FCC Test Report

FCC Part 15.247 for DSSS systems

For

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 #: EMC_BROAD_033_07002_FCC15_247_b_g_BRCM1020
DATE: 2007-7-23

ilac-MRA ACCREDITED Certificate # 2135.01

Bluetooth

Bluetooth Qualification Test Facility (BQTF)

CTIA Authorized Test Lab
LAB CODE 20020328-00

FCC listed: A2LA accredited

IC recognized # 3925

***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

1 Assessment

The following is in compliance with the applicable criteria specified in FCC rules Part 15.247 of the Code of Federal Regulations.

Company	Description	Model #
Broadcom Coporation	**Wireless LAN PCI-E Mini Card**	**BCM94311MCG**

Technical responsibility for area of testing:

		Lothar Schmidt	Lothar Schmidt I am approving this document
2007-7-23	**EMC & Radio**	**(Director Regulatory and Antenna Services)**	
Date	**Section**	**Name**	**Signature**

This report is prepared by:

			I am the author of this document
		Peter Mu	
2007-7-23	**EMC & Radio**	**(EMC Project Engineer)**	
Date	**Section**	**Name**	**Signature**

2 Administrative Data

2.1 Identification of the Testing Laboratory

Company Name:	**CETECOM Inc.**
Department:	**EMC**
Address:	**411 Dixon Landing Road** **Milpitas, CA 95035** **U.S.A.**
Telephone:	**+1 (408) 586 6200**
Fax:	**+1 (408) 586 6299**
Responsible Test Lab Manager:	**Lothar Schmidt**

2.2 Identification of the Client

Applicant's Name:	**Broadcom Corporation**
Address Line 1:	**190 Mathilda Place**
Address Line 2:	
City/ Zip Code	**Sunnyvale, California 94086**
Country:	**U.S.A**
Contact Person:	**Daniel Lawless**
Phone No.:	**408 922 5870**
Fax:	**408 543 3399**
e-mail:	**dlawless@broadcom.com**

2.3 Identification of the Manufacturer

Same as above applicant.

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Product Type	**Mini PCI Card**
Marketing Name:	**802.11g Wireless LAN PCI-E Mini Card**
Model No:	**BCM94311MCG**
Operating Frequency:	**2400MHz – 2483.5MHz**
Number of Channels:	**11**
Date of Test:	**2007-6-27 to 2007-7-18**
Type(s) of Modulation:	**CCK, OFDM**
Antenna Type:	**Foxconn WDAN-DWDS1-001-DF**
Output Power[1]:	**22.35 dBm (0.172W)** **EIRP WLAN 802.11b Chain A 2462MHz** **25.77 dBm (0.378W)** **EIRP WLAN 802.11g Chain A 2462MHz**

3.2 Specification of the Supporting Portable Platform

Product Type	**Notebook PC**
Marketing Name:	**Dell XPS M1730**
Model No:	**Dell PP06XA**

4 Subject Of Investigation

All testing was performed on the product referred to in Section 3 as EUT. EUT contains Broadcom BCM94311MCG WLAN module, FCC ID: QDS-BRCM1020 that supports the following mode and frequency bands:

2400-2483.5MHz: 802.11b, 802.11g

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT operating under 802.11b/g mode in the 2400-2483.5MHz range as specified by requirements listed in FCC rules Part 15.247 of Title 47 of the Code of Federal Regulations. The maximization of portable equipment is conducted in accordance with ANSI C63.4

5 Measurements

5.1 MAXIMUM PEAK OUTPUT POWER (RADIATED) § 15.247 (b) (1)

EIRP:

802.11b

TEST CONDITIONS			MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)			2412	2437	2462
Chain A	T_{nom}(23)° C	V_{nom}	13.38	20.7	22.35
Chain B	T_{nom}(23)° C	V_{nom}	17.64	20.19	19.67
Measurement uncertainty			±0.5dBm		

802.11g

TEST CONDITIONS			MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)			2412	2437	2462
Chain A	T_{nom}(23)° C	V_{nom}	19.81	25.49	25.77
Chain B	T_{nom}(23)° C	V_{nom}	23.2	25.31	22.66
Measurement uncertainty			±0.5dBm		

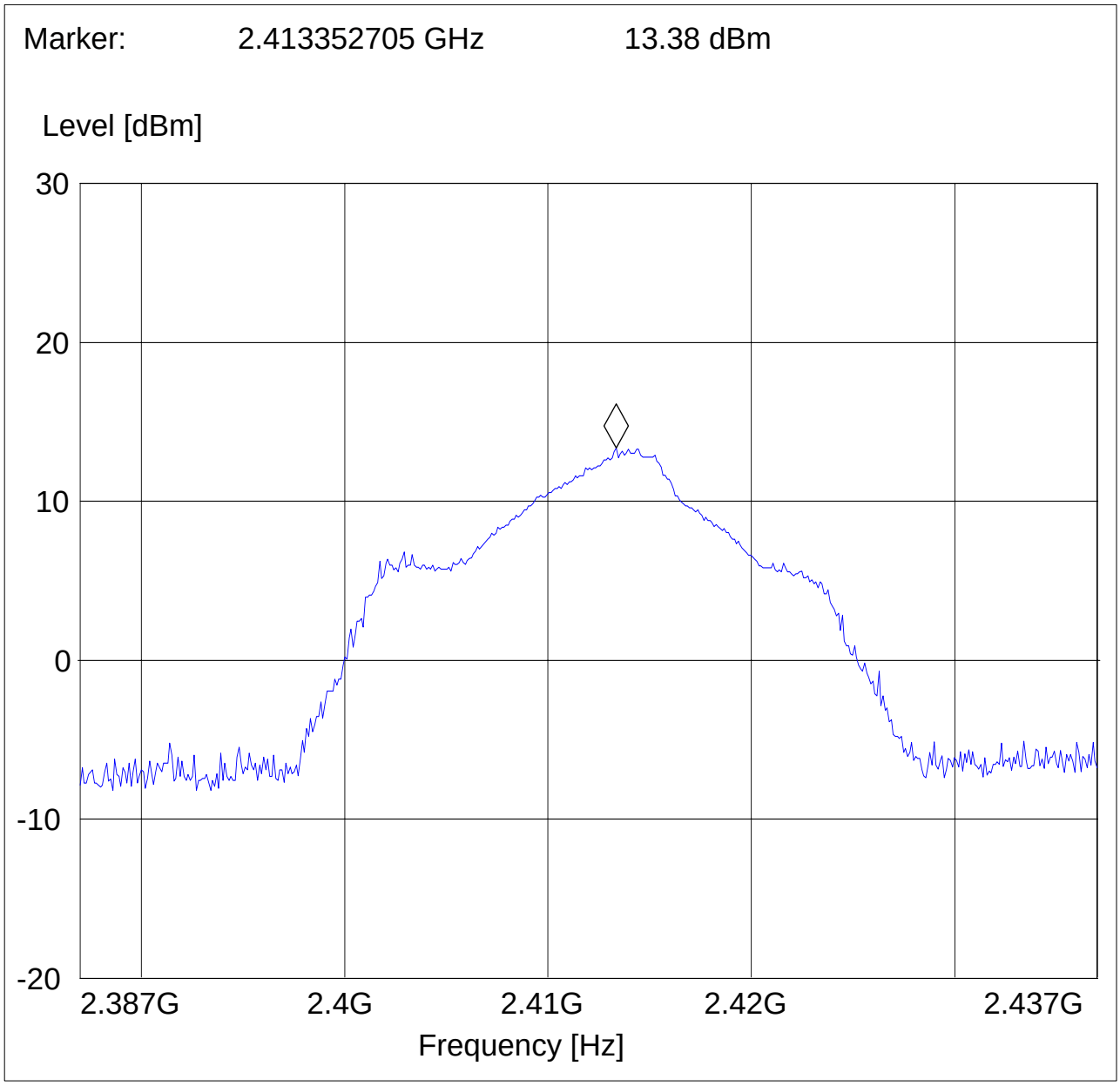
EIRP: 2412MHz (802.11b) Chain A

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11b, ch 1, chain a
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 Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.4 GHz	2.4 GHz	MaxPeak MaxPeak	Coupled	10 MHz	DUMMY-DBM

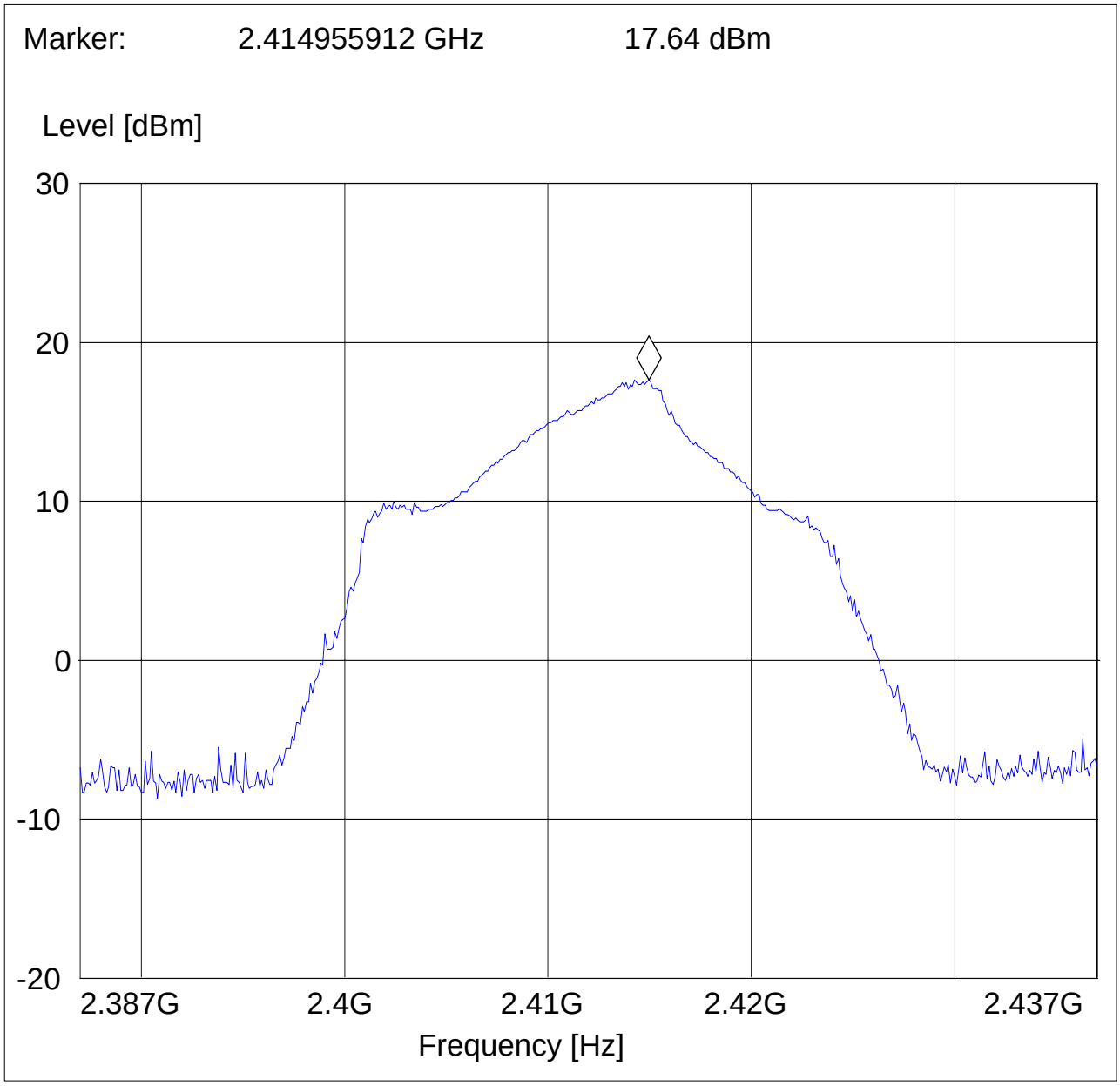


EIRP: 2412MHz (802.11b) Chain B

```
EUT:              Dell Siberia
Customer:         Broadcom
Test Mode:        802.11b, ch 1, chain b
ANT Orientation:  V
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.     IF        Transducer
  Frequency  Frequency             Time      Bandw.
  2.4 GHz    2.4 GHz    MaxPeak   Coupled   10 MHz    DUMMY-DBM
                        MaxPeak
```



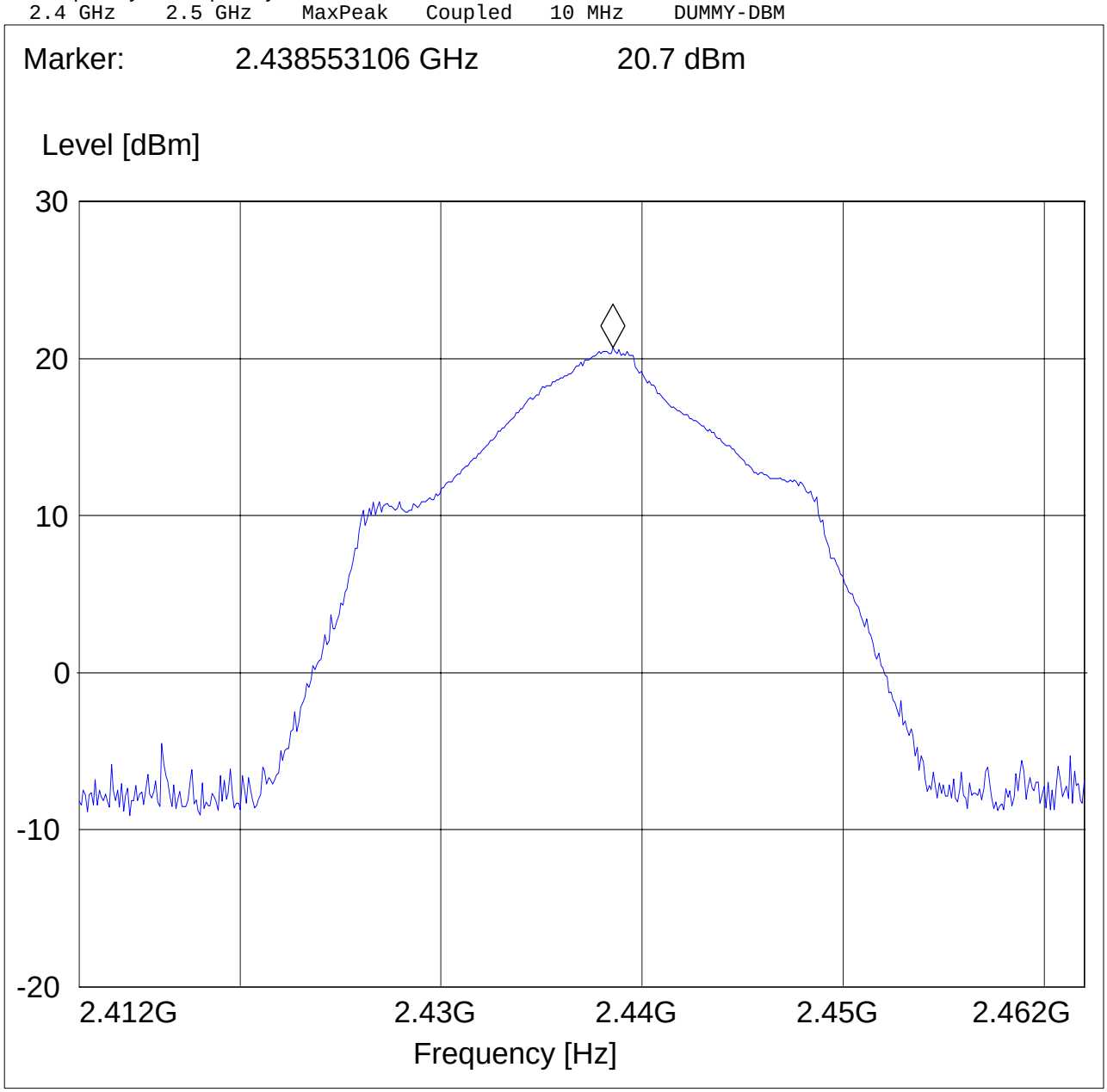
EIRP: 2437MHz (802.11b) Chain A

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11b, ch 6, chain a
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 Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.4 GHz	2.5 GHz	MaxPeak	Coupled	10 MHz	DUMMY-DBM



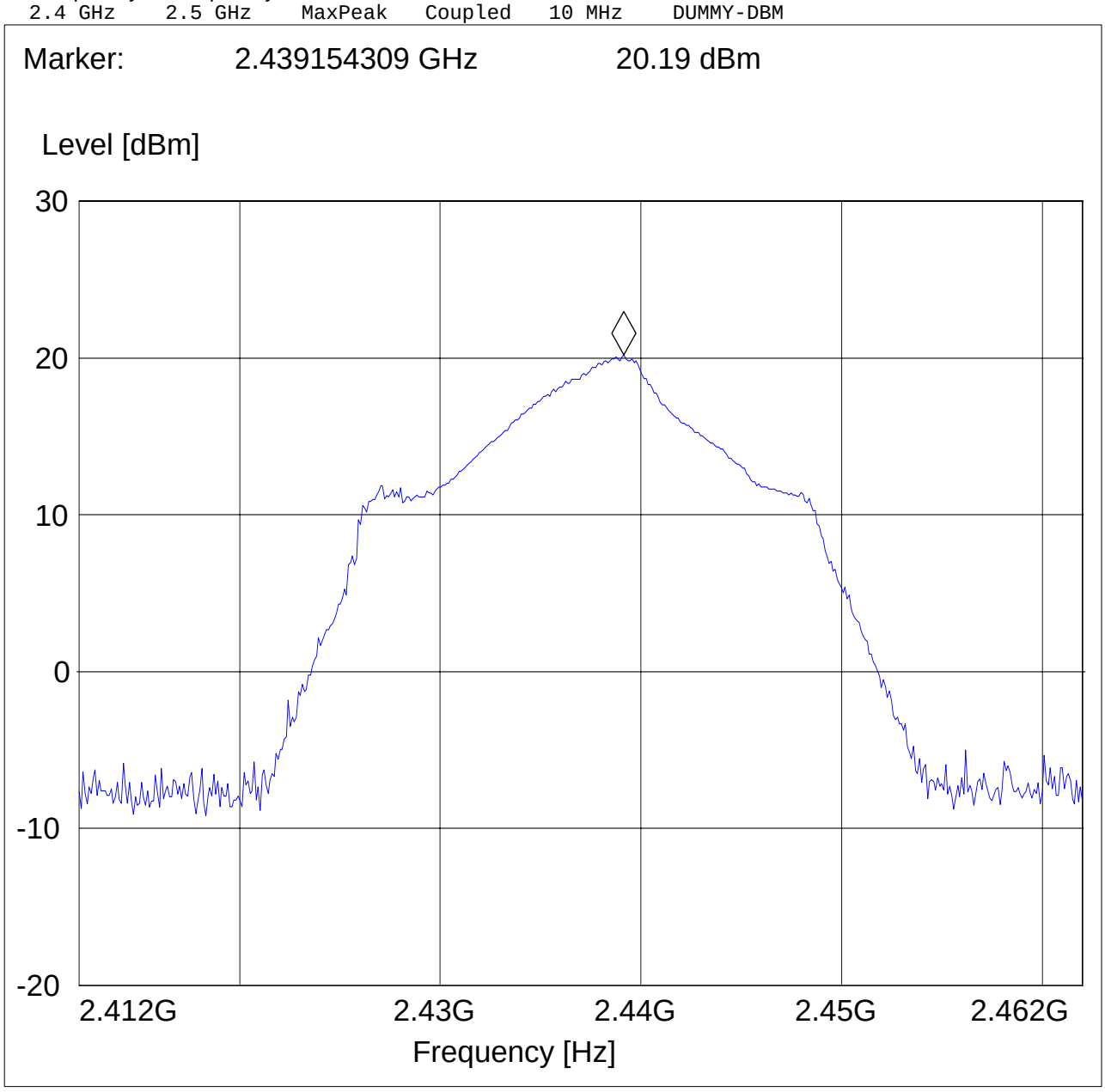
EIRP: 2437MHz (802.11b) Chain B

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11b, ch 6, chain b
ANT Orientation: V
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "EIRP RLAN CH6"

Short Description: EIRP RLAN channel-2437 MHz

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.4 GHz	2.5 GHz	MaxPeak	Coupled	10 MHz	DUMMY-DBM



