



Class II Permissive Change FCC Test Report

FCC Part 15.247 & RSS-210, Issue 7 for Digital Transmission Systems

FOR:

802.11g Wireless LAN PCI-E Mini Card

MODEL #: BCM94311MCG

Broadcom Corporation
190 Mathilda Place
Sunnyvale, CA 94086
U.S.A

FCC ID: QDS-BRCM1020

Test report no.: EMC_BROAD_038_07001_G_DTS



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

© Copyright by CETECOM

Table of Contents

- 1 General information
 - 1.1 Notes
 - 1.2 Testing laboratory
 - 1.3 Details of applicant
 - 1.4 Application details
 - 1.5 Test item
 - 1.6 Test standards
- 2 Technical test
 - 2.1 Summary of test results
 - 2.2 Test report

1 General information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 1.5. 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.

TEST REPORT PREPARED BY:

EMC Engineer: Juan Martinez

1.2 Testing laboratory

CETECOM Inc.

411 Dixon Landing Road, Milpitas, CA-95035, USA

Phone: +1 408 586 6200 Fax: +1 408 586 6299

E-mail: lothar.schmidt@cetecomusa.com

Internet: www.cetecom.com

1.1 Details of applicant

Name : **Broadcom Corporation**
Street : **190 Mathilda Place**
City / Zip Code : **Sunnyvale, California 94086**
Country : **USA**
Contact : **Daniel Lawless**
Telephone : **408 922 5870**
Tele-fax : **408 543 3399**
e-mail : **dlawless@broadcom.com**

1.2 Application details

Date of receipt test item : **07/30/2007**
Date of test : **07/31/2007**

1.3 Test item

Manufacturer : **Applicant**
Marketing Name : **802.11g Wireless LAN PCI-E Mini Card**
Model No. : **BCM94311MCG**
Description : **802.11g Wireless LAN PCI-E Mini Card**
FCC-ID : **QDS-BRCM1020**

Additional information

Frequency : **2412MHz – 2462MHz**
Type of modulation : **CCK/OFDM**
Number of channels : **11**
Antenna Type : **Acon (Model: AMP6P-700000), Stamped metal sheet (2.6dBi)**
Amphenol (Model: WT541-22-003), Stamped metal sheet (1.88 dBi)
802.11 (b) mode: 0.056 W EIRP @ 2412MHz
802.11 (b) mode: 0.073 W EIRP @ 2437MHz
Output power : **802.11 (b) mode: 0.064 W EIRP @ 2462MHz**
802.11 (g) mode: 0.257 W EIRP @ 2412MHz
802.11 (g) mode: 0.324 W EIRP @ 2437MHz
802.11 (g) mode: 0.320 W EIRP @ 2462MHz

Test standards: **FCC Part 15 §15.247 & RSS-210, Issue 7**

1.4 Class II permissive change laptops to be added

| EUT # | TYPE | MANF. | MODEL | SERIAL # |
|-------|--------|-------|-------|----------|
| 1 | Laptop | Dell | PP12S | UNIT 1 |

1.5 Identification of Accessory equipment

| TYPE | MANF. | MODEL |
|------------|-------|------------|
| AC ADAPTOR | Dell | DA65NS0-00 |

Subject Of Investigation

All testing were performed on the PP12S (Parker) laptop with the BCM94311MCAG pre-approved module. Measurements were performed on the Acon antenna. This report is to also cover the Amphenol 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.

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 15.247 of Title 47 of the Code of Federal Regulations and to Industry Canada RSS-210, Issue 7. The maximization of portable equipment is conducted in accordance with ANSI C63.4.

2 Technical test**2.1 Summary of test results**

| | |
|--|---------------|
| No deviations from the technical specification(s) were ascertained in the course of the tests Performed | |
| Final Verdict: (Only “passed” if all single measurements are “passed”) | Passed |

Technical responsibility for area of testing:

| | | |
|-------------------|------------------------|---------------------------------|
| 07/31/2007 | EMC & Radio | Lothar Schmidt (Manager) |
|-------------------|------------------------|---------------------------------|

Date**Section****Name****Signature****Responsible for test report and project leader:**

| | | |
|-------------------|------------------------|---|
| 07/31/2007 | EMC & Radio | Juan Martinez (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.

2.2 Test report

TEST REPORT

Test report no.: EMC_BROAD_038_07001_G_DTS

TEST REPORT REFERENCE

LIST OF MEASUREMENTS

PAGE

1 GENERAL INFORMATION 2

1.1 DETAILS OF APPLICANT 3

1.2 APPLICATION DETAILS 3

1.3 TEST ITEM 3

1.4 CLASS II PERMISSIVE CHANGE LAPTOPS TO BE ADDED 4

1.5 IDENTIFICATION OF ACCESSORY EQUIPMENT 4

SUBJECT OF INVESTIGATION 4

2 TECHNICAL TEST 5

2.1 MAXIMUM PEAK OUTPUT POWER § 15.247 (B) (3) & RSS-210 (A8.4)(4) 8

2.2 BAND EDGE COMPLIANCE (802.11B) §15.247 (D) & RSS-210(A8.5) 15

2.3 BAND EDGE COMPLIANCE (802.11G) §15.247 (D) & RSS-210(A8.5) 19

3 EMISSION LIMITATIONS §15.247 (D) & RSS-210(A8.5) 23

3.1 EMISSION LIMITATIONS - RADIATED (TRANSMITTER), 802.11B 24

LOWEST CHANNEL (2412MHZ): 30MHZ – 1GHZ 26

LOWEST CHANNEL (2412MHZ): 1GHZ – 18GHZ 27

LOWEST CHANNEL (2412MHZ): 1GHZ – 18GHZ 28

MID CHANNEL (2437MHZ): 1GHZ – 18GHZ 29

HIGHEST CHANNEL (2462MHZ): 1GHZ – 18GHZ 30

18GHZ – 26.5GHZ FOR LOW, MIDDLE, AND HIGH CHANNELS 31

3.2 EMISSION LIMITATIONS - RADIATED (TRANSMITTER), 802.11G 32

LOWEST CHANNEL (2412MHZ): 30MHZ – 1GHZ 33

LOWEST CHANNEL (2412MHZ): 30MHZ – 1GHZ 34

LOWEST CHANNEL (2412MHZ): 1GHZ – 18GHZ 35

MID CHANNEL (2437MHZ): 1GHZ – 18GHZ 36

HIGHEST CHANNEL (2462MHZ): 1GHZ – 18GHZ 37

18GHZ – 26.5GHZ FOR LOW, MIDDLE, AND HIGH CHANNELS 38

3.3 AC POWER LINE CONDUCTED EMISSIONS § 15.207 & RSS-GEN (7.2.2) 39

4 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS 42

5 BLOCK DIAGRAMS 43

2.1 MAXIMUM PEAK OUTPUT POWER (RADIATED)

§ 15.247 (b) (3) & RSS-210 (A8.4)(4)

EIRP:

802.11b

| TEST CONDITIONS | | MAXIMUM PEAK OUTPUT POWER (dBm) | | |
|-------------------------|------------------|---------------------------------|-------|-------|
| Frequency (MHz) | | 2412 | 2437 | 2462 |
| T _{nom} (23)°C | V _{nom} | 17.45 | 18.65 | 18.06 |
| Measurement uncertainty | | ±0.5dBm | | |

802.11g

| TEST CONDITIONS | | MAXIMUM PEAK OUTPUT POWER (dBm) | | |
|-------------------------|------------------|---------------------------------|-------|-------|
| Frequency (MHz) | | 2412 | 2437 | 2462 |
| T _{nom} (23)°C | V _{nom} | 24.1 | 25.11 | 25.06 |
| Measurement uncertainty | | ±0.5dBm | | |

LIMIT

SUBCLAUSE § 15.247 (b) (3) & RSS-210 (A8.4)(4)

| Frequency range | RF power output |
|-----------------|--------------------|
| 2400-2483.5 MHz | 30dBm on Conducted |

Notes:

1. For 802.11b power were set to transmit at the specified conducted average output power.
2. EIRP was measured with the device transmitting on both the auxiliary and the main antenna. The EIRP was highest when transmitting on the main antenna. EIRP values shown in this report are with the device transmitting on the main antenna.
3. Both vertical and horizontal were measured. Worst case polarization was horizontal for all modes.

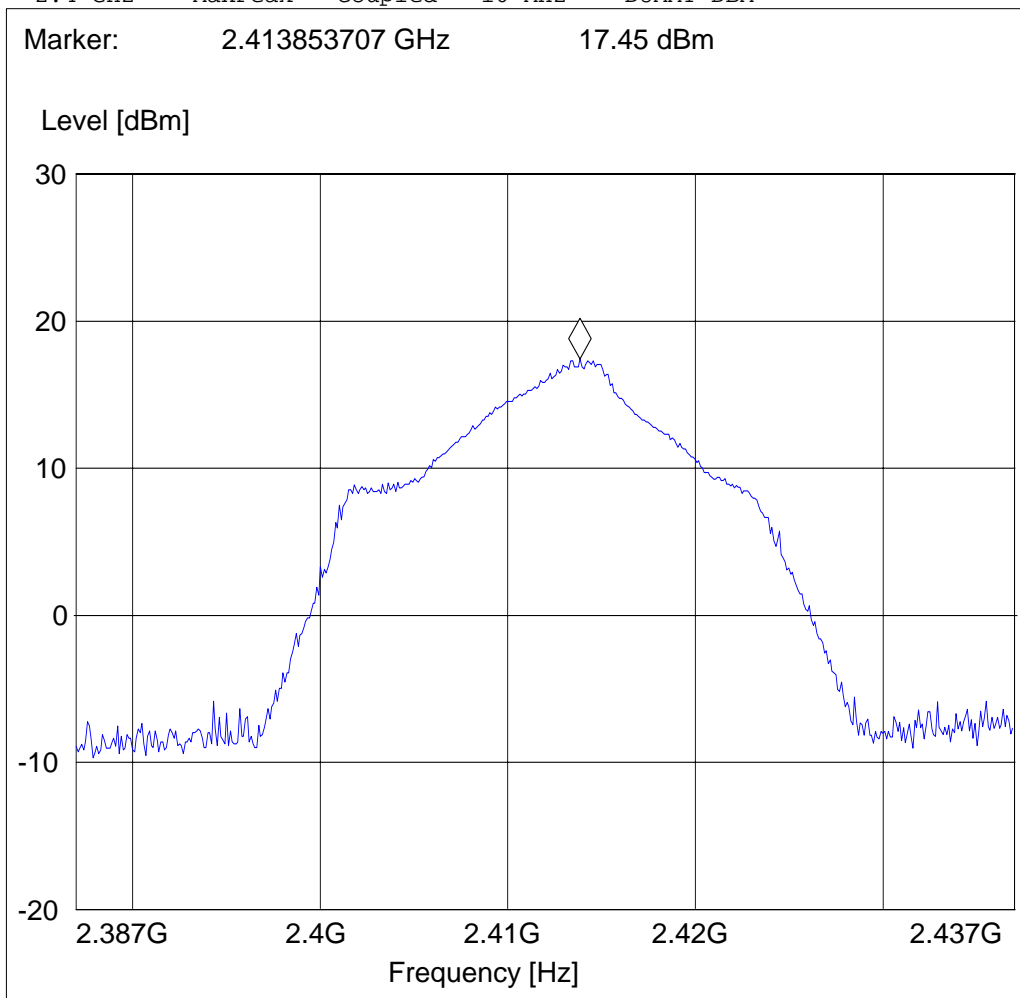
EIRP: 2412 MHz (802.11b)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11b, ch 1 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "EIRP RLAN CH1"

| Short Description: | | EIRP RLAN channel-2412 MHz | | | |
|--------------------|---------|----------------------------|------------|-----------|------------|
| Start | Stop | Detector | Meas. Time | IF Bandw. | Transducer |
| 2.4 GHz | 2.4 GHz | MaxPeak | Coupled | 10 MHz | DUMMY-DBM |



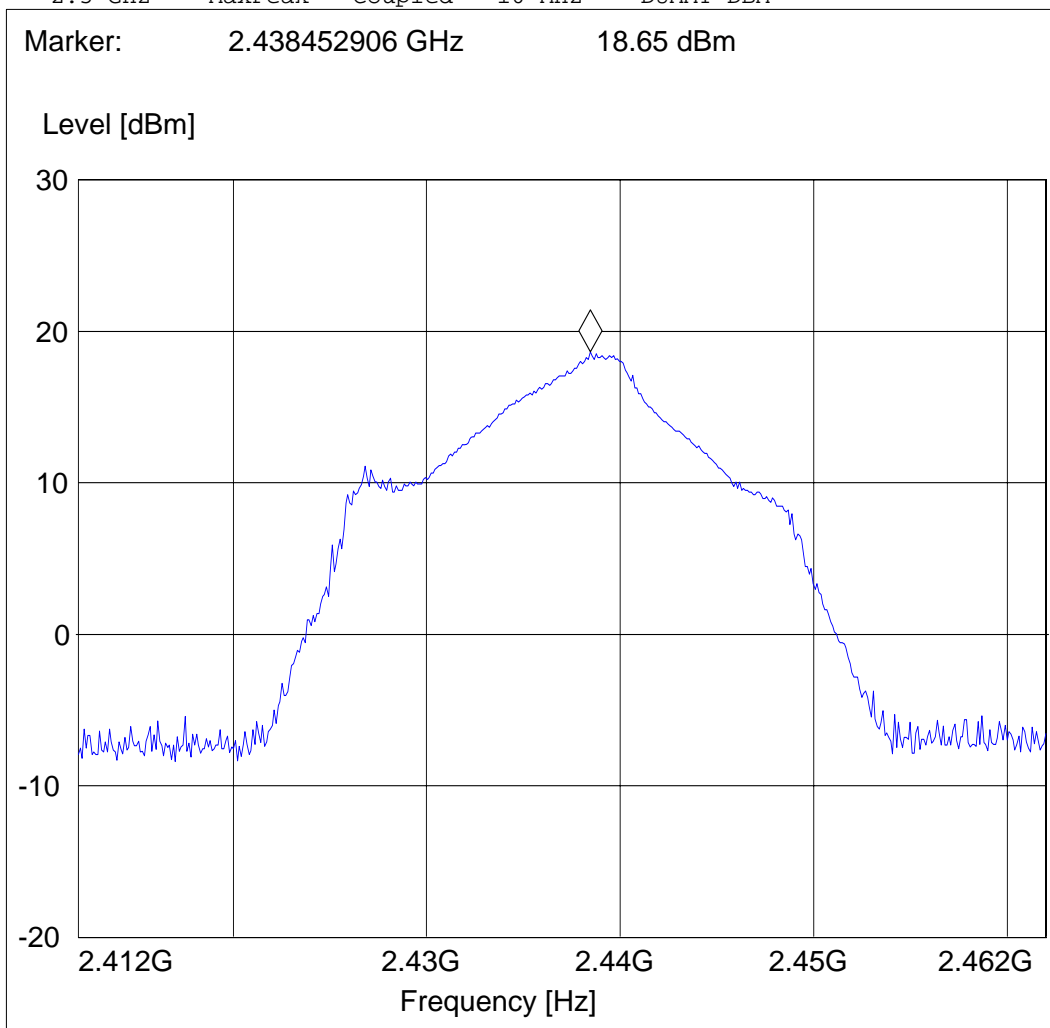
EIRP: 2437 MHz (802.11b)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11b, ch 6 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "EIRP RLAN CH6"

| | | | | | |
|--------------------|-----------|----------------------------|---------|--------|------------|
| Short Description: | | EIRP RLAN channel-2437 MHz | | | |
| Start | Stop | Detector | Meas. | IF | Transducer |
| Frequency | Frequency | | Time | Bandw. | |
| 2.4 GHz | 2.5 GHz | MaxPeak | Coupled | 10 MHz | DUMMY-DBM |



