FCC and IC Test Report

FCC Part 15.247 and RSS210 for DSSS systems

for the

Hand Held Products, Inc.

Portable Data Terminal with BT BGB203 module

Model Number: Dolphin 7850PLGE

FCC ID: HD57850LPGE

IC-ID: 1693B-7850GE

TEST REPORT #: EMC_HANDH_032_07001_7850_FCC15_247_1
DATE: April 27, 2007

ilac-MRA ACCREDITED Certificate # 2135.01

Bluetooth Qualification Test Facility (BQTF)

CTIA Authorized Testing Laboratory

FCC listed# 101450

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

Test Report Cover Sheet/Performance Test Data

TEST REPORT NUMBER: EMC_HAND_032_07001_7850_FCC15_247

EQUIPMENT MODEL NUMBER: Dolphin 7850LPGE

CERTIFICATION NO: 1693B-7850GE

MANUFACTURER : 1693B

TESTED TO RADIO STANDARDS SPECIFICATION NO. : RSS 210

OPEN AREA TEST SITE INDUSTRY CANADA NUMBER: **3463**

FREQUENCY RANGE (or fixed frequency): 2400MHz to 2483.5MHz

R.F. POWER IN WATTS: 0.257W conducted

OCCUPIED BANDWIDTH (99% BW): 18.096 MHz

TYPE OF MODULATION: OFDM

EMISSION DESIGNATOR (TRC-43): **18M0G7D**

ANTENNA INFORMATION: Integral

TRANSMITTER SPURIOUS (worst case): 40.50 dBuV/m @ 17.319GHz

RECEIVER SPURIOUS (worst case): 50.19 dBuV/m @ 1.977955GHz

ATTESTATION:
DECLARATION OF COMPLIANCE: I declare that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned Industry Canada standard(s); and that the equipment identified in this application has been subjected to all the applicable test conditions specified in the Industry Canada standards and all of the requirements of the standard have been met.

Signature:
Val Tankov
Project Engineer
CETECOM Inc.
411 Dixon Landing Road
Milpitas, CA 95035

Date: 2007-04-27

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 #
Hand Held Products, Inc.	**Portable Data Terminal with BT BGB203 module**	**Dolphin 7850LPGE**

Technical responsibility for area of testing:

Date	Section	Name	Signature
April 27, 2007	**EMC & Radio**	Piter Mu **(Project Engineer)**	Peter Mu I have reviewed this document

Responsible for test report and project leader:

Date	Section	Name	Signature
April 27, 2007	**EMC & Radio**	**Val Tankov (Project Engineer)**	Ivaylo Tankov I am the author of this document

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the SAR Assessment Report

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

2.2 Identification of the Client

Applicant's Name:	Hand Held Products, Inc.
Address:	700 Visions Drive, P.O.Box 208 Skaneateles Falls, New York, USA
Contact Person:	Mandana Mobasher
Phone No.	+1 803 835 8190
Fax:	+1 803 835 8097
e-mail:	mandana.mobasher@handheld.com

2.3 Identification of the Manufacturer

Manufacturer's Name:	Hand Held Products, Inc.
Manufacturer's Address:	700 Visions Drive, P.O.Box 208, Skaneateles Falls, New York USA

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Product Type	Portable Data Terminal with BT BGB203 module
Marketing Name:	Dolphin 7850PLGE
Model No:	Dolphin 7850LPGE
FCC-ID:	HD57850LPGE
IC-ID :	1693B-7850GE
Frequency Range:	2400MHz – 2483.5MHz
Number of Channels	11
Type(s) of Modulation:	DSSS, OFDM
Antenna Type:	Integral
Output Power[1]:	24.10 dBm (0.257W) Conducted WLAN 802.11g

3.2 Identification of Accessory equipment

AE #	TYPE	MANF.	MODEL	SERIAL #
1	AC/DC ADAPTER	DVL	DSA-0151D-09.5	41206346-01E

Subject Of Investigation

All testing was performed on the product referred to in Section 3 as EUT.

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. The maximization of portable equipment is conducted in accordance with ANSI C63.4.

4 Measurements

4.1 SPECTRUM BANDWIDTH OF DSSS SYSTEM §15.247(a) (2)

6 dB bandwidth

TEST CONDITIONS			6 dB BANDWIDTH (kHz)		
Frequency (MHz)			2412	2437	2462
802.11g	T_{nom}(23)°C	V_{nom}(9.5) VDC	13 927	16 533	16 583

TEST CONDITIONS			20 dB BANDWIDTH (kHz)		
Frequency (MHz)			2412	2437	2462
802.11g	T_{nom}(23)°C	V_{nom}(9.5) VDC	18 096	18 096	17 915

4.1.1 Limit

SUBCLAUSE §15.247(a) (2)

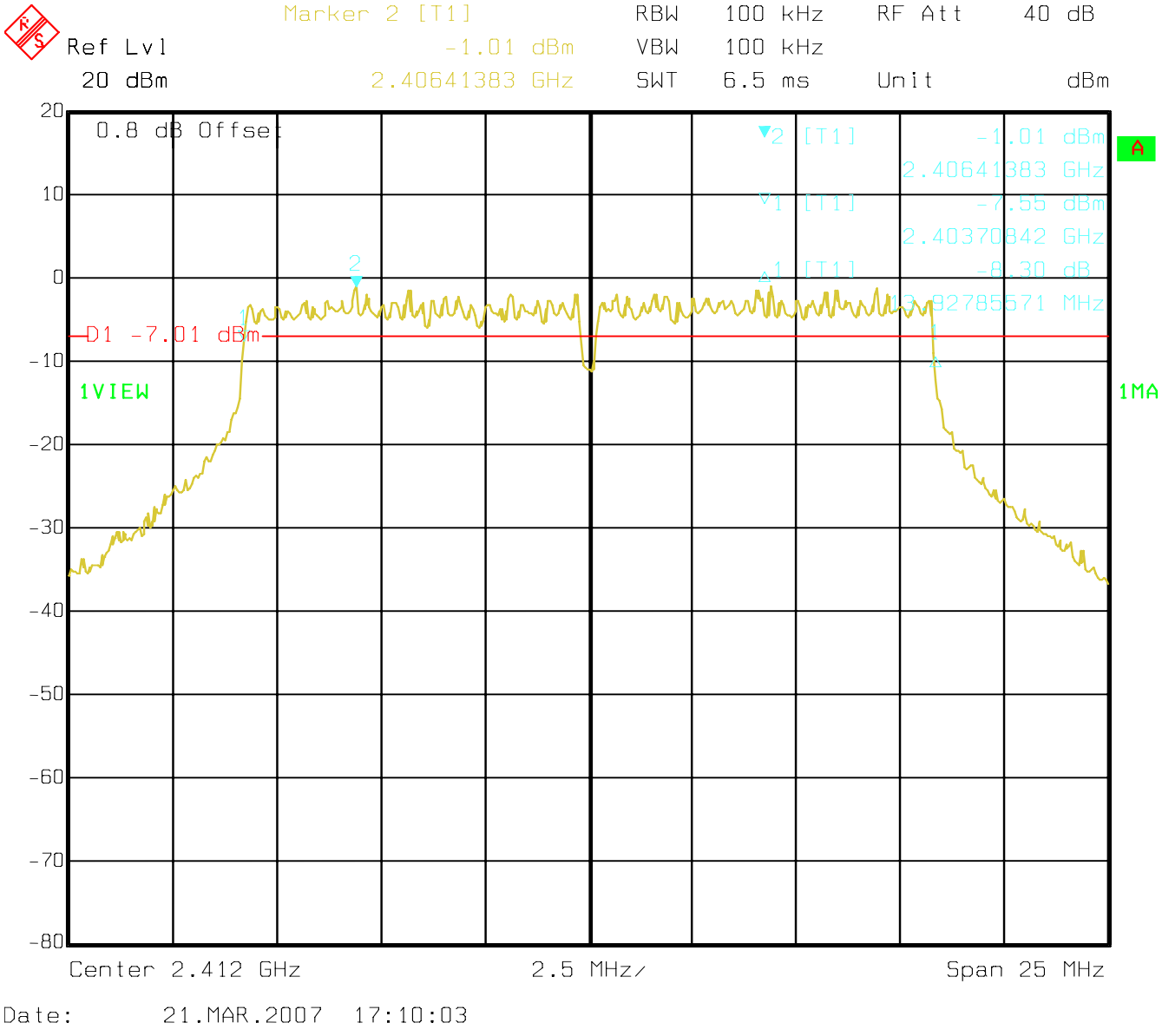
The minimum 6dB bandwidth shall be at least 500 KHz

4.1.2 Results

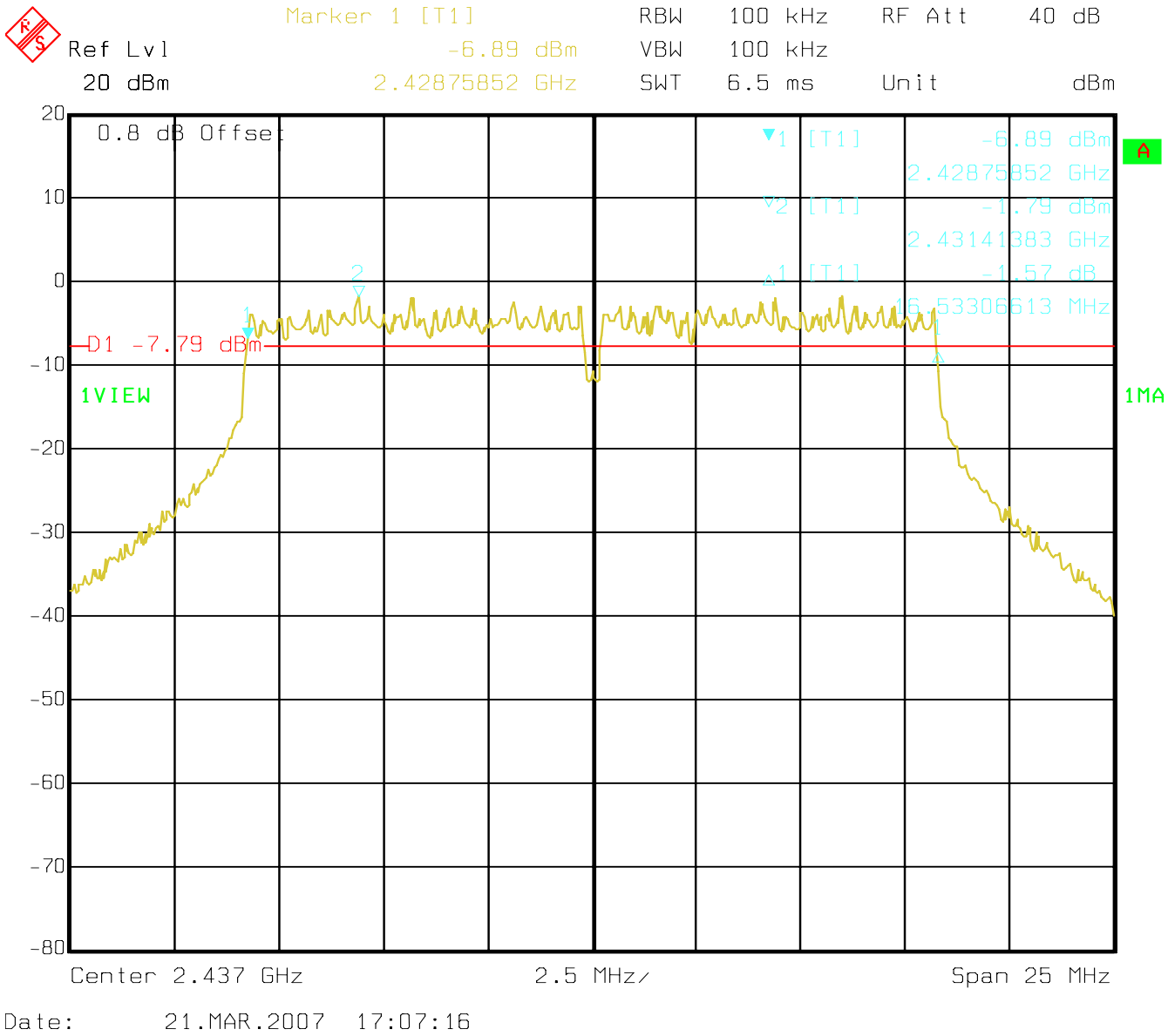
SPECTRUM BANDWIDTH **§15.247(a) (2)**

6 dB bandwidth

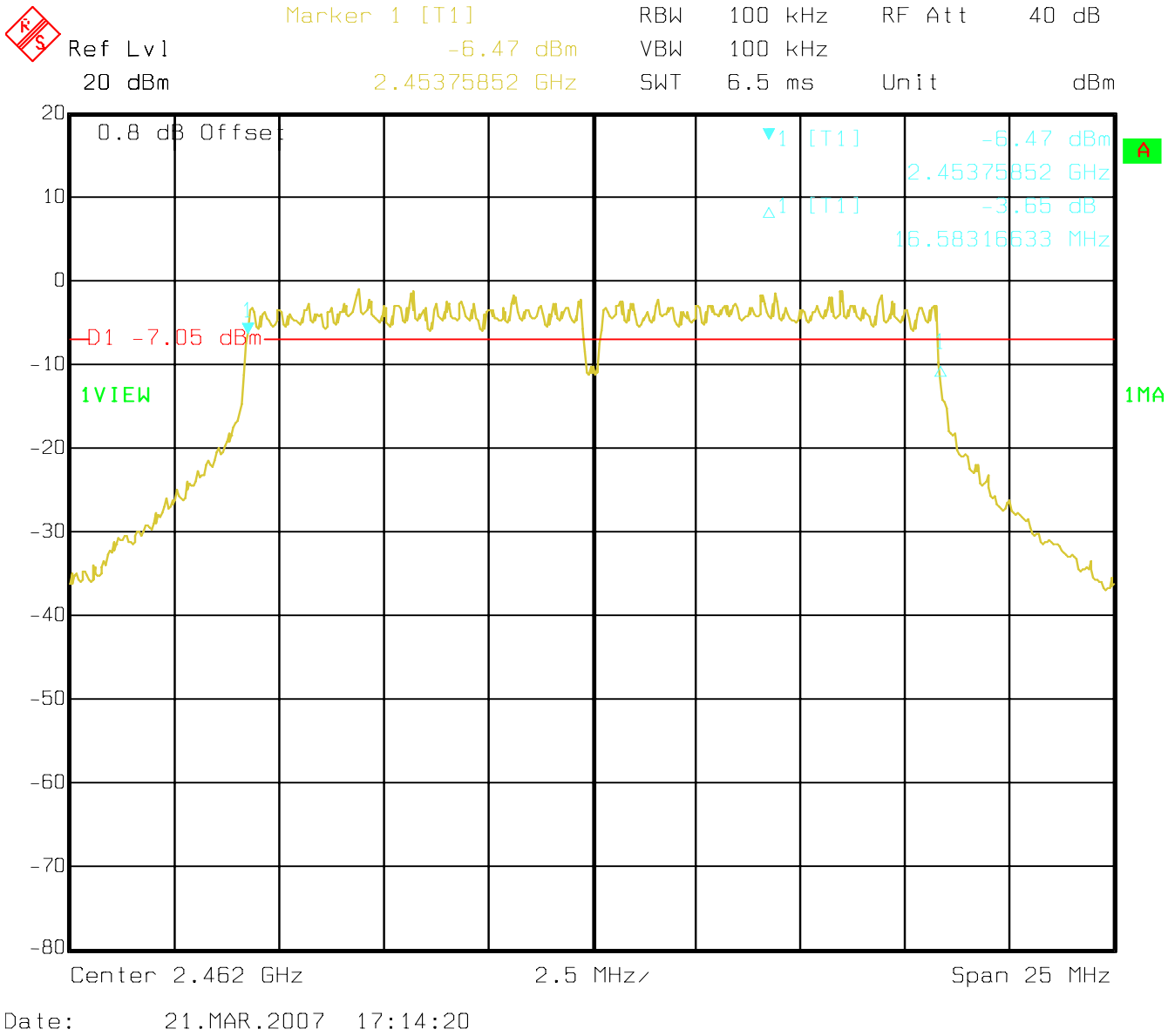
Lowest Channel: 802.11g 2412MHz



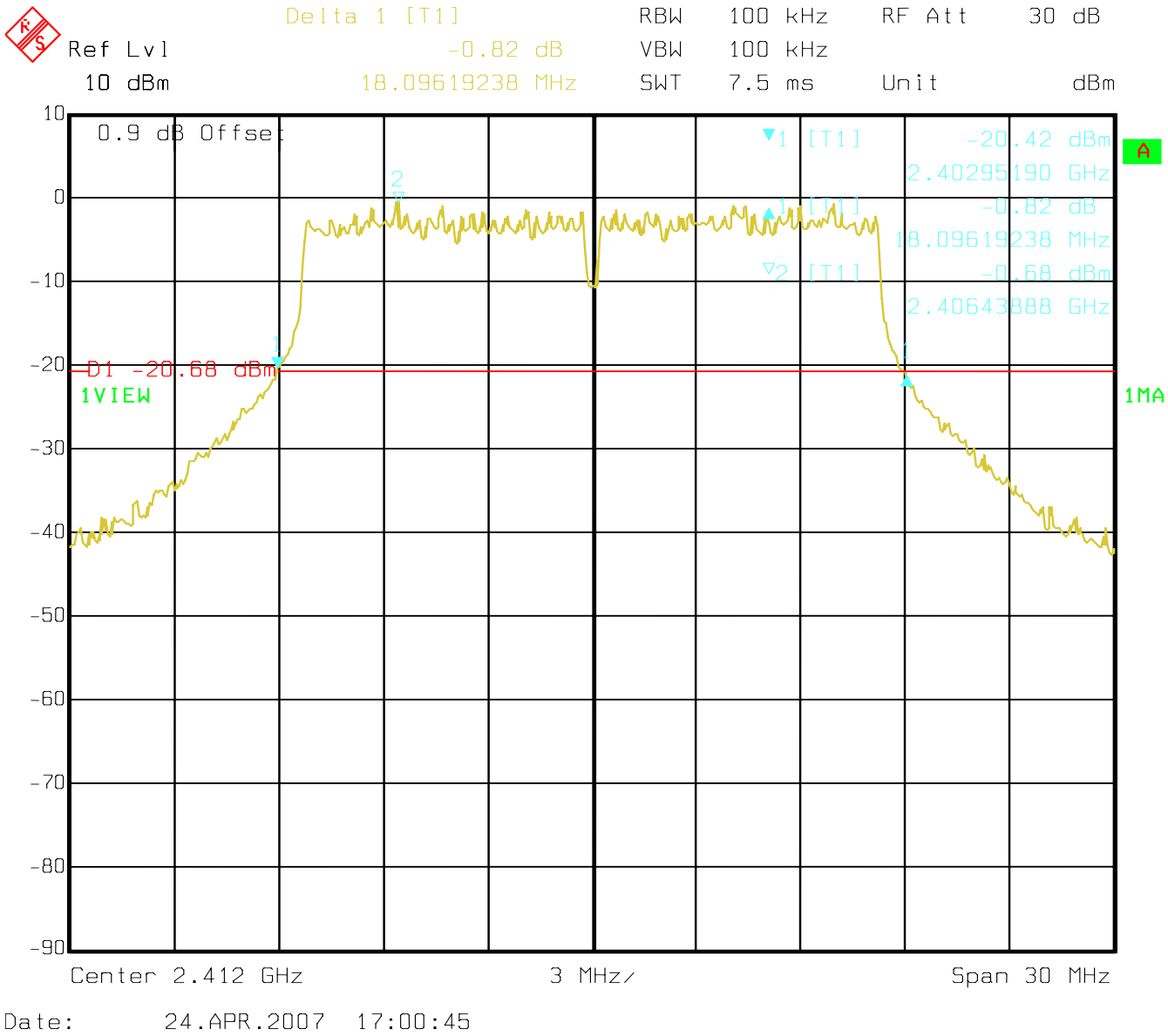
SPECTRUM BANDWIDTH **§15.247(a) (2)**
6 dB bandwidth
Mid Channel: 802.11g 2437MHz