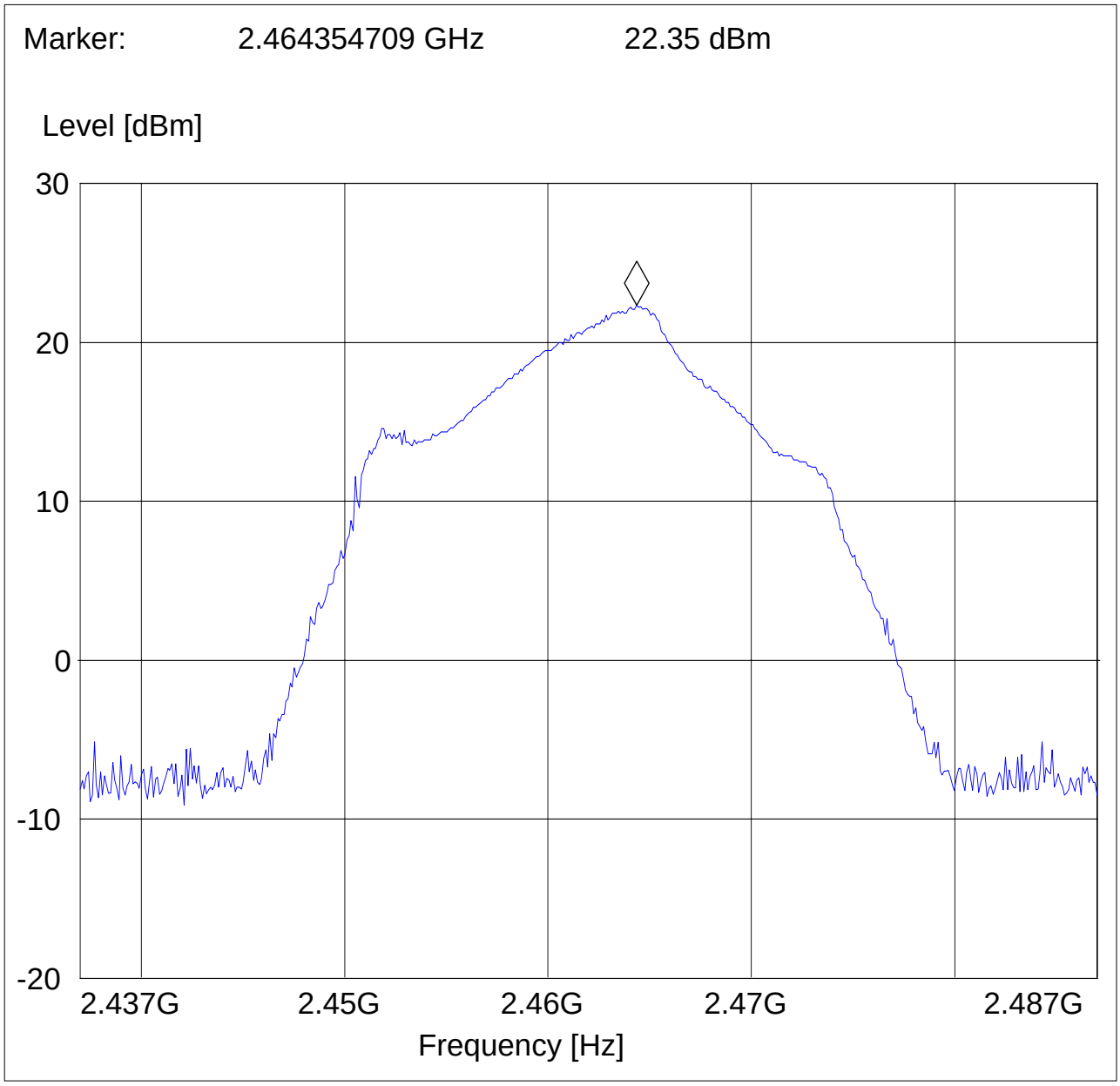
EIRP: 2462MHz (802.11b) Chain A

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11b, ch 11, chain a
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 Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.4 GHz	2.5 GHz	MaxPeak MaxPeak	Coupled	10 MHz	DUMMY-DBM



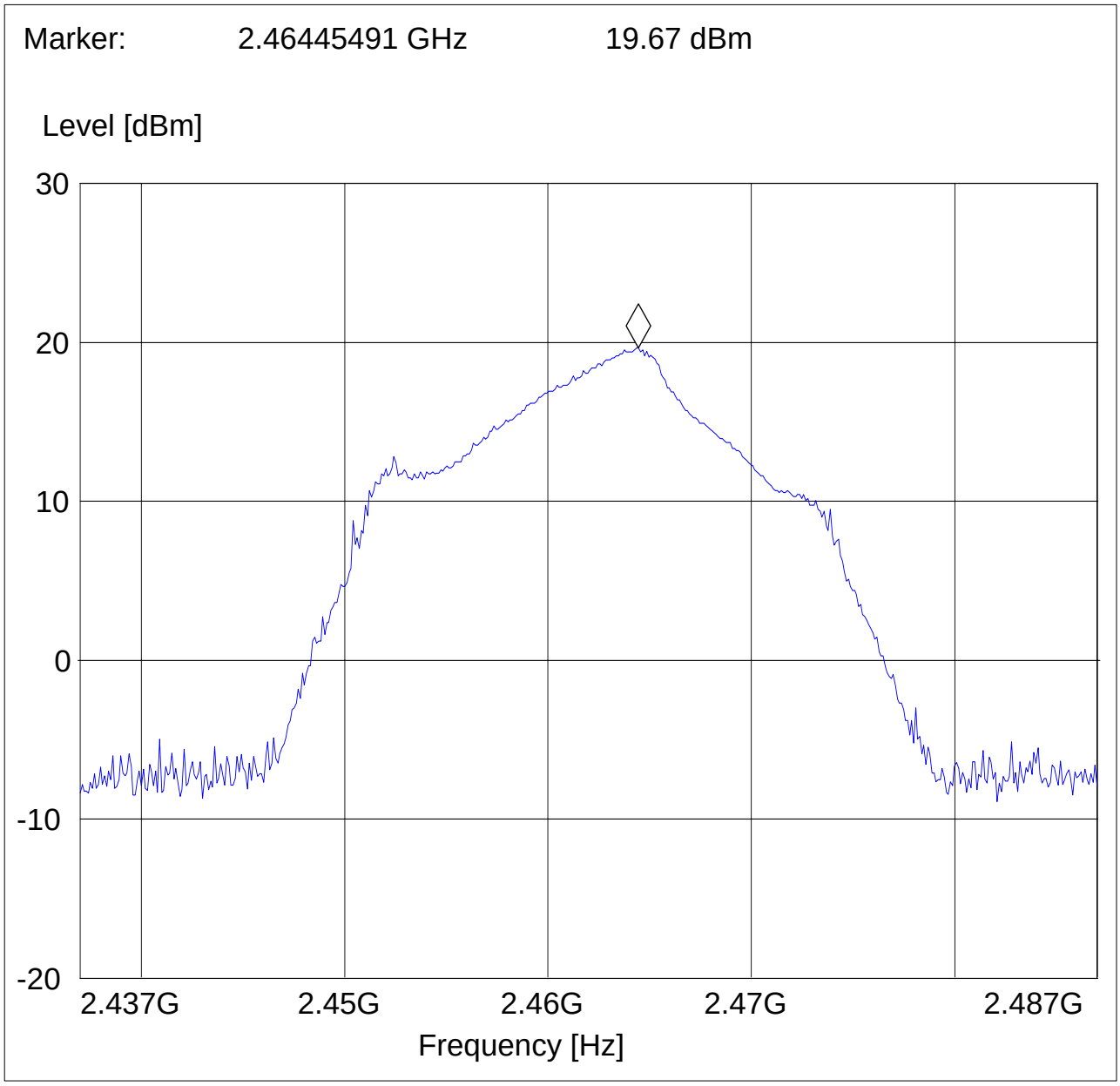
EIRP: 2462MHz (802.11b) Chain B

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11b, ch 11, chain b
ANT Orientation: V
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "EIRP RLAN CH11"

Short Description: EIRP RLAN channel-2462 MHz

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.4 GHz	2.5 GHz	MaxPeak MaxPeak	Coupled	10 MHz	DUMMY-DBM



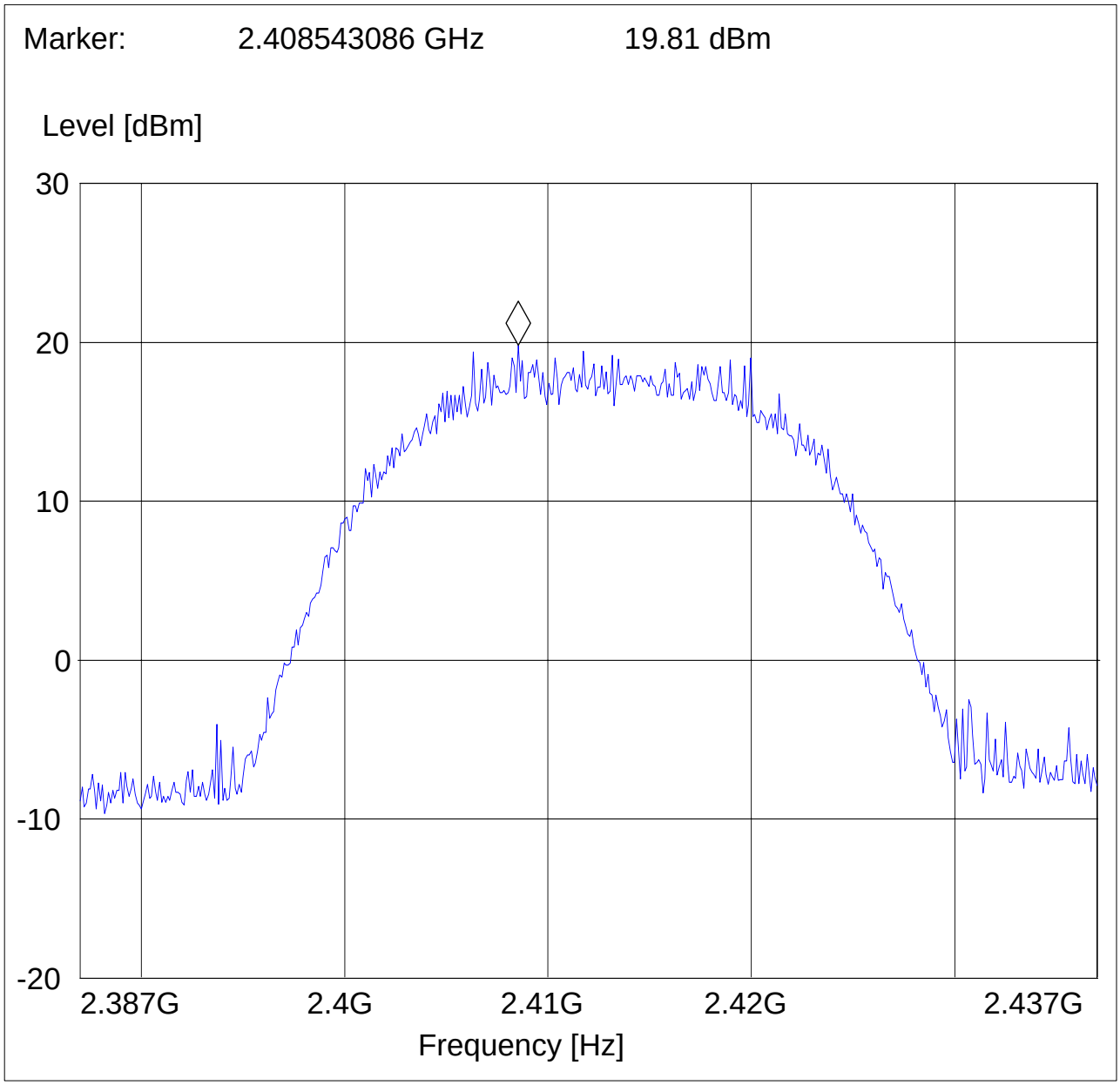
EIRP: 2412MHz (802.11g) Chain A

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11g, ch 1, chain a
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 Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.4 GHz	2.4 GHz	MaxPeak MaxPeak	Coupled	10 MHz	DUMMY-DBM



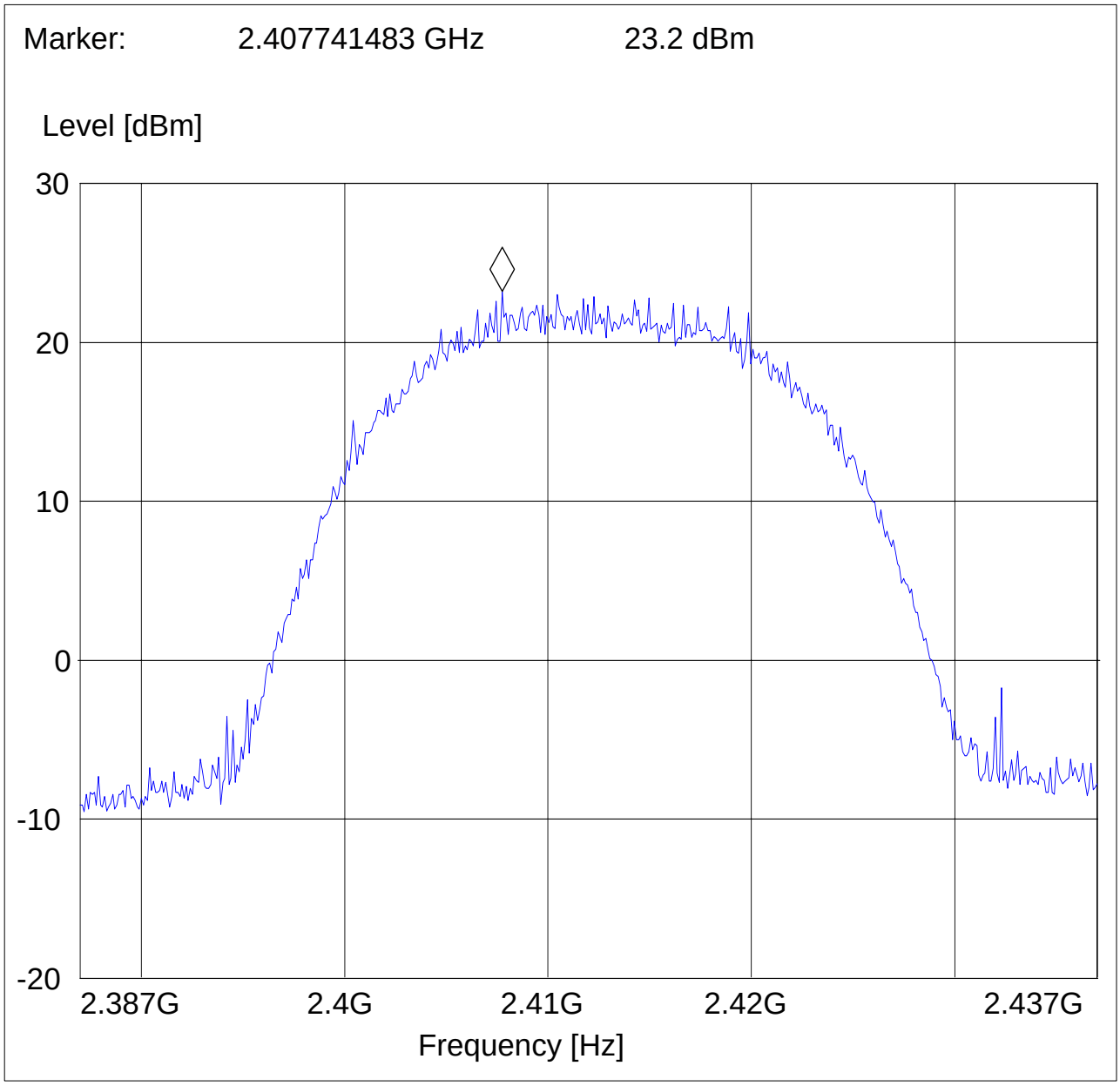
EIRP: 2412MHz (802.11g) Chain B

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11g, ch 1, chain b
ANT Orientation: V
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "EIRP RLAN CH1"

Short Description: EIRP RLAN channel-2412 MHz

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.4 GHz	2.4 GHz	MaxPeak MaxPeak	Coupled	10 MHz	DUMMY-DBM



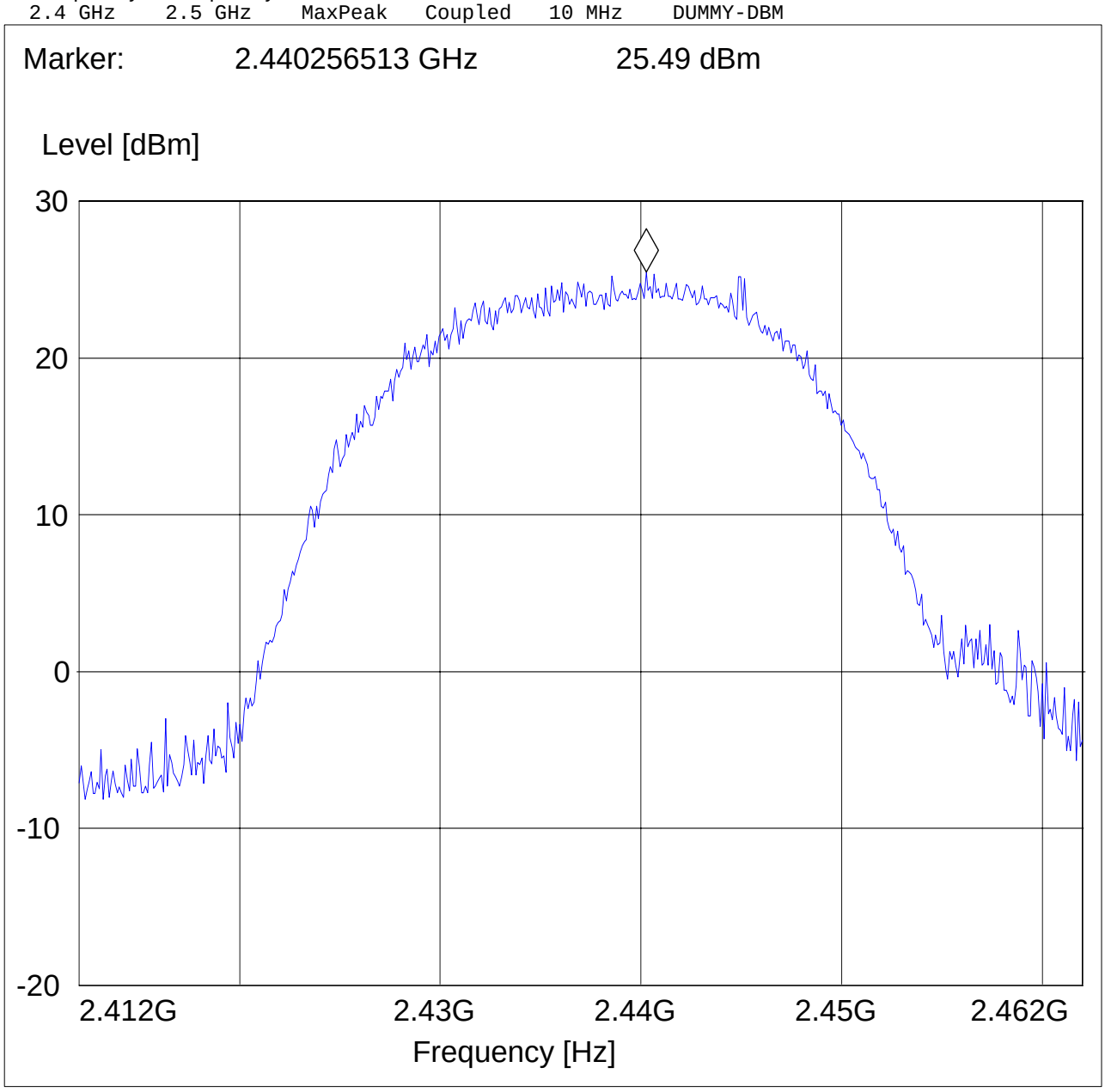
EIRP: 2437MHz (802.11g) Chain A

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11g, ch 6, chain a
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 Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.4 GHz	2.5 GHz	MaxPeak	Coupled	10 MHz	DUMMY-DBM



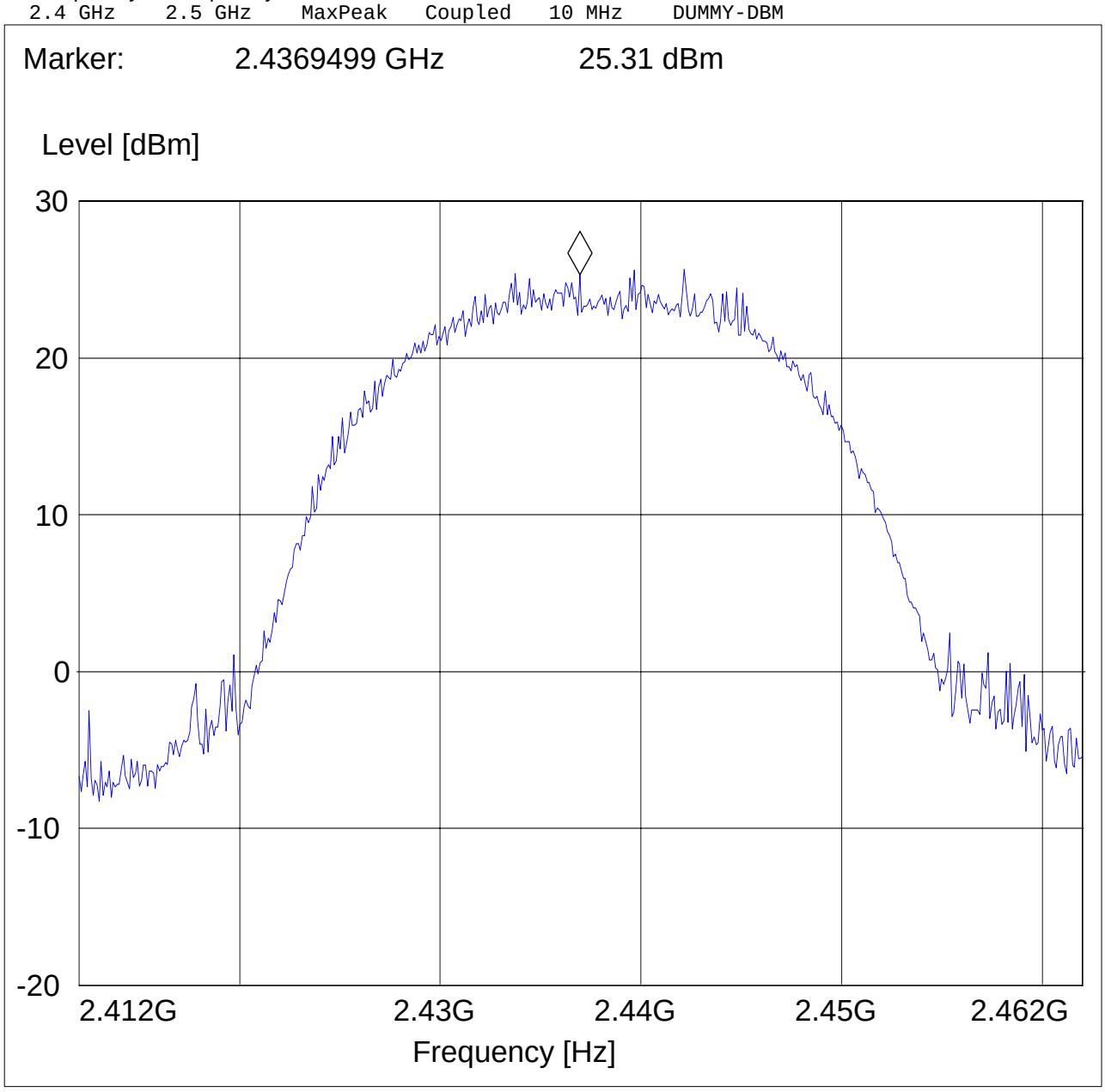
EIRP: 2437MHz (802.11g) Chain B

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11g, ch 6, chain b
ANT Orientation: V
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "EIRP RLAN CH6"

