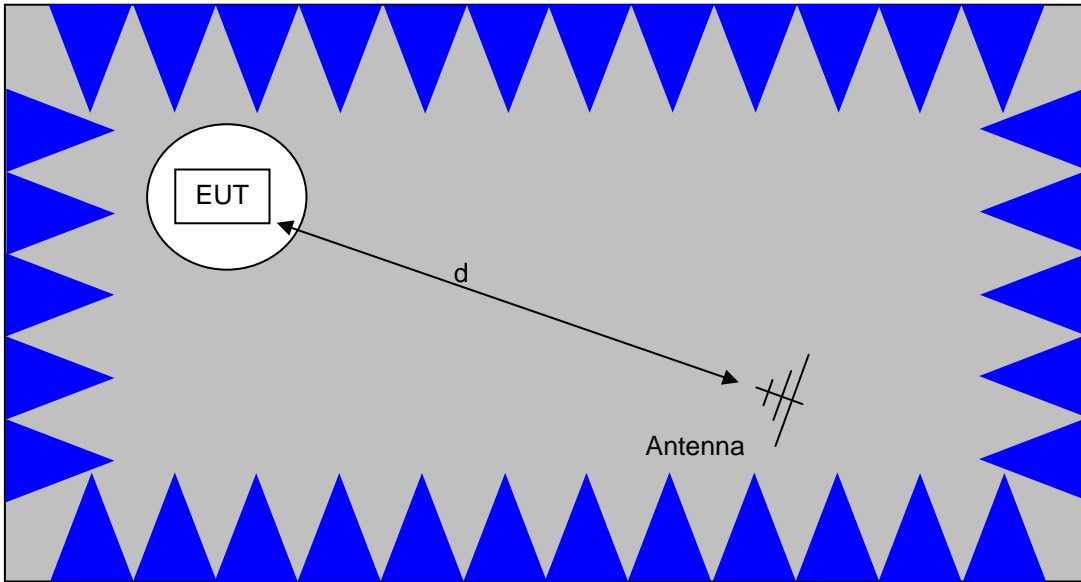
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

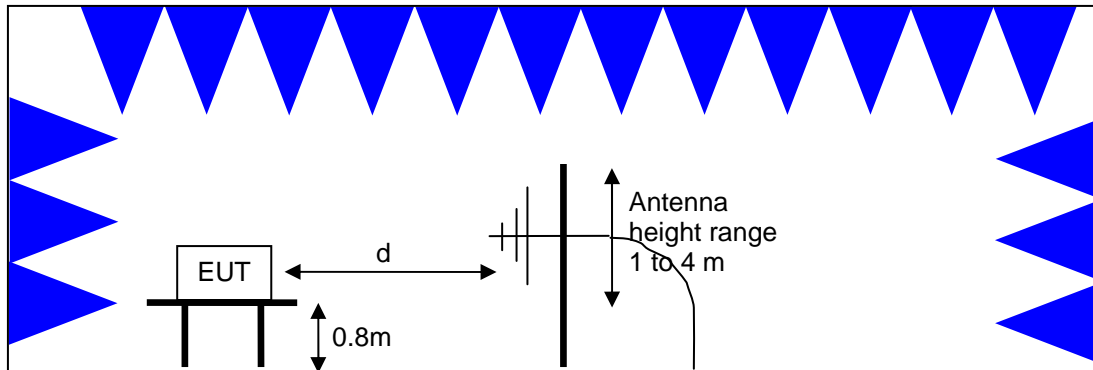


Typical Test Configuration for Radiated Field Strength Measurements



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 bands¹ (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

Frequency Range (MHz)	Limit (uV/m)	Limit (dBuV/m @ 3m)
0.009-0.490	2400/F _{KHz} @ 300m	67.6-20*log ₁₀ (F _{KHz}) @ 300m
0.490-1.705	24000/F _{KHz} @ 30m	87.6-20*log ₁₀ (F _{KHz}) @ 30m
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100 @ 3m	40 @ 3m
88 to 216	150 @ 3m	43.5 @ 3m
216 to 960	200 @ 3m	46.0 @ 3m
Above 960	500 @ 3m	54.0 @ 3m

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.

The peak excursion envelope is limited to 13dB.

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

OUTPUT POWER LIMITS –LELAN 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) ² 1W (30dBm) eirp	11 dBm/MHz
5470 – 5725	250 mW (24 dBm) ³ 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) by more than 3dB. The “average” power spectral density is determined by dividing the output power by $10\log(\text{EBW})$ where EBW is the 99% power bandwidth.

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.

SPURIOUS EMISSIONS LIMITS –UNII and LELAN DEVICES

The spurious emissions limits for signals below 1GHz are the FCC/RSS-GEN general limits. For emissions above 1GHz, signals in restricted bands are subject to the FCC/RSS GEN general limits. All other signals have a limit of -27dBm/MHz , which is a field strength of 68.3dBuV/m/MHz at a distance of 3m. This is an average limit so the peak value of the emission may not exceed -7dBm/MHz (68.3dBuV/m/MHz at a distance of 3m). For devices operating in the 5725-5850Mhz bands under the LELAN/UNII rules, the limit within 10Mhz of the allocated band is increased to -17dBm/MHz .

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

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

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

² If EIRP exceeds 500mW the device must employ TPC

³ If EIRP exceeds 500mW the device must employ TPC

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:

$$F_d = 20 * \text{LOG}_{10} (D_m/D_s)$$

where:

$$F_d = \text{Distance Factor in dB}$$

$$D_m = \text{Measurement Distance in meters}$$

$$D_s = \text{Specification Distance in meters}$$

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:

$$F_d = 40 * \text{LOG}_{10} (D_m/D_s)$$

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

$$R_r = \text{Receiver Reading in dBuV/m}$$

$$F_d = \text{Distance Factor in dB}$$

$$R_c = \text{Corrected Reading in dBuV/m}$$

$$L_s = \text{Specification Limit in dBuV/m}$$

$$M = \text{Margin in dB Relative to Spec}$$

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp), or where a field strength measurement of output power is made in lieu of a direct measurement, the following formula is used to convert between eirp and field strength at a distance of d (meters) from the equipment under test:

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

where P is the eirp (Watts)

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

Appendix A Test Equipment Calibration Data**Radio Spurious Emissions, 10-May-10**

<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	9/2/2010
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	3/16/2011

Radio (Spurious Emissions), 12-May-10

<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	785	6/3/2010
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	7/15/2010
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	6/12/2010
Hewlett Packard	High Pass filter, 8.2 GHz (Red System)	P/N 84300-80039 (84125C)	1152	9/28/2010
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	1729	9/25/2010

Radiated Emissions, DTS Bandedge, 12-May-10

<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/10/2010
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	3/16/2011

Radio Spurious Emissions, 30 - 6,500 MHz, 13-May-10

<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	9/2/2010
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	3/16/2011

Radiated Emissions, 1000 - 40,000 MHz, 14-May-10

<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/10/2010
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	4/14/2011
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	1780	9/17/2010

Appendix B Test Data

T79260 36 Pages



EMC Test Data

Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Emissions Standard(s):	15.209 / 15.247 / 15.E / RSS-210	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Broadcom Corporation

Model

BCM94322HM8L

Date of Last Test: 5/13/2010

Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
		Account Manager:	Sheareen Washington
Contact:	Pin Wen		
Standard:	15.209 / 15.247 / 15.E / RSS-210	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: See below
 Test Engineer: See below
 Test Location: See below

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

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: 19.4 °C
 Rel. Humidity: 40 %

Summary of Results

Worse Case Mode for Bandedges: 40MHz CDD

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1	802.11a Chain A	38 - 5190 MHz	-	-	Restricted Band Edge at 5150 MHz	15.209	52.3dBµV/m @ 5149.9MHz (-1.7dB)

Worse Case Mode for Spurious: Legacy A

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
2	802.11a Chain A	36 - 5180 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	43.4dBµV/m @ 5037.6MHz (-10.6dB)
	802.11a Chain A	40 - 5200 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	47.5dBµV/m @ 5040.0MHz (-6.5dB)
	802.11a Chain A	48 - 5240 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	40.9dBµV/m @ 1196.7MHz (-13.1dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Note: Preliminary testing showed no emissions below 1 GHz and above 18GHz.

Client: Broadcom Corporation	Job Number: J79248
Model: BCM94322HM8L	T-Log Number: T79249
Contact: Pin Wen	Account Manager: Sheareen Washington
Standard: 15.209 / 15.247 / 15.E / RSS-210	Class: N/A

Run #1, Radiated Spurious Emissions, Bandedge Measurement. Mode: 40MHz CDD

Date of Test: 5/12/2010
 Test Engineer: Joseph Cadigal
 Test Location: FTChamber#3

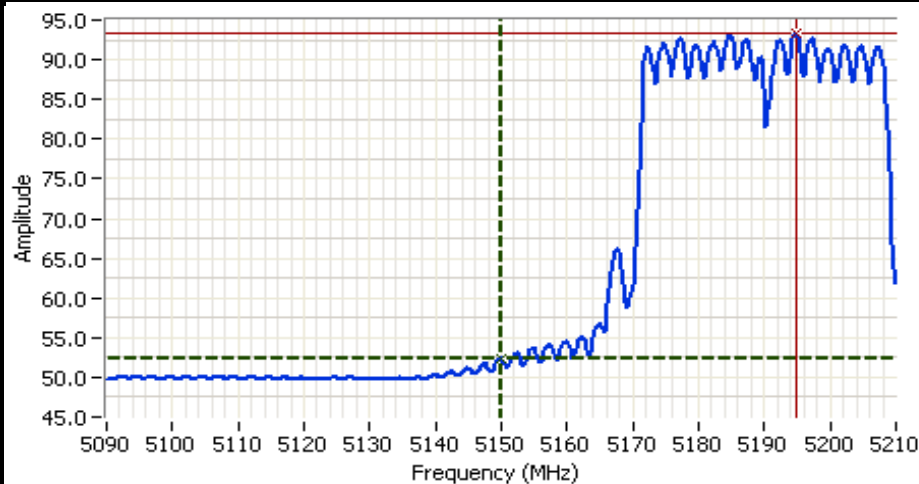
Run #1a: Low Channel (38) @ 5190 MHz

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5184.509	105.7	v	-	-	Pk	75	1.1	RB = VB = 1MHz
5194.850	93.3	v	-	-	Avg	75	1.1	RB = 1MHz, VB = 10Hz
5199.178	100.5	h	-	-	Pk	124	1.3	RB = VB = 1MHz
5194.609	87.7	h	-	-	Avg	124	1.3	RB = 1MHz, VB = 10Hz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.880	52.3	-	54.0	-1.7	Avg	75	1.1	
5142.185	68.5	-	74.0	-5.5	Pk	75	1.1	



Analyzer Settings

Rohde&Schwarz, ESI
 CF: 5150.000 MHz
 SPAN: 120.000 MHz
 RB: 1.000 MHz
 VB: 10 Hz
 Detector: POS
 Attn: 10 DB
 RL Offset: 41.2 DB
 Sweep Time: 30.0s
 Ref Lvl: 123.2 DBUV

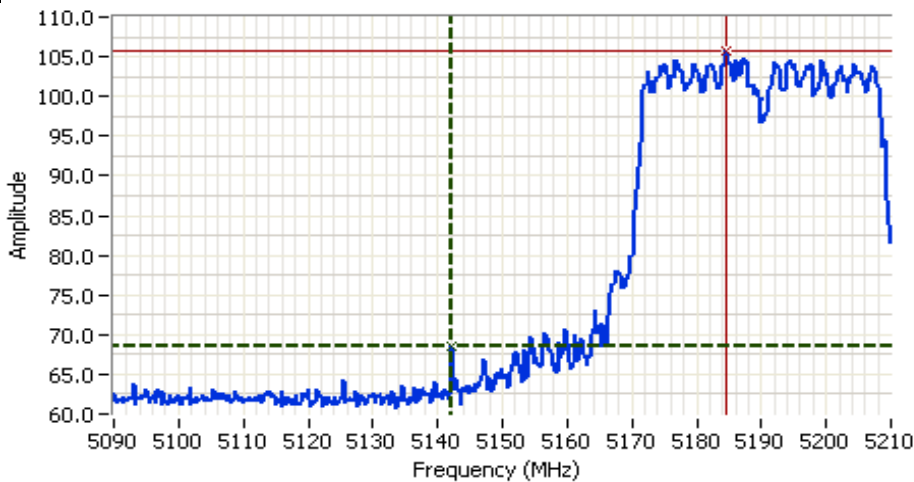
Comments

BE @ 5150MHz
 802.11n40
 CH 38 - vertical

Cursor 1	5149.8799	52.26	+	-	+	+	+	Delta Freq.	44.970
Cursor 2	5194.8496	93.31	+	-	+	+	+	Delta Amplitude	41.05



Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A



Analyzer Settings
 Rohde&Schwarz, ESI
 CF: 5150.000 MHz
 SPAN: 120.000 MHz
 RB: 1.000 MHz
 VB: 1.000 MHz
 Detector: POS
 Attn: 10 DB
 RL Offset: 41.2 DB
 Sweep Time: 5.0ms
 Ref Lvl: 123.2 DBUV

Comments
 BE @ 5150MHz
 802.11n40
 CH 38 - vertical

Cursor 1 5142.1846 68.48
 Cursor 2 5184.5088 105.65

Delta Freq. 42.324
 Delta Amplitude 37.17



Run #2, Radiated Spurious Emissions, 30 - 40,000 MH. Spurious Emissions. Mode: Legacy A

Date of Test: 5/11/2010
 Test Engineer: Rafael Varelas
 Test Location: FT Chamber #4

