



# Permissive Class II Change FCC Test Report

FCC Part 15.407 for UNII Devices/  
IC RSS-210, Issue 7

FOR:  
Broadcom, Inc.

802.11abg Wireless LAN PCI-E Mini Card

Model Number: **BCM94311MCAG**

FCC ID: **QDS-BRCM1019**

IC UPN: **4324A-BRCM1019**

TEST REPORT #:EMC\_BROAD\_051\_08001\_AG\_UNII\_YAGEO  
DATE: March 14, 2008



Certificate # 2135.01



Bluetooth Qualification  
Test Facility  
(BQTF)



LAB CODE 20020328-00

FCC listed#  
A2LA Certified

IC recognized #  
3462B

## CETECOM Inc.

411 Dixon Landing Road • Milpitas, CA 95035 • U.S.A.

Phone: + 1 (408) 586 6200 • Fax: + 1 (408) 586 6299 • E-mail: info@cetecomusa.com • <http://www.cetecom.com>

CETECOM Inc. is a Delaware Corporation with Corporation number: 2113686

Board of Directors: Dr. Harald Ansorge, Dr. Klaus Matkey, Hans Peter May

**TABLE OF CONTENTS**

<b>1</b>	<b><i>Assessment</i></b>	<b>3</b>
<b><i>Technical responsibility for area of testing:</i></b>		<b>3</b>
<b>2</b>	<b><i>Administrative Data</i></b>	<b>4</b>
2.1	Identification of the Testing Laboratory Issuing the EMC Test Report	4
2.2	Identification of the Client	4
2.3	Identification of the Manufacturer	4
<b>3</b>	<b><i>Equipment under Test (EUT)</i></b>	<b>5</b>
3.1	Specification of the Equipment under Test	5
3.2	Class II permissive change laptops to be added	5
3.3	Identification of Accessory equipment	5
<b>4</b>	<b><i>Subject Of Investigation</i></b>	<b>6</b>
<b>5</b>	<b><i>Measurements</i></b>	<b>7</b>
5.1	<b>MAXIMUM PEAK OUTPUT POWER § 15.407 &amp; RSS-210 (RADIADED)</b>	<b>7</b>
5.1.1	LIMIT SUB CLAUSE § 15.407 (a) & RSS-210 (A9.2)(2)	7
5.1.2	EIRP 802.11 (a) MODE:	7
5.2	<b>RESTRICTED BAND EDGE COMPLIANCE RADIATED §15.407(b)/15.205</b>	<b>14</b>
5.2.1	LIMITS	14
5.2.2	<b>802.11 (a) MODE (5180MHz)</b>	15
5.2.3	<b>802.11 (a) MODE (5320MHz)</b>	15
5.3	<b>TRANSMITTER SPURIOUS EMISSIONS RADIATED § 15.407(b)/15.205/15.209 &amp; RSS-210 (A9.3)</b>	<b>15</b>
5.3.1	LIMITS	15
5.3.2	RESULTS <b>802.11 (a) MODE</b>	15
5.4	<b>RECEIVER SPURIOUS RADIATION § 15.109/RSS-GEN (4.10)</b>	<b>15</b>
5.5	<b>AC POWER LINE CONDUCTED EMISSIONS § 15.207 &amp; RSS-GEN (7.2.2)</b>	<b>15</b>
5.5.1	LIMITS	15
<b>6</b>	<b><i>TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS</i></b>	<b>15</b>

## **1 Assessment**

**The following is in compliance with the applicable criteria specified in FCC rules Part 15.407 of the Code of Federal Regulations and in compliance with the applicable criteria specified in Industry Canada rules RSS-210.**

Company	Description	Model #
<b>Broadcom, Inc.</b>	<b>Wireless LAN PCI-E Mini Card</b>	<b>BCM94311MCAG</b>

**Technical responsibility for area of testing:**

**March** Ivaylo Tankov  
**14, 2008** **EMC & Radio** **(Project Engineer)**

Date	Section	Name	Signature
------	---------	------	-----------

**Responsible for test report and project leader:**

**March** Juan Martinez  
**14, 2008** **EMC & Radio** **(Project Engineer)**

Date	Section	Name	Signature
------	---------	------	-----------

The test results of this test report relate exclusively to the test item specified in Identification of the Equipment under Test. The CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM Inc USA.

## **2 Administrative Data**

### **2.1 Identification of the Testing Laboratory Issuing the EMC Test Report**

<b>Company Name:</b>	<b>CETECOM Inc.</b>
<b>Department:</b>	<b>EMC</b>
<b>Address:</b>	<b>411 Dixon Landing Road Milpitas, CA 95035 U.S.A.</b>
<b>Telephone:</b>	<b>+1 (408) 586 6200</b>
<b>Fax:</b>	<b>+1 (408) 586 6299</b>
<b>Project Leader:</b>	<b>Juan Martinez</b>
<b>Responsible Test Lab Manager:</b>	<b>Ivaylo Tankov</b>

### **2.2 Identification of the Client**

<b>Applicant's Name:</b>	<b>Broadcom, Inc.</b>
<b>Address:</b>	<b>190 Mathilda Place, Sunnyvale, CA 94086, USA</b>
<b>Contact Person:</b>	<b>Daniel Lawless</b>
<b>Phone No.</b>	<b>408 965-3346</b>
<b>Fax:</b>	<b>408 324-4840</b>
<b>e-mail:</b>	<b>dlawless@broadcom.com</b>

### **2.3 Identification of the Manufacturer**

<b>Manufacturer's Name:</b>	<b>Broadcom, Inc.</b>
<b>Manufacturer's Address:</b>	<b>190 Mathilda Place, Sunnyvale, CA 94086 USA</b>

### **3 Equipment under Test (EUT)**

#### **3.1 Specification of the Equipment under Test**

<b>Product Type</b>	Wireless LAN PCI-E Mini Card
<b>Marketing Name:</b>	802.11abg Wireless LAN PCI-E Mini Card
<b>Model No:</b>	BCM94311MCAG
<b>FCC-ID:</b>	QDS-BRCM1019
<b>IC UPN:</b>	4324A-BRCM1019
<b>Frequency Range:</b>	5150 – 5350 MHz
<b>Number of Channels</b>	11
<b>Type(s) of Modulation:</b>	OFDM
<b>Antenna Type:</b>	YAGEO PIFA 5150 – 5350 MHz Main (2.45dBi) & Aux (1.78dBi)
<b>Max Radiated Output Power:</b>	24.51dBm (0.282W), 802.11a EIRP 26.92dBm (0.492W), 802.11a EIRP 25.82dBm (0.382W), 802.11a EIRP

#### **3.2 Class II permissive change laptops to be added**

<b>EUT #</b>	<b>TYPE</b>	<b>MANF.</b>	<b>MODEL</b>	<b>SERIAL #</b>
1	Laptop	HP	HSTNN-I46C	N/A

#### **3.3 Identification of Accessory equipment**

<b>TYPE</b>	<b>MANF.</b>	<b>MODEL</b>
AC ADAPTOR	HP	N/A

#### **4 Subject Of Investigation**

All testing were performed on the HP HSTNN-I46C laptop with the BCM94311MCAG pre-approved module. Measurements were performed on the Amphenol antenna. This report is to also cover the Acon antenna which has a lower gain antenna, but same type of antenna. Data, presented in this report, was collected for a Class II permissive change to add the laptop to the BCM94311MCAG (FCC ID: QDS-BRCM1019) module application.

During the testing process the EUT was tested in “a” mode with 6Mbps data rate which yielded the worst case results. All testing was performed on main antenna which yielded the highest gain, all data in this report shows the worst case between horizontal and vertical polarization for above 1GHz.

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT as specified by requirements listed in FCC rules Part 15.407 of Title 47 of the Code of Federal Regulations and Industry Canada rules RSS-210.

## **5 Measurements**

### **5.1 MAXIMUM PEAK OUTPUT POWER § 15.407 & RSS-210 (RADIATED)**

#### **5.1.1 LIMIT SUB CLAUSE § 15.407 (a) & RSS-210 (A9.2)(2)**

Frequency range	RF power output limit
<b>5180MHz</b>	<b>23dBm EIRP</b>
<b>5260MHz</b>	<b>30dBm EIRP</b>
<b>5320MHz</b>	<b>30dBm EIRP</b>

#### **5.1.2 EIRP 802.11 (a) MODE:**

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
		5180	5260	5320
$T_{\text{nom}}$ (23)°C	$V_{\text{nom}}$ VDC	24.51	26.92	25.82
<b>Measurement uncertainty</b>		<b>±0.5dBm</b>		

Note 1: For 802.11a power were set to transmit at the specified conducted average output power

Note 2: EIRP measurements were performed on the Main and Auxiliary. Results showed that the Main antenna produced the highest EIRP level. All measurements were performed on the Main antenna.

Note 3: Both vertical and horizontal were measured. Worst case polarization was horizontal for all modes.

**EIRP 802.11 (a) Mode (5180)**

EUT: 94311MCAG

Customer: Broadcom

Test Mode: 802.11a CH.36, Main

ANT Orientation: V

EUT Orientation: H

Test Engineer: Sam

Voltage: AC Adapter

***SWEEP TABLE: "EIRP 802.11a 36"***

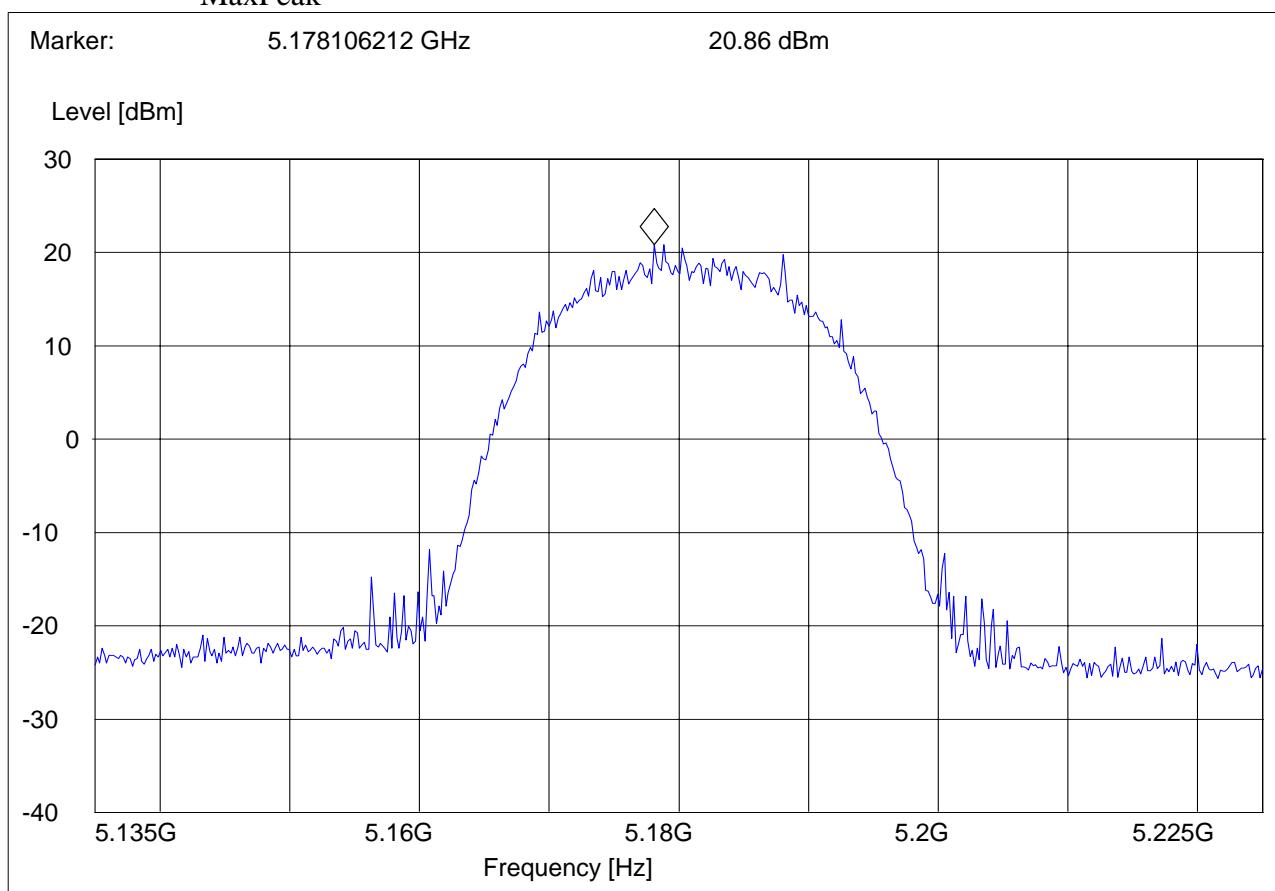
Short Description: EIRP channel-5180 MHz

Start Stop Detector Meas. IF Transducer

Frequency Frequency Time Bandw.