Short Description: EIRP RLAN channel-2437 MHz

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.4 GHz	2.5 GHz	MaxPeak	Coupled	10 MHz	DUMMY-DBM



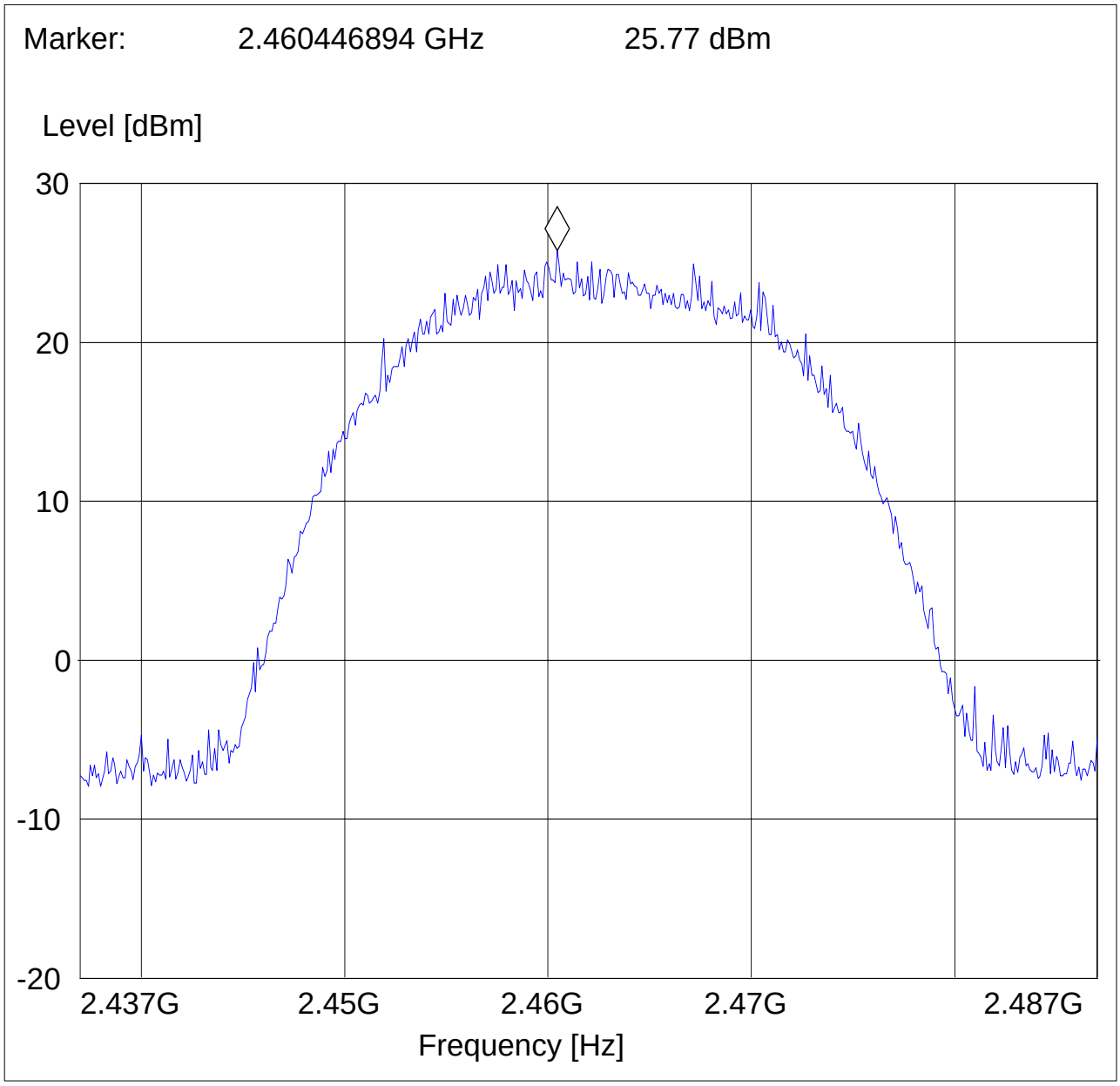
EIRP: 2462MHz (802.11g) Chain A

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11g, ch 11, chain a
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 Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.4 GHz	2.5 GHz	MaxPeak MaxPeak	Coupled	10 MHz	DUMMY-DBM



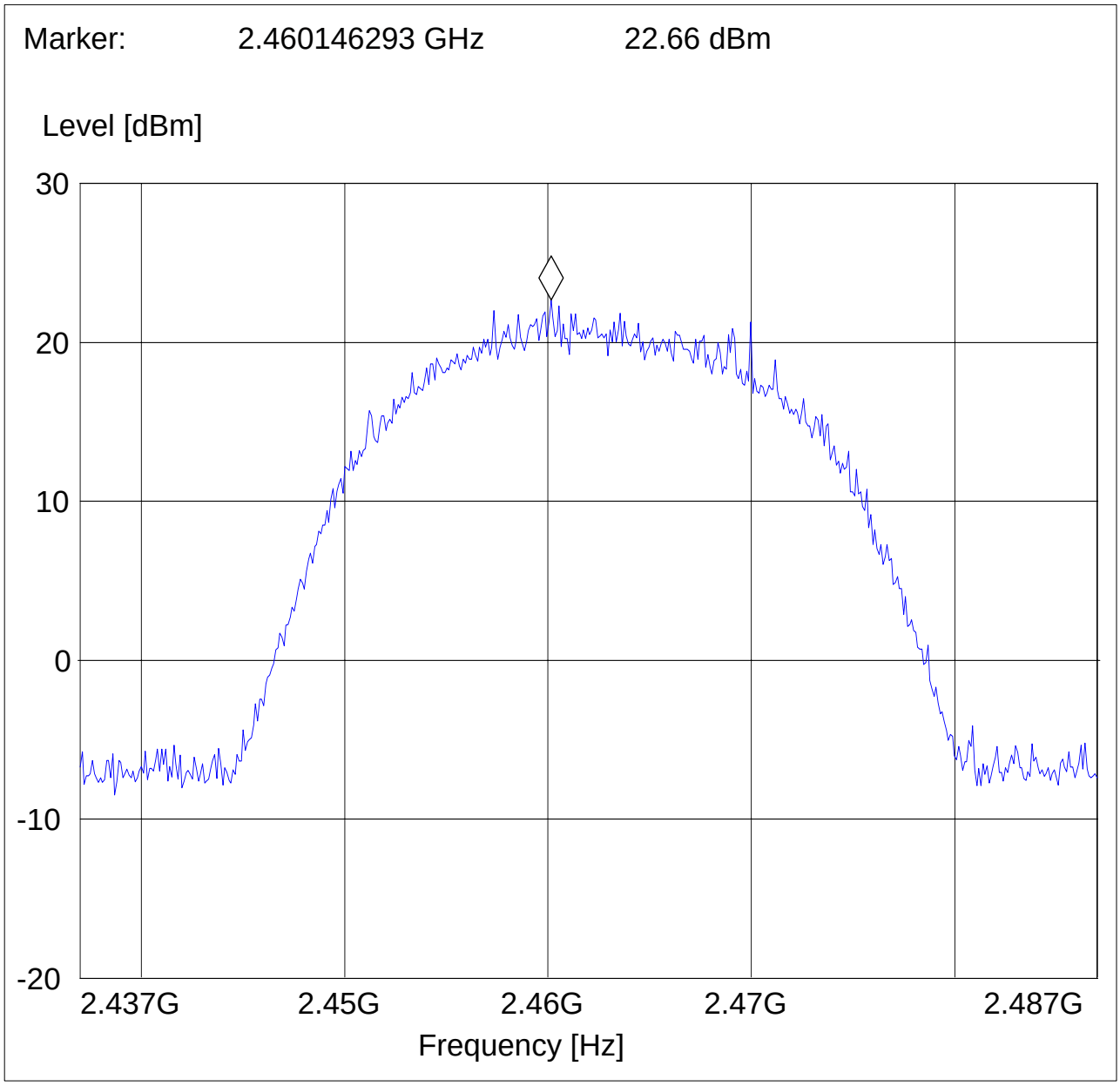
EIRP: 2462MHz (802.11g) Chain B

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11g, ch 11, chain b
ANT Orientation: V
EUT Orientation: H
Test Engineer: Ed
Power Supply: AC Adapter
Comments:

SWEEP TABLE: "EIRP RLAN CH11"

Short Description: EIRP RLAN channel-2462 MHz

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.4 GHz	2.5 GHz	MaxPeak MaxPeak	Coupled	10 MHz	DUMMY-DBM



5.2 RESTRICTED BAND EDGE COMPLIANCE RADIATED §15.247/15.205

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
[1]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	([2])
13.36 - 13.41			

***PEAK LIMIT= 74dBuV/m**
***AVG. LIMIT= 54dBuV/m**

Notes:

1. Radiated emissions are maximized by rotating the EUT 360° at 0.5 meter height increments between 1 and 4 meters.
2. Measurements were performed with the EUT in X, Y and Z orientations with the measurement antenna in both horizontal and vertical polarity. The plots below show the results of the worst case orientation and polarity.

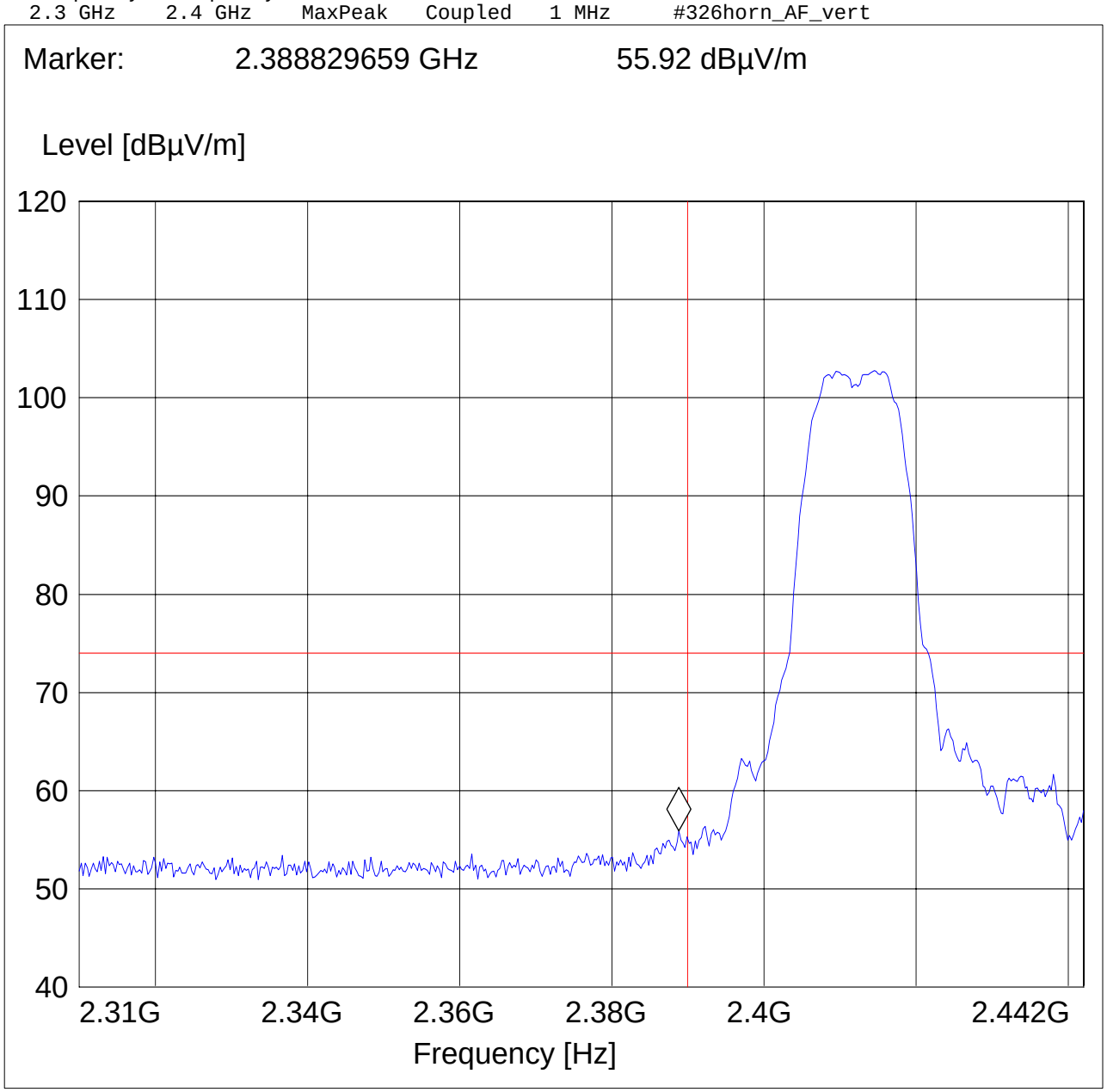
5.2.2 Results Lower Restricted Band 2310 MHz to 2390 MHz