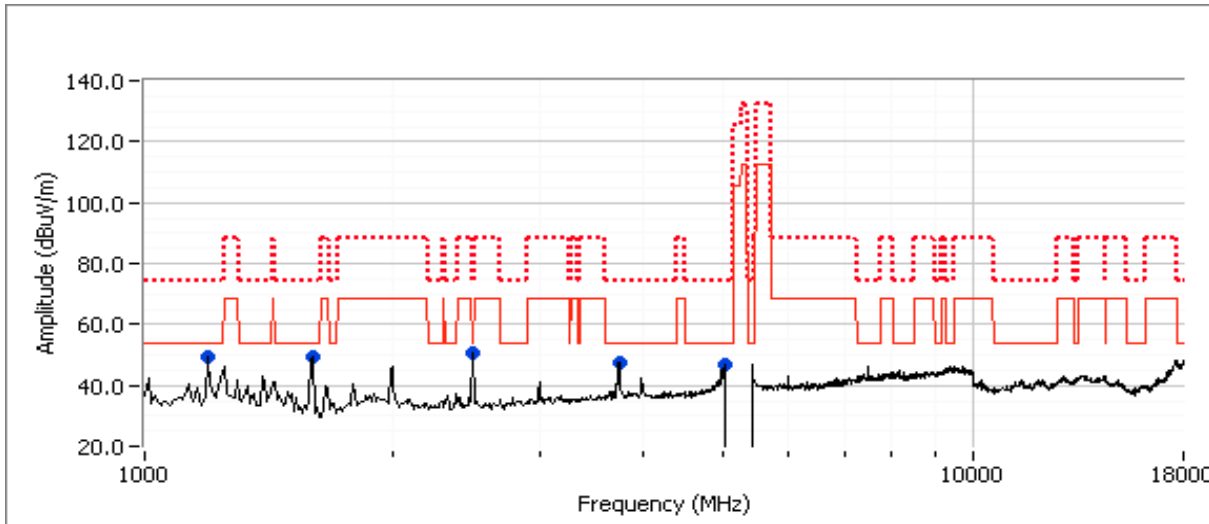
Run #2a: Low Channel (36) @ 5180 MHz

Spurious Radiated Emissions:

Frequency MHz	Level dBuV/m	Pol v/h	15.209 / 15E		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
5037.620	43.4	V	54.0	-10.6	AVG	213	1.9	RB 1 MHz; VB: 10 Hz
5039.500	55.0	V	74.0	-19.0	PK	213	1.9	RB 1 MHz; VB: 1 MHz
2493.270	31.8	V	54.0	-22.2	AVG	316	1.6	RB 1 MHz; VB: 10 Hz
2493.750	57.3	V	74.0	-16.7	PK	316	1.6	RB 1 MHz; VB: 1 MHz
3734.990	32.5	V	54.0	-21.5	AVG	176	1.0	RB 1 MHz; VB: 10 Hz
3734.380	57.8	V	74.0	-16.2	PK	176	1.0	RB 1 MHz; VB: 1 MHz
1595.370	41.0	V	54.0	-13.0	AVG	46	1.0	RB 1 MHz; VB: 10 Hz
1596.590	61.7	V	74.0	-12.3	PK	46	1.0	RB 1 MHz; VB: 1 MHz
1196.870	41.0	V	54.0	-13.0	AVG	4	0.0	RB 1 MHz; VB: 10 Hz
1195.990	59.7	V	74.0	-14.3	PK	4	0.0	RB 1 MHz; VB: 1 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:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A



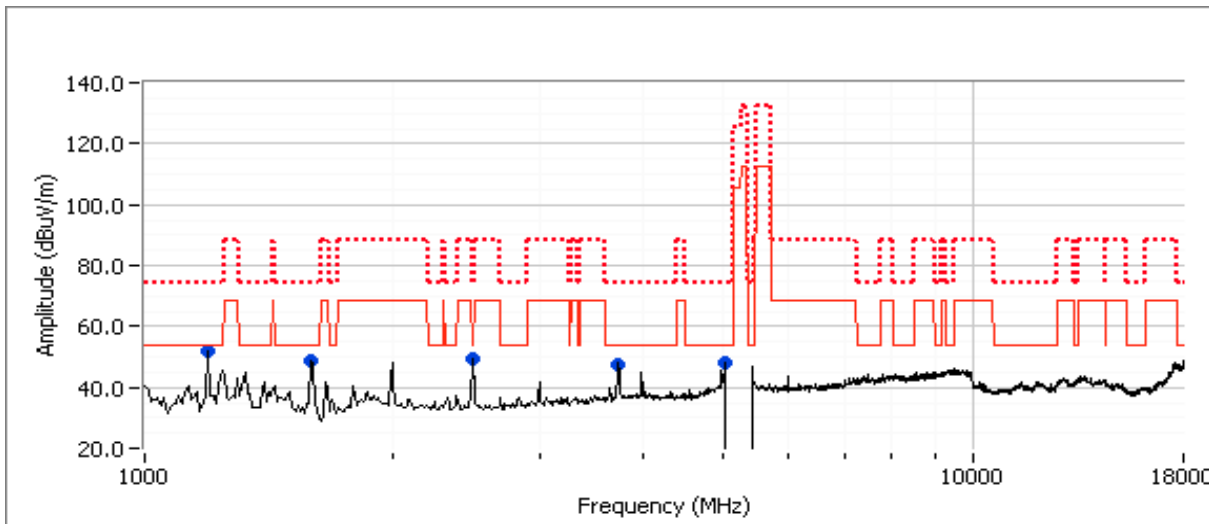
Run #2b: Center Channel (40) @ 5200 MHz

Spurious Radiated Emissions:

Frequency MHz	Level dB μ V/m	Pol v/h	15.209 / 15E		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
5039.970	47.5	V	54.0	-6.5	AVG	214	1.6	RB 1 MHz; VB: 10 Hz
5037.680	57.9	V	74.0	-16.1	PK	214	1.6	RB 1 MHz; VB: 1 MHz
3736.970	32.5	H	54.0	-21.5	AVG	258	1.8	RB 1 MHz; VB: 10 Hz
3737.050	56.4	H	74.0	-17.6	PK	258	1.8	RB 1 MHz; VB: 1 MHz
1595.600	41.1	V	54.0	-12.9	AVG	47	1.0	RB 1 MHz; VB: 10 Hz
1595.620	61.9	V	74.0	-12.1	PK	47	1.0	RB 1 MHz; VB: 1 MHz
1196.770	41.4	V	54.0	-12.6	AVG	0	1.0	RB 1 MHz; VB: 10 Hz
1195.060	59.3	V	74.0	-14.7	PK	0	1.0	RB 1 MHz; VB: 1 MHz
2493.040	33.0	V	54.0	-21.0	AVG	0	1.4	RB 1 MHz; VB: 10 Hz
2493.700	60.6	V	74.0	-13.4	PK	0	1.4	RB 1 MHz; VB: 1 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:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A



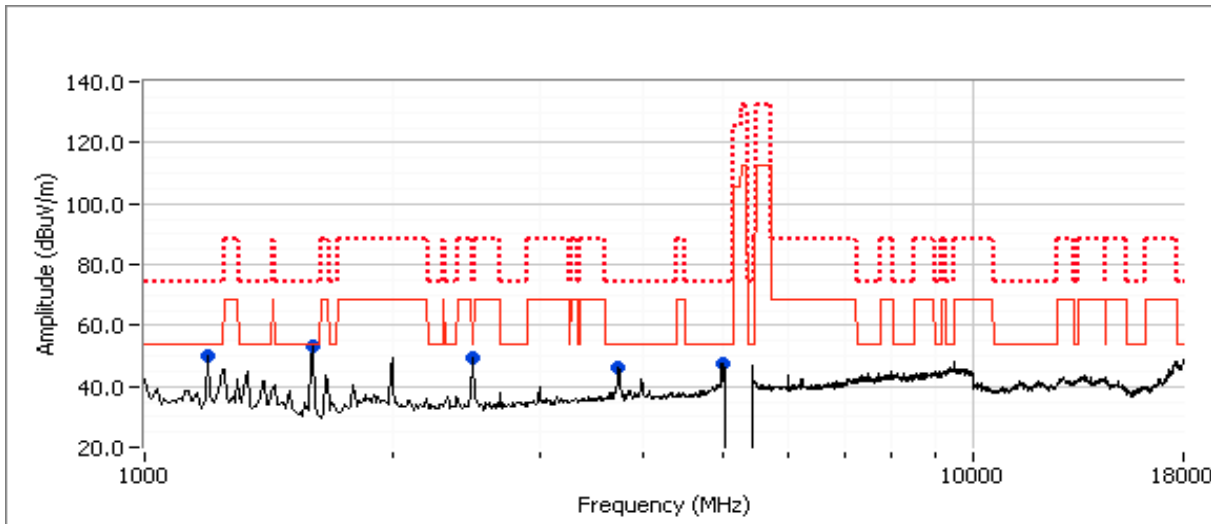
Run #2c: High Channel (48) @ 5240 MHz

Spurious Radiated Emissions:

Frequency MHz	Level dBuV/m	Pol v/h	15.209 / 15E		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
1196.740	40.9	V	54.0	-13.1	AVG	164	1.0	RB 1 MHz; VB: 10 Hz
1195.270	60.9	V	74.0	-13.1	PK	164	1.0	RB 1 MHz; VB: 1 MHz
1595.440	38.8	V	54.0	-15.2	AVG	83	1.0	RB 1 MHz; VB: 10 Hz
1595.440	56.8	V	74.0	-17.2	PK	83	1.0	RB 1 MHz; VB: 1 MHz
5020.920	39.3	V	54.0	-14.7	AVG	153	1.0	RB 1 MHz; VB: 10 Hz
5021.590	50.7	V	74.0	-23.3	PK	153	1.0	RB 1 MHz; VB: 1 MHz
3733.830	32.4	V	54.0	-21.6	AVG	175	1.9	RB 1 MHz; VB: 10 Hz
3734.810	55.8	V	74.0	-18.2	PK	175	1.9	RB 1 MHz; VB: 1 MHz
2492.850	32.4	V	54.0	-21.6	AVG	332	1.1	RB 1 MHz; VB: 10 Hz
2493.200	58.9	V	74.0	-15.1	PK	332	1.1	RB 1 MHz; VB: 1 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: J79248
Model: BCM94322HM8L	T-Log Number: T79249
Contact: Pin Wen	Account Manager: Sheareen Washington
Standard: 15.209 / 15.247 / 15.E / RSS-210	Class: N/A



Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
		Account Manager:	Sheareen Washington
Contact:	Pin Wen		
Standard:	15.209 / 15.247 / 15.E / RSS-210	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: See below
Test Engineer: See below
Test Location: See below

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

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: 19.4 °C
Rel. Humidity: 40 %

Summary of Results

Worse Case Mode for Bandedges: 40MHz CDD

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1	40MHz CDD	62 - 5310 MHz	-	-	Restricted Band Edge at 5350 MHz	15.209	52.3dBμV/m @ 5350.1MHz (-1.7dB)

Worse Case Mode for Spurious: 20MHz CDD

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
2	20MHz CDD	52 - 5260 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	49.8dBμV/m @ 15778.8MHz (-4.2dB)
	20MHz CDD	60 - 5300 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	48.1dBμV/m @ 15904.1MHz (-5.9dB)
	20MHz CDD	64 - 5320 MHz	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	47.1dBμV/m @ 5416.1MHz (-6.9dB)

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 below 1 GHz and above 18GHz.

Client: Broadcom Corporation	Job Number: J79248
Model: BCM94322HM8L	T-Log Number: T79249
	Account Manager: Sheareen Washington
Contact: Pin Wen	
Standard: 15.209 / 15.247 / 15.E / RSS-210	Class: N/A

Run #1, Radiated Spurious Emissions, Bandedge Measurement. Mode: 40MHz CDD

Date of Test: 5/12/2010
 Test Engineer: Joseph Cadigal
 Test Location: FT Chamber#3

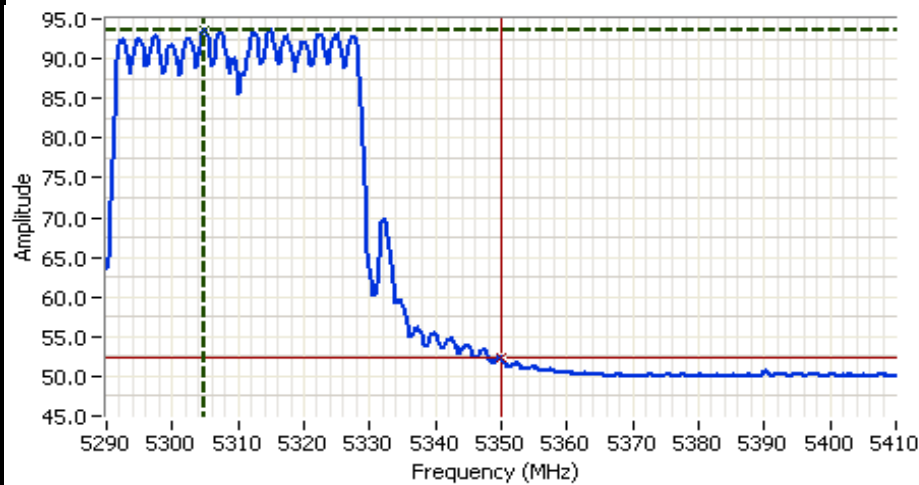
Run #1a: Channel 62 @ 5310 MHz

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5305.150	106.5	v	-	-	Pk	77	1.0	RB = VB = 1MHz
5304.910	93.6	v	-	-	Avg	77	1.0	RB = 1MHz, VB = 10Hz
5318.136	103.0	h	-	-	Pk	119	1.4	RB = VB = 1MHz
5324.389	89.1	h	-	-	Avg	119	1.4	RB = 1MHz, VB = 10Hz

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.120	52.3	-	54.0	-1.7	Avg	77	1.0	
5351.804	68.5	-	74.0	-5.5	Pk	77	1.0	



Analyzer Settings

Rohde&Schwarz, ESI
 CF: 5350.000 MHz
 SPAN: 120.000 MHz
 RB: 1.000 MHz
 VB: 10 Hz
 Detector: POS
 Attn: 10 DB
 RL Offset: 41.2 DB
 Sweep Time: 30.0s
 Ref Lvl: 123.2 DBUW