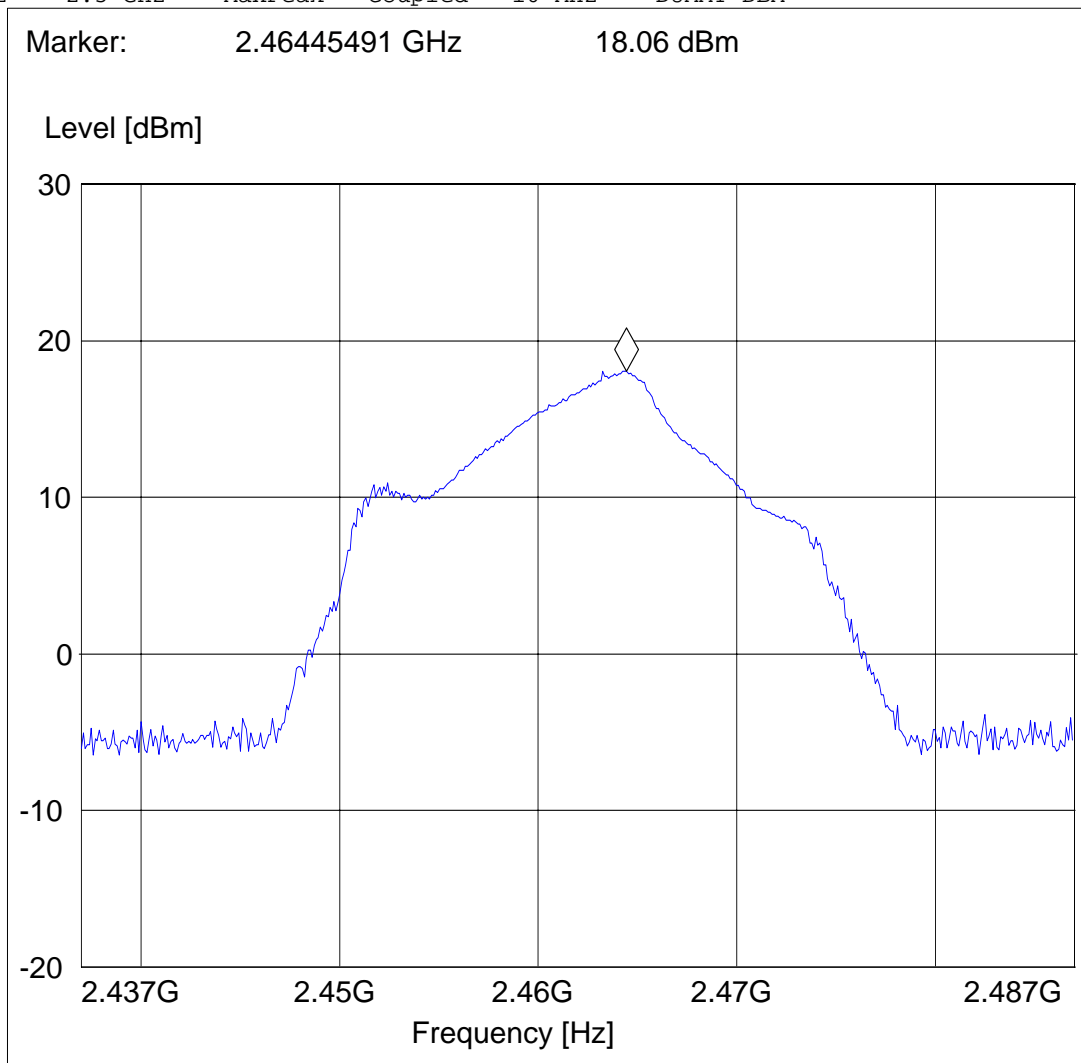
EIRP: 2462 MHz (802.11b)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11b, ch 11 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter

SWEEP TABLE: "EIRP RLAN CH11"

| Short Description: | | EIRP RLAN channel-2462 MHz | | | |
|--------------------|---------|----------------------------|------------|-----------|------------|
| Start | Stop | Detector | Meas. Time | IF Bandw. | Transducer |
| 2.4 GHz | 2.5 GHz | MaxPeak | Coupled | 10 MHz | DUMMY-DBM |



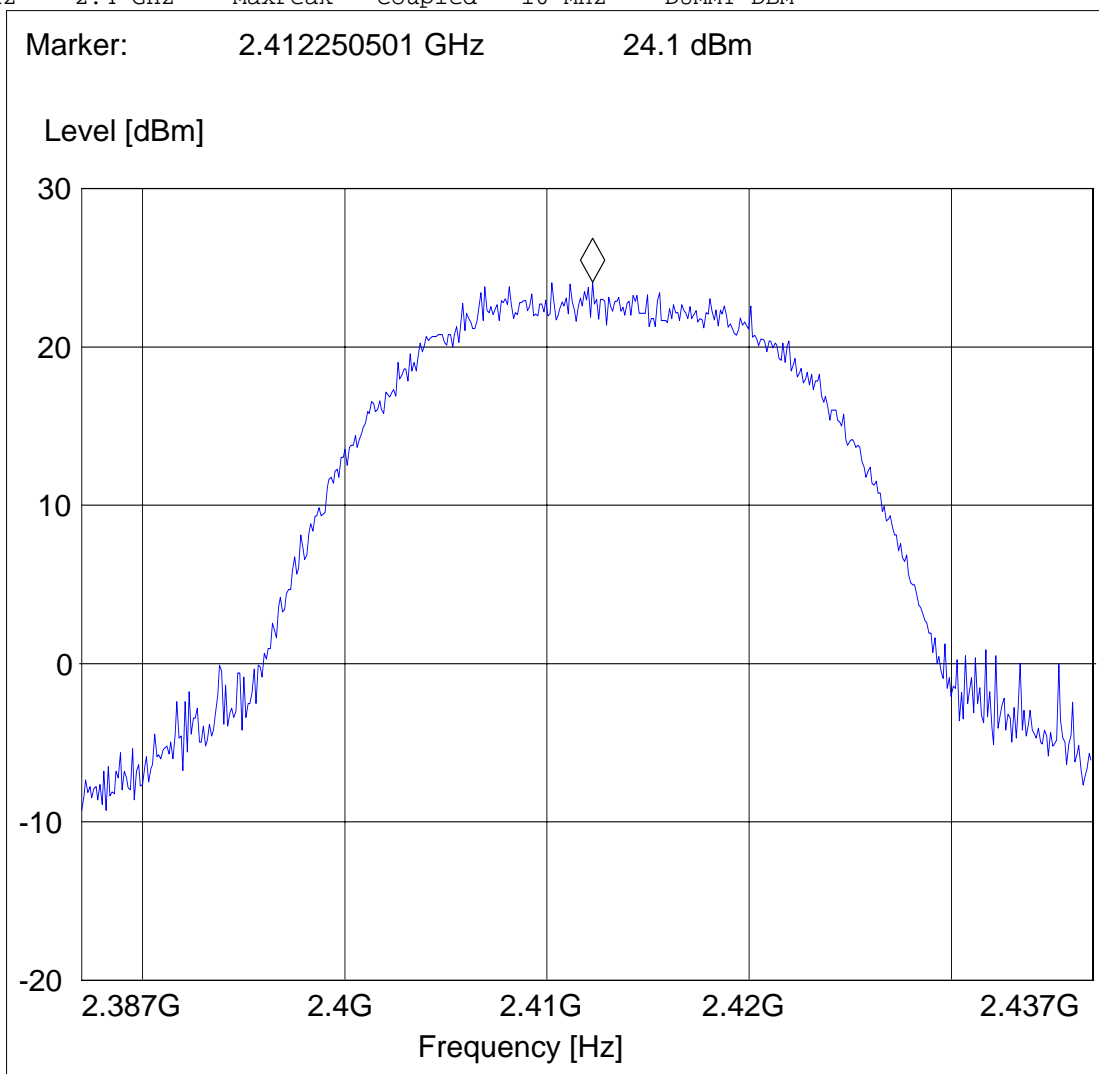
EIRP: 2412 MHz (802.11g)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11g, ch 1 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "EIRP RLAN CH1"

| Short Description: | | EIRP RLAN channel-2412 MHz | | | |
|--------------------|---------|----------------------------|------------|-----------|------------|
| Start | Stop | Detector | Meas. Time | IF Bandw. | Transducer |
| 2.4 GHz | 2.4 GHz | MaxPeak | Coupled | 10 MHz | DUMMY-DBM |



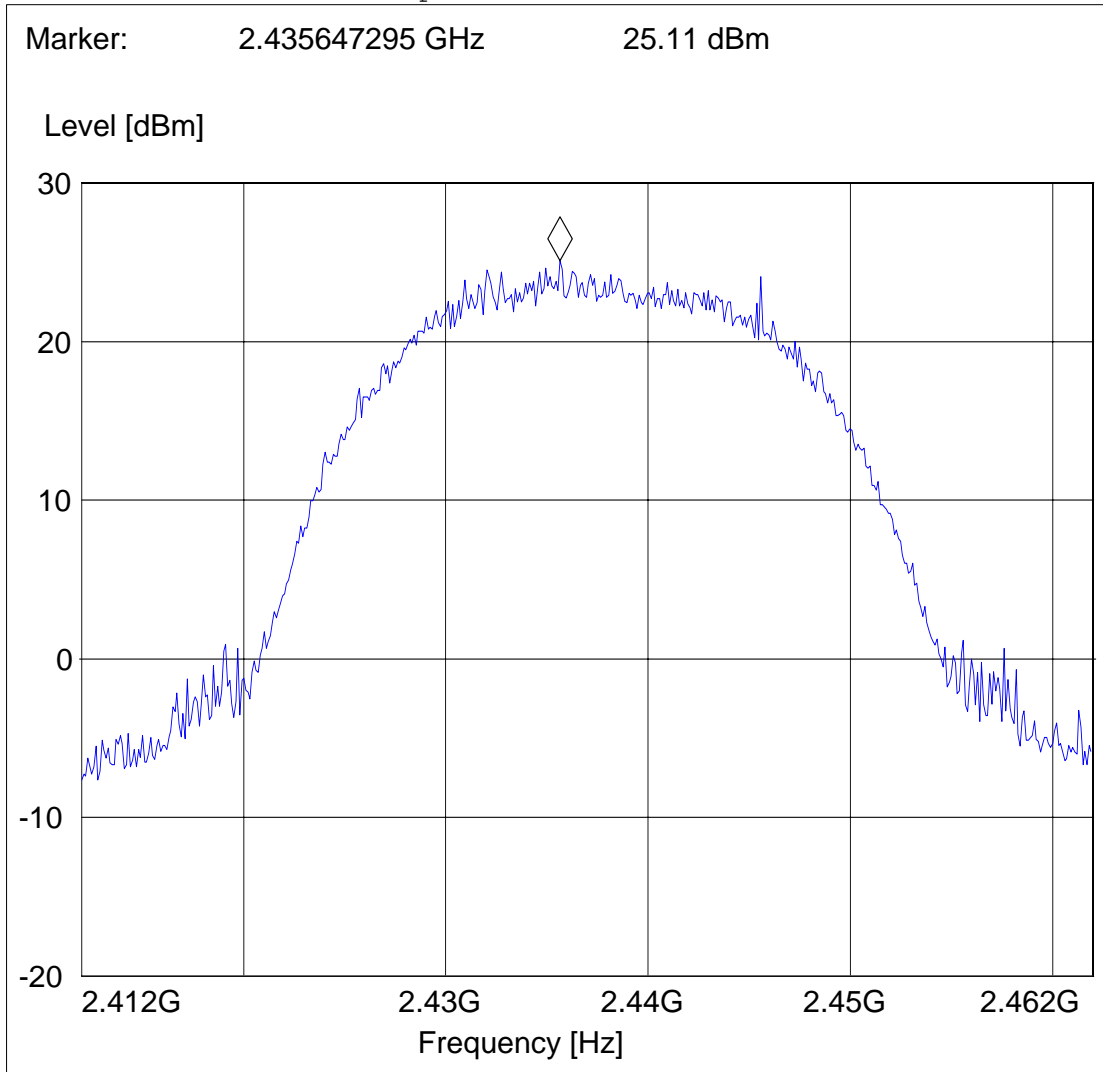
EIRP: 2437 MHz (802.11g)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11g, ch 6 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "EIRP RLAN CH6"

| Short Description: | | EIRP RLAN channel-2437 MHz | | | |
|--------------------|---------|----------------------------|------------|-----------|------------|
| Start | Stop | Detector | Meas. Time | IF Bandw. | Transducer |
| 2.4 GHz | 2.5 GHz | MaxPeak | Coupled | 10 MHz | DUMMY-DBM |



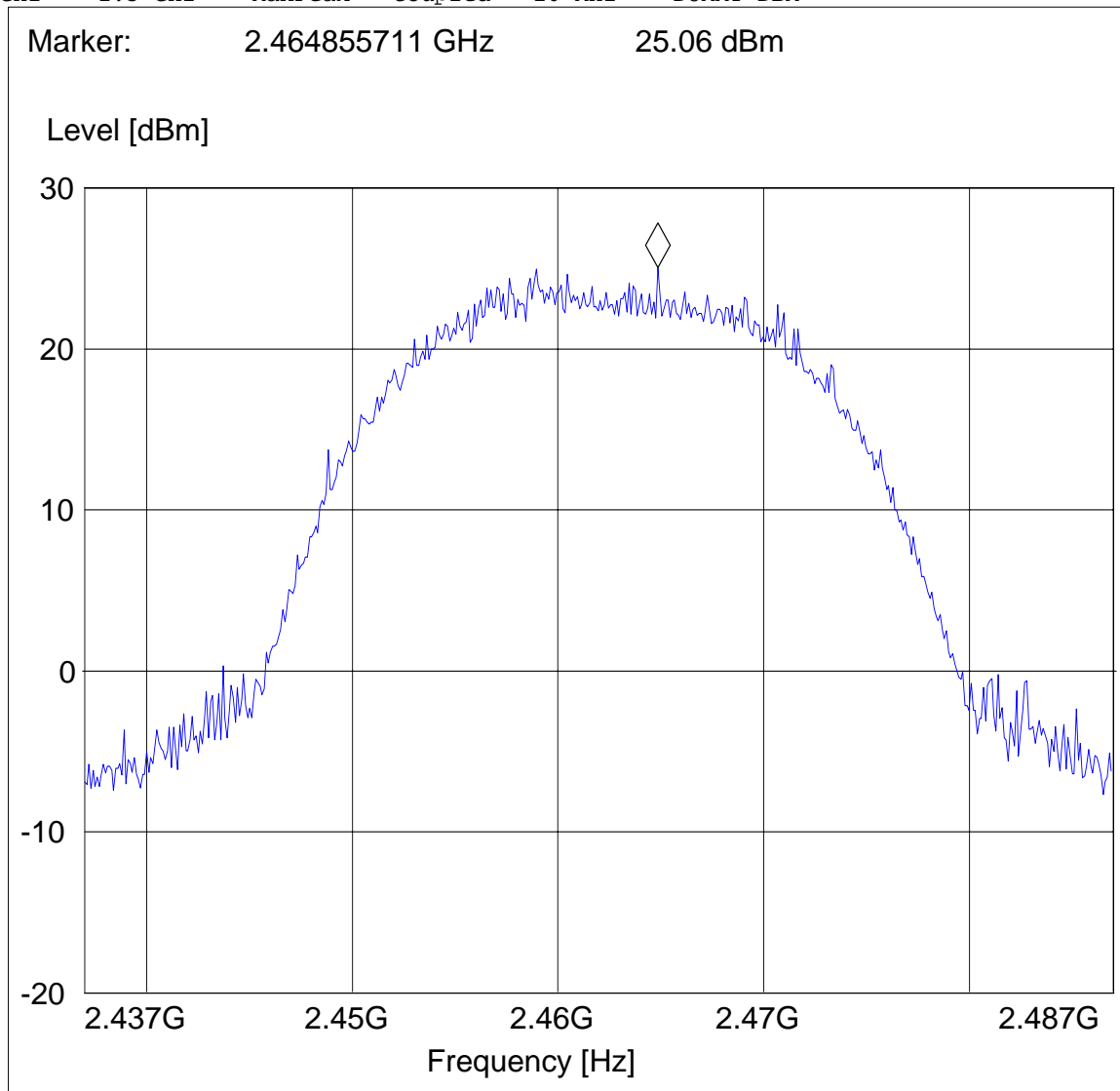
EIRP: 2462 MHz (802.11g)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11g, ch 11
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "EIRP RLAN CH11"

| | | | | | |
|--------------------|-----------|----------------------------|---------|--------|------------|
| Short Description: | | EIRP RLAN channel-2462 MHz | | | |
| Start | Stop | Detector | Meas. | IF | Transducer |
| Frequency | Frequency | | Time | Bandw. | |
| 2.4 GHz | 2.5 GHz | MaxPeak | Coupled | 10 MHz | DUMMY-DBM |



