FCC Test Report

FCC Part 15.247 for DSSS systems

FOR:

GSM Cellular Telephone with Bluetooth and Wifi

Model #: A1203

Apple Inc.
1 Infinite Loop Mail Stop26A
Cupertino, California 95014
U.S.A

FCC ID: BCGA1203

TEST REPORT #: EMC_ACIHO_010_06002_FCC15_247WLAN
DATE: February 6th, 2007

ilac-MRA ACCREDITED Certificate # 2135.01

Bluetooth

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

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 #
Apple Inc.	GSM Cellular Telephone with Bluetooth and Wifi	A1203

Technical responsibility for area of testing:

Date	Section	Name	Signature
2/6/2007	EMC & Radio	Lothar Schmidt (Test Lab Manager)	

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

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
Responsible Project Leader:	Pete Krebill
Date of test:	1/26/2006 to 2/5/2007

2.2 Identification of the Client

Applicant's Name:	Apple Inc.
Street Address:	1 Infinite Loop Mail Stop26A
City/Zip Code	Cupertino, California 95014
Country	USA
Contact Person:	Robert Steinfeld
Phone No.	408-974-2618
Fax:	408-862-5061
e-mail:	steinfe1@apple.com

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as applicant

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Marketing Name:	A1203
Description:	GSM Cellular Telephone with Bluetooth and Wifi
Model No:	A1203
Hardware Revision :	M68 DVT
Software Revision :	M68 DVT
FCC ID:	BCGA1203
Frequency Range:	2412-2462 MHz
Type(s) of Modulation:	CCK, OFDM
Number of Channels:	11
Antenna Type:	Patch
Output Power:	27.51 dBm (0.564W) peak conducted power

4 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.

5 Measurements

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

6 dB bandwidth

TEST CONDITIONS			6 dB BANDWIDTH (kHz)		
Frequency (MHz)			2412	2437	2462
802.11b	T_{nom}(23)°C	V_{nom}(4.2) VDC	10.02	9.97	10.02
802.11g	T_{nom}(23)°C	V_{nom}(4.2) VDC	16.58	16.58	16.58

5.1.1 Limit

SUBCLAUSE §15.247(a) (2)

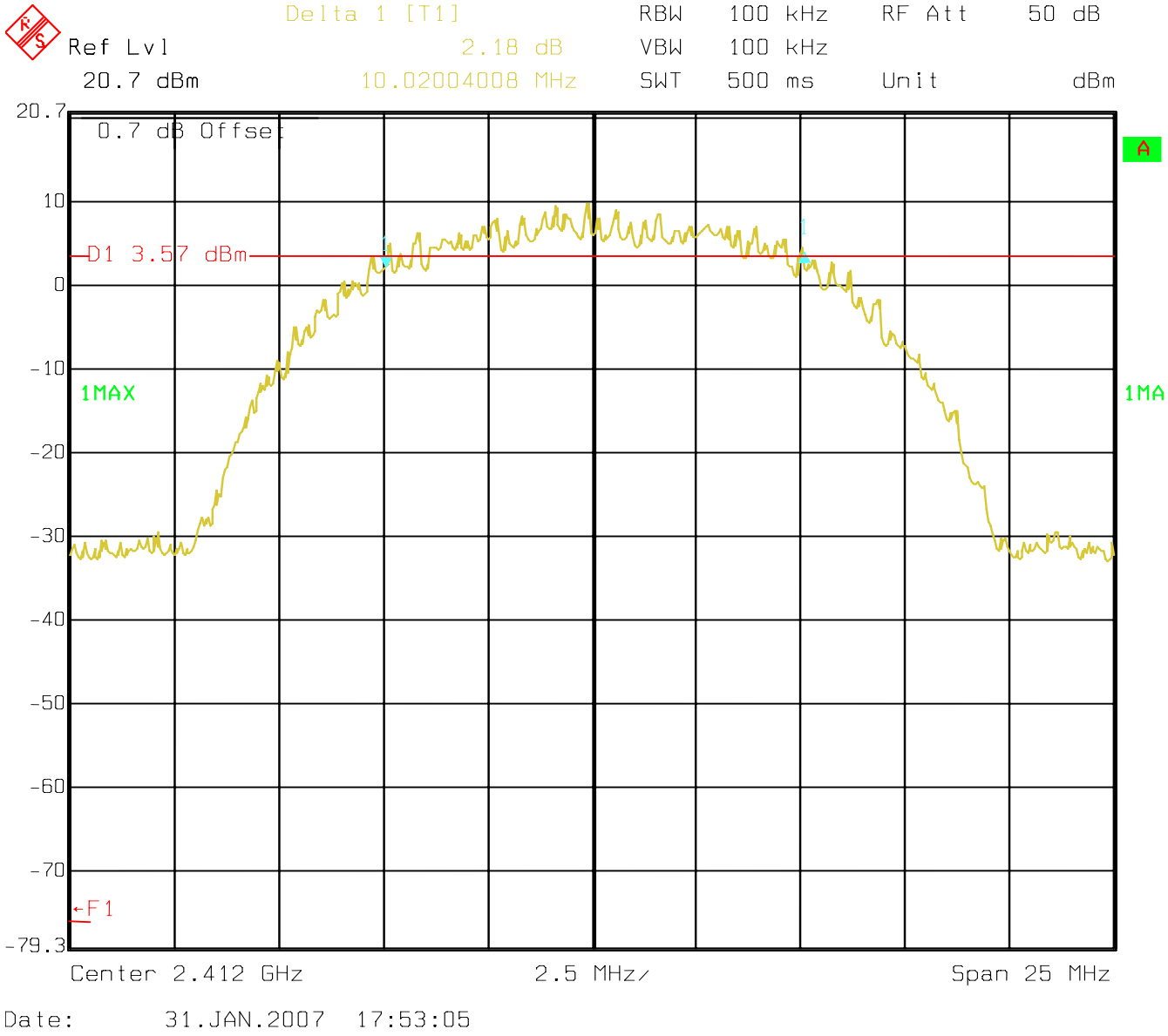
The minimum 6dB bandwidth shall be at least 500 KHz

5.1.2 Results

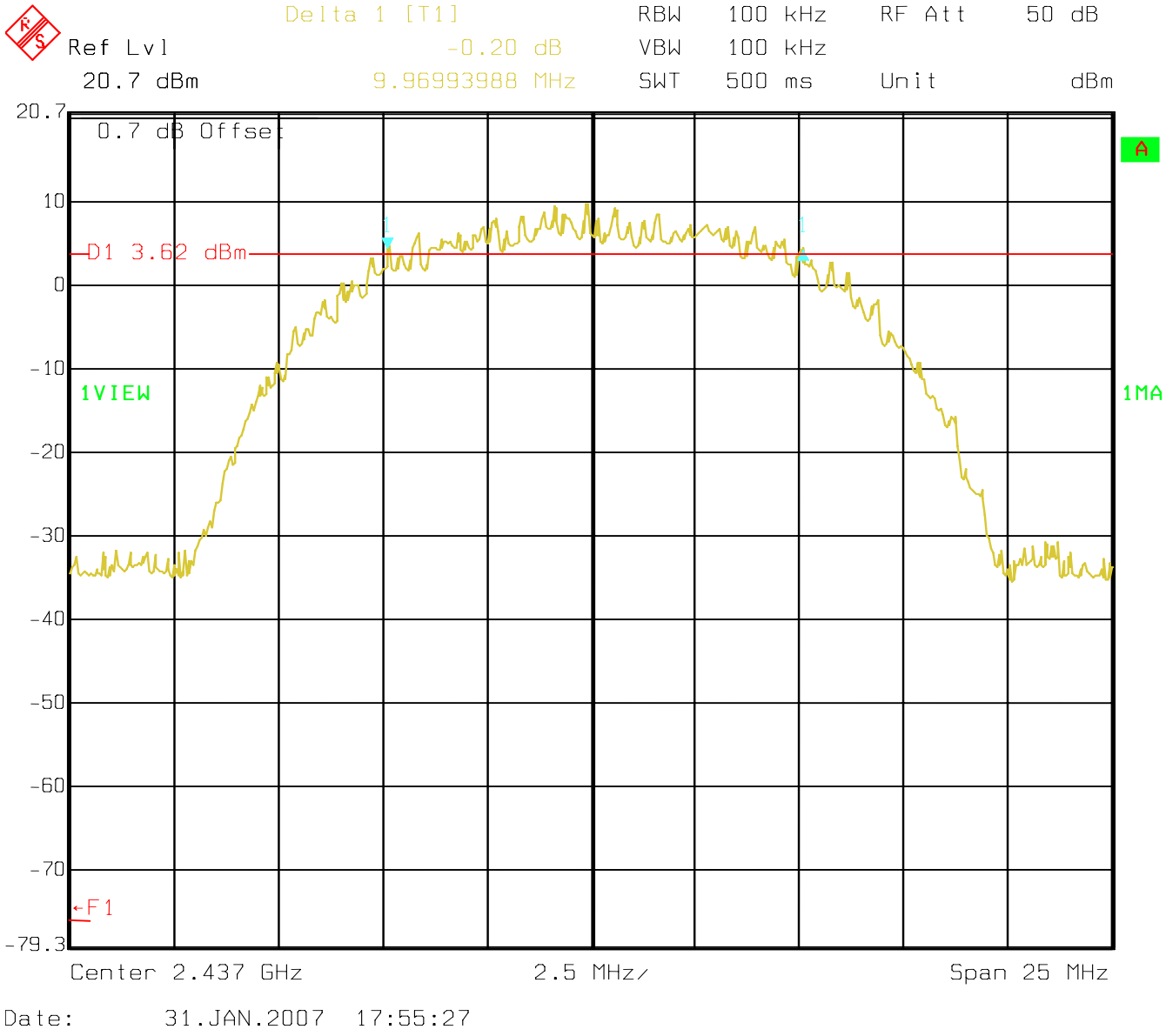
SPECTRUM BANDWIDTH OF DSSS SYSTEM **§15.247(a) (2)**

6 dB bandwidth

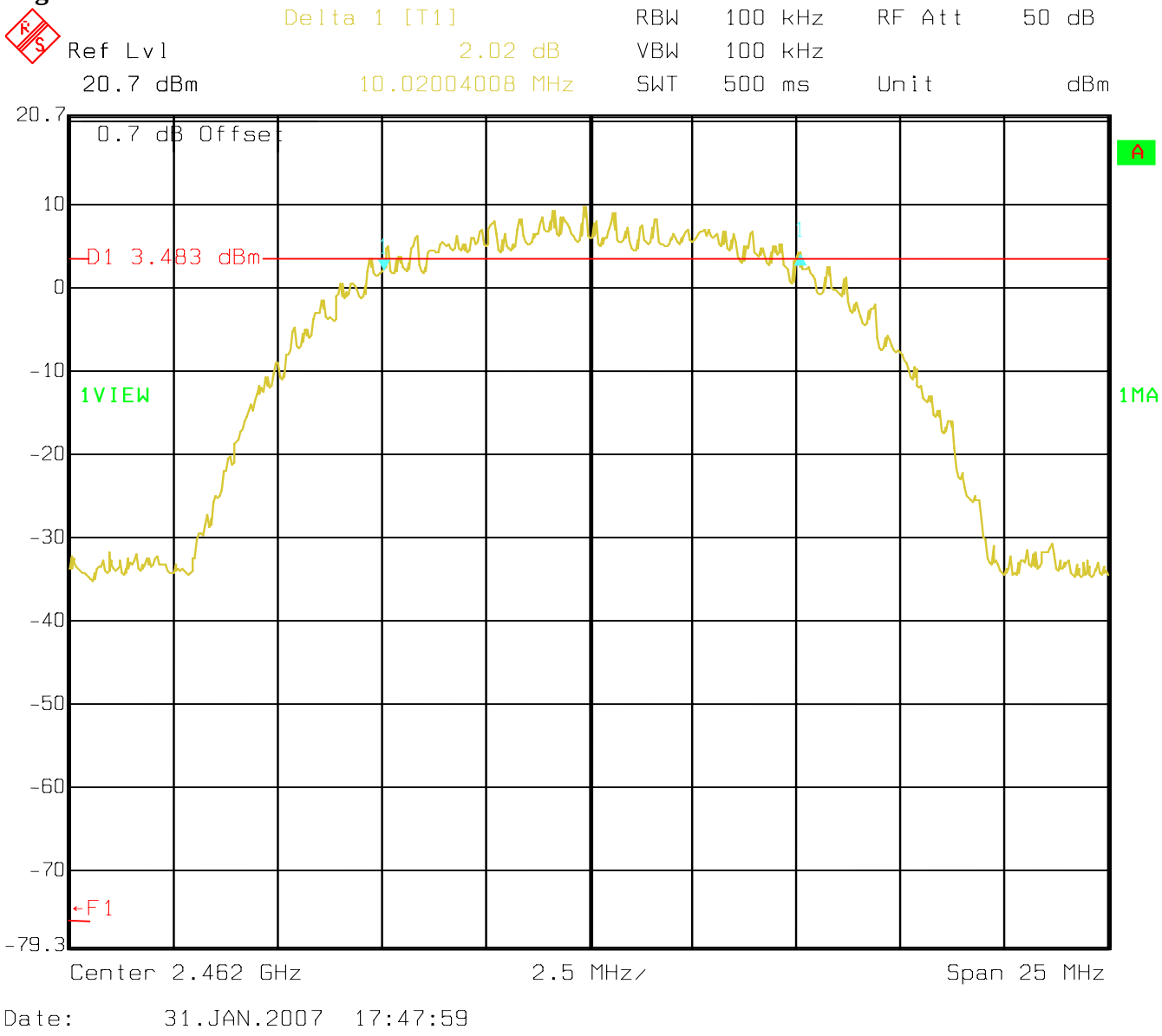
Lowest Channel: 802.11b 2412MHz



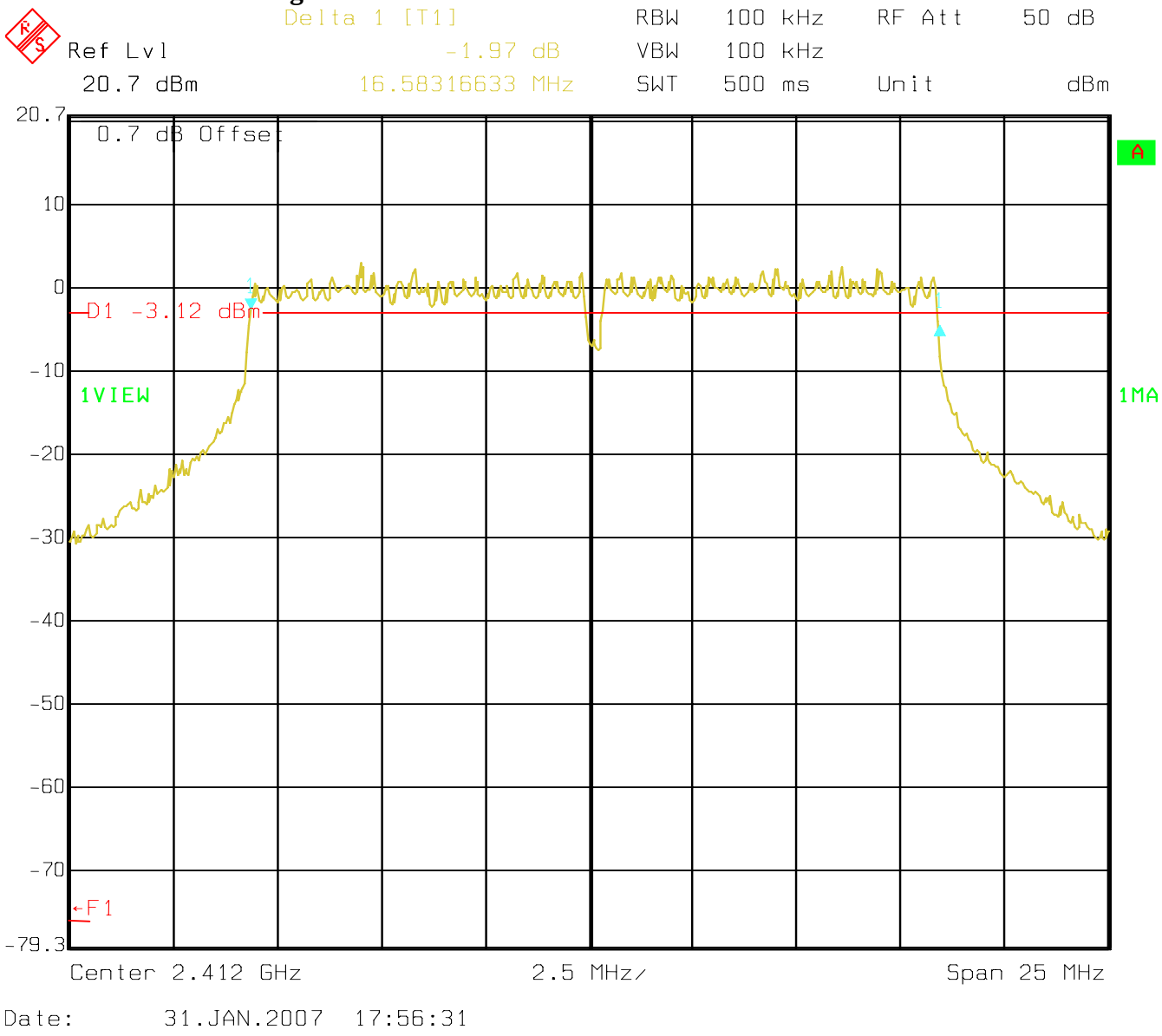
SPECTRUM BANDWIDTH OF DSSS SYSTEM **§15.247(a) (2)**
6 dB bandwidth
Mid Channel: 802.11b 2437MHz



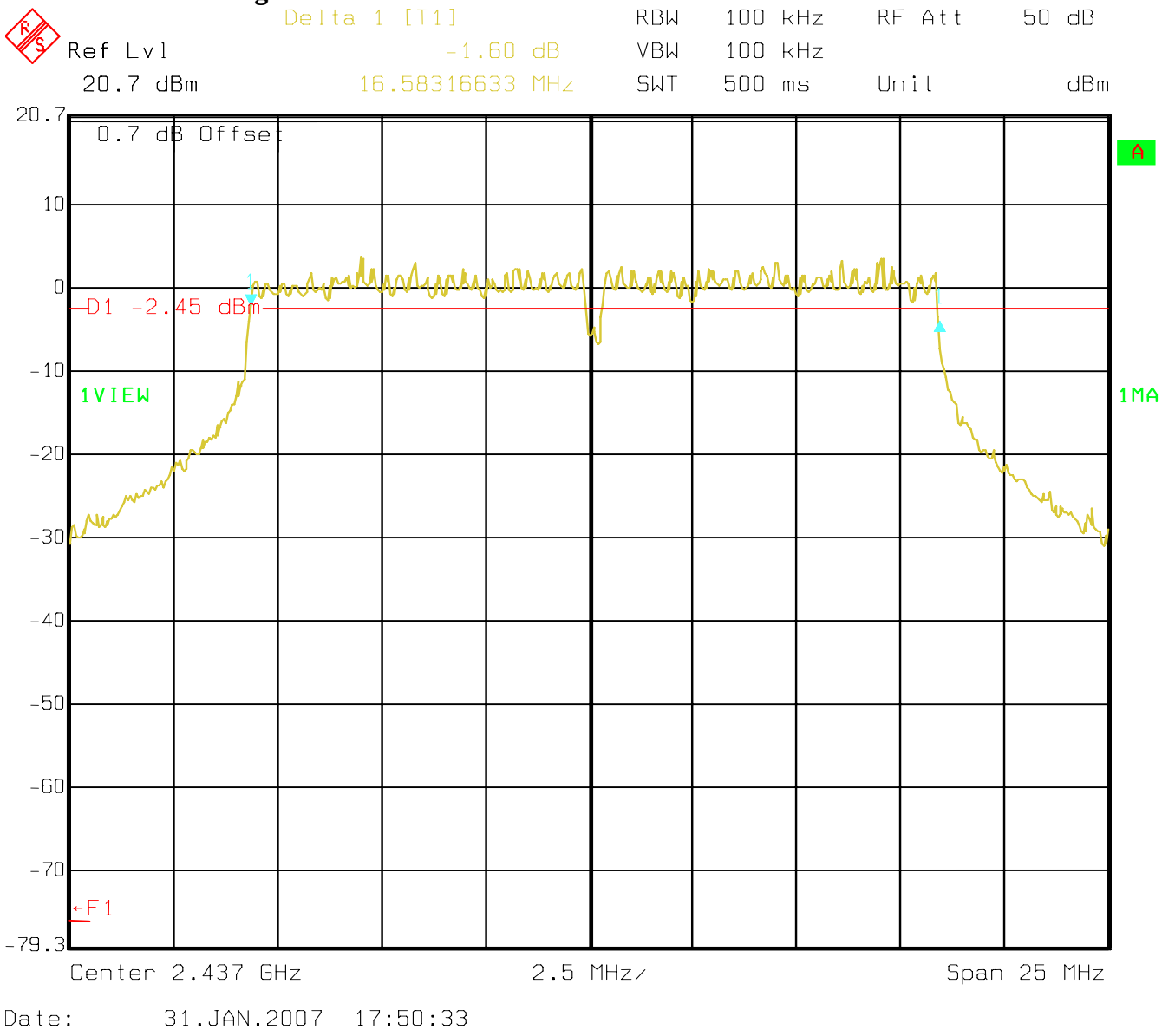
SPECTRUM BANDWIDTH OF DSSS SYSTEM **§15.247(a) (2)**
6 dB bandwidth
Highest Channel: 802.11b 2462MHz