802.11b (2412MHz) PEAK Chain A

```
EUT:              Dell Siberia
Customer:         Broadcom
Test Mode:        802.11b, ch 1, chain a
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

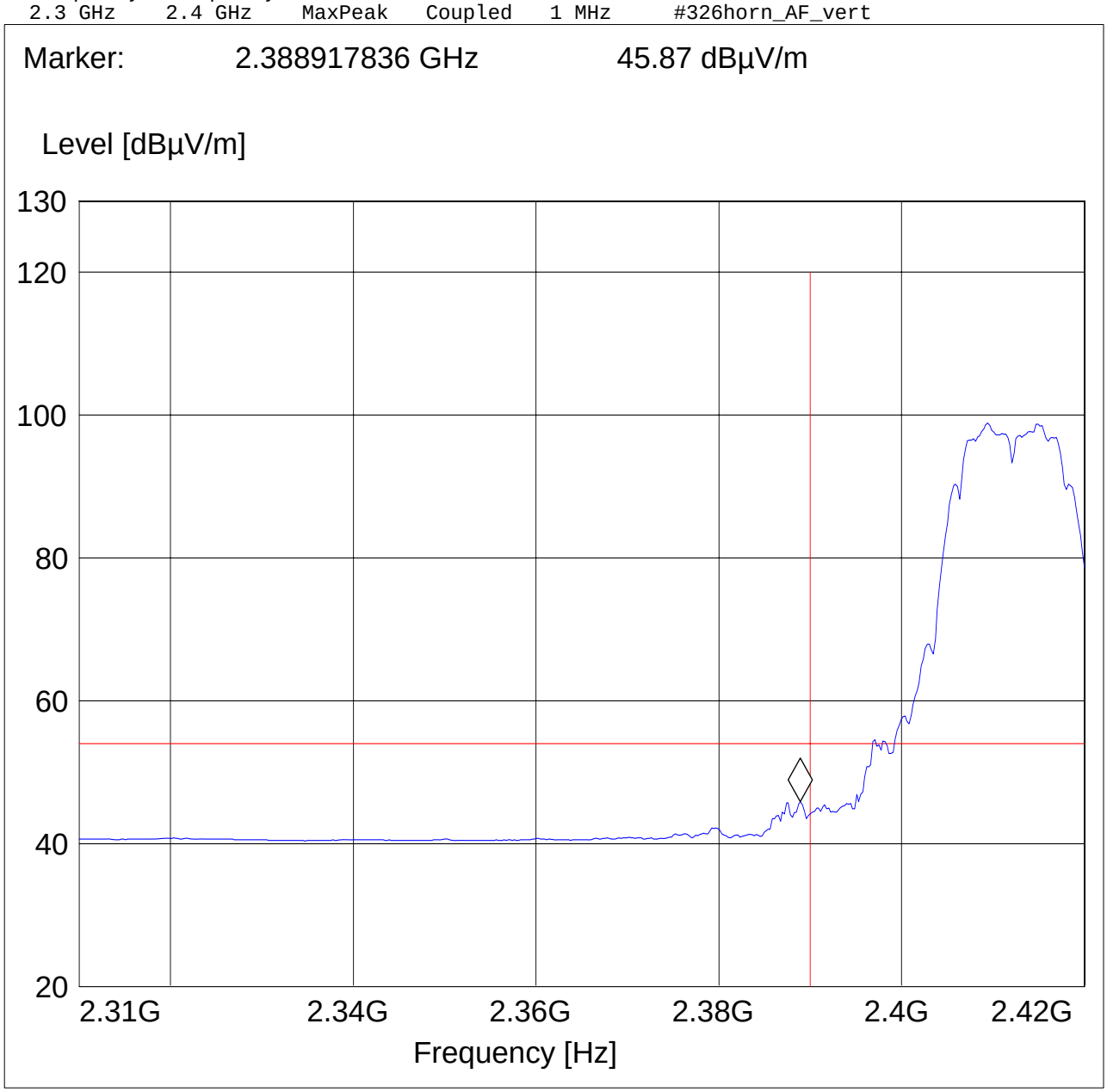


802.11b (2412MHz) AVG Chain A

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11b, ch 1, chain a
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

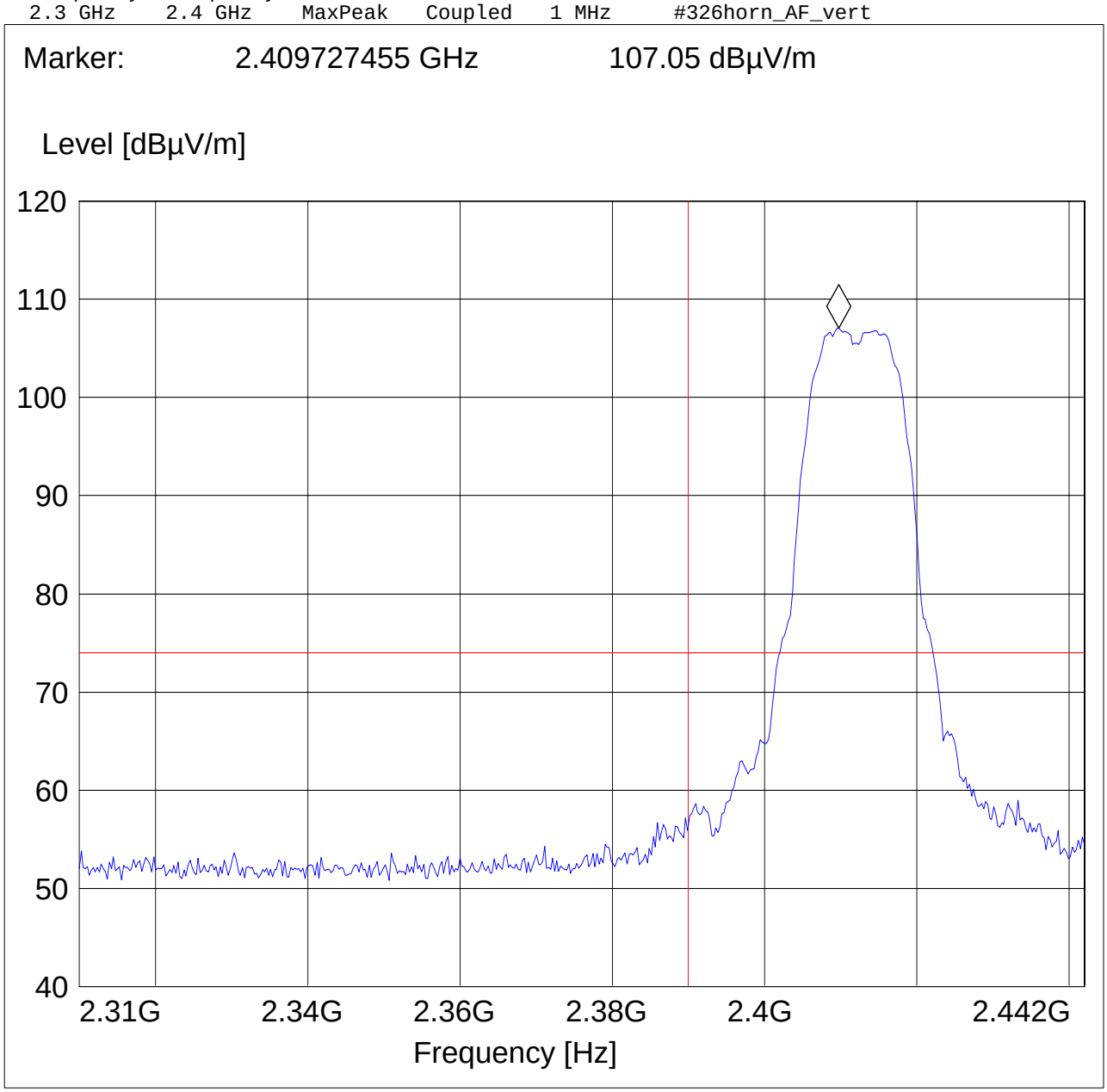


802.11b (2412MHz) PEAK Chain B

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11b, ch 1, chain b
ANT Orientation: V
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

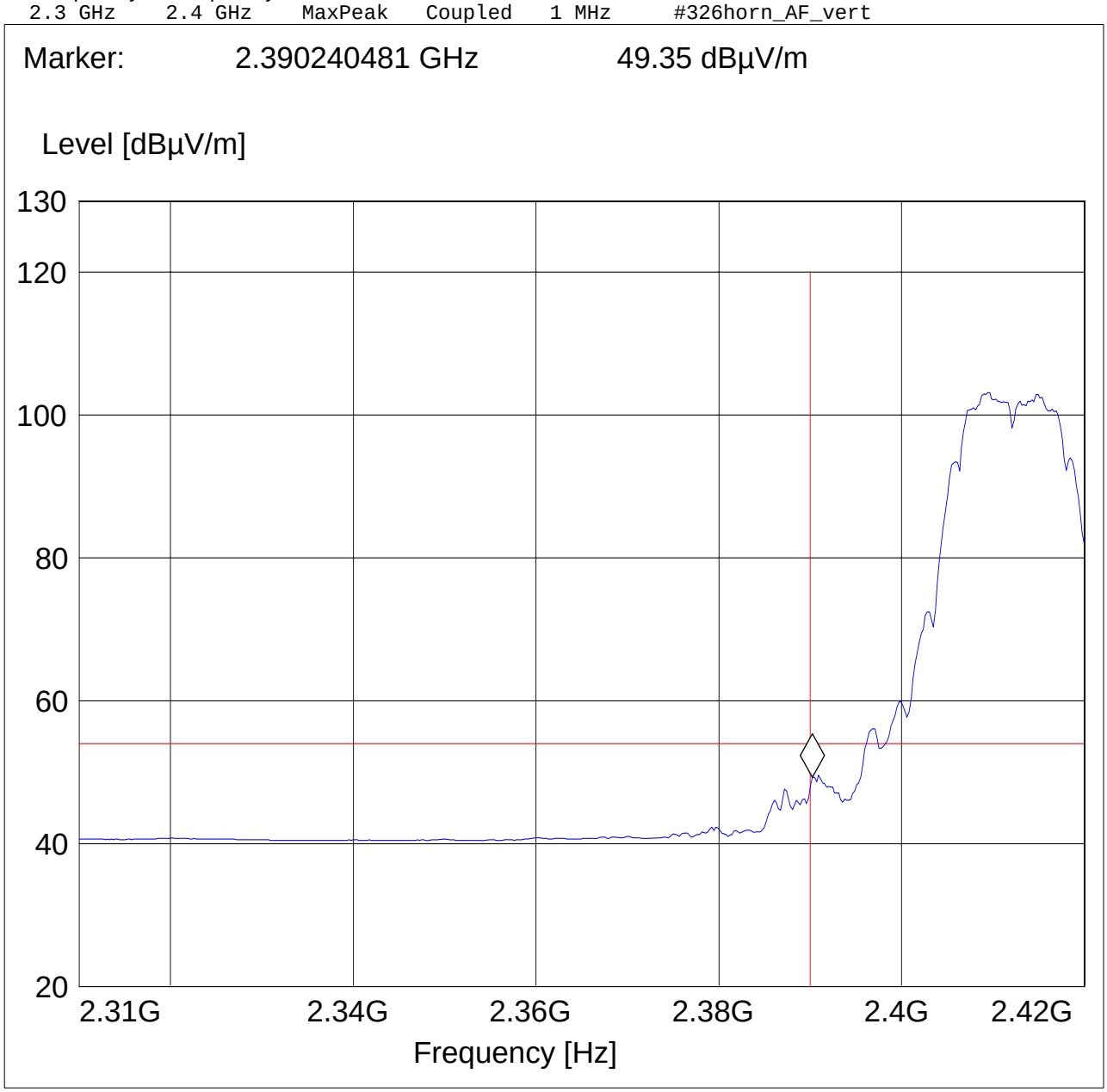


802.11b (2412MHz) AVG Chain B

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11b, ch 1, chain b
ANT Orientation: V
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

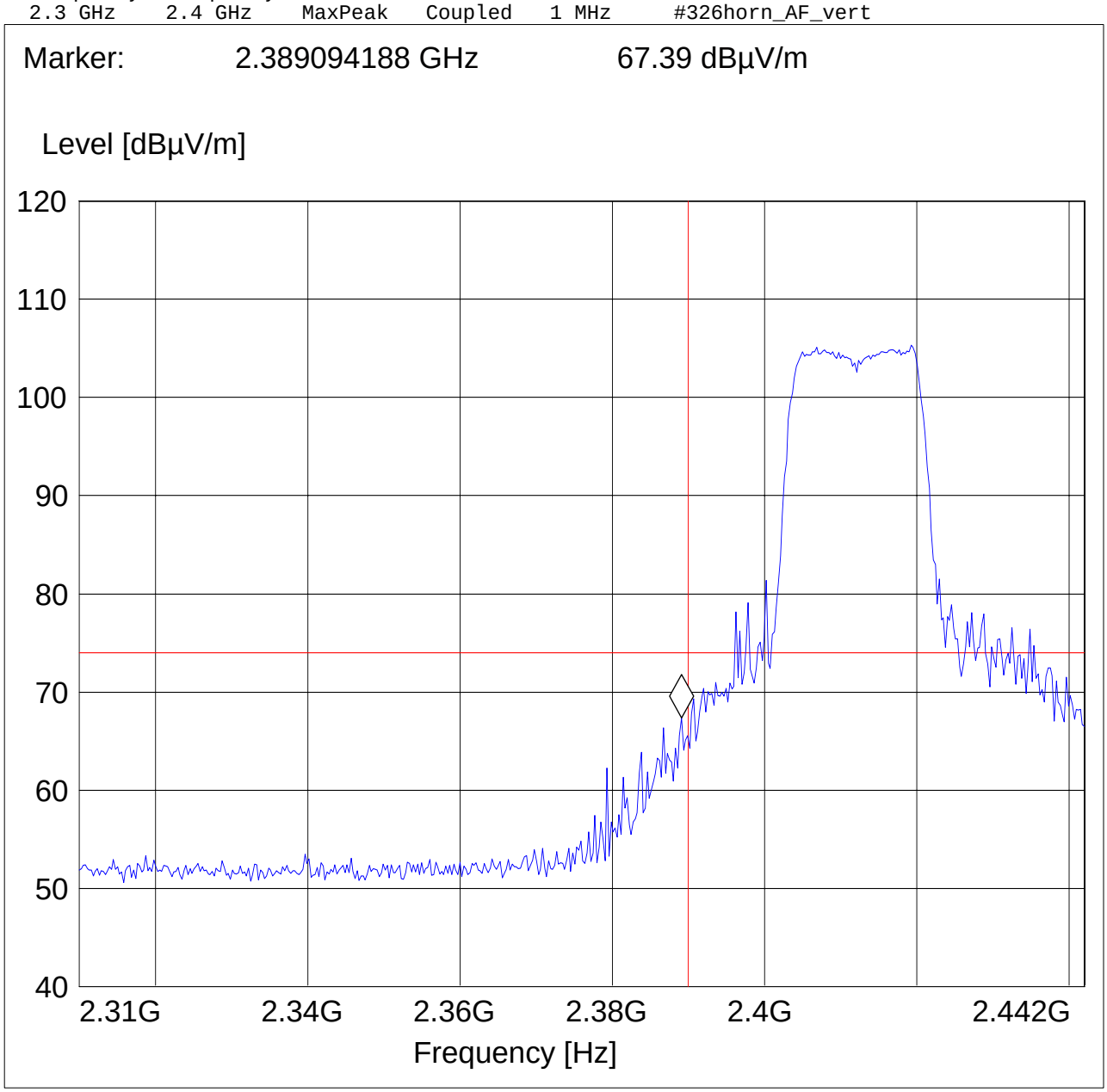


802.11g (2412MHz) PEAK Chain A

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11g, ch 1, chain a
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

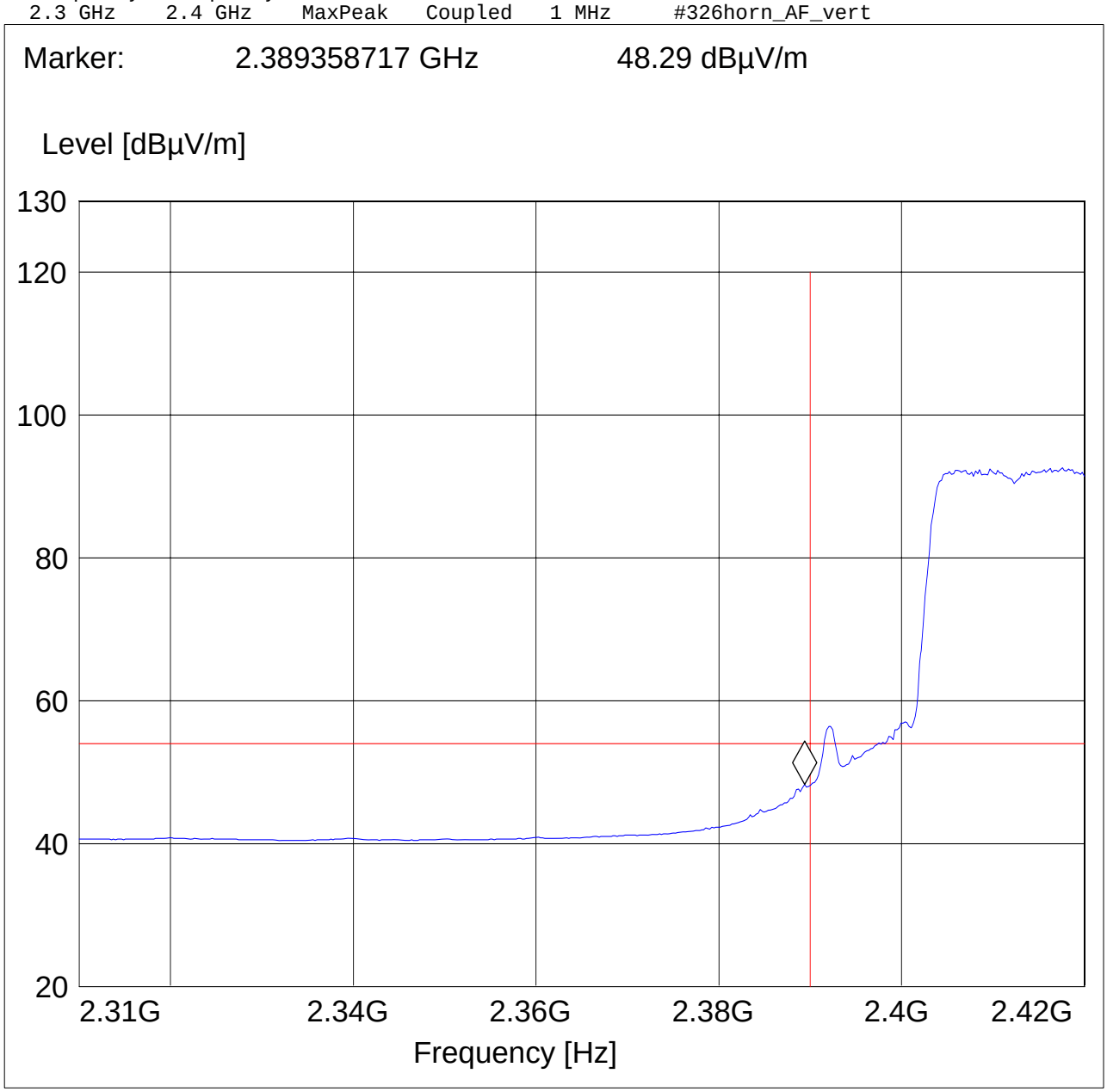


802.11g (2412MHz) AVG Chain A

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11g, ch 1, chain a
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

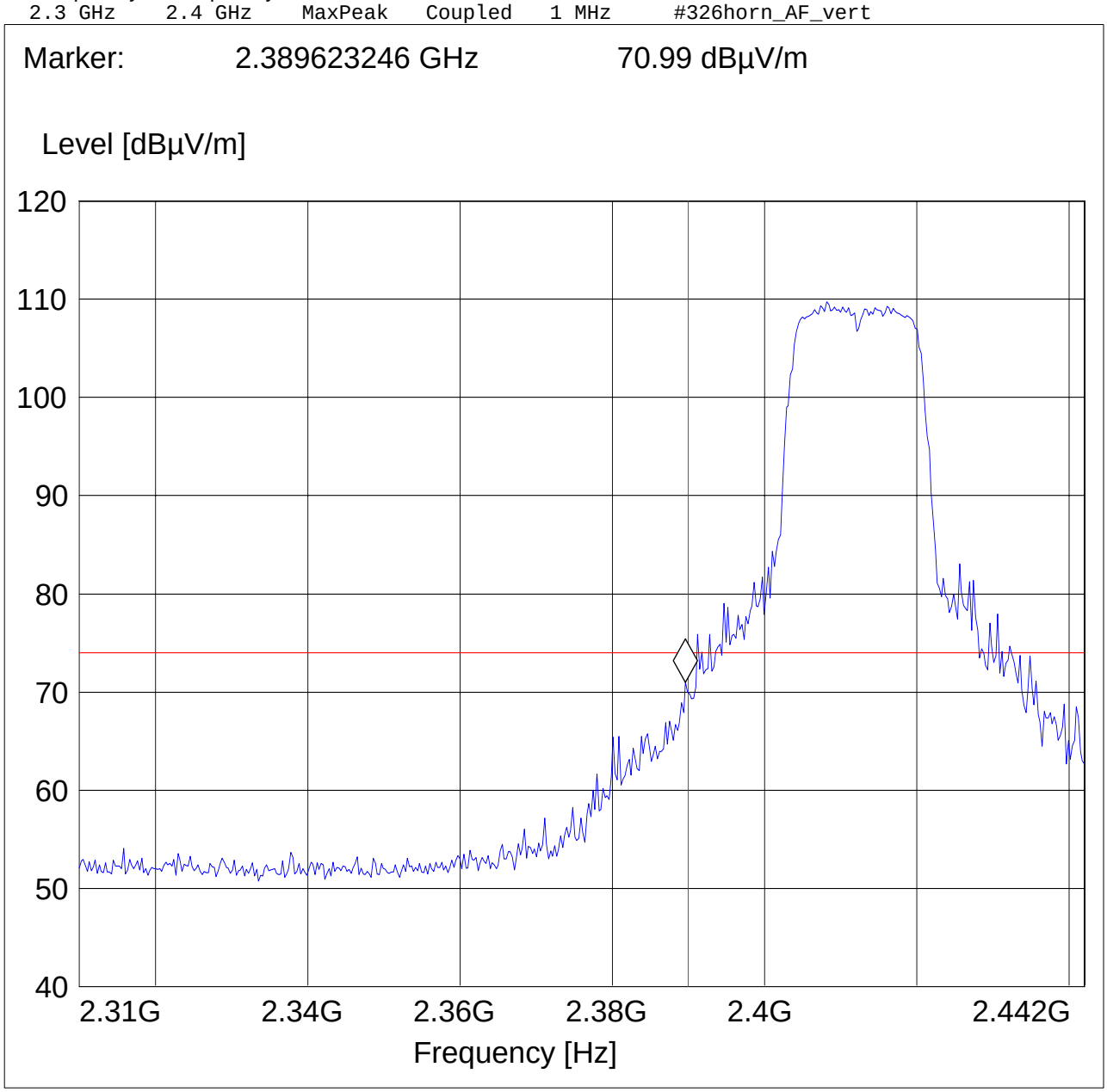


802.11g (2412MHz) PEAK Chain B

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11g, ch 1, chain b
ANT Orientation: V
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

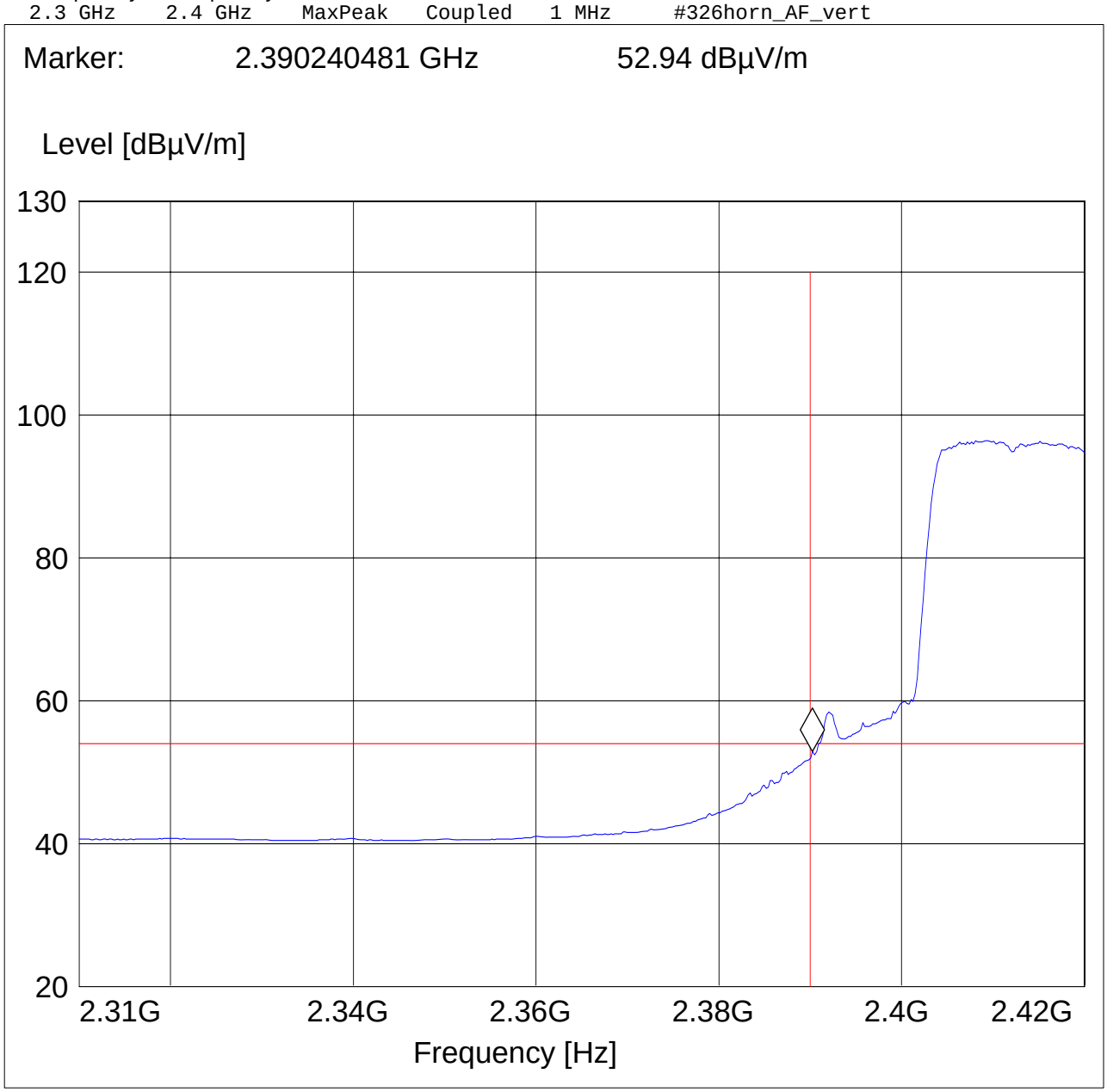


802.11g (2412MHz) AVG Chain B

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11g, ch 1, chain b
ANT Orientation: V
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



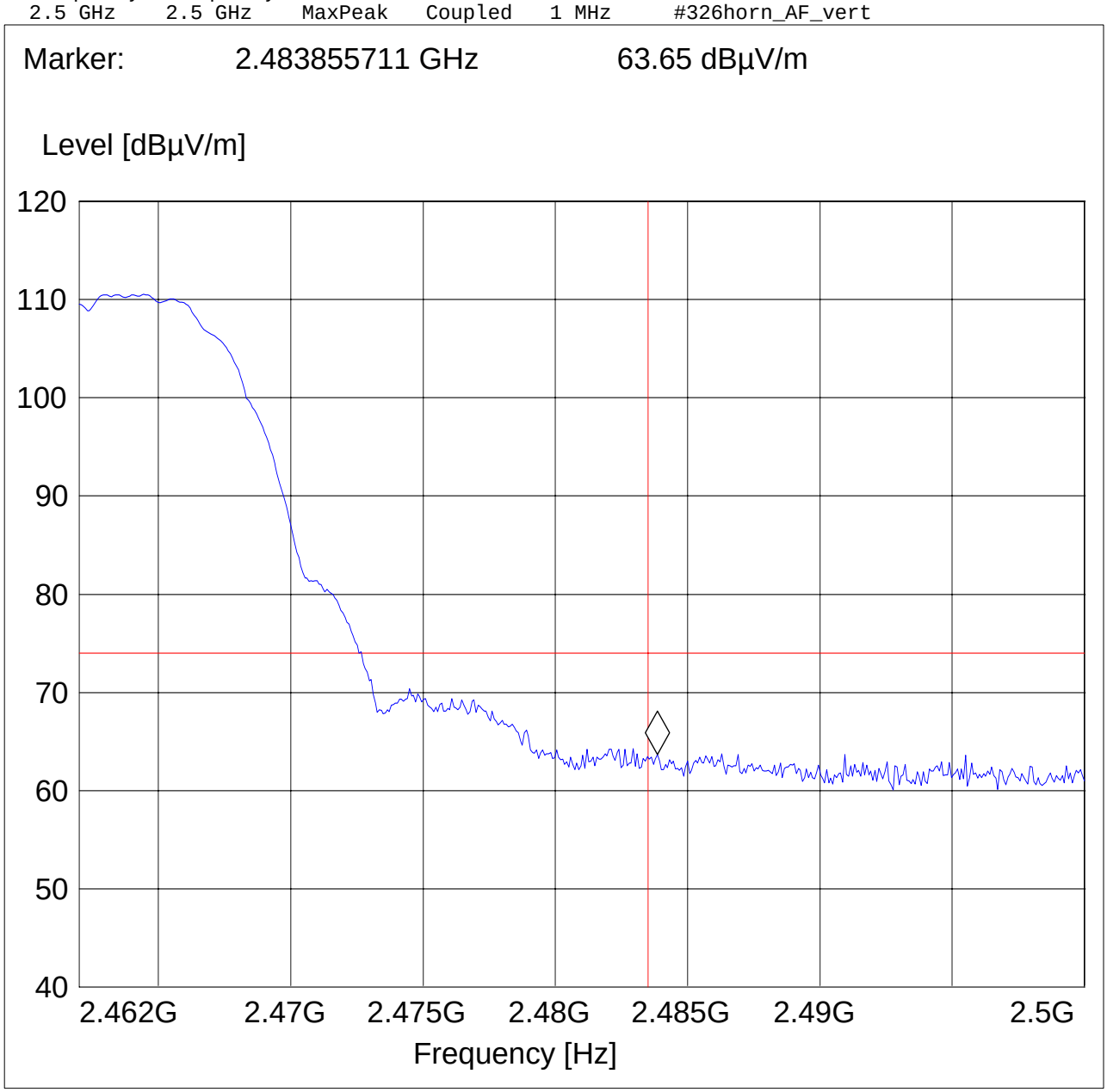
5.2.3 Results Upper Restricted Band 2483.5 MHz to 2500 MHz

802.11b (2462MHz) PEAK Chain A