2.2 BAND EDGE COMPLIANCE (802.11b)

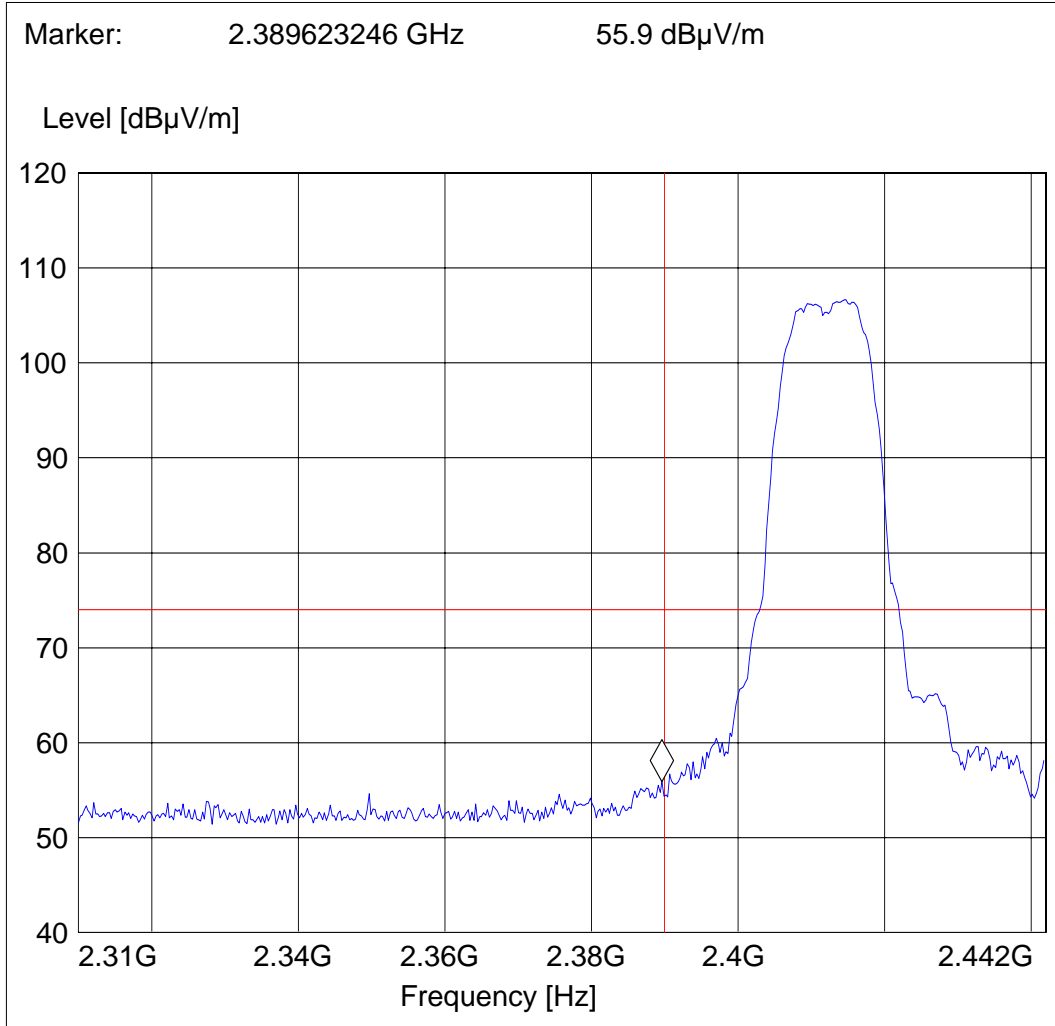
§15.247 (d) & RSS-210(A8.5)

802.11b Low frequency section (spurious in the restricted band 2310 – 2390 MHz)
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11b, Ch. 1 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "FCC15.247 LBE_PK"

| Start Frequency | Stop Frequency | Detector | Meas. Time | IF Bandw. | Transducer |
|-----------------|----------------|----------|------------|-----------|------------------|
| 2.3 GHz | 2.4 GHz | MaxPeak | Coupled | 1 MHz | #326horn_AF_vert |



BAND EDGE COMPLIANCE

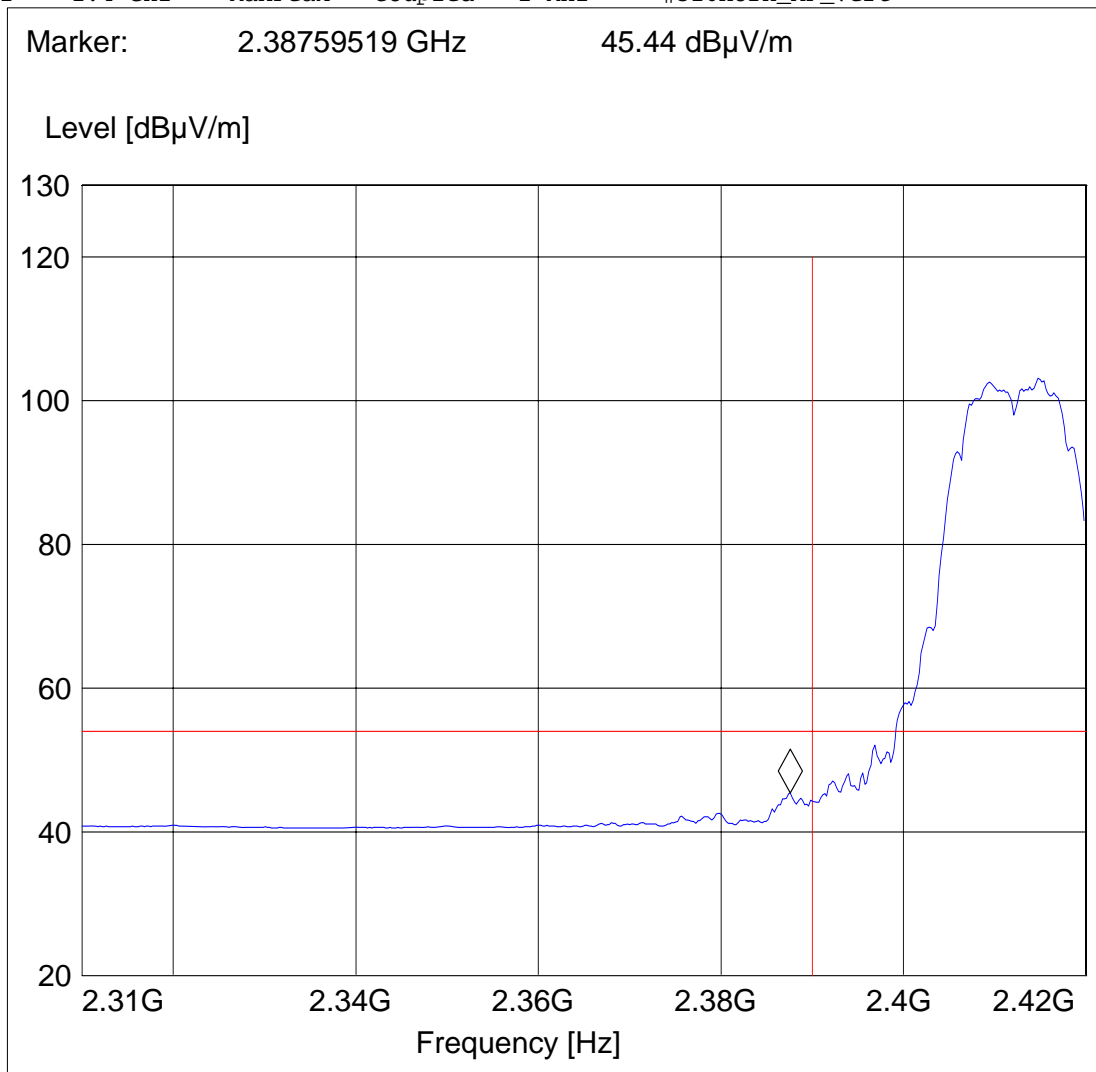
§15.247 (d) & RSS-210(A8.5)

**802.11b Low frequency section (spurious in the restricted band 2310 – 2390 MHz)
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11b, Ch. 1 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "FCC15.247 LBE_AVG"

| Start Frequency | Stop Frequency | Detector | Meas. Time | IF Bandw. | Transducer |
|-----------------|----------------|----------|------------|-----------|------------------|
| 2.3 GHz | 2.4 GHz | MaxPeak | Coupled | 1 MHz | #326horn_AF_vert |



BAND EDGE COMPLIANCE

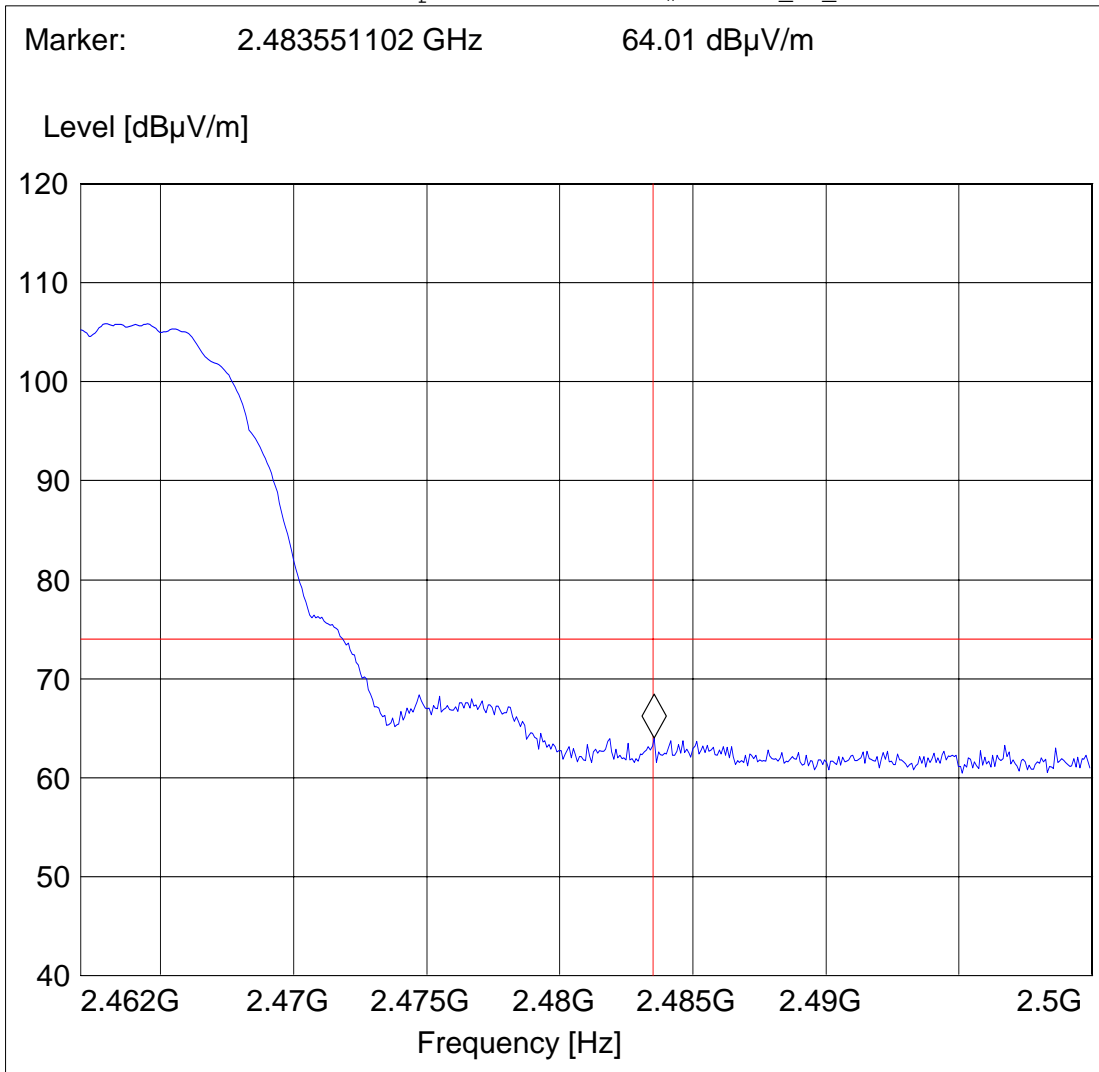
§15.247 (d) & RSS-210(A8.5)

**802.11b High frequency section (spurious in the restricted band 2483.5 – 2500 MHz)
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11b, Ch. 11 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "FCC15.247 HBE_PK"

| Start Frequency | Stop Frequency | Detector | Meas. Time | IF Bandw. | Transducer |
|-----------------|----------------|----------|------------|-----------|------------------|
| 2.5 GHz | 2.5 GHz | MaxPeak | Coupled | 1 MHz | #326horn_AF_vert |



BAND EDGE COMPLIANCE

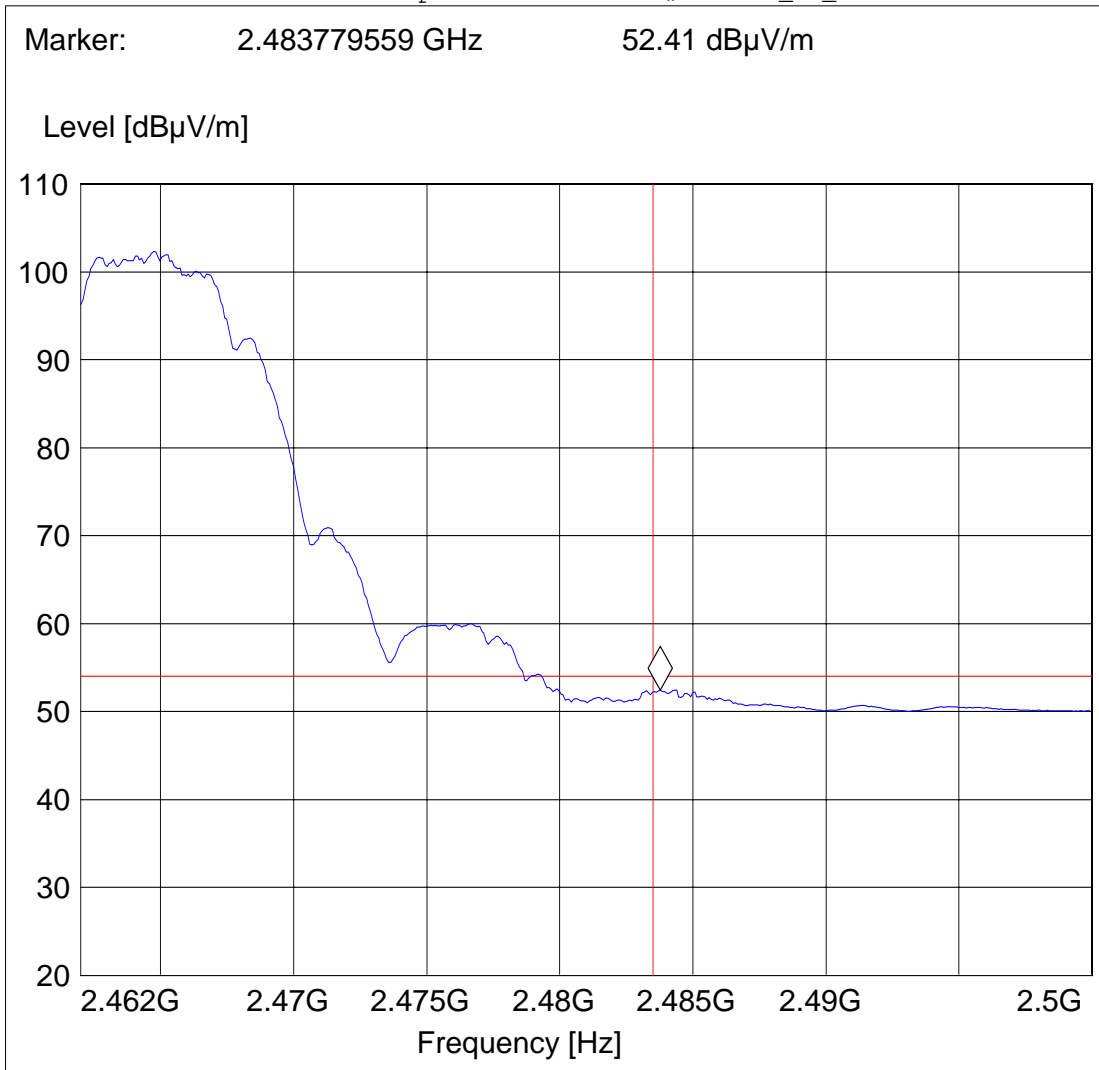
§15.247 (d) & RSS-210(A8.5)