5.1 GHz 5.2 GHz MaxPeak Coupled 10 MHz DUMMY-DBM

MaxPeak



EUT:

Customer:: Broadcom

Test Mode: 802.11a CH.36, Main

ANT Orientation: H

EUT Orientation: H

Test Engineer: Sam

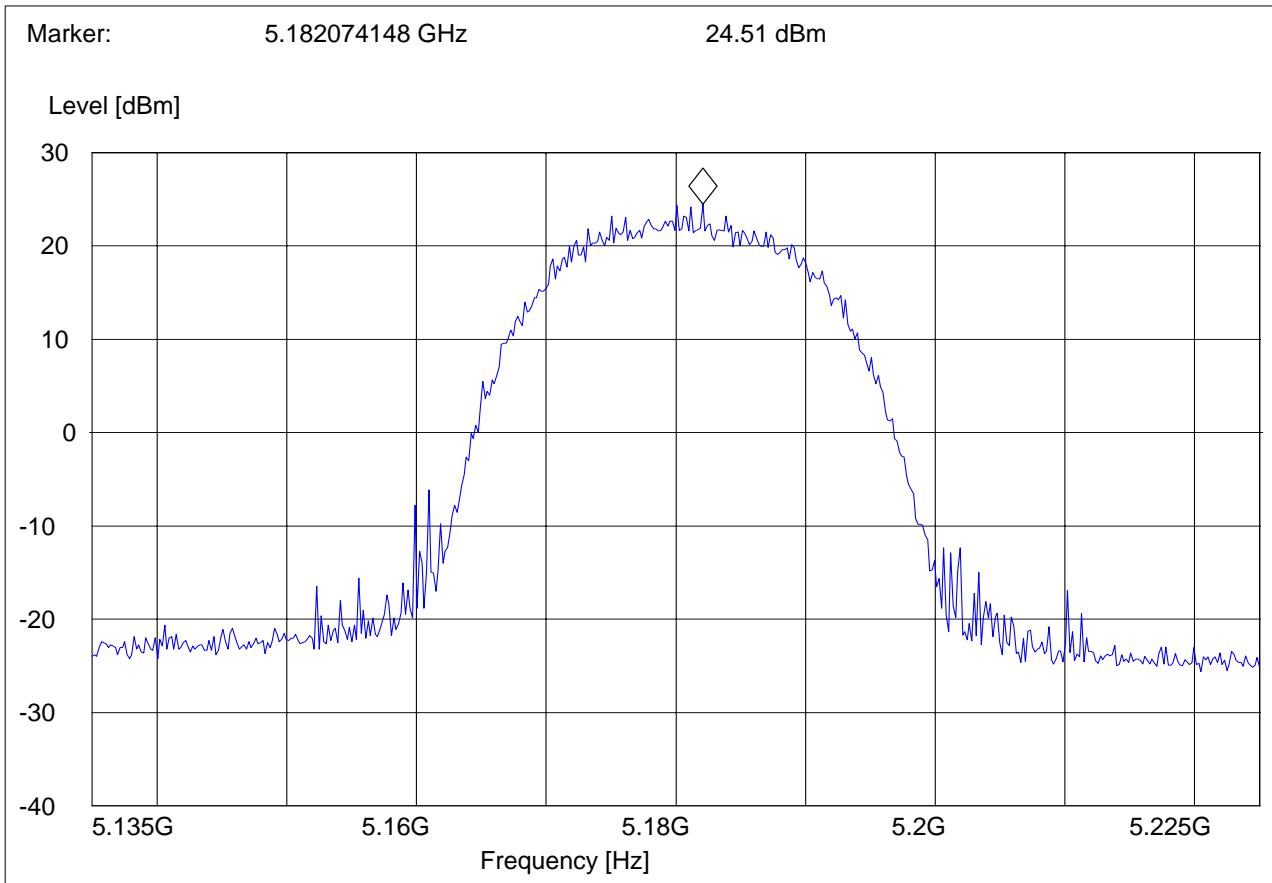
Voltage: AC Adapter

***SWEEP TABLE: "EIRP 802.11a 36"***

Short Description: EIRP channel-5180 MHz

Start Stop Detector Meas. IF Transducer

Frequency Frequency Time Bandw.

5.1 GHz 5.2 GHz MaxPeak Coupled 10 MHz DUMMY-DBM  
MaxPeak

**EIRP 802.11 (a) Mode (5260MHz)**

EUT: 94311MCAG

Customer: Broadcom

Test Mode: 802.11a CH.52, Main

ANT Orientation: V

EUT Orientation: H

Test Engineer: Sam

Voltage: AC Adapter

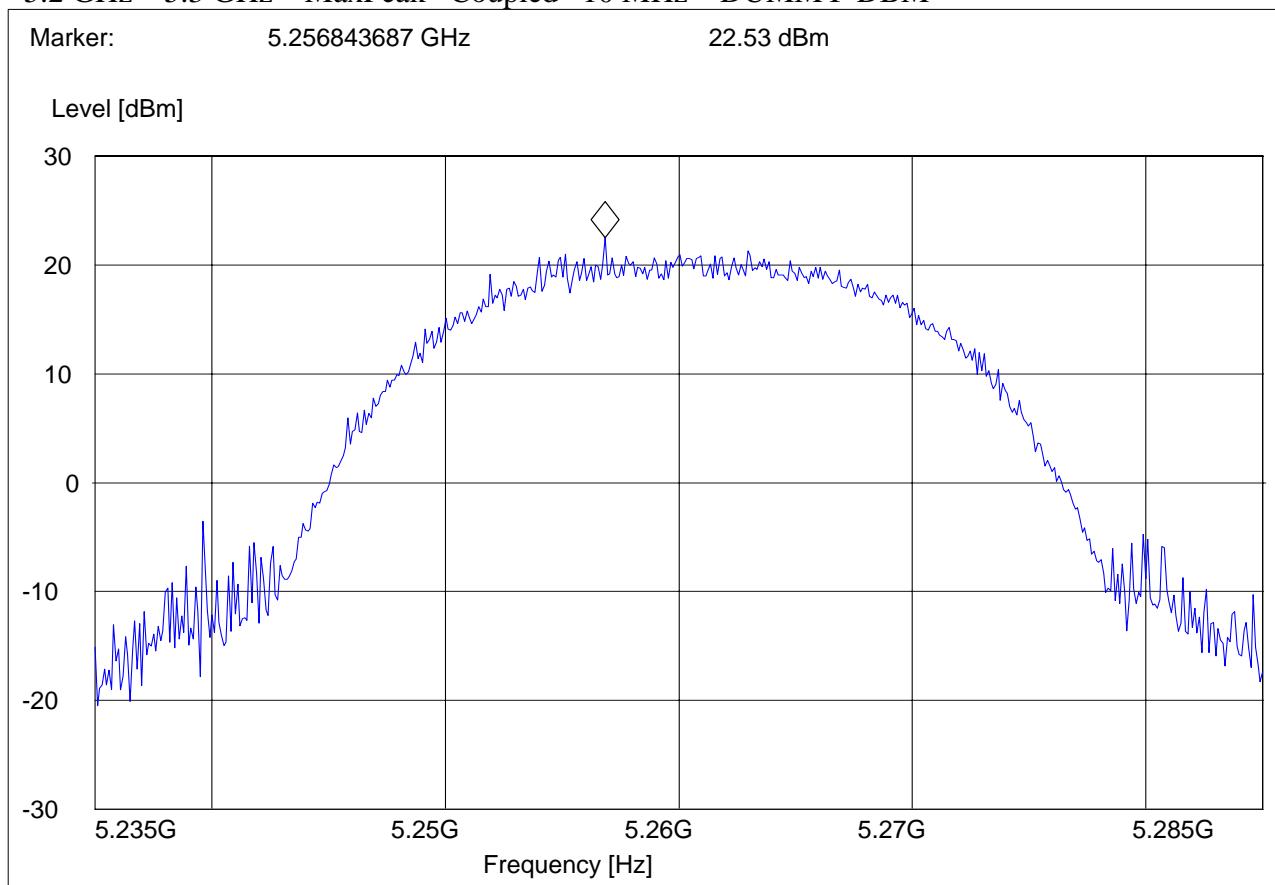
***SWEEP TABLE: "EIRP 802.11a 52"***

Short Description: EIRP channel-5260 MHz

Start Stop Detector Meas. IF Transducer

Frequency Frequency Time Bandw.

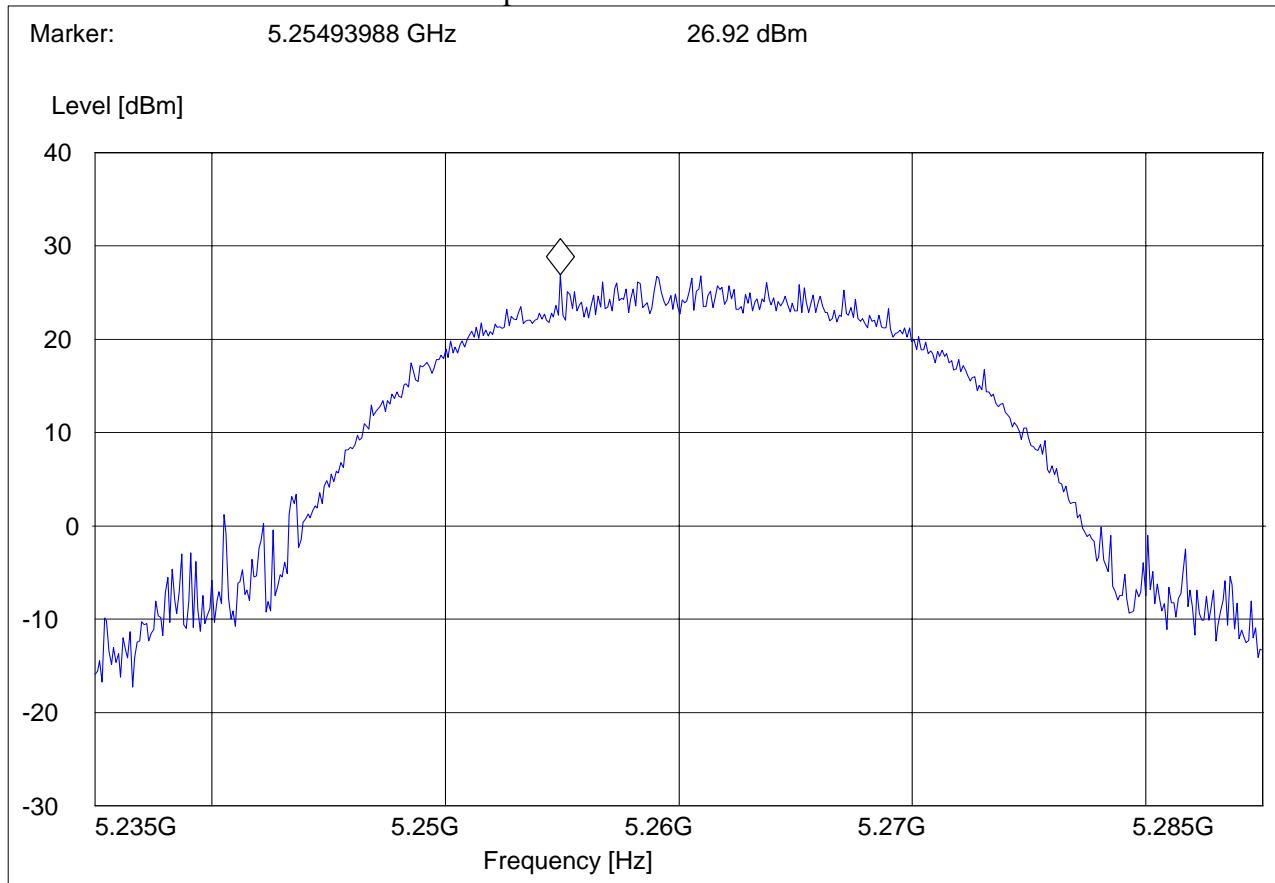
5.2 GHz 5.3 GHz MaxPeak Coupled 10 MHz DUMMY-DBM



EUT: 94311MCAG  
Customer: Broadcom  
Test Mode: 802.11a CH.52, Main  
ANT Orientation: H  
EUT Orientation: H  
Test Engineer: Sam  
Voltage: AC Adapter