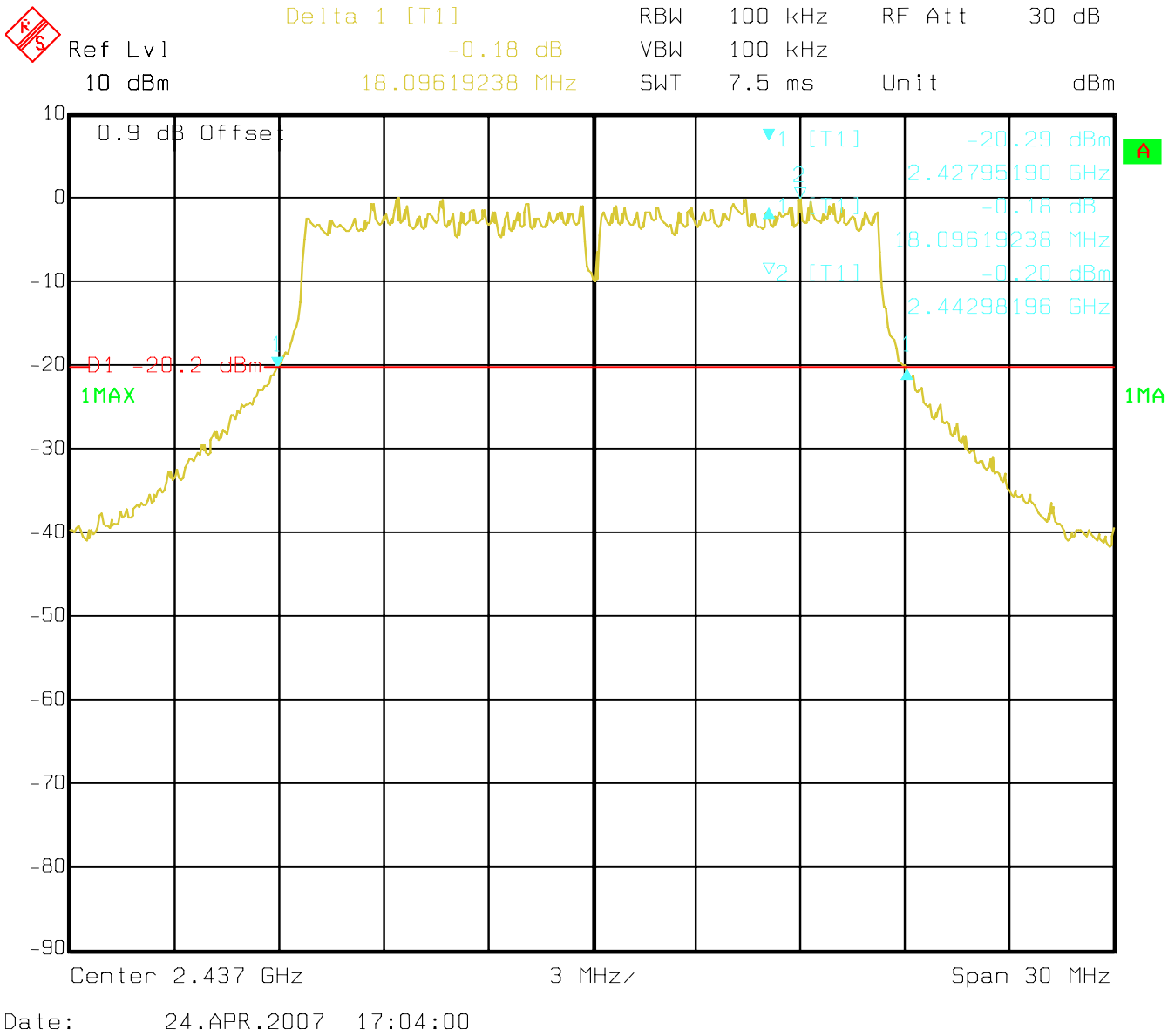
SPECTRUM BANDWIDTH **§15.247(a) (2)**
6 dB bandwidth
Highest Channel: 802.11g 2462MHz



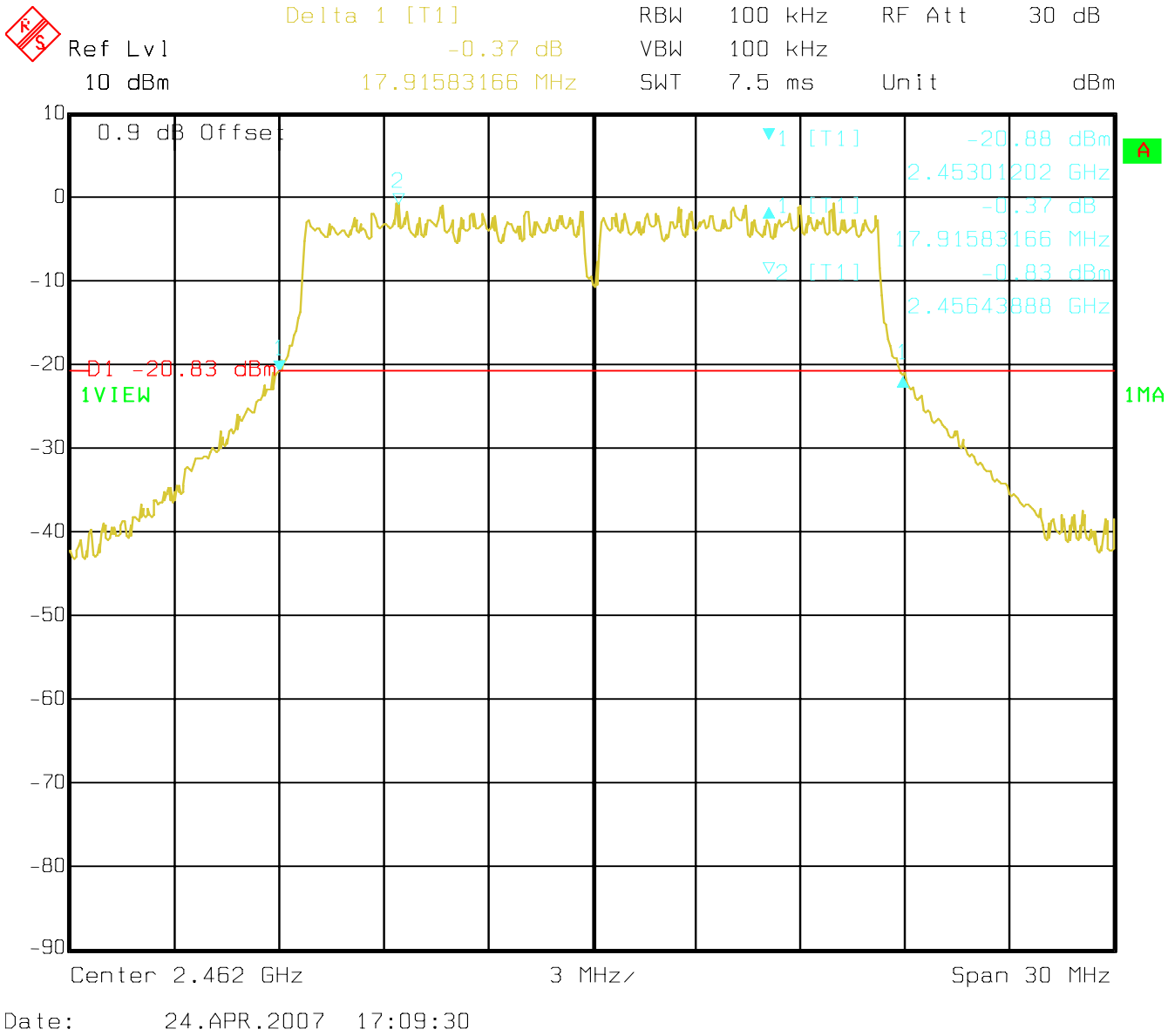
SPECTRUM BANDWIDTH
20 dB bandwidth
Lowest Channel: 802.11g 2412MHz



SPECTRUM BANDWIDTH
20 dB bandwidth
Mid Channel: 802.11g 2437MHz



SPECTRUM BANDWIDTH
20 dB bandwidth
Highest Channel: 802.11g 2462MHz



4.2 MAXIMUM PEAK OUTPUT POWER (Conducted) § 15.247 (b) (1)

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)			
Frequency (MHz)			2412	2441	2462
T_{nom}(23)°C	V_{nom}(9.5) VDC	802.11g	21.19	21.92	21.46
Measurement uncertainty		±0.5dBm			

RBW / VBW: 10MHz

TEST CONDITIONS		CORRECTED OUTPUT POWER (dBm)			
Frequency (MHz)			2412	2441	2462
Correction factor (dB)			1.43	2.18	2.19
T_{nom}(23)°C	V_{nom}(9.5) VDC	802.11g	22.62	24.10	23.65
Measurement uncertainty		±0.5dBm			

Note: Since maximum available BW on Spectrum Analyzer is 10MHz, if 6dB spectrum BW is more than 10MHz, correction of the measured output power has been made.

4.2.1 Limit

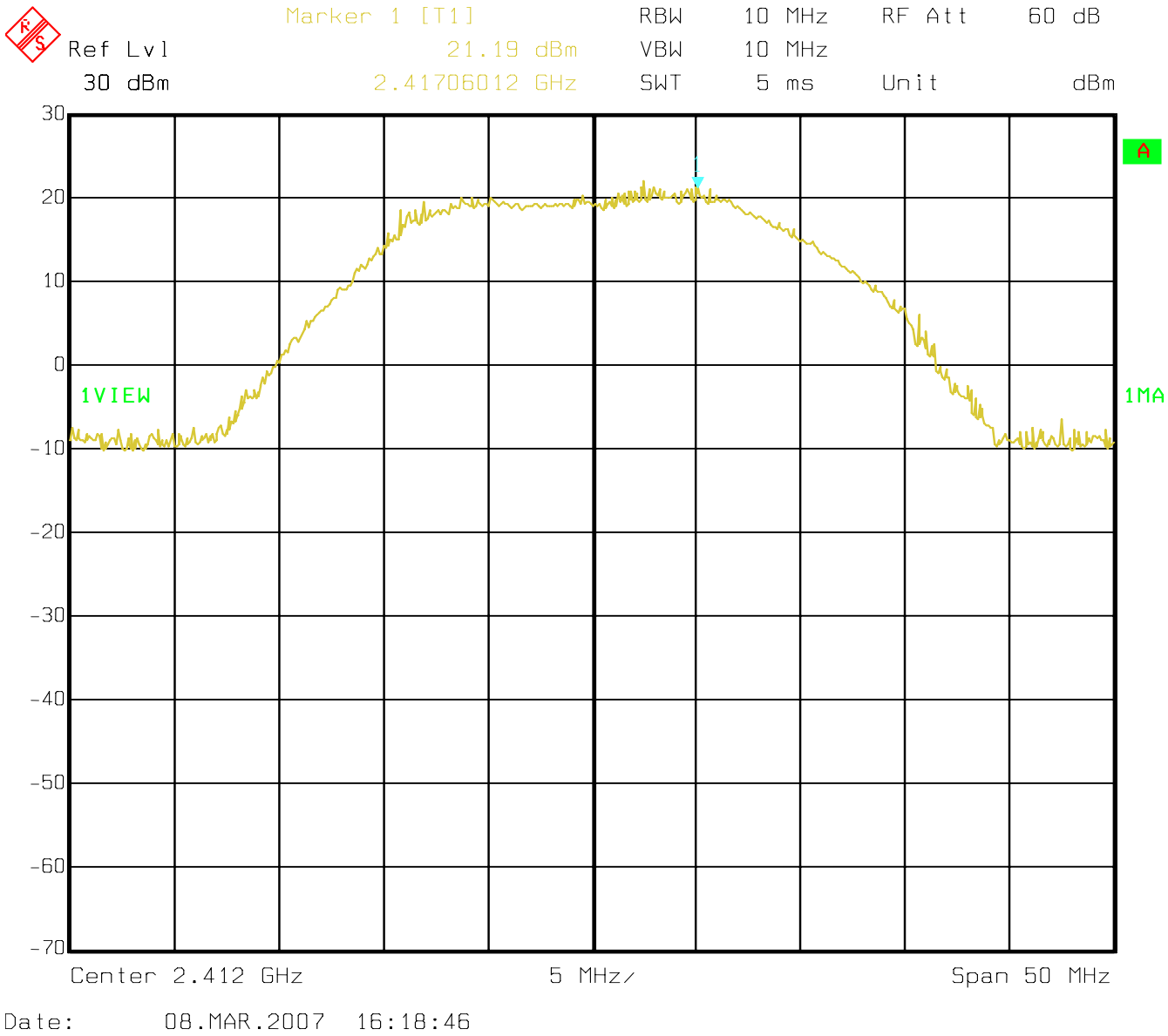
SUBCLAUSE § 15.247 (b) (1)

Frequency range	RF power output
2400-2483.5 MHz	1.0 Watt / 30dBm

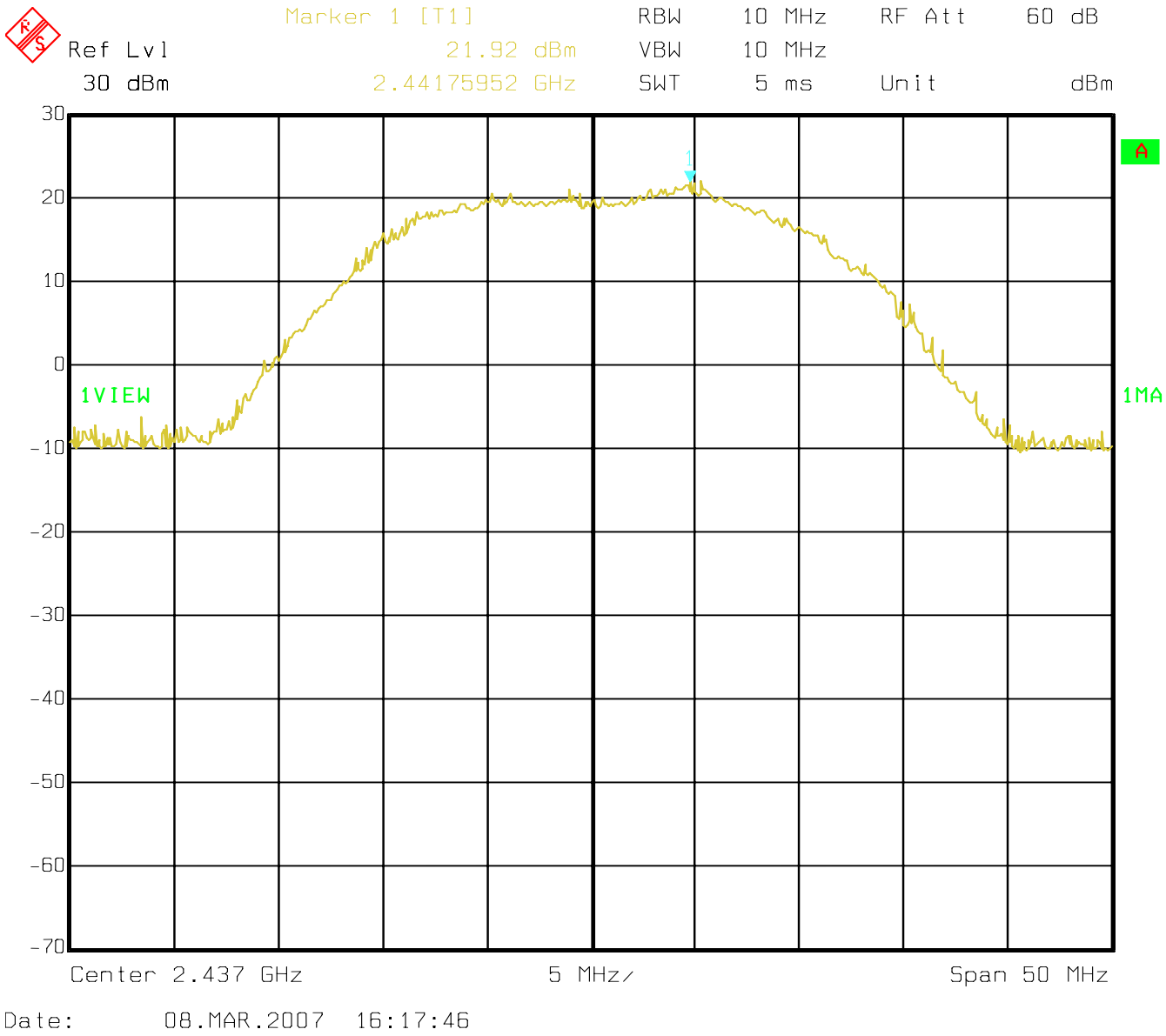
4.2.2 Results

PEAK OUTPUT POWER (CONDUCTED) §15.247 (b) (1)

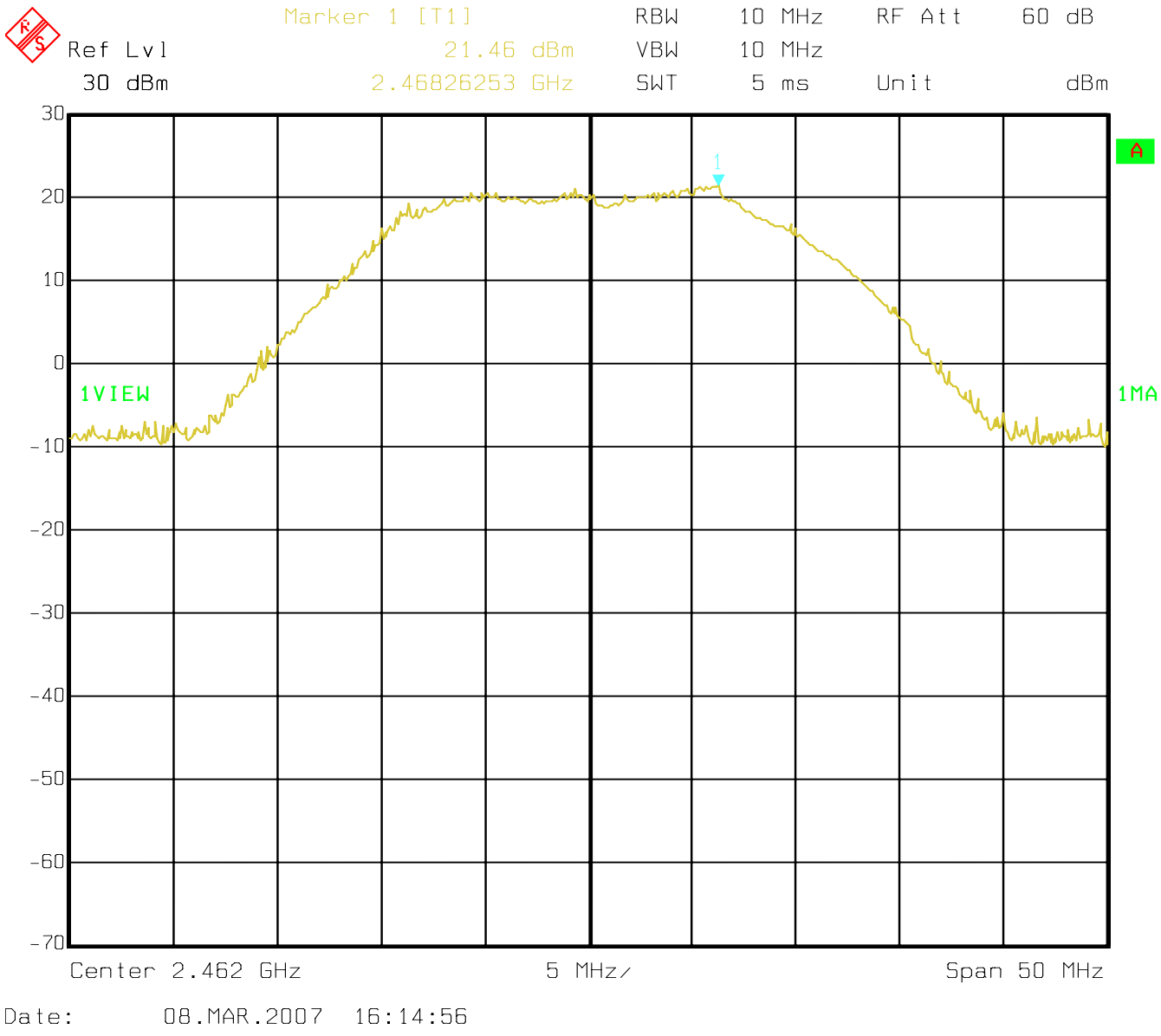
Lowest Channel: 802.11g 2412MHz



PEAK OUTPUT POWER (CONDUCTED) **§15.247 (b)**
Mid Channel: 802.11g 2437MHz



PEAK OUTPUT POWER (CONDUCTED) **§15.247 (b)**
Highest Channel: 802.11g 2462MHz



4.3 POWER SPECTRAL DENSITY §15.247 (d)

TEST CONDITIONS			POWER SPECTRAL DENSITY (dBm)		
	Frequency (MHz)		2412	2437	2462
802.11g	T_{nom}(23) °C	V_{nom}(9.5) VDC	-16.62	-15.43	-15.95

4.3.1 Limit

SUBCLAUSE §15.247(d)