**802.11b High frequency section (spurious in the restricted band 2483.5 – 2500 MHz)
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11b, Ch. 11 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "FCC15.247 HBE_AVG"

| Start Frequency | Stop Frequency | Detector | Meas. Time | IF Bandw. | Transducer |
|-----------------|----------------|----------|------------|-----------|------------------|
| 2.5 GHz | 2.5 GHz | MaxPeak | Coupled | 1 MHz | #326horn_AF_horz |



2.3 BAND EDGE COMPLIANCE (802.11g)

§15.247 (d) & RSS-210(A8.5)

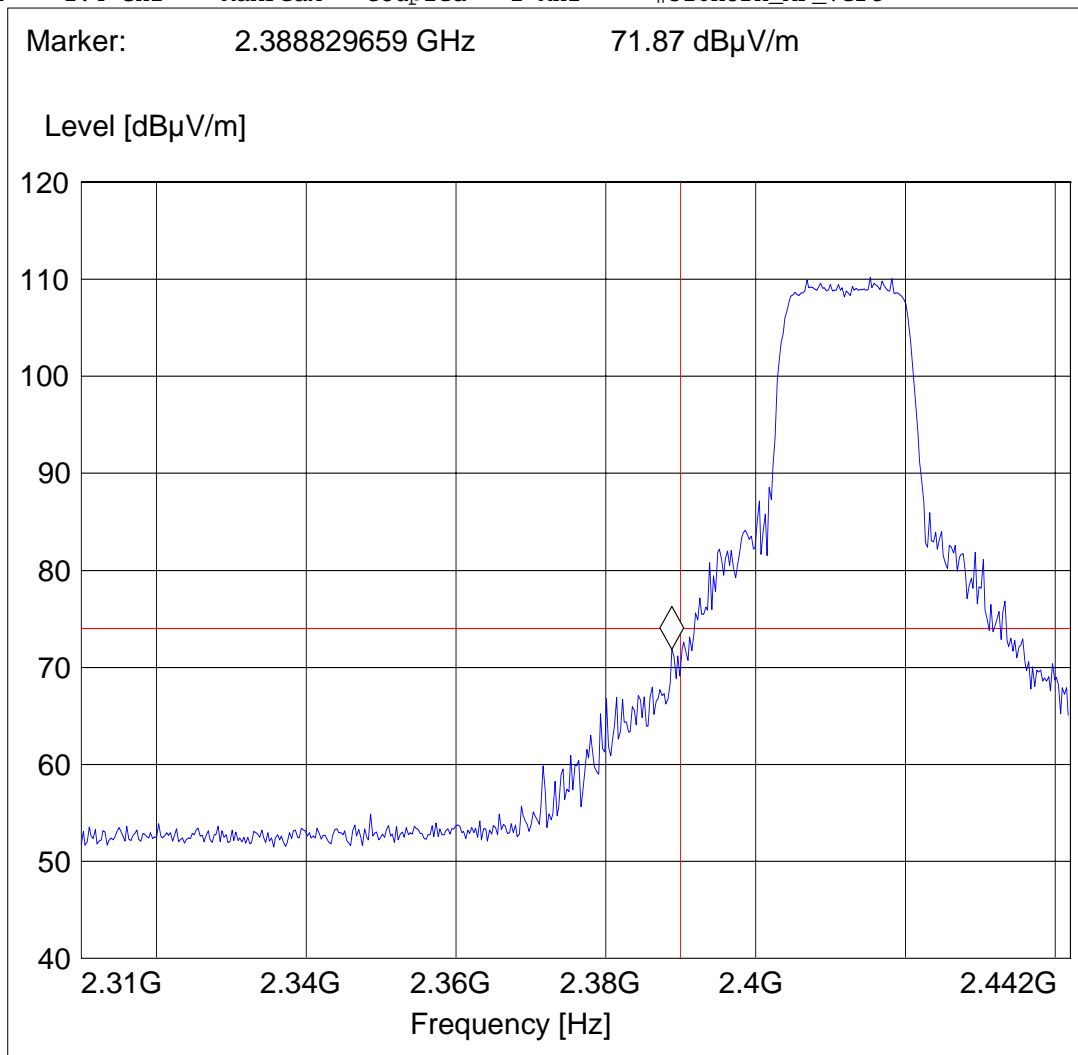
802.11g Low frequency section (spurious in the restricted band 2310 – 2390 MHz)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: Dell PP12S with BCM94311MCG
 Customer: Broadcom
 Test Mode: 802.11g, ch 1 (Main Antenna)
 ANT Orientation: H
 EUT Orientation: H
 Test Engineer: Ed
 Power Supply: AC Adapter
 Comments: 18dBm

SWEEP TABLE: "FCC15.247 LBE_PK"

| Start Frequency | Stop Frequency | Detector | Meas. Time | IF Bandw. | Transducer |
|-----------------|----------------|----------|------------|-----------|------------------|
| 2.3 GHz | 2.4 GHz | MaxPeak | Coupled | 1 MHz | #326horn_AF_vert |



BAND EDGE COMPLIANCE

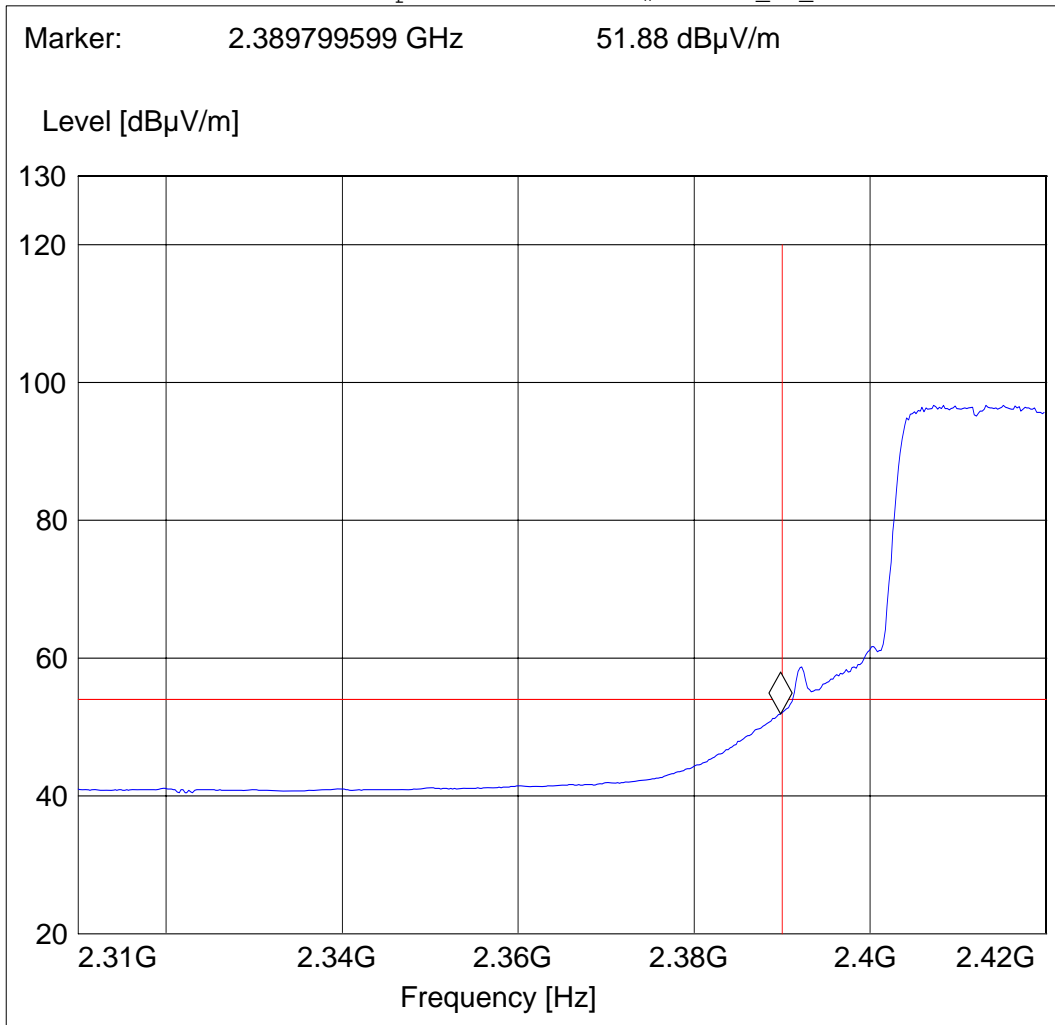
§15.247 (d) & RSS-210(A8.5)

**802.11g Low frequency section (spurious in the restricted band 2310 – 2390 MHz)
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11g, ch 1 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments: 18dBm

SWEEP TABLE: "FCC15.247 LBE_AVG"

| Start Frequency | Stop Frequency | Detector | Meas. Time | IF Bandw. | Transducer |
|-----------------|----------------|----------|------------|-----------|------------------|
| 2.3 GHz | 2.4 GHz | MaxPeak | Coupled | 1 MHz | #326horn_AF_vert |



BAND EDGE COMPLIANCE

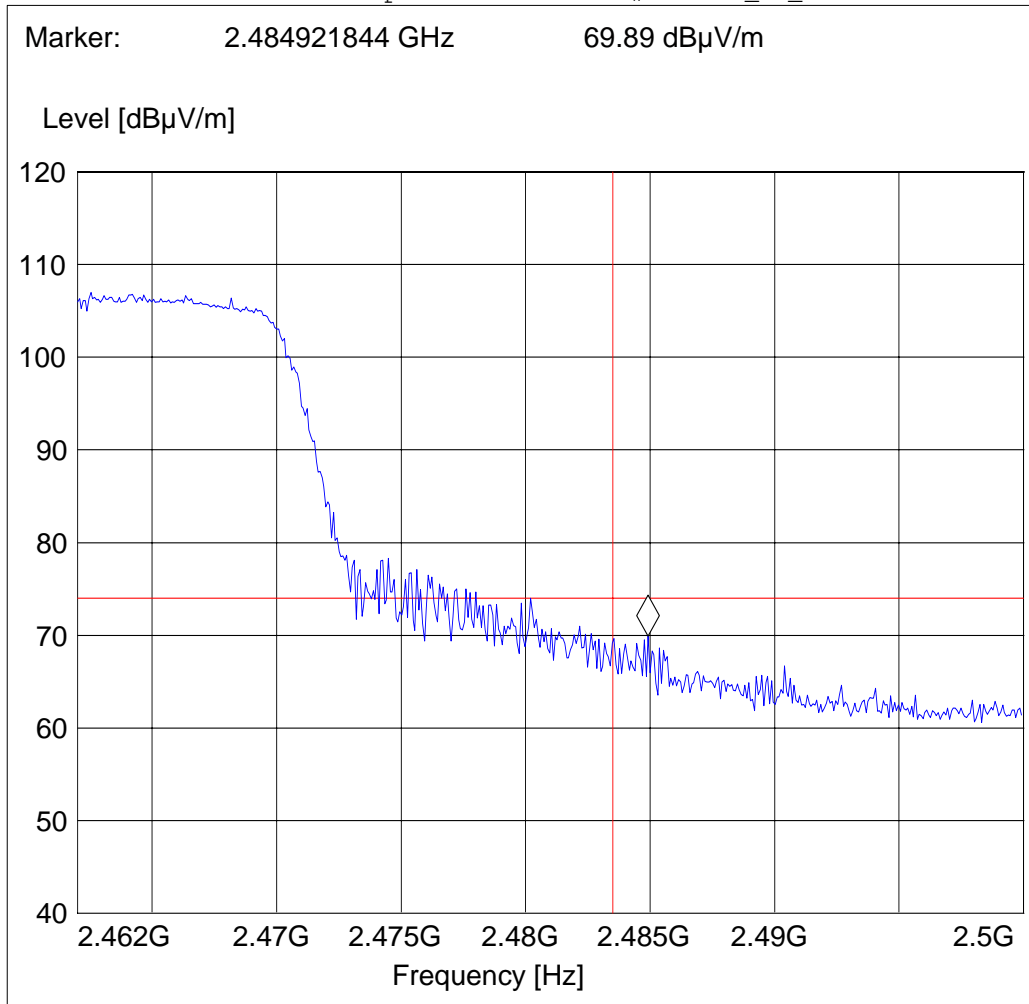
§15.247 (d) & RSS-210(A8.5)

**802.11g High frequency section (spurious in the restricted band 2483.5 – 2500 MHz)
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11g, ch 11 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments: 17dBm

SWEEP TABLE: "FCC15.247 HBE_PK"

| Start Frequency | Stop Frequency | Detector | Meas. Time | IF Bandw. | Transducer |
|-----------------|----------------|----------|------------|-----------|------------------|
| 2.5 GHz | 2.5 GHz | MaxPeak | Coupled | 1 MHz | #326horn_AF_vert |



BAND EDGE COMPLIANCE

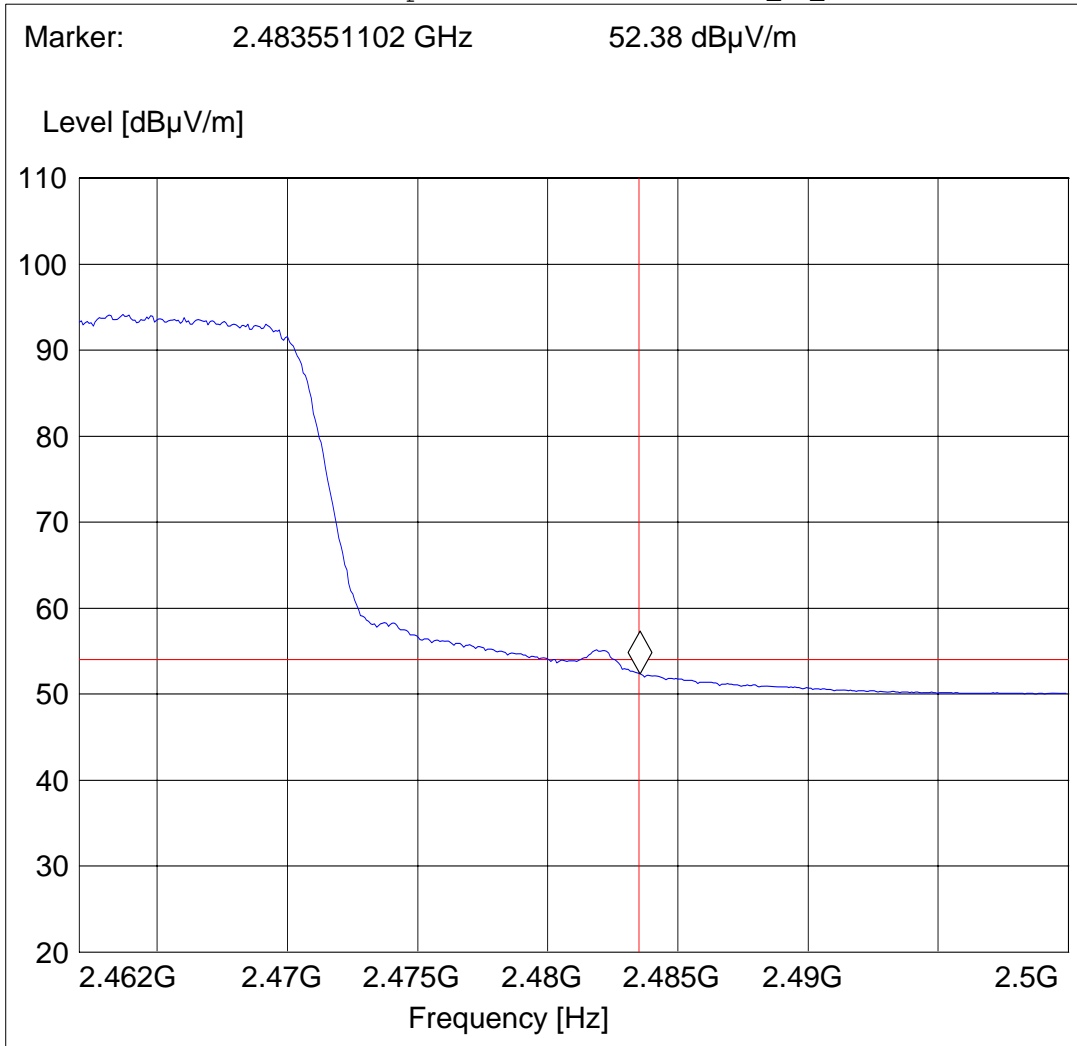
§15.247 (d) & RSS-210(A8.5)

802.11g High frequency section (spurious in the restricted band 2483.5 – 2500 MHz)
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11g, ch 11 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments: 17dBm

SWEEP TABLE: "FCC15.247 HBE_AVG"

| Start Frequency | Stop Frequency | Detector | Meas. Time | IF Bandw. | Transducer |
|-----------------|----------------|----------|------------|-----------|------------------|
| 2.5 GHz | 2.5 GHz | MaxPeak | Coupled | 1 MHz | #326horn_AF_horz |



3 EMISSION LIMITATIONS
Transmitter (Radiated)

§15.247 (d) & RSS-210(A8.5)

LIMITS

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions, which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

NOTES:

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 26.5 GHz very short cable connections to the antenna was used to minimize the noise level.
2. All measurements are done in peak mode unless specified with the plots.
3. Emissions were measured with the device in 802.11b mode, 802.11g mode, and 802.11a mode.