```
EUT:             Dell Siberia
Customer:        Broadcom
Test Mode:       802.11b, ch 11, chain a
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

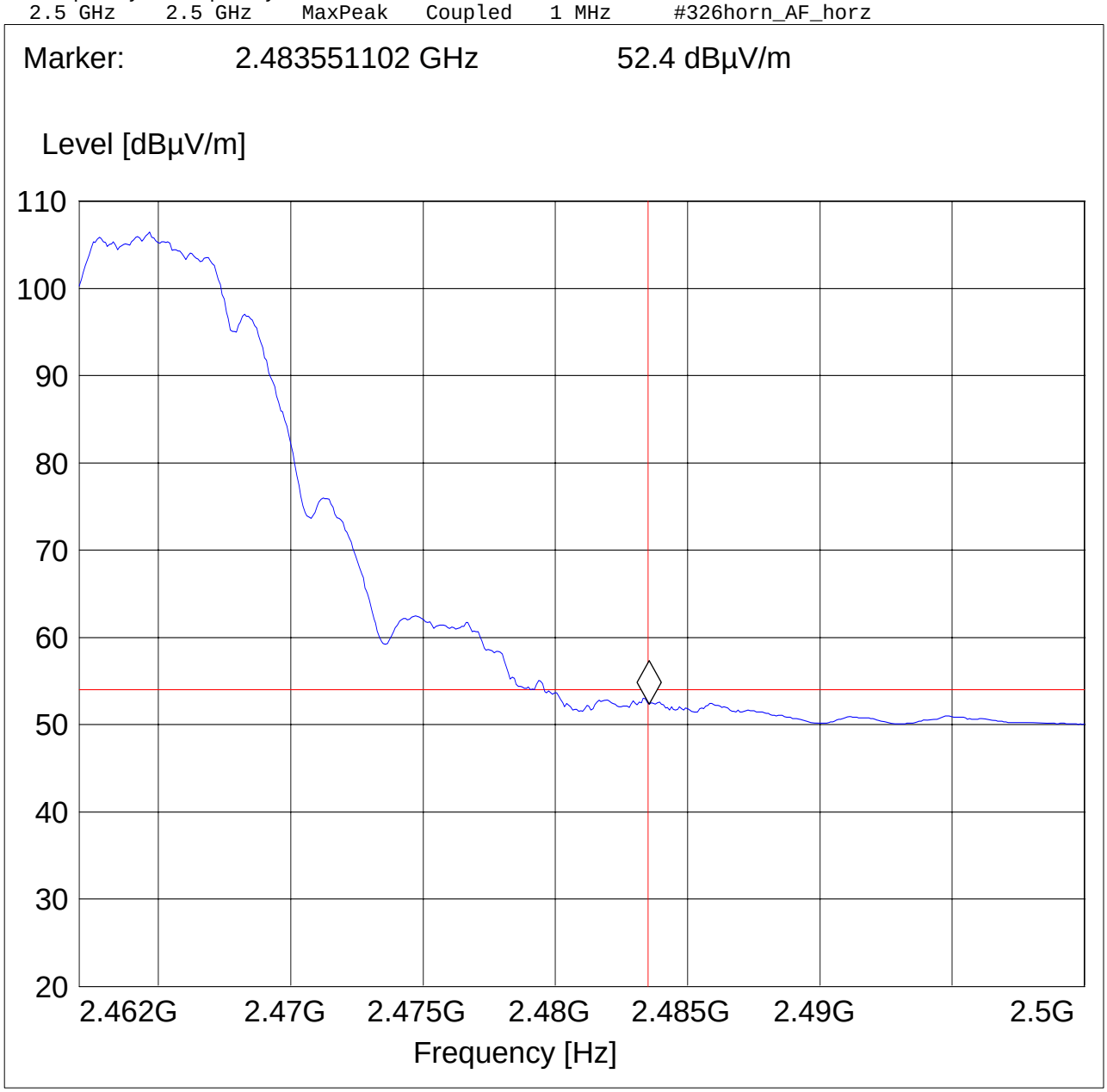


802.11b (2462MHz) AVG Chain A

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11b, ch 11, chain a
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

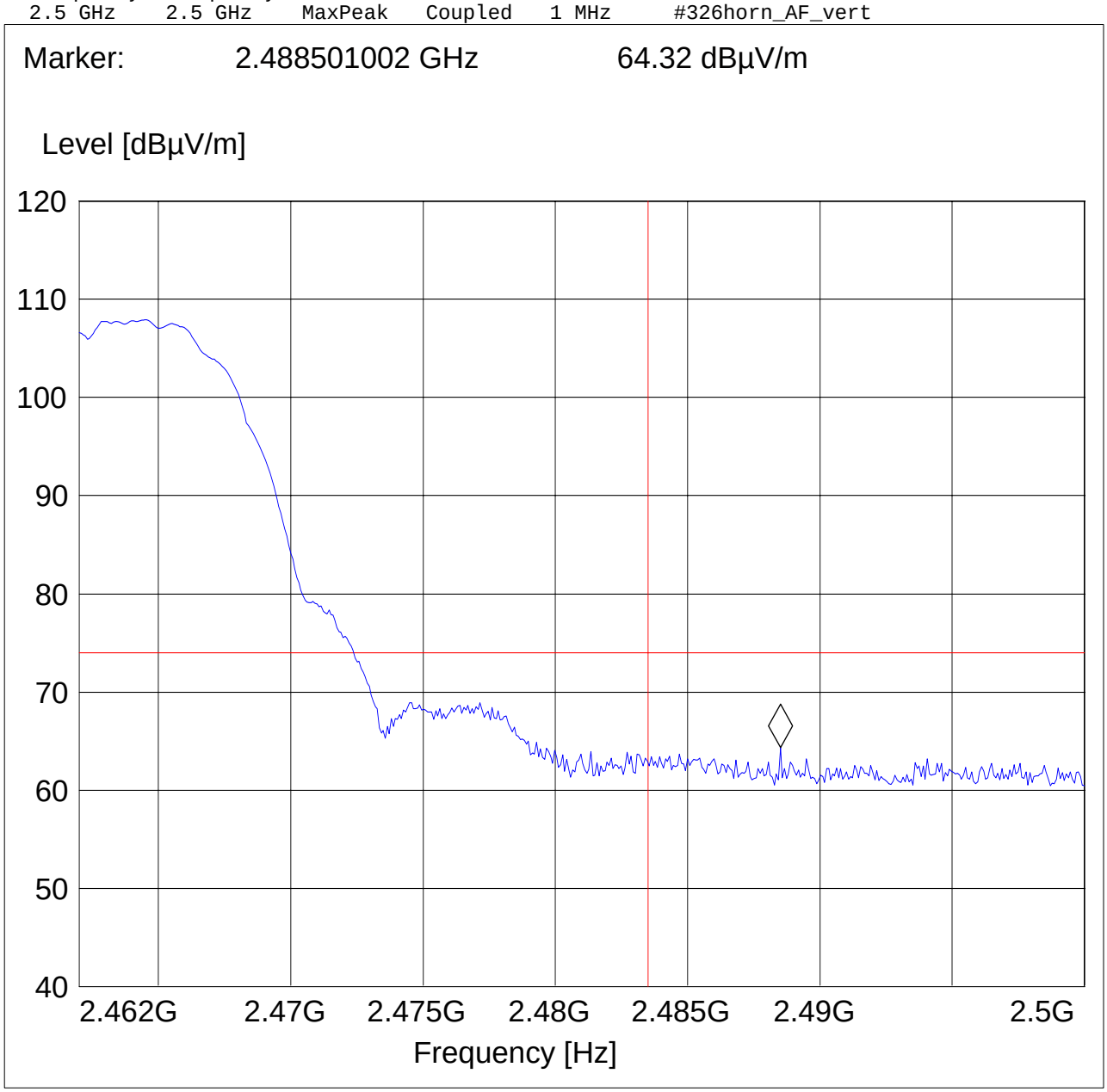


802.11b (2462MHz) PEAK Chain B

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11b, ch 11, chain b
ANT Orientation: V
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

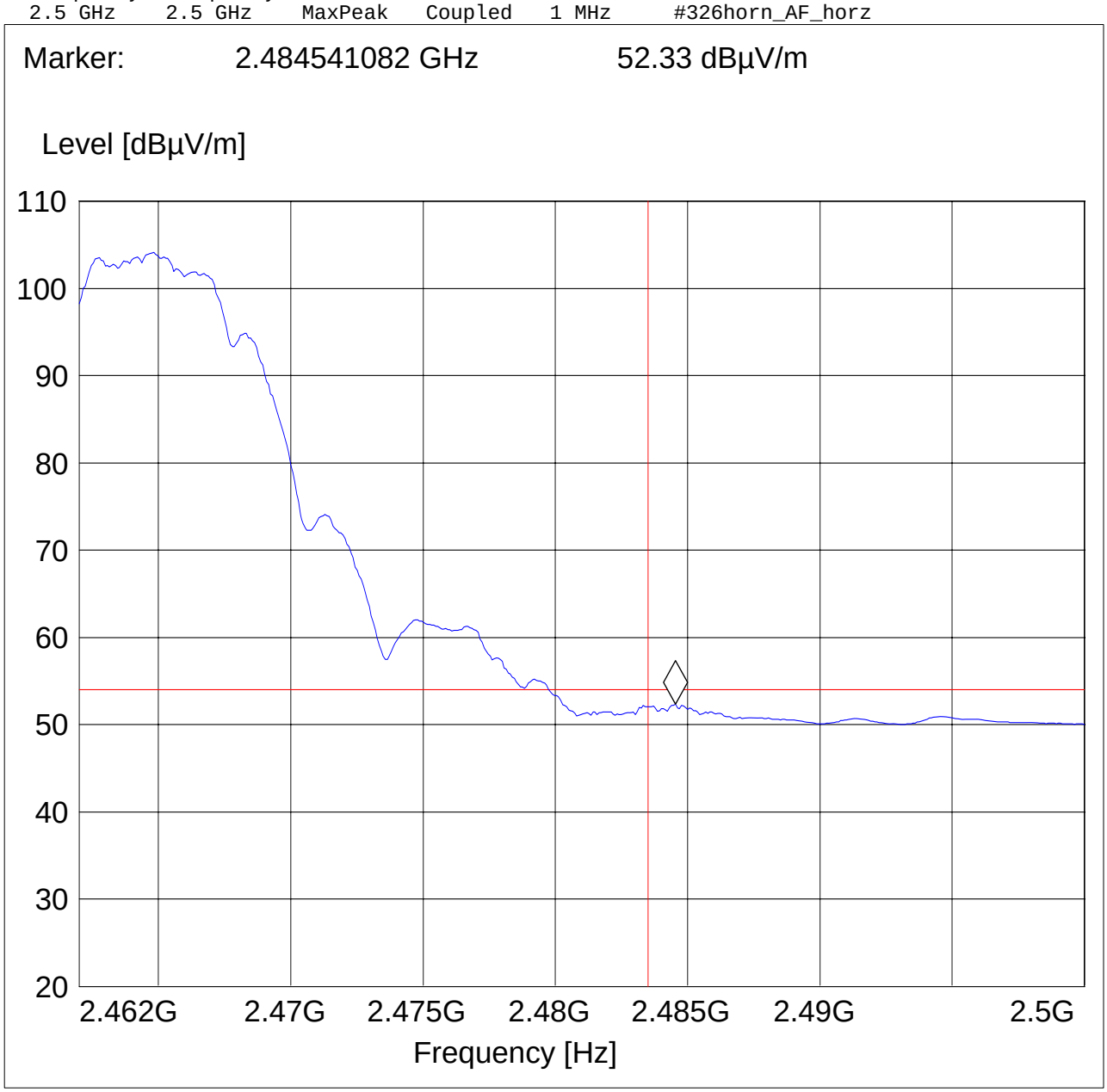


802.11b (2462MHz) AVG Chain B

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11b, ch 11, chain b
ANT Orientation: V
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

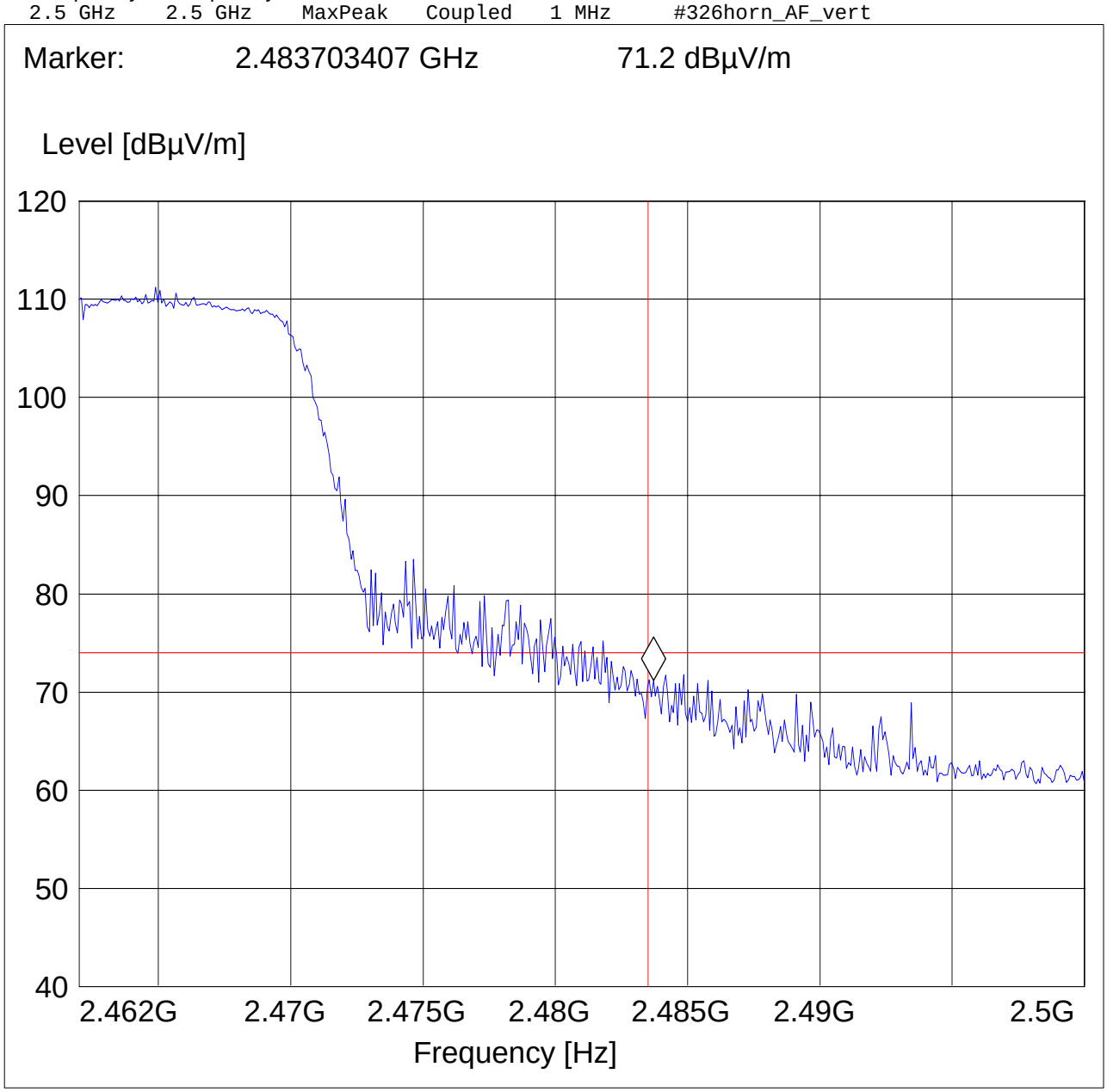


802.11g (2462MHz) PEAK Chain A

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11g, ch 11, chain a
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

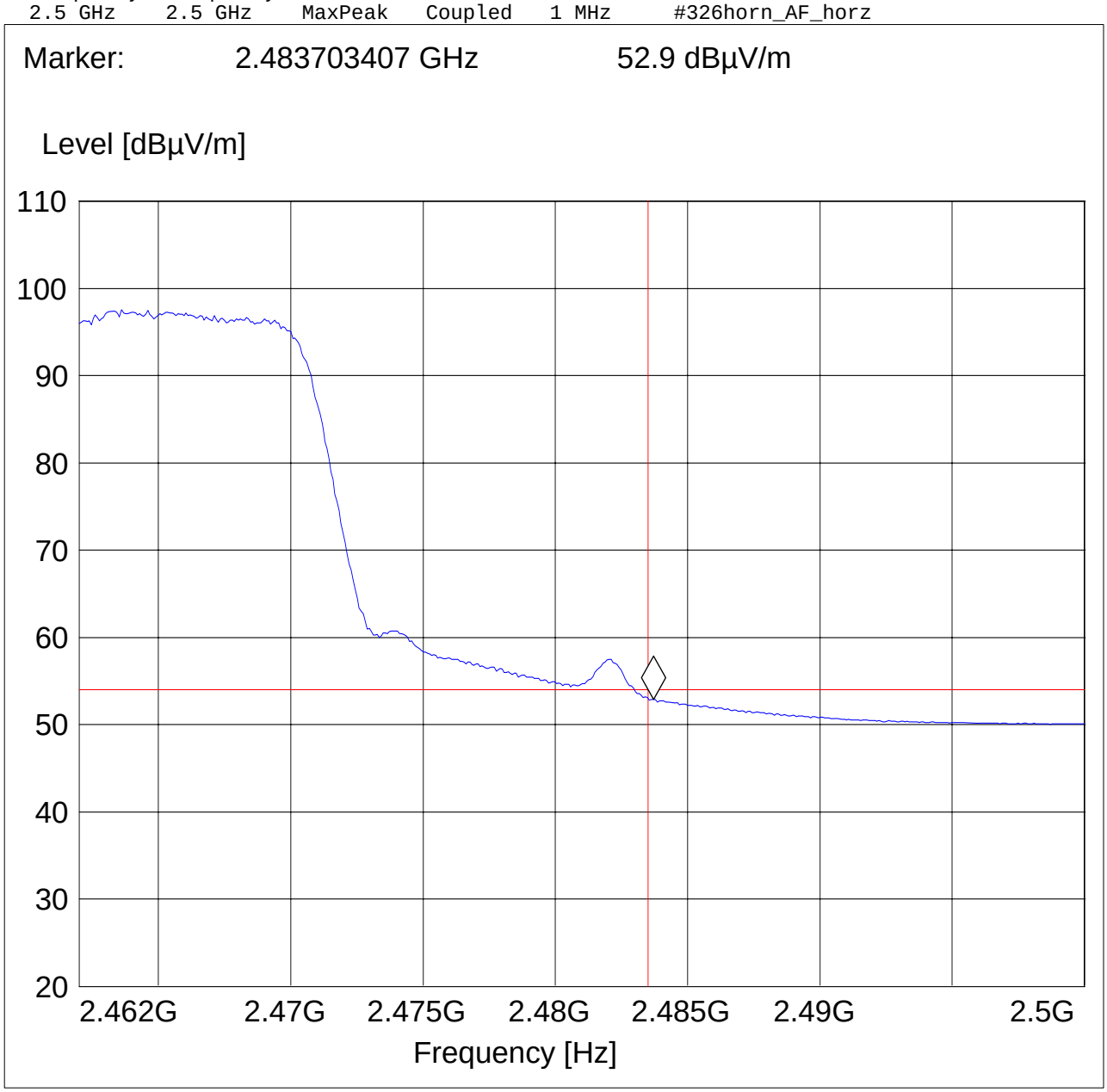


802.11g (2462MHz) AVG Chain A

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11g, ch 11, chain a
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