***SWEEP TABLE: "EIRP 802.11a 52"***

Short Description: EIRP channel-5260 MHz  
Start Stop Detector Meas. IF Transducer  
Frequency Frequency Time Bandw.  
5.2 GHz 5.3 GHz MaxPeak Coupled 10 MHz DUMMY-DBM



**EIRP 802.11 (a) Mode (5320MHz)**

EUT: 94311MCAG

Customer:: Broadcom

Test Mode: 802.11a CH.64, Main

ANT Orientation: V

EUT Orientation: H

Test Engineer: Sam

Voltage: AC Adapter

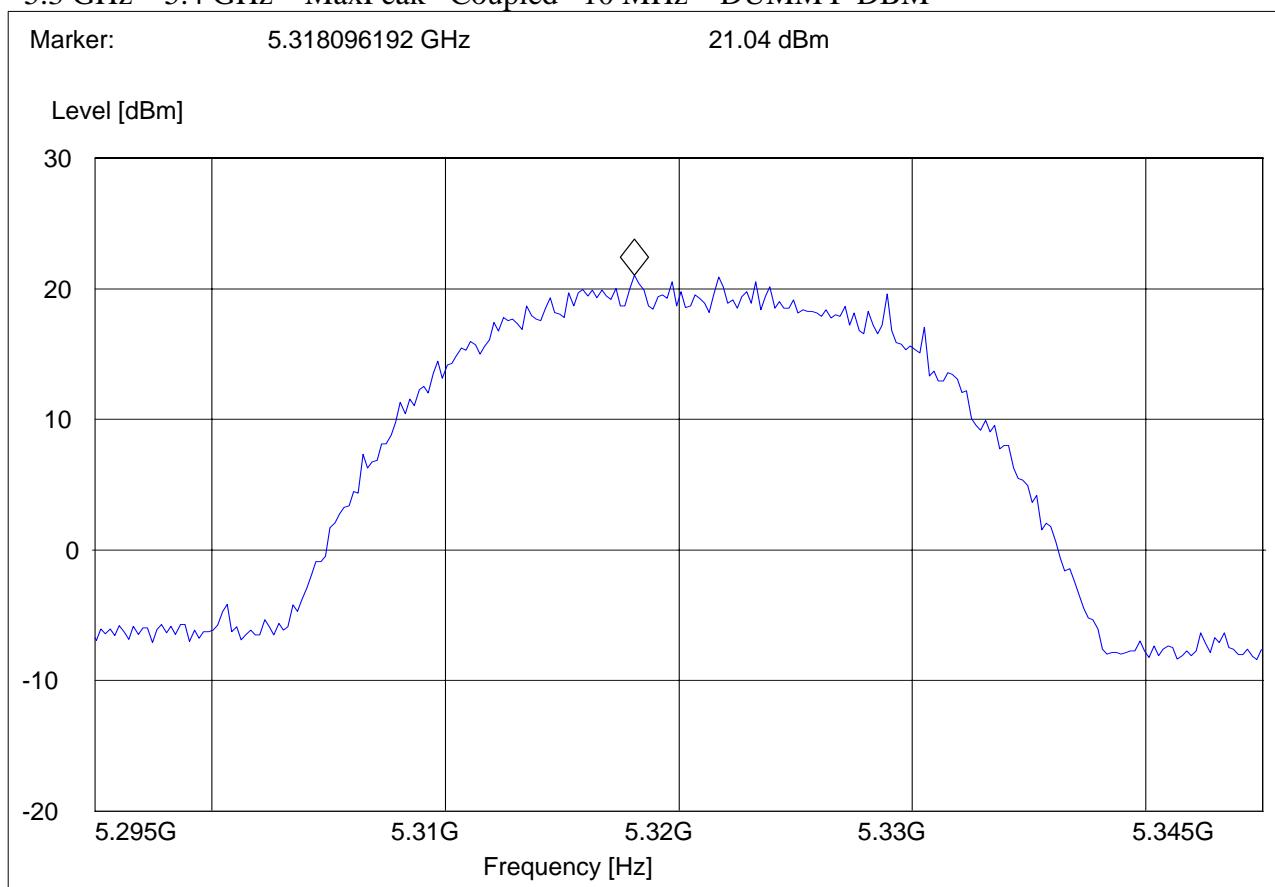
***SWEEP TABLE: "EIRP 802.11a 64"***

Short Description: EIRP channel-5320 MHz

Start Stop Detector Meas. IF Transducer

Frequency Frequency Time Bandw.

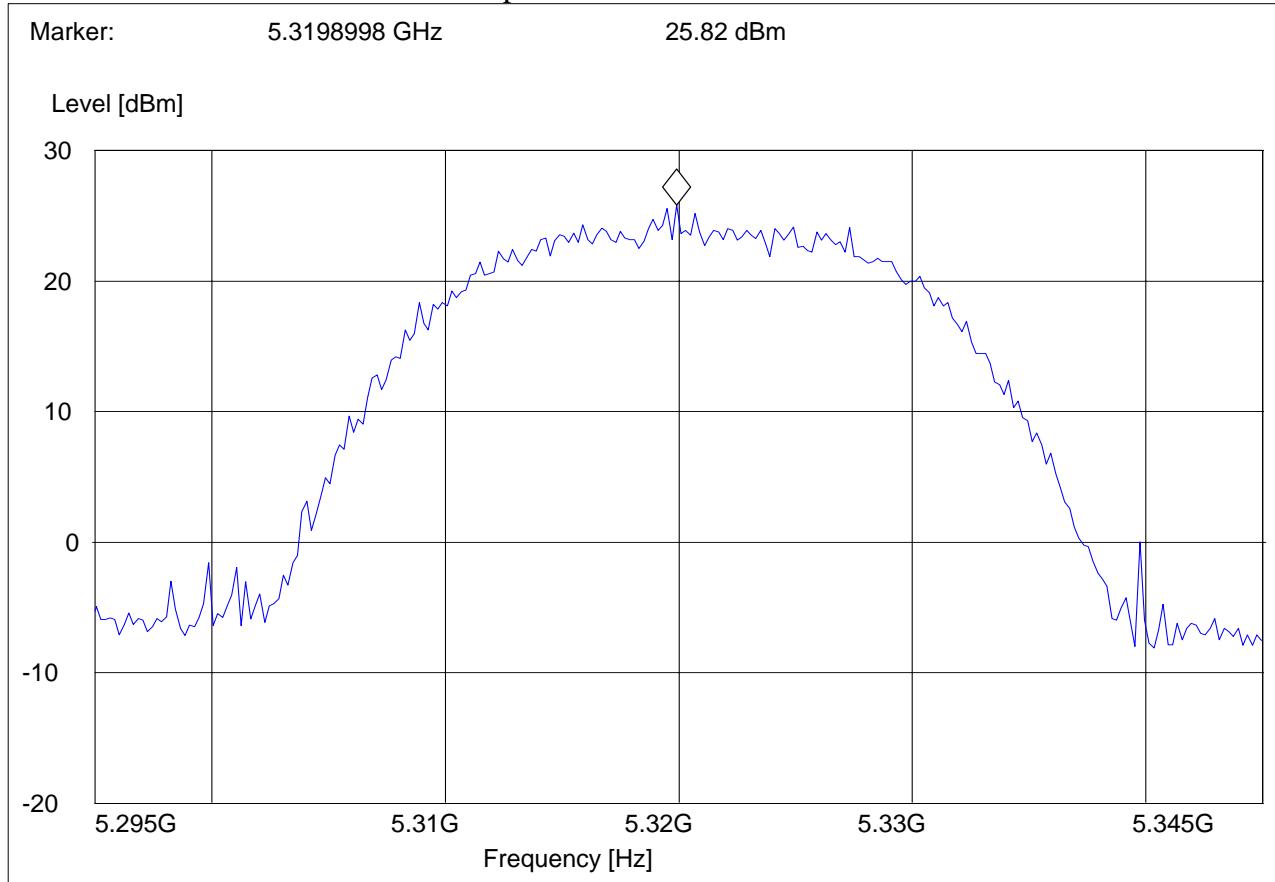
5.3 GHz 5.4 GHz MaxPeak Coupled 10 MHz DUMMY-DBM



EUT: 94311MCAG  
Customer: Broadcom  
Test Mode: 802.11a CH.64, Main  
ANT Orientation: H  
EUT Orientation: H  
Test Engineer: Sam  
Voltage: AC Adapter

***SWEEP TABLE: "EIRP 802.11a 64"***

Short Description: EIRP channel-5320 MHz  
Start Stop Detector Meas. IF Transducer  
Frequency Frequency Time Bandw.  
5.3 GHz 5.4 GHz MaxPeak Coupled 10 MHz DUMMY-DBM



## 5.2 RESTRICTED BAND EDGE COMPLIANCE RADIATED §15.407(b)/15.205

### 5.2.1 LIMITS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41			

\*PEAK LIMIT= 74dB<sub>UV</sub>/m

\*AVG. LIMIT= 54dB<sub>UV</sub>/m

**5.2.2 802.11 (a) MODE (5180MHz)  
PEAK**

EUT: 94311MCAG

Customer:: Broadcom

Test Mode: 802.11a CH.36

ANT Orientation: H

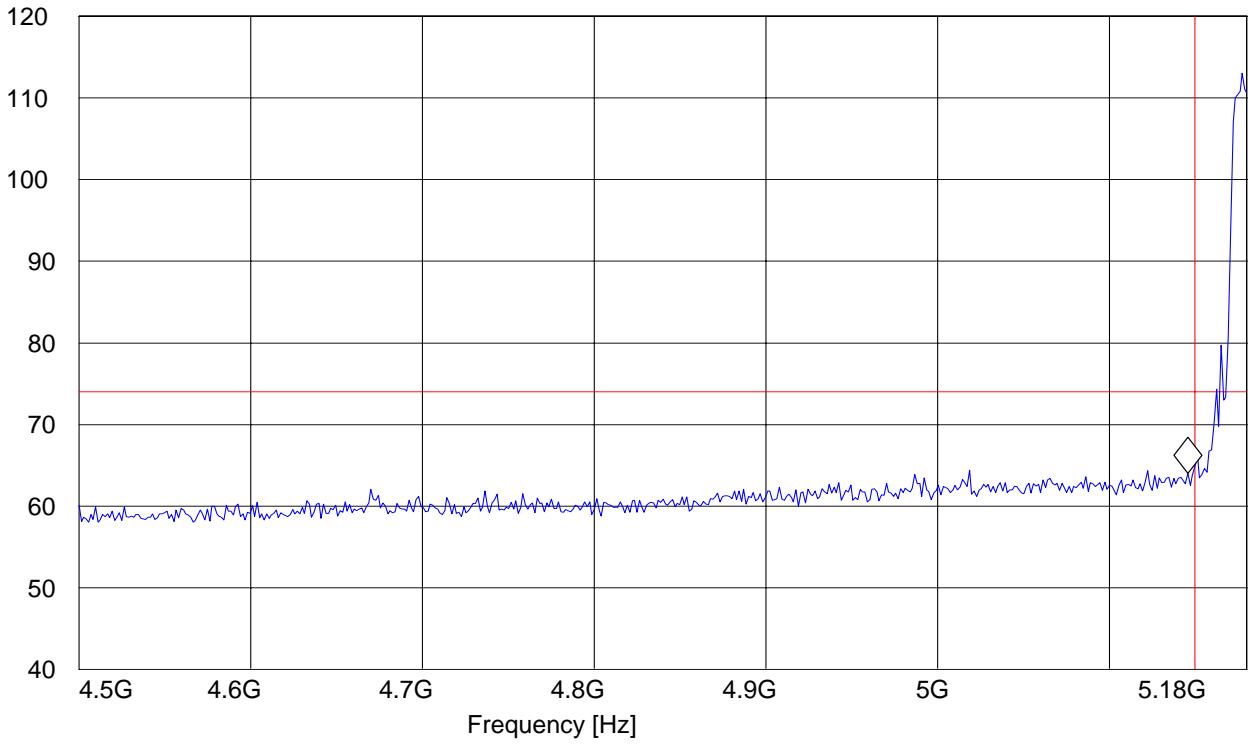
EUT Orientation: H

Test Engineer: Sam

Voltage: AC ADAPTER

***SWEEP TABLE: "FCC15.407 A\_LBE\_PK"***

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
4.5 GHz	5.2 GHz	MaxPeak	Coupled	1 MHz #326horn_AF_horz

Marker: 5.145751503 GHz 64.01 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**AVG**