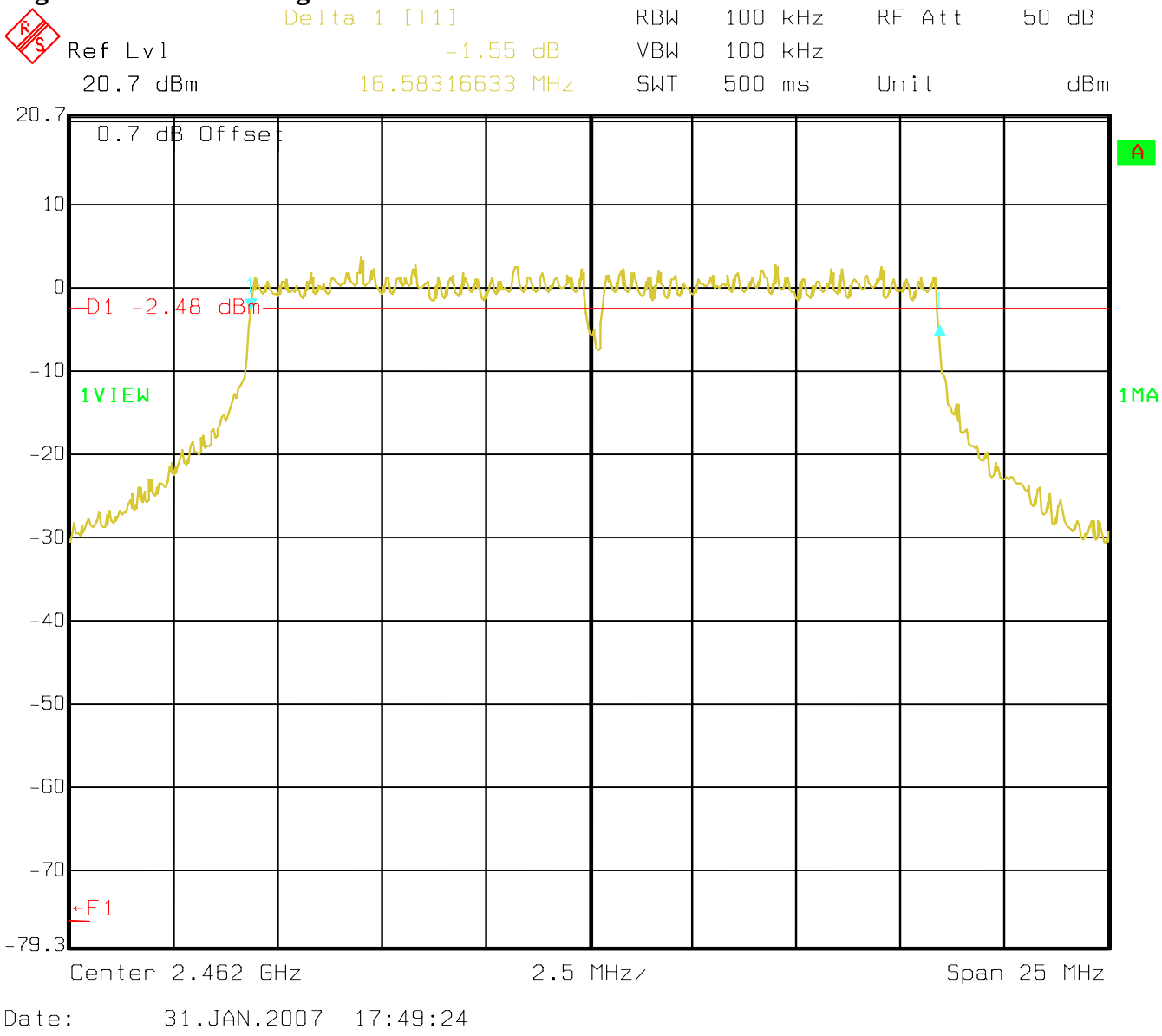
SPECTRUM BANDWIDTH OF DSSS SYSTEM **§15.247(a) (2)**
6 dB bandwidth
Lowest Channel: 802.11g 2412MHz



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



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



5.2 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}(4.2) VDC	802.11b	24.90	26.30	26.18
		802.11g	27.51	27.02	27.02
Measurement uncertainty		±0.5dBm			

RBW / VBW: 10MHz

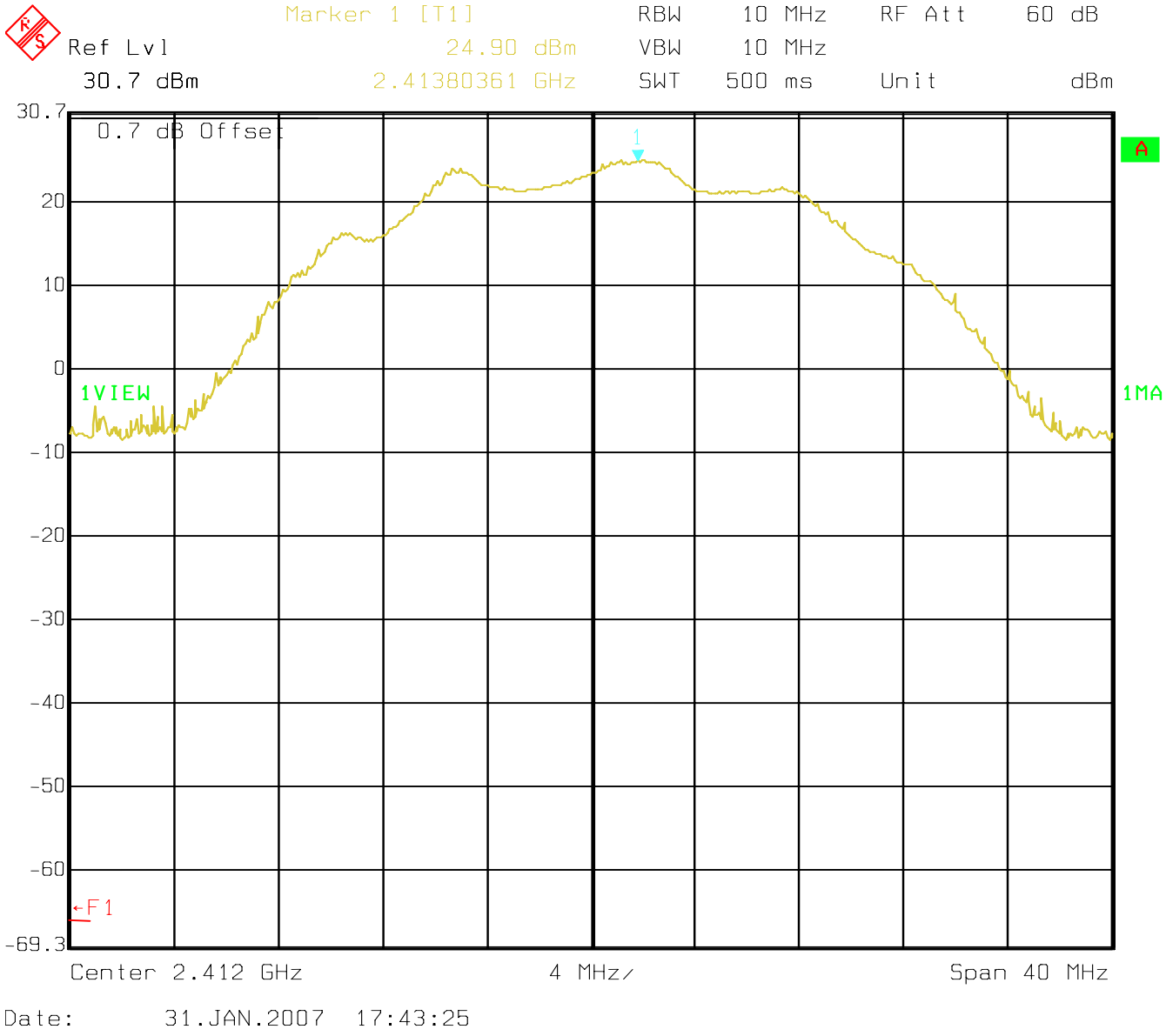
5.2.1 Limit
SUBCLAUSE § 15.247 (b) (1)

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

5.2.2 Results

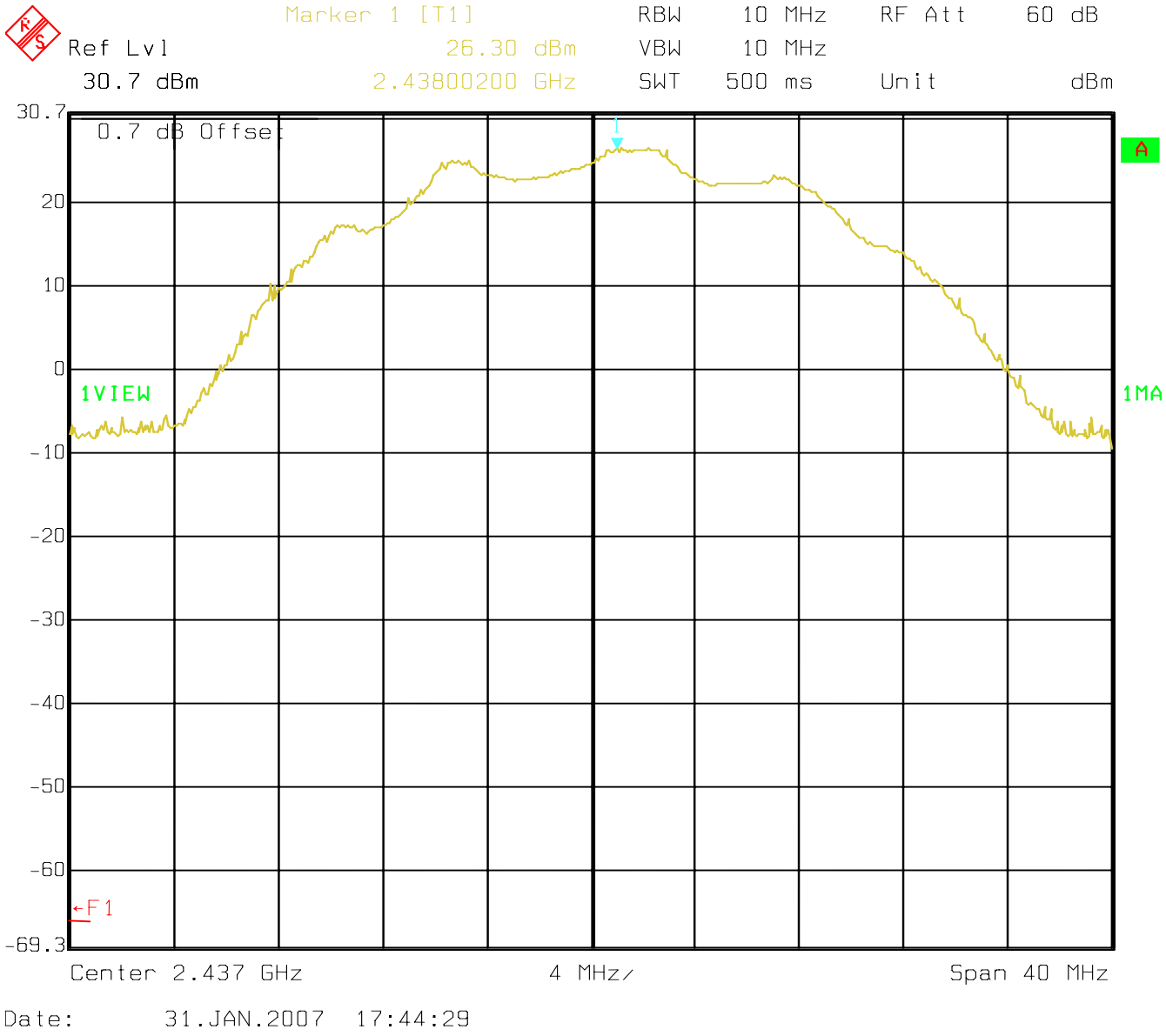
PEAK OUTPUT POWER (CONDUCTED) §15.247 (b) (1)

Lowest Channel: 802.11b 2412MHz



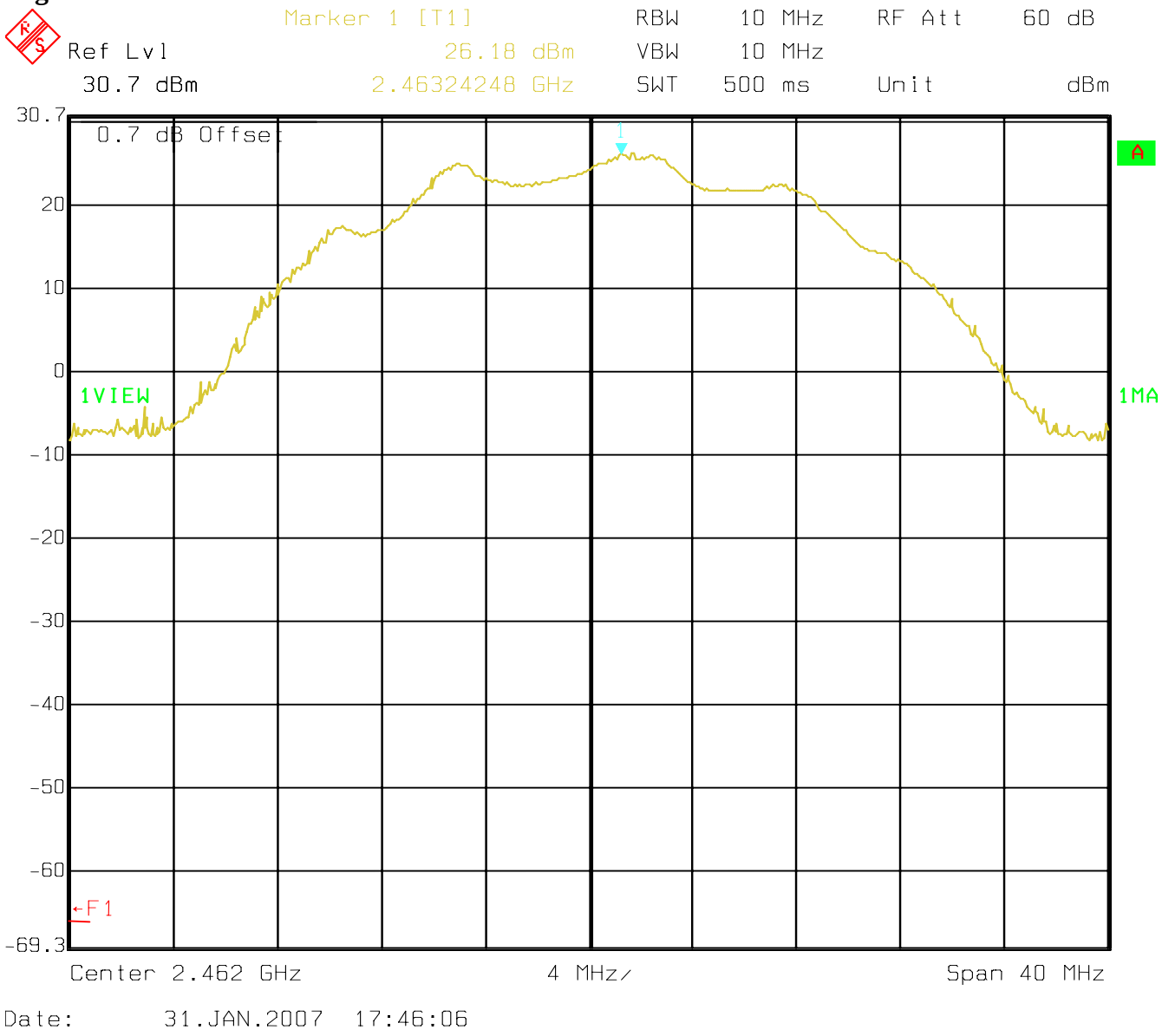
PEAK OUTPUT POWER (CONDUCTED) **§15.247 (b)**

Mid Channel: 802.11b 2437MHz



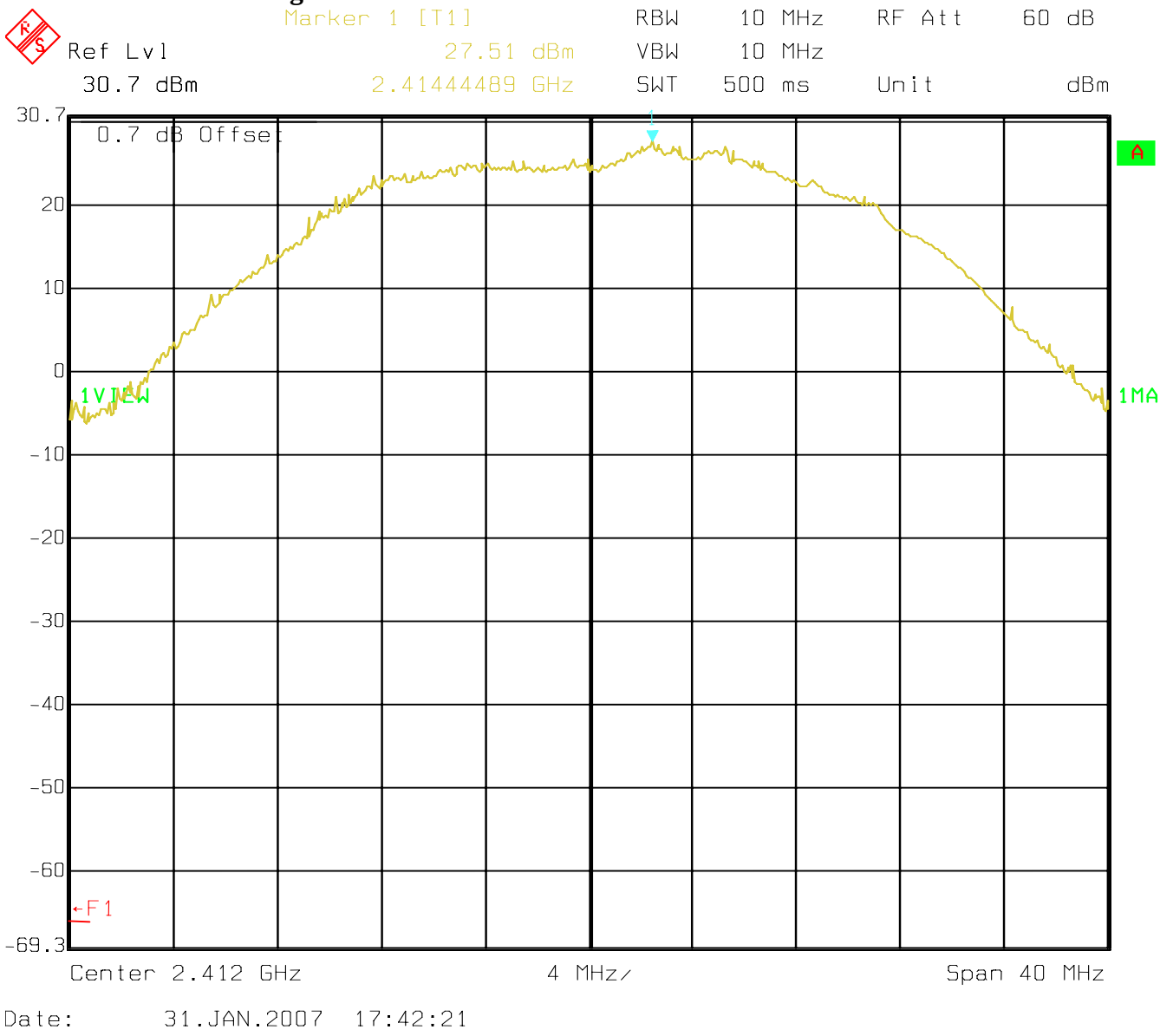
PEAK OUTPUT POWER (CONDUCTED) **§15.247 (b)**