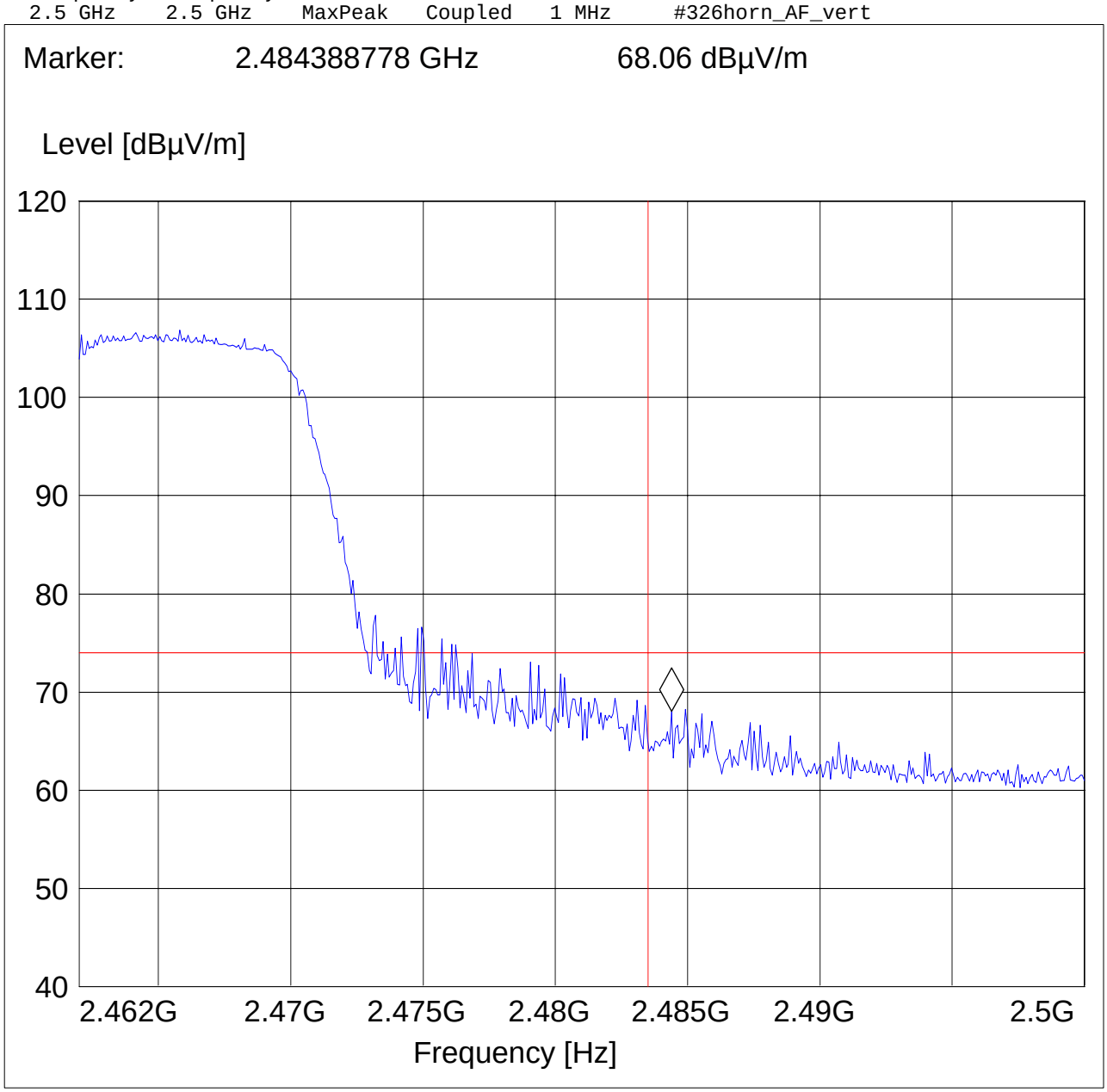


802.11g (2462MHz) PEAK Chain B

```
EUT:              Dell Siberia
Customer:         Broadcom
Test Mode:        802.11g, ch 11, chain b
ANT Orientation:  V
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

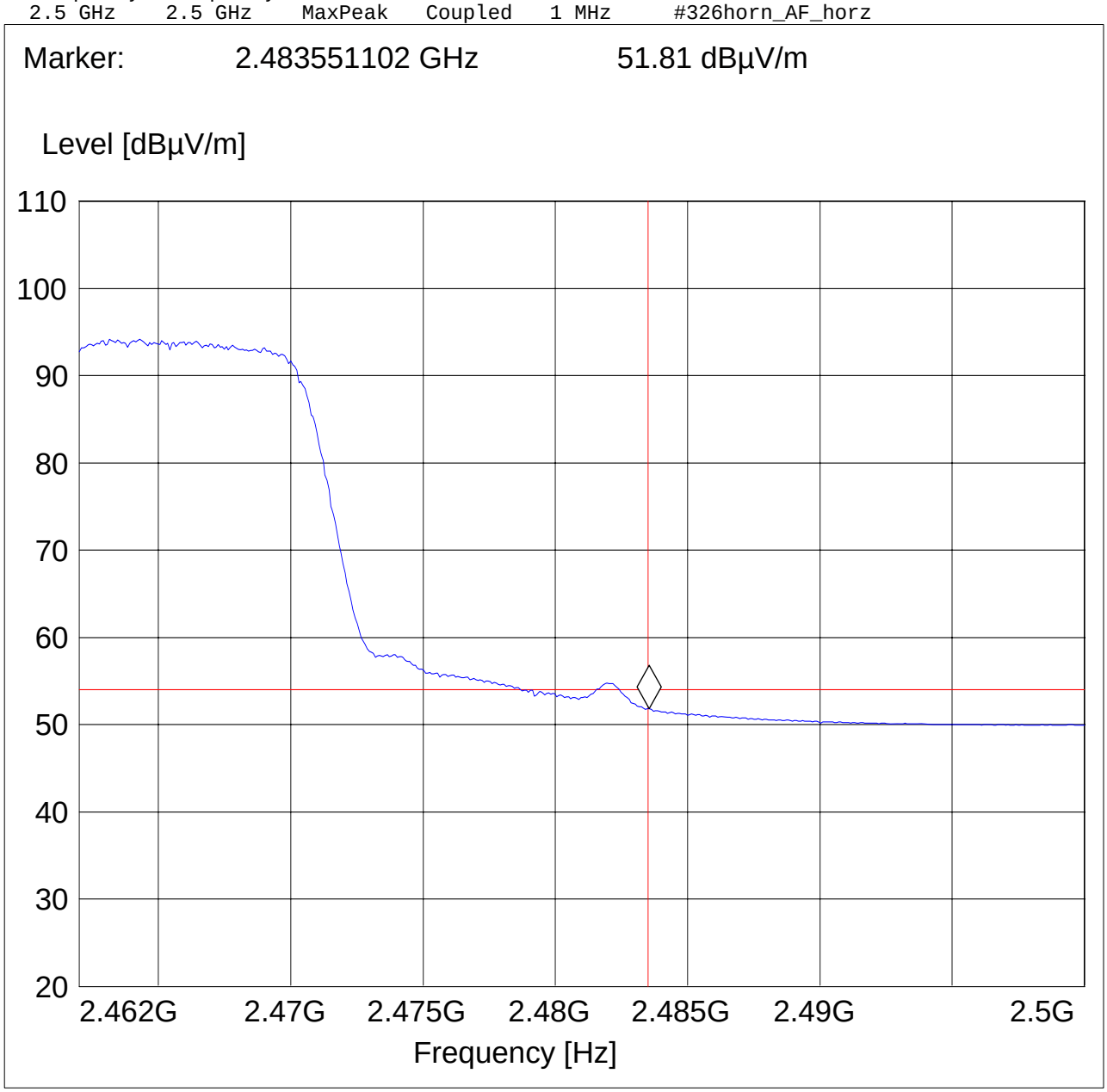


802.11g (2462MHz) AVG Chain B

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11g, ch 11, chain b
ANT Orientation: V
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



5.3 TRANSMITTER SPURIOUS EMISSIONS RADIATED § 15.247/15.205/15.209

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
[1]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	([2])
13.36 - 13.41			

***PEAK LIMIT= 74dBuV/m AVG. LIMIT= 54dBuV/m**

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 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.
3. Radiated emissions are maximized by rotating the EUT 360° at 0.5 meter height increments between 1 and 4 meters.
4. Measurements were performed with the EUT in X, Y and Z orientations with the measurement antenna in both horizontal and vertical polarity. The plots below show the results of the worst case orientation and polarity
5. After maximization it is determined that 802.11g mode has worse case emission and only this mode is reported here.

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

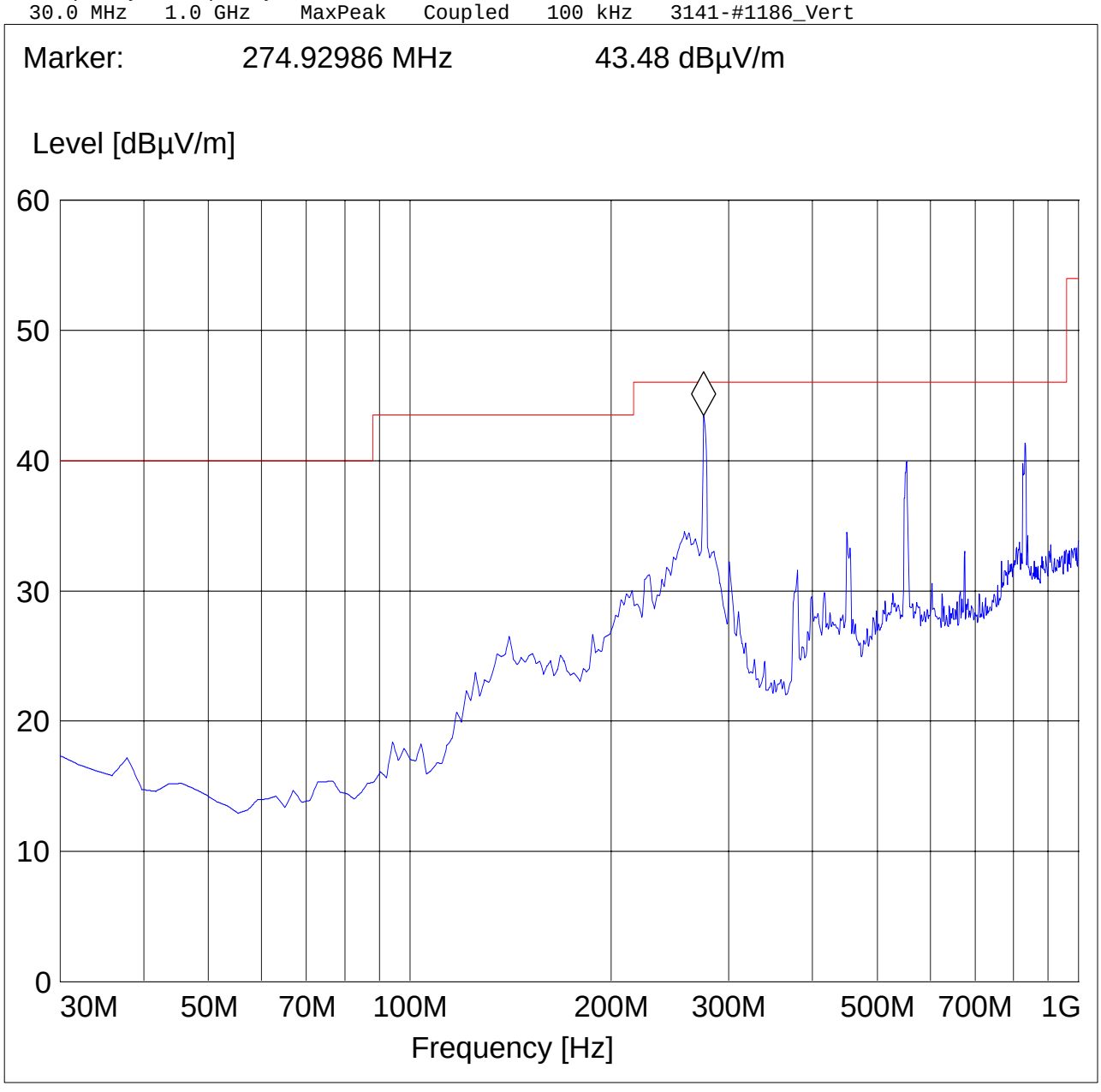
30MHz – 1GHz Chain A, Antenna: vertical

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

```
EUT:             Dell Siberia
Customer:        Broadcom
Test Mode:       802.11g, ch 6, chain a
ANT Orientation: V
EUT Orientation: H
Test Engineer:   Ed
Power Supply:    AC Adapter
Comments:        new module from Broadcom
```

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



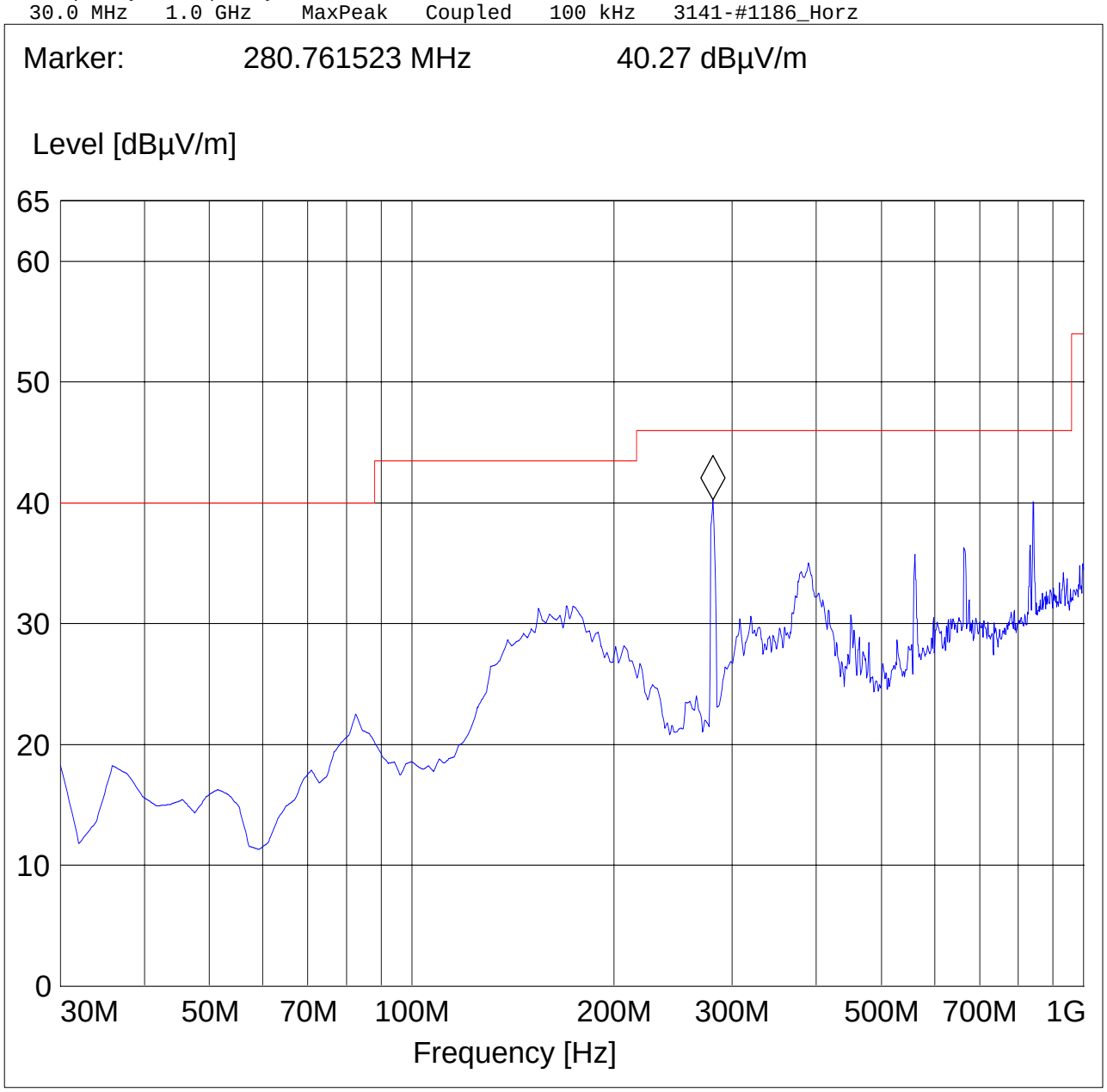
30MHz – 1GHz Chain A, Antenna: horizontal

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

```
EUT:             Dell Siberia
Customer:        Broadcom
Test Mode:       802.11b, ch 6, chain a
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



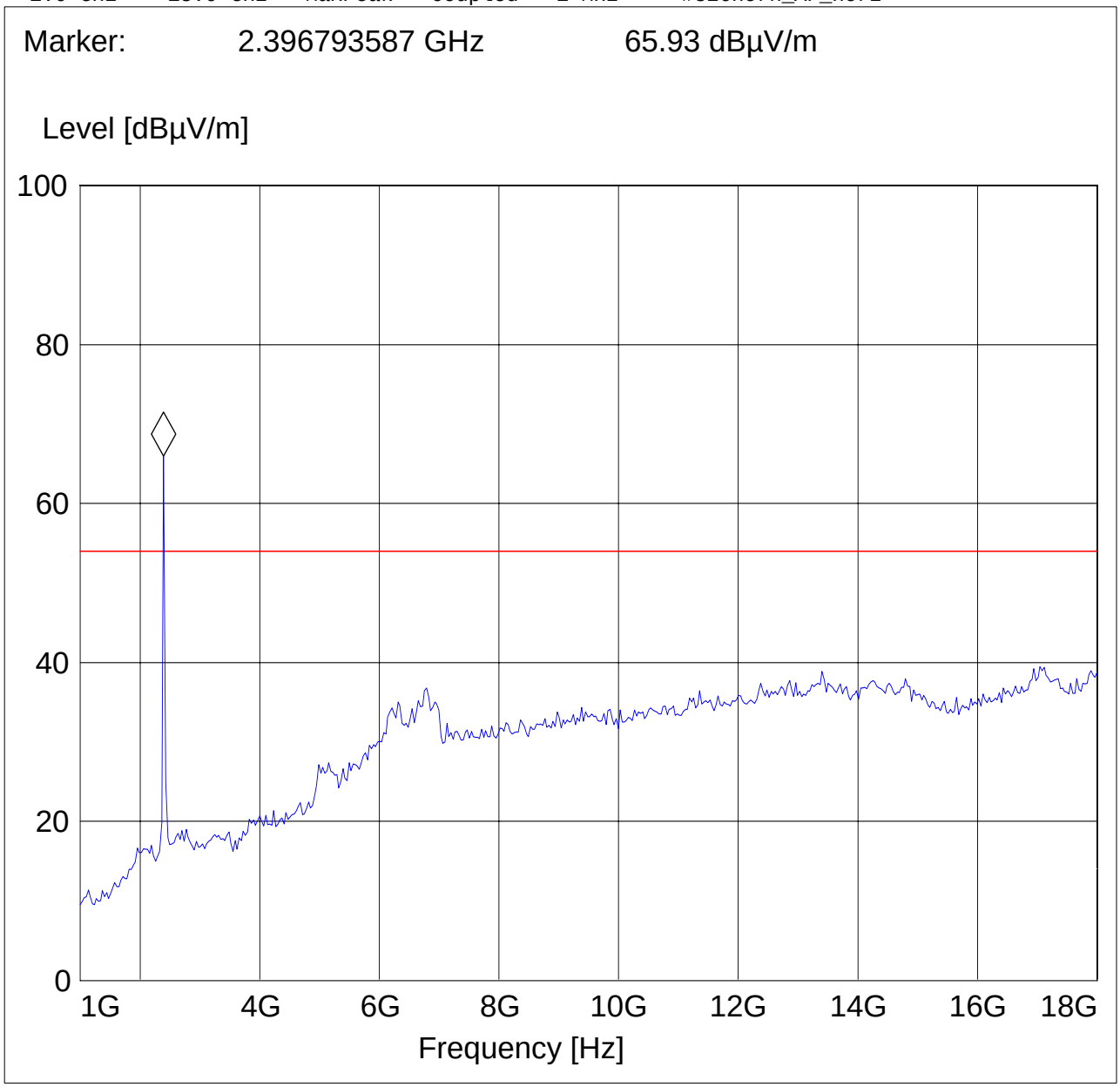
1-18GHz (2412MHz) Chain A

Note:The peak above the limit line is the carrier freq. Note:Peak Reading vs. Average limit

EUT / Description: Dell Siberia
Manufacturer: Broadcom
Test mode: 802.11b, ch 1, chain a
ANT Orientation: : H
EUT Orientation:: H
Test Engineer: Ed
Voltage: AC Adapter
Comments:: marker is on uplink sig.