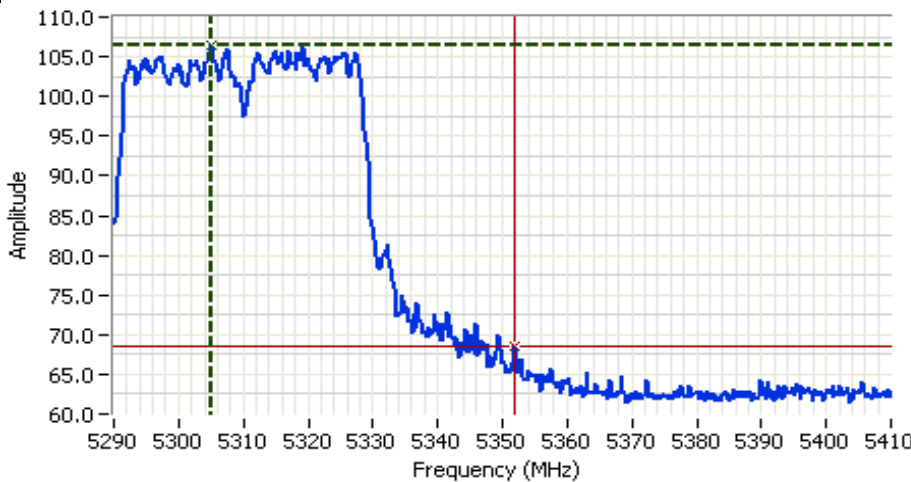
Comments

BE @ 5350MHz
 802.11n40
 CH 62 - vertical

Cursor 1	5304.9097	93.56	+	-	+	Delta Freq.	45.210
Cursor 2	5350.1201	52.26	+	-	+	Delta Amplitude	41.30



Client: Broadcom Corporation	Job Number: J79248
Model: BCM94322HM8L	T-Log Number: T79249
Contact: Pin Wen	Account Manager: Sheareen Washington
Standard: 15.209 / 15.247 / 15.E / RSS-210	Class: N/A



Analyzer Settings
 Rohde&Schwarz, ESI
 CF: 5350.000 MHz
 SPAN: 120.000 MHz
 RB: 1.000 MHz
 VB: 1.000 MHz
 Detector: POS
 Attn: 10 DB
 RL Offset: 41.2 DB
 Sweep Time: 5.0ms
 Ref Lvl: 123.2 DBUW

Comments
 BE @ 5350MHz
 802.11n40
 CH 62 - vertical

Cursor 1 5305.1504 106.49
 Cursor 2 5351.8037 68.54
 Delta Freq. 46.653
 Delta Amplitude 37.95



Run #2, Radiated Spurious Emissions, 30 - 40,000 MH. Mode: 20MHz CDD

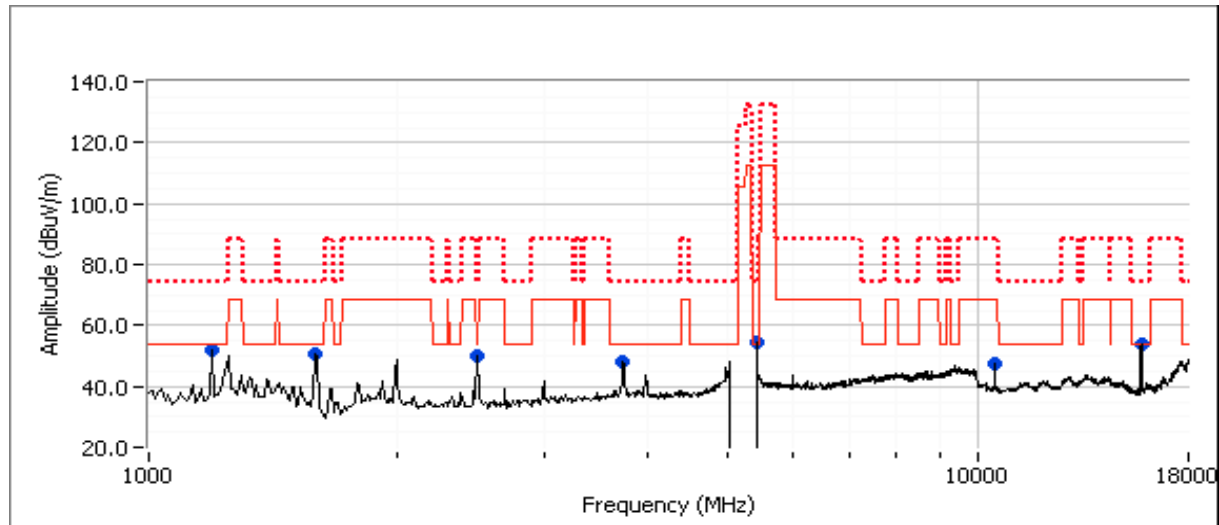
Date of Test: 5/11/2010
 Test Engineer: Rafael Varelas
 Test Location: FT Chamber #4

Run #2a: Low Channel (52) @ 5260 MHz

Spurious Radiated Emissions:

Frequency MHz	Level dB μ V/m	Pol v/h	15.209 / 15E		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
15778.810	49.8	V	54.0	-4.2	AVG	83	0.0	RB 1 MHz;VB 10 Hz;Pk
15783.880	60.8	V	74.0	-13.2	PK	83	0.0	RB 1 MHz;VB 3 MHz;Pk
5415.910	49.5	V	54.0	-4.5	AVG	199	1.2	RB 1 MHz;VB 10 Hz;Pk
5415.620	60.4	V	74.0	-13.6	PK	199	1.2	RB 1 MHz;VB 3 MHz;Pk
3741.750	34.3	V	54.0	-19.7	AVG	24	1.6	RB 1 MHz;VB 10 Hz;Pk
3743.130	59.4	V	74.0	-14.6	PK	24	1.6	RB 1 MHz;VB 3 MHz;Pk
1595.370	31.5	V	54.0	-22.5	AVG	39	1.9	RB 1 MHz;VB 10 Hz;Pk
1595.290	45.3	V	74.0	-28.7	PK	39	1.9	RB 1 MHz;VB 3 MHz;Pk
1196.580	41.5	V	54.0	-12.5	AVG	326	1.1	RB 1 MHz;VB 10 Hz;Pk
1196.960	58.9	V	74.0	-15.1	PK	326	1.1	RB 1 MHz;VB 3 MHz;Pk
2493.470	34.9	V	54.0	-19.1	AVG	331	1.9	RB 1 MHz;VB 10 Hz;Pk
2496.670	55.0	V	74.0	-19.0	PK	331	1.9	RB 1 MHz;VB 3 MHz;Pk
10522.330	47.3	V	68.3	-21.0	Peak	297	1.0	

Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A



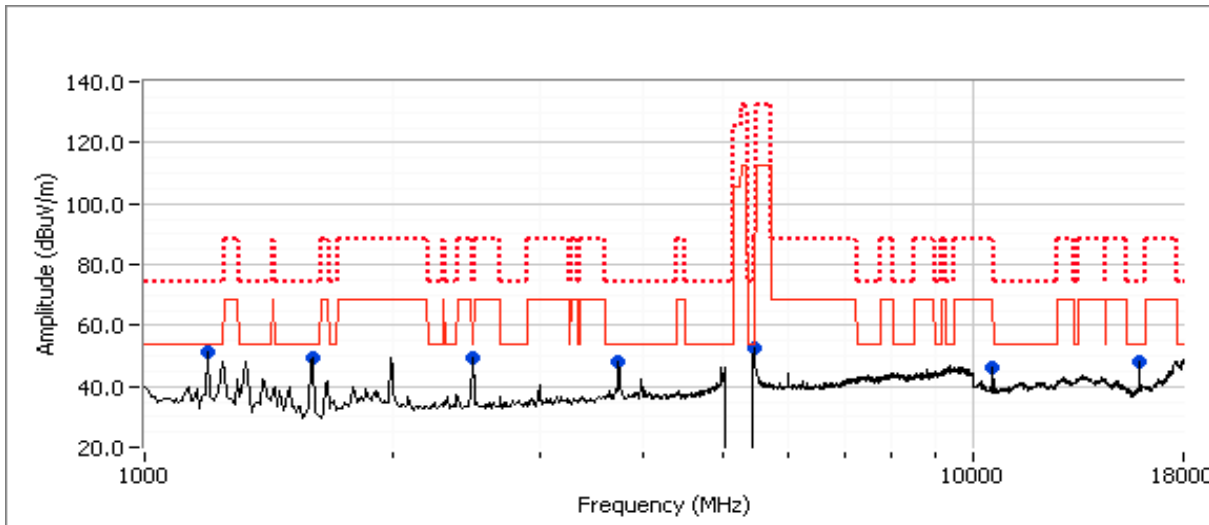
Run #2b: Center Channel (60) @ 5300 MHz

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
15904.120	48.1	V	54.0	-5.9	AVG	105	1.0	RB 1 MHz; VB: 10 Hz
15906.500	61.2	V	74.0	-12.8	PK	105	1.0	RB 1 MHz; VB: 1 MHz
10600.920	43.9	V	54.0	-10.1	AVG	277	1.2	RB 1 MHz; VB: 10 Hz
10601.270	55.4	V	74.0	-18.6	PK	277	1.2	RB 1 MHz; VB: 1 MHz
2493.040	32.0	V	54.0	-22.0	AVG	345	1.1	RB 1 MHz; VB: 10 Hz
2489.870	58.0	V	74.0	-16.0	PK	345	1.1	RB 1 MHz; VB: 1 MHz
1196.890	38.2	V	54.0	-15.8	AVG	322	1.0	RB 1 MHz; VB: 10 Hz
1194.560	58.1	V	74.0	-15.9	PK	322	1.0	RB 1 MHz; VB: 1 MHz
5460.170	46.5	V	54.0	-7.5	AVG	162	1.0	RB 1 MHz; VB: 10 Hz
5460.330	55.4	V	74.0	-18.6	PK	162	1.0	RB 1 MHz; VB: 1 MHz
1595.430	38.3	V	54.0	-15.7	AVG	86	1.0	RB 1 MHz; VB: 10 Hz
1593.830	56.0	V	74.0	-18.0	PK	86	1.0	RB 1 MHz; VB: 1 MHz
3739.520	32.0	V	54.0	-22.0	AVG	2	1.0	RB 1 MHz; VB: 10 Hz
3741.680	50.8	V	74.0	-23.2	PK	2	1.0	RB 1 MHz; VB: 1 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:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A



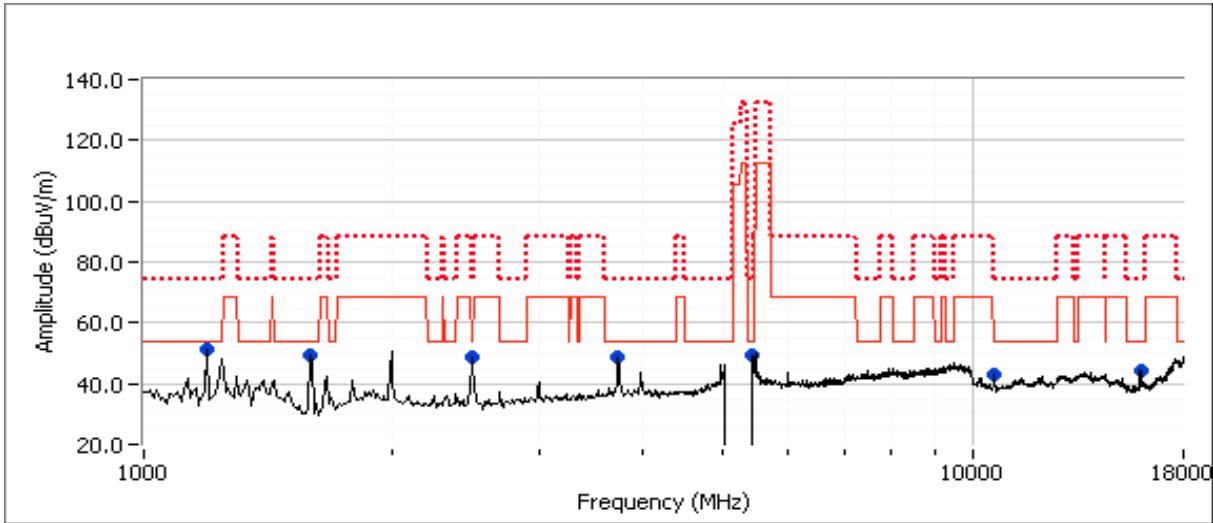
Run #2c: High Channel (64) @ 5320 MHz

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	
5416.060	47.1	V	54.0	-6.9	AVG	317	1.4	RB 1 MHz; VB: 10 Hz
5417.060	58.4	V	74.0	-15.6	PK	317	1.4	RB 1 MHz; VB: 1 MHz
3733.860	32.1	V	54.0	-21.9	AVG	30	1.0	RB 1 MHz; VB: 10 Hz
3741.340	53.5	V	74.0	-20.5	PK	30	1.0	RB 1 MHz; VB: 1 MHz
1595.550	39.8	V	54.0	-14.2	AVG	49	1.0	RB 1 MHz; VB: 10 Hz
1592.700	60.7	V	74.0	-13.3	PK	49	1.0	RB 1 MHz; VB: 1 MHz
1196.770	41.4	V	54.0	-12.6	AVG	166	1.0	RB 1 MHz; VB: 10 Hz
1195.750	61.1	V	74.0	-12.9	PK	166	1.0	RB 1 MHz; VB: 1 MHz
2493.750	31.5	V	54.0	-22.5	AVG	288	1.4	RB 1 MHz; VB: 10 Hz
2492.450	55.4	V	74.0	-18.6	PK	288	1.4	RB 1 MHz; VB: 1 MHz
15959.110	40.6	V	54.0	-13.4	AVG	61	1.0	RB 1 MHz; VB: 10 Hz
15956.640	54.8	V	74.0	-19.2	PK	61	1.0	RB 1 MHz; VB: 1 MHz
10640.570	36.6	V	54.0	-17.4	AVG	275	1.0	RB 1 MHz; VB: 10 Hz
10642.570	49.5	V	74.0	-24.5	PK	275	1.0	RB 1 MHz; VB: 1 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:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A



Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	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: See below
Test Engineer: See below
Test Location: See below

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

General Test Configuration

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

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

Ambient Conditions: Temperature: 18.9 °C
Rel. Humidity: 36 %

Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1	802.11a Chain A	5470-5725 Low	-	-	Restricted Band Edge at 5460 MHz	15.209	51.5dBµV/m @ 5459.7MHz (-2.5dB)
	802.11a Chain A	5470-5725 Low	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	63.0dBµV/m @ 1599.5MHz (-11.0dB)
	802.11a Chain A	5470-5725 Center	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	62.5dBµV/m @ 1597.9MHz (-11.5dB)
	802.11a Chain A	5470-5725 High	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	41.7dBµV/m @ 1196.6MHz (-12.3dB)
2	20MHz CDD	5470-5725 Low	-	-	Restricted Band Edge at 5460 MHz	15.209	53.0dBµV/m @ 5459.5MHz (-1.0dB)
	20MHz CDD	5470-5725 Low	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	45.8dBµV/m @ 10999.3MHz (-8.2dB)
	20MHz CDD	5470-5725 Center	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	43.5dBµV/m @ 11199.0MHz (-10.5dB)
	20MHz CDD	5470-5725 High	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	44.4dBµV/m @ 11398.7MHz (-9.6dB)

Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
3	40MHz CDD	5470-5725 Low	-	-	Restricted Band Edge at 5460 MHz	15.209	53.7dB μ V/m @ 5459.1MHz (-0.3dB)
	40MHz CDD	5470-5725 Low	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	61.9dB μ V/m @ 1195.2MHz (-12.1dB)
	40MHz CDD	5470-5725 Center	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	44.7dB μ V/m @ 1594.7MHz (-9.3dB)
	40MHz CDD	5470-5725 High	-	-	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	41.3dB μ V/m @ 1594.5MHz (-12.7dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Note: Preliminary testing showed no emissions below 1 GHz and above 18GHz.