Highest Channel: 802.11b 2462MHz



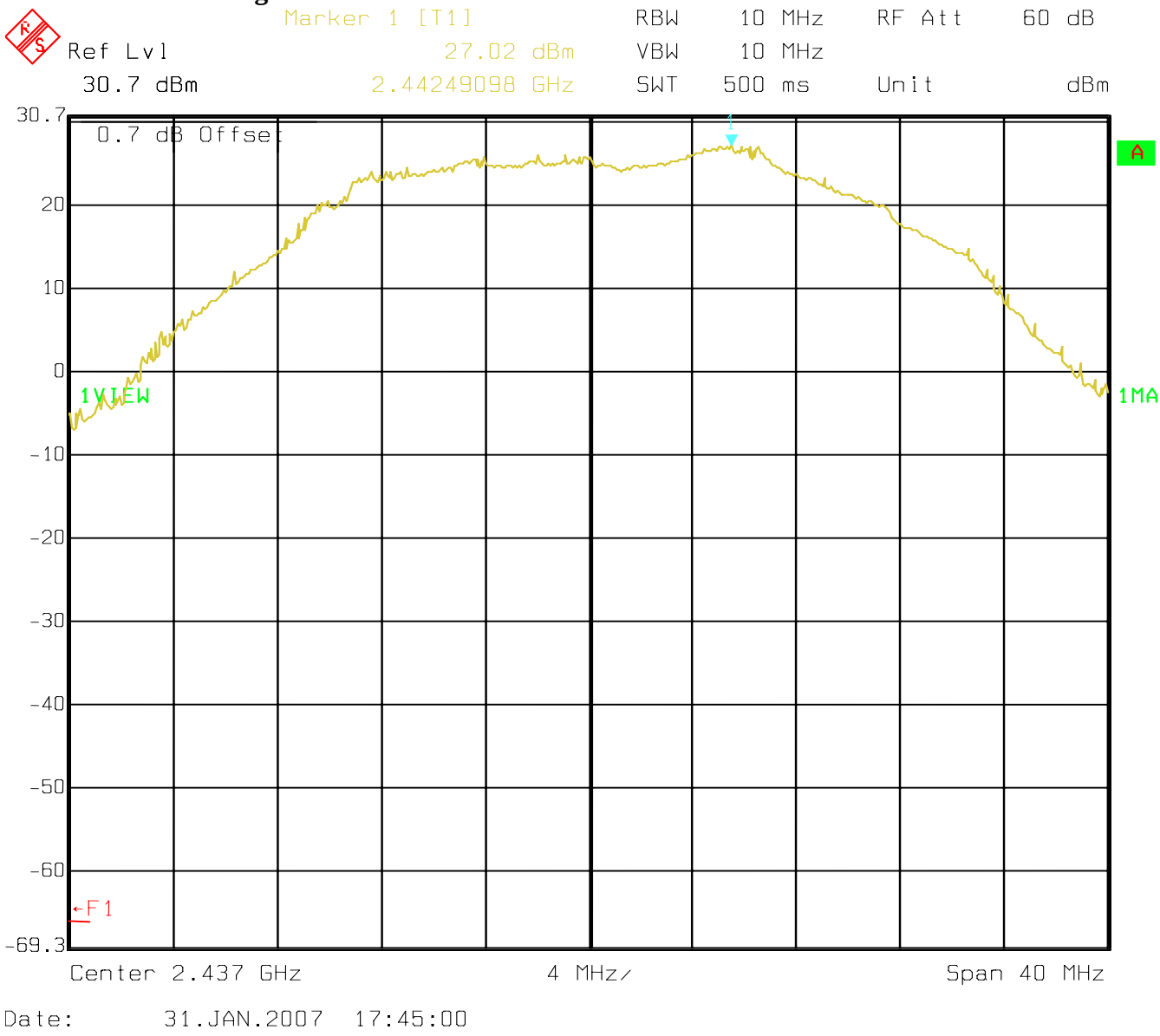
PEAK OUTPUT POWER (CONDUCTED) **§15.247 (b) (1)**

Lowest Channel: 802.11g 2412MHz



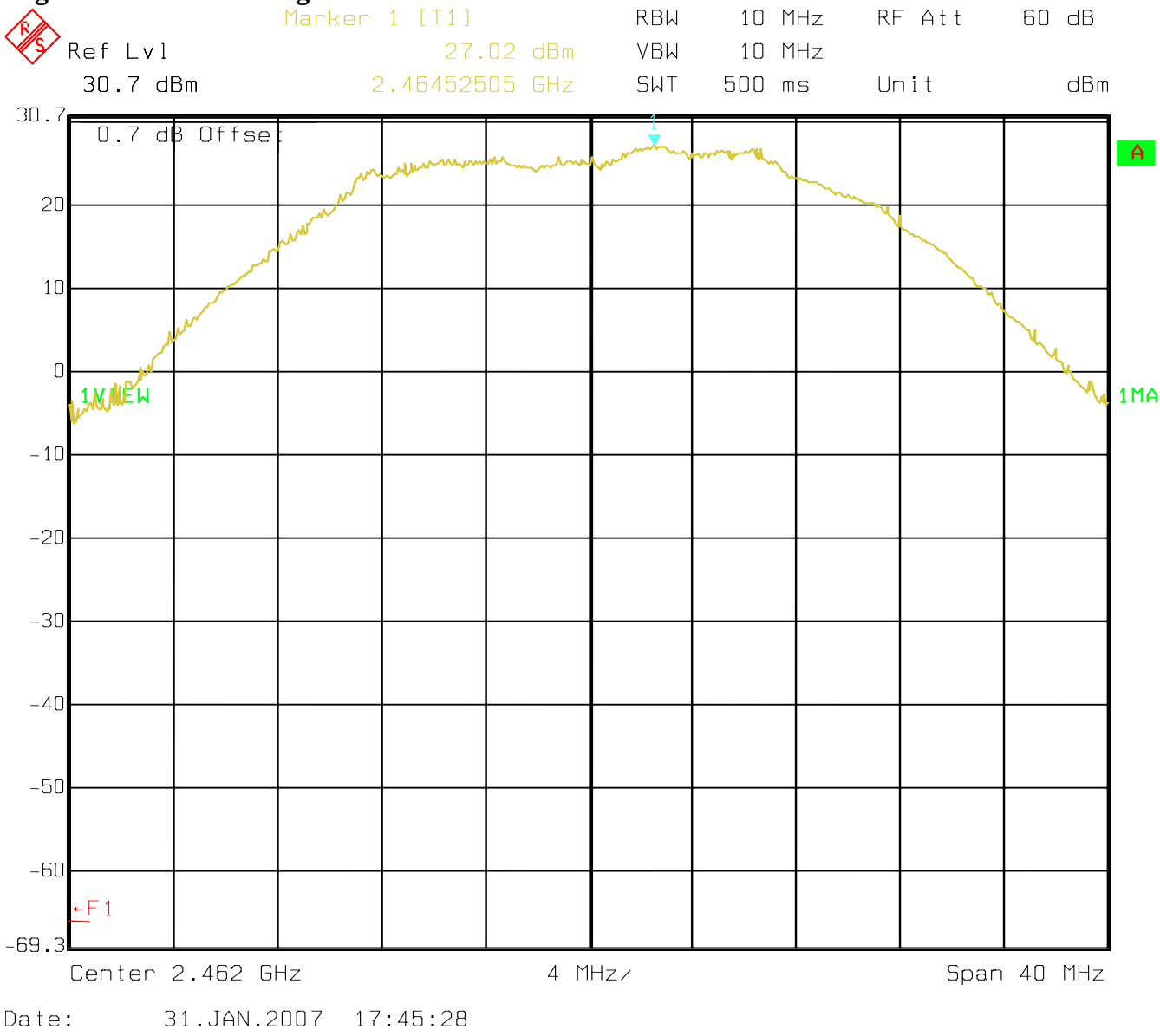
PEAK OUTPUT POWER (CONDUCTED) **§15.247 (b)**

Mid Channel: 802.11g 2437MHz



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

Highest Channel: 802.11g 2462MHz



5.3 POWER SPECTRAL DENSITY §15.247 (d)

TEST CONDITIONS			POWER SPECTRAL DENSITY (dBm)		
	Frequency (MHz)		2412	2437	2462
802.11b	T_{nom}(23) °C	V_{nom}(4.2) VDC	-6.46	-4.83	-5.14
802.11g	T_{nom}(23) °C	V_{nom}(4.2) VDC	-12.56	-11.67	-11.71

5.3.1 Limit

SUBCLAUSE §15.247(d)

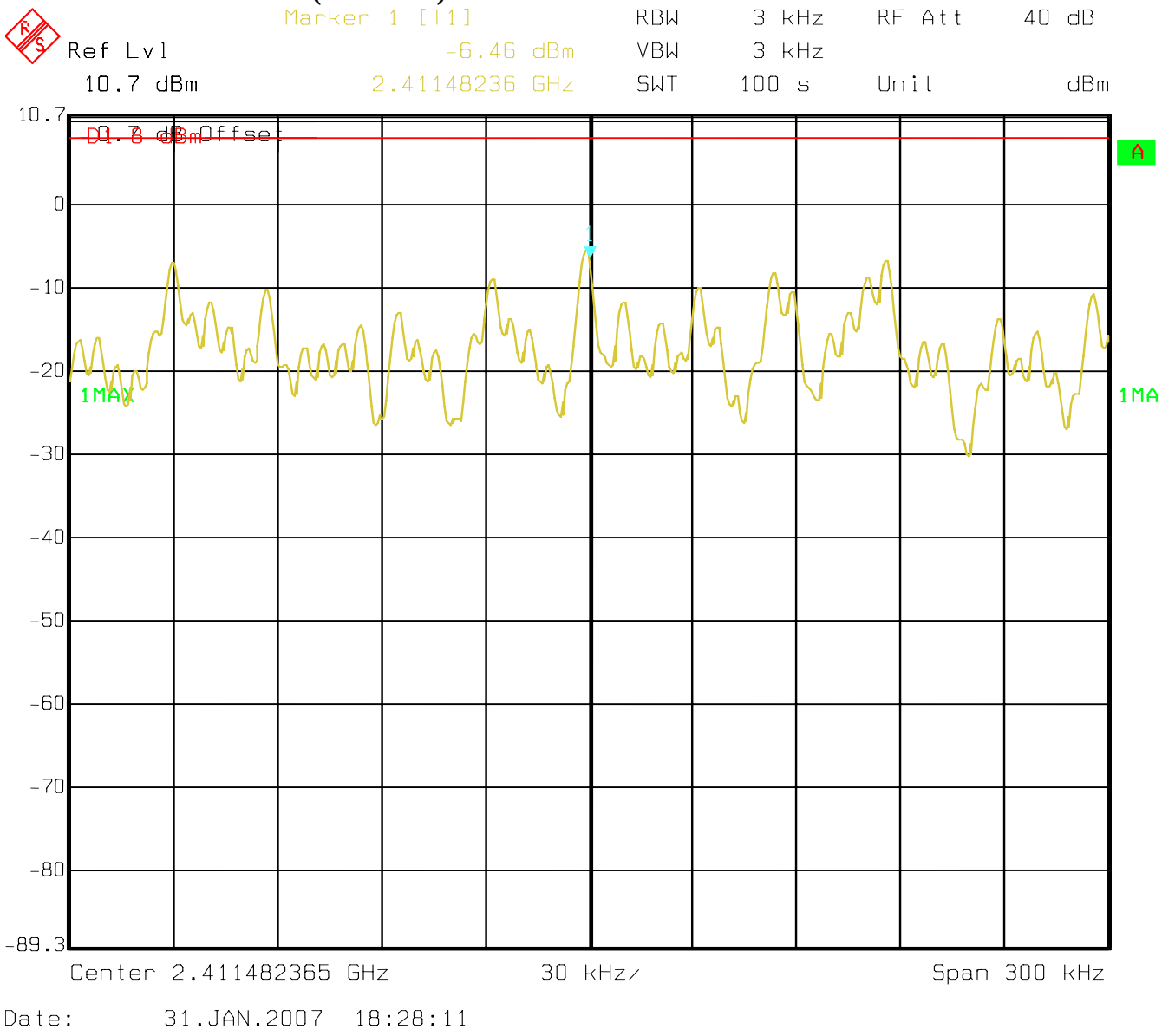
The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band

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

5.3.2 Results

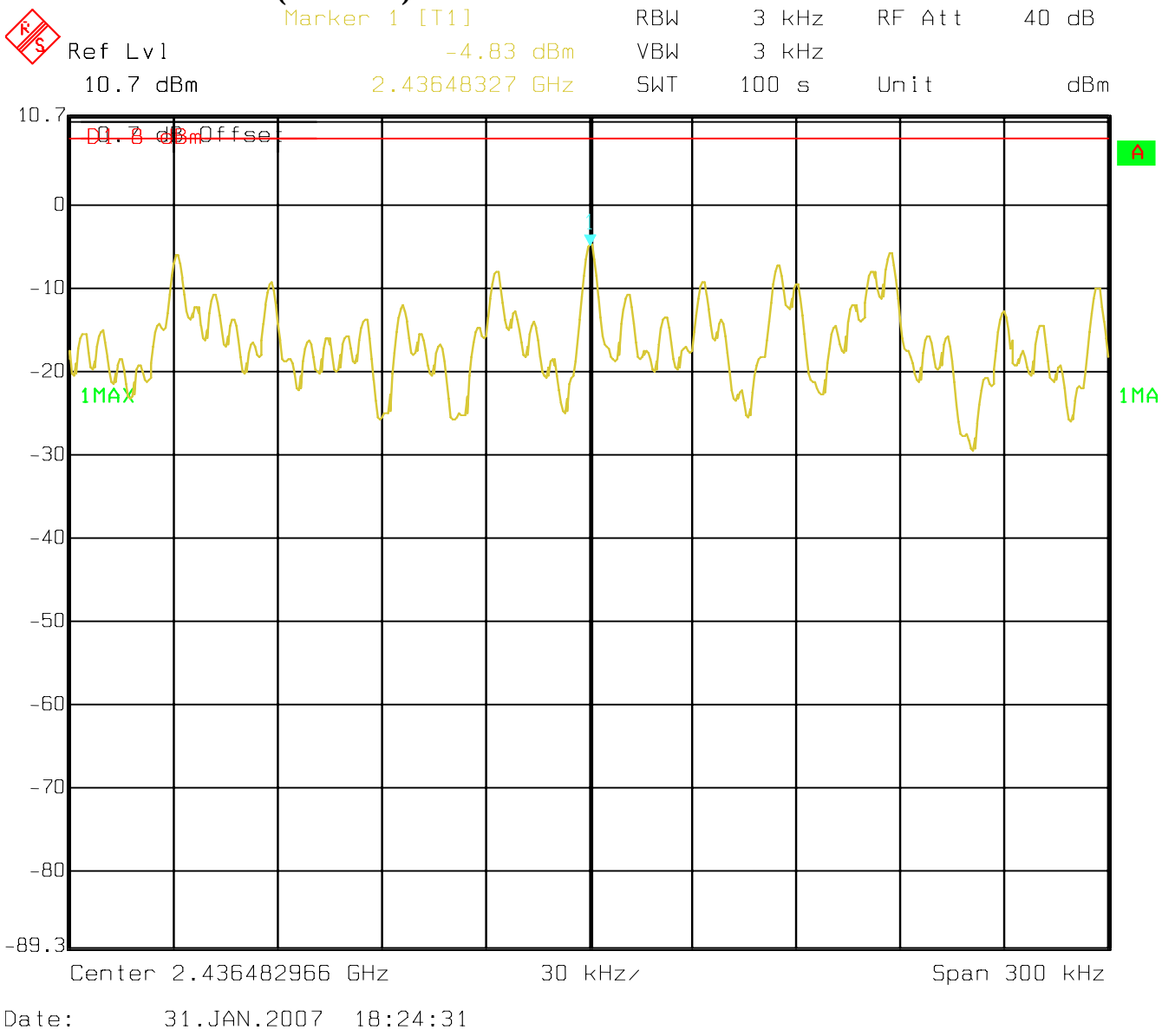
POWER SPECTRAL DENSITY **§15.247(d)**

Lowest Channel: 802.11b (2412MHz)



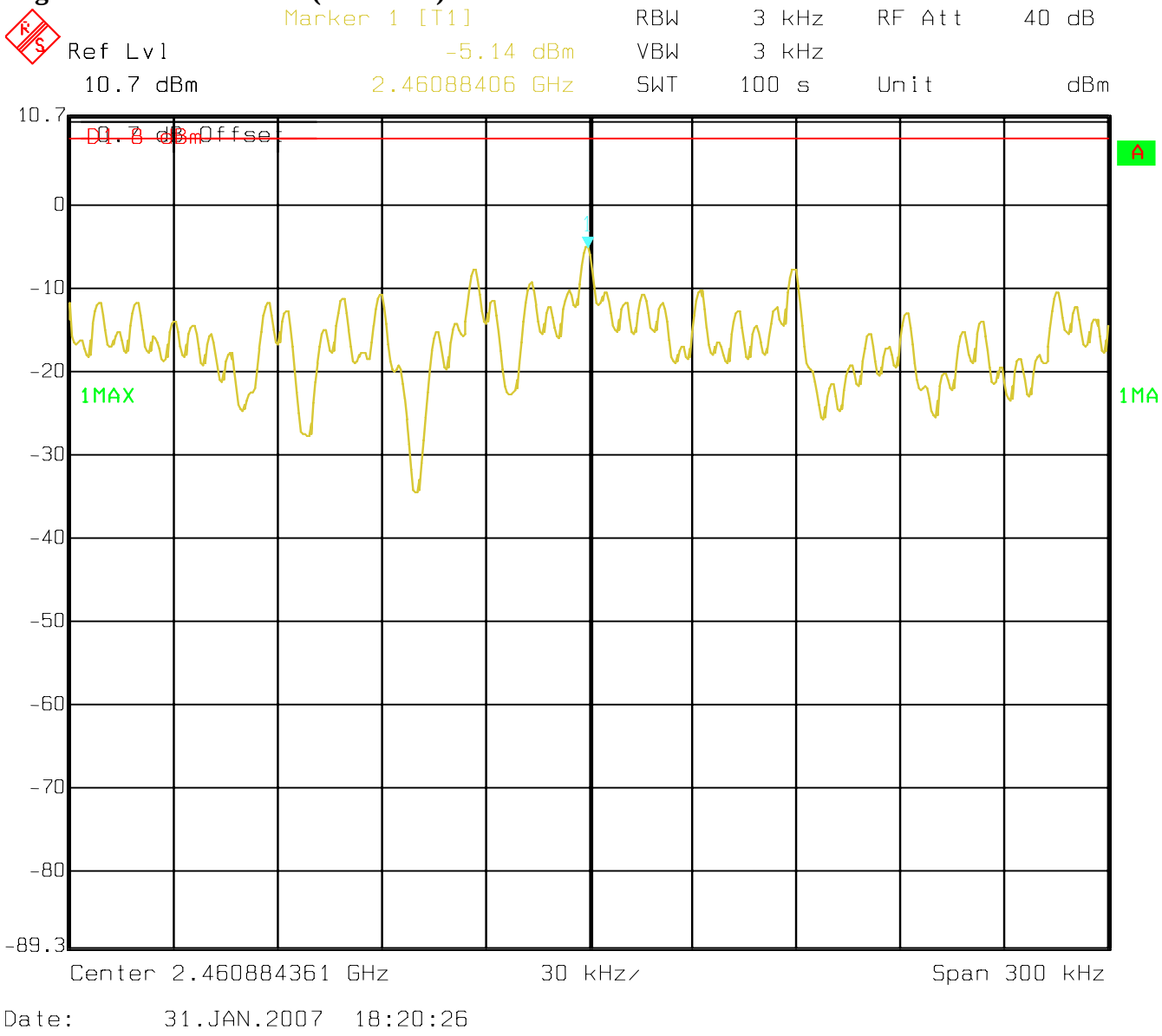
POWER SPECTRAL DENSITY **§15.247(d)**

Mid Channel: 802.11b (2437MHz)