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 |

3.1 EMISSION LIMITATIONS - Radiated (Transmitter), 802.11b

§15.247 (d) & RSS-210(A8.5):

| Transmit at Lowest channel Frequency 2412MHz (802.11b) | | | |
|--|-----------------------|-------------------|----------------|
| Frequency (MHz) | Level (dBµV/m) | | |
| | Peak | Quasi-Peak | Average |
| | | | |
| SEE PLOTS | | | |
| | | | |
| | | | |
| | | | |
| Transmit at Middle channel Frequency 2437MHz (802.11b) | | | |
| Frequency (MHz) | Level (dBµV/m) | | |
| | Peak | Quasi-Peak | Average |
| | | | |
| SEE PLOTS | | | |
| | | | |
| | | | |
| | | | |
| Transmit at Highest channel Frequency 2462MHz (802.11b) | | | |
| Frequency (MHz) | Level (dBµV/m) | | |
| | Peak | Quasi-Peak | Average |
| | | | |
| SEE PLOTS | | | |
| | | | |
| | | | |
| | | | |

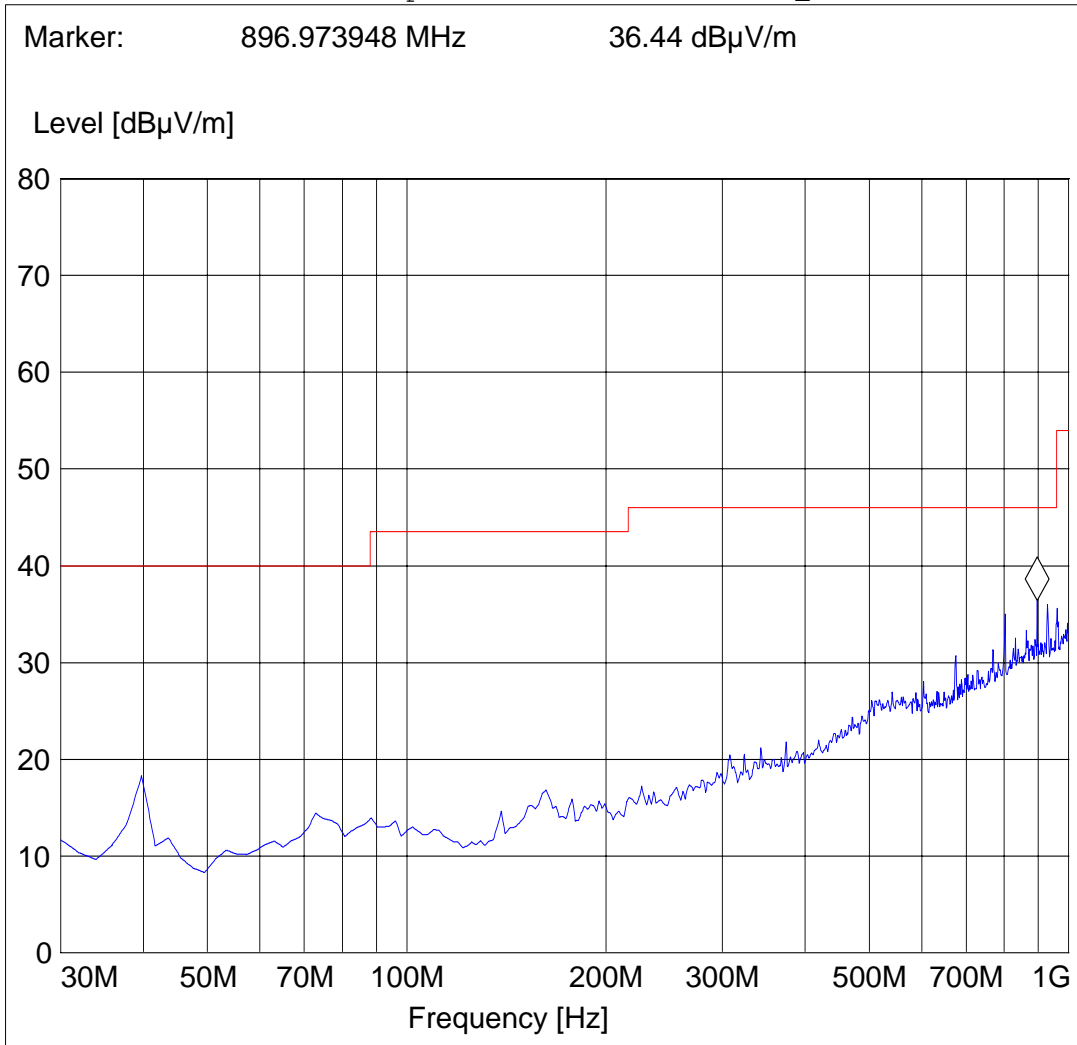
EMISSION LIMITATIONS - Radiated (Transmitter) §15.247 (d) & RSS-210(A8.5)
Lowest Channel (2412MHz): 30MHz – 1GHz

Note: This plot is valid for low, mid, high channels (worst-case plot)
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11b, ch 1 (Main Antenna)
ANT Orientation: V
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "FCC15.247_30M-1G_Ver"

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



EMISSION LIMITATIONS - Radiated (Transmitter) §15.247 (d) & RSS-210(A8.5)

Lowest Channel (2412MHz): 30MHz – 1GHz

Antenna: Horizontal

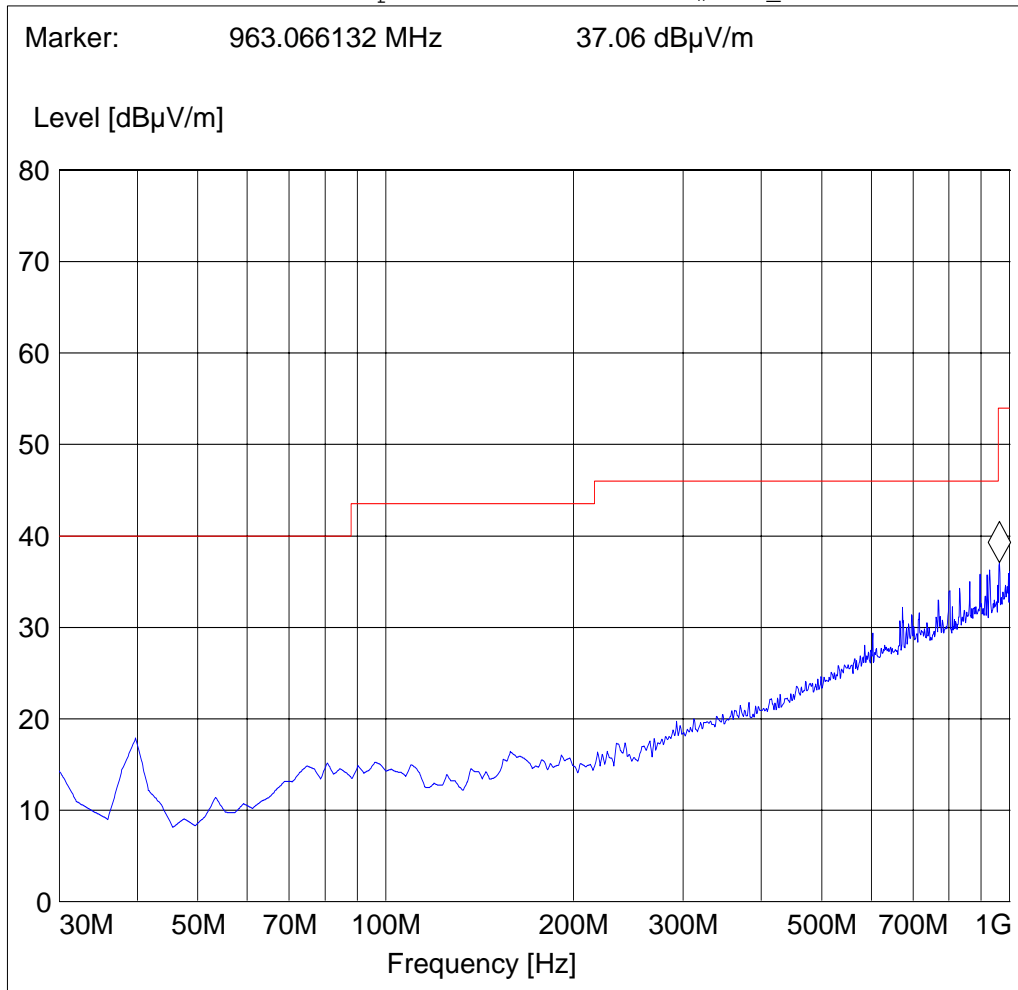
Note: This plot is valid for low, mid, high channels (worst-case plot)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11b, ch 1 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "FCC15.247_30M-1G_Hor"

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



EMISSION LIMITATIONS - Radiated (Transmitter) §15.247 (d) & RSS-210(A8.5)

Lowest Channel (2412MHz): 1GHz – 18GHz

Note: No significant harmonic emissions detected either in Vertical or Horizontal

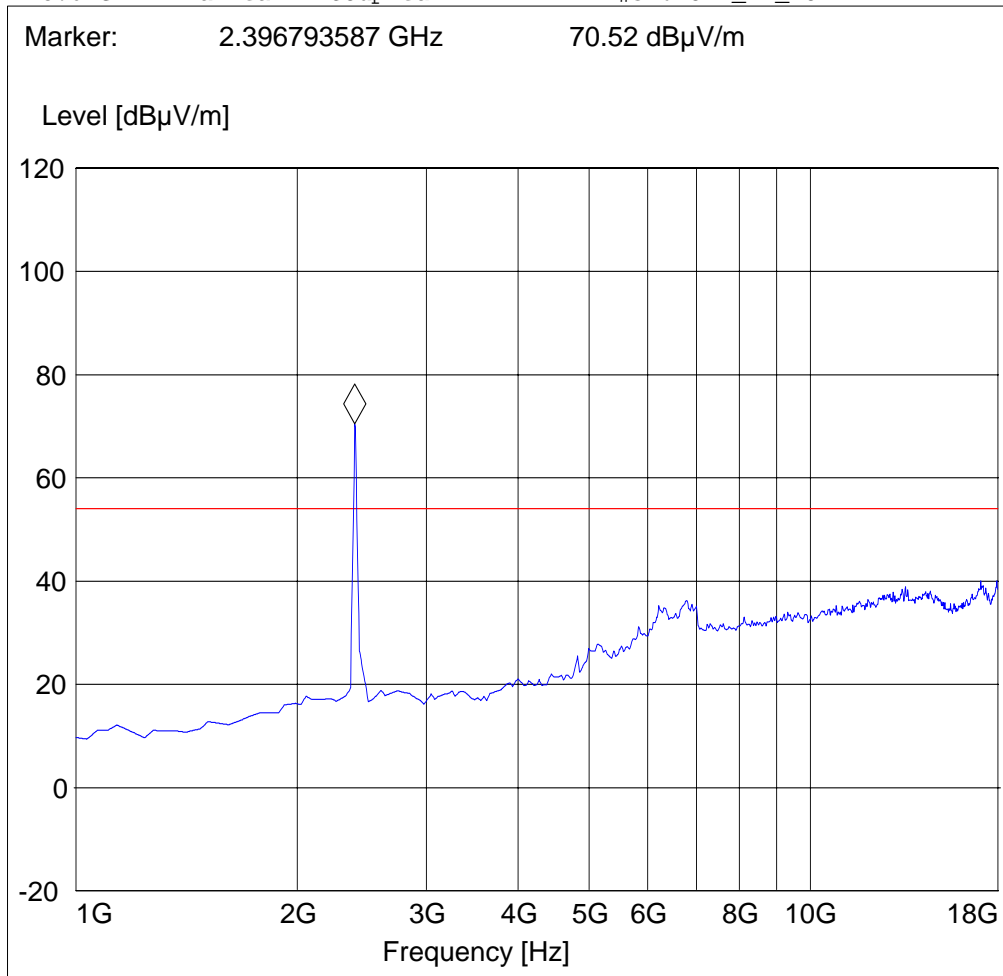
Note: Peak above the limit line is the carrier freq.

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11b, ch 1 (Main Antenna)
ANT Orientation: V
EUT Orientation: H
Test Engineer: Juan
Voltage: AC Adapter
Comments: Marker on fundamental signal

SWEEP TABLE: "FCC15.247_1-18G"

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



EMISSION LIMITATIONS - Radiated (Transmitter) §15.247 (d) & RSS-210(A8.5)

Lowest Channel (2412MHz): 1GHz – 18GHz

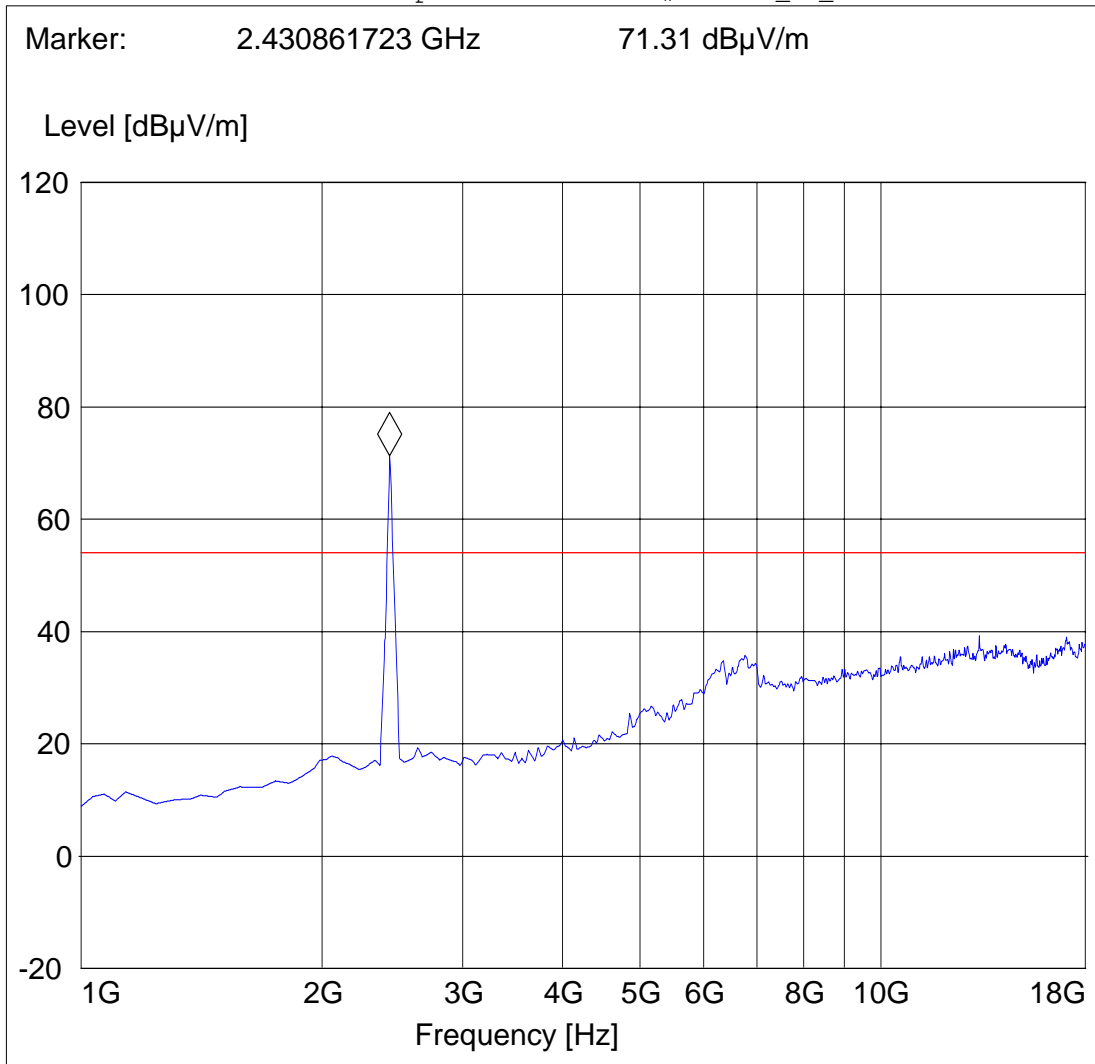
Note: No significant harmonic emissions detected either in Vertical or Horizontal