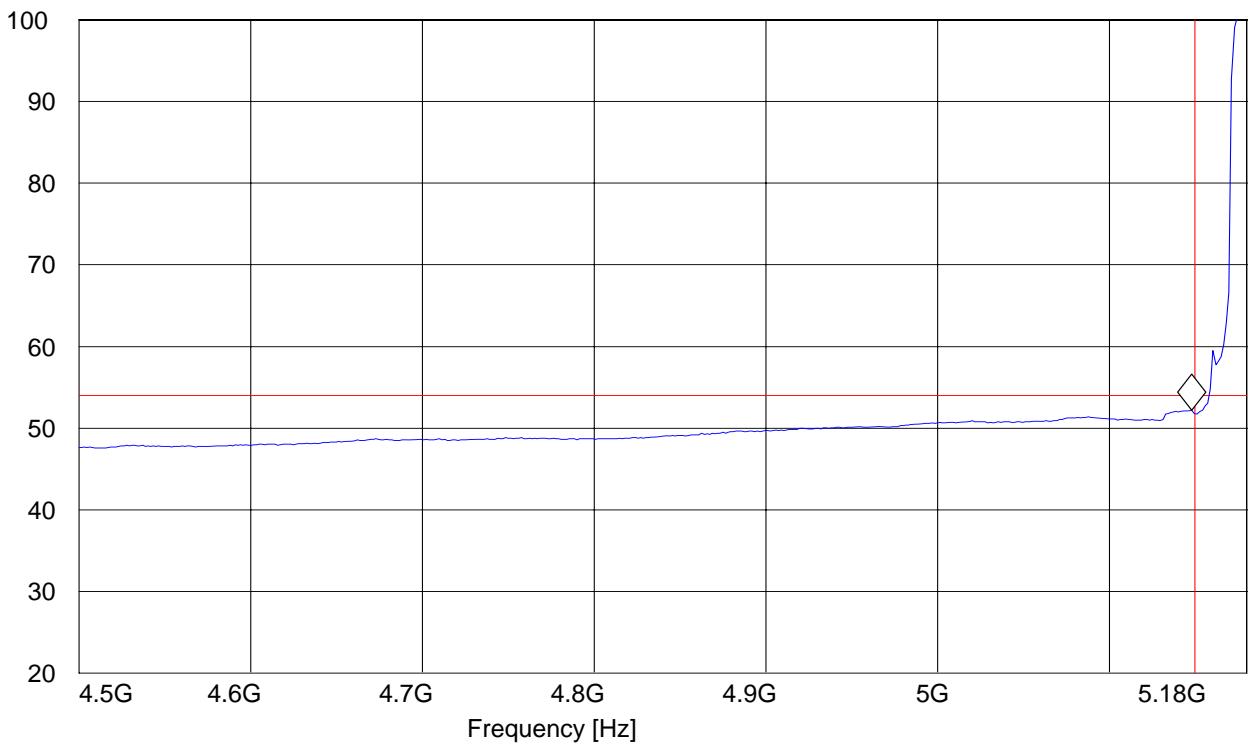
EUT: 94311MCAG  
Customer: Broadcom  
Test Mode: 802.11a CH.36  
ANT Orientation: H  
EUT Orientation: H  
Test Engineer: Sam  
Voltage: AC ADAPTER

***SWEEP TABLE: "FCC15.407 A\_LBE\_AVG"***

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
4.5 GHz	5.3 GHz	MaxPeak	Coupled	1 MHz #326horn_AF_vert

Marker: 5.148096192 GHz 52.2 dB $\mu$ V/m

Level [dB $\mu$ V/m]



**5.2.3 802.11 (a) MODE (5320MHz)  
PEAK**

EUT: 94311MCAG

Customer:: Broadcom

Test Mode: 802.11a CH.64

ANT Orientation: H

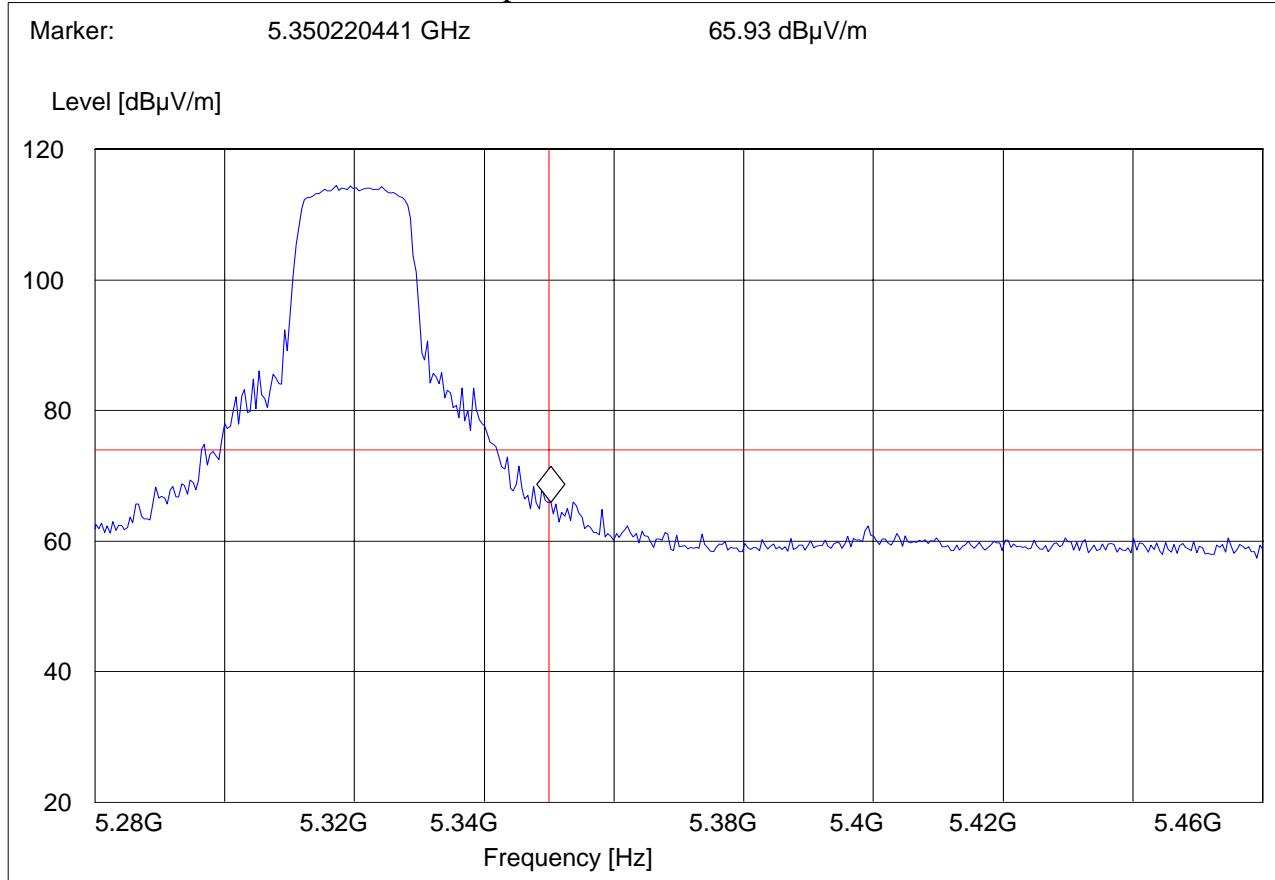
EUT Orientation: H

Test Engineer: Sam

Voltage: AC ADAPTER

***SWEEP TABLE: "FCC15.407 A\_HBE\_PK"***

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
5.2 GHz	5.5 GHz	MaxPeak	Coupled	1 MHz #326horn_AF_horz



**AVG**

EUT: 94311MCAG

Customer: Broadcom

Test Mode: 802.11a CH.64

ANT Orientation: H

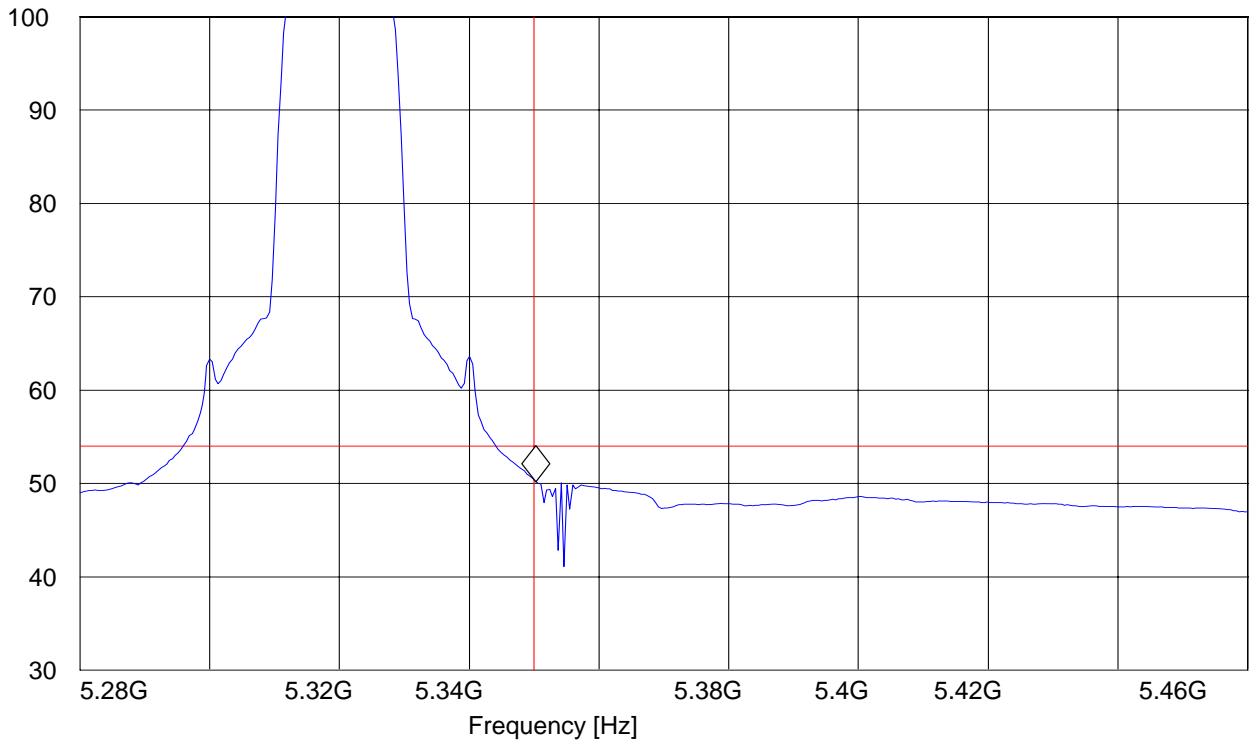
EUT Orientation: H

Test Engineer: Sam

Voltage: AC ADAPTER

***SWEEP TABLE: "FCC15.407 A\_HBE\_AVG"***

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
5.2 GHz	5.5 GHz	MaxPeak	Coupled	1 MHz #326horn_AF_horz

Marker: 5.350220441 GHz 50.18 dB $\mu$ V/mLevel [dB $\mu$ V/m]

### **5.3 TRANSMITTER SPURIOUS EMISSIONS RADIATED § 15.407(b)/15.205/15.209 & RSS-210 (A9.3)**

#### **5.3.1 LIMITS**

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41			

**\*PEAK LIMIT= 74dBuV/m for spurious in restricted bands**

**\*AVG. LIMIT= 54dBuV/m for spurious in restricted bands**

**\*AVG. LIMIT= 68.2dBuV/m for spurious NOT in restricted bands**

#### **NOTE:**

1. The radiated emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels. In the range between 3 and 25 GHz very short cable connections to the antenna was used to minimize the noise level.