Client: Broadcom Corporation	Job Number: J79248
Model: BCM94322HM8L	T-Log Number: T79249
	Account Manager: Sheareen Washington
Contact: Pin Wen	
Standard: 15.209 / 15.247 / 15.E / RSS-210	Class: N/A

Run #1, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5470-5725 MHz Band, Legacy A

Date of Test: 5/10/2010
 Test Engineer: Joseph Cadigal
 Test Location: FT Chamber #3

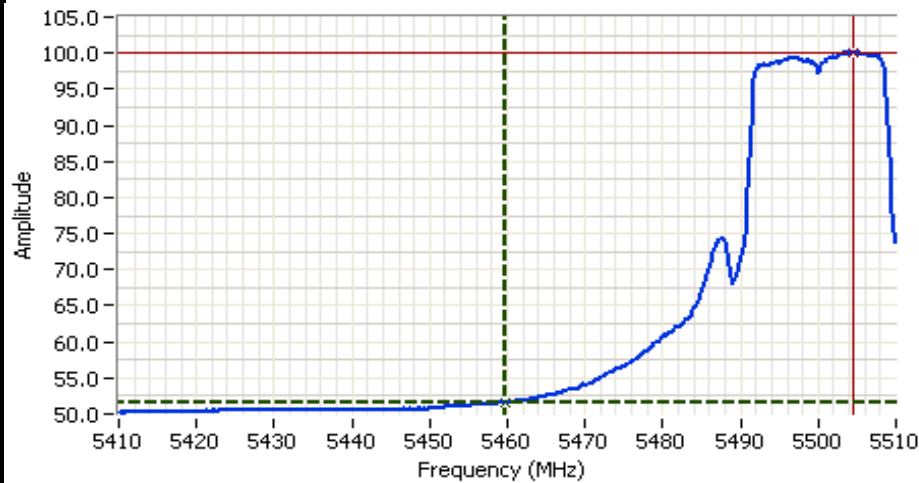
Run #1a: Low Channel (5500 MHz)

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	PK/QP/Avg	degrees	meters	
5504.790	111.7	v	-	-	Pk	25	1.3	RB = VB = 1MHz
5504.589	100.1	v	-	-	Avg	25	1.3	RB = 1MHz, VB = 10Hz
5506.393	105.5	h	-	-	Pk	351	1.8	RB = VB = 1MHz
5492.565	94.0	h	-	-	Avg	351	1.8	RB = 1MHz, VB = 10Hz

5350-5460 MHz Restricted Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	PK/QP/Avg	degrees	meters	
5459.699	51.5	v	54.0	-2.5	Avg	25	1.3	
5459.900	50.7	h	54.0	-3.3	Avg	351	1.8	



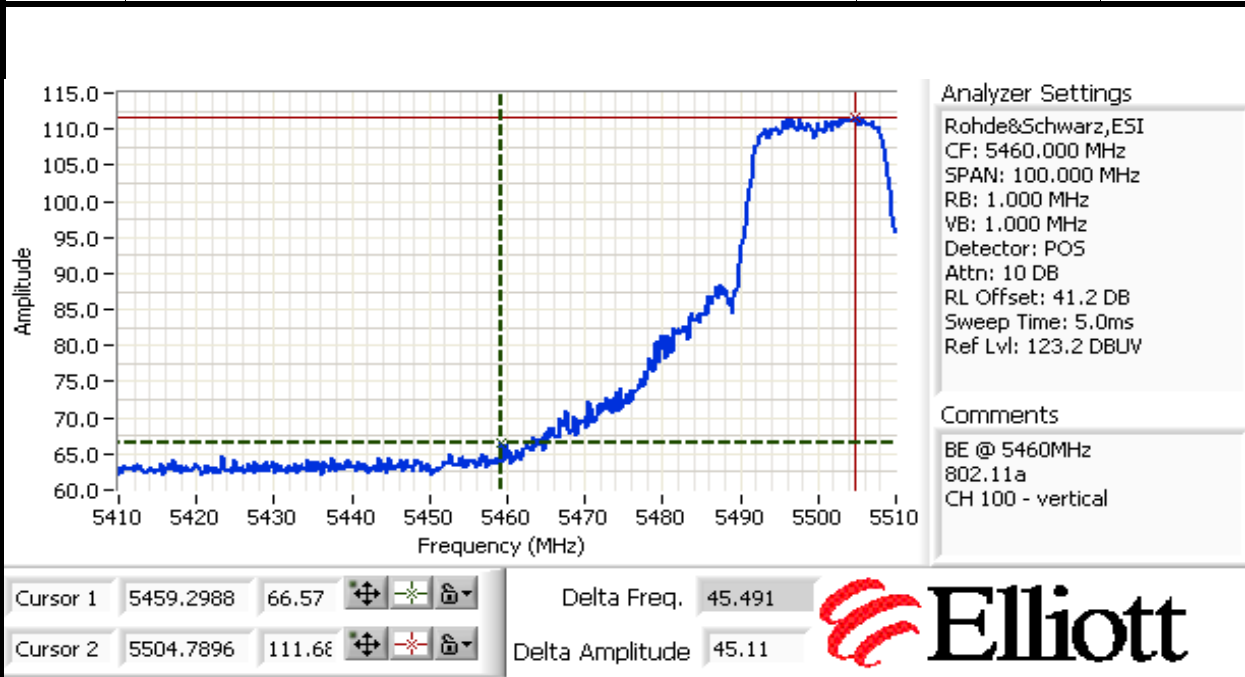
Analyzer Settings
 Rohde&Schwarz, ESI
 CF: 5460.000 MHz
 SPAN: 100.000 MHz
 RB: 1.000 MHz
 VB: 10 Hz
 Detector: POS
 Attn: 10 DB
 RL Offset: 41.2 DB
 Sweep Time: 25.0s
 Ref Lvl: 123.2 DBUW

Comments
 BE @ 5460MHz
 802.11a
 CH 100 - vertical

Cursor 1	5459.6992	51.54	+	-	+	Delta Freq.	44.890
Cursor 2	5504.5894	100.13	+	-	+	Delta Amplitude	48.59



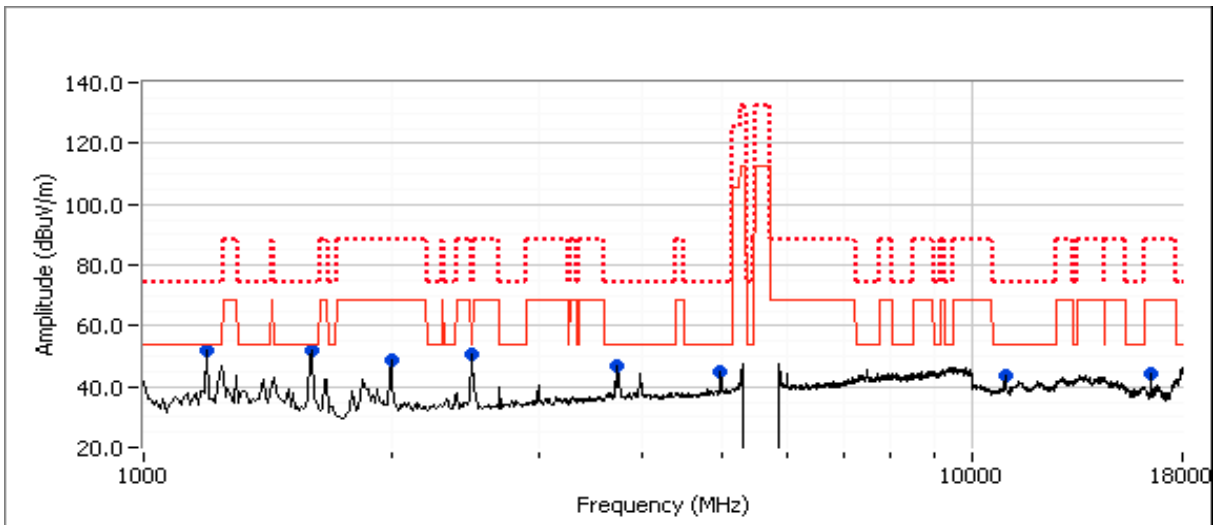
Client: Broadcom Corporation	Job Number: J79248
Model: BCM94322HM8L	T-Log Number: T79249
Contact: Pin Wen	Account Manager: Sheareen Washington
Standard: 15.209 / 15.247 / 15.E / RSS-210	Class: N/A



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	
1599.480	63.0	V	74.0	-11.0	PK	143	1.0	RB 1 MHz; VB: 1 MHz
10976.600	42.1	V	54.0	-11.9	AVG	195	1.3	RB 1 MHz; VB: 10 Hz
1196.450	61.6	V	74.0	-12.4	PK	312	1.3	RB 1 MHz; VB: 1 MHz
1597.140	40.9	V	54.0	-13.1	AVG	143	1.0	RB 1 MHz; VB: 10 Hz
3735.410	59.9	V	74.0	-14.1	PK	26	1.9	RB 1 MHz; VB: 1 MHz
2493.860	59.6	V	74.0	-14.4	PK	95	1.3	RB 1 MHz; VB: 1 MHz
1196.660	36.7	V	54.0	-17.3	AVG	312	1.3	RB 1 MHz; VB: 10 Hz
4981.930	55.0	V	74.0	-19.0	PK	151	1.9	RB 1 MHz; VB: 1 MHz
4981.150	34.8	V	54.0	-19.2	AVG	151	1.9	RB 1 MHz; VB: 10 Hz
10976.790	53.9	V	74.0	-20.1	PK	195	1.3	RB 1 MHz; VB: 1 MHz
3735.340	32.8	V	54.0	-21.2	AVG	26	1.9	RB 1 MHz; VB: 10 Hz
2493.620	32.8	V	54.0	-21.2	AVG	95	1.3	RB 1 MHz; VB: 10 Hz
16500.610	44.6	V	68.3	-23.7	AVG	70	1.0	RB 1 MHz; VB: 10 Hz
1991.720	59.3	H	88.3	-29.0	PK	139	1.9	RB 1 MHz; VB: 1 MHz
16501.680	56.7	V	88.3	-31.6	PK	70	1.0	RB 1 MHz; VB: 1 MHz
1992.910	36.2	H	68.3	-32.1	AVG	139	1.9	RB 1 MHz; VB: 10 Hz

Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A



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).

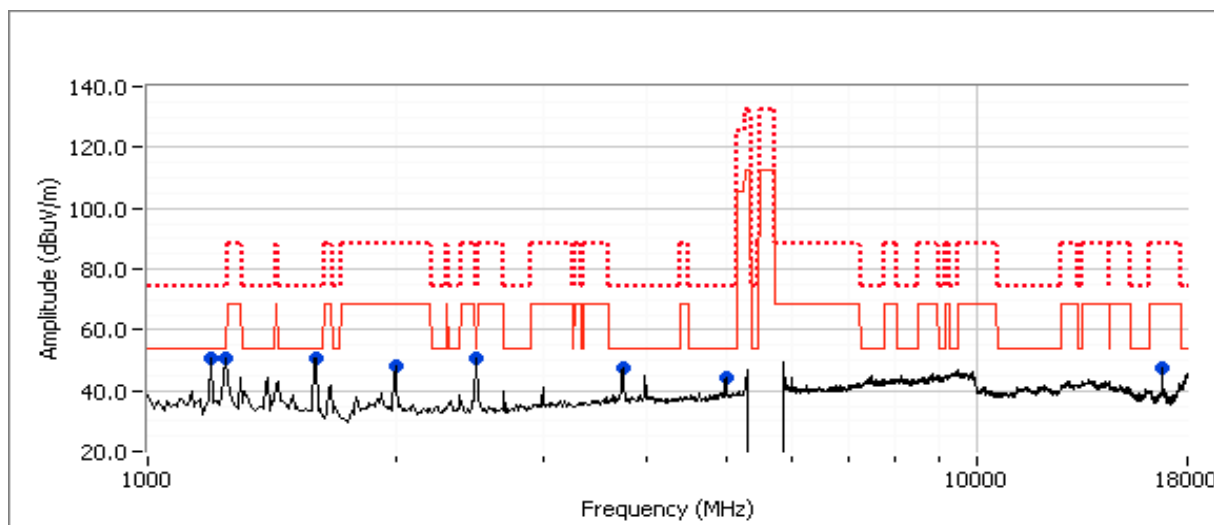
Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A

Run #1b: Center Channel (5600 MHz)

Spurious Radiated Emissions:

Frequency MHz	Level dB μ V/m	Pol v/h	15.209 / 15E		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
1597.880	62.5	V	74.0	-11.5	PK	67	1.0	RB 1 MHz; VB: 1 MHz
1197.310	61.6	V	74.0	-12.4	PK	306	1.3	RB 1 MHz; VB: 1 MHz
1597.270	40.6	V	54.0	-13.4	AVG	67	1.0	RB 1 MHz; VB: 10 Hz
1197.220	37.0	V	54.0	-17.0	AVG	306	1.3	RB 1 MHz; VB: 10 Hz
4994.120	55.2	V	74.0	-18.8	PK	141	1.9	RB 1 MHz; VB: 1 MHz
4991.120	34.7	V	54.0	-19.3	AVG	141	1.9	RB 1 MHz; VB: 10 Hz
3724.100	32.4	V	54.0	-21.6	AVG	17	1.9	RB 1 MHz; VB: 10 Hz
3725.090	50.4	V	74.0	-23.6	PK	17	1.9	RB 1 MHz; VB: 1 MHz
1993.740	58.4	H	88.3	-29.9	PK	141	1.9	RB 1 MHz; VB: 1 MHz
1994.070	36.8	H	68.3	-31.5	AVG	141	1.9	RB 1 MHz; VB: 10 Hz
16800.980	36.4	V	68.3	-31.9	AVG	105	1.0	RB 1 MHz; VB: 10 Hz
1244.570	54.1	V	88.3	-34.2	PK	0	1.3	RB 1 MHz; VB: 1 MHz
16803.300	54.0	V	88.3	-34.3	PK	105	1.0	RB 1 MHz; VB: 1 MHz
1245.570	30.7	V	68.3	-37.6	AVG	0	1.3	RB 1 MHz; VB: 10 Hz
2455.540	29.4	V	68.3	-38.9	AVG	96	1.3	RB 1 MHz; VB: 10 Hz
2457.010	41.3	V	88.3	-47.0	PK	96	1.3	RB 1 MHz; VB: 1 MHz