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Dell PP12S with BCM94311MCG
Manufacturer: Broadcom
Test mode: 802.11b, Ch. 1 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Juan
Voltage: AC Adapter
Comments: Marker on fundamental signal

SWEEP TABLE: "FCC15.247_1-18G"

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



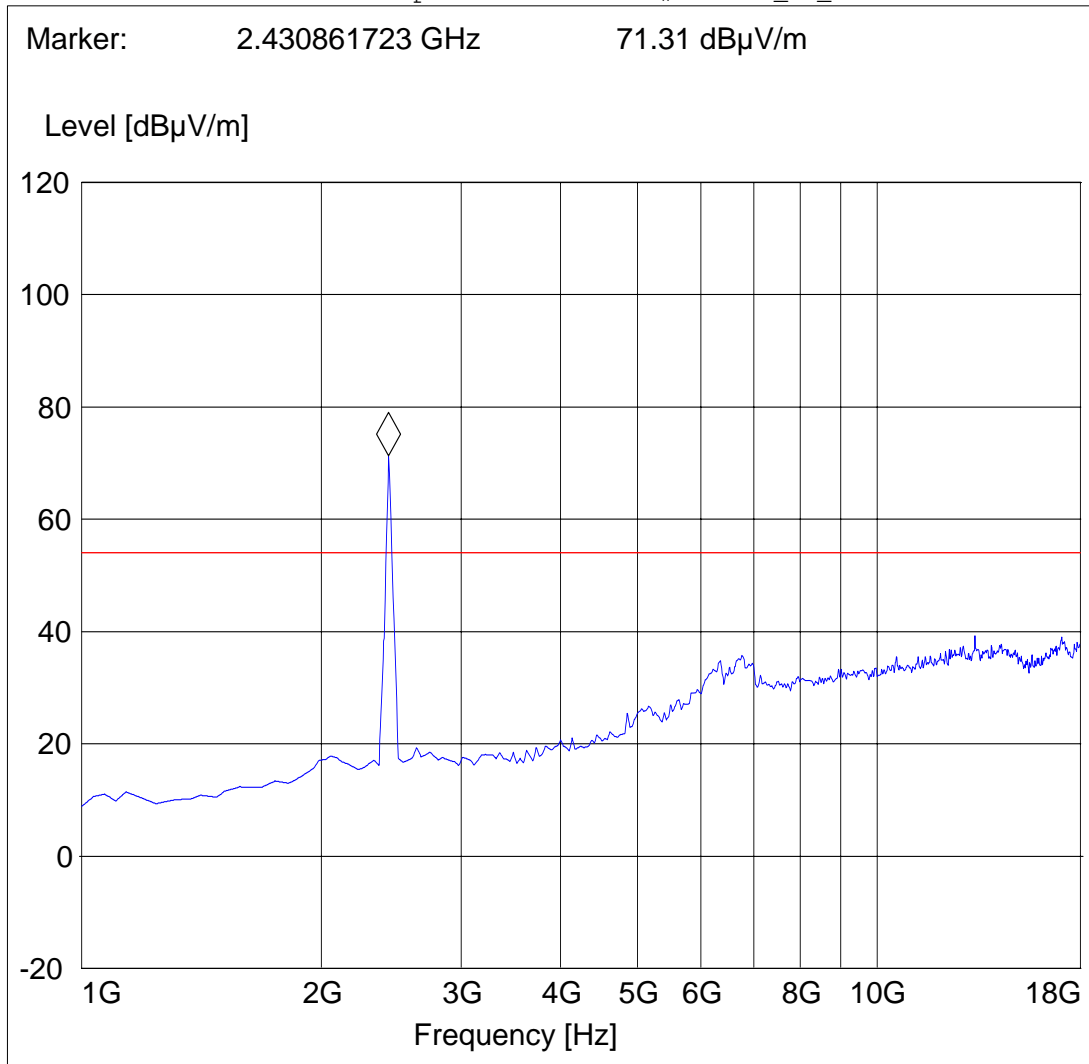
**EMISSION LIMITATIONS - Radiated (Transmitter) §15.247 (d) & RSS-210(A8.5)
Mid Channel (2437MHz): 1GHz – 18GHz**

**Note: No significant harmonic emissions detected either in Vertical or Horizontal
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT / Description: Dell PP12S with BCM94311MCG
Manufacturer: Broadcom
Test mode: 802.11b, Ch. 6 (Main Antenna)
ANT Orientation: V
EUT Orientation: H
Test Engineer: Juan
Voltage: AC Adapter
Comments: Marker on fundamental signal

SWEEP TABLE: "FCC15.247_1-18G"

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



EMISSION LIMITATIONS - Radiated (Transmitter) §15.247 (d) & RSS-210(A8.5)

Highest Channel (2462MHz): 1GHz – 18GHz

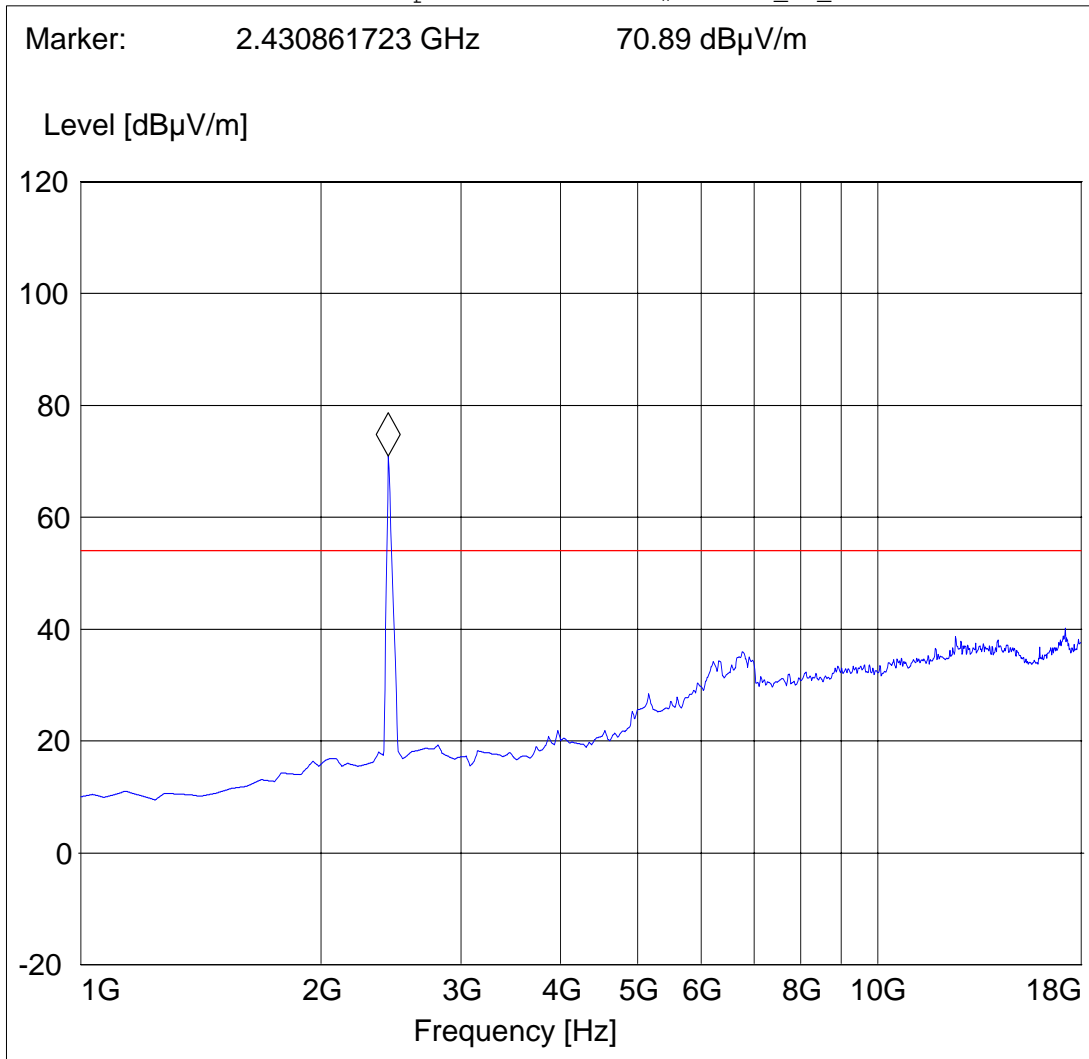
Note: No significant harmonic emissions detected either in Vertical or Horizontal

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Dell PP12S with BCM94311MCG
Manufacturer: Broadcom
Test mode: 802.11b, Ch. 11 (Main Antenna)
ANT Orientation: V
EUT Orientation: H
Test Engineer: Juan
Voltage: AC Adapter
Comments: Marker on fundamental signal

SWEEP TABLE: "FCC15.247_1-18G"

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



**EMISSION LIMITATIONS - Radiated (Transmitter) §15.247 (d) & RSS-210(A8.5)
18GHz – 26.5GHz for low, middle, and high channels**

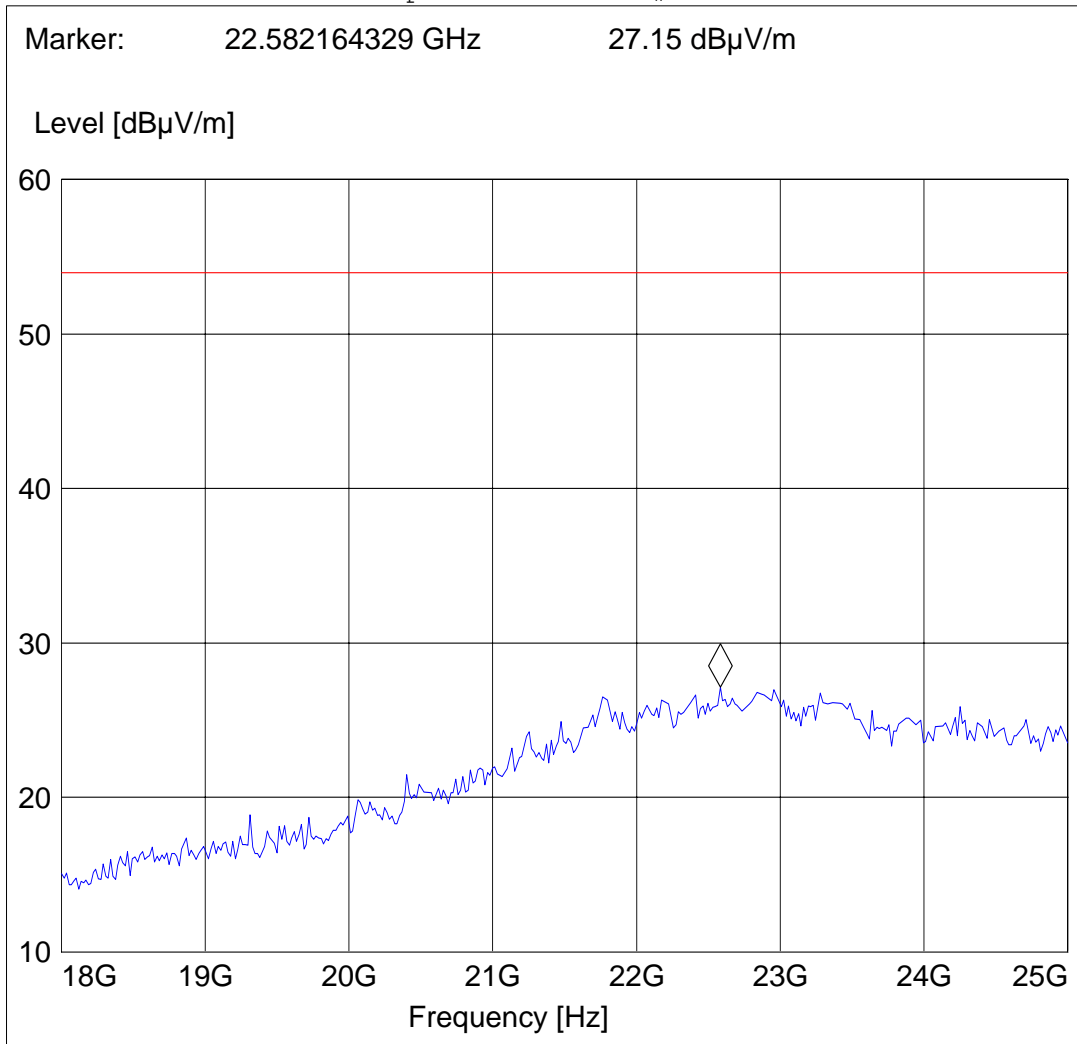
Note: This plot is valid for low, mid, high channels (worst-case plot)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Dell PP12S with BCM94311MCG
 Manufacturer: Broadcom
 Test Mode: 802.11b, Measurement for low, middle, and high channels
 ANT Orientation: V
 EUT Orientation: H
 Test Engineer: Juan
 Power Supply: AC Adapter
 Comments:

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

| Start Frequency | Stop Frequency | Detector | Meas. Time | IF Bandw. | Transducer |
|-----------------|----------------|----------|------------|-----------|--------------|
| 18.0 GHz | 26.5 GHz | MaxPeak | Coupled | 1 MHz | #572 horn AF |



3.2 EMISSION LIMITATIONS - Radiated (Transmitter), 802.11g

§15.247 (d) & RSS-210(A8.5):

| Transmit at Lowest channel Frequency 2412MHz (802.11g) | | | |
|--|-----------------------|-------------------|----------------|
| Frequency (MHz) | Level (dBµV/m) | | |
| | Peak | Quasi-Peak | Average |
| SEE PLOTS | | | |
| | | | |
| | | | |
| | | | |
| Transmit at Middle channel Frequency 2437MHz (802.11g) | | | |
| Frequency (MHz) | Level (dBµV/m) | | |
| | Peak | Quasi-Peak | Average |
| SEE PLOTS | | | |
| | | | |
| | | | |
| | | | |
| Transmit at Highest channel Frequency 2462MHz (802.11g) | | | |
| Frequency (MHz) | Level (dBµV/m) | | |
| | Peak | Quasi-Peak | Average |
| SEE PLOTS | | | |
| | | | |
| | | | |
| | | | |

EMISSION LIMITATIONS - Radiated (Transmitter) §15.247 (d) & RSS-210(A8.5)