2. All measurements are done in peak mode using an average limit , unless specified with the plots.

#### **Results for the radiated measurements below 30MHz according § 15.33**

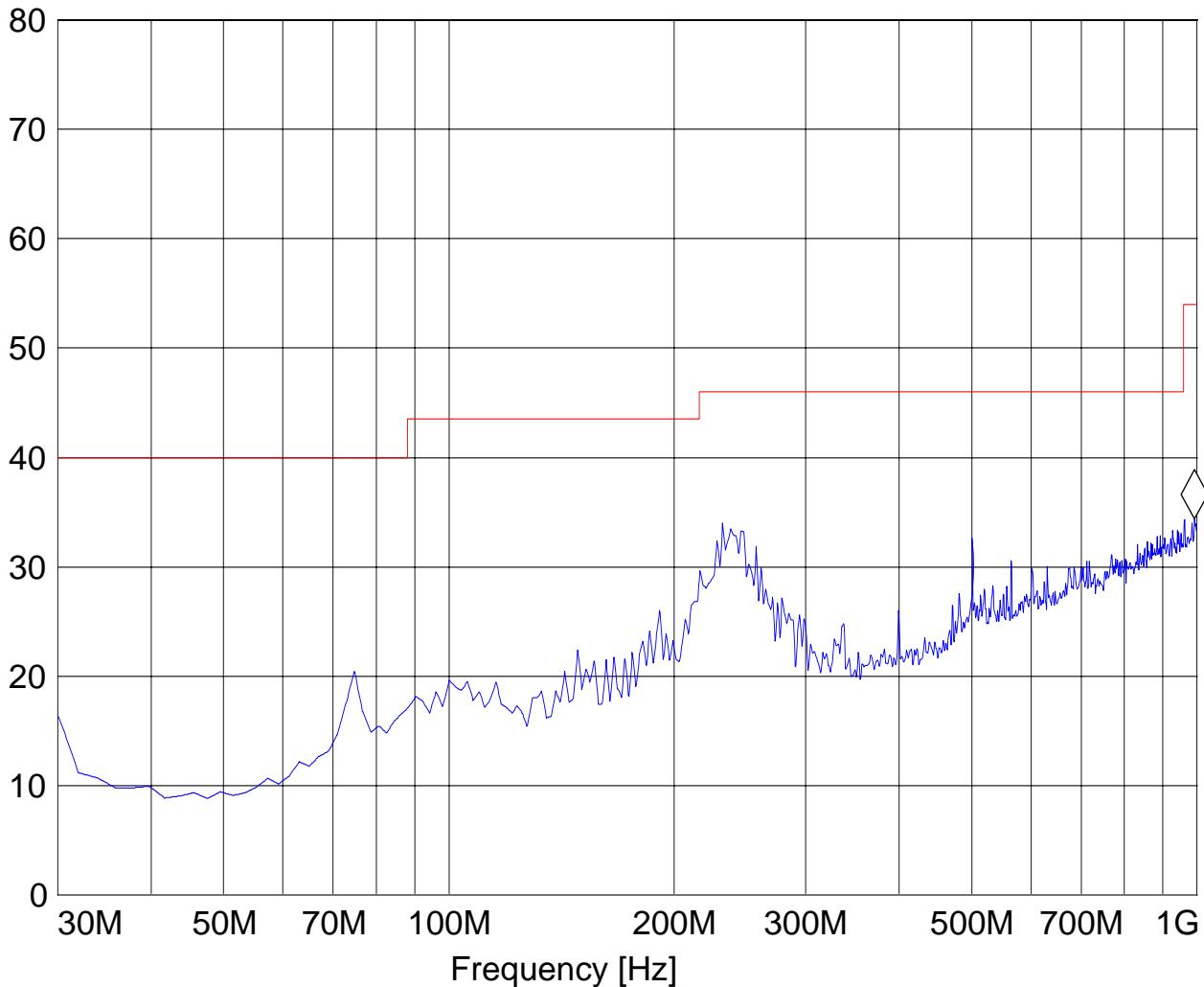
Frequency	Measured values	Remarks
9KHz – 30MHz	No emissions found, caused by the EUT	This is valid for all the tested channels

**5.3.2 RESULTS 802.11 (a) MODE****30MHz – 1GHz****Antenna: Horizontal****Note: This plot is valid for low, mid, high channels horizontal and vertical polarities (worst-case plot).****CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT / Description: BCM94311MCAG

***SWEET TABLE: "FCC15.247\_30M-1G\_Ver"***

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186_Vert

**Marker: 992.224449 MHz 34.4 dB $\mu$ V/m****Level [dB $\mu$ V/m]**

**1-18GHz (5180MHz)****Note: The peaks above the limit line is the carrier freq.****Note: Peak Reading vs. Average limit (54 dB $\mu$ V/m)**

EUT / Description: 94311MCAG

Manufacturer: Broadcom

Operation Mode: 802.11a CH.36

ANT Orientation: : V

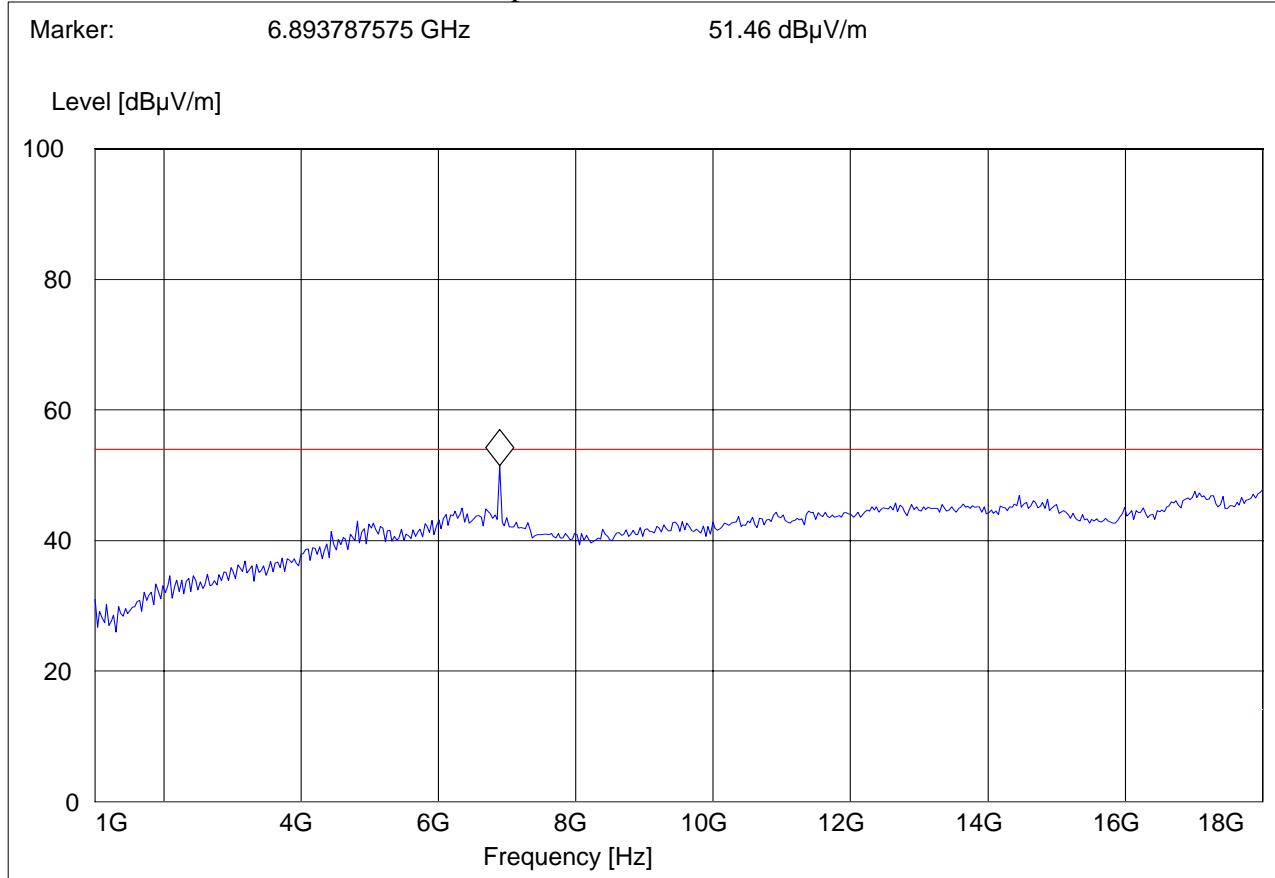
EUT Orientation: H

Test Engineer: SAM

Voltage: AC Adapter

***SWEEP TABLE: "FCC 15.407 1-18G"***

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz #326horn_AF_horz



EUT / Description: 94311MCAG

Manufacturer: Broadcom

Operation Mode: 802.11a CH.36

ANT Orientation: : H

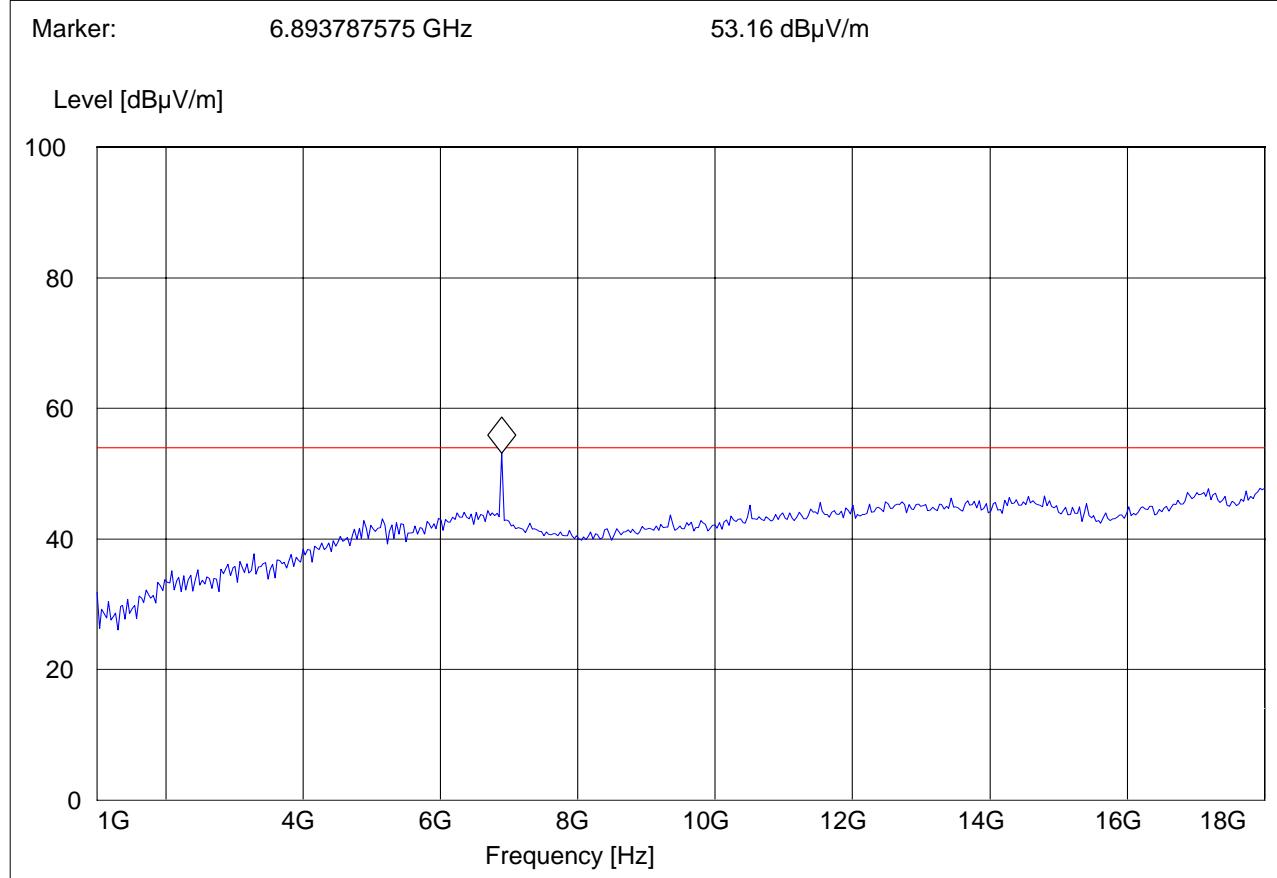
EUT Orientation: H

Test Engineer: SAM

Voltage: AC Adapter

***SWEEP TABLE: "FCC 15.407 1-18G"***

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz #326horn_AF_horz



**1-18GHz (5260MHz)****Note: The peaks above the limit line is the carrier freq.****Note: Peak Reading vs. Average limit (54 dB $\mu$ V/m)**