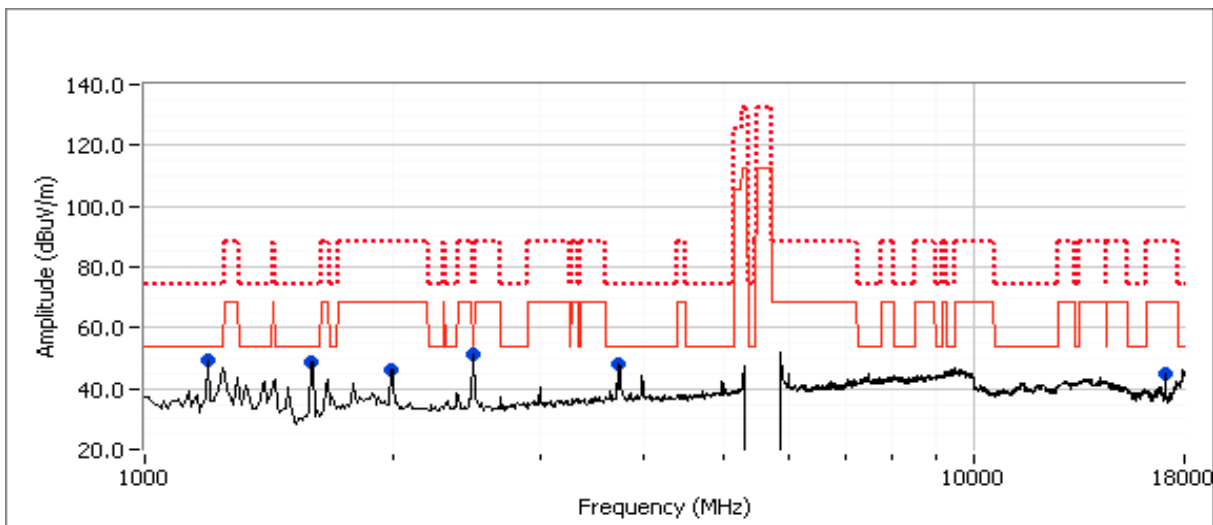
Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).



Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A

Run #1c: High Channel (5700 MHz)

Frequency MHz	Level dB μ V/m	Pol v/h	15.209 / 15E		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
1196.620	41.7	V	54.0	-12.3	AVG	143	1.0	RB 1 MHz; VB: 10 Hz
2493.180	59.9	V	74.0	-14.1	PK	5	1.0	RB 1 MHz; VB: 1 MHz
3737.330	59.3	V	74.0	-14.7	PK	12	1.3	RB 1 MHz; VB: 1 MHz
1195.390	59.0	V	74.0	-15.0	PK	143	1.0	RB 1 MHz; VB: 1 MHz
1593.810	58.0	V	74.0	-16.0	PK	156	1.0	RB 1 MHz; VB: 1 MHz
1594.960	37.7	V	54.0	-16.3	AVG	156	1.0	RB 1 MHz; VB: 10 Hz
2493.000	32.9	V	54.0	-21.1	AVG	5	1.0	RB 1 MHz; VB: 10 Hz
3735.200	32.8	V	54.0	-21.2	AVG	12	1.3	RB 1 MHz; VB: 10 Hz
1993.520	58.3	H	88.3	-30.0	PK	146	1.0	RB 1 MHz; VB: 1 MHz
1994.840	36.7	H	68.3	-31.6	AVG	146	1.0	RB 1 MHz; VB: 10 Hz
17107.890	34.4	V	68.3	-33.9	AVG	96	1.0	RB 1 MHz; VB: 10 Hz
17108.190	45.4	V	88.3	-42.9	PK	96	1.0	RB 1 MHz; VB: 1 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: J79248
Model: BCM94322HM8L	T-Log Number: T79249
	Account Manager: Sheareen Washington
Contact: Pin Wen	
Standard: 15.209 / 15.247 / 15.E / RSS-210	Class: N/A

Run #2, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5470-5725 MHz Band, 20MHz CDD

Date of Test: 5/10/2010
 Test Engineer: Rafael Varelas/ Joseph Cadigal
 Test Location: FT Chamber #3

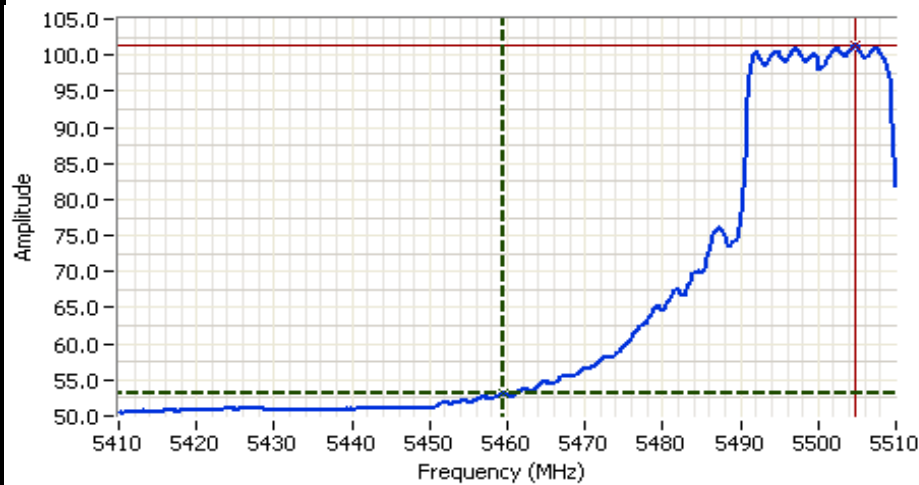
Run #2a: Low Channel (5500 MHz)

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5504.790	112.5	v	-	-	Pk	22	1.3	RB = VB = 1MHz
5504.790	101.3	v	-	-	Avg	22	1.3	RB = 1MHz, VB = 10Hz
5504.389	108.7	h	-	-	Pk	149	1.3	RB = VB = 1MHz
5504.189	97.1	h	-	-	Avg	149	1.3	RB = 1MHz, VB = 10Hz

5350-5460 MHz Restricted Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.499	53.0	-	54.0	-1.0	Avg	22	1.3	
5459.299	67.7	-	74.0	-6.3	Pk	22	1.3	



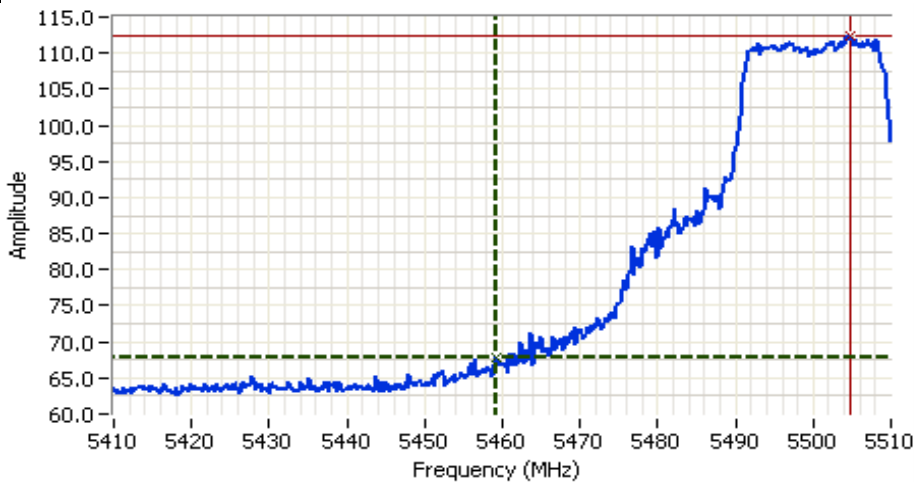
Analyzer Settings
 Rohde&Schwarz, ESI
 CF: 5460.000 MHz
 SPAN: 100.000 MHz
 RB: 1.000 MHz
 VB: 10 Hz
 Detector: POS
 Attn: 10 DB
 RL Offset: 41.2 DB
 Sweep Time: 25.0s
 Ref Lvl: 123.2 DBUW

Comments
 BE @ 5460MHz
 802.11n20
 CH 100 - vertical

Cursor 1	5459.4990	53.01	+	-	+	-	Delta Freq.	45.291
Cursor 2	5504.7896	101.25	+	-	+	-	Delta Amplitude	48.24



Client: Broadcom Corporation	Job Number: J79248
Model: BCM94322HM8L	T-Log Number: T79249
Contact: Pin Wen	Account Manager: Sheareen Washington
Standard: 15.209 / 15.247 / 15.E / RSS-210	Class: N/A



Analyzer Settings

Rohde&Schwarz,ESI
 CF: 5460.000 MHz
 SPAN: 100.000 MHz
 RB: 1.000 MHz
 VB: 1.000 MHz
 Detector: POS
 Attn: 10 DB
 RL Offset: 41.2 DB
 Sweep Time: 5.0ms
 Ref Lvl: 123.2 DBUV

Comments

BE @ 5460MHz
 802.11n20
 CH 100 - vertical

Cursor 1	5459.2988	67.69	
Cursor 2	5504.7896	112.47	

Delta Freq. 45.491

Delta Amplitude 44.78

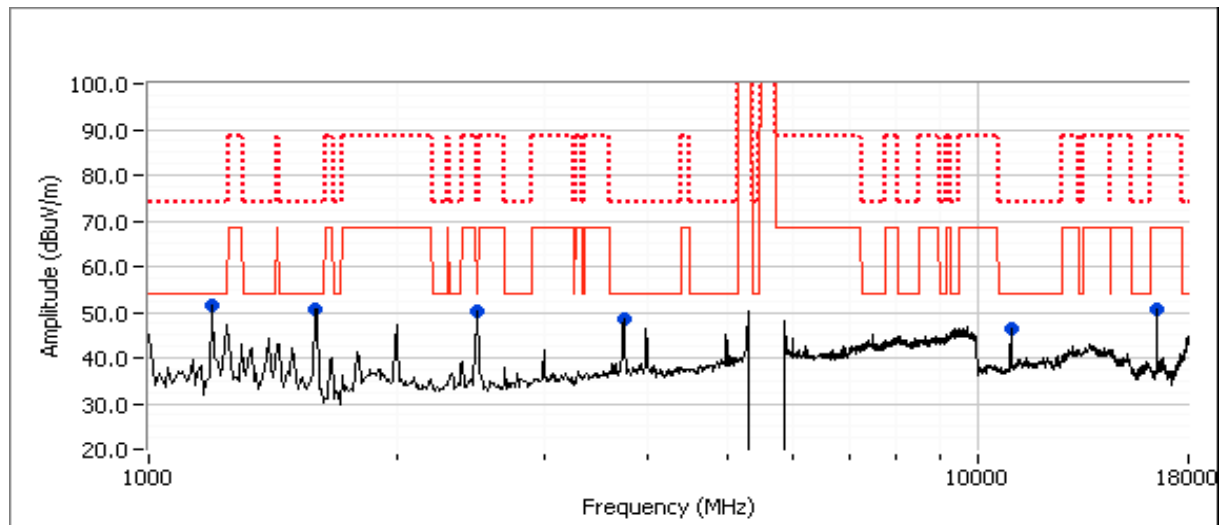


Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A

Spurious Radiated Emissions:

Frequency MHz	Level dB μ V/m	Pol v/h	15.209 / 15E		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
10999.270	45.8	V	54.0	-8.2	AVG	268	1.0	RB 1 MHz; VB: 10 Hz
10998.720	57.0	V	74.0	-17.0	PK	268	1.0	RB 1 MHz; VB: 1 MHz
16501.650	51.3	V	68.3	-17.0	AVG	74	1.2	RB 1 MHz; VB: 10 Hz
16501.580	62.5	V	88.3	-25.8	PK	74	1.2	RB 1 MHz; VB: 1 MHz
3738.180	33.1	V	54.0	-20.9	AVG	13	1.5	RB 1 MHz; VB: 10 Hz
3740.380	61.5	V	74.0	-12.5	PK	13	1.5	RB 1 MHz; VB: 1 MHz
1596.030	39.0	V	54.0	-15.0	AVG	149	1.0	RB 1 MHz; VB: 10 Hz
1596.560	59.9	V	74.0	-14.1	PK	149	1.0	RB 1 MHz; VB: 1 MHz
2493.430	33.7	V	54.0	-20.3	AVG	266	1.4	RB 1 MHz; VB: 10 Hz
2494.190	61.8	V	74.0	-12.2	PK	266	1.4	RB 1 MHz; VB: 1 MHz
1196.560	38.9	V	54.0	-15.1	AVG	307	1.2	RB 1 MHz; VB: 10 Hz
1195.010	63.2	V	74.0	-10.8	PK	307	1.2	RB 1 MHz; VB: 1 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).