Lowest Channel (2412MHz): 30MHz – 1GHz

Antenna Polarization: Vertical

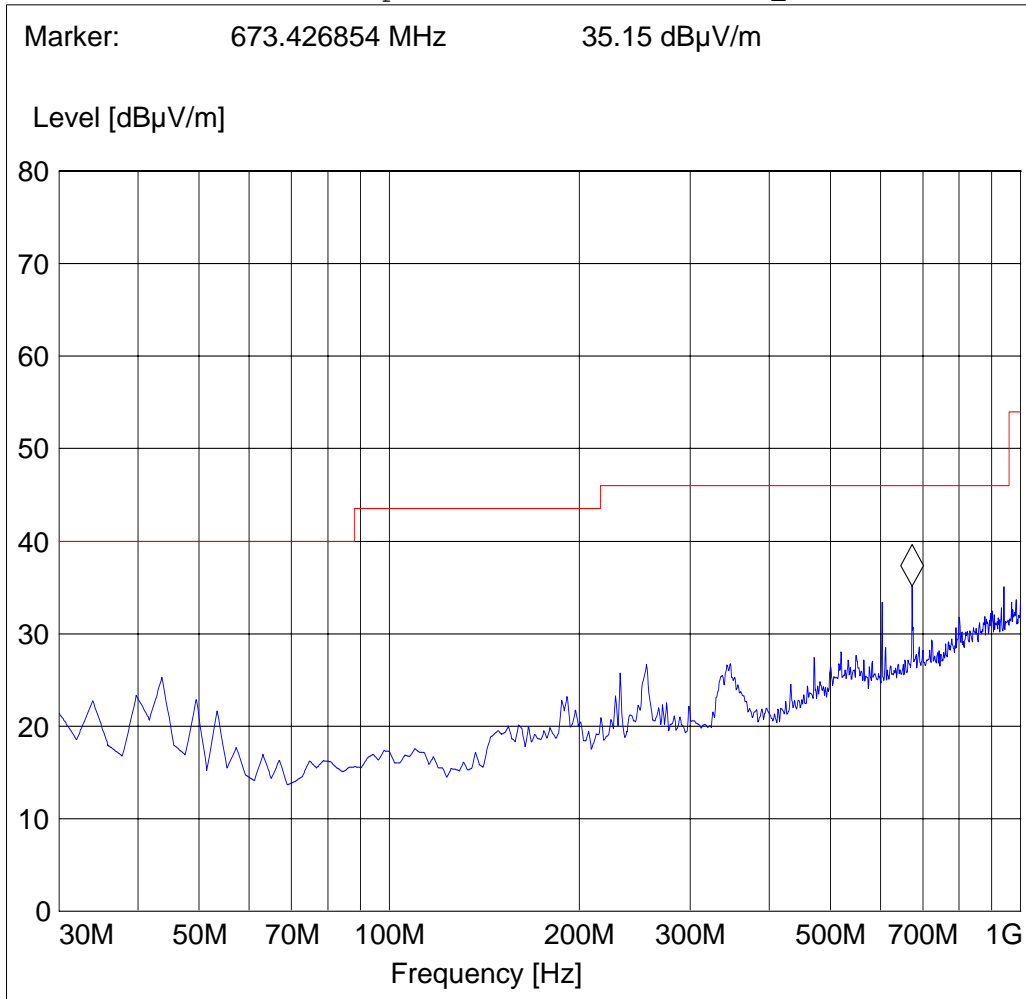
Note: This plot is valid for low, mid, high channels (worst-case plot)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11g, ch 1 (Main Antenna)
ANT Orientation: V
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "FCC15.247_30M-1G_Ver"

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



EMISSION LIMITATIONS - Radiated (Transmitter)

§15.247 (d) & RSS-210(A8.5)

Lowest Channel (2412MHz): 30MHz – 1GHz

Antenna: Horizontal

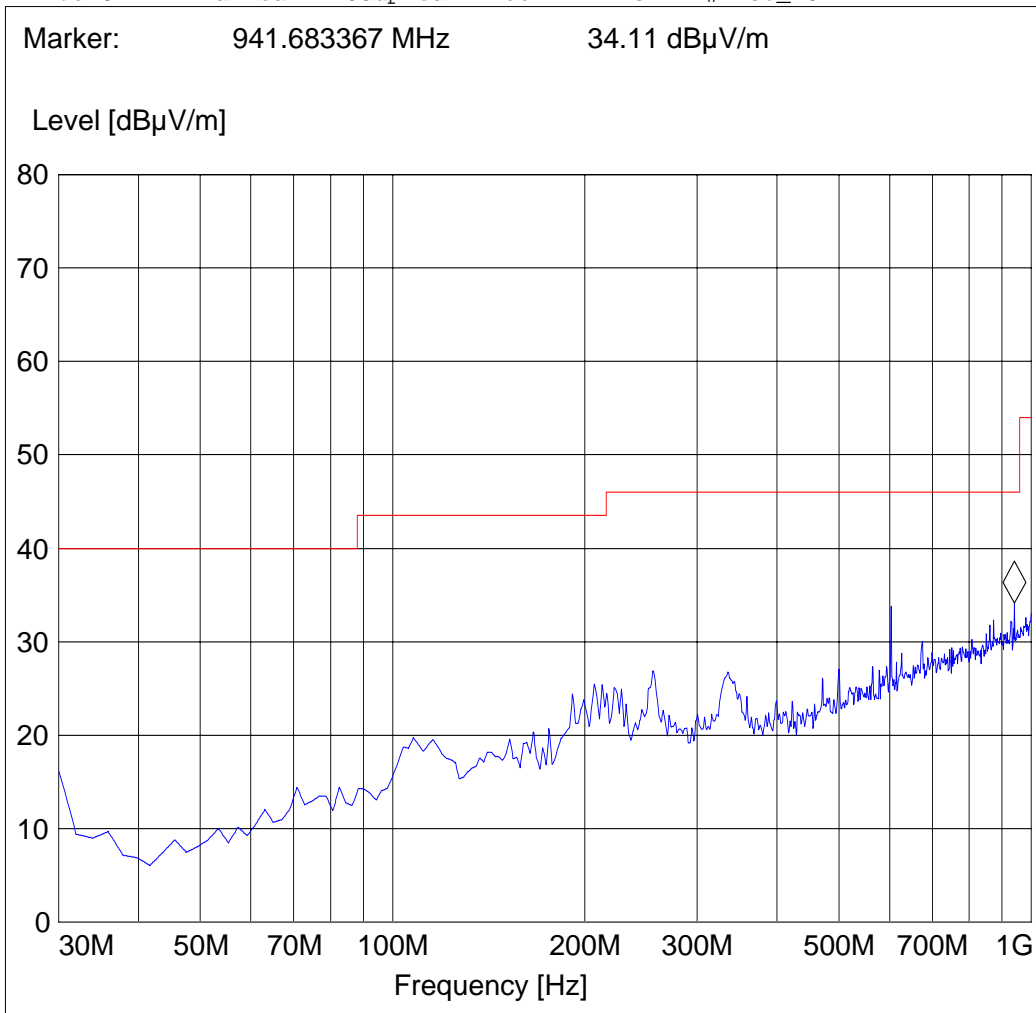
Note: This plot is valid for low, mid, high channels (worst-case plot)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: Dell PP12S with BCM94311MCG
Customer: Broadcom
Test Mode: 802.11g, ch 1 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "FCC15.247_30M-1G_Horz"

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



EMISSION LIMITATIONS - Radiated (Transmitter)

§15.247 (d) & RSS-210(A8.5)

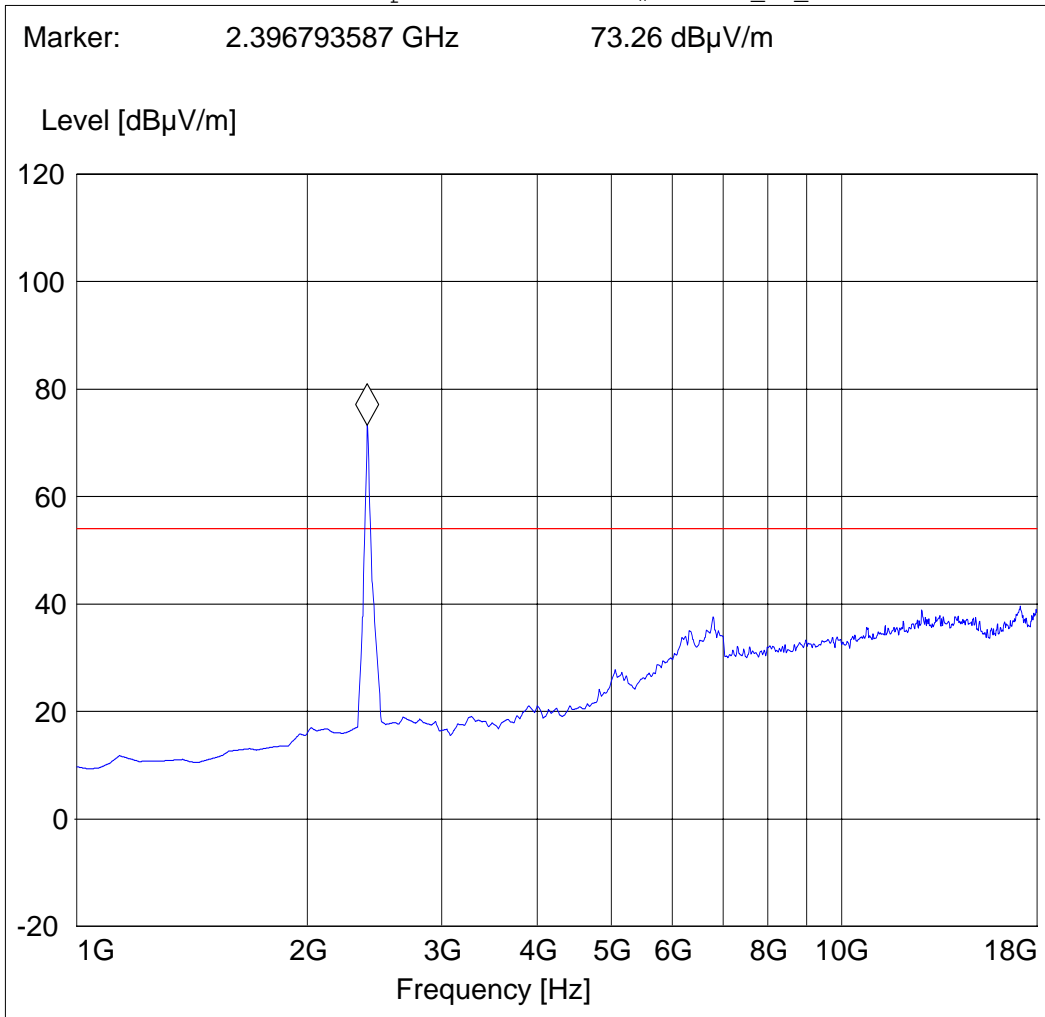
Lowest Channel (2412MHz): 1GHz – 18GHz

**Note: No significant harmonic emissions detected either in Vertical or Horizontal
CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT / Description: Dell PP12S with BCM94311MCG
Manufacturer: Broadcom
Test mode: 802.11g, Ch. 1 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Voltage: AC Adapter
Comments: Marker on fundamental signal

SWEEP TABLE: "FCC15.247_1-18G"

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



EMISSION LIMITATIONS - Radiated (Transmitter)

§15.247 (d) & RSS-210(A8.5)

Mid Channel (2437MHz): 1GHz – 18GHz

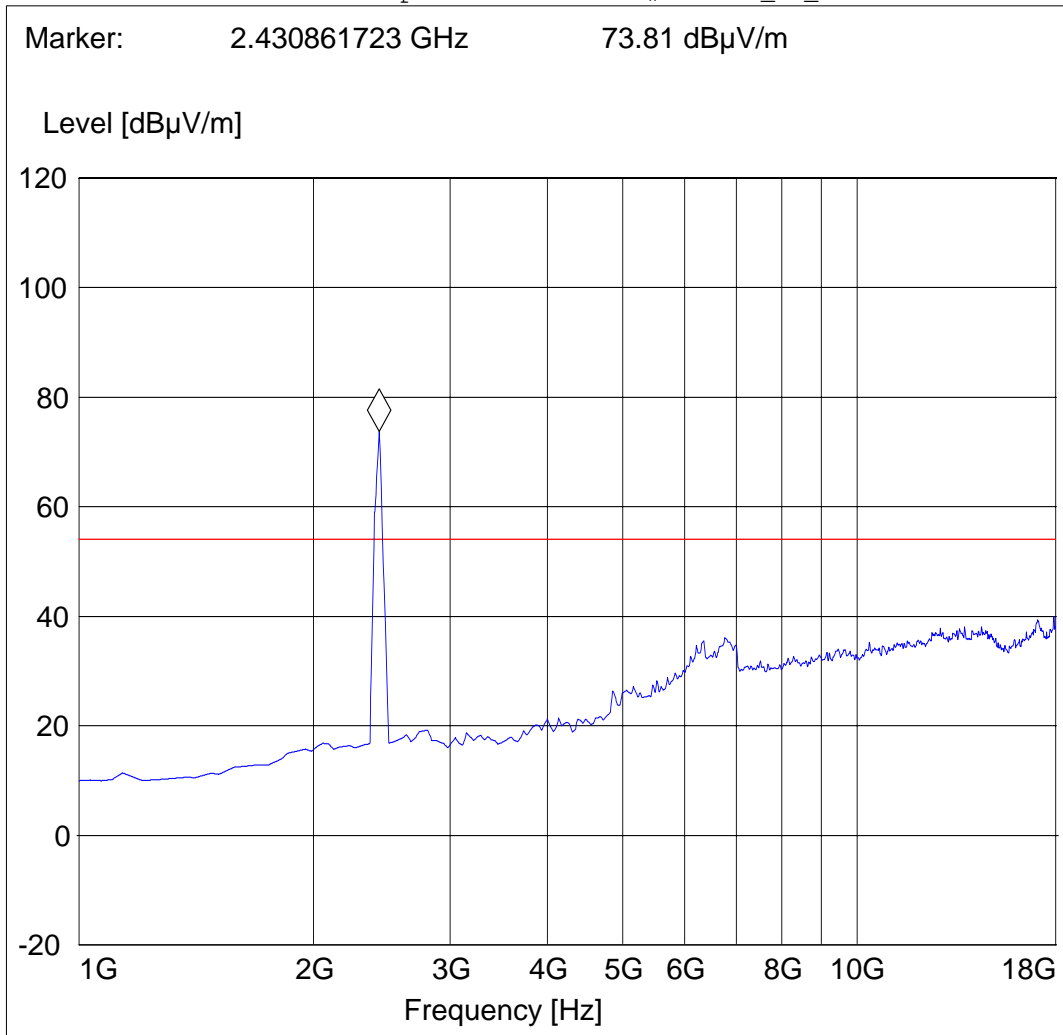
Note: No significant harmonic emissions detected either in Vertical or Horizontal

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Dell PP12S with BCM94311MCG
Manufacturer: Broadcom
Test mode: 802.11g, Ch. 6 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Voltage: AC Adapter
Comments: Marker on fundamental signal

SWEEP TABLE: "FCC15.247_1-18G"

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



EMISSION LIMITATIONS - Radiated (Transmitter)

§15.247 (d) & RSS-210(A8.5)

Highest Channel (2462MHz): 1GHz – 18GHz

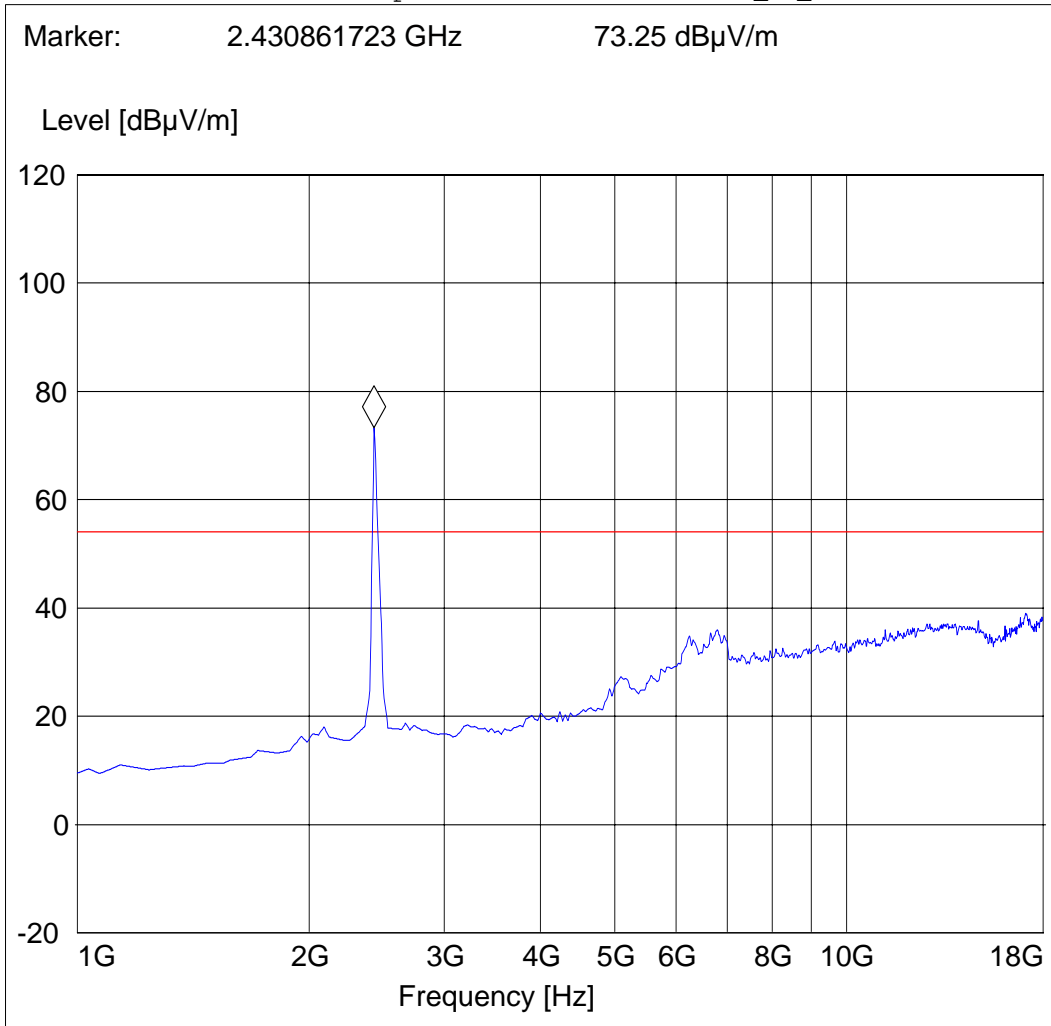
Note: No significant harmonic emissions detected either in Vertical or Horizontal