EUT / Description: 94311MCAG

Manufacturer: Broadcom

Operation Mode: 802.11a CH.52

ANT Orientation: : V

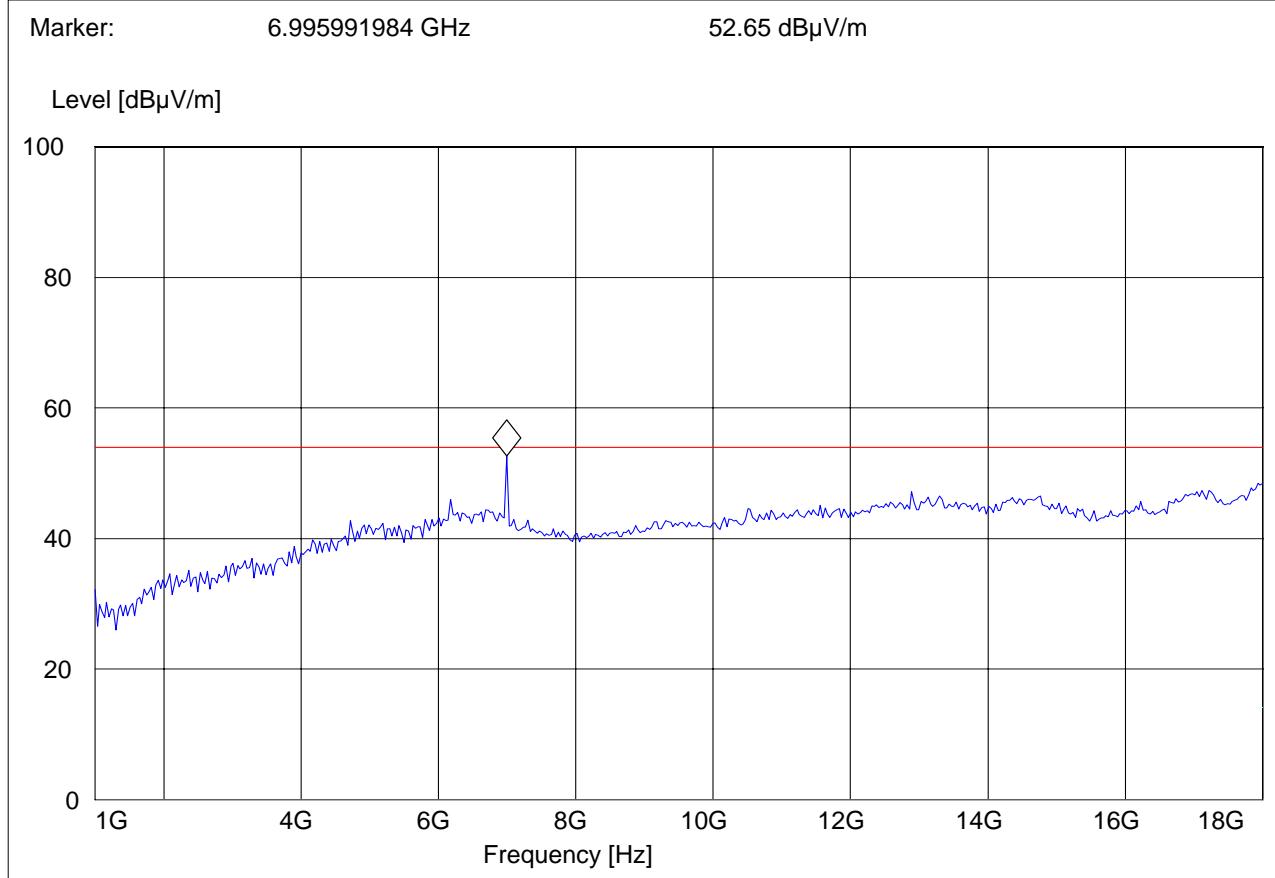
EUT Orientation: H

Test Engineer: SAM

Voltage: AC Adapter

***SWEEP TABLE: "FCC 15.407 1-18G"***

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz #326horn_AF_horz



EUT / Description: 94311MCAG

Manufacturer: Broadcom

Operation Mode: 802.11a CH.52

ANT Orientation: : H

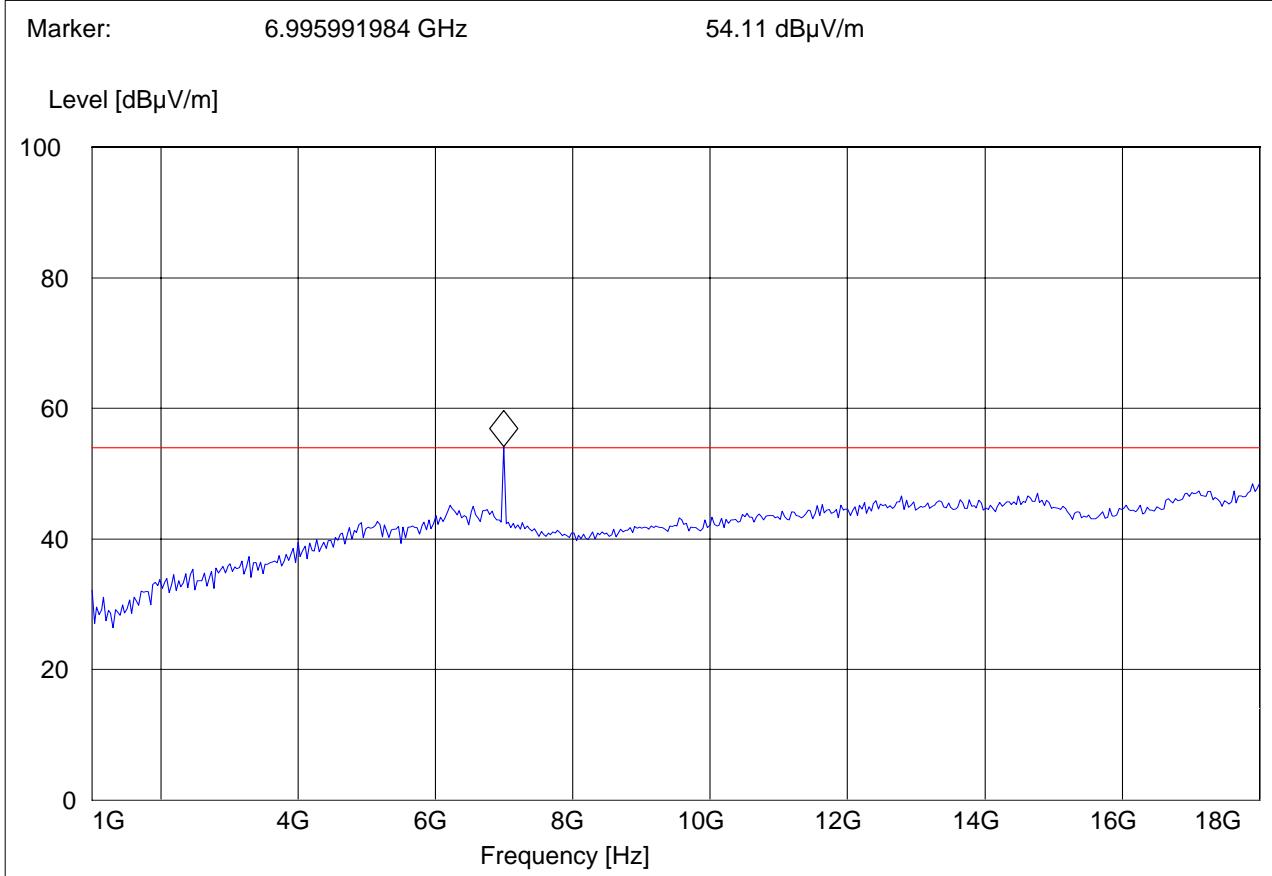
EUT Orientation: H

Test Engineer: SAM

Voltage: AC Adapter

***SWEEP TABLE: "FCC 15.407 1-18G"***

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz #326horn_AF_horz



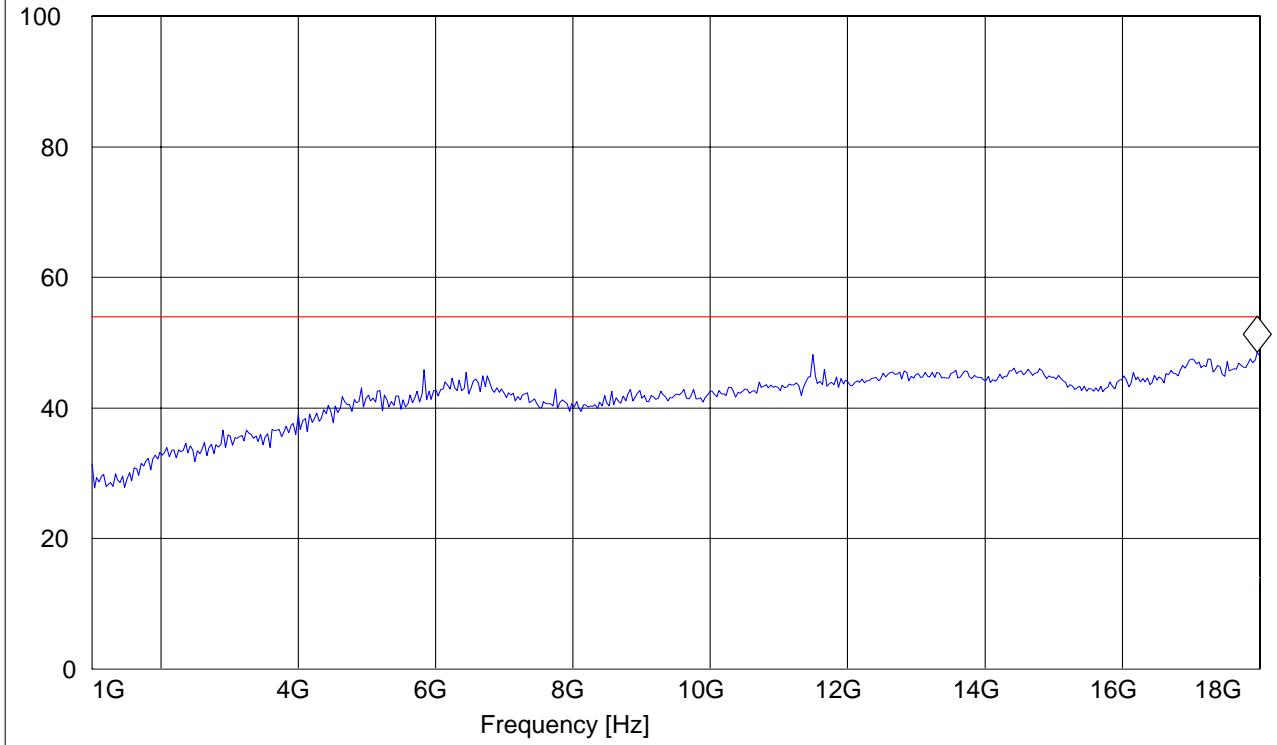
**1-18GHz (5320MHz)****Note: The peaks above the limit line is the carrier freq.****Note: Peak Reading vs. Average limit (54 dB $\mu$ V/m)**

EUT / Description: 94311MCAG  
Manufacturer: Broadcom  
Operation Mode: 802.11a CH.64  
ANT Orientation: : V  
EUT Orientation:: H  
Test Engineer: SAM  
Voltage: AC Adapter

***SWEEP TABLE: "FCC 15.407 1-18G"***

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
1.0 GHz	18.0 GHz	MaxPeak	Time Coupled	1 MHz	#326horn_AF_horz

Marker: 17.965931864 GHz 48.54 dB $\mu$ V/m

Level [dB $\mu$ V/m]