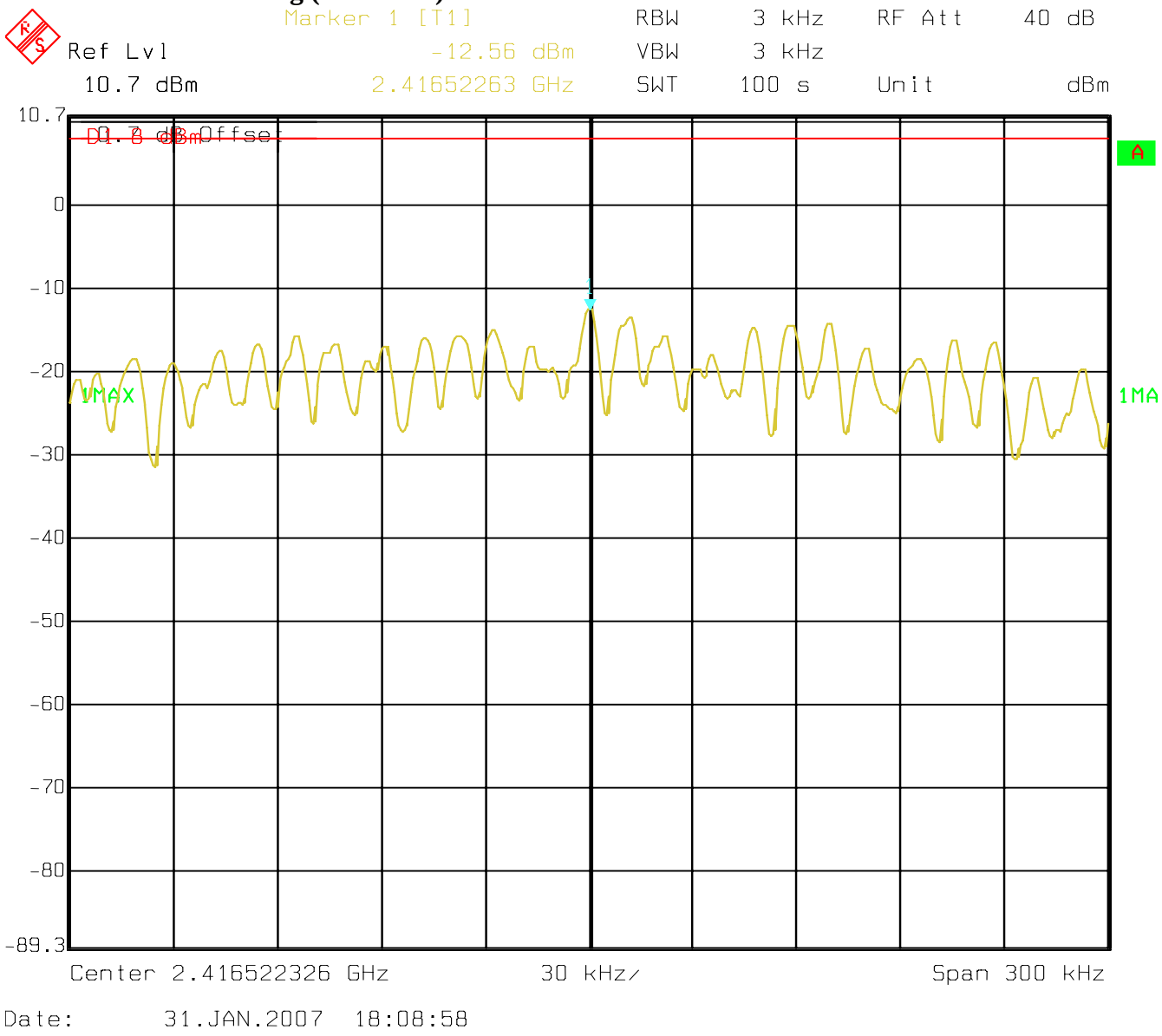
POWER SPECTRAL DENSITY **§15.247(d)**

Highest Channel: 802.11b(2462MHz)



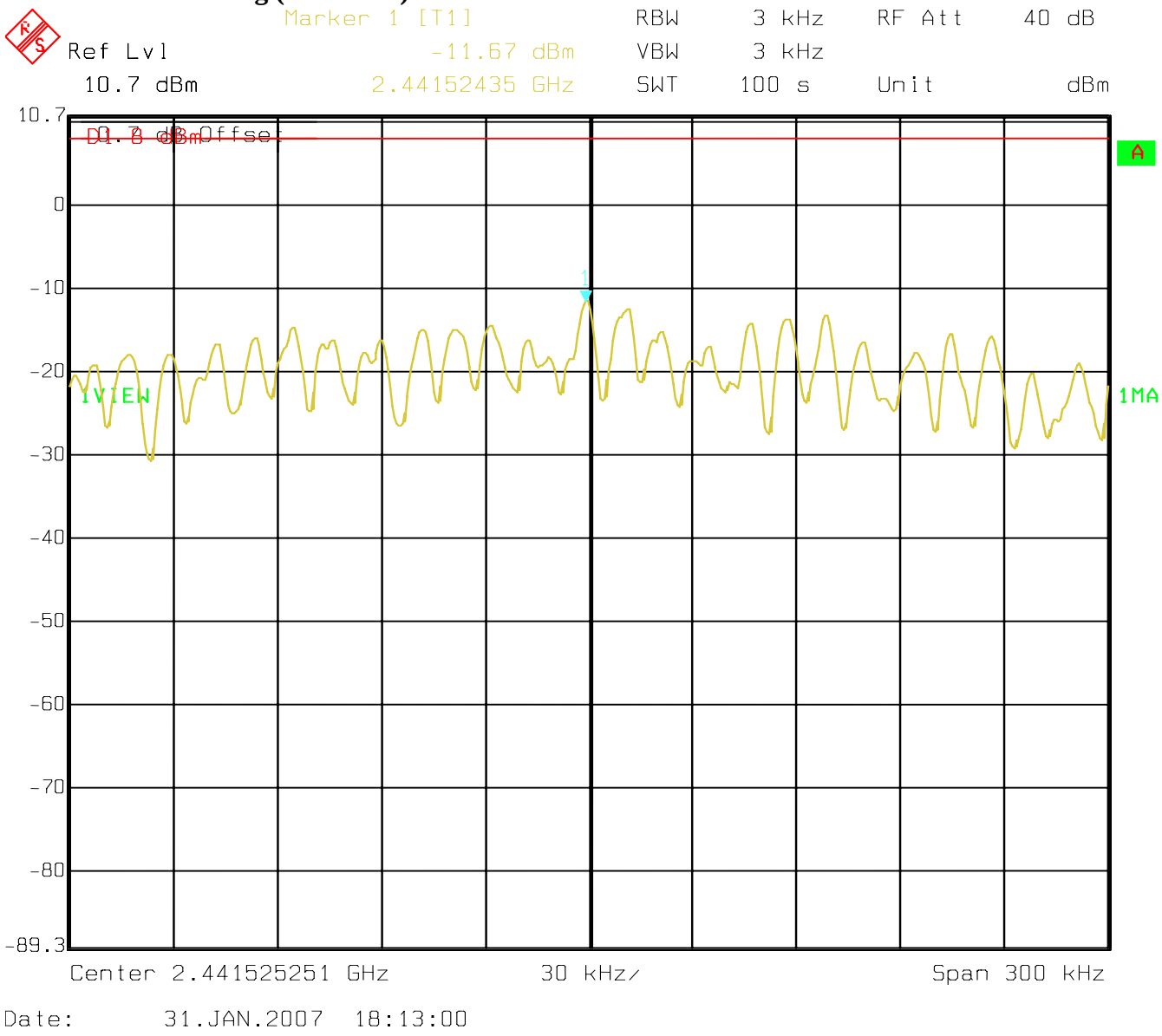
POWER SPECTRAL DENSITY **§15.247(d)**

Lowest Channel: 802.11g (2412MHz)



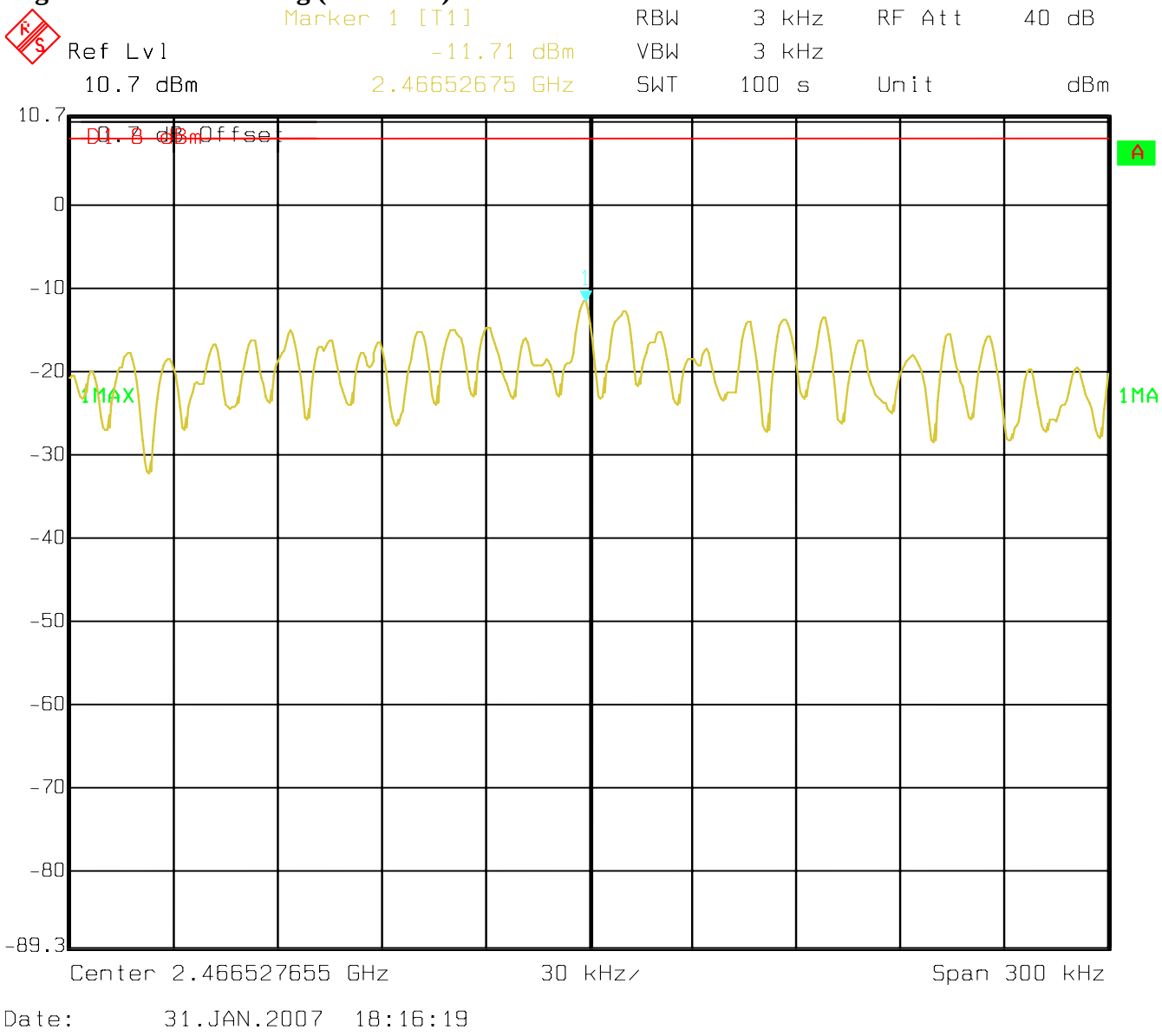
POWER SPECTRAL DENSITY **§15.247(d)**

Mid Channel: 802.11g (2437MHz)



POWER SPECTRAL DENSITY **§15.247(d)**

Highest Channel: 802.11g (2462MHz)



5.4 RESTRICTED BAND EDGE COMPLIANCE RADIATED §15.247/15.205

5.4.1 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.

5.4.2 Results Lower Restricted Band 2310 MHz to 2390 MHz

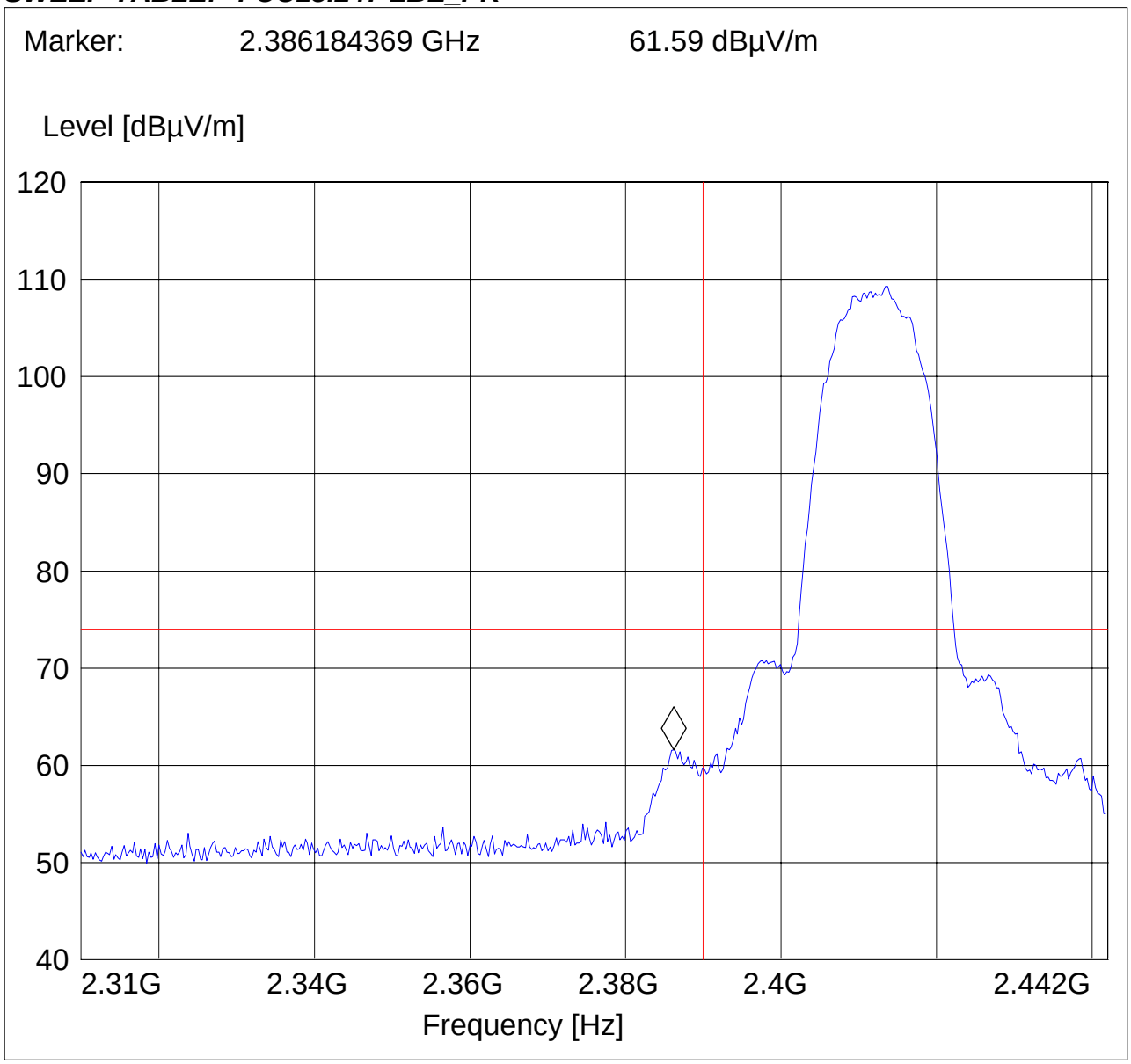
802.11b (2412MHz) PEAK

CETECOM Inc.