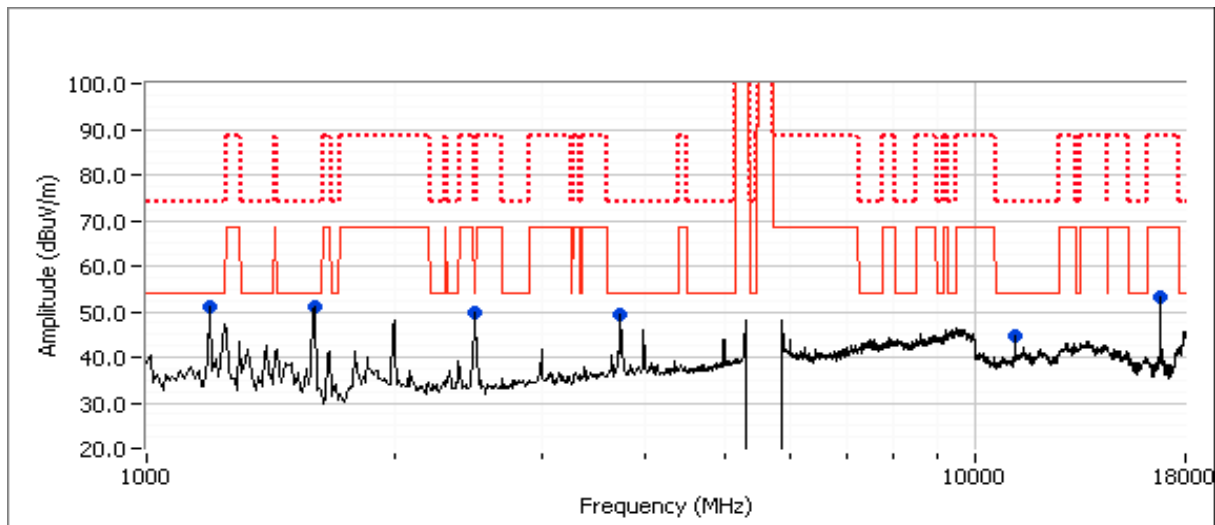


Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A

Run #2b: Center Channel (5600 MHz)

Frequency MHz	Level dB μ V/m	Pol v/h	15.209 / 15E		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
11199.020	43.5	V	54.0	-10.5	AVG	326	1.6	RB 1 MHz; VB: 10 Hz
11191.350	55.8	V	74.0	-18.2	PK	326	1.6	RB 1 MHz; VB: 1 MHz
16801.930	53.7	V	68.3	-14.6	AVG	68	1.0	RB 1 MHz; VB: 10 Hz
16802.030	67.3	V	88.3	-21.0	PK	68	1.0	RB 1 MHz; VB: 1 MHz
3739.810	32.8	V	54.0	-21.2	AVG	171	1.0	RB 1 MHz; VB: 10 Hz
3745.850	59.4	V	74.0	-14.6	PK	171	1.0	RB 1 MHz; VB: 1 MHz
1196.860	41.3	V	54.0	-12.7	AVG	345	1.7	RB 1 MHz; VB: 10 Hz
1197.130	55.7	V	74.0	-18.3	PK	345	1.7	RB 1 MHz; VB: 1 MHz
2493.320	32.1	V	54.0	-21.9	AVG	332	1.4	RB 1 MHz; VB: 10 Hz
2492.650	58.4	V	74.0	-15.6	PK	332	1.4	RB 1 MHz; VB: 1 MHz
1595.540	40.9	V	54.0	-13.1	AVG	71	1.0	RB 1 MHz; VB: 10 Hz
1596.280	61.1	V	74.0	-12.9	PK	71	1.0	RB 1 MHz; VB: 1 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).

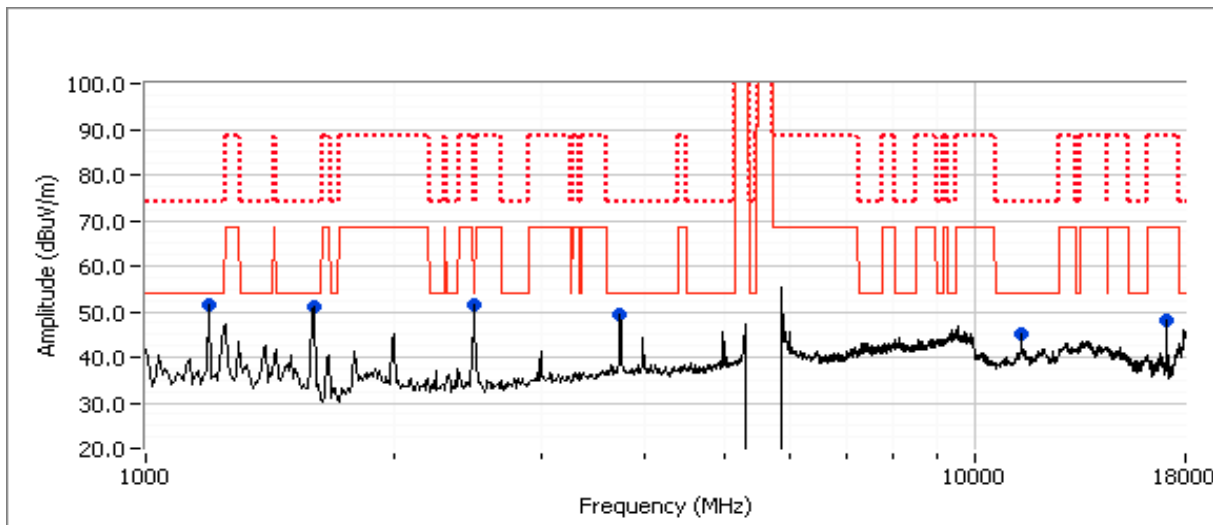


Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A

Run #2c: High Channel (5700 MHz)

Frequency MHz	Level dB μ V/m	Pol v/h	15.209 / 15E		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
11398.650	44.4	V	54.0	-9.6	AVG	277	1.2	RB 1 MHz; VB: 10 Hz
11408.450	55.9	V	74.0	-18.1	PK	277	1.2	RB 1 MHz; VB: 1 MHz
17099.570	49.9	V	68.3	-18.4	AVG	66	1.0	RB 1 MHz; VB: 10 Hz
17104.300	61.4	V	88.3	-26.9	PK	66	1.0	RB 1 MHz; VB: 1 MHz
1196.610	40.2	V	54.0	-13.8	AVG	167	1.0	RB 1 MHz; VB: 10 Hz
1197.080	62.0	V	74.0	-12.0	PK	167	1.0	RB 1 MHz; VB: 1 MHz
2493.070	32.2	H	54.0	-21.8	AVG	136	1.8	RB 1 MHz; VB: 10 Hz
2489.470	56.5	H	74.0	-17.5	PK	136	1.8	RB 1 MHz; VB: 1 MHz
1595.260	41.2	V	54.0	-12.8	AVG	62	1.0	RB 1 MHz; VB: 10 Hz
1599.890	61.6	V	74.0	-12.4	PK	62	1.0	RB 1 MHz; VB: 1 MHz
3734.670	32.8	V	54.0	-21.2	AVG	13	1.6	RB 1 MHz; VB: 10 Hz
3735.400	60.4	V	74.0	-13.6	PK	13	1.6	RB 1 MHz; VB: 1 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: J79248
Model: BCM94322HM8L	T-Log Number: T79249
	Account Manager: Sheareen Washington
Contact: Pin Wen	
Standard: 15.209 / 15.247 / 15.E / RSS-210	Class: N/A

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

Date of Test: 5/10/2010

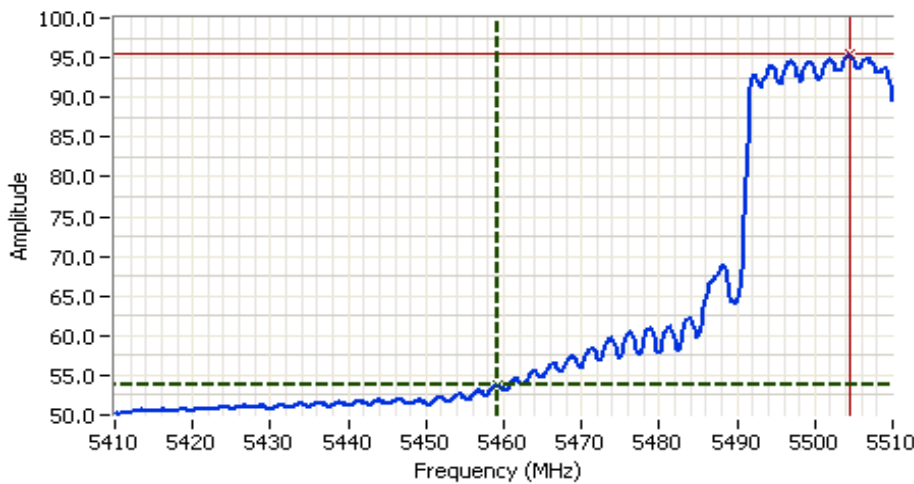
Test Engineer: Joseph Cadigal

Test Location: FT Chamber #3

Run #3a: Low Channel (5510 MHz)

5350-5460 MHz Restricted Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.098	53.7	-	54.0	-0.3	Avg	24	1.3	
5456.493	69.2	-	74.0	-4.8	Pk	24	1.3	



Analyzer Settings

Rohde&Schwarz,ESI
 CF: 5460.000 MHz
 SPAN: 100.000 MHz
 RB: 1.000 MHz
 VB: 10 Hz
 Detector: POS
 Attn: 10 DB
 RL Offset: 41.2 DB
 Sweep Time: 25.0s
 Ref Lvl: 123.2 DBUW

Comments

BE @ 5460MHz
 802.11n40
 CH 102 - vertical

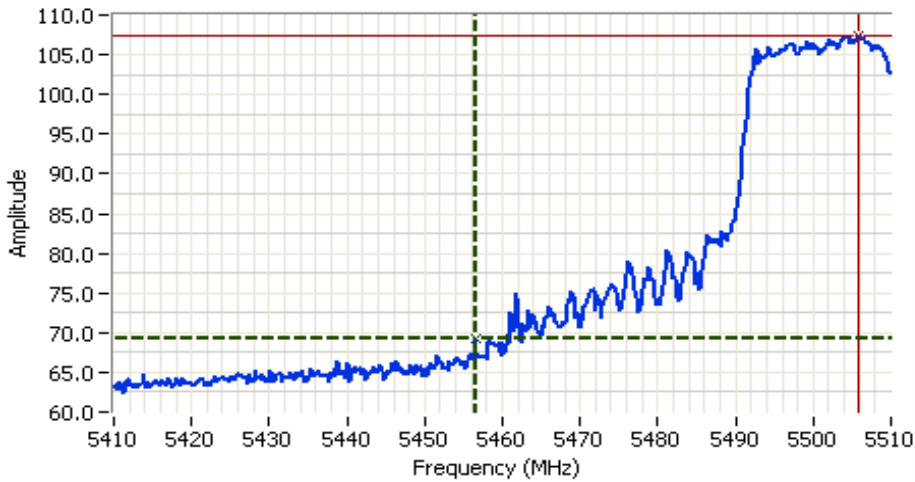
Cursor 1	5459.0981	53.68	
Cursor 2	5504.3887	95.38	

Delta Freq. 45.291

Delta Amplitude 41.70



Client: Broadcom Corporation	Job Number: J79248
Model: BCM94322HM8L	T-Log Number: T79249
Contact: Pin Wen	Account Manager: Sheareen Washington
Standard: 15.209 / 15.247 / 15.E / RSS-210	Class: N/A



Analyzer Settings

Rohde&Schwarz, ESI
 CF: 5460.000 MHz
 SPAN: 100.000 MHz
 RB: 1.000 MHz
 VB: 1.000 MHz
 Detector: POS
 Attn: 10 DB
 RL Offset: 41.2 DB
 Sweep Time: 5.0ms
 Ref Lvl: 123.2 DBUV

Comments

BE @ 5460MHz
 802.11n40
 CH 102 - vertical

Cursor 1	5456.4932	69.19	
Cursor 2	5505.7915	107.32	

Delta Freq. 49.298

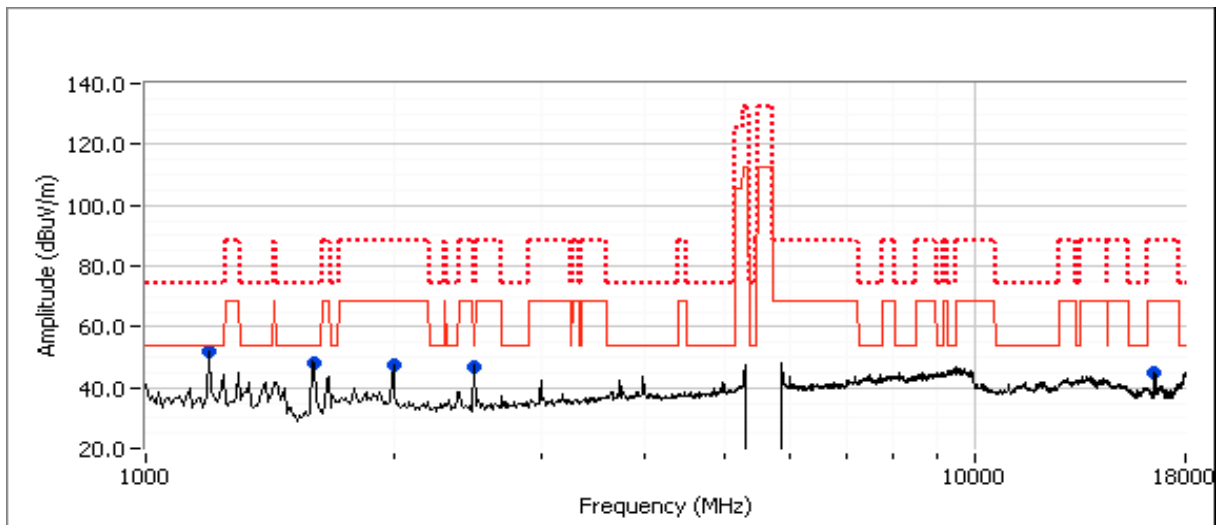
Delta Amplitude 38.13



Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A

Spurious Radiated Emissions:

Frequency MHz	Level dB μ V/m	Pol v/h	15.209 / 15E		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
1195.160	61.9	V	74.0	-12.1	PK	60	1.0	RB 1 MHz; VB: 1 MHz
1196.290	38.0	V	54.0	-16.0	AVG	60	1.0	RB 1 MHz; VB: 10 Hz
1595.660	37.4	V	54.0	-16.6	AVG	205	1.0	RB 1 MHz; VB: 10 Hz
2490.720	36.0	V	54.0	-18.0	AVG	100	1.3	RB 1 MHz; VB: 10 Hz
2490.500	55.9	V	74.0	-18.1	PK	100	1.3	RB 1 MHz; VB: 1 MHz
1594.950	55.9	V	74.0	-18.1	PK	205	1.0	RB 1 MHz; VB: 1 MHz
16526.540	39.1	V	68.3	-29.2	AVG	64	1.0	RB 1 MHz; VB: 10 Hz
1996.960	33.7	H	68.3	-34.6	AVG	155	1.9	RB 1 MHz; VB: 10 Hz
1997.420	53.1	H	88.3	-35.2	PK	155	1.9	RB 1 MHz; VB: 1 MHz
16526.720	51.5	V	88.3	-36.8	PK	64	1.0	RB 1 MHz; VB: 1 MHz