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Dell PP12S with BCM94311MCG
Manufacturer: Broadcom
Test mode: 802.11g, Ch. 11 (Main Antenna)
ANT Orientation: H
EUT Orientation: H
Test Engineer: Ed
Voltage: AC Adapter
Comments: Marker on fundamental signal

SWEEP TABLE: "FCC15.247_1-18G"

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



EMISSION LIMITATIONS - Radiated (Transmitter)

§15.247 (d) & RSS-210(A8.5)

18GHz – 26.5GHz for low, middle, and high channels

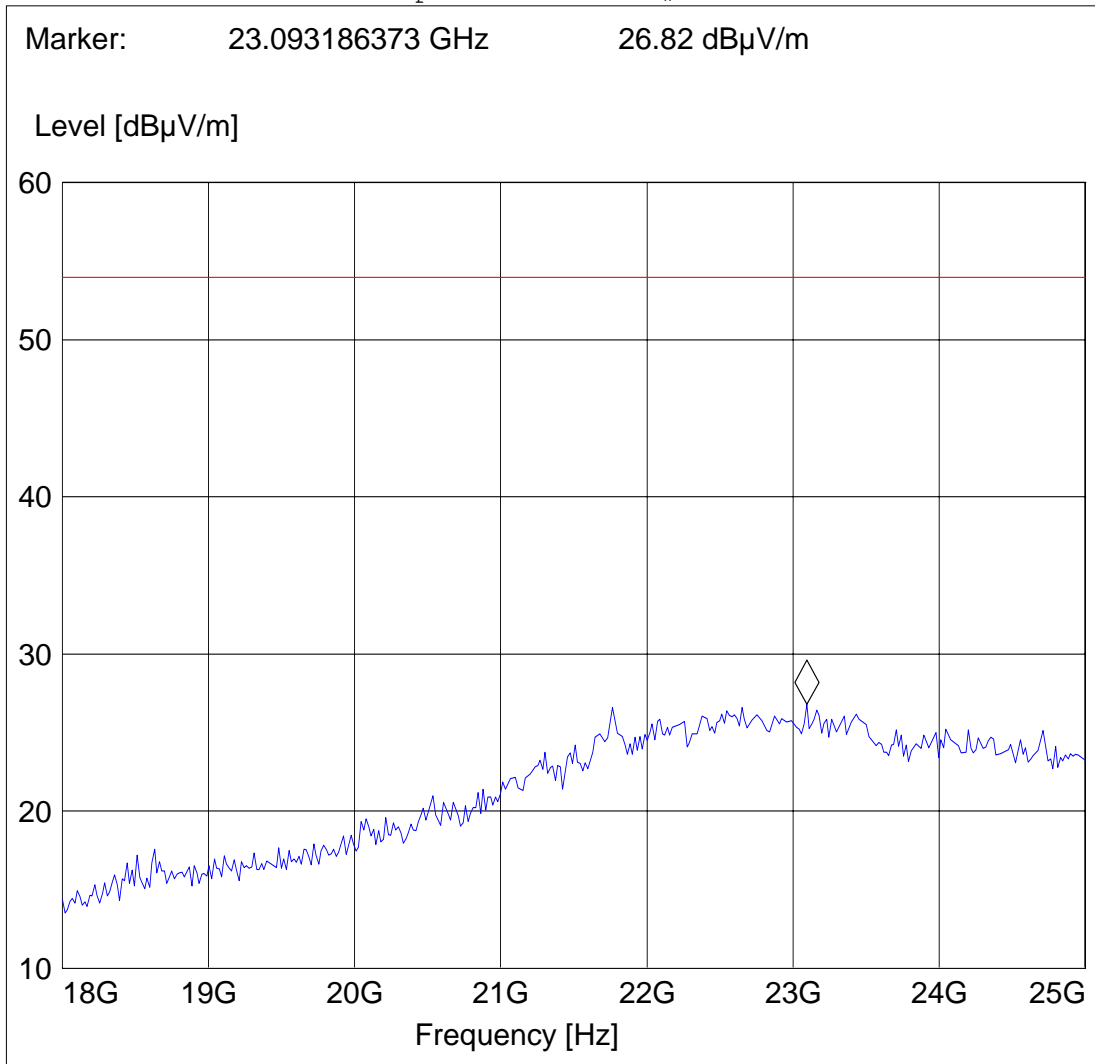
Note: This plot is valid for low, mid, high channels (worst-case plot)

CETECOM Inc., 411 Dixon Landing Road, Milpitas CA 95035, USA

EUT / Description: Dell PP12S with BCM94311MCG
Manufacturer: Broadcom
Test Mode: 802.11g, Measurement for low, middle, and high channels
ANT Orientation: V
EUT Orientation: H
Test Engineer: Juan
Power Supply: AC Adapter
Comments:

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

| Start Frequency | Stop Frequency | Detector | Meas. Time | IF Bandw. | Transducer |
|-----------------|----------------|----------|------------|-----------|--------------|
| 18.0 GHz | 26.5 GHz | MaxPeak | Coupled | 1 MHz | #572 horn AF |



3.3 AC POWER LINE CONDUCTED EMISSIONS § 15.207 & RSS-GEN (7.2.2)

LIMITS

Technical specification: 15.207 (Revised as of August 20, 2002)

§15.107 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

| Frequency of Emission (MHz) | Conducted Limit (dBµV) | |
|-----------------------------|------------------------|-----------|
| | 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 802.11g mode.

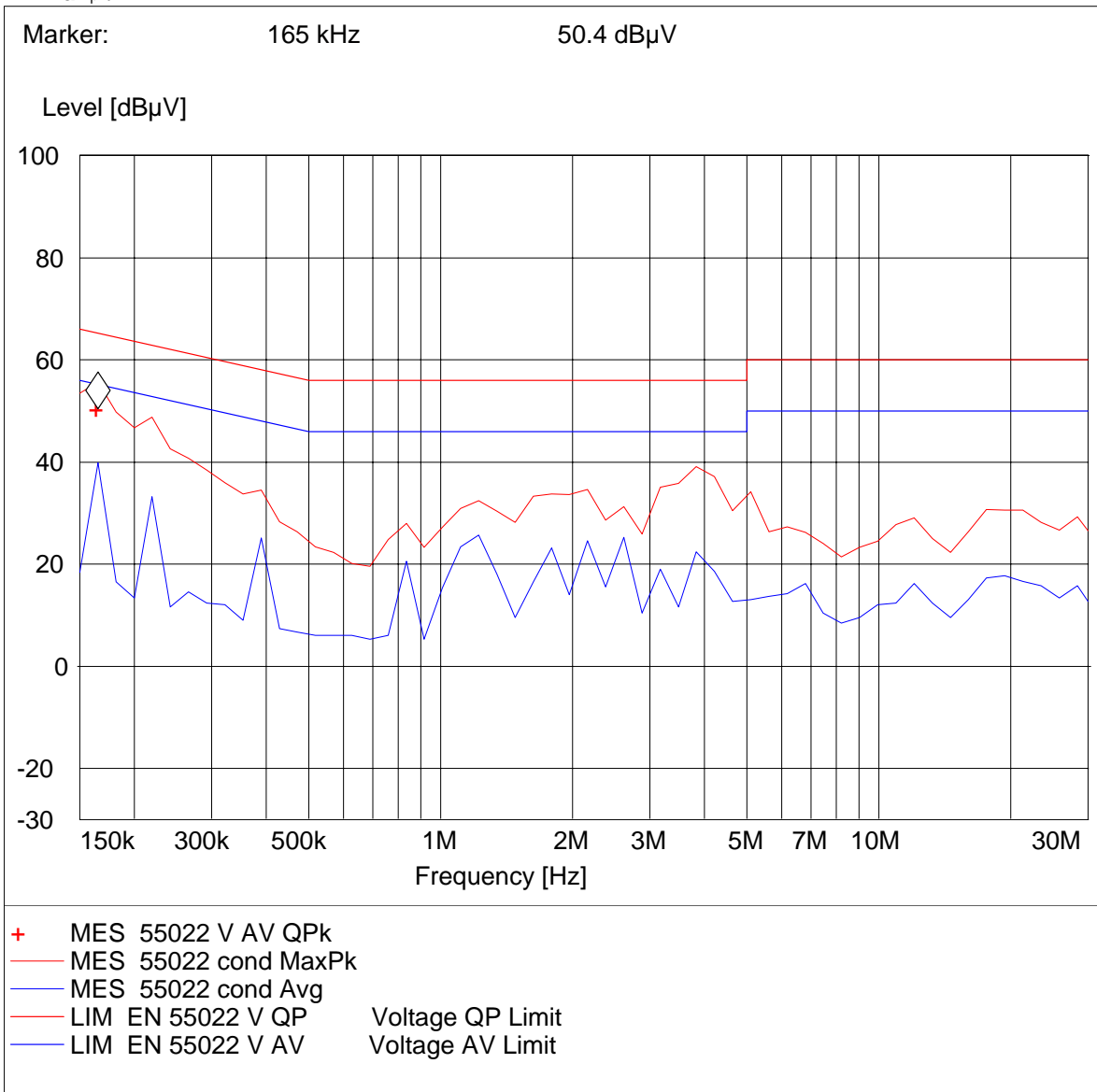
Voltage Mains Test (Line)

CETECOM Inc. Milpitas, USA

EUT: Dell P12S with BCM94311MCG
Manufacturer: Broadcom
Operating Condition: Tx Mode
ANT Orientation:: CONDUCTED
EUT Orientation:: H
Test Engineer: Juan M.
Power Supply: AC Adaptor
Comments: 120V,60Hz (Line)

SWEEP TABLE: "55022 cond"

Short Description: EN 55022 for 150kHz-30MHz
Unit: dBµV

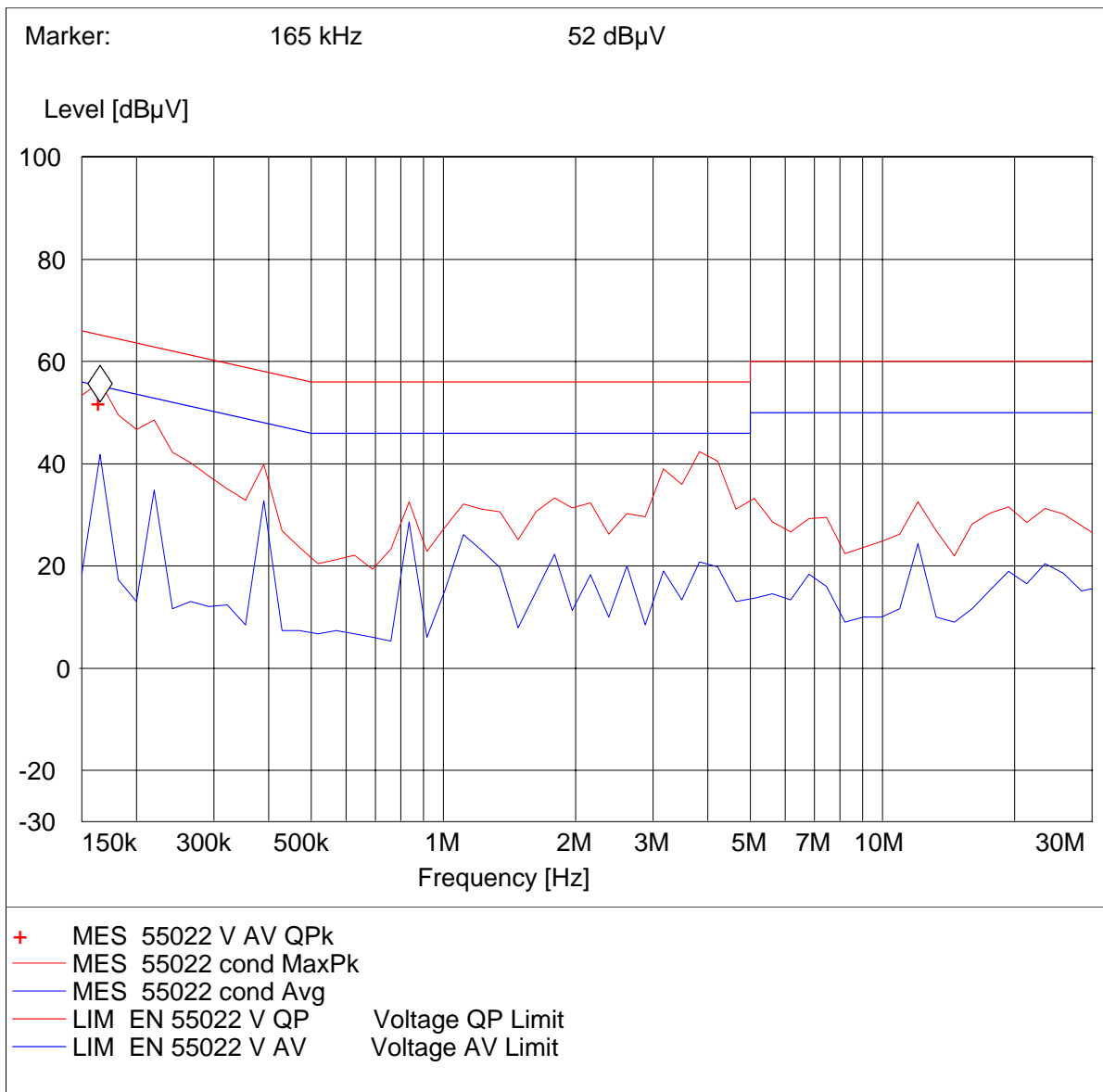


Voltage Mains Test (Neutral)

EUT: Dell PP12S with BCM94311MCG
 Manufacturer: Broadcom
 Operating Condition: Tx Mode
 ANT Orientation:: CONDUCTED
 EUT Orientation:: H
 Test Engineer:: Juan M.
 Power Supply: : AC Adaptor
 Comments: : 120V,60Hz (Neutral)

SWEEP TABLE: "55022 cond"

Short Description: EN 55022 for 150KHz-30MHz
 Unit: dBµV



4 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

| No | Instrument/Ancillary | Type | Manufacturer | Serial No. | Cal Due | Interval |
|-----------|-----------------------------|-------------|---------------------|-------------------|----------------|-----------------|
| 01 | Spectrum Analyzer | ESIB 40 | Rohde & Schwarz | 100107 | May 2008 | 1 year |
| 05 | Biconilog Antenna | 3141 | EMCO | 0005-1186 | June 2008 | 1 year |
| 06 | Horn Antenna (1-18GHz) | SAS-200/571 | AH Systems | 325 | June 2008 | 1 year |
| 07 | Horn Antenna (18-26.5GHz) | 3160-09 | EMCO | 1240 | June 2008 | 1 year |
| 10 | High Pass Filter | 5HC2700 | Trilithic Inc. | 9926013 | n/a | n/a |
| 11 | High Pass Filter | 4HC1600 | Trilithic Inc. | 9922307 | n/a | n/a |
| 16 | LISN | ESH3-Z5 | Rohde & Schwarz | 836679/003 | May 2008 | 1 year |

5 BLOCK DIAGRAMS
Radiated Testing

ANECHOIC CHAMBER