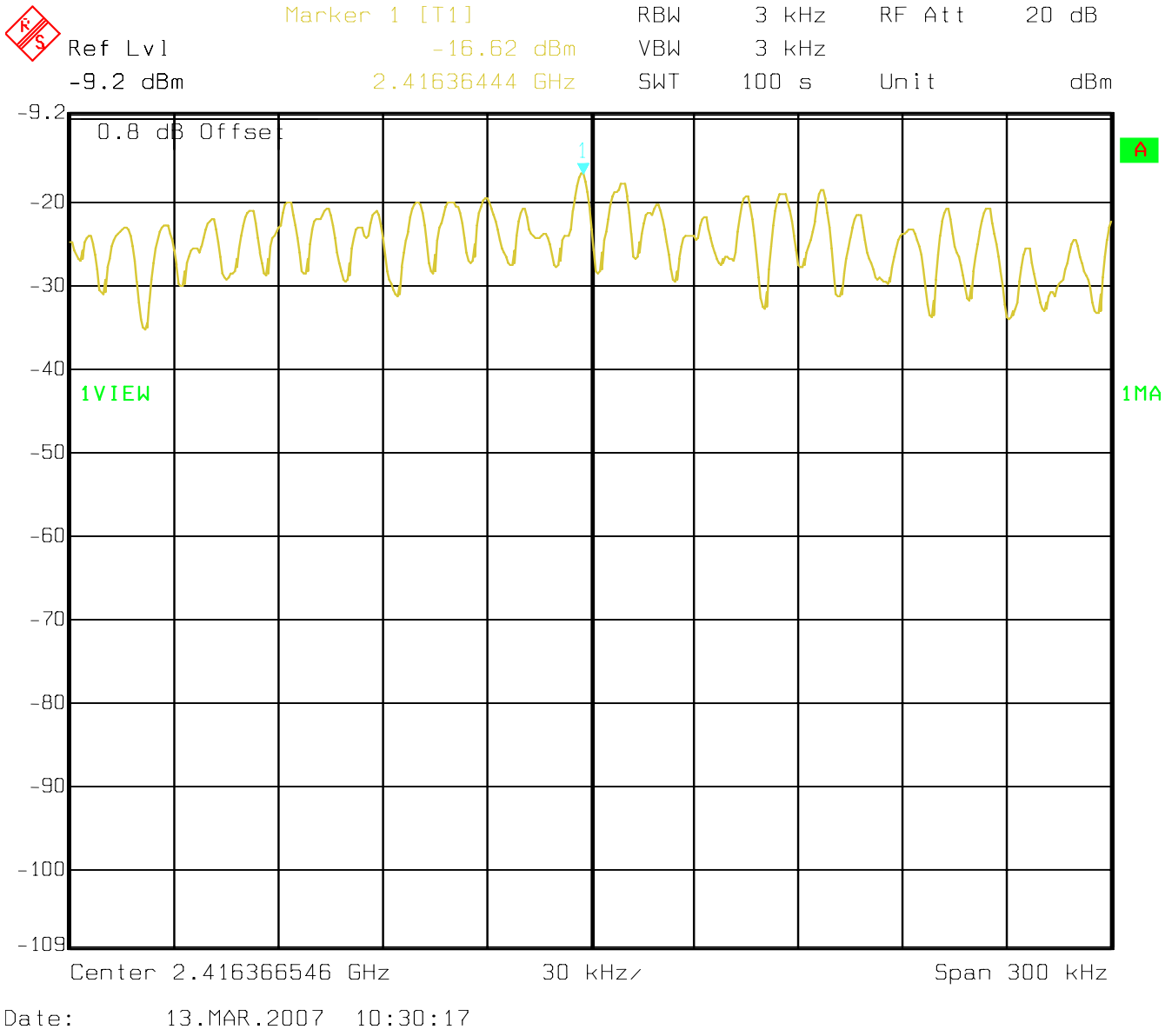
The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band

ANALYZER SETTINGS: RBW=3KHz, VBW=3KHz

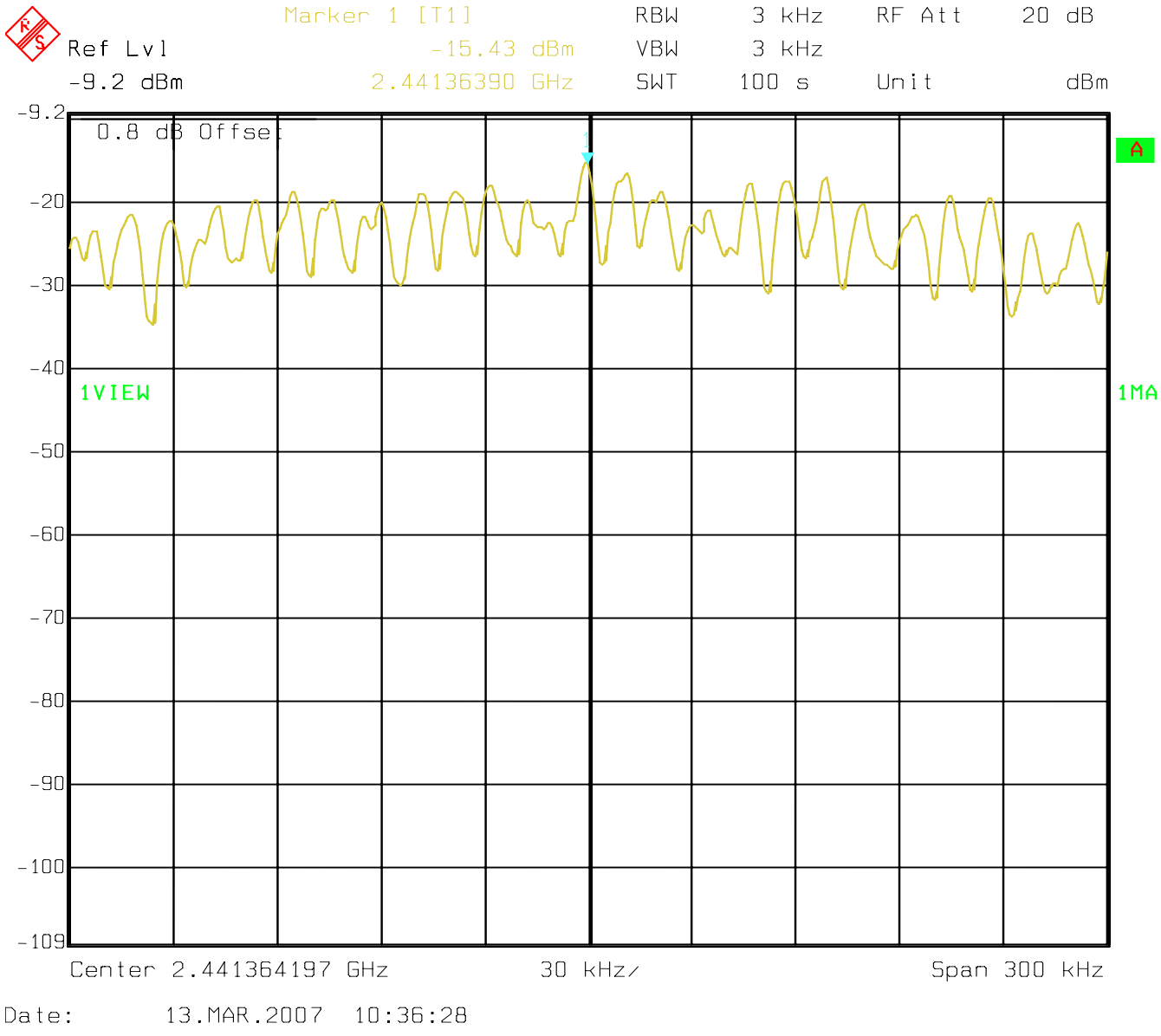
4.3.2 Results

POWER SPECTRAL DENSITY **§15.247(d)**

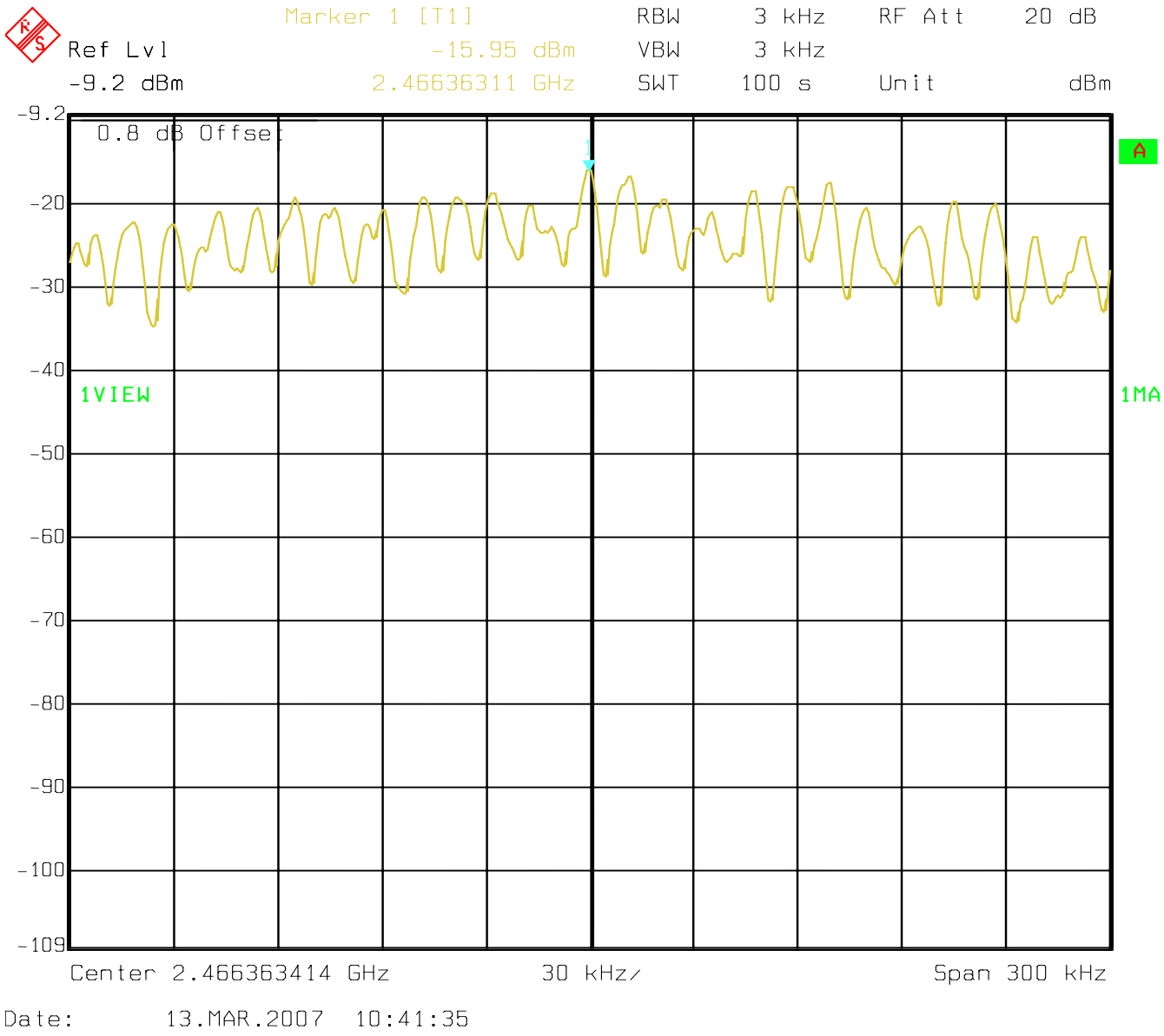
Lowest Channel: 802.11g (2412MHz)



POWER SPECTRAL DENSITY **§15.247(d)**
Mid Channel: 802.11g (2437MHz)



POWER SPECTRAL DENSITY **§15.247(d)**
Highest Channel: 802.11g (2462MHz)



4.4 RESTRICTED BAND EDGE COMPLIANCE RADIATED §15.247/15.205

4.4.1 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.

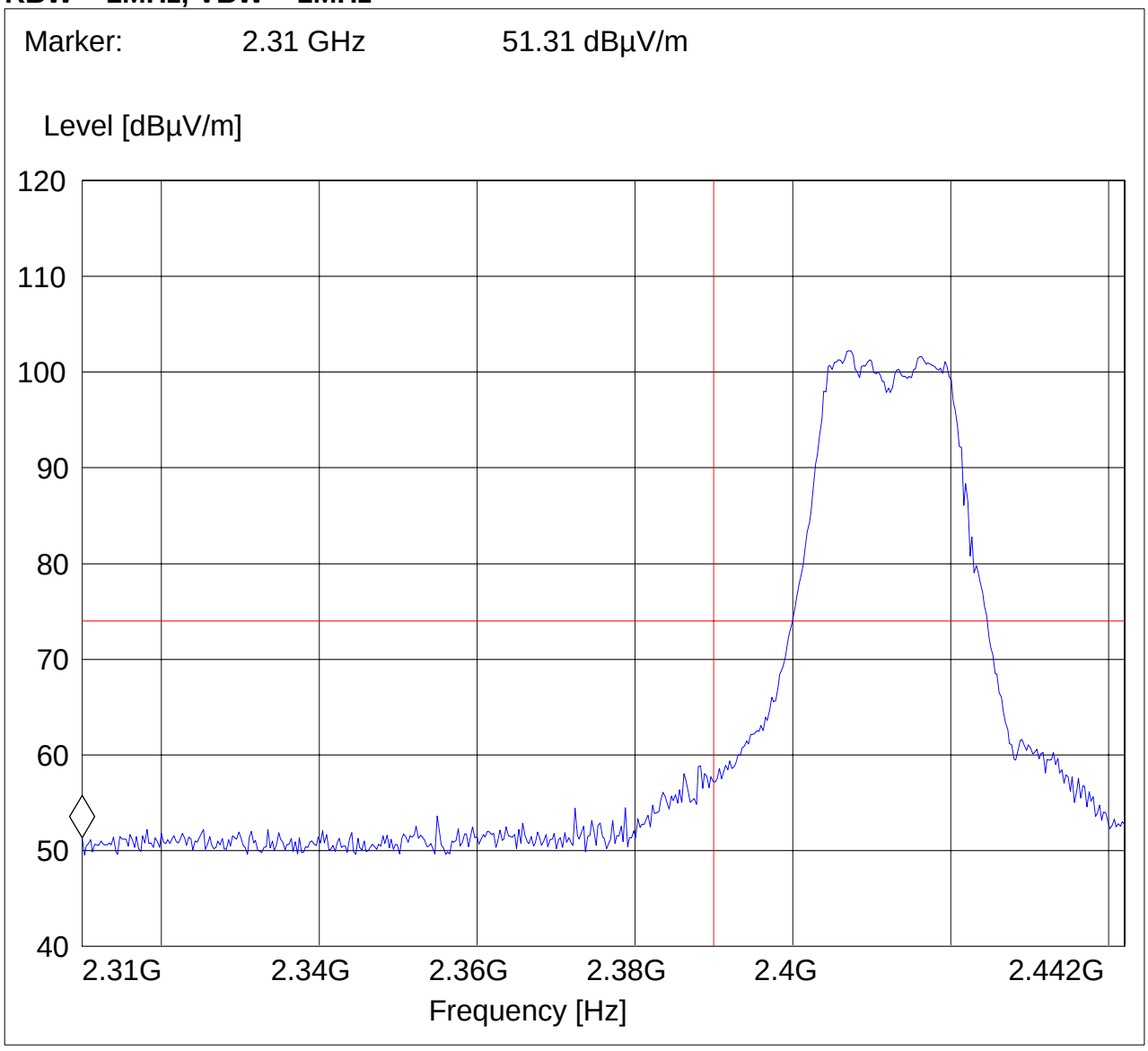
4.4.2 Results Lower Restricted Band 2310 MHz to 2390 MHz
802.11g (2412MHz) PEAK

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

EUT:	7850
Customer:	HHP
Test Mode:	802.11g, Ch.1, 54Mb/s
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Val Tankov
Voltage:	AC Adapter
Comments:	FCC Ch.(1-11) COUNTRY CODE

SWEEP TABLE: "FCC15.247 LBE_PK"

RBW = 1MHz, VBW = 1MHz



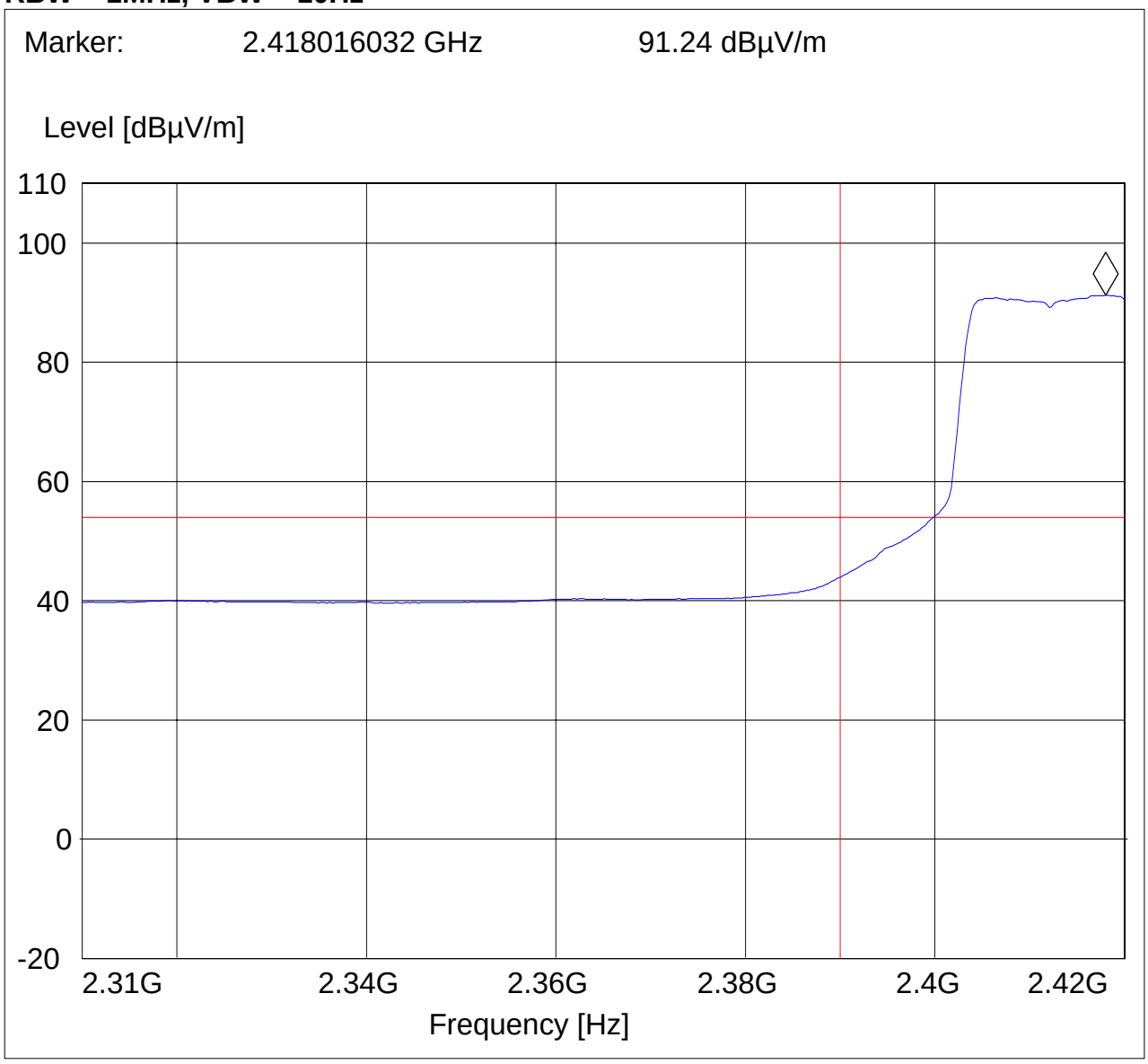
802.11g (2412MHz) AVG

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

EUT:	7850
Customer:	HHP
Test Mode:	802.11g, Ch.1, 54Mb/s
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Val Tankov
Voltage:	AC Adapter
Comments:	FCC Ch.(1-11) COUNTRY CODE

SWEEP TABLE: "FCC15.247 LBE_AVG"