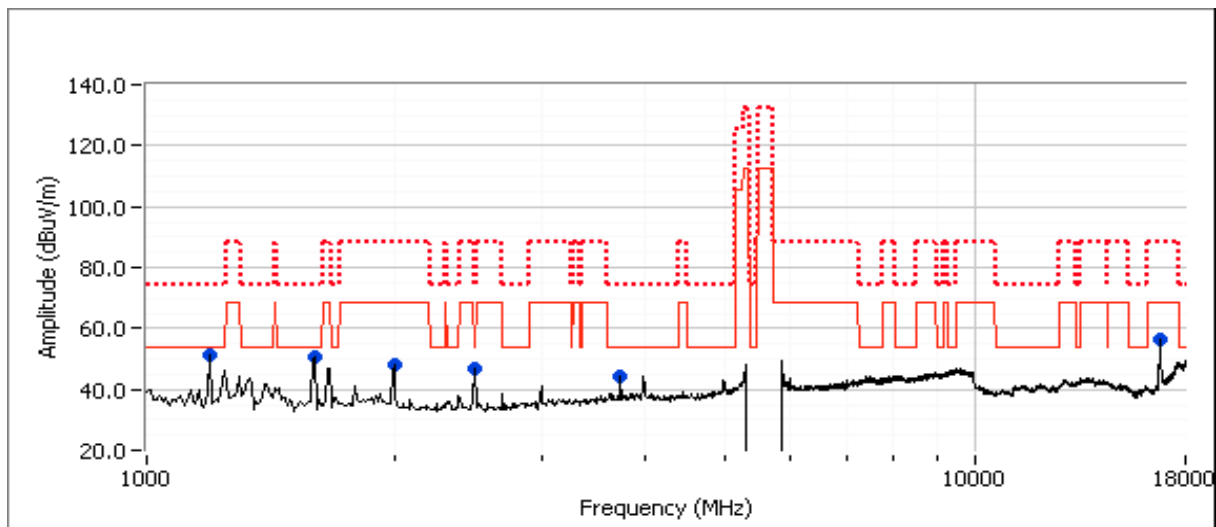


Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A

Run #3b: Center Channel (5590 MHz)

Spurious Radiated Emissions:

Frequency MHz	Level dB μ V/m	Pol v/h	15.209 / 15E		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
1594.700	44.7	V	54.0	-9.3	AVG	142	1.0	
1594.860	63.5	V	74.0	-10.5	PK	142	1.0	
1196.710	41.3	V	54.0	-12.7	AVG	358	1.3	
16764.130	53.5	V	68.3	-14.8	AVG	60	1.0	
2492.860	57.4	H	74.0	-16.6	PK	89	2.5	
2491.520	36.3	H	54.0	-17.7	AVG	89	2.5	
3739.050	33.3	H	54.0	-20.7	AVG	267	1.9	
3737.720	53.3	H	74.0	-20.7	PK	267	1.9	
1195.220	52.3	V	74.0	-21.7	PK	358	1.3	
16763.750	63.9	V	88.3	-24.4	PK	60	1.0	
1992.480	60.9	H	88.3	-27.4	PK	138	2.2	
1993.470	39.4	H	68.3	-28.9	AVG	138	2.2	

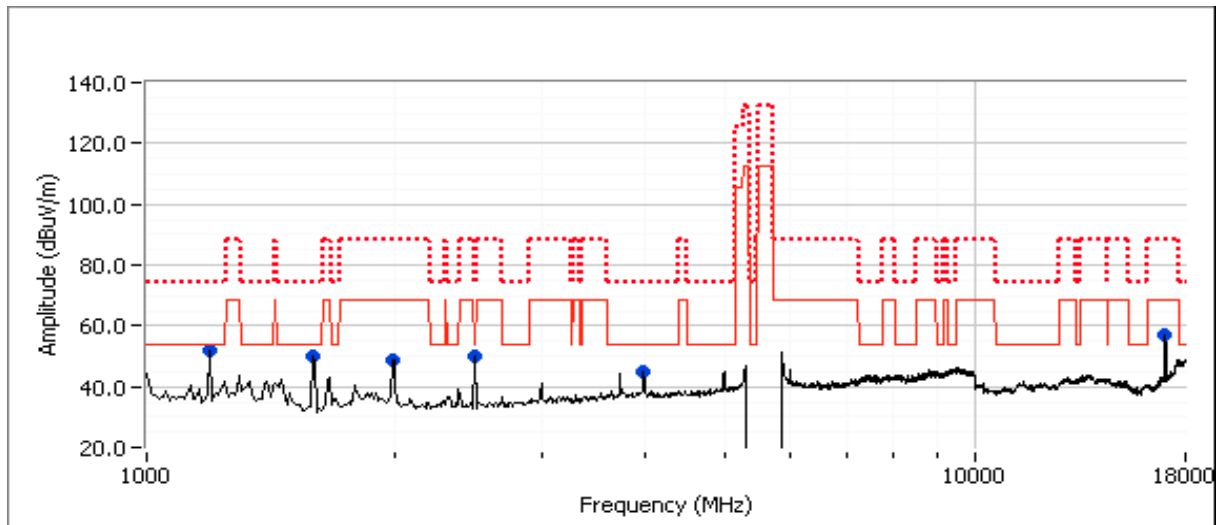


Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	N/A

Run #3c: High Channel (5670 MHz)

Spurious Radiated Emissions:

Frequency MHz	Level dB μ V/m	Pol v/h	15.209 / 15E		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
1594.480	41.3	V	54.0	-12.7	AVG	52	1.0	
1196.140	41.1	V	54.0	-12.9	AVG	167	1.0	
1195.300	60.9	V	74.0	-13.1	PK	167	1.0	
1593.780	60.9	V	74.0	-13.1	PK	52	1.0	
2492.780	39.8	V	54.0	-14.2	AVG	345	1.3	
3988.910	37.6	V	54.0	-16.4	AVG	15	1.3	
17016.760	51.4	V	68.3	-16.9	AVG	56	1.0	
2492.180	56.9	V	74.0	-17.1	PK	345	1.3	
3990.060	51.2	V	74.0	-22.8	PK	15	1.3	
17016.950	62.0	V	88.3	-26.3	PK	56	1.0	
1991.280	60.6	H	88.3	-27.7	PK	134	1.9	
1991.240	37.5	H	68.3	-30.8	AVG	134	1.9	



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:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
		Account Manager:	Sheareen Washington
Contact:	Pin Wen		
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	-

Receive Spurious Radiated Emissions (RSS-GEN) *(Elliott Laboratories Fremont Facility, Semi-Anechoic Chamber)*

Test Specific Details

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

Date of Test: 5/14/2010	Config. Used: 1
Test Engineer: Joseph Cadigal	Config Change: none
Test Location: FTChamber#3	EUT Voltage: Powered from host laptop

General Test Configuration

The EUT and any local support equipment were located on the turntable for radiated emissions testing. Any remote support equipment was located outside the semi-anechoic chamber. Any cables running to remote support equipment where routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.

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

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

Ambient Conditions:	Temperature:	18.9 °C
	Rel. Humidity:	36 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1 (2.4GHz)	Radiated Emissions 1 GHz - 10 GHz Maximized	RSS-GEN	Pass	60.9dBμV/m @ 1596.1MHz (-13.1dB)
2 (5.15-5.25GHz)	Radiated Emissions 1 GHz - 18 GHz Maximized	RSS-GEN	Pass	62.2dBμV/m @ 1196.4MHz (-11.8dB)
3 (5.25-5.35GHz)	Radiated Emissions 1 GHz - 18 GHz Maximized	RSS-GEN	Pass	63.2dBμV/m @ 1595.4MHz (-10.8dB)
4 (5.4-5.7GHz)	Radiated Emissions 1 GHz - 18 GHz Maximized	RSS-GEN	Pass	53.5dBμV/m @ 1195.1MHz (-20.5dB)
5 (5.7-5.8GHz)	Radiated Emissions 1 GHz - 18 GHz Maximized	RSS-GEN	Pass	61.5dBμV/m @ 1593.5MHz (-12.5dB)

Note: Preliminary testing showed no radio related emissions below 1 GHz

Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	-

Modifications Made During Testing

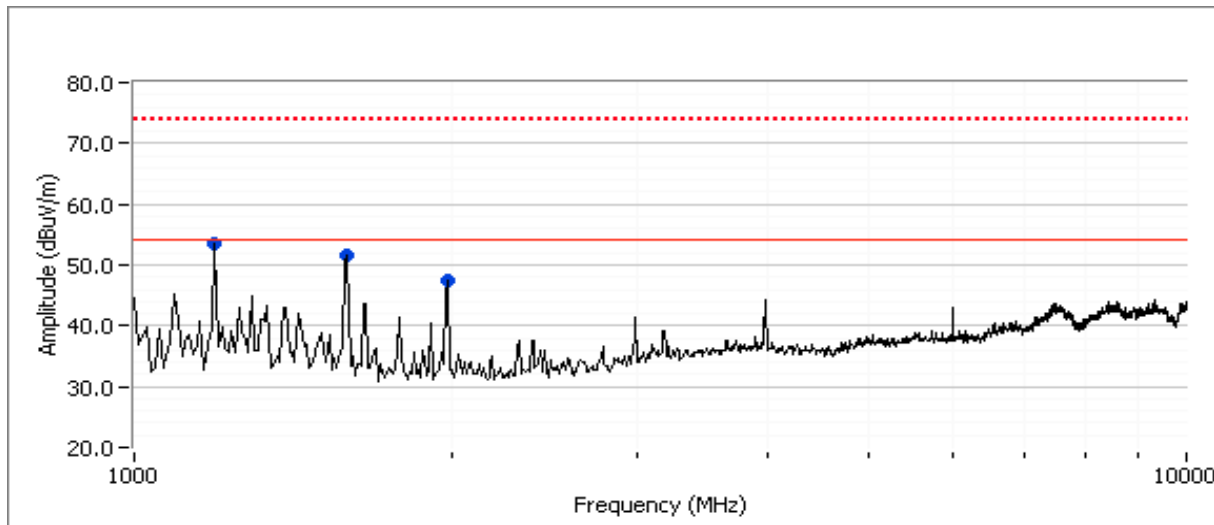
No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Run #1: Receive Mode Spurious Emissions, EUT tuned to Channel 6 (2437 MHz)

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 18000 MHz	3	3	0.0



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

Frequency MHz	Level dB μ V/m	Pol v/h	RSS-GEN		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
1597.390	51.7	V	54.0	-2.3	Peak	133	1.0	
1998.360	47.6	V	54.0	-6.4	Peak	140	1.0	
1197.010	53.6	V	54.0	-0.4	Peak	322	1.3	

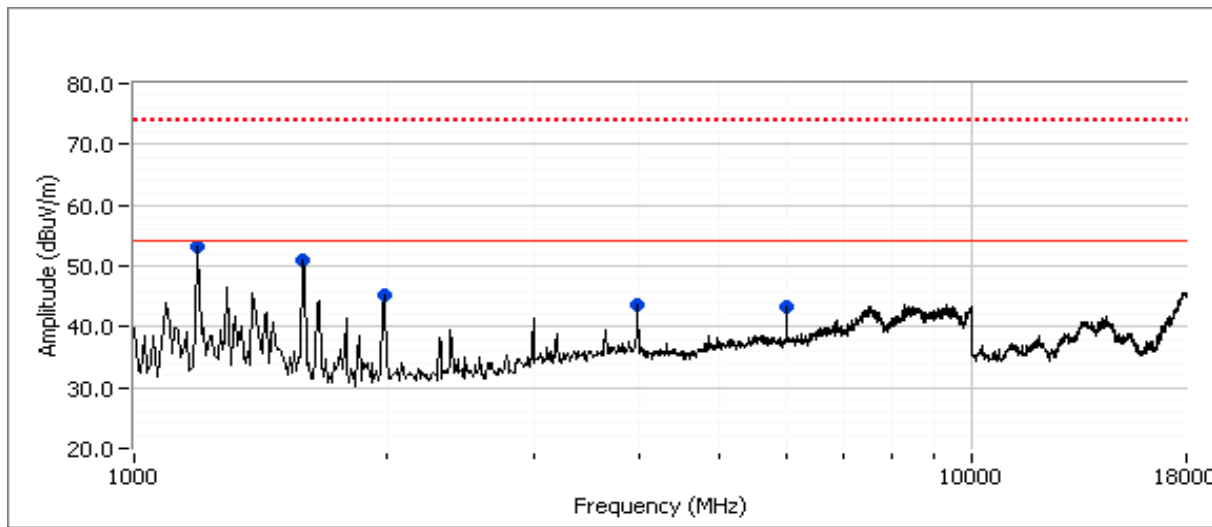
Final peak and average readings

Frequency MHz	Level dB μ V/m	Pol v/h	RSS-GEN		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
1596.110	60.9	V	74.0	-13.1	PK	131	1.0	RB 1 MHz;VB 3 MHz;Pk
1595.940	40.2	V	54.0	-13.8	AVG	131	1.0	RB 1 MHz;VB 10 Hz;Pk
1998.690	57.2	V	74.0	-16.8	PK	141	1.0	RB 1 MHz;VB 3 MHz;Pk
1196.320	36.7	V	54.0	-17.3	AVG	324	1.3	RB 1 MHz;VB 10 Hz;Pk
1195.840	55.5	V	74.0	-18.5	PK	324	1.3	RB 1 MHz;VB 3 MHz;Pk
1997.060	34.8	V	54.0	-19.2	AVG	141	1.0	RB 1 MHz;VB 10 Hz;Pk

Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	-

Run #2: Receive Mode Spurious Emissions, EUT tuned to Channel 40 (5200 MHz)

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 18000 MHz	3	3	0.0



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

Frequency MHz	Level dBuV/m	Pol v/h	RSS-GEN		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
6003.430	43.4	V	54.0	-10.6	Peak	40	1.9	
1990.790	45.1	H	54.0	-8.9	Peak	141	1.9	
1594.390	51.1	V	54.0	-2.9	Peak	258	1.0	
1197.350	53.3	V	54.0	-0.7	Peak	319	1.0	
3971.240	43.5	V	54.0	-10.5	Peak	322	1.3	