411 Dixon Landing Road, Milpitas CA 95035, USA

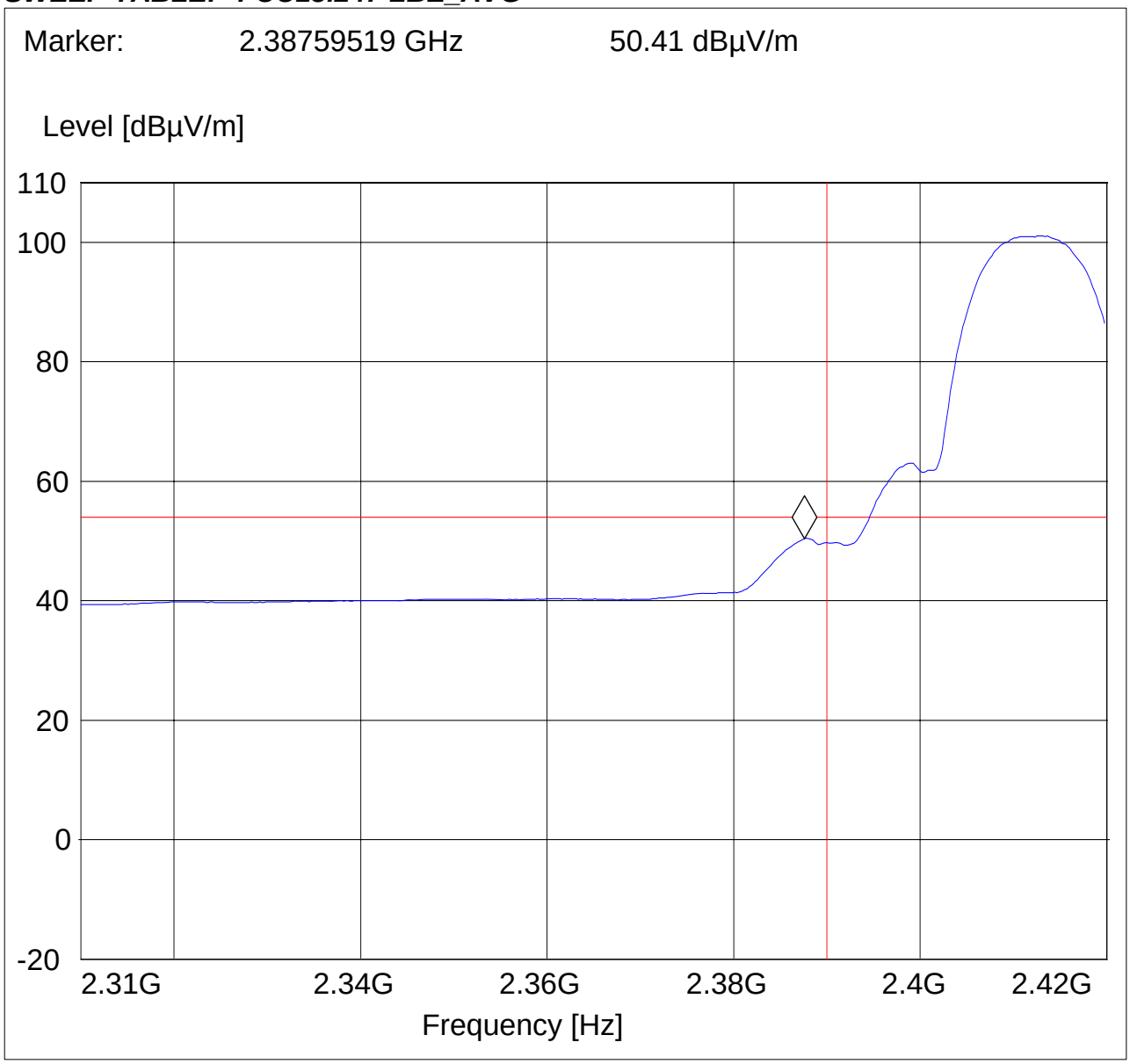
Test Mode: WLAN-CCK, ch1
Ant Orientation: V
EUT Orientation: +45° from horizontal
Test Engineer: Ed
Voltage:: Battery
Comments:: maximized Peak

SWEEP TABLE: "FCC15.247 LBE_PK"



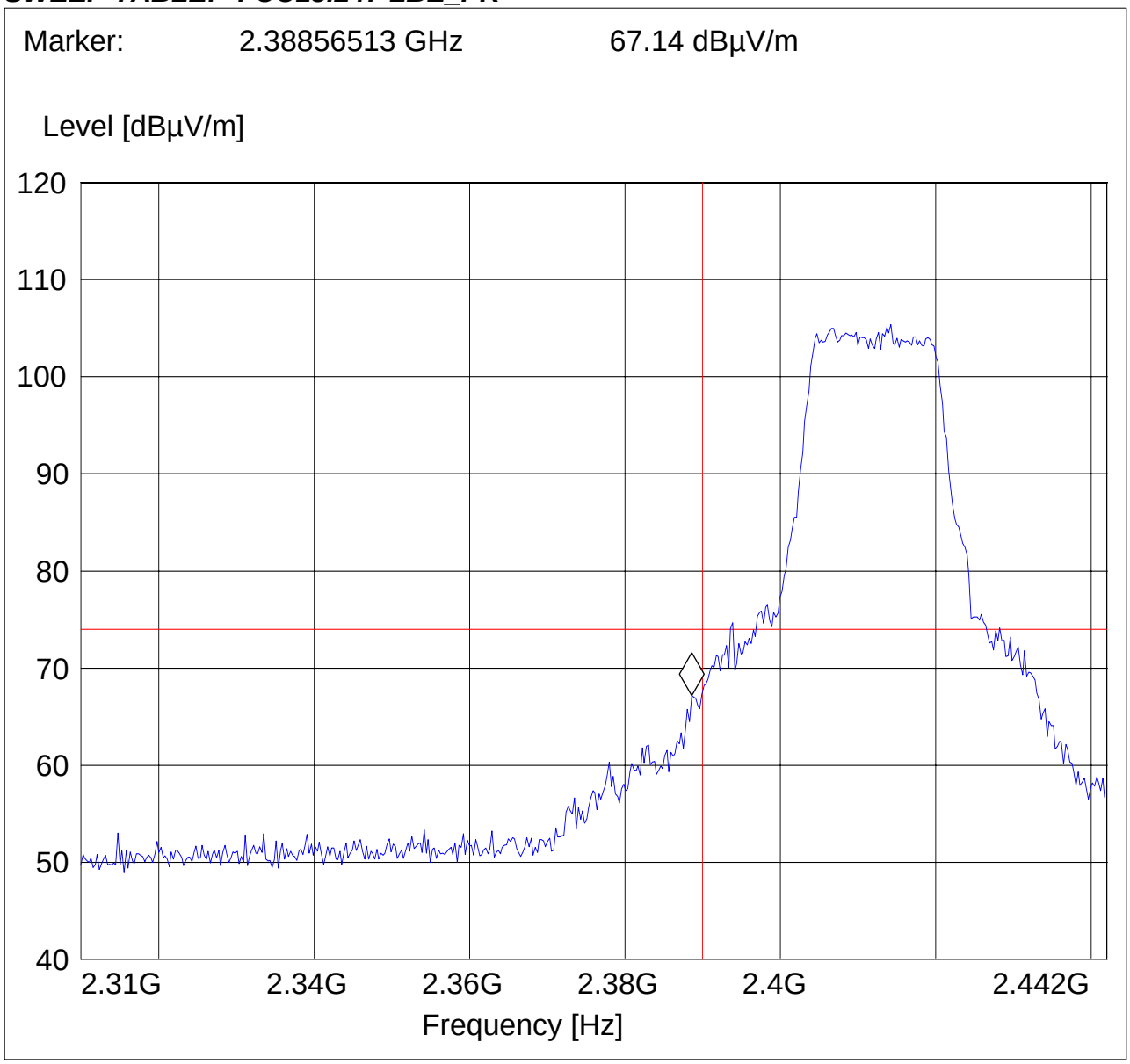
802.11b (2412MHz) AVG
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
Test Mode: WLAN-CCK, ch1
Ant Orientation: V
EUT Orientation: +45° from horizontal
Test Engineer: Ed
Voltage:: Battery
Comments:: maximized Average

SWEEP TABLE: "FCC15.247 LBE_AVG"



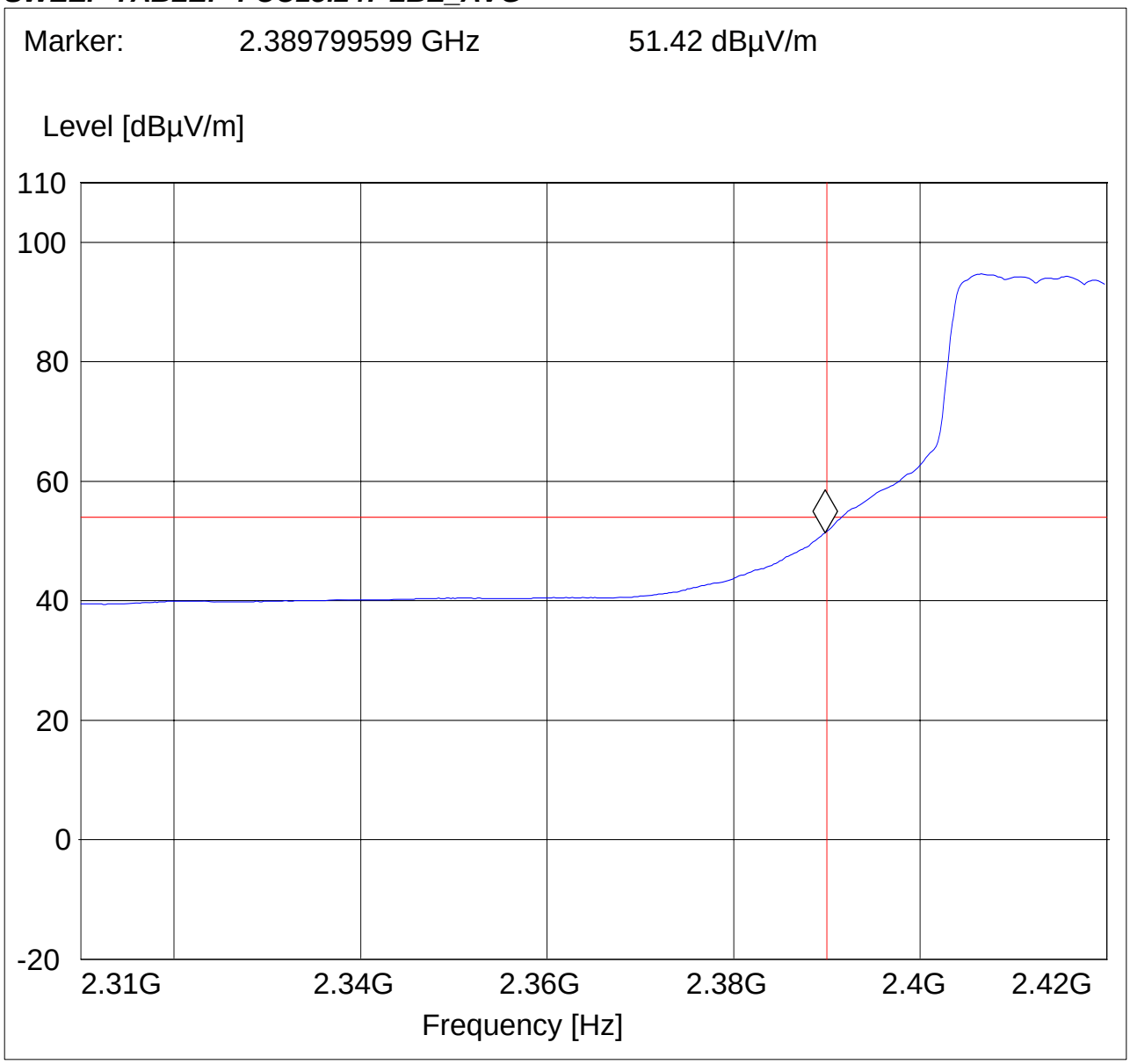
802.11g (2412MHz) PEAK
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
Test Mode: WLAN-OFDM, ch1
Ant Orientation: V
EUT Orientation: +45° from horizontal
Test Engineer: Ed
Voltage:: Battery
Comments:: maximized Peak

SWEEP TABLE: "FCC15.247 LBE_PK"



802.11g (2412MHz) AVG
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
Test Mode: WLAN-OFDM, ch1
Ant Orientation: V
EUT Orientation: +45° from horizontal
Test Engineer: Ed
Voltage:: Battery
Comments:: maximized Average

SWEEP TABLE: "FCC15.247 LBE_AVG"



5.4.3 Results Upper Restricted Band 2483.5 MHz to 2500 MHz

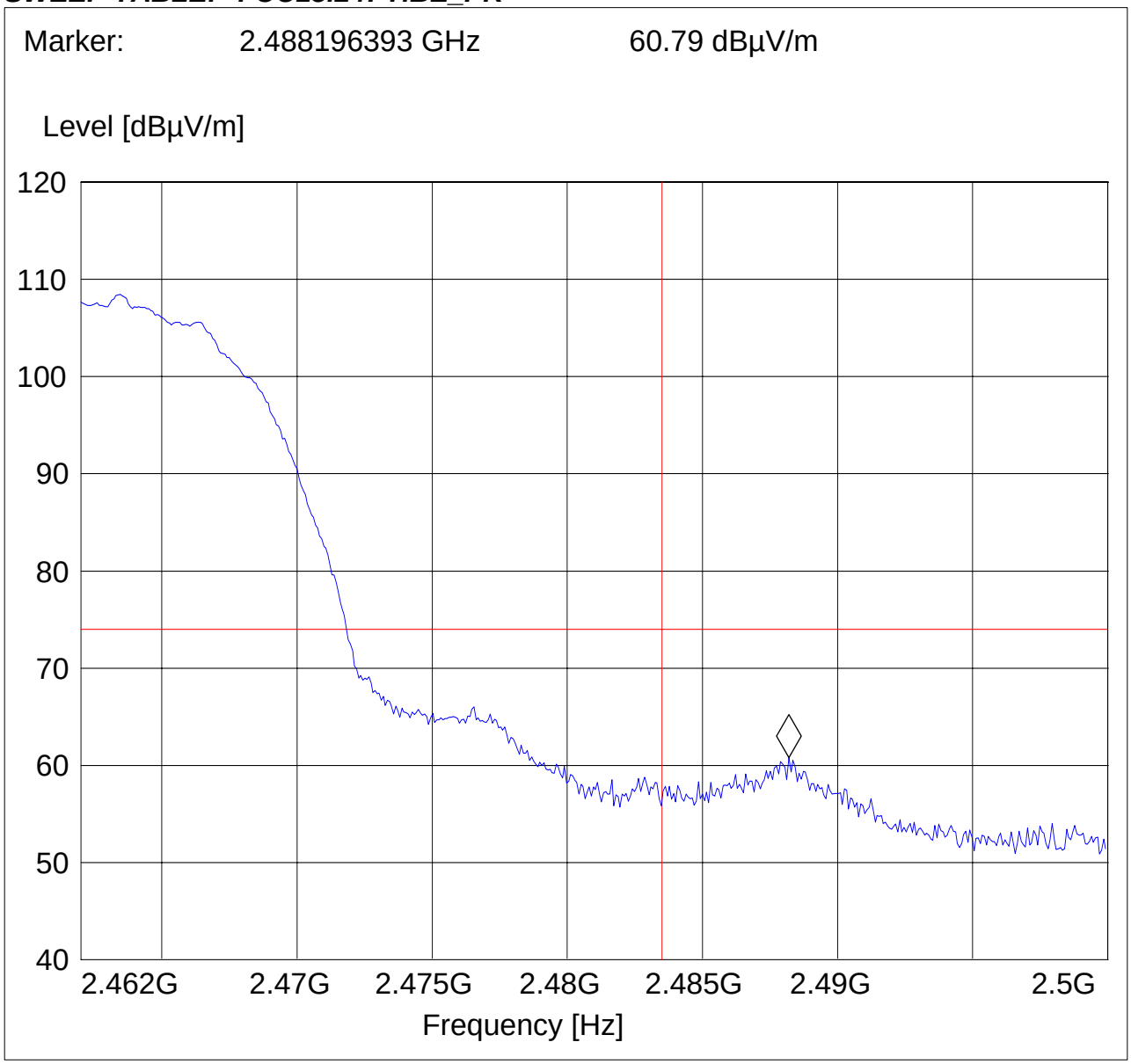
802.11b (2462MHz) PEAK

CETECOM Inc.

411 Dixon Landing Road, Milpitas CA 95035, USA

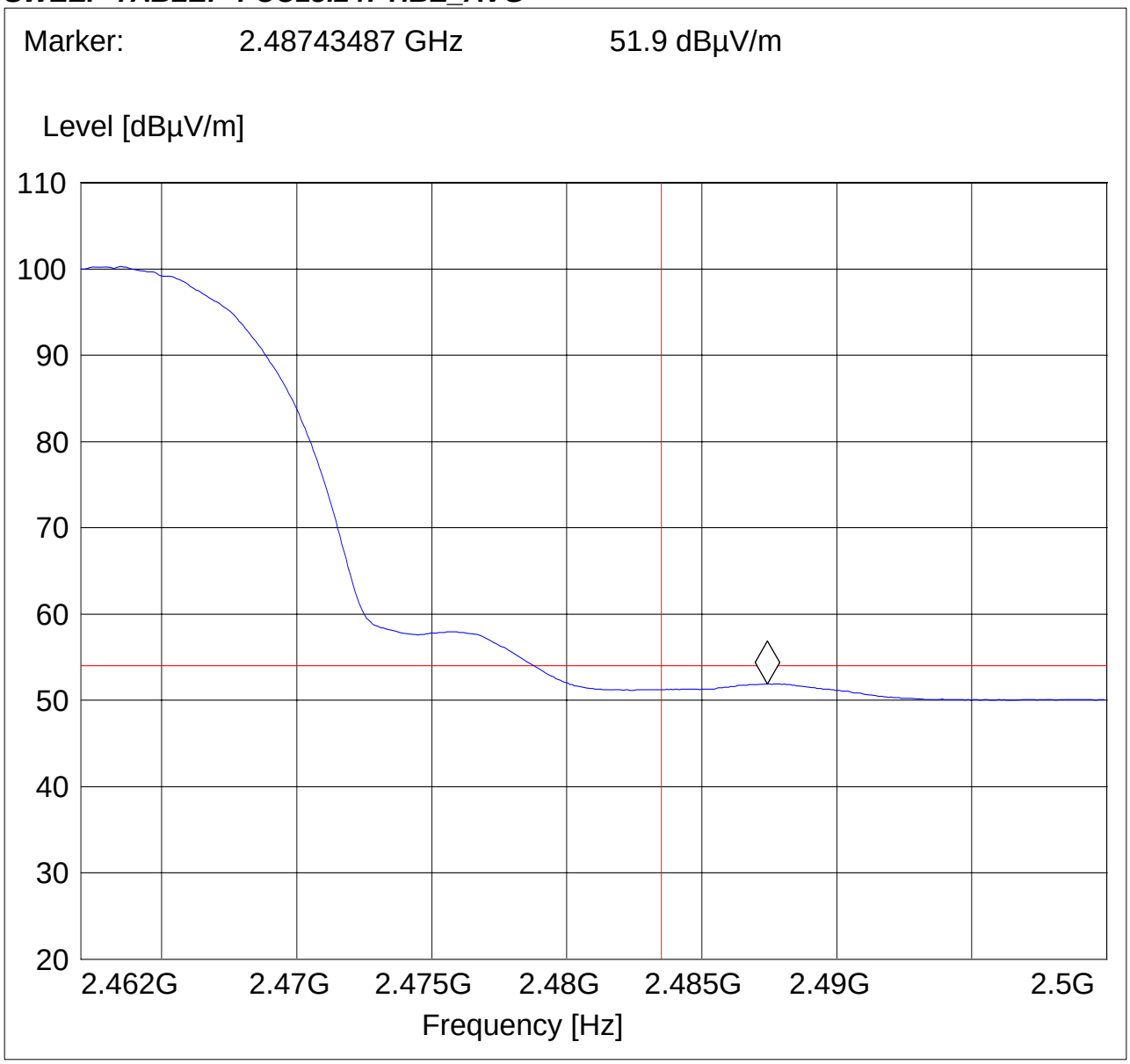
Test Mode: WLAN-CCK, ch11
Ant Orientation: V
EUT Orientation: +45° from horizontal
Test Engineer: Ed
Voltage:: Battery
Comments:: maximized Peak

SWEEP TABLE: "FCC15.247 HBE_PK"