RBW = 1MHz, VBW = 10Hz



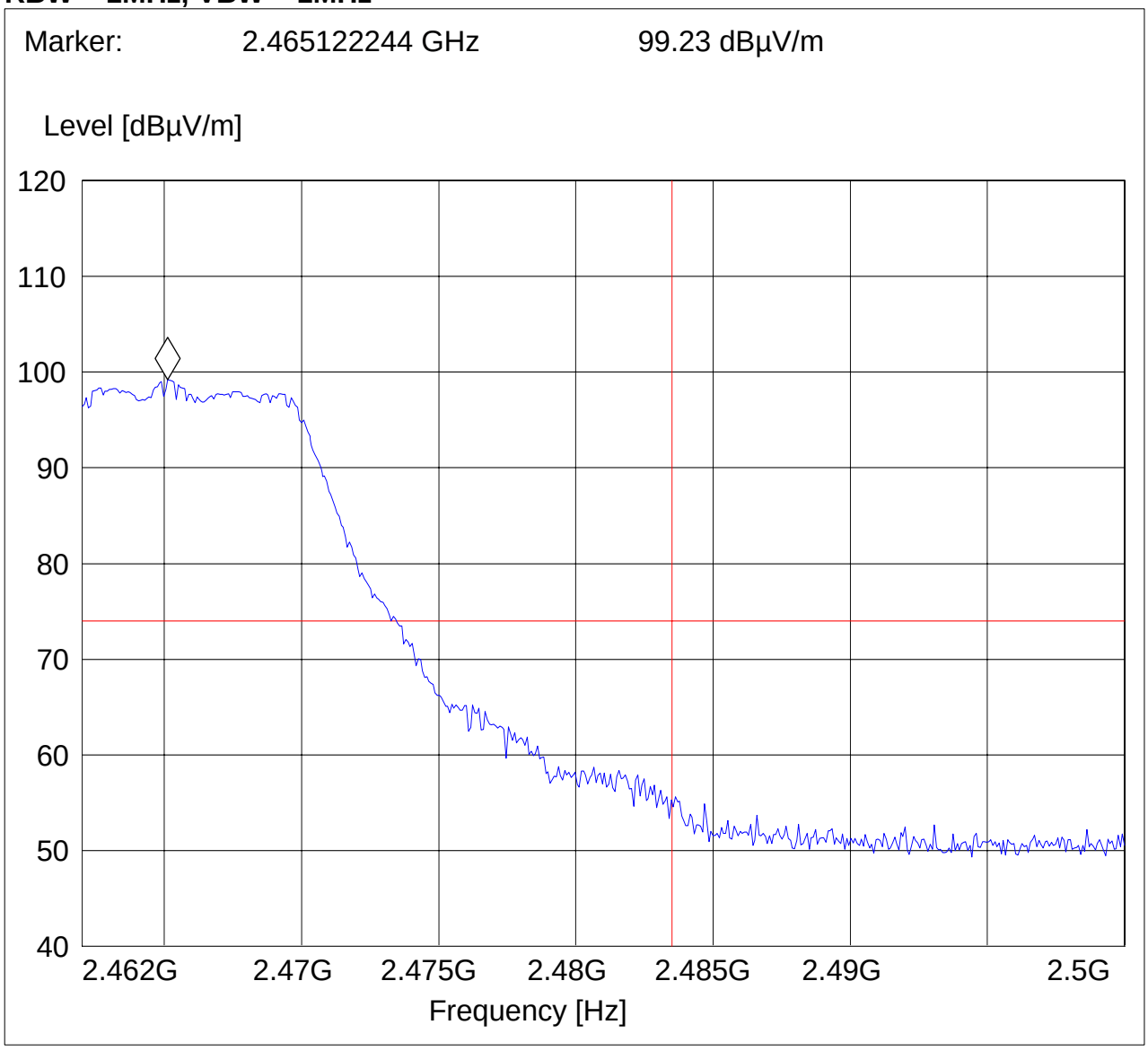
4.4.3 Results Upper Restricted Band 2483.5 MHz to 2500 MHz
802.11g (2462MHz) PEAK

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

EUT:	7850
Customer:	HHP
Test Mode:	802.11g, Ch.11, 54Mb/s
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Val Tankov
Voltage:	AC Adapter
Comments:	FCC Ch.(1-11) COUNTRY CODE

SWEEP TABLE: "FCC15.247 HBE_PK"

RBW = 1MHz, VBW = 1MHz



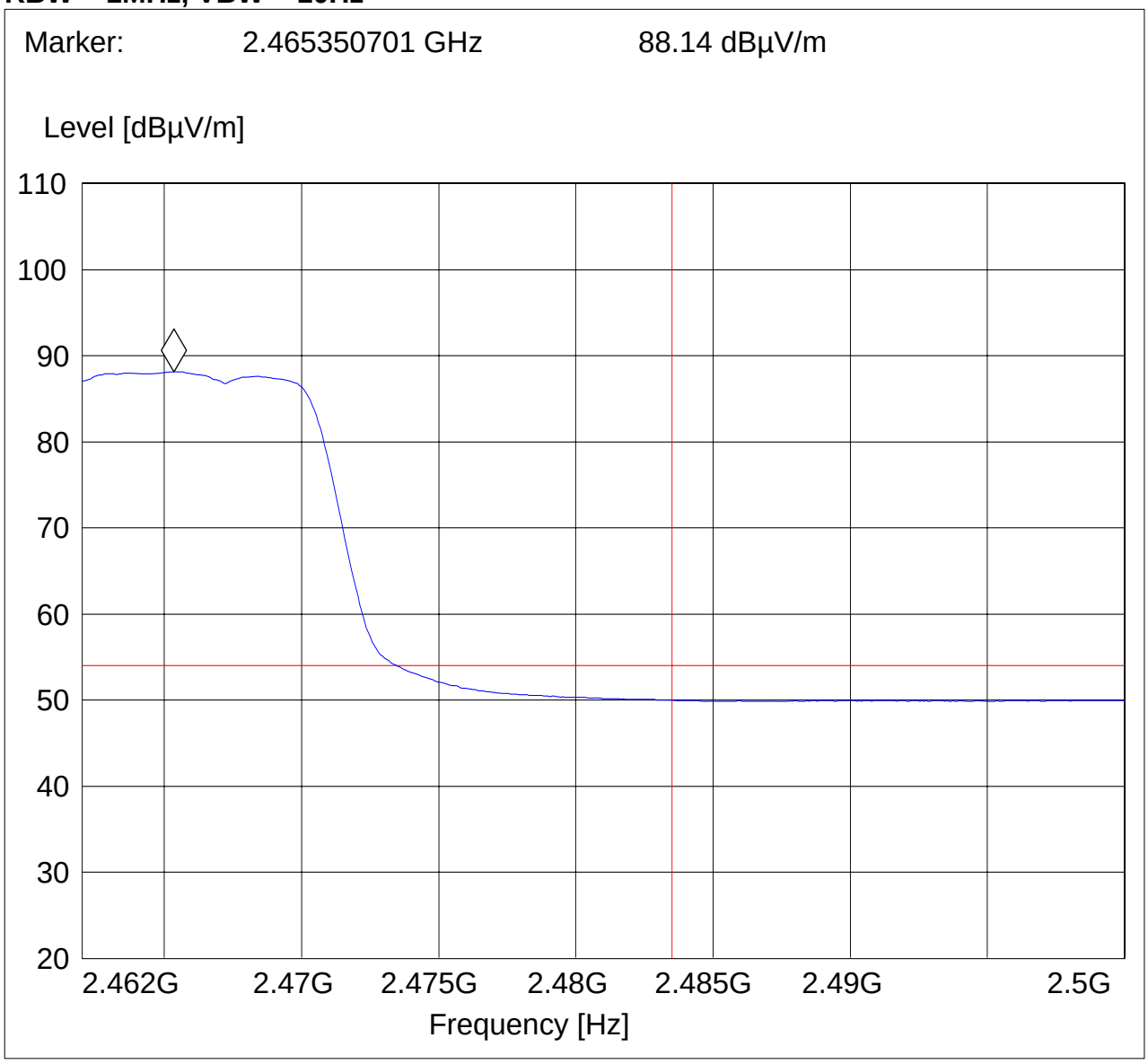
802.11g (2462MHz) AVG

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

EUT:	7850
Customer:	HHP
Test Mode:	802.11g, Ch.11, 54Mb/s
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Val Tankov
Voltage:	AC Adapter
Comments:	FCC Ch.(1-11) COUNTRY CODE

SWEEP TABLE: "FCC15.247 HBE_AVG"

RBW = 1MHz, VBW = 10Hz



4.5 TRANSMITTER SPURIOUS EMISSIONS RADIATED § 15.247/15.205/15.209

4.5.1 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

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

4.5.2 RESULTS

30MHz – 1GHz; Antenna: vertical

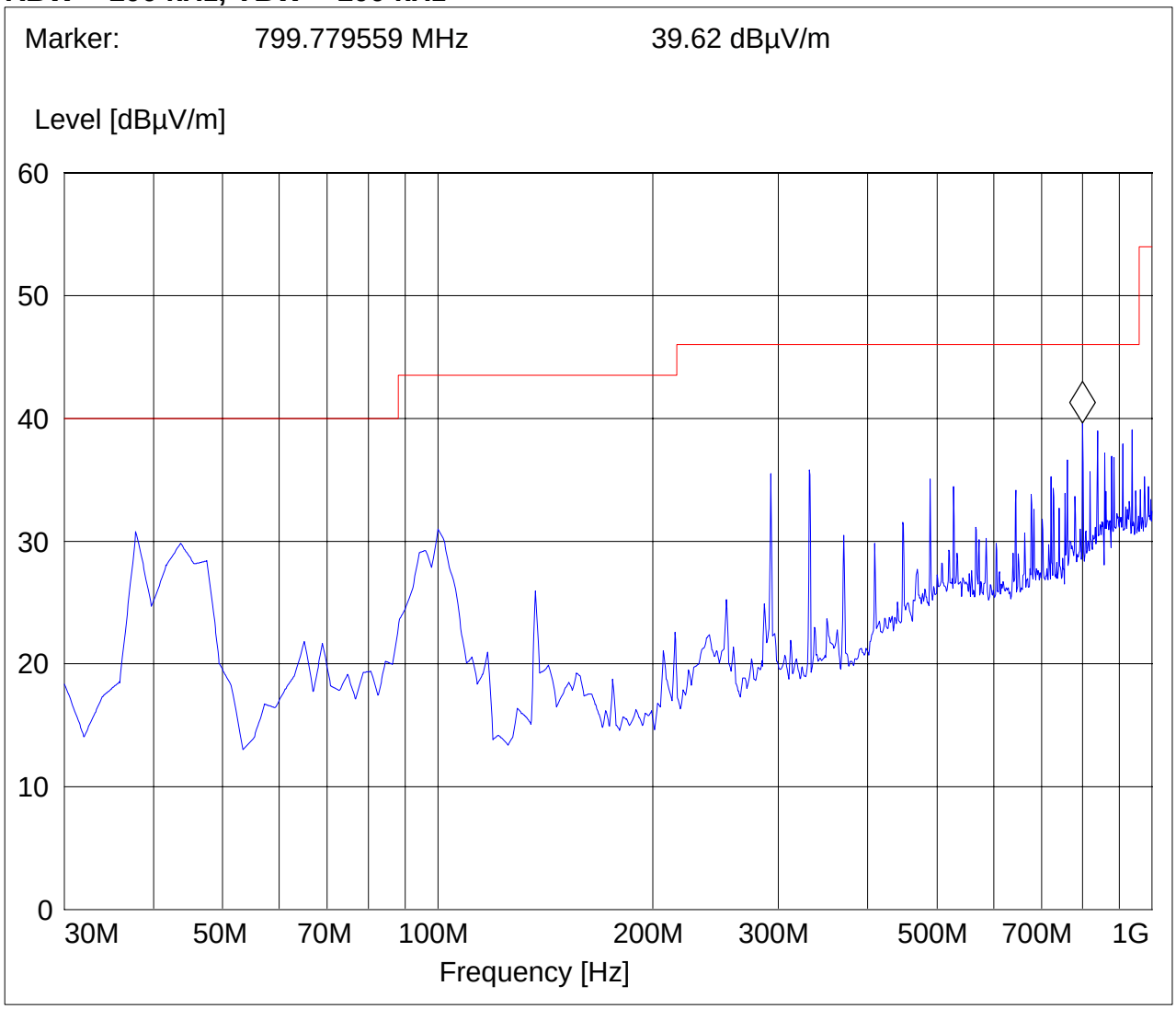
Note: This plot is valid for low, mid, high channels (worst-case plot)

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

EUT:	HHP7850
Customer:	HHP
Test Mode:	WLAN 802.11g, 54Mbps
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Peter Mu
Voltage:	Battery + AC Adaptor
Comments:	FCC Ch.(1-11) COUNTRY CODE

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

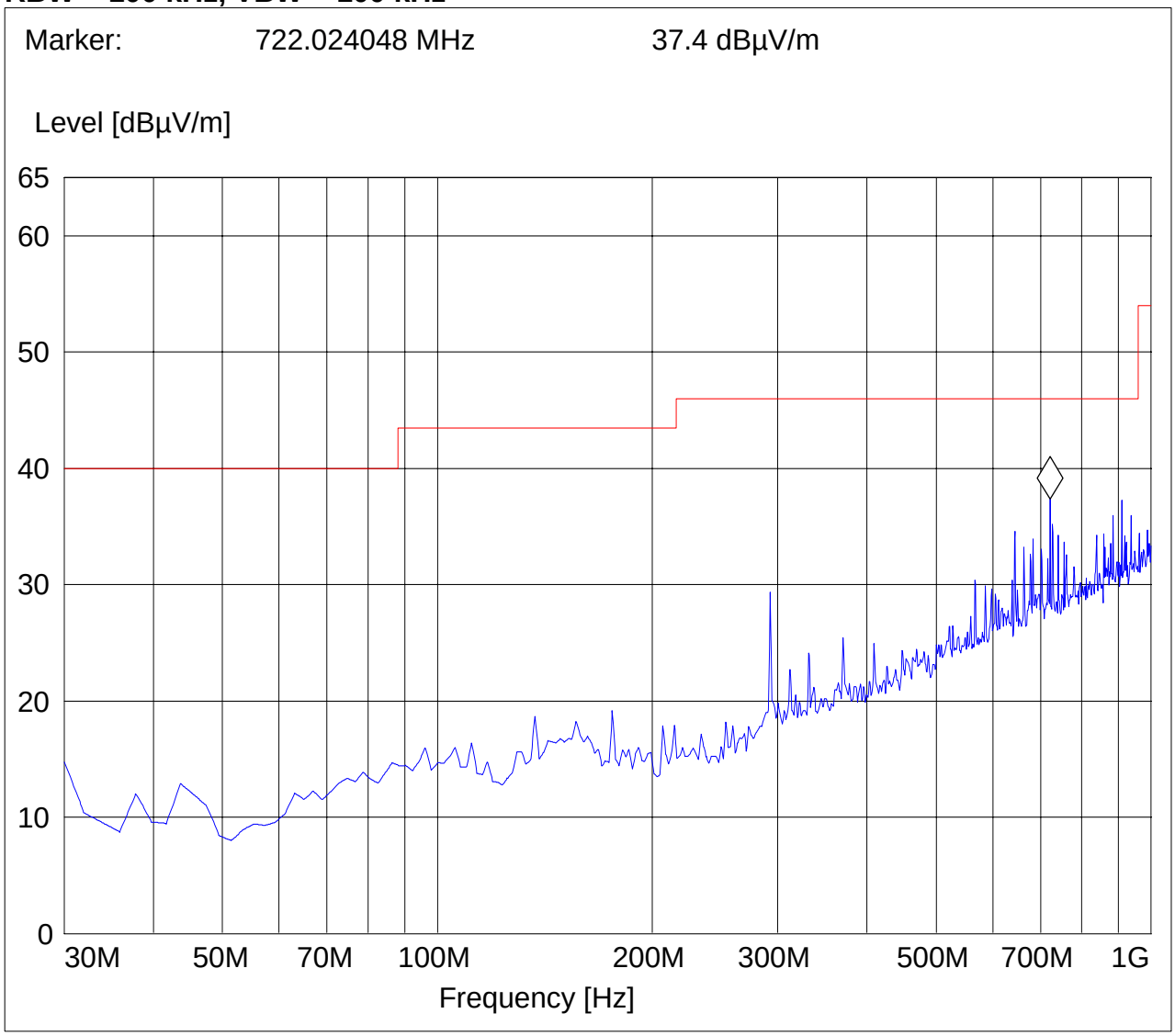
RBW = 100 kHz, VBW = 100 kHz



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:	HHP7850
Customer:	HHP
Test Mode:	WLAN 802.11g, 54Mbps
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Peter Mu
Voltage:	Battery + AC Adaptor
Comments:	FCC Ch.(1-11) COUNTRY CODE

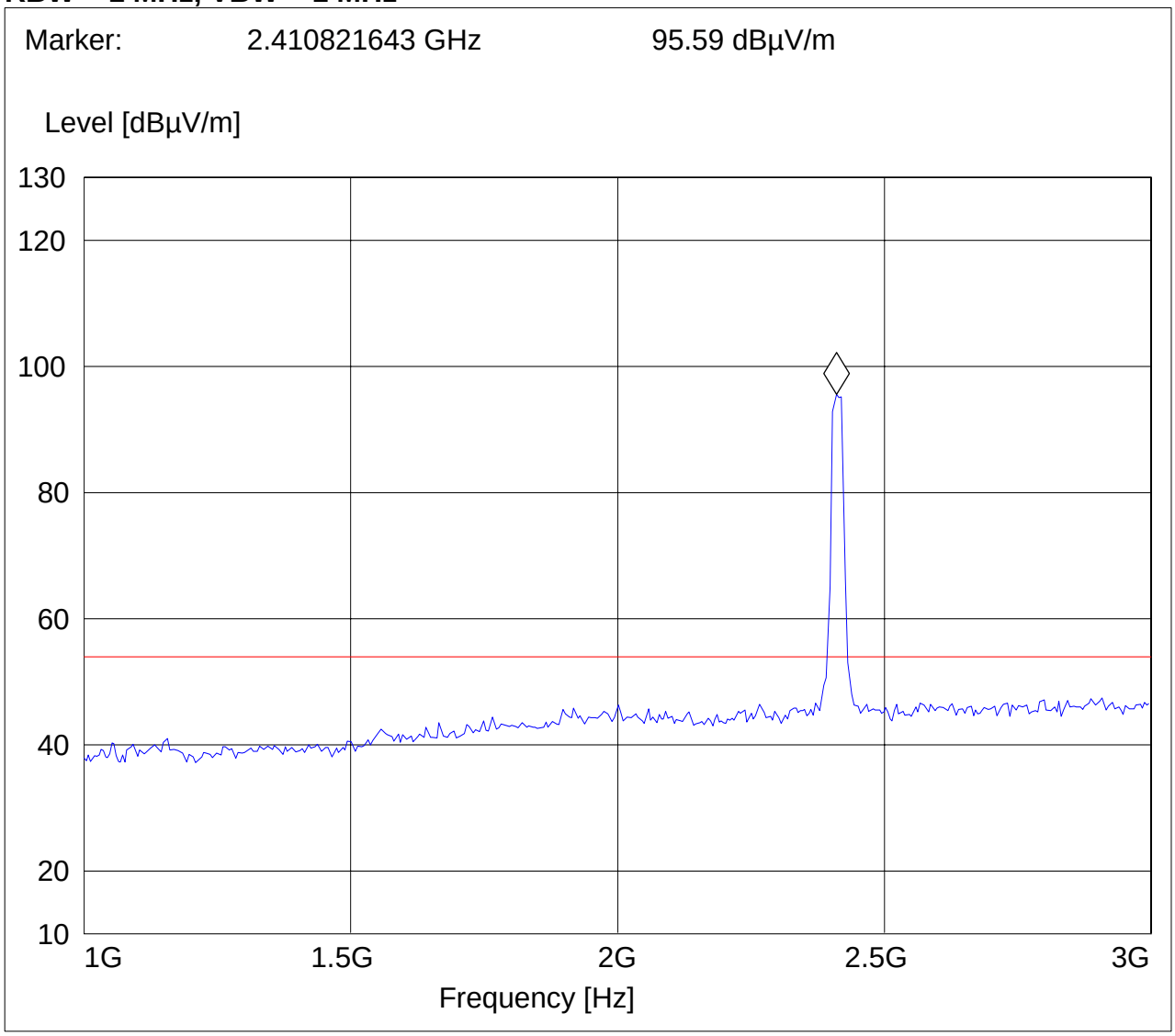
SWEEP TABLE: "FCC15.247_30M-1G_Hor"
RBW = 100 kHz, VBW = 100 kHz



1-3GHz (2412MHz)
Note: The peaks above the limit line is the carrier freq.
Note: Peak Reading vs. Average limit
CETECOM Inc.411 Dixon Landing Road, Milpitas CA 95035, USA

EUT:	HHP7850
Customer:	HHP
Test Mode:	WLAN 802.11g, 54Mbps
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Peter Mu
Voltage:	Battery + AC Adaptor
Comments:	marker is on uplink sig.