EUT / Description: 94311MCAG

Manufacturer: Broadcom

Operation Mode: 802.11a CH.64

ANT Orientation: : H

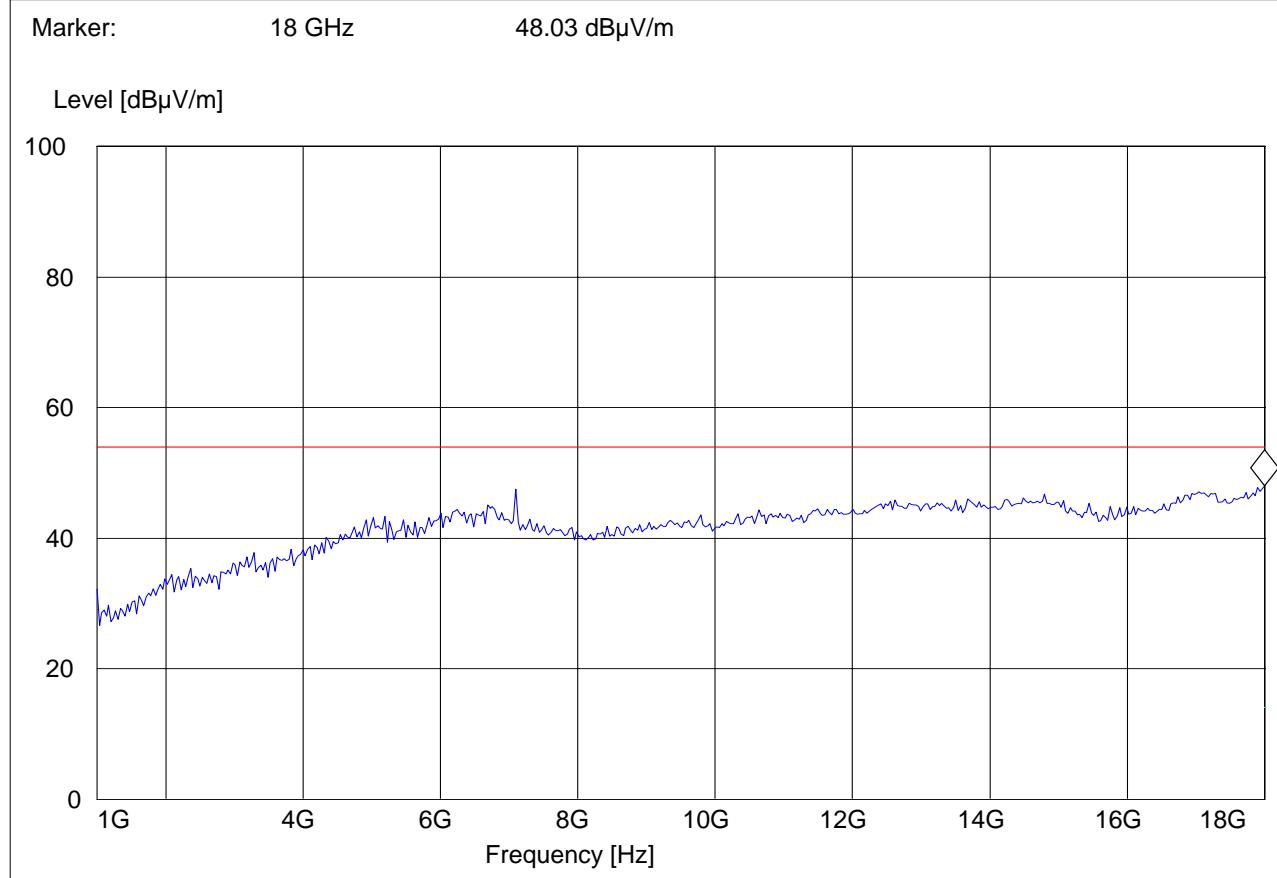
EUT Orientation: : H

Test Engineer: SAM

Voltage: AC Adapter

***SWEEP TABLE: "FCC 15.407 1-18G"***

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz #326horn_AF_horz

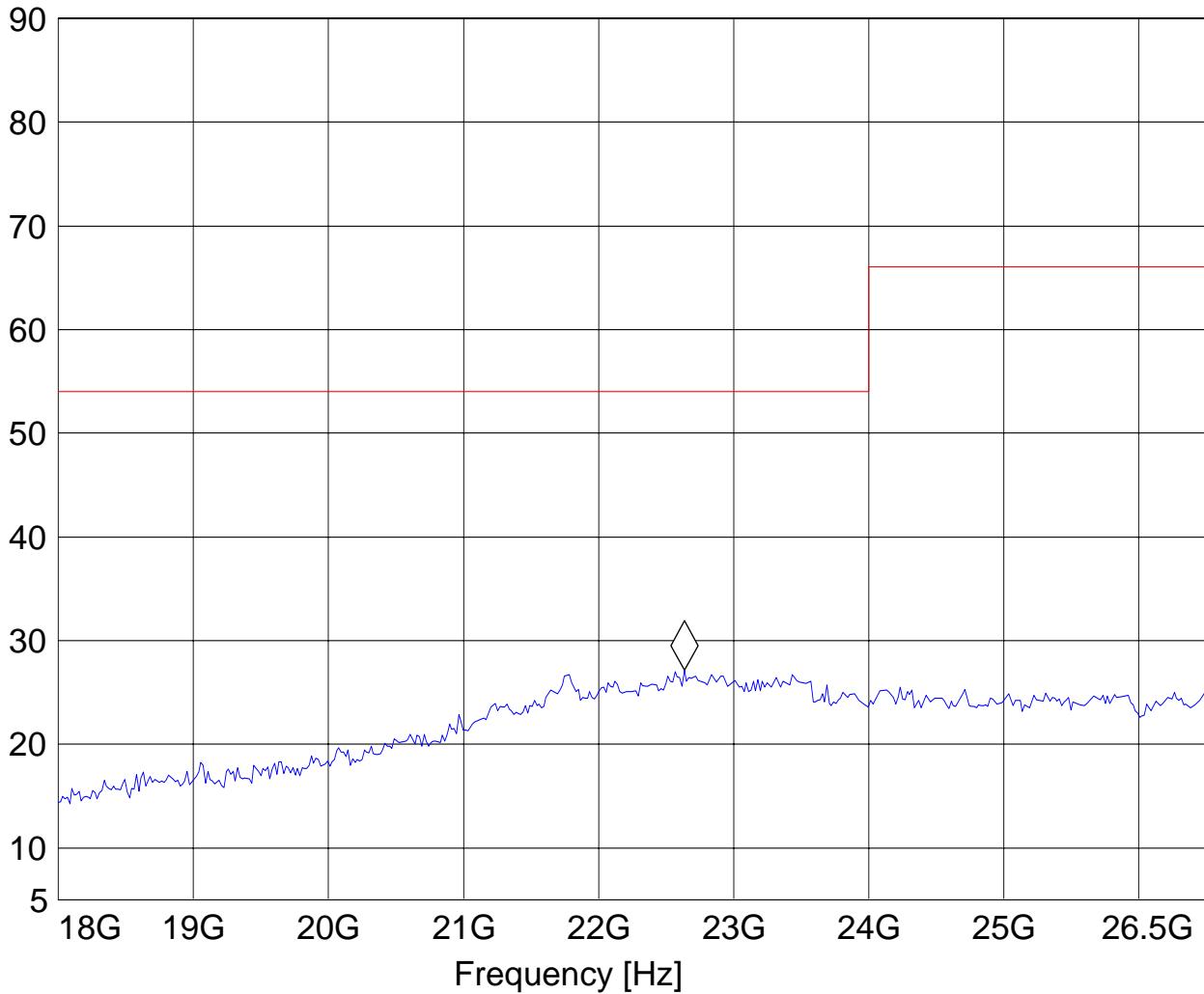


**18-26.5GHz (5180MHz)****Note: Peak Reading vs. Average limit (54 dB $\mu$ V/m)****CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT / Description: BCM94311MCAG

***SWEEP TABLE: "FCC15.247\_18-26.5G"***

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
18.0 GHz	25.0 GHz	MaxPeak	Coupled	1 MHz	3160 Horn 18-26.5G

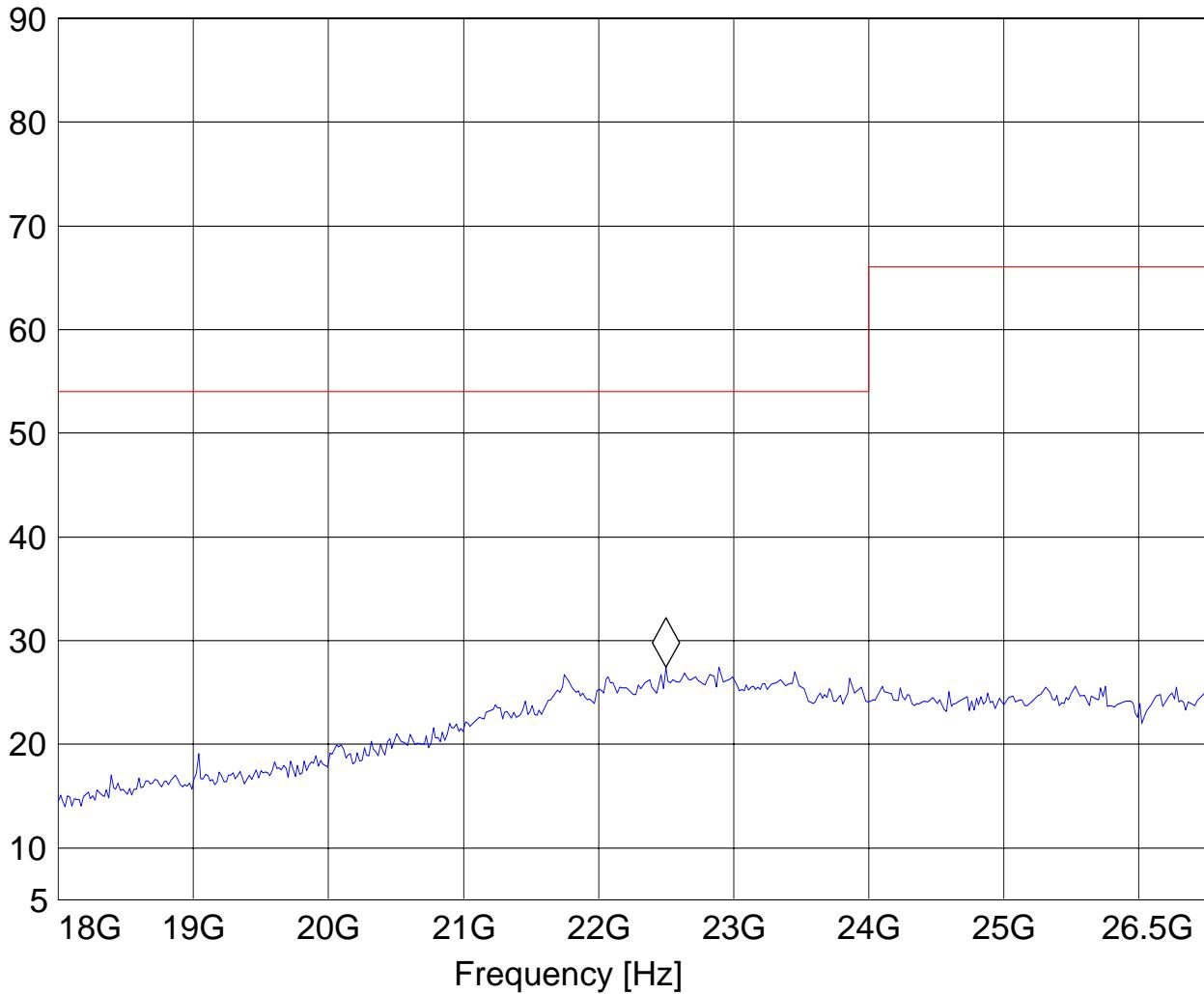
Marker: 22.633266533 GHz 27.15 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**18-26.5GHz (5260MHz)****Note: Peak Reading vs. Average limit (54 dB $\mu$ V/m)****CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT / Description: BCM94311MCAG

***SWEEP TABLE: "FCC15.247\_18-26.5G"***

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
18.0 GHz	25.0 GHz	MaxPeak	Coupled	1 MHz	3160 Horn 18-26.5G

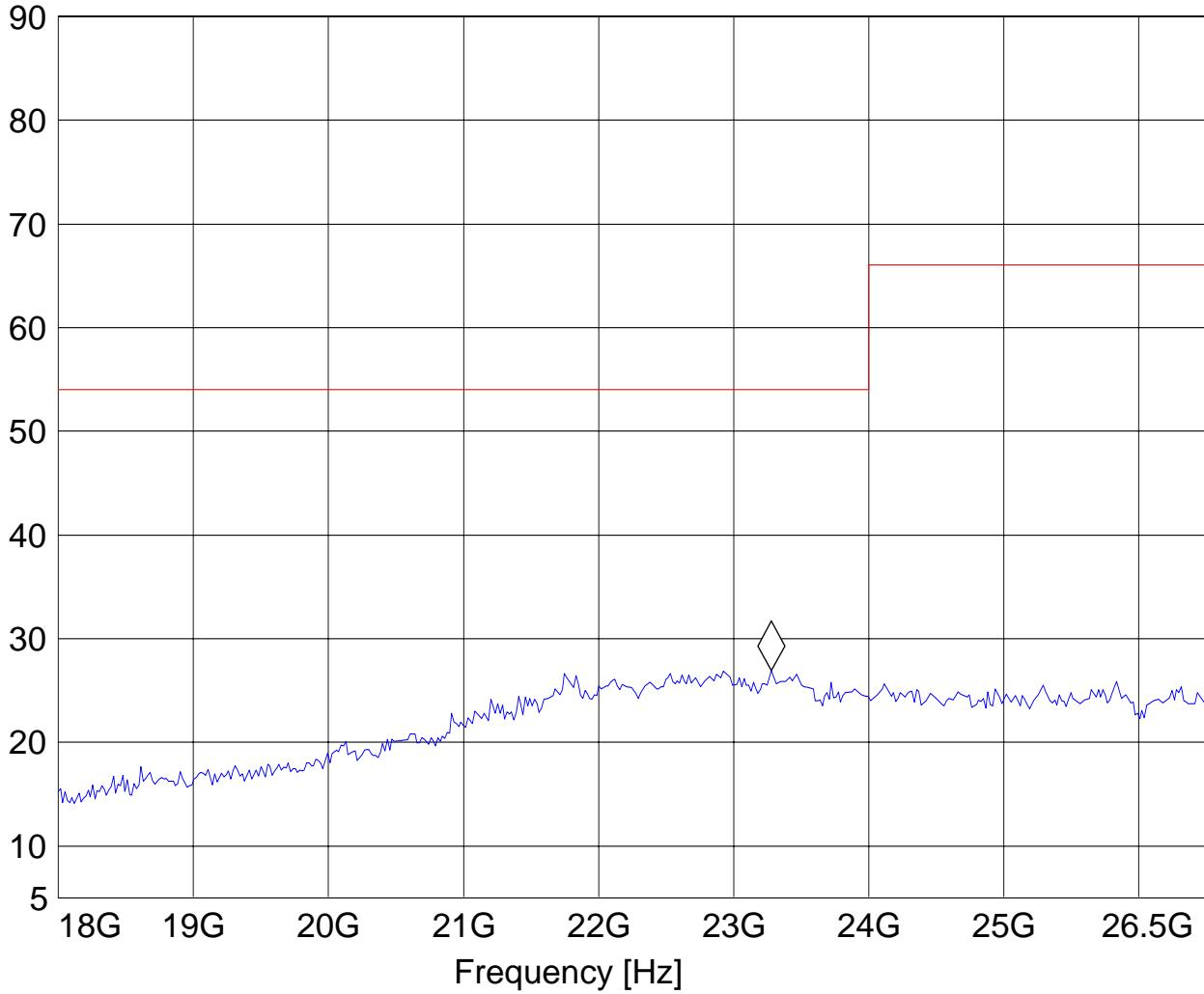
Marker: 22.496993988 GHz 27.46 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**18-26.5GHz (5320MHz)****Note: Peak Reading vs. Average limit (54 dB $\mu$ V/m)****CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT / Description: BCM94311MCAG