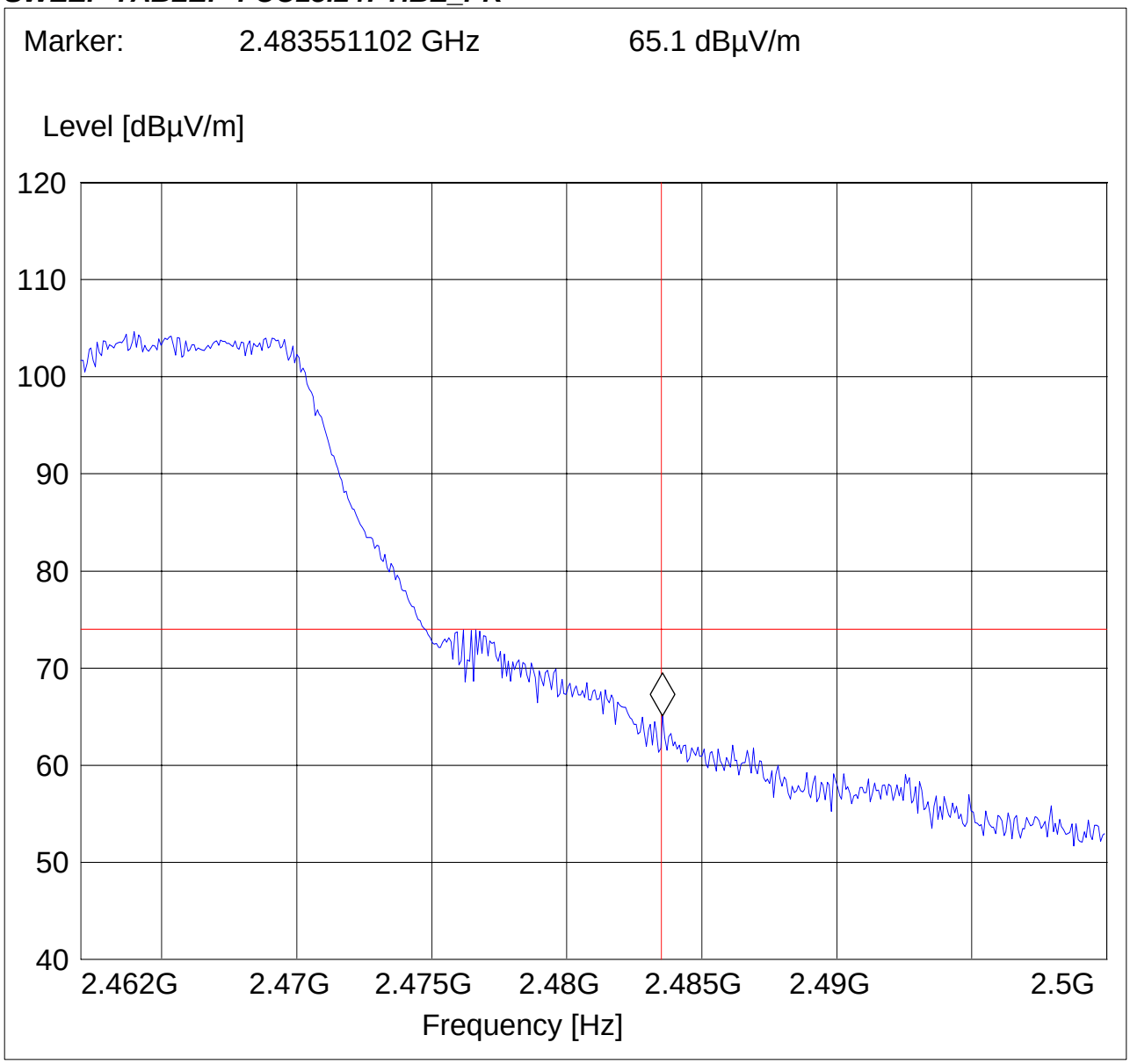
802.11b (2462MHz) AVG
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
Test Mode: WLAN-CCK, ch11
Ant Orientation: V
EUT Orientation: +45° from horizontal
Test Engineer: Ed
Voltage:: Battery
Comments:: maximized Average

SWEEP TABLE: "FCC15.247 HBE_AVG"



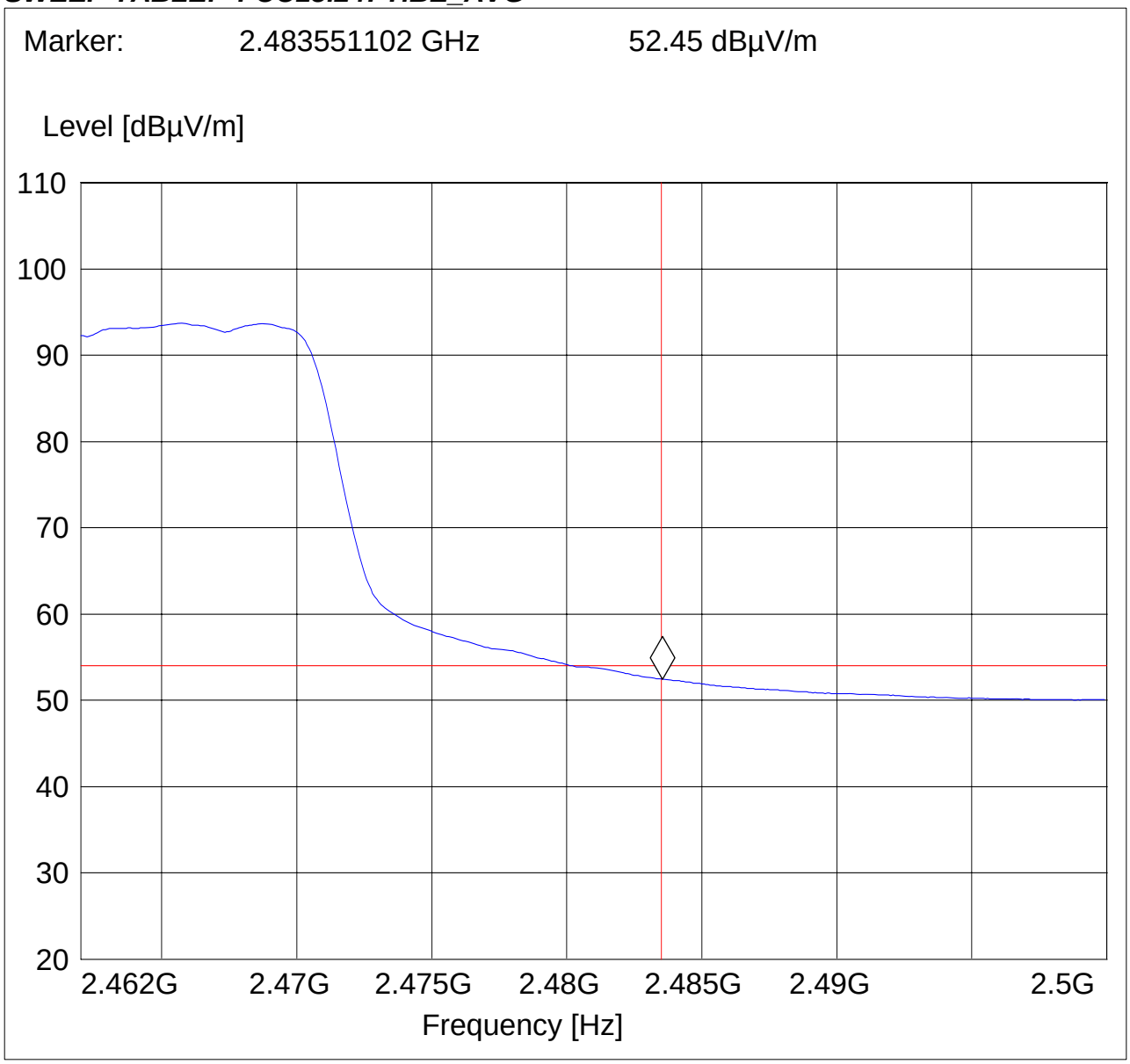
802.11g (2462MHz) PEAK
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
Test Mode: WLAN-OFDM, ch11
Ant Orientation: V
EUT Orientation: +45° from horizontal
Test Engineer: Ed
Voltage:: Battery
Comments:: maximized Peak

SWEEP TABLE: "FCC15.247 HBE_PK"



802.11g (2462MHz) AVG
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
Test Mode: WLAN-OFDM, ch11
Ant Orientation: V
EUT Orientation: +45° from horizontal
Test Engineer: Ed
Voltage:: Battery
Comments:: maximized Average

SWEEP TABLE: "FCC15.247 HBE_AVG"



5.5 TRANSMITTER SPURIOUS EMISSIONS RADIATED § 15.247/15.205/15.209

5.5.1 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

5.5.2 RESULTS

30MHz – 1GHz

Antenna: vertical

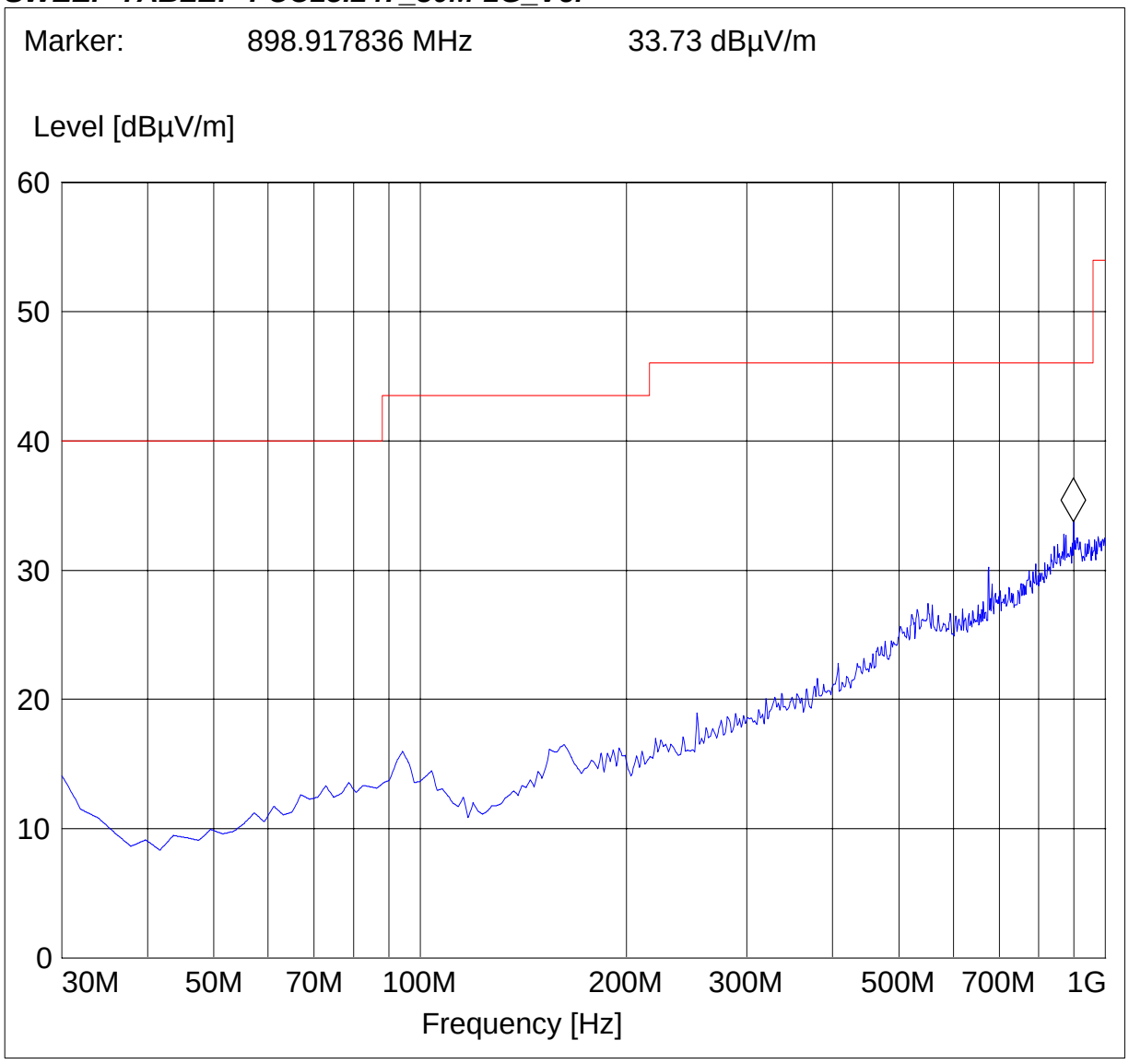
Note: This plot is valid for low, mid, high channels (worst-case plot)

CETECOM Inc.

411 Dixon Landing Road, Milpitas CA 95035, USA

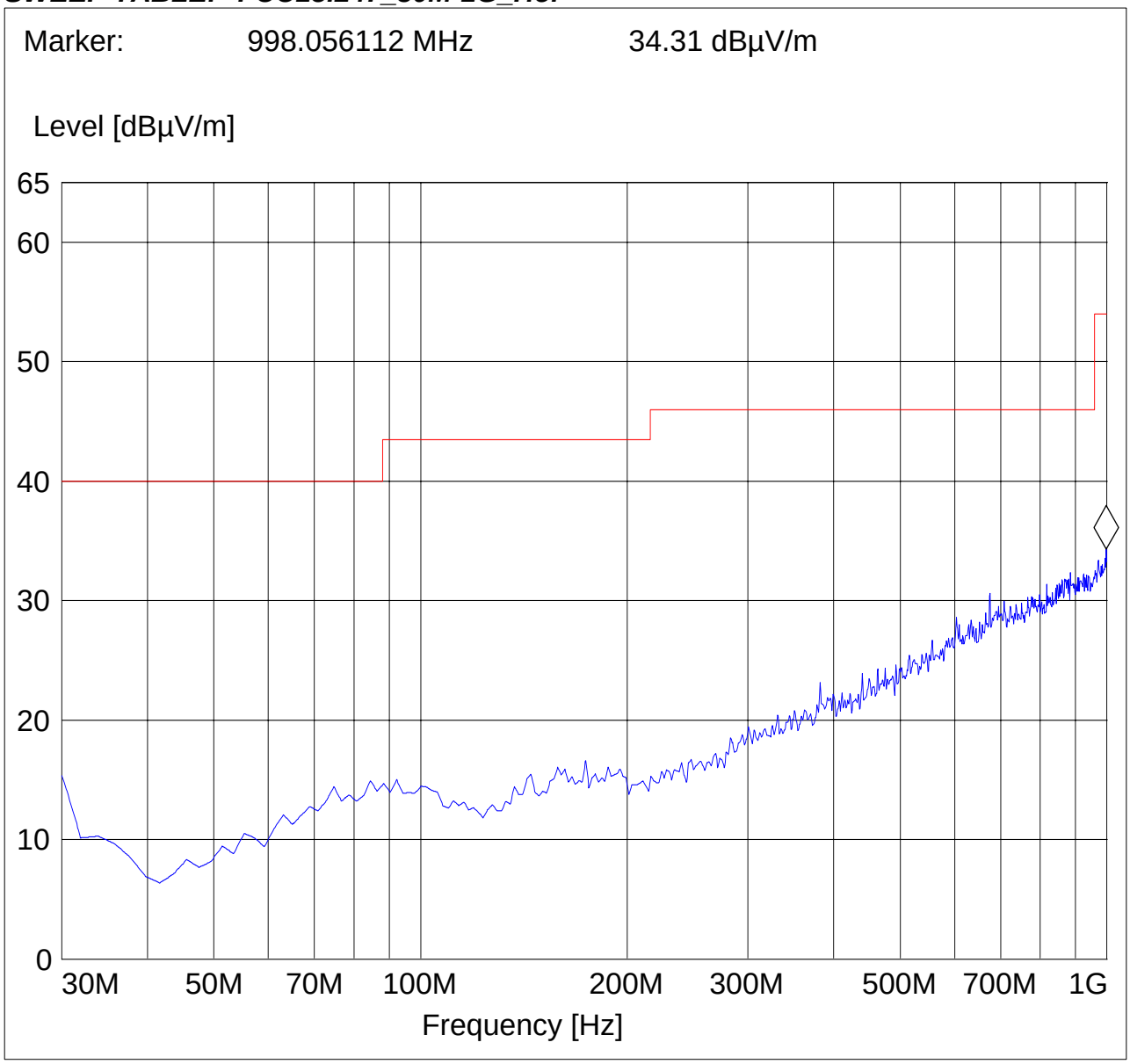
Test Mode: WLAN-ODFM
Ant Orientation: V
EUT Orientation: V
Test Engineer: Ed
Voltage:: Battery
Comments:: 360° rotation

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



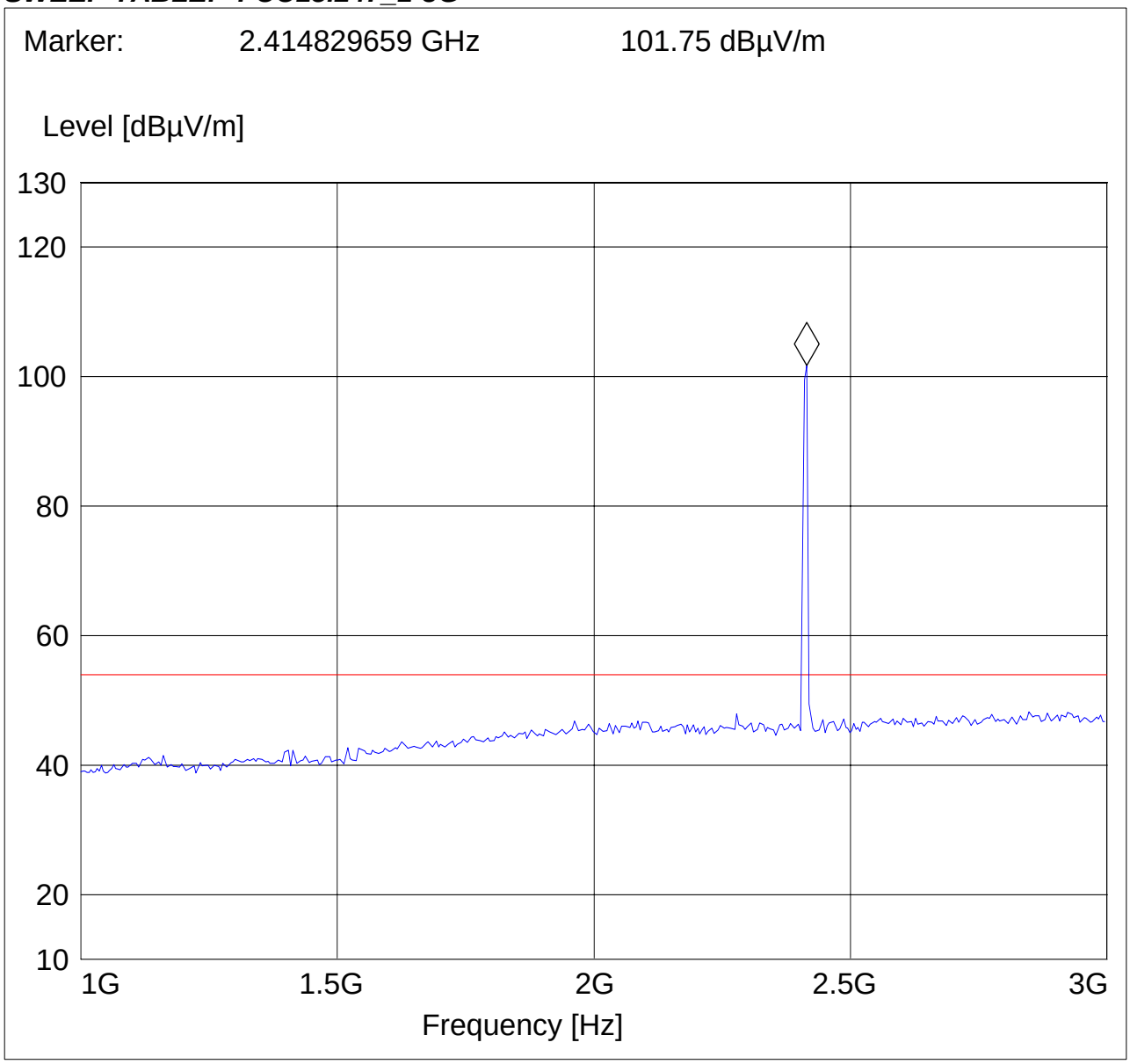
30MHz – 1GHz
Antenna: horizontal
Note: This plot is valid for low, mid, high channels (worst-case plot)
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
Test Mode: WLAN-ODFM
Ant Orientation: H
EUT Orientation: V
Test Engineer: Ed
Voltage:: Battery
Comments:: 360° rotation