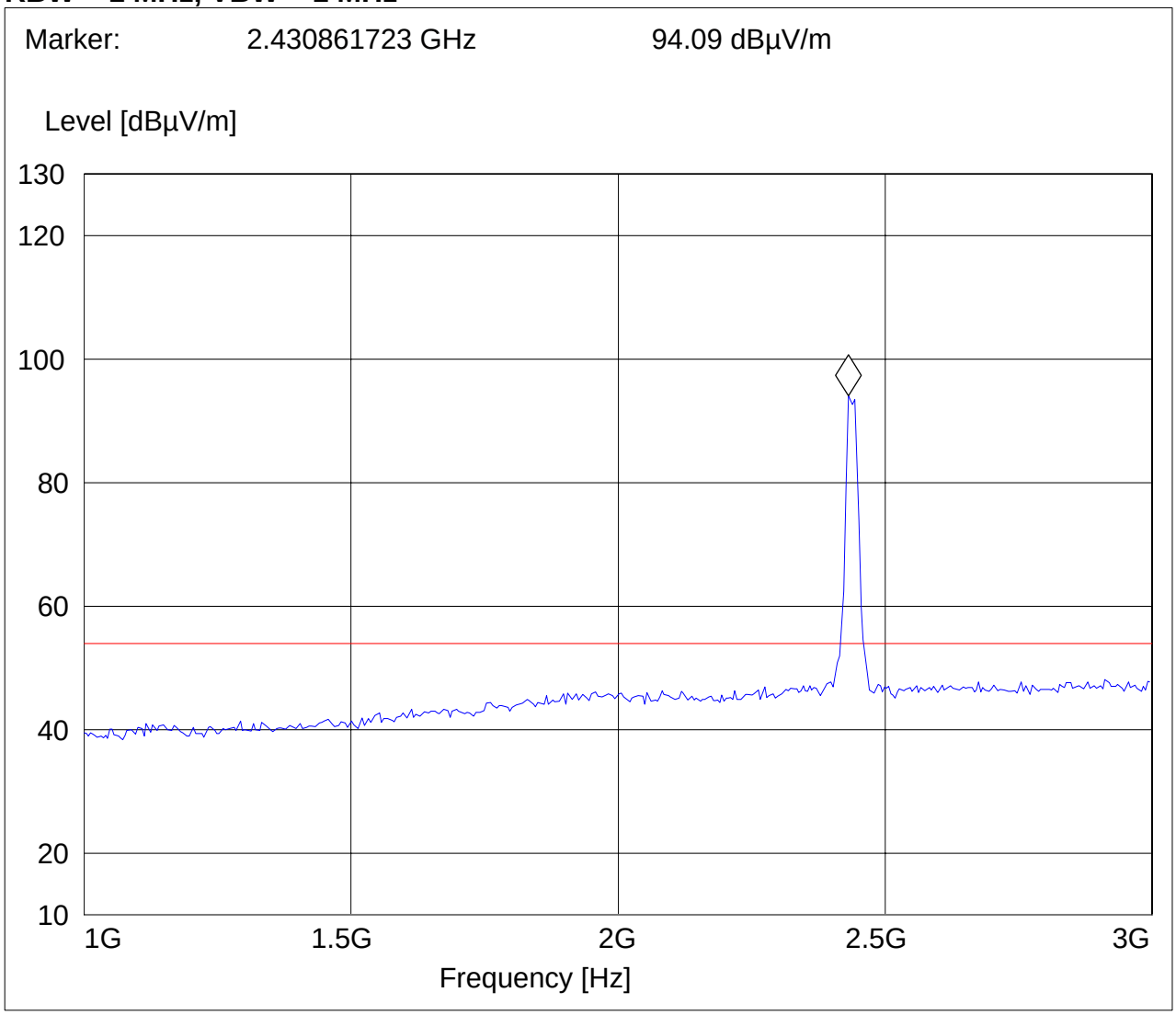
SWEEP TABLE: "FCC15.247_1-3G"
RBW = 1 MHz, VBW = 1 MHz



1-3GHz (2437MHz)
Note: The peaks above the limit line is the carrier freq.
Note: Peak Reading vs. Average limit
CETECOM Inc.411 Dixon Landing Road, Milpitas CA 95035, USA

EUT:	HHP7850
Customer:	HHP
Test Mode:	WLAN 802.11g, 54Mbps
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Peter Mu
Voltage:	Battery + AC Adaptor
Comments:	marker is on uplink sig.

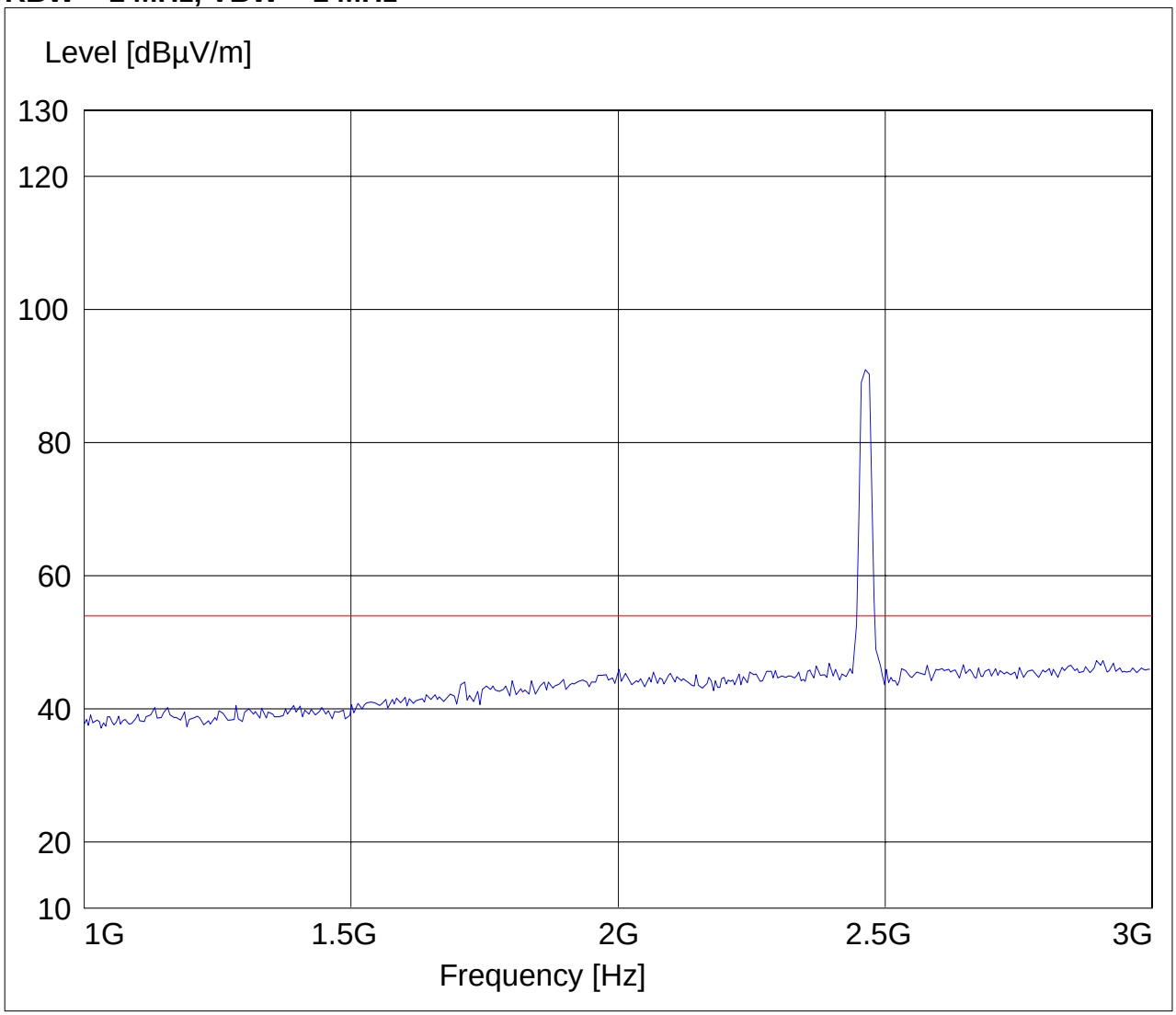
SWEEP TABLE: "FCC15.247_1-3G"
RBW = 1 MHz, VBW = 1 MHz



1-3GHz (2462MHz)
Note: The peaks above the limit line is the carrier freq.
Note: Peak Reading vs. Average limit
CETECOM Inc.411 Dixon Landing Road, Milpitas CA 95035, USA

EUT:	HHP7850
Customer:	HHP
Test Mode:	WLAN 802.11g, 54Mbps
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Peter Mu
Voltage:	Battery + AC Adaptor
Comments:	marker is on uplink sig.

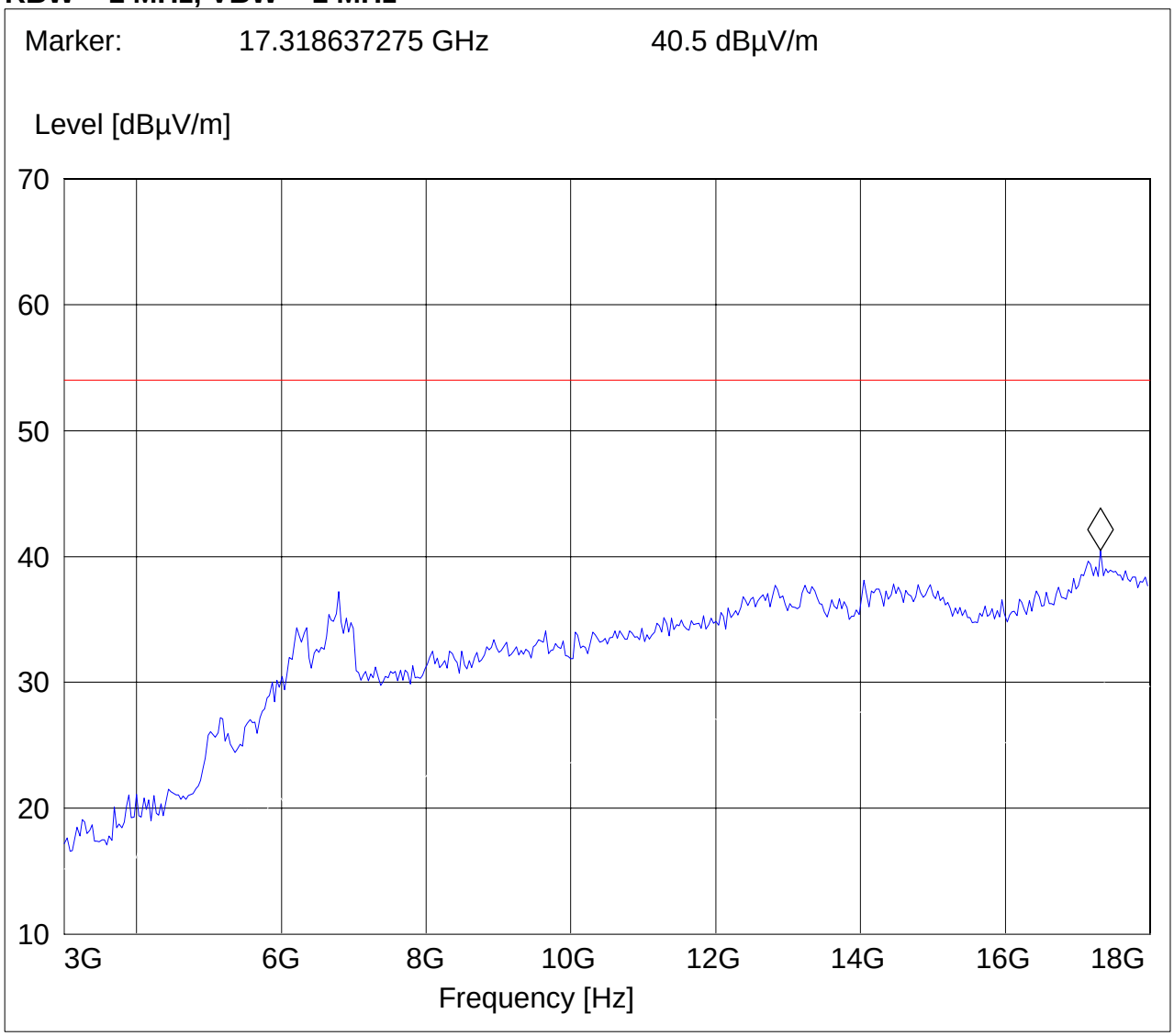
SWEEP TABLE: "FCC15.247_1-3G"
RBW = 1 MHz, VBW = 1 MHz



3-18GHz (2412MHz)
Note: Peak Reading vs. Average limit
CETECOM Inc.411 Dixon Landing Road, Milpitas CA 95035, USA

EUT:	HHP7850
Customer:	HHP
Test Mode:	WLAN 802.11g, TX
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Ed
Voltage:	Battery + AC Adaptor
Comments:	

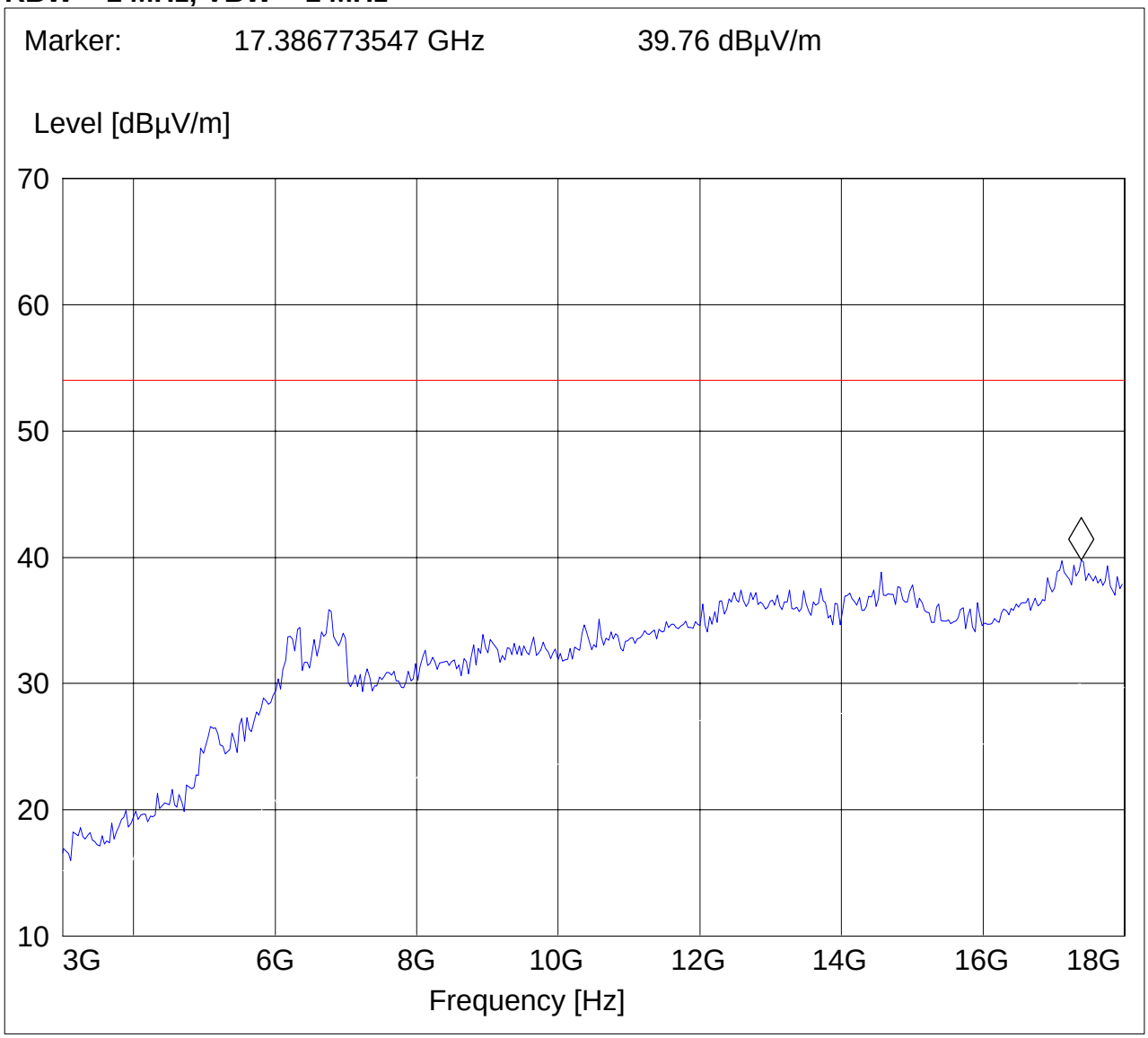
SWEEP TABLE: "FCC15.247_3-18G"
RBW = 1 MHz, VBW = 1 MHz



3-18GHz (2437MHz)
Note: Peak Reading vs. Average limit
CETECOM Inc.411 Dixon Landing Road, Milpitas CA 95035, USA

EUT:	HHP7850
Customer:	HHP
Test Mode:	WLAN 802.11g, TX
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Ed
Voltage:	Battery + AC Adaptor
Comments:	

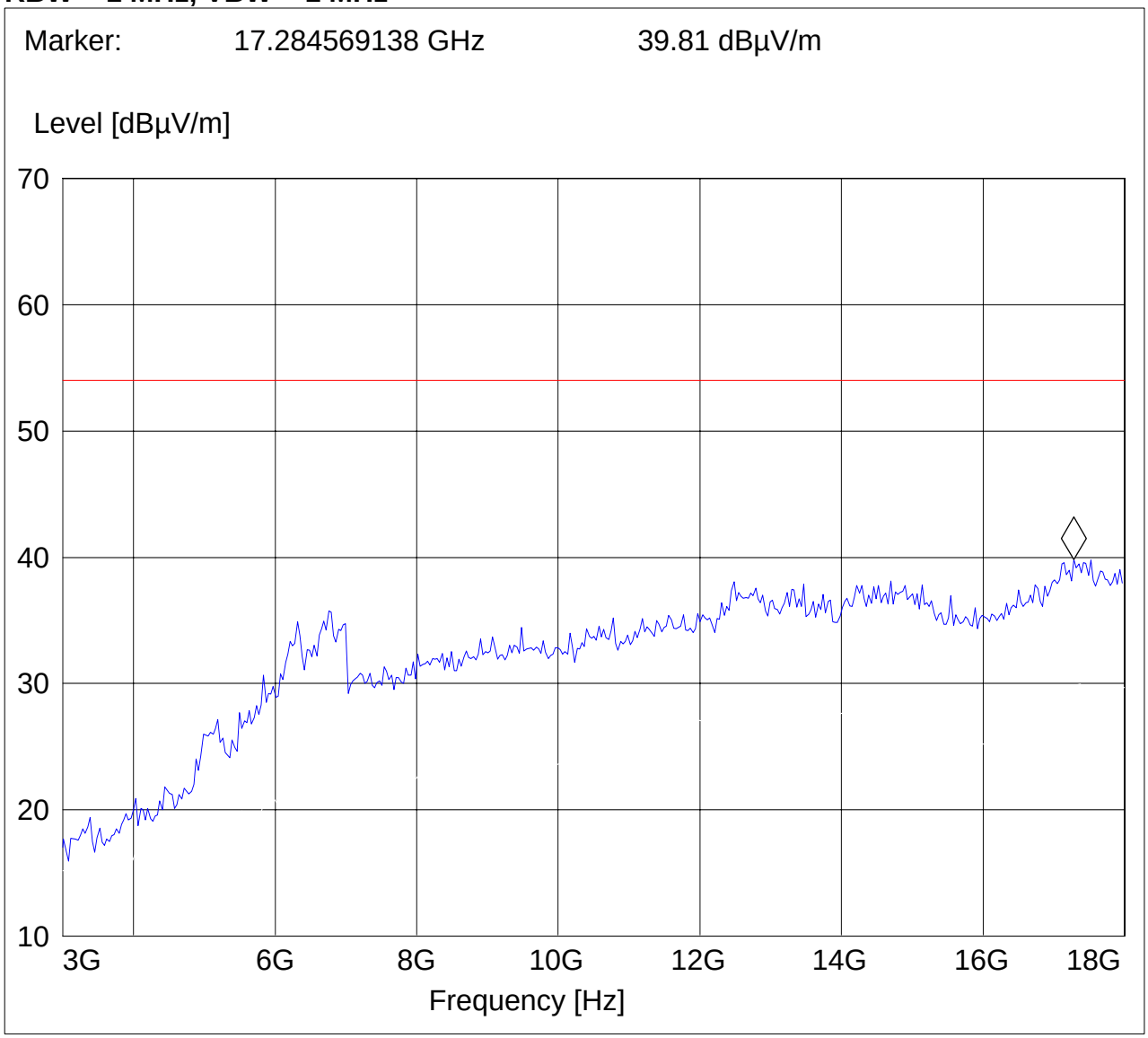
SWEEP TABLE: "FCC15.247_3-18G"
RBW = 1 MHz, VBW = 1 MHz



3-18GHz (2462MHz)
Note: Peak Reading vs. Average limit
CETECOM Inc.411 Dixon Landing Road, Milpitas CA 95035, USA