SWEEP TABLE: "FCC 15.407 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



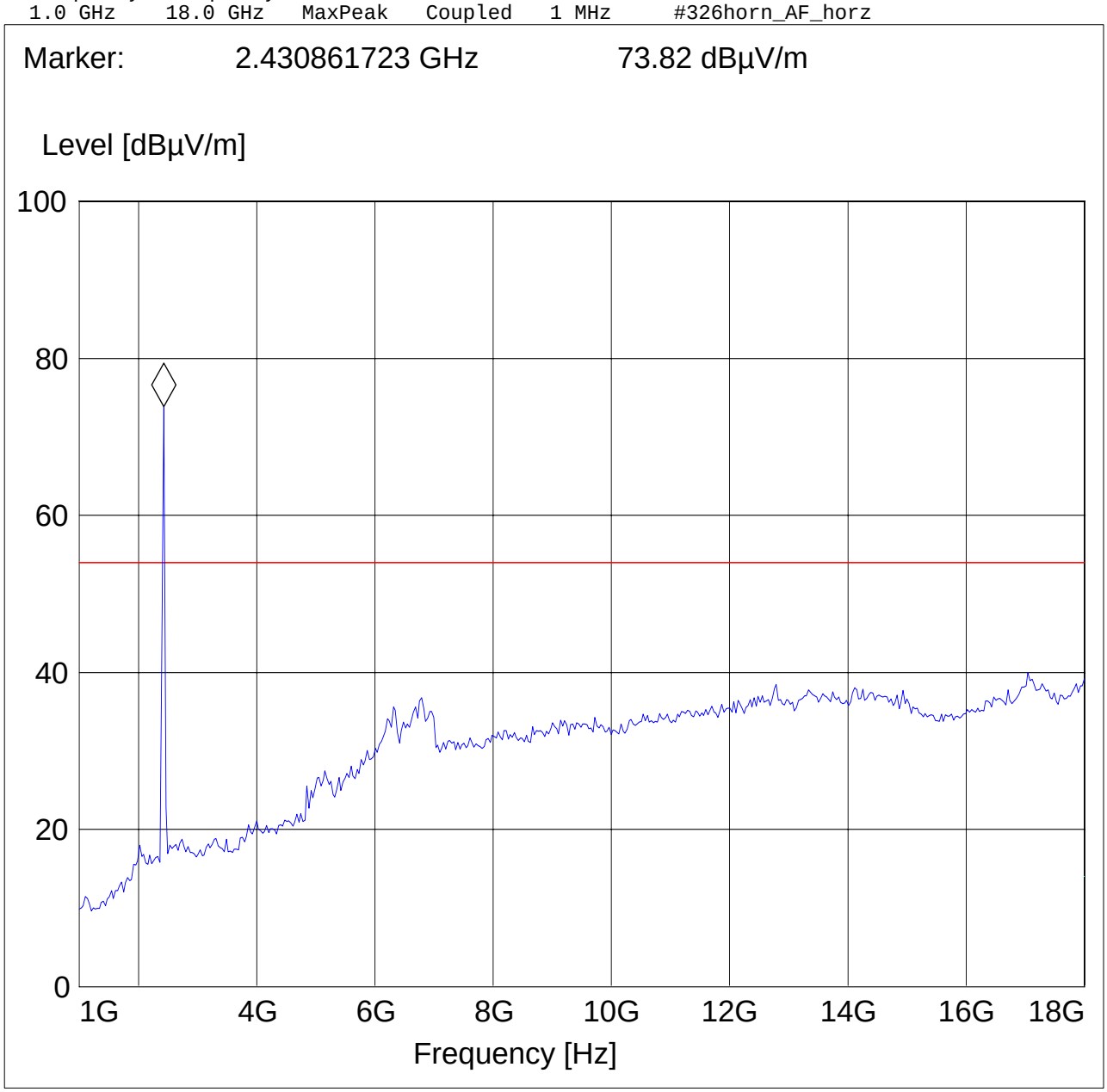
1-18GHz (2437MHz) Chain A

Note:The peak above the limit line is the carrier freq.Note:Peak Reading vs. Average limit

```
EUT / Description: Dell Siberia
Manufacturer:      Broadcom
Test mode:         802.11b, ch 6, chain a
ANT Orientation: : H
EUT Orientation::  H
Test Engineer:     Ed
Voltage:           AC Adapter
Comments::         marker is on uplink sig.
```

SWEEP TABLE: "FCC 15.407 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



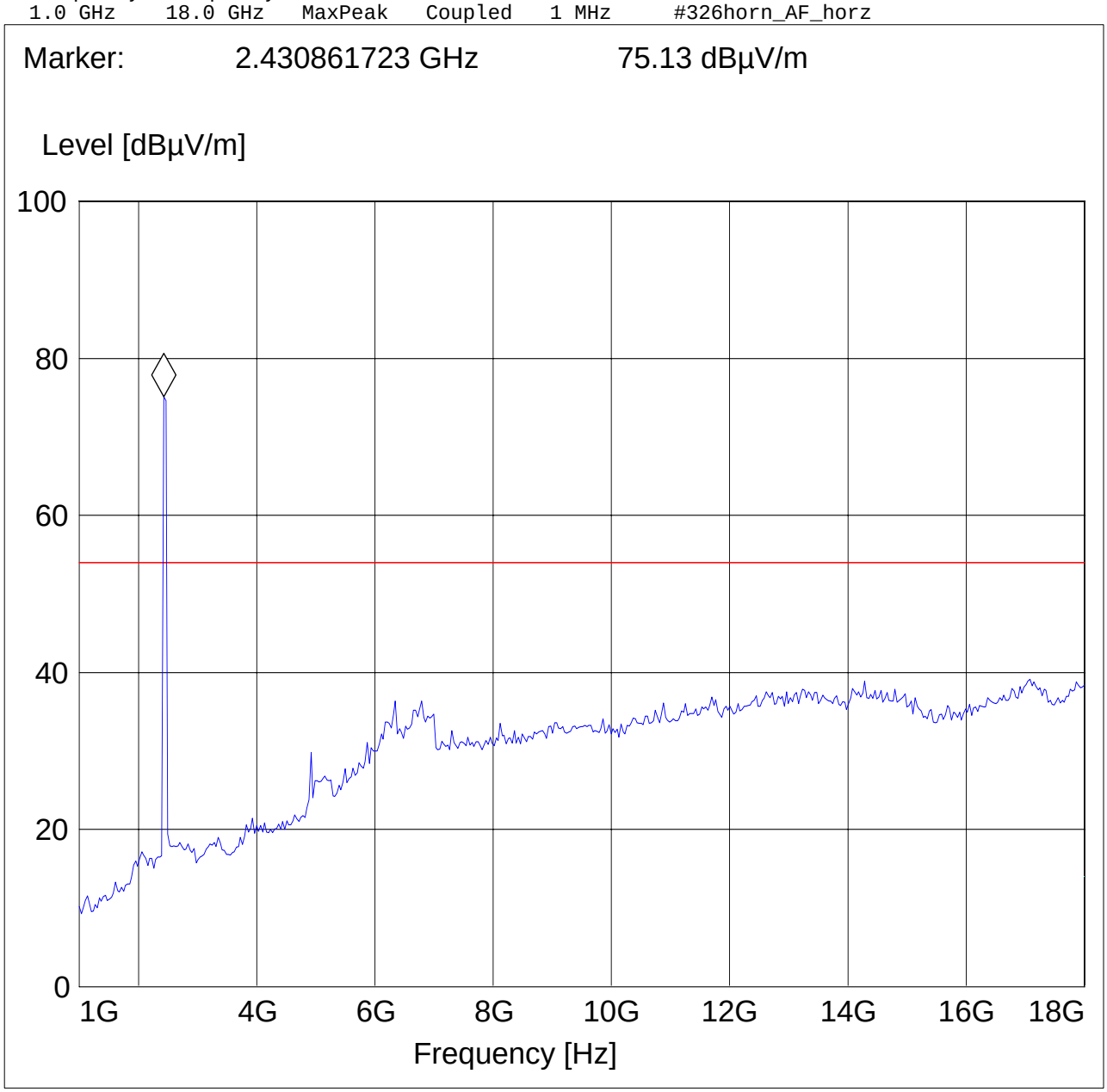
1-18GHz (2462MHz) Chain A

Note:The peak above the limit line is the carrier freq.Note:Peak Reading vs. Average limit

```
EUT / Description: Dell Siberia
Manufacturer:      Broadcom
Test mode:         802.11b, ch 11, chain a
ANT Orientation: : H
EUT Orientation::  H
Test Engineer:     Ed
Voltage:           AC Adapter
Comments::         marker is on uplink sig.
```

SWEEP TABLE: "FCC 15.407 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



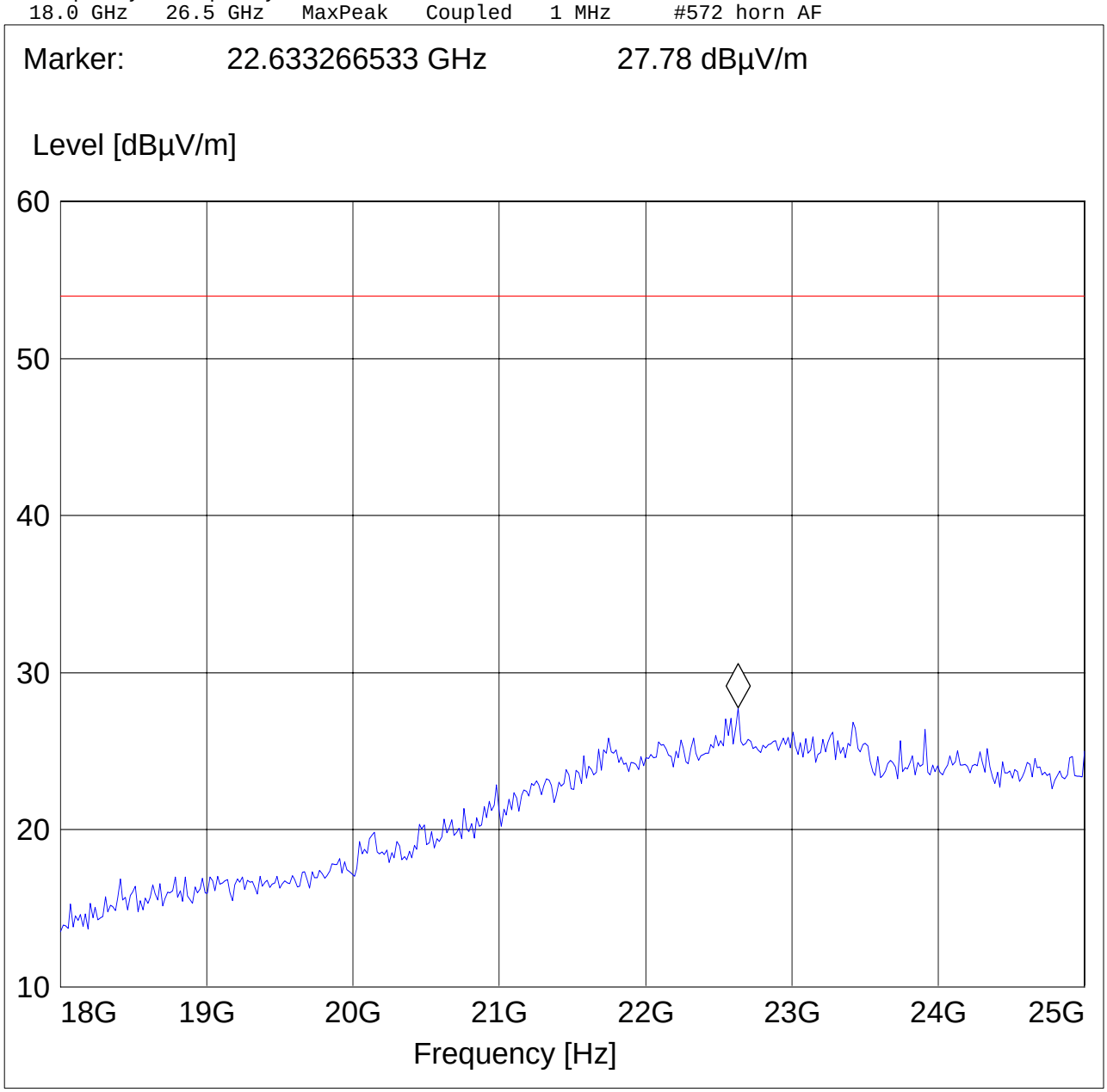
18-25GHz Chain A

Note: This plot is valid for low, mid, high channels (worst-case plot)Note: Peak Reading vs. Average limit

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11b, ch 11, chain a
ANT Orientation: V
EUT Orientation: H
Test Engineer: Ed
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



30MHz – 1GHz Chain B

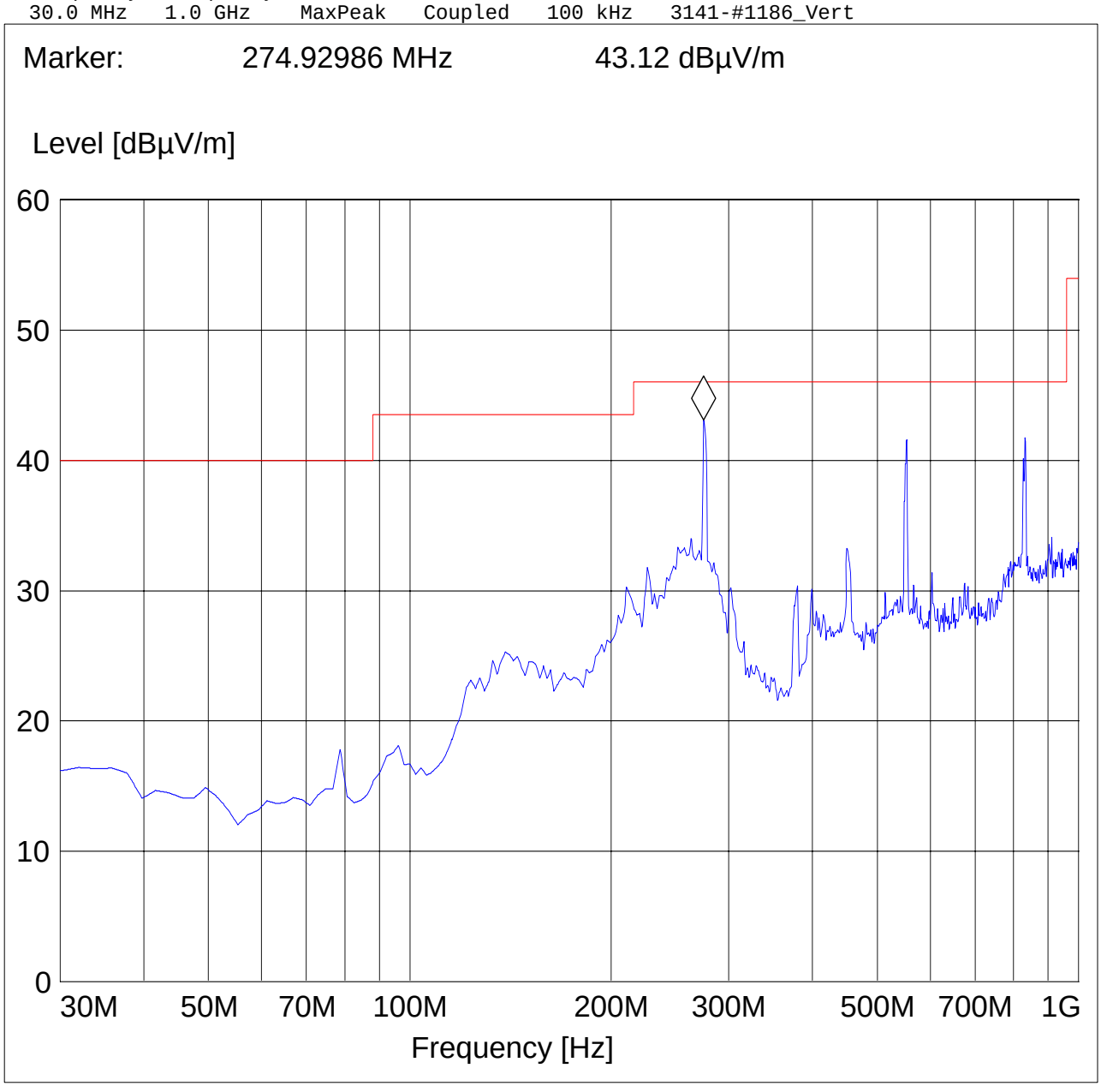
Antenna: vertical

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

```
EUT:             Dell Siberia
Customer:        Broadcom
Test Mode:       802.11g, ch 11, chain b
ANT Orientation: V
EUT Orientation: H
Test Engineer:   Ed
Power Supply:    AC Adapter
Comments:        new module from Broadcom
```

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



30MHz – 1GHz Chain B

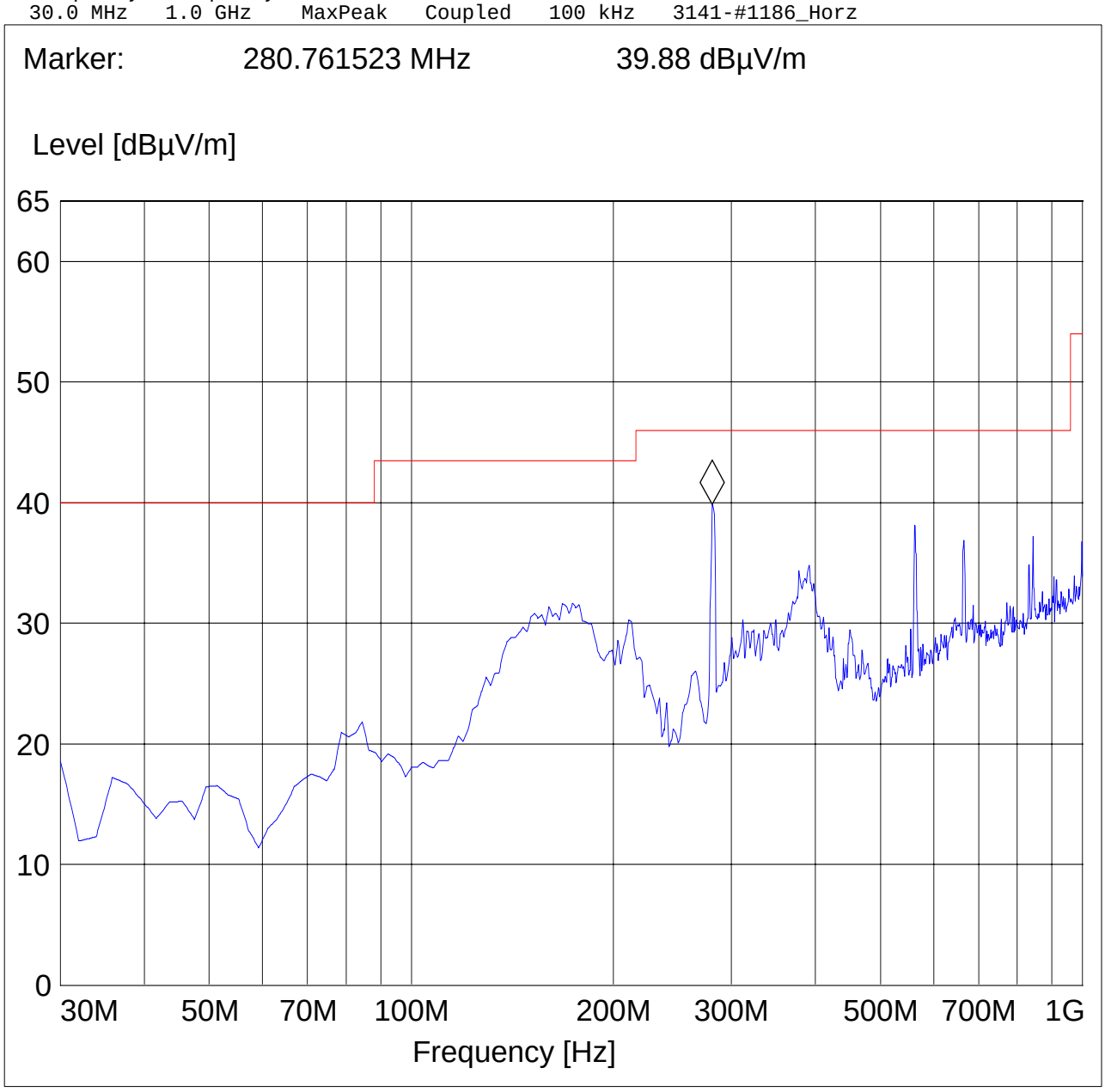
Antenna: horizontal

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

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11g, ch 11, chain b
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



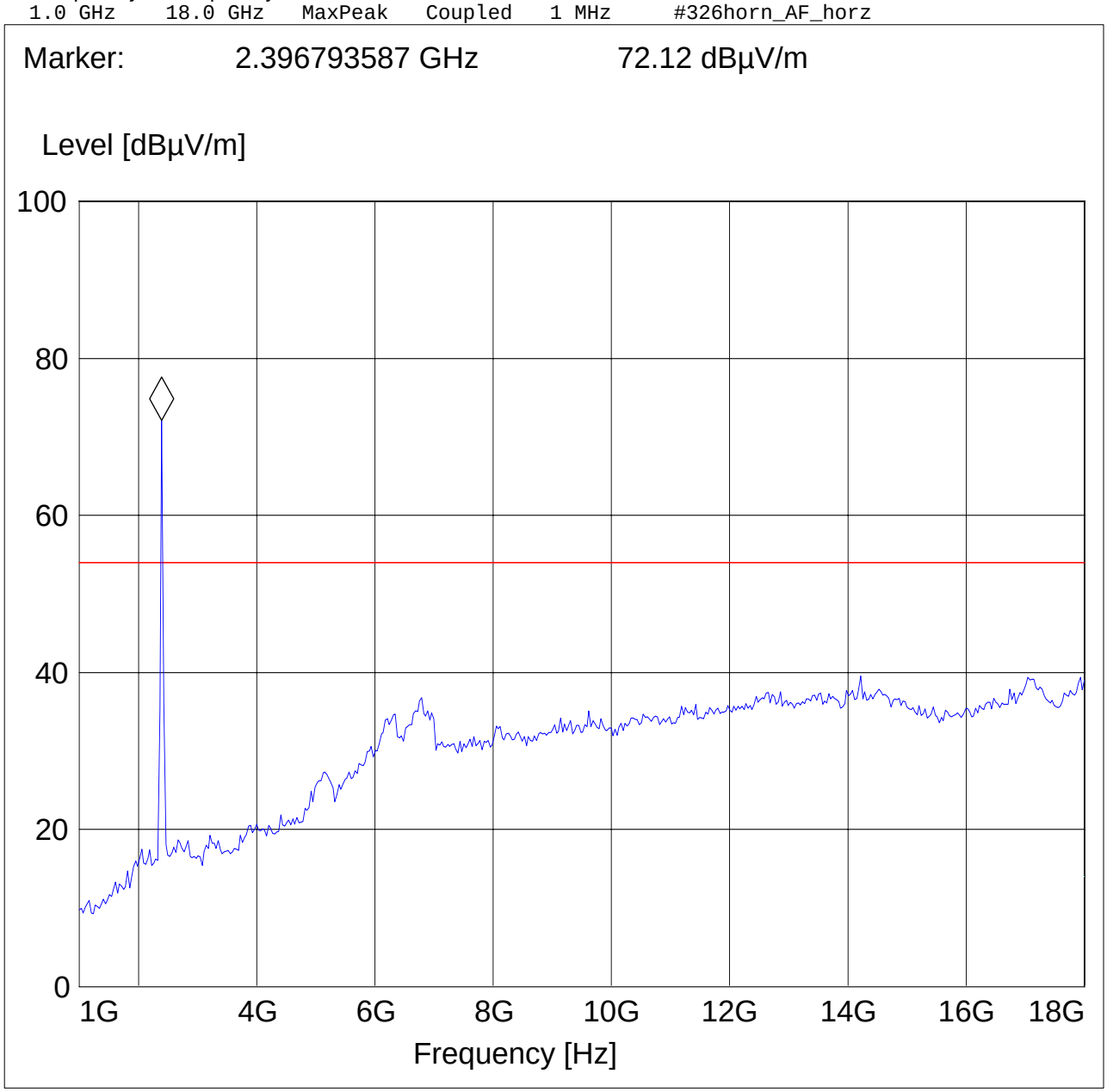
1-18GHz (2412MHz) Chain B

Note:The peak above the limit line is the carrier freq.Note:Peak Reading vs. Average limit

```
EUT / Description: Dell Siberia
Manufacturer:      Broadcom
Test mode:         802.11g, ch 1, chain b
ANT Orientation: : V
EUT Orientation::  H
Test Engineer:     Ed
Voltage:           AC Adapter
Comments::
```