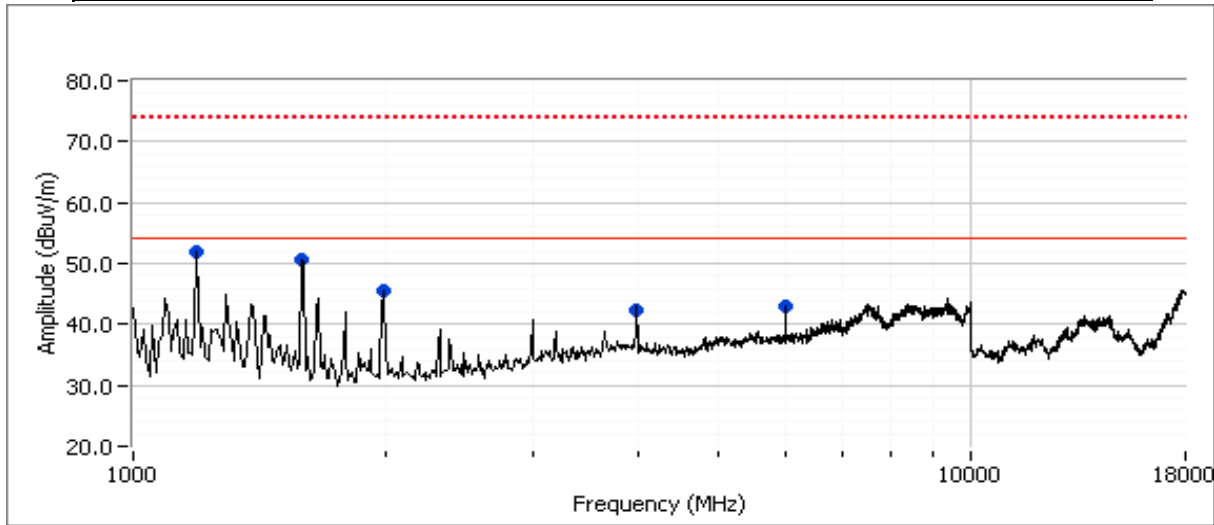
Final peak and average readings

Frequency MHz	Level dBuV/m	Pol v/h	RSS-GEN		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
1196.400	62.2	V	74.0	-11.8	PK	320	1.0	RB 1 MHz;VB 3 MHz;Pk
1196.120	41.3	V	54.0	-12.7	AVG	320	1.0	RB 1 MHz;VB 10 Hz;Pk
1594.980	39.9	V	54.0	-14.1	AVG	259	1.0	RB 1 MHz;VB 10 Hz;Pk
1595.740	59.7	V	74.0	-14.3	PK	259	1.0	RB 1 MHz;VB 3 MHz;Pk
1991.220	54.6	H	74.0	-19.4	PK	142	1.9	RB 1 MHz;VB 3 MHz;Pk
1991.810	33.5	H	54.0	-20.5	AVG	142	1.9	RB 1 MHz;VB 10 Hz;Pk
6001.940	32.0	V	54.0	-22.0	AVG	38	1.9	RB 1 MHz;VB 10 Hz;Pk
3972.380	31.0	V	54.0	-23.0	AVG	322	1.3	RB 1 MHz;VB 10 Hz;Pk
6002.680	43.7	V	74.0	-30.3	PK	38	1.9	RB 1 MHz;VB 3 MHz;Pk
3971.860	42.3	V	74.0	-31.7	PK	322	1.3	RB 1 MHz;VB 3 MHz;Pk

Client: Broadcom Corporation	Job Number: J79248
Model: BCM94322HM8L	T-Log Number: T79249
Contact: Pin Wen	Account Manager: Sheareen Washington
Standard: 15.209 / 15.247 / 15.E / RSS-210	Class: -

Run #3: Receive Mode Spurious Emissions, EUT tuned to Channel 60 (5300 MHz)

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 18000 MHz	3	3	0.0



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

Frequency MHz	Level dBuV/m	Pol v/h	RSS-GEN		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
5988.690	42.9	V	54.0	-11.1	Peak	40	1.9	
1595.090	50.7	V	54.0	-3.3	Peak	137	1.0	
1993.720	45.5	V	54.0	-8.5	Peak	137	1.0	
1196.280	51.8	V	54.0	-2.2	Peak	311	1.0	
3984.760	42.3	V	54.0	-11.7	Peak	320	1.3	

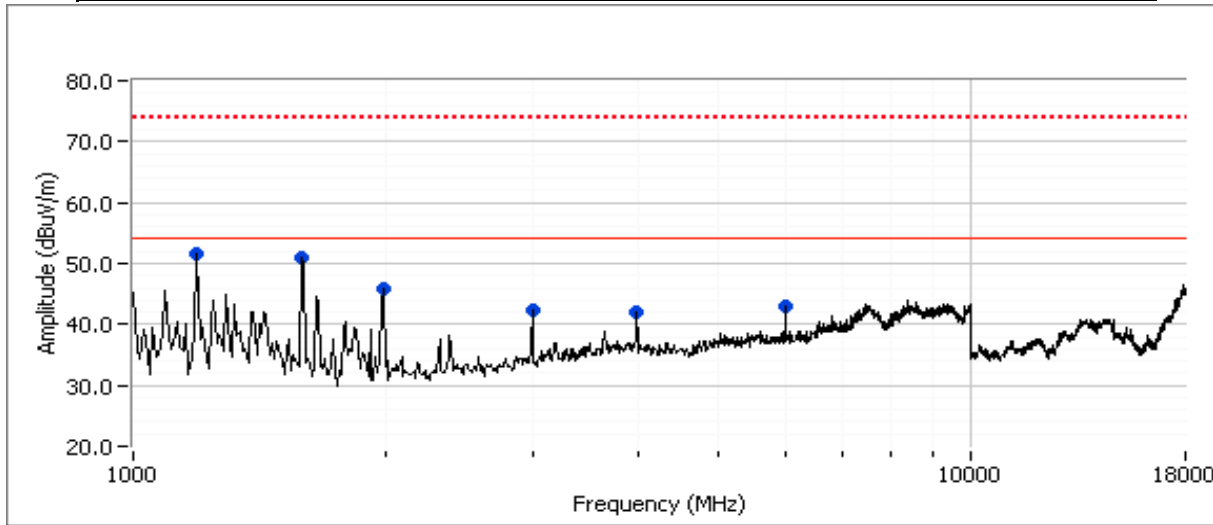
Final peak and average readings

Frequency MHz	Level dBuV/m	Pol v/h	RSS-GEN		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
1595.420	63.2	V	74.0	-10.8	PK	139	1.0	RB 1 MHz;VB 3 MHz;Pk
1195.470	62.7	V	74.0	-11.3	PK	312	1.0	RB 1 MHz;VB 3 MHz;Pk
1594.440	42.3	V	54.0	-11.7	AVG	139	1.0	RB 1 MHz;VB 10 Hz;Pk
1196.010	42.1	V	54.0	-11.9	AVG	312	1.0	RB 1 MHz;VB 10 Hz;Pk
1994.500	55.7	V	74.0	-18.3	PK	136	1.0	RB 1 MHz;VB 3 MHz;Pk
3984.500	35.1	V	54.0	-18.9	AVG	322	1.3	RB 1 MHz;VB 10 Hz;Pk
1993.670	33.7	V	54.0	-20.3	AVG	136	1.0	RB 1 MHz;VB 10 Hz;Pk
5988.560	32.1	V	54.0	-21.9	AVG	38	1.9	RB 1 MHz;VB 10 Hz;Pk
3983.580	49.5	V	74.0	-24.5	PK	322	1.3	RB 1 MHz;VB 3 MHz;Pk
5988.400	43.4	V	74.0	-30.6	PK	38	1.9	RB 1 MHz;VB 3 MHz;Pk

Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	-

Run #4: Receive Mode Spurious Emissions, EUT tuned to Channel 120 (5600 MHz)

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 18000 MHz	3	3	0.0



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

Frequency MHz	Level dB μ V/m	Pol v/h	RSS-GEN		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
6004.710	43.1	V	54.0	-10.9	Peak	45	1.9	
1593.660	51.1	V	54.0	-2.9	Peak	143	1.0	
1994.970	46.0	V	54.0	-8.0	Peak	265	1.0	
1196.070	51.6	V	54.0	-2.4	Peak	299	1.0	
3985.220	42.0	V	54.0	-12.0	Peak	347	1.3	
3000.430	42.2	V	54.0	-11.8	Peak	357	1.9	

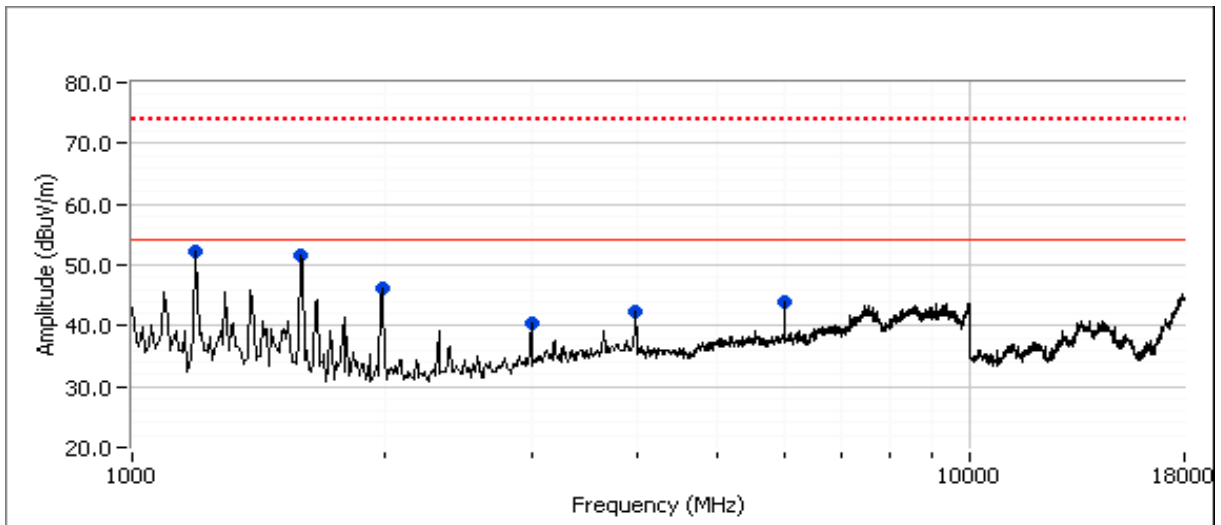
Final peak and average readings

Frequency MHz	Level dB μ V/m	Pol v/h	RSS-GEN		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
1195.060	53.5	V	74.0	-20.5	PK	299	1.0	RB 1 MHz;VB 3 MHz;Pk
1196.270	31.9	V	54.0	-22.1	AVG	299	1.0	RB 1 MHz;VB 10 Hz;Pk
1594.370	51.3	V	74.0	-22.7	PK	144	1.0	RB 1 MHz;VB 3 MHz;Pk
1594.950	30.4	V	54.0	-23.6	AVG	144	1.0	RB 1 MHz;VB 10 Hz;Pk
3000.410	29.9	V	54.0	-24.1	AVG	358	1.9	RB 1 MHz;VB 10 Hz;Pk
1994.470	29.4	V	54.0	-24.6	AVG	266	1.0	RB 1 MHz;VB 10 Hz;Pk
1996.090	48.0	V	74.0	-26.0	PK	266	1.0	RB 1 MHz;VB 3 MHz;Pk
3985.520	26.4	V	54.0	-27.6	AVG	348	1.3	RB 1 MHz;VB 10 Hz;Pk
6004.860	22.6	V	54.0	-31.4	AVG	43	1.9	RB 1 MHz;VB 10 Hz;Pk
3984.110	40.7	V	74.0	-33.3	PK	348	1.3	RB 1 MHz;VB 3 MHz;Pk

Client:	Broadcom Corporation	Job Number:	J79248
Model:	BCM94322HM8L	T-Log Number:	T79249
Contact:	Pin Wen	Account Manager:	Sheareen Washington
Standard:	15.209 / 15.247 / 15.E / RSS-210	Class:	-

Run #5: Receive Mode Spurious Emissions, EUT tuned to Channel 157 (5785 MHz)

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 18000 MHz	3	3	0.0



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

Frequency MHz	Level dBuV/m	Pol v/h	RSS-GEN		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
5988.230	43.8	V	54.0	-10.2	Peak	43	1.9	
3986.410	42.3	V	54.0	-11.7	Peak	122	1.3	
1593.440	51.6	V	54.0	-2.4	Peak	142	1.0	
3000.430	40.5	H	54.0	-13.5	Peak	189	2.2	
1993.630	46.3	V	54.0	-7.7	Peak	264	1.0	
1195.460	52.3	V	54.0	-1.7	Peak	319	1.3	

Final peak and average readings

Frequency MHz	Level dBuV/m	Pol v/h	RSS-GEN		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
1593.470	61.5	V	74.0	-12.5	PK	143	1.0	RB 1 MHz;VB 3 MHz;Pk
1196.690	40.2	V	54.0	-13.8	AVG	320	1.3	RB 1 MHz;VB 10 Hz;Pk
1594.830	40.1	V	54.0	-13.9	AVG	143	1.0	RB 1 MHz;VB 10 Hz;Pk
1195.850	59.5	V	74.0	-14.5	PK	320	1.3	RB 1 MHz;VB 3 MHz;Pk
1994.710	59.4	V	74.0	-14.6	PK	265	1.0	RB 1 MHz;VB 3 MHz;Pk
1994.560	39.1	V	54.0	-14.9	AVG	265	1.0	RB 1 MHz;VB 10 Hz;Pk
3000.430	38.5	H	54.0	-15.5	AVG	190	2.2	RB 1 MHz;VB 10 Hz;Pk
3987.440	34.2	V	54.0	-19.8	AVG	123	1.3	RB 1 MHz;VB 10 Hz;Pk
5987.350	32.1	V	54.0	-21.9	AVG	41	1.9	RB 1 MHz;VB 10 Hz;Pk
3985.870	47.9	V	74.0	-26.1	PK	123	1.3	RB 1 MHz;VB 3 MHz;Pk

Appendix C Photographs of Test Configurations

Uploaded as a separate exhibit

Appendix D RF Exposure Information

Uploaded as a separate exhibit