EUT:	HHP7850
Customer:	HHP
Test Mode:	WLAN 802.11g, TX
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Ed
Voltage:	Battery + AC Adaptor
Comments:	

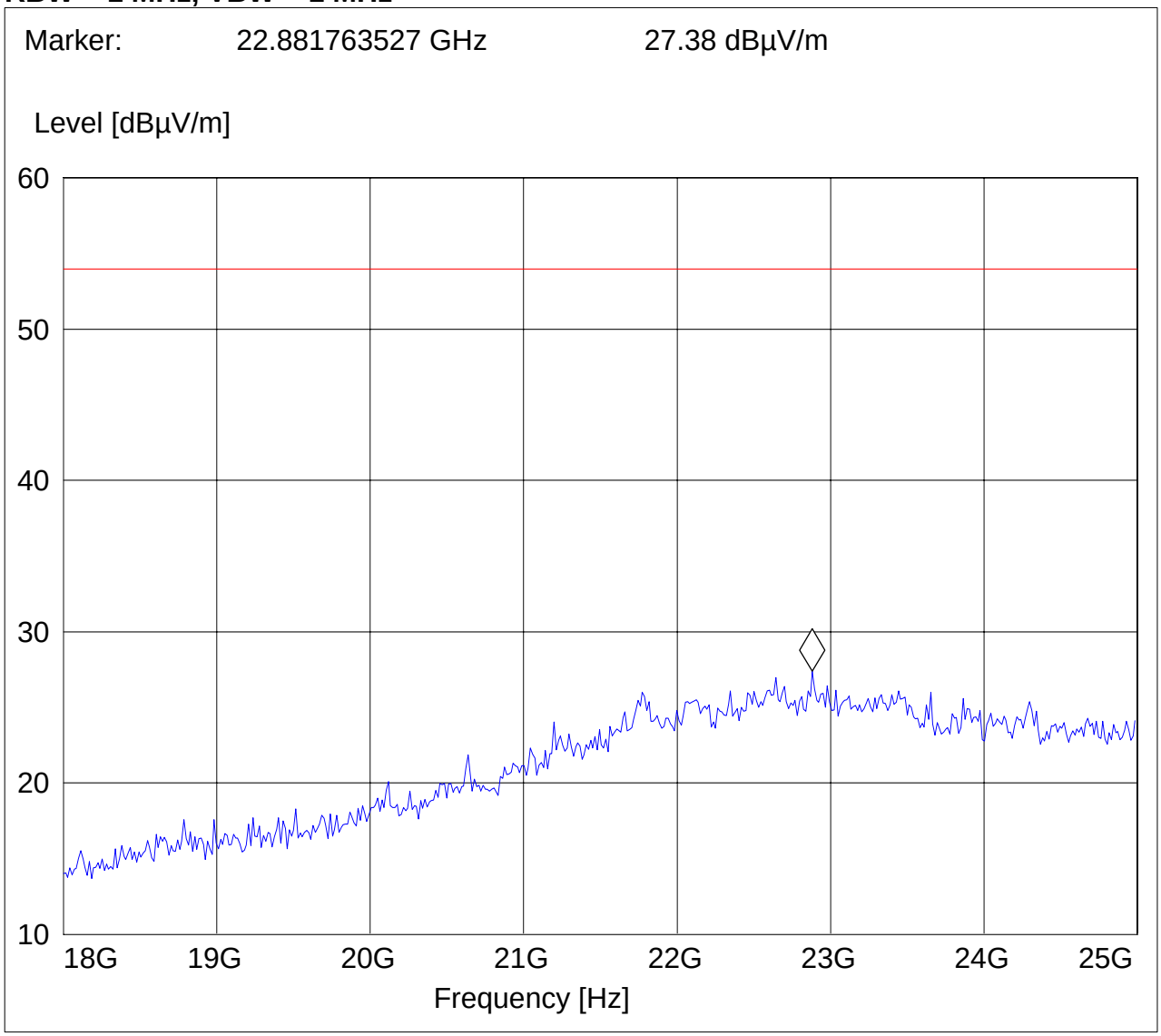
SWEEP TABLE: "FCC15.247_3-18G"
RBW = 1 MHz, VBW = 1 MHz



18-25GHz
Note: This plot is valid for low, mid, high channels (worst-case plot)
Note: Peak Reading vs. Average limit
CETECOM Inc.411 Dixon Landing Road, Milpitas CA 95035, USA

EUT:	HHP7850
Customer:	HHP
Test Mode:	WLAN 802.11g, TX
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Ed
Voltage:	Battery + AC Adaptor
Comments:	

SWEEP TABLE: "FCC15.247_18-26.5G"
RBW = 1 MHz, VBW = 1 MHz



4.6 EMISSION LIMITATIONS § 15.247 (c) (1)
Transmitter (Conducted)

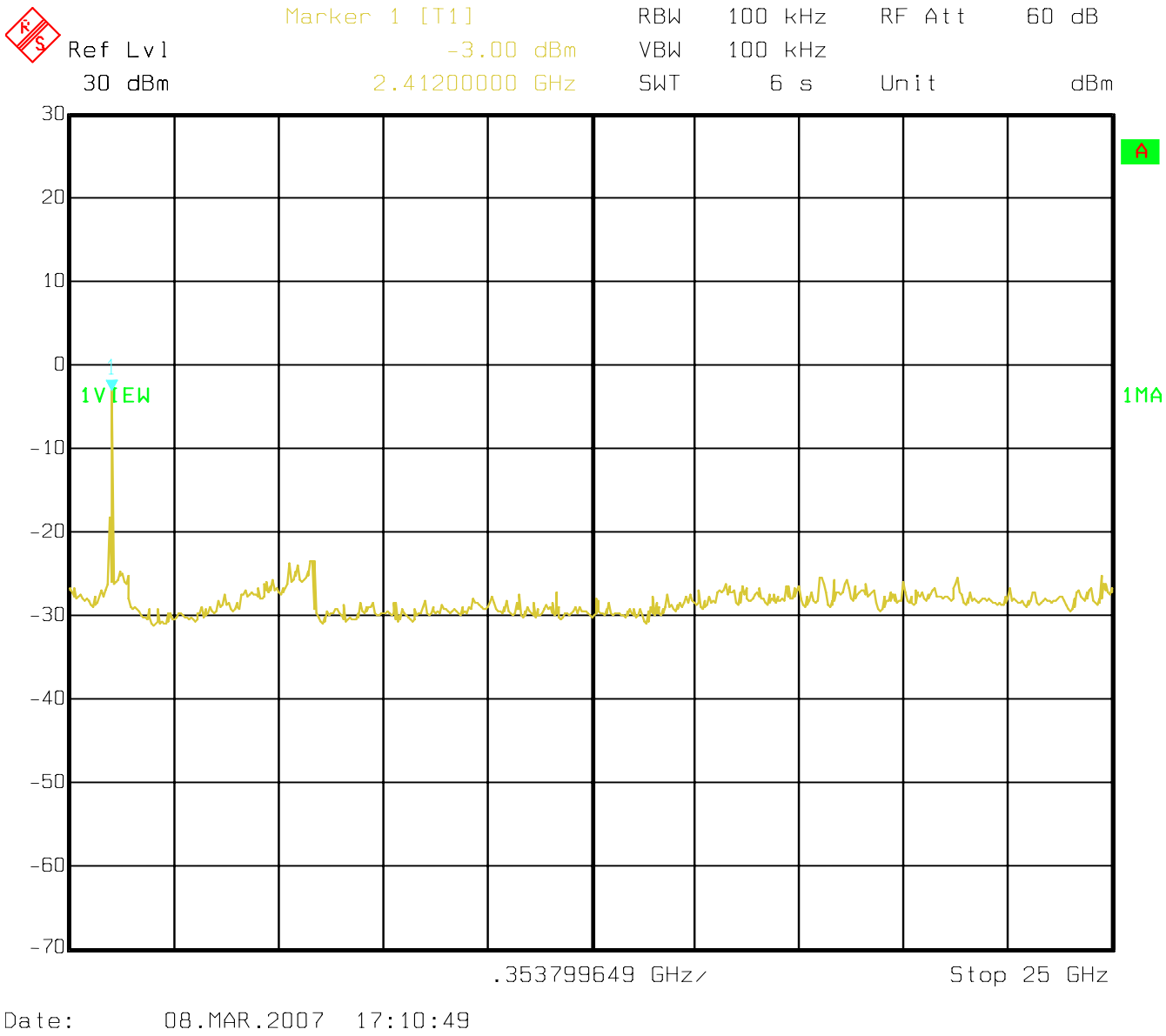
4.6.1 Limits

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)).

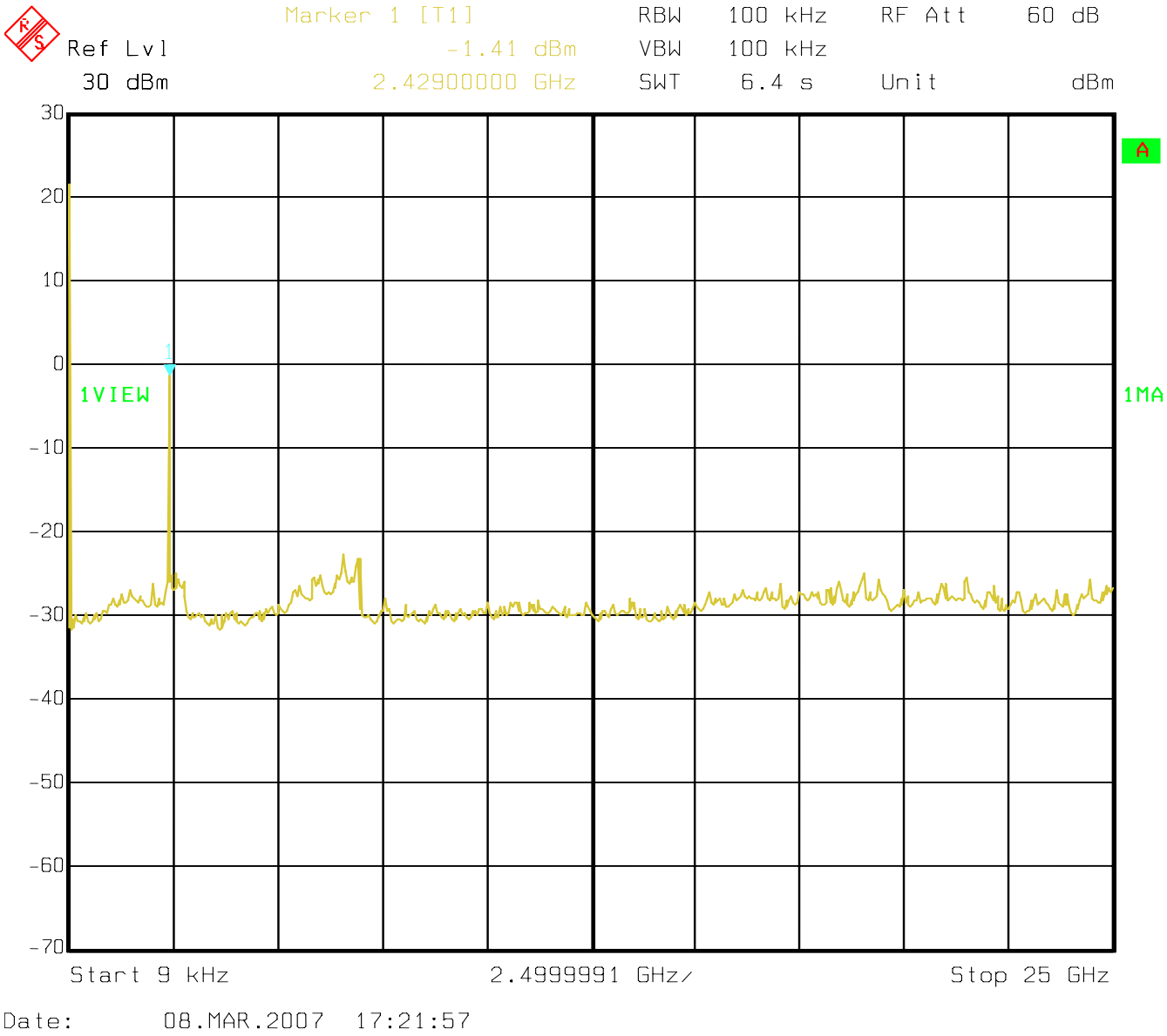
Notes:

1. Measurements were performed with a spectrum analyzer.
2. During measurements the equipment was configured as shown in the block diagram of section 7 of this report.

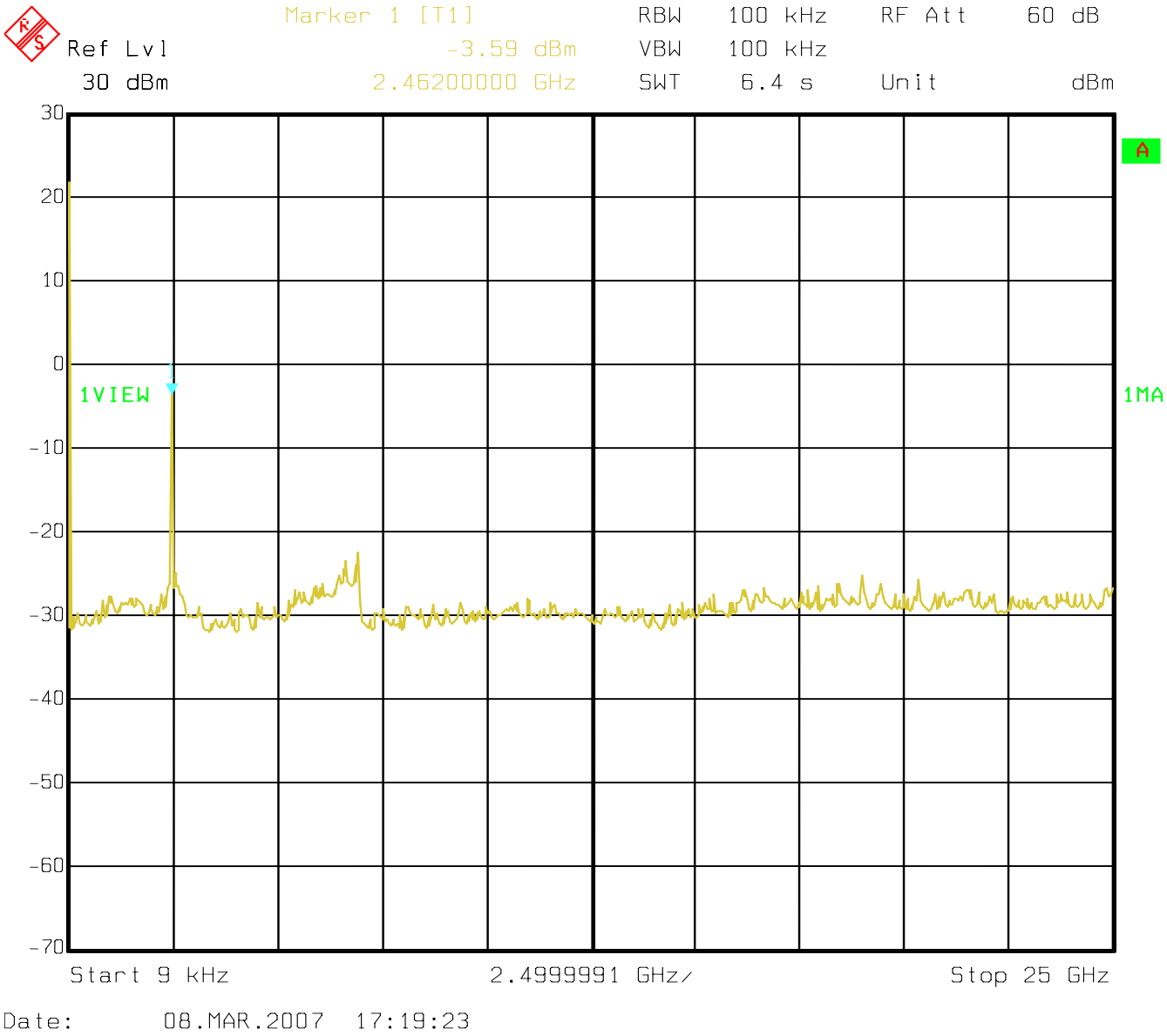
4.6.2 Results
(2412 MHz)



(2437 MHz)


Marker 1 [T1]
Ref Lvl
30 dBm
-1.41 dBm
2.42900000 GHz
RBW 100 kHz
VBW 100 kHz
SWT 6.4 s
RF Att 60 dB
Unit dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
1VIEW
A
1MA
Start 9 kHz
2.4999991 GHz/
Stop 25 GHz
Date: 08.MAR.2007 17:21:57

(2462 MHz)


Marker 1 [T1]
RBW 100 kHz
RF Att 60 dB
Ref Lvl
-3.59 dBm
VBW 100 kHz
30 dBm
2.46200000 GHz
SWT 6.4 s
Unit dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
1VIEW
A
1MA
Start 9 kHz
2.4999991 GHz/
Stop 25 GHz
Date: 08.MAR.2007 17:19:23

4.7 RECEIVER SPURIOUS RADIATION § 15.209/RSS210

4.7.1 LIMITS

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	2400/F (kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

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 a quasi peak or average limit , unless specified with the plots.

4.7.2 RESULTS

30MHz – 1GHz Antenna: horizontal

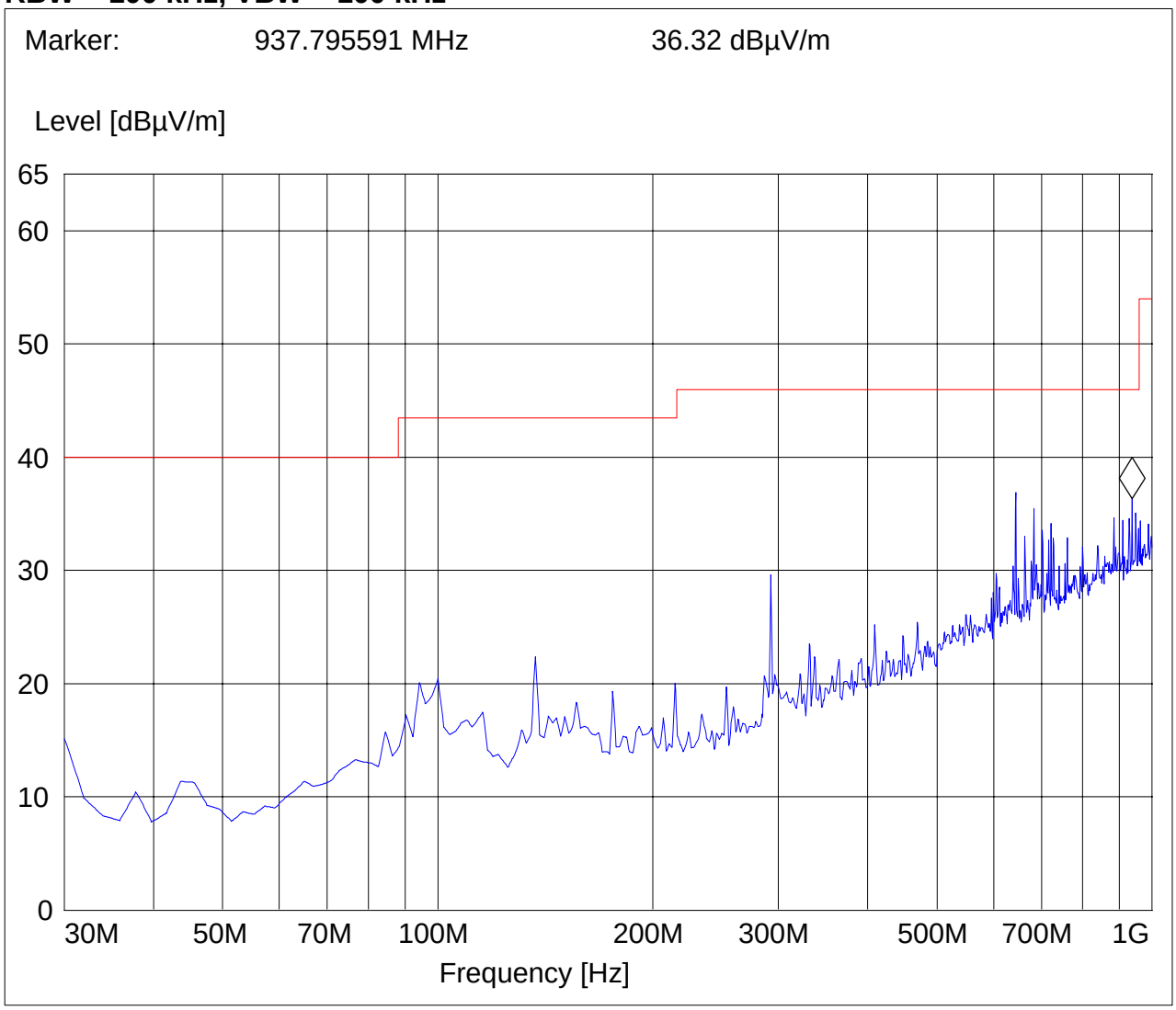
Note: This plot is valid for low, mid, high channels (worst-case plot)