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



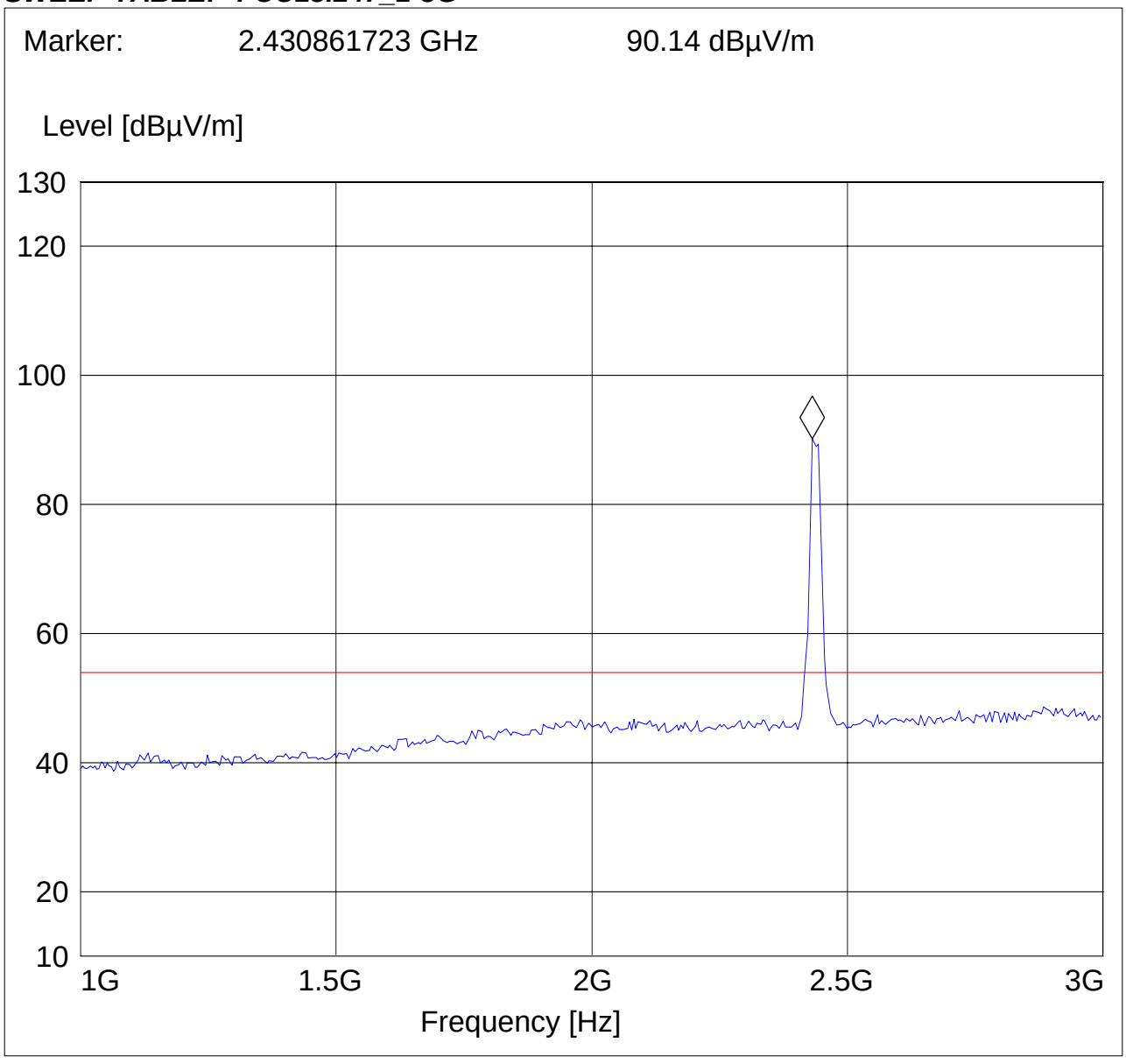
1-3GHz (2412MHz)
Note: The peaks above the limit line is the carrier freq.
Note: Peak Reading vs. Average limit
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
Test Mode: WLAN-ODFM
Ant Orientation: V
EUT Orientation: V
Test Engineer: Ed
Voltage:: Battery
Comments:: 360° rotation, marker on tch sig.

SWEEP TABLE: "FCC15.247_1-3G"



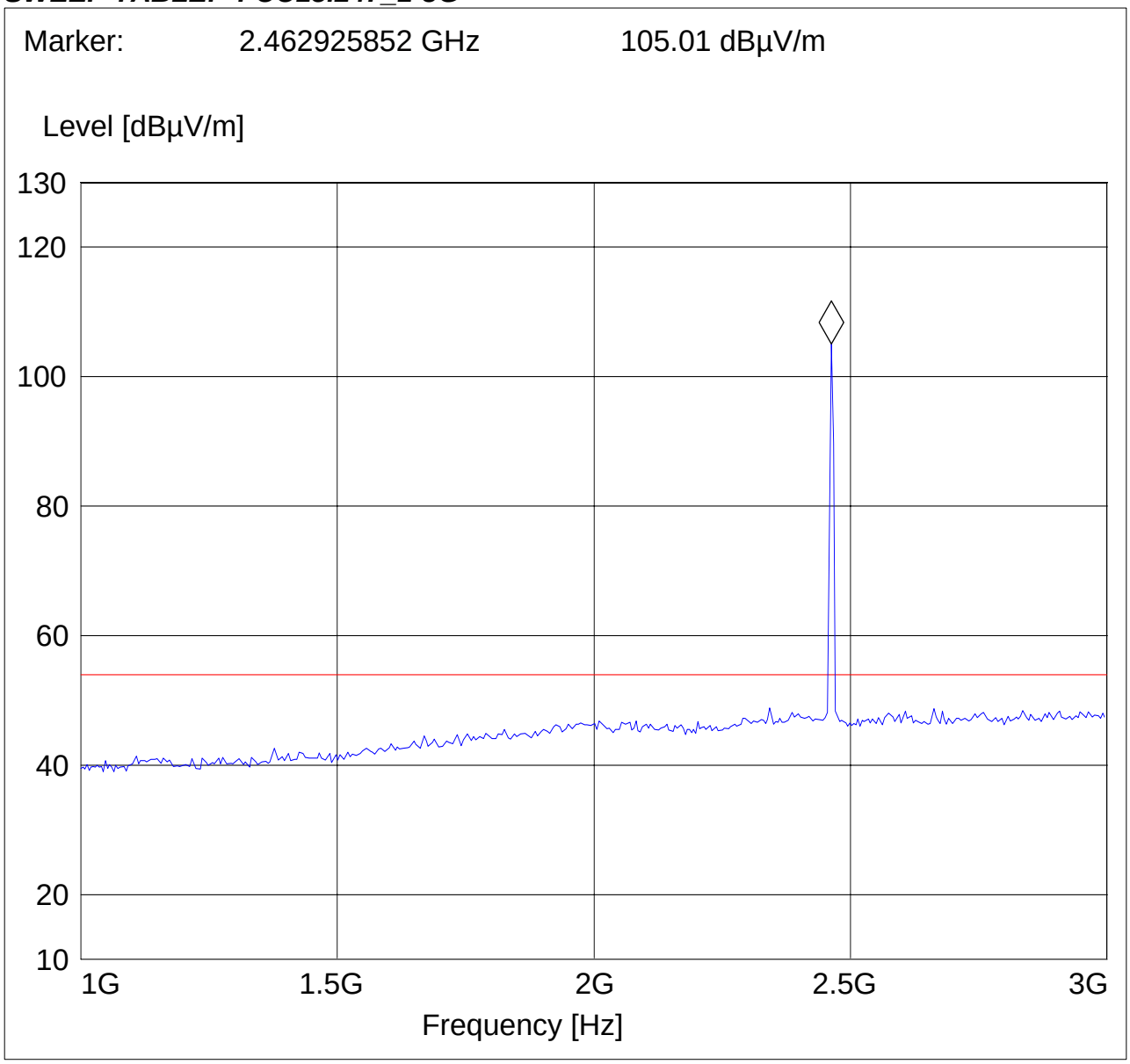
1-3GHz (2437MHz)
Note: The peaks above the limit line is the carrier freq.
Note: Peak Reading vs. Average limit
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
Test Mode: WLAN-ODFM
Ant Orientation: V
EUT Orientation: V
Test Engineer: Ed
Voltage:: Battery
Comments:: 360°rotation

SWEEP TABLE: "FCC15.247_1-3G"



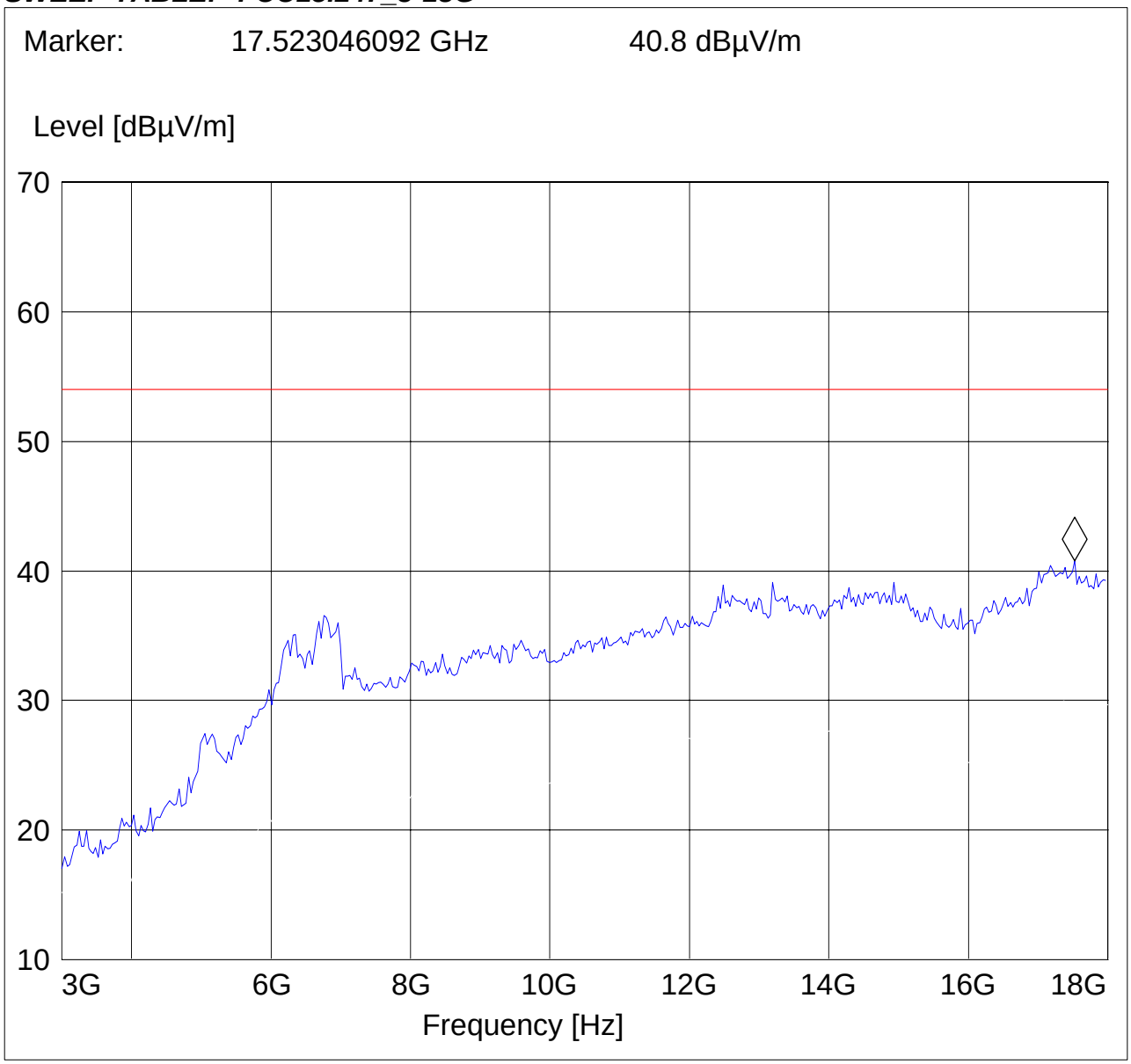
1-3GHz (2462MHz)
Note: The peaks above the limit line is the carrier freq.
Note: Peak Reading vs. Average limit
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
Test Mode: WLAN-ODFM
Ant Orientation: V
EUT Orientation: V
Test Engineer: Ed
Voltage:: Battery
Comments:: 360° rotation, marker is on tch sig.

SWEEP TABLE: "FCC15.247_1-3G"



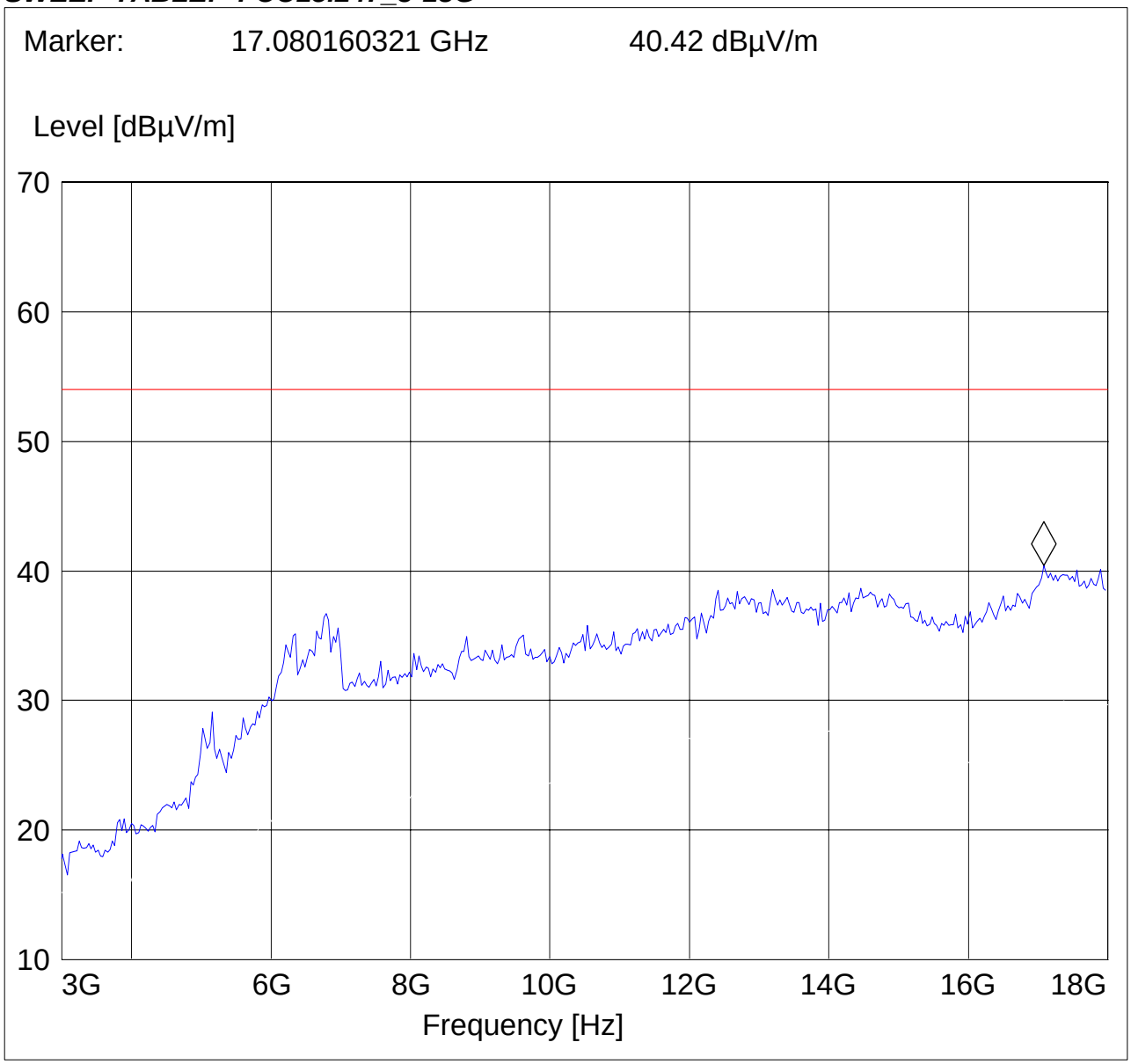
3-18GHz (2412MHz)
Note: Peak Reading vs. Average limit
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
Test Mode: WLAN-ODFM
Ant Orientation: V
EUT Orientation: V
Test Engineer: Ed
Voltage:: Battery
Comments:: 360° rotation

SWEEP TABLE: "FCC15.247_3-18G"



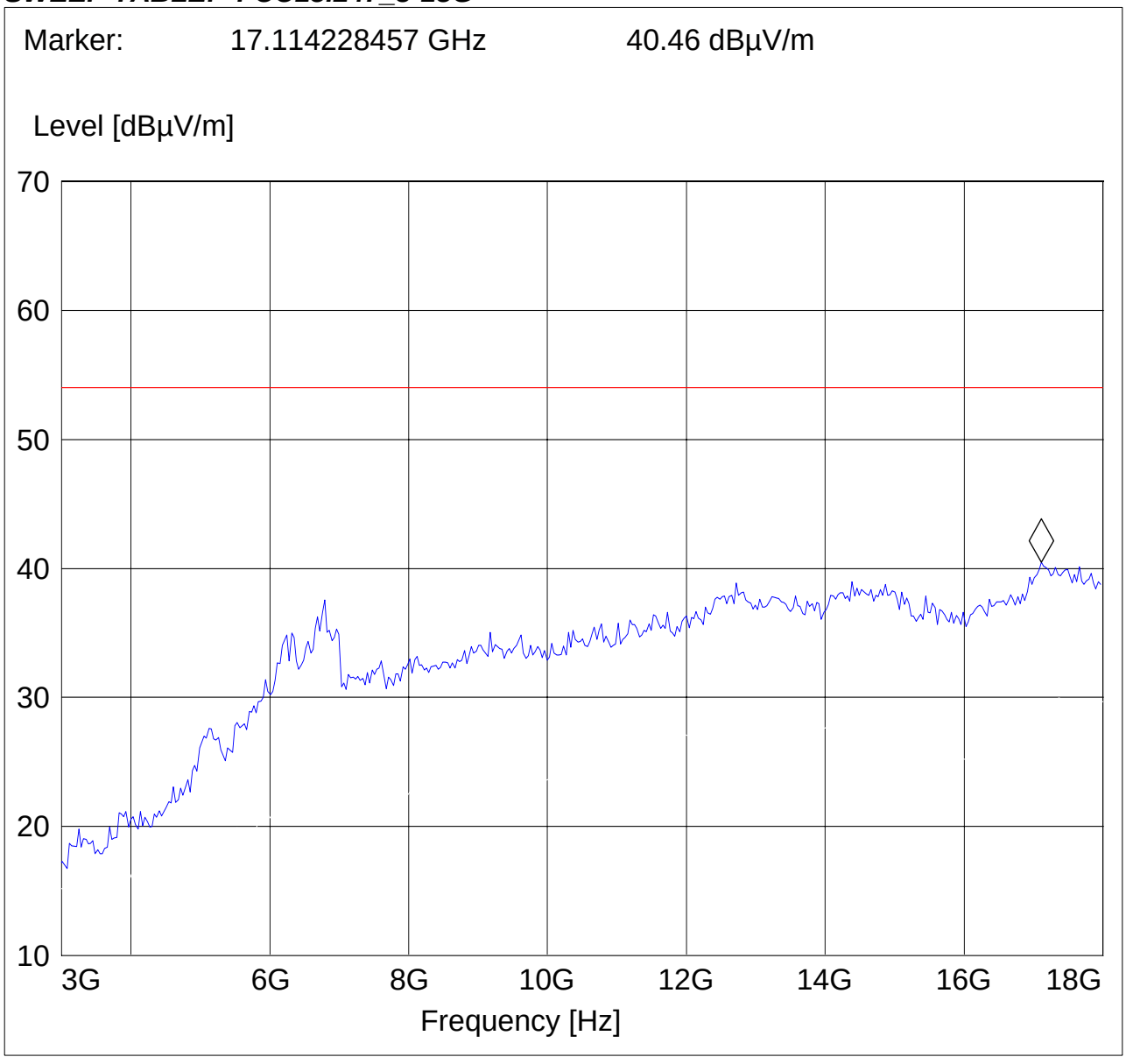
3-18GHz (2437MHz)
Note: Peak Reading vs. Average limit
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
Test Mode: WLAN-ODFM
Ant Orientation: V
EUT Orientation: V
Test Engineer: Ed
Voltage:: Battery
Comments:: 360°rotation

SWEEP TABLE: "FCC15.247_3-18G"