SWEEP TABLE: "FCC 15.407 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



1-18GHz (2437MHz) Chain B

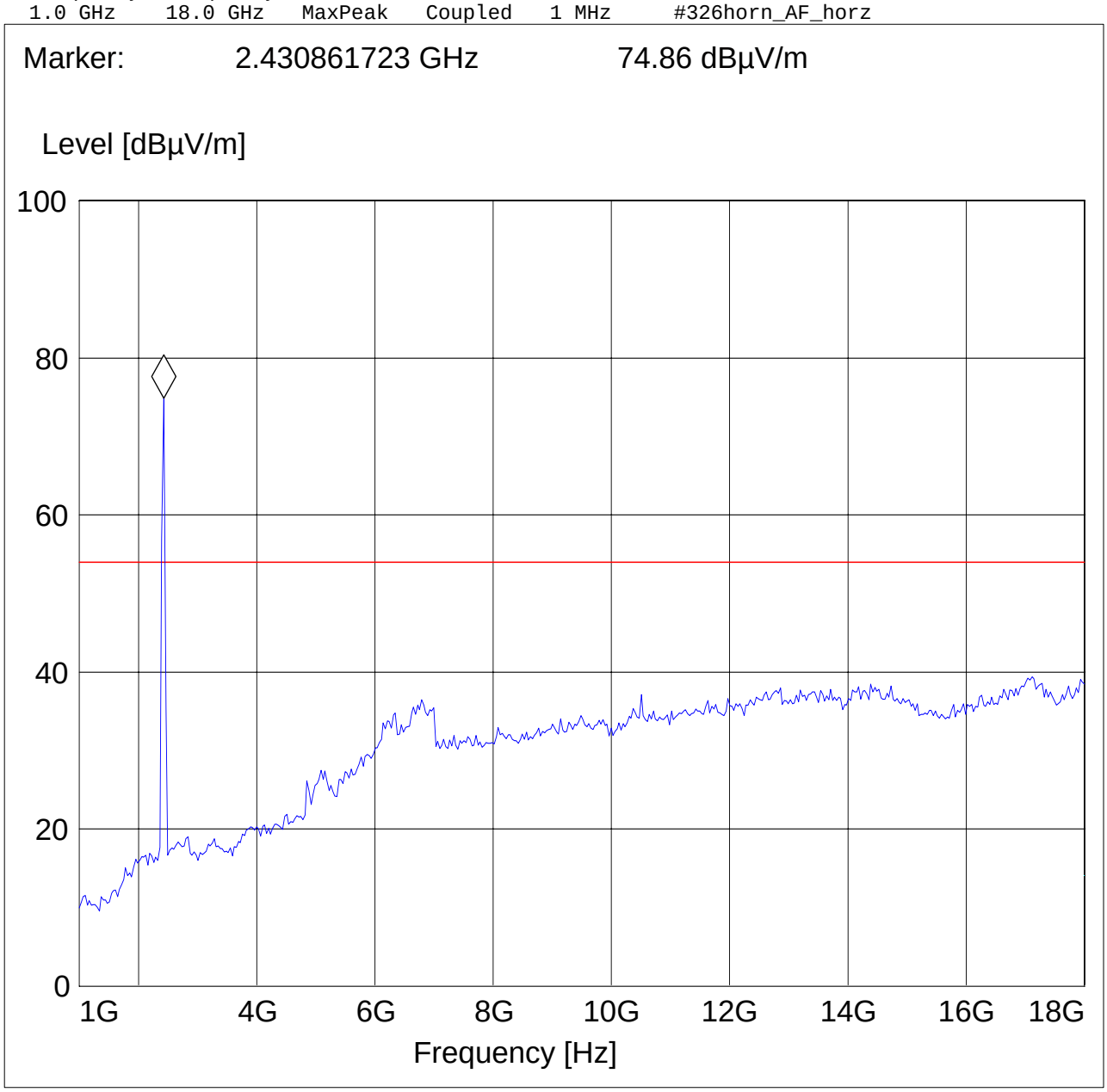
Note:The peak above the limit line is the carrier freq.Note:Peak Reading vs. Average limit

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

EUT / Description: Dell Siberia
Manufacturer: Broadcom
Test mode: 802.11g, ch 6, chain b
ANT Orientation: : V
EUT Orientation:: H
Test Engineer: Ed
Voltage: AC Adapter
Comments::

SWEEP TABLE: "FCC 15.407 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



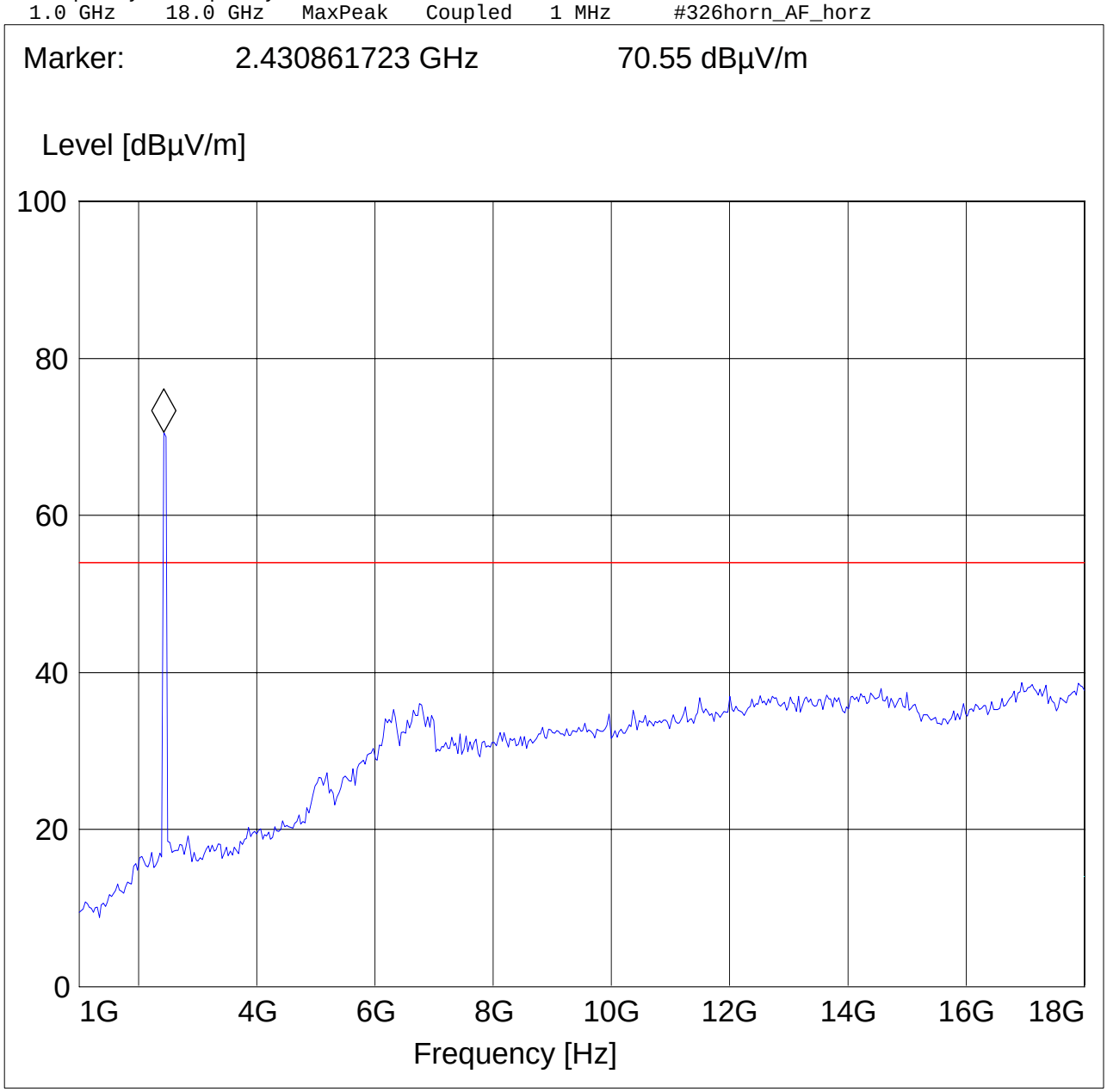
1-18GHz (2462MHz) Chain B

Note:The peak above the limit line is the carrier freq.Note:Peak Reading vs. Average limit

EUT / Description: Dell Siberia
Manufacturer: Broadcom
Test mode: 802.11g, ch 11, chain b
ANT Orientation: : V
EUT Orientation:: H
Test Engineer: Ed
Voltage: AC Adapter
Comments::

SWEEP TABLE: "FCC 15.407 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



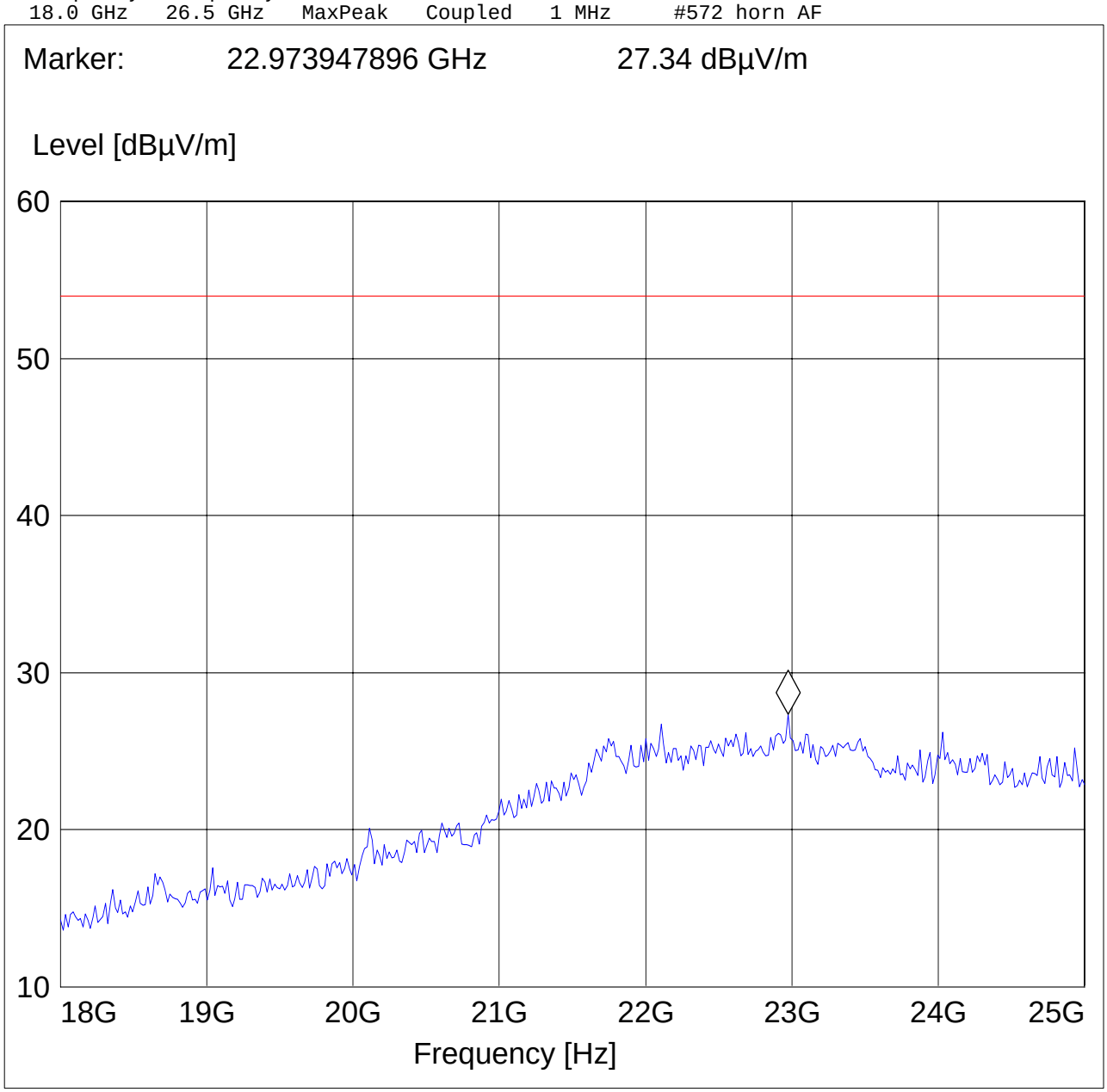
18-25GHz Chain B

Note: This plot is valid for low, mid, high channels (worst-case plot)Note: Peak Reading vs. Average limit

EUT: Dell Siberia
Customer: Broadcom
Test Mode: 802.11g, ch 1, chain b
ANT Orientation: V
EUT Orientation: H
Test Engineer: Ed
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



5.4 AC POWER LINE CONDUCTED EMISSIONS § 15.107/207

5.4.1 Limits

Technical specification: 15.107 / 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.

Limit

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

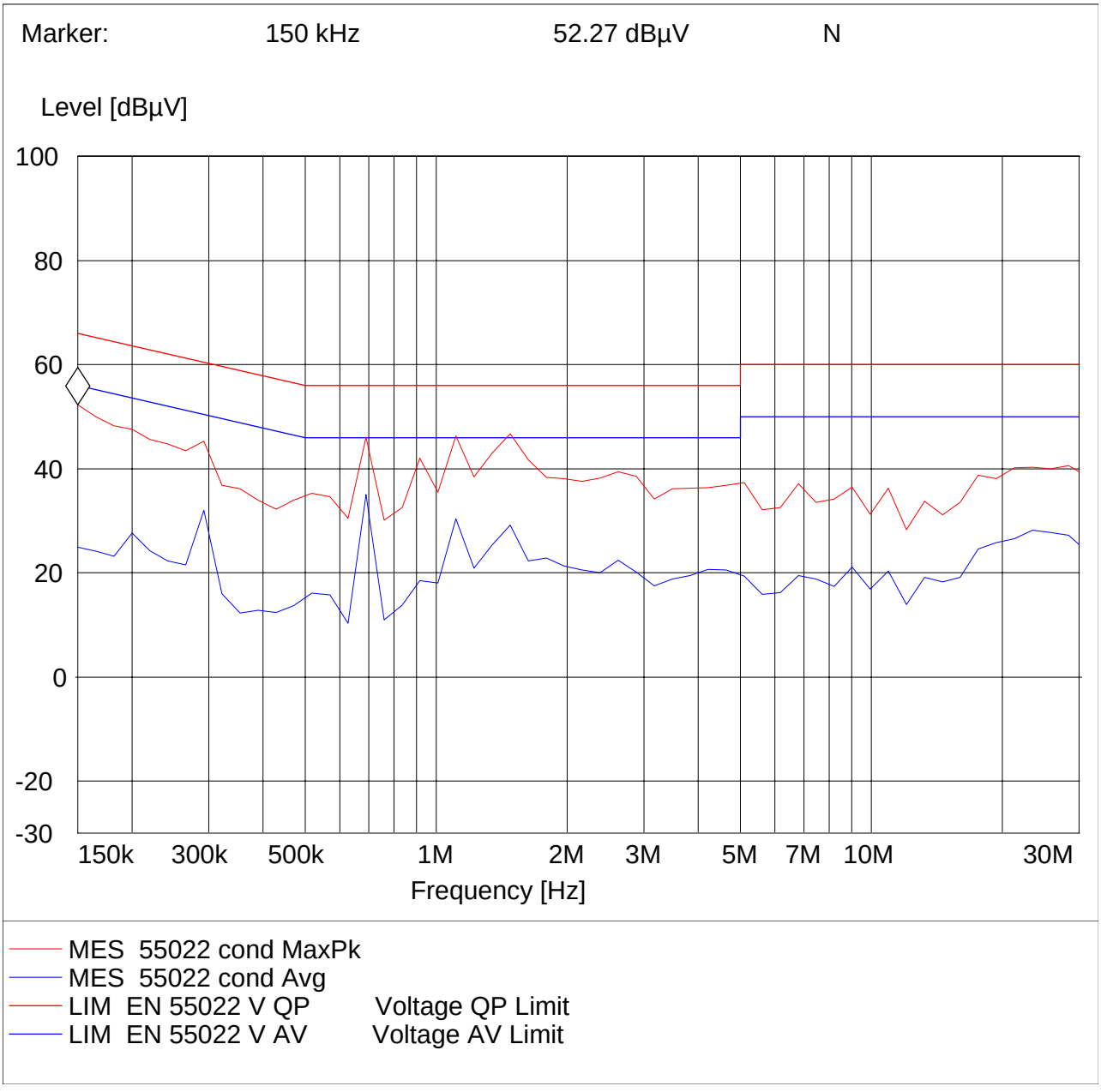
5.4.2 Results, Line:

```
EUT:                  Dell Siberia
Manufacturer:         Broadcom
Operating Condition:  WLAN
ANT Orientation::     CONDUCTED
EUT Orientation::     H
Test Engineer::       Peter Mu
Power Supply: :       AC Adaptor
Comments:  :          LINE
```

SWEEP TABLE: "55022 cond"

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

          Detector:         Mode:
```



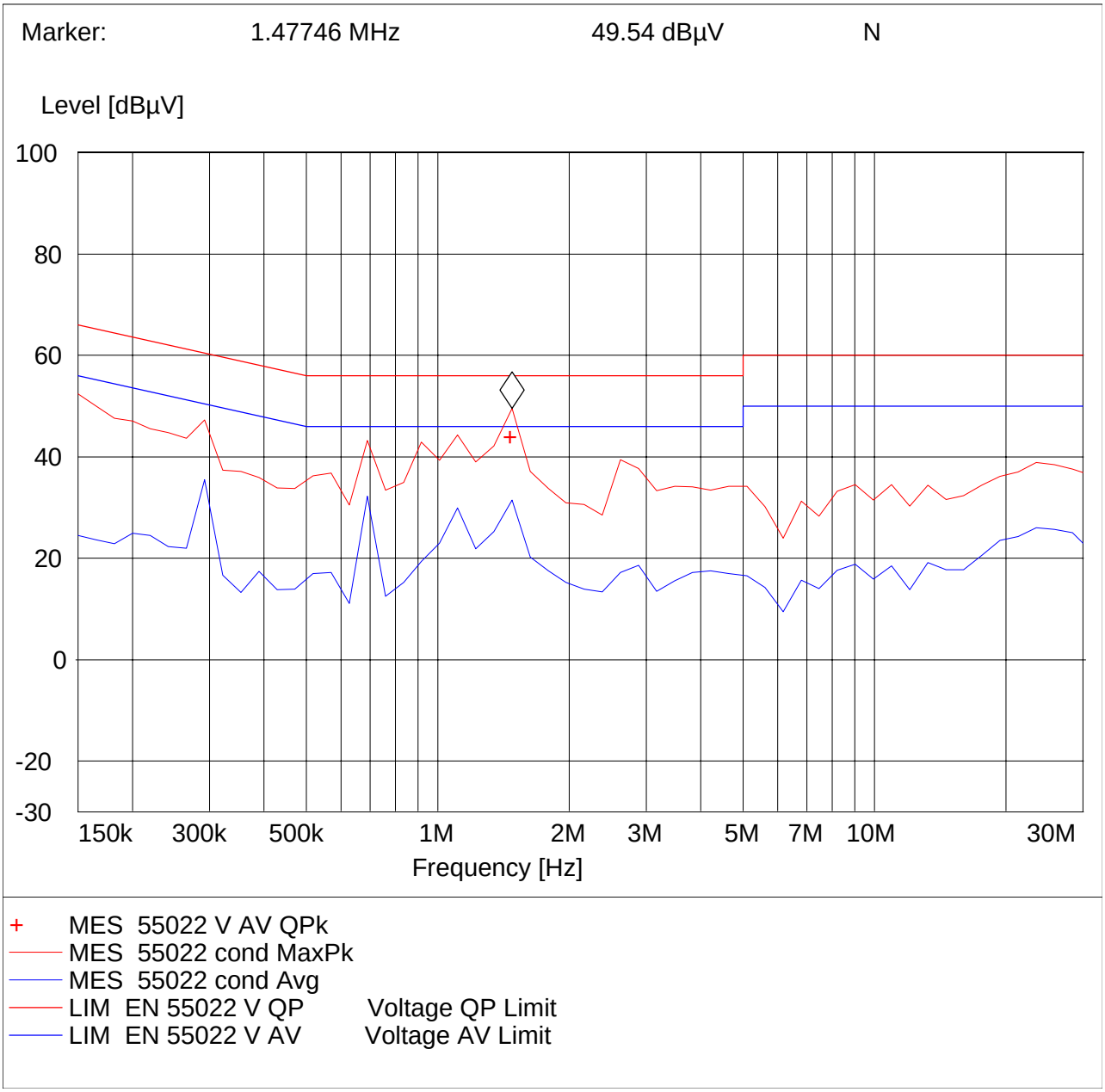
Neutral:

```
EUT:                  Dell Siberia
Manufacturer:         Broadcom
Operating Condition:  WLAN
ANT Orientation::     CONDUCTED
EUT Orientation::     H
Test Engineer::       Peter Mu
Power Supply: :       AC Adaptor
Comments:  :          N
```

SWEEP TABLE: "55022 cond"

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

          Detector:         Mode:
```



6 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
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	August 2008	1 year
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2008	1 year
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	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
08	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
09	Climatic Chamber	VT4004	Voltsch	G1115	May 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
12	Pre-Amplifier	JS4-00102600	Miteq	00616	May 2008	1 year
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2008	1 year
14	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008	May 2008	1 year
15	Universal Radio Comm. Tester	CMU 200	Rohde & Schwarz	832221/06	May 2008	1 year
16	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	May 2008	1 year
17	Loop Antenna	6512	EMCO	00049838	July 2008	2 years

7 BLOCK DIAGRAMS

Radiated Testing