Note: Peak Reading vs. Quasi-peak limit

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

EUT:	HHP7850
Customer:	HHP
Test Mode:	WLAN 802.11g, RX
ANT Orientation:	H
EUT Orientation:	V
Test Engineer:	Peter Mu
Voltage:	Battery + AC Adaptor

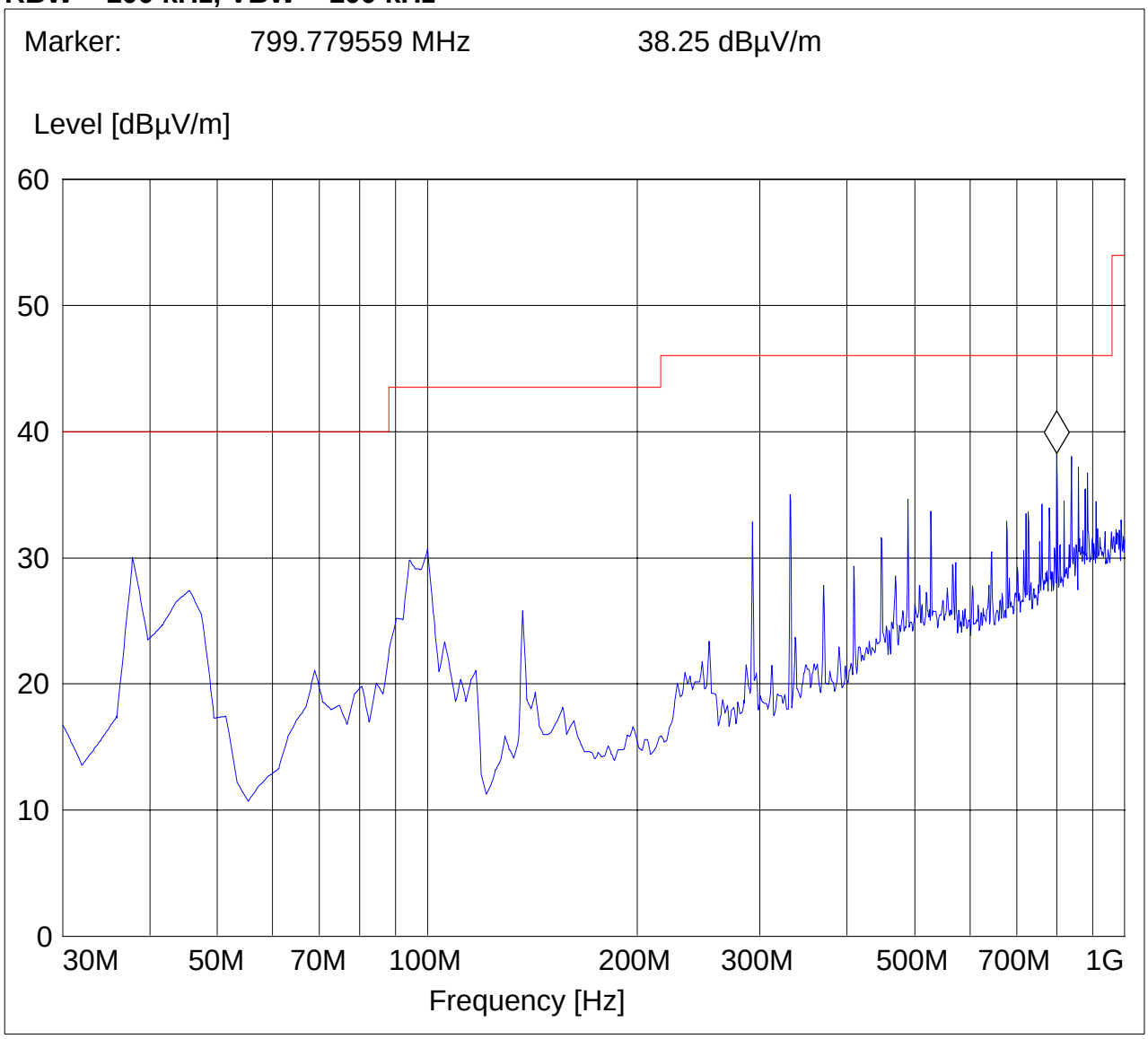
RBW = 100 kHz, VBW = 100 kHz



30MHz – 1GHz Antenna: Vertical
Note: This plot is valid for low, mid, high channels (worst-case plot)
Note: Peak Reading vs. Quasi-peak limit
CETECOM Inc.411 Dixon Landing Road, Milpitas CA 95035, USA

EUT:	HHP7850
Customer:	HHP
Test Mode:	WLAN 802.11g, RX
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Peter Mu
Voltage:	Battery + AC Adaptor

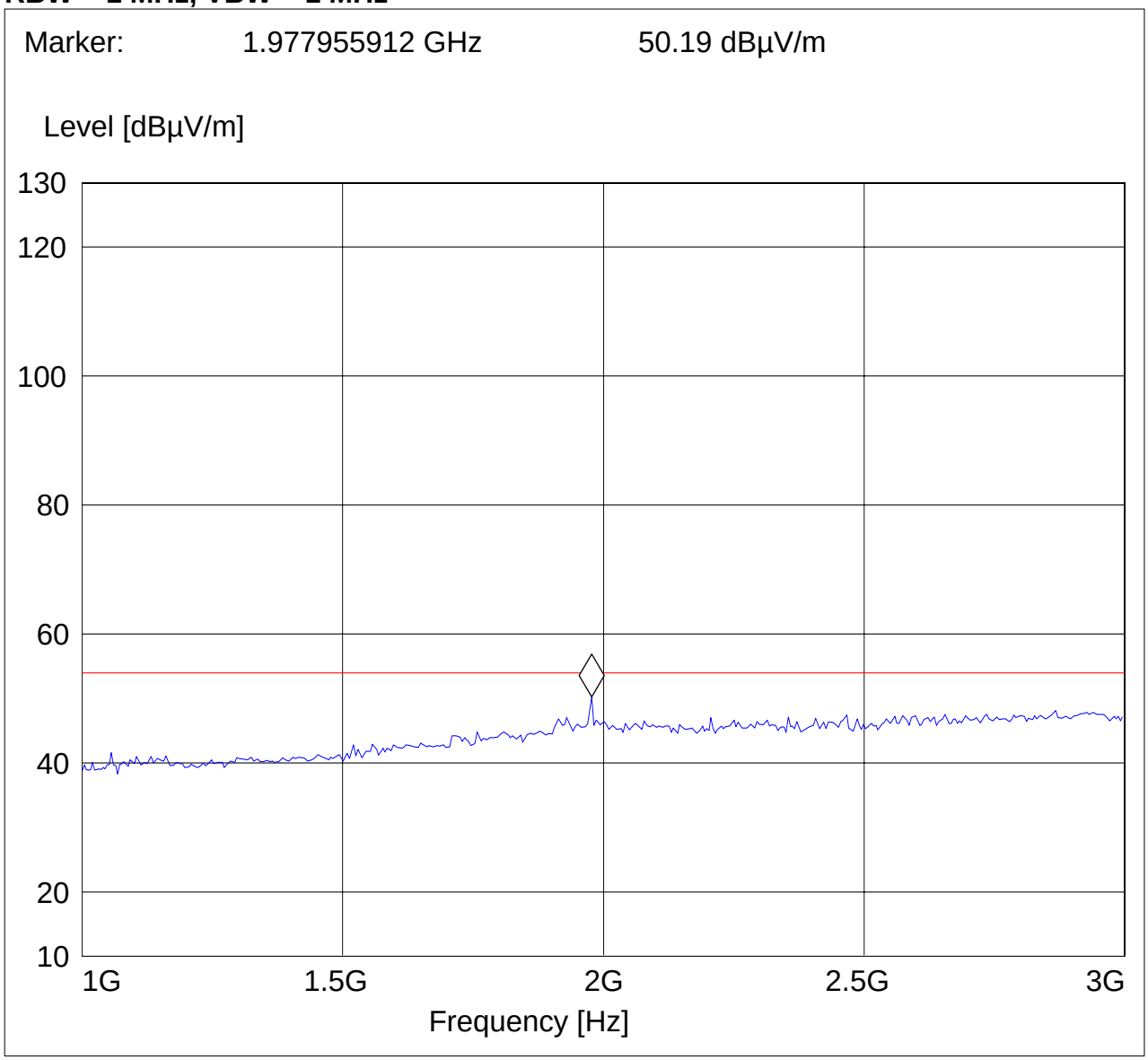
RBW = 100 kHz, VBW = 100 kHz



1-3GHz
Note: This plot is valid for all polarizations and low, mid, high channels (worst-case plot)
Note: Peak Reading vs. Average limit
CETECOM Inc.411 Dixon Landing Road, Milpitas CA 95035, USA

EUT:	HHP7850
Customer:	HHP
Test Mode:	WLAN 802.11g, RX
ANT Orientation:	H
EUT Orientation:	V
Test Engineer:	Peter Mu
Voltage:	Battery + AC Adaptor

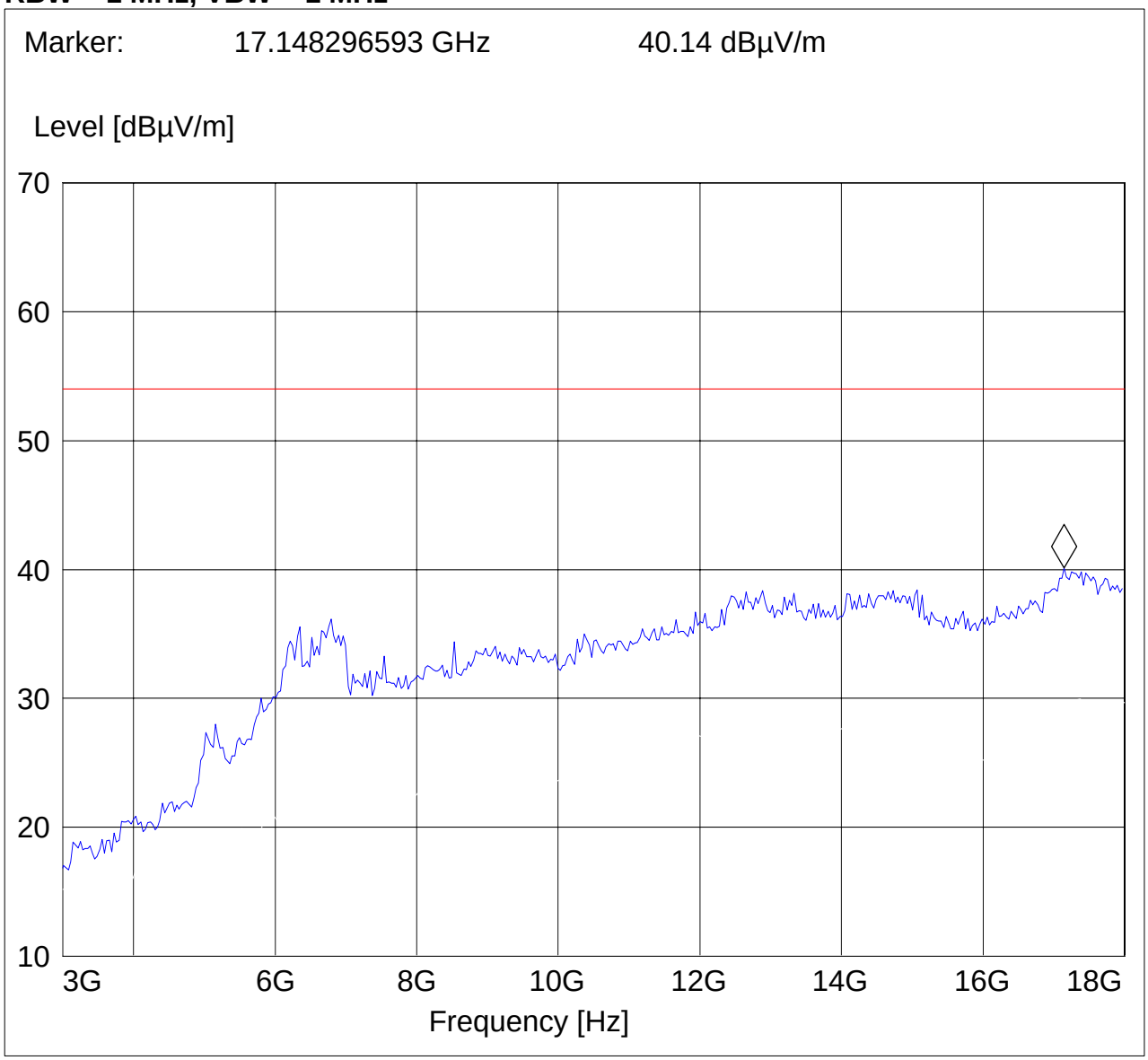
RBW = 1 MHz, VBW = 1 MHz



3-18GHz
Note: This plot is valid for all polarizations and low, mid, high channels (worst-case plot)
Note: Peak Reading vs. Average limit
CETECOM Inc.411 Dixon Landing Road, Milpitas CA 95035, USA

EUT:	HHP7850
Customer:	HHP
Test Mode:	WLAN 802.11g, RX
ANT Orientation:	H
EUT Orientation:	V
Test Engineer:	Peter Mu
Voltage:	Battery + AC Adaptor

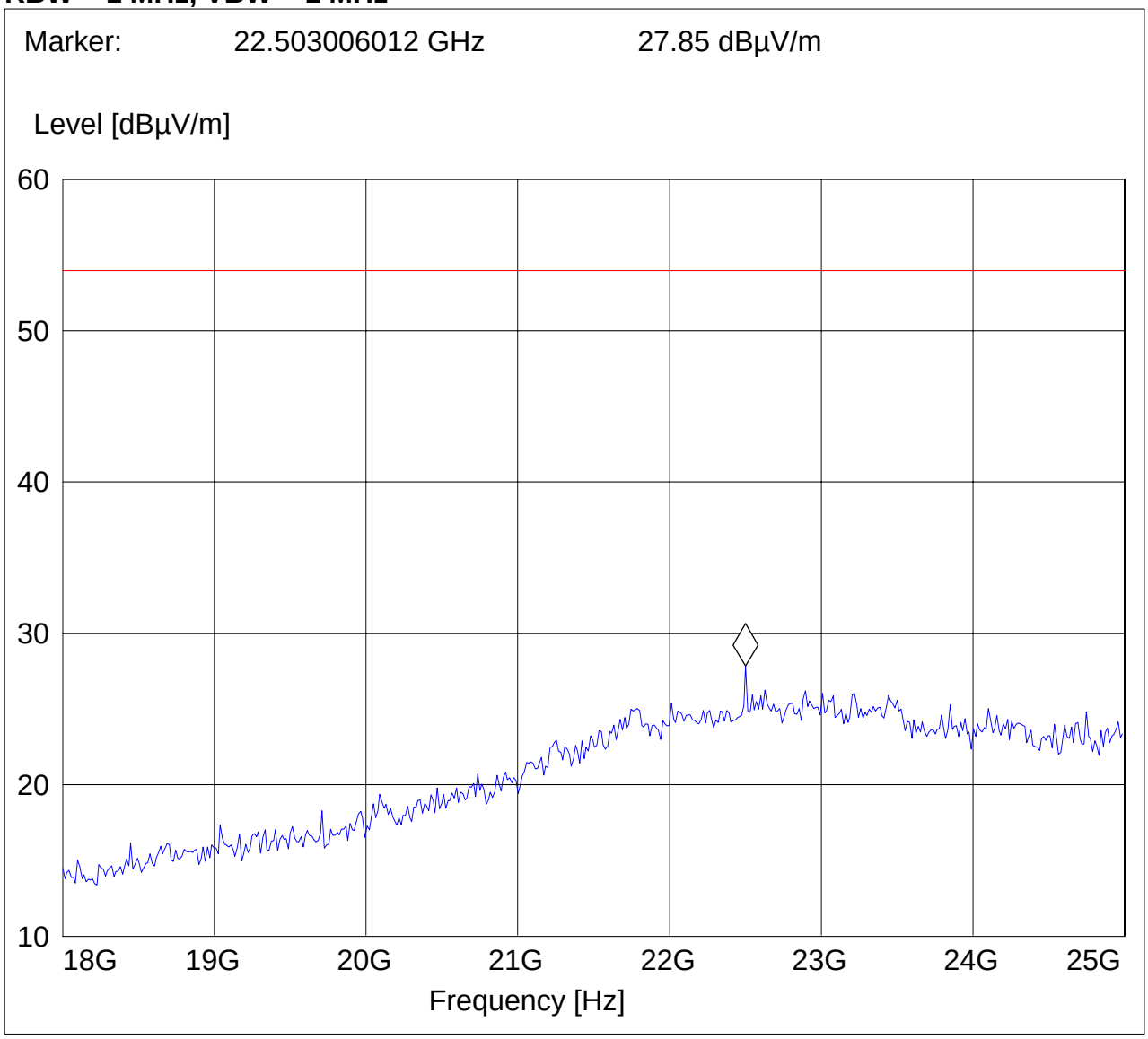
RBW = 1 MHz, VBW = 1 MHz



18-25GHz
Note: This plot is valid for all polarizations and low, mid, high channels (worst-case plot)
Note: Peak Reading vs. Average limit
CETECOM Inc.411 Dixon Landing Road, Milpitas CA 95035, USA

EUT:	HHP7850
Customer:	HHP
Test Mode:	WLAN 802.11g, RX
ANT Orientation:	H
EUT Orientation:	V
Test Engineer:	Peter Mu
Voltage:	Battery + AC Adaptor

RBW = 1 MHz, VBW = 1 MHz



4.8 RADIATED OUTPUT POWER MEASUREMENTS

TEST CONDITIONS		**EIRP (dBm)**			
Frequency (MHz)		**2412**		**2441**	**2462**
T_{nom}(23)°C	**V_{nom}(9.5) VDC**	**802.11g**	**15.23**	**14.86**	**13.47**
Measurement uncertainty		**±0.5dBm**			

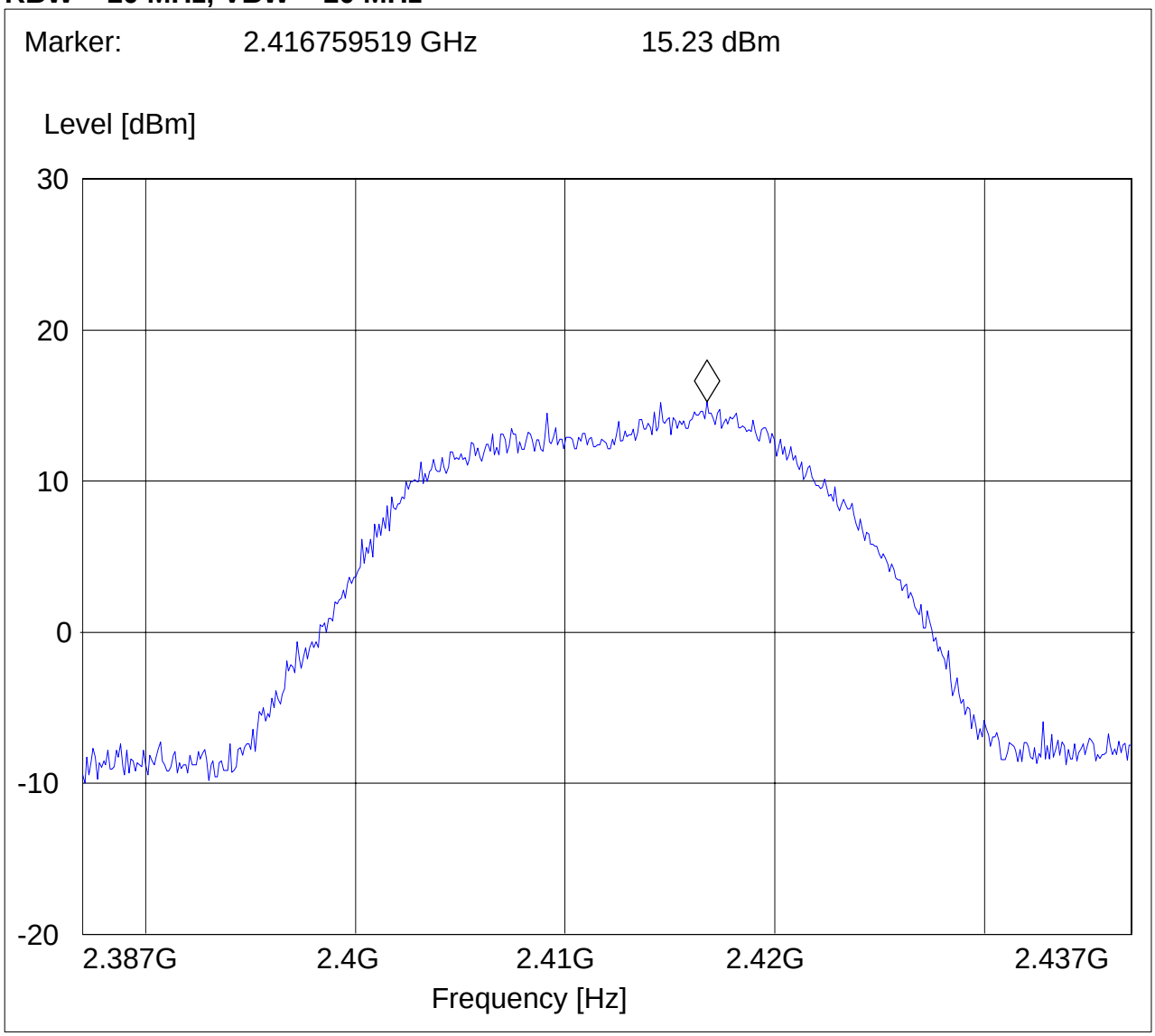
RBW / VBW: 10MHz

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

EUT: 7850
Customer: HHP
Test Mode: 802.11g, Ch.1
ANT Orientation: V
EUT Orientation: V
Test Engineer: Val Tankov
Voltage: Battery + AC Adapter
Comments: FCC Ch.(1-11) COUNTRY CODE