***SWEEP TABLE: "FCC15.247\_18-26.5G"***

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
18.0 GHz	25.0 GHz	MaxPeak	Coupled	1 MHz	3160 Horn 18-26.5G

Marker: 23.280561122 GHz 26.92 dB $\mu$ V/mLevel [dB $\mu$ V/m]

Test Report #:

**EMC\_BROAD\_051\_08001\_AG\_UNII\_YAGEO**

Date of Report:

**March 14, 2008**

Page 30 of 36



## **26-40GHz**

**Note: Since no harmonic emissions were detected 20-dB of the limit for scans 18 – 26GHz it was determine that no emissions will be detected from 26 – 40 GHz, so no scans were captured.**

Test Report #:

**EMC\_BROAD\_051\_08001\_AG\_UNII\_YAGEO**

Date of Report:

**March 14, 2008**

Page 31 of 36



#### **5.4 RECEIVER SPURIOUS RADIATION § 15.109/RSS-GEN (4.10)**

**Note:** Receiver emissions are exempt from testing per FCC 15.101(b) if it operated below 30 MHz and/or above 960 MHz. But, testing is required for Industry Canada approval for all receivers, which only needs to be tested on the middle channel of the radios operating band.

**The radio being tested receives at 2.4GHz therefore exempting it from testing to the FCC part 15 rules.**

**5.5 AC POWER LINE CONDUCTED EMISSIONS § 15.207 & RSS-GEN (7.2.2)****5.5.1 LIMITS****Technical specification: 15.207 (Revised as of August 20, 2002)****Limit**

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

\* Decreases with logarithm of the frequency

**ANALYZER SETTINGS: RBW = 10KHz****VBW = 10KHz****OPERATING MODE**

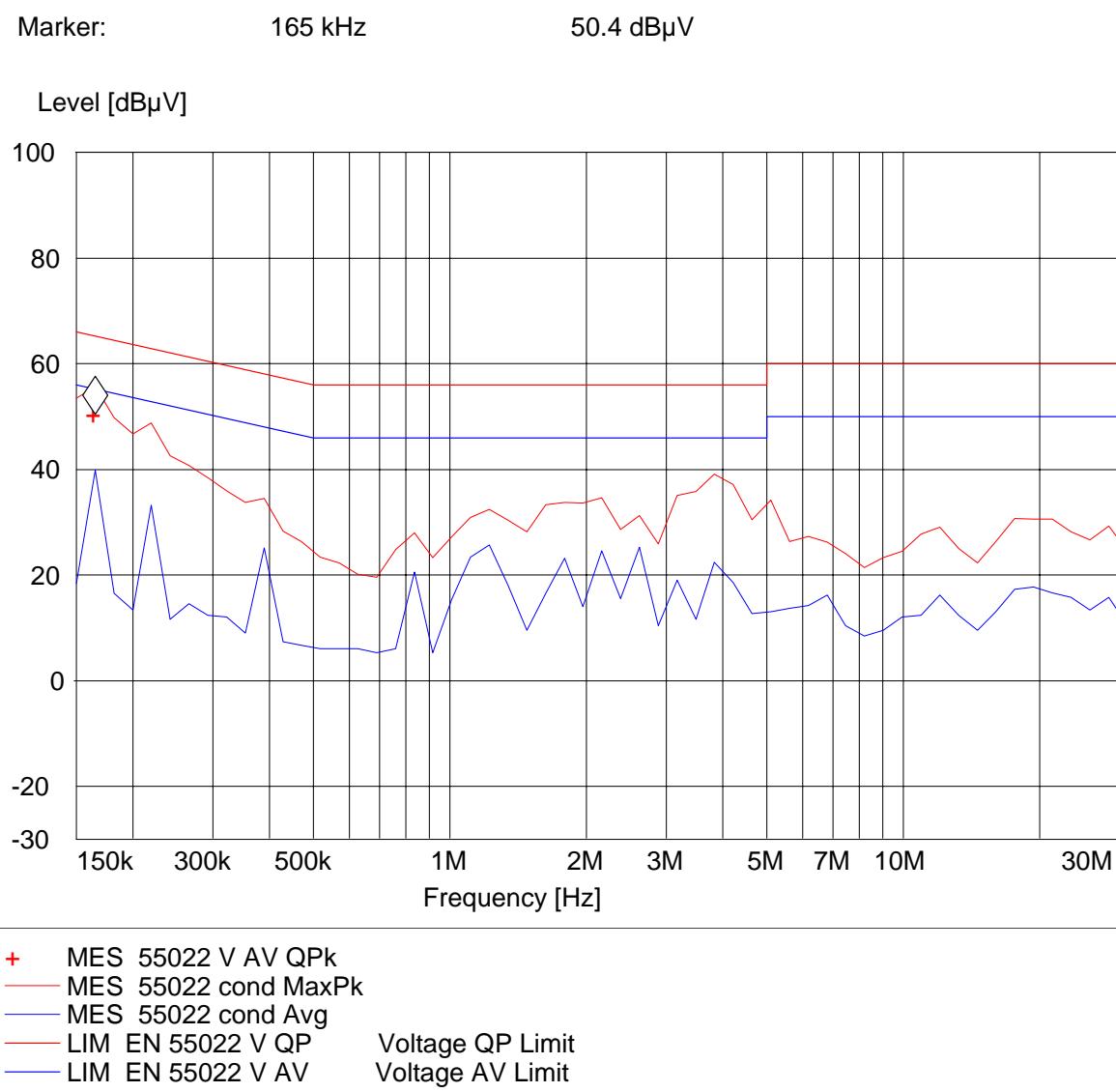
Conducted AC emissions testing were performed with 110 VAC @ 60 Hz with the EUT in mode that produce the highest power.

***Voltage Mains Test (Line)******CETECOM Inc. Milpitas, USA***

EUT: BCM94311MCAG  
Manufacturer: Broadcom  
Operating Condition: Tx Mode  
ANT Orientation:: CONDUCTED  
EUT Orientation:: H  
Test Engineer: Juan M.  
Power Supply: AC Adaptor  
Comments: 120V, 60Hz (Line)

***SWEET TABLE: "55022 cond"***

Short Description: EN 55022 for 150KHz-30MHz  
Unit: dB $\mu$ V

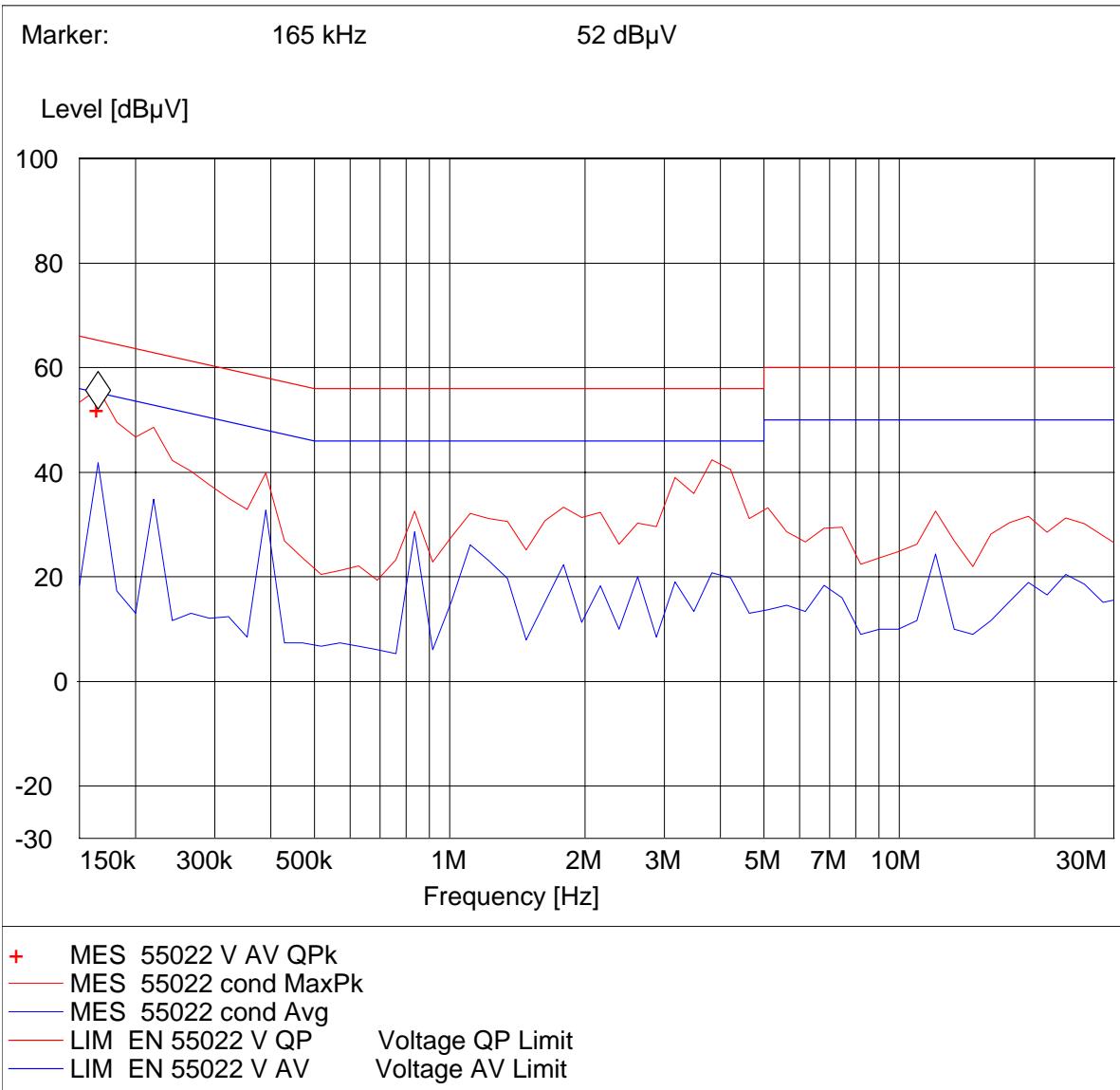


***Voltage Mains Test (Neutral)***

EUT: BCM94311MCAG  
 Manufacturer: Broadcom  
 Operating Condition: Tx Mode  
 ANT Orientation:: CONDUCTED  
 EUT Orientation:: H  
 Test Engineer:: Juan M.  
 Power Supply: AC Adaptor  
 Comments: 120V, 60Hz (Neutral)

***SWEET TABLE: "55022 cond"***

Short Description: EN 55022 for 150KHz-30MHz  
 Unit: dB $\mu$ V



**6 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS**

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal Due	Interval
<b>01</b>	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2008	1 year
<b>05</b>	Biconilog Antenna	3141	EMCO	0005-1186	June 2008	1 year
<b>06</b>	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	June 2008	1 year
<b>07</b>	Horn Antenna (18-26.5GHz)	3116	EMCO	n/a	June 2008	1 year
<b>10</b>	High Pass Filter	5HC2700	Trilithic Inc.	9926013	n/a	n/a
<b>11</b>	High Pass Filter	4HC1600	Trilithic Inc.	9922307	n/a	n/a
<b>16</b>	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	May 2008	1 year

**Radiated Testing****ANECHOIC CHAMBER**