SWEEP TABLE: "EIRP RLAN CH1"

RBW = 10 MHz, VBW = 10 MHz

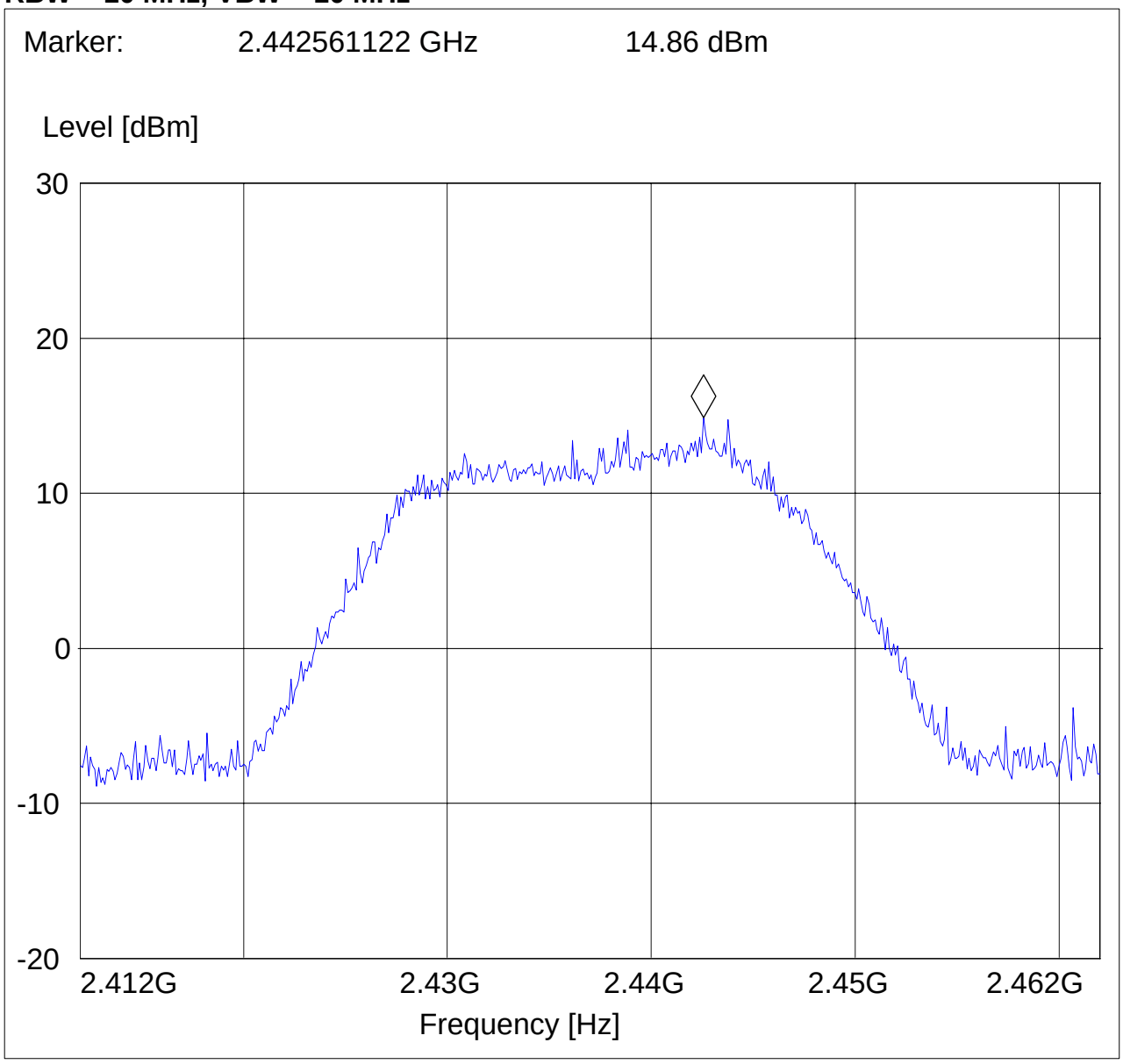


CETECOM Inc.411 Dixon Landing Road, Milpitas CA 95035, USA

EUT:	7850
Customer:	HHP
Test Mode:	802.11g, Ch.6
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Val Tankov
Voltage:	Battery + AC Adapter
Comments:	FCC Ch.(1-11) COUNTRY CODE

SWEEP TABLE: "EIRP RLAN CH6"

RBW = 10 MHz, VBW = 10 MHz

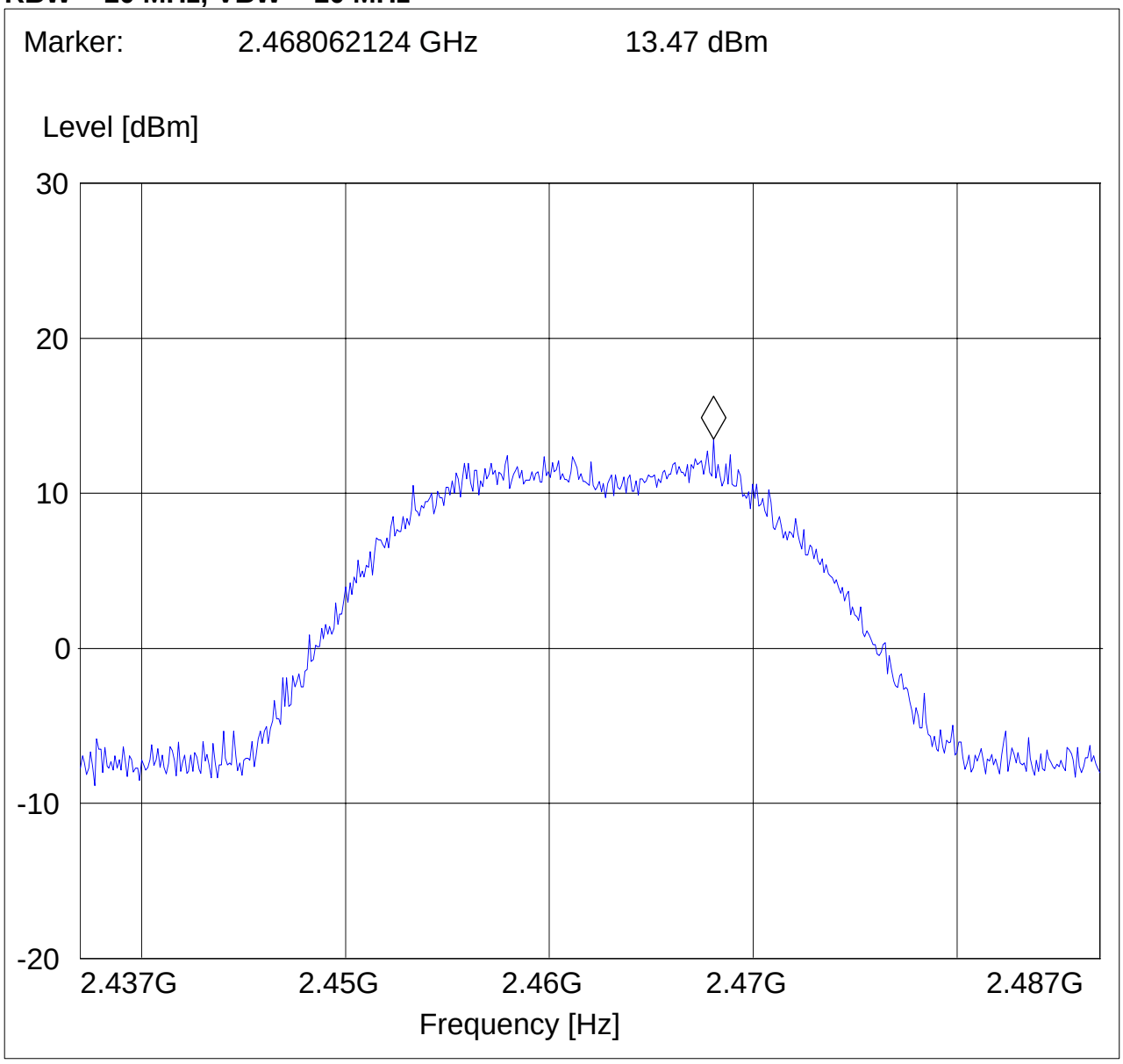


CETECOM Inc.411 Dixon Landing Road, Milpitas CA 95035, USA

EUT:	7850
Customer:	HHP
Test Mode:	802.11g, Ch.11
ANT Orientation:	V
EUT Orientation:	V
Test Engineer:	Val Tankov
Voltage:	Battery + AC Adapter
Comments:	FCC Ch.(1-11) COUNTRY CODE

SWEEP TABLE: "EIRP RLAN CH11"

RBW = 10 MHz, VBW = 10 MHz



4.9 AC POWER LINE CONDUCTED EMISSIONS § 15.107/207

4.9.1 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		

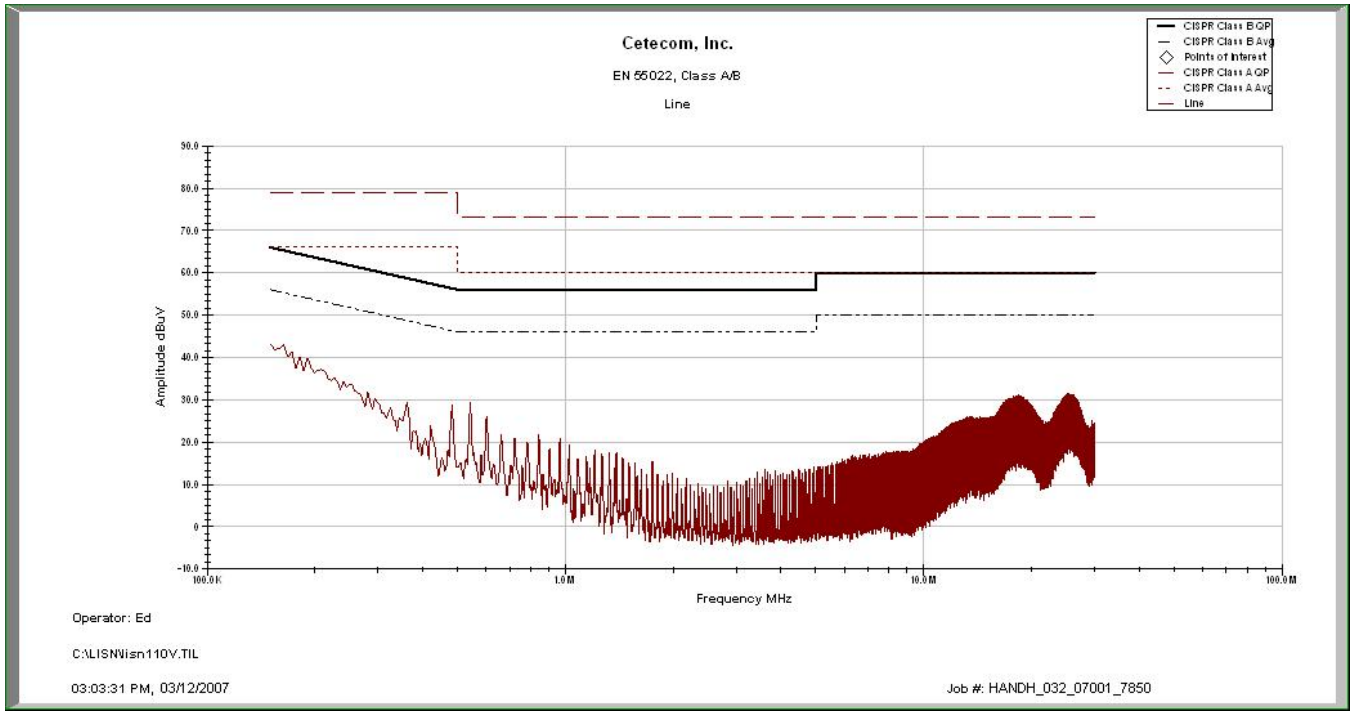
ANALYZER SETTINGS: RBW = 10KHz VBW = 10KHz

OPERATING MODE

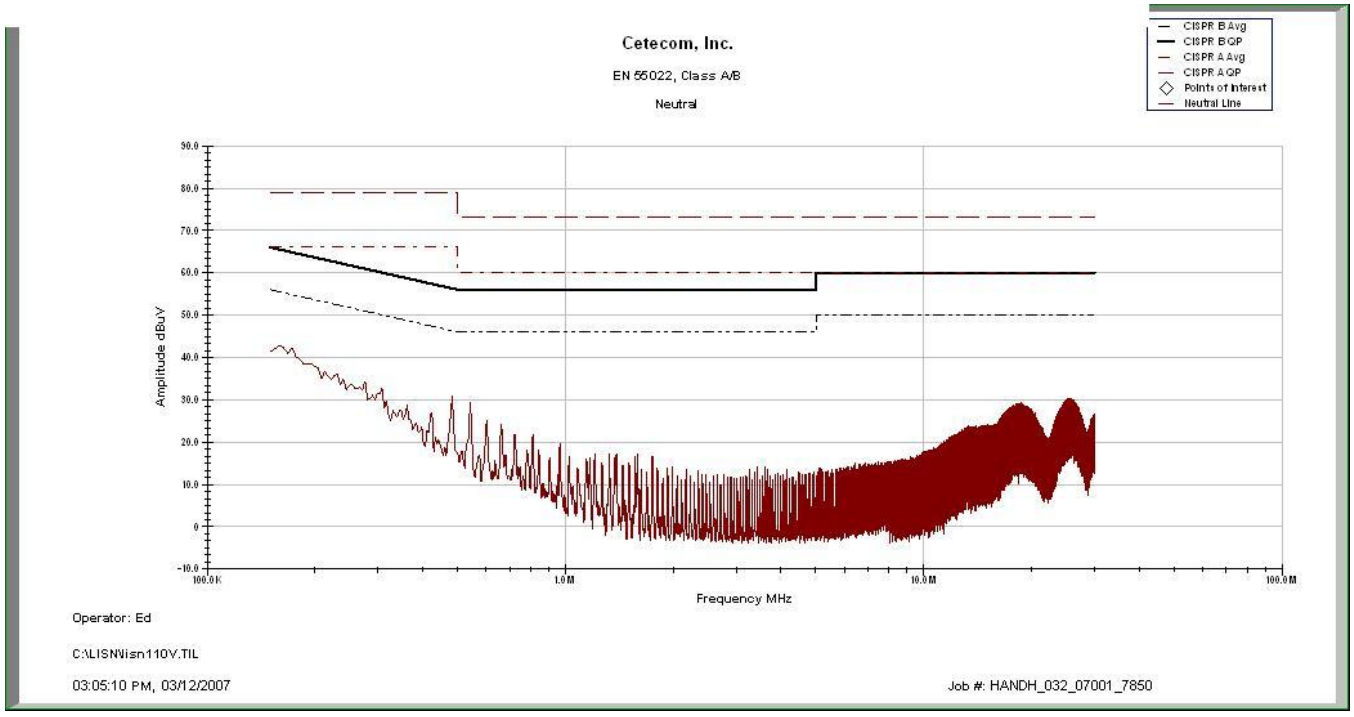
Conducted AC emissions testing was performed with 110 VAC @ 60 Hz with the EUT in battery charging mode. During the testing an uncharged battery was installed in the EUT.

4.9.2 Results

Line:



Neutral:

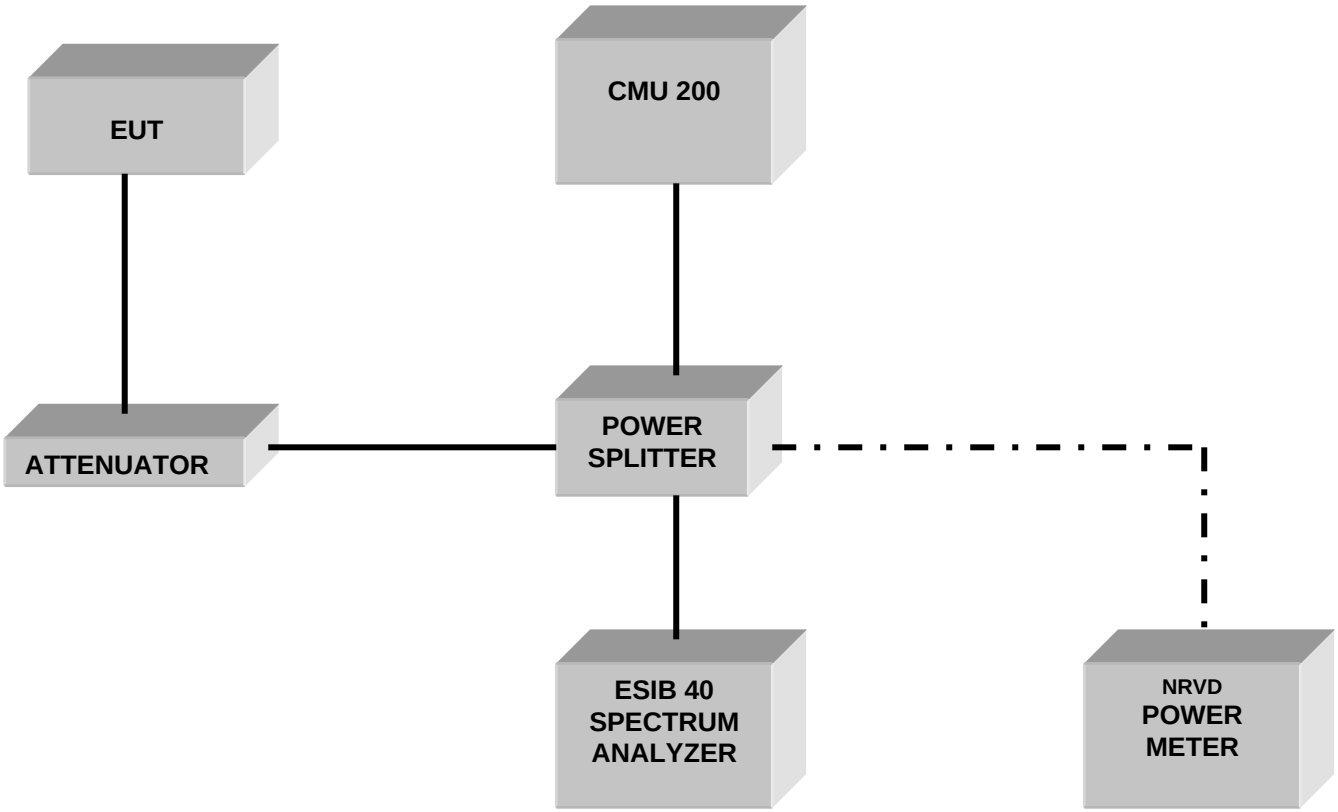


5 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal Due	Interval
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2007	1 year
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	August 2007	1 year
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2007	1 year
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2007	1 year
05	Biconilog Antenna	3141	EMCO	0005-1186	June 2007	1 year
06	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	June 2007	1 year
07	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240	June 2007	1 year
08	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
09	Climatic Chamber	VT4004	Voltsch	G1115	May 2007	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 2007	1 year
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2007	1 year
14	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008	May 2007	1 year
15	Universal Radio Comm. Tester	CMU 200	Rohde & Schwarz	832221/06	May 2007	1 year
16	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	May 2007	1 year
17	Loop Antenna	6512	EMCO	00049838	July 2007	2 years

6 BLOCK DIAGRAMS

Conducted Testing



Radiated Testing