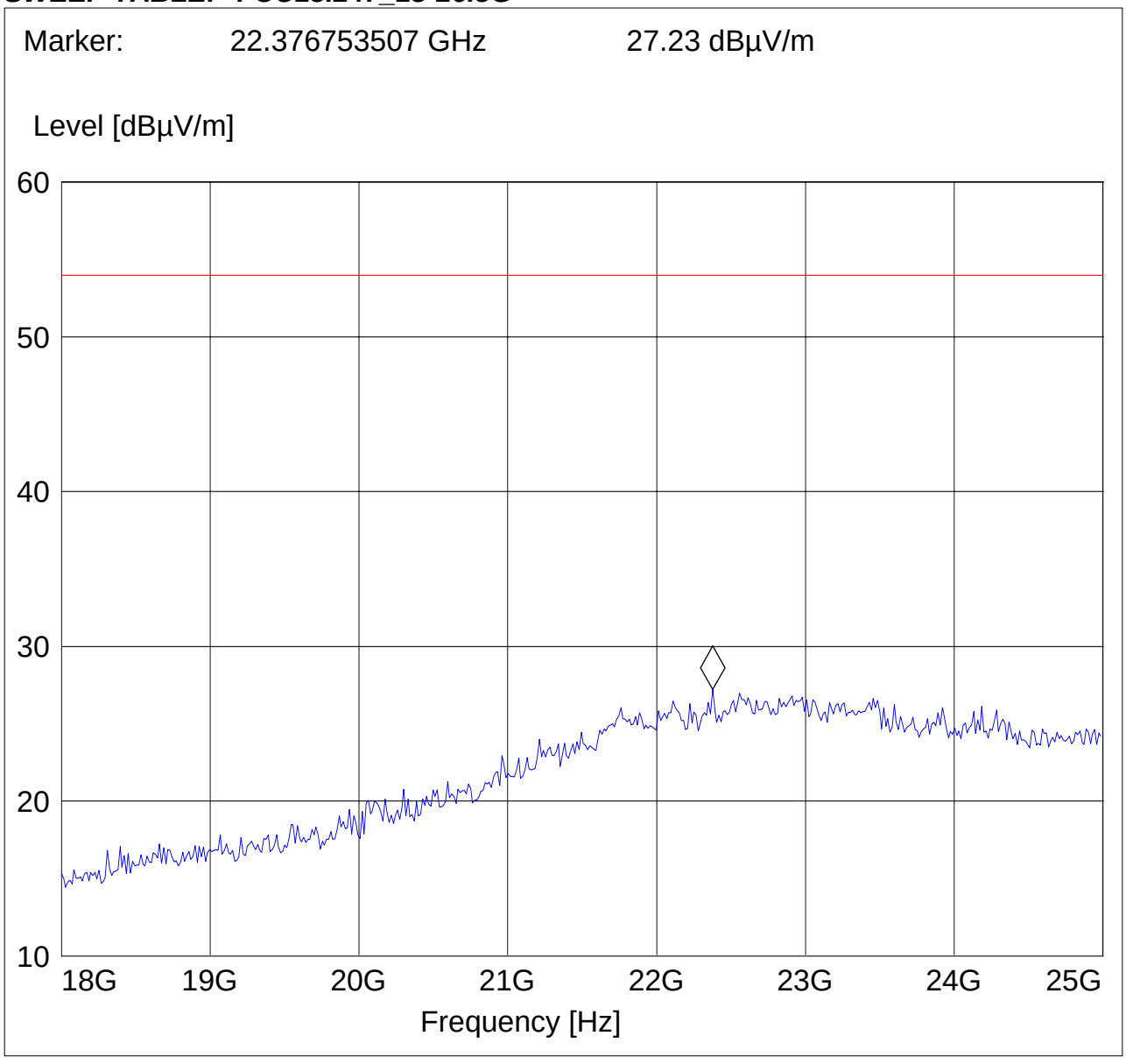
3-18GHz (2462MHz)
Note: Peak Reading vs. Average limit
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
Customer:: ACI
Test Mode: WLAN-ODFM
Ant Orientation: V
EUT Orientation: V
Test Engineer: Ed
Voltage:: Battery
Comments:: 360° rotation

SWEEP TABLE: "FCC15.247_3-18G"



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
Test Mode: WLAN-ODFM
Ant Orientation: V
EUT Orientation: V
Test Engineer: Ed
Voltage:: Battery
Comments:: 360° rotation

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



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

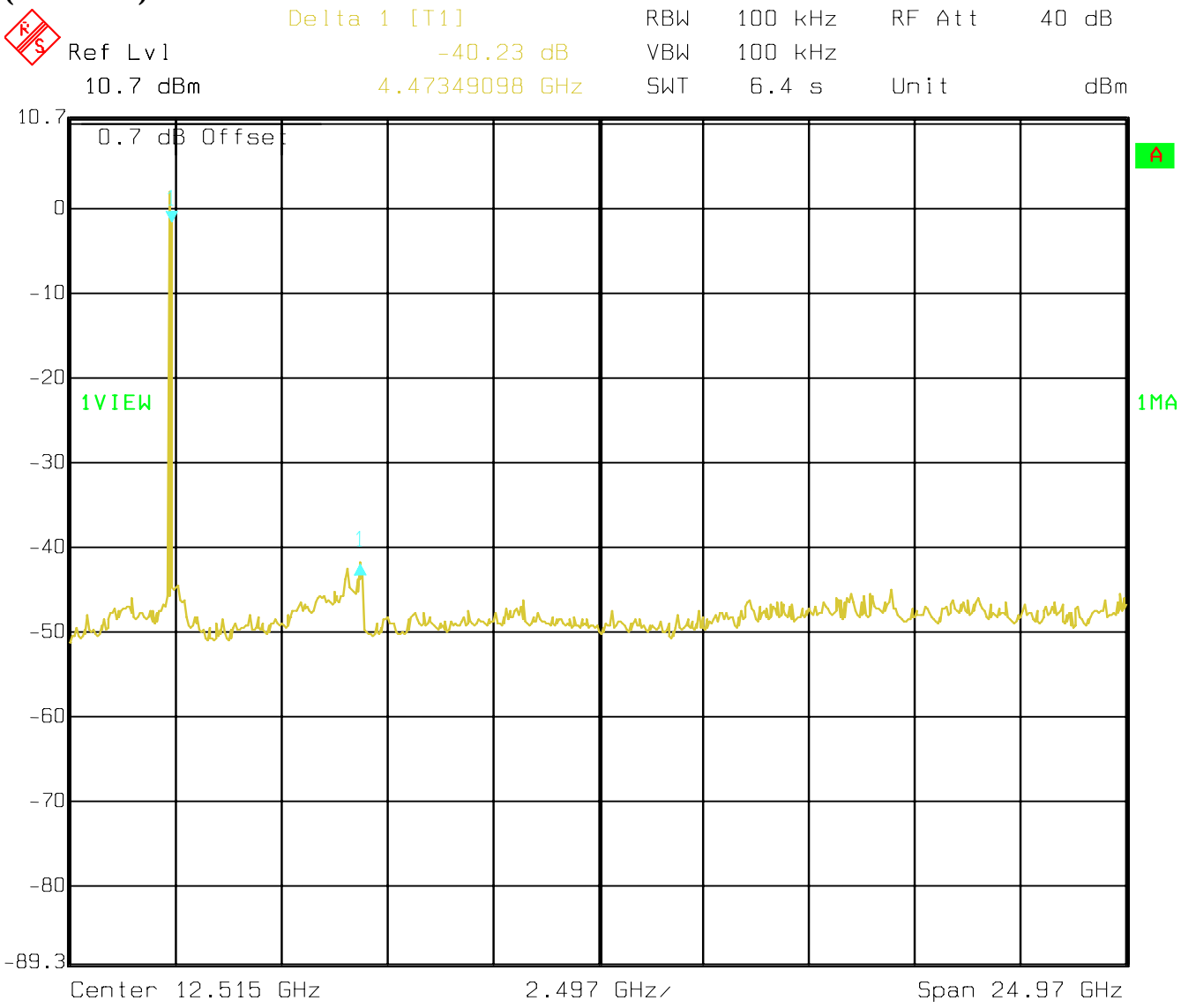
5.6.1 Limits

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)).

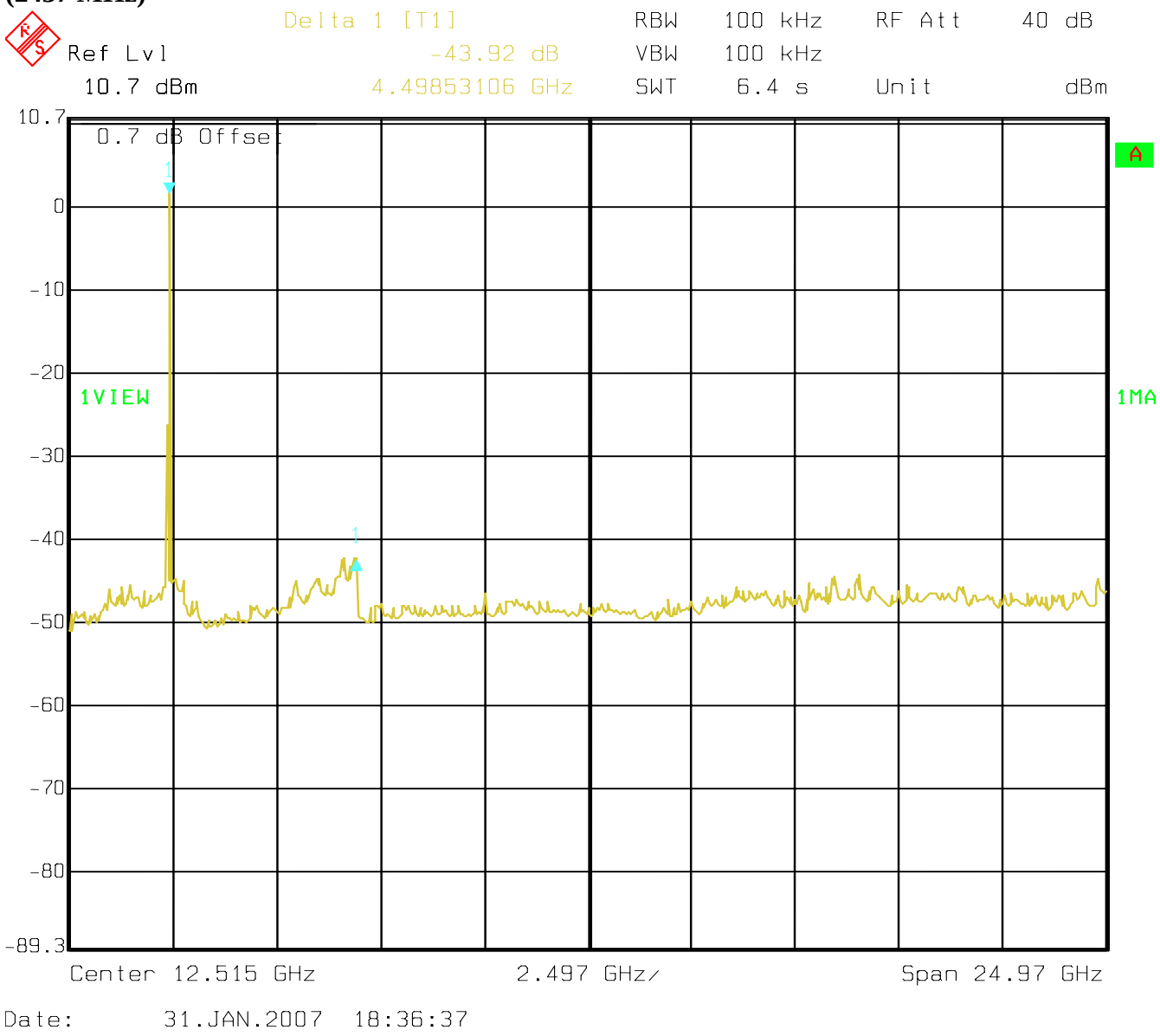
Notes:

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.

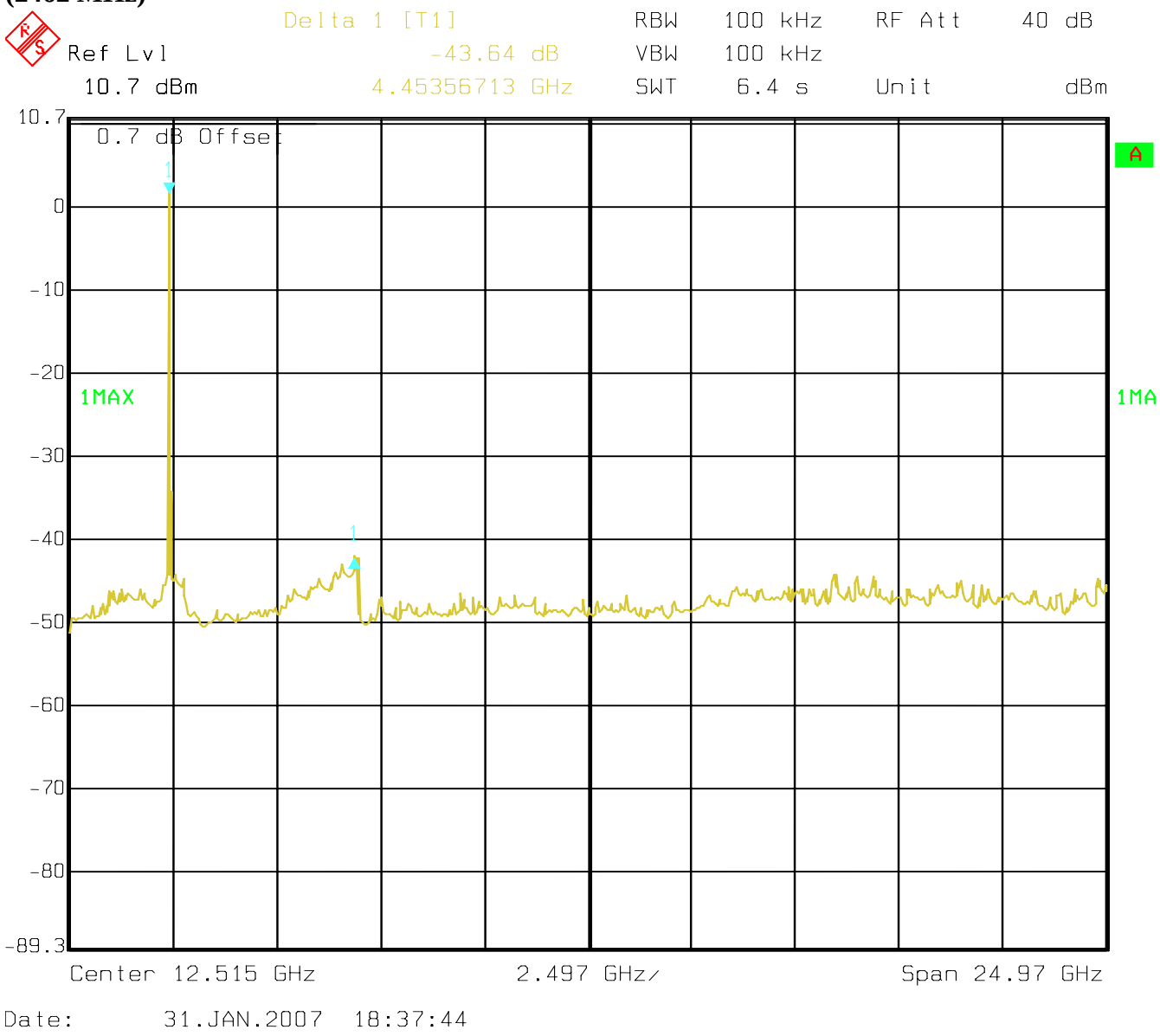
5.6.2 Results
(2412 MHz)



(2437 MHz)


Delta 1 [T1]
RBW 100 kHz
RF Att 40 dB
Ref Lvl
-43.92 dB
VBW 100 kHz
10.7 dBm
4.49853106 GHz
SWT 6.4 s
Unit dBm
10.7
0.7 dB Offset
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.3
1VIEW
A
1MA
Center 12.515 GHz
2.497 GHz/
Span 24.97 GHz
Date: 31.JAN.2007 18:36:37

(2462 MHz)


Delta 1 [T1]
RBW 100 kHz
RF Att 40 dB
Ref Lvl
-43.64 dB
VBW 100 kHz
10.7 dBm
4.45356713 GHz
SWT 6.4 s
Unit dBm
10.7
0.7 dB Offset
0
-10
-20
1MAX
-30
-40
-50
-60
-70
-80
-89.3
A
1MA
Center 12.515 GHz
2.497 GHz/
Span 24.97 GHz
Date: 31.JAN.2007 18:37:44

5.7 AC POWER LINE CONDUCTED EMISSIONS § 15.107/207

5.7.1 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		

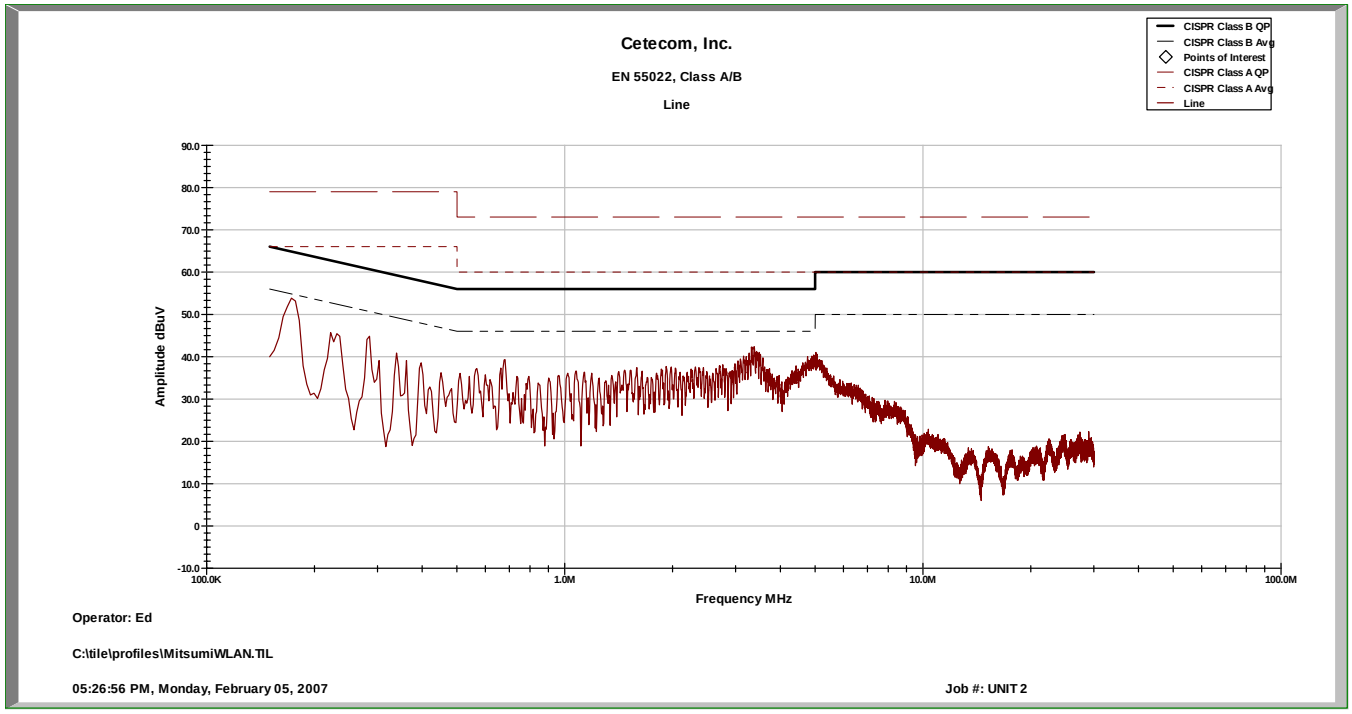
ANALYZER SETTINGS: RBW = 10KHz VBW = 10KHz

OPERATING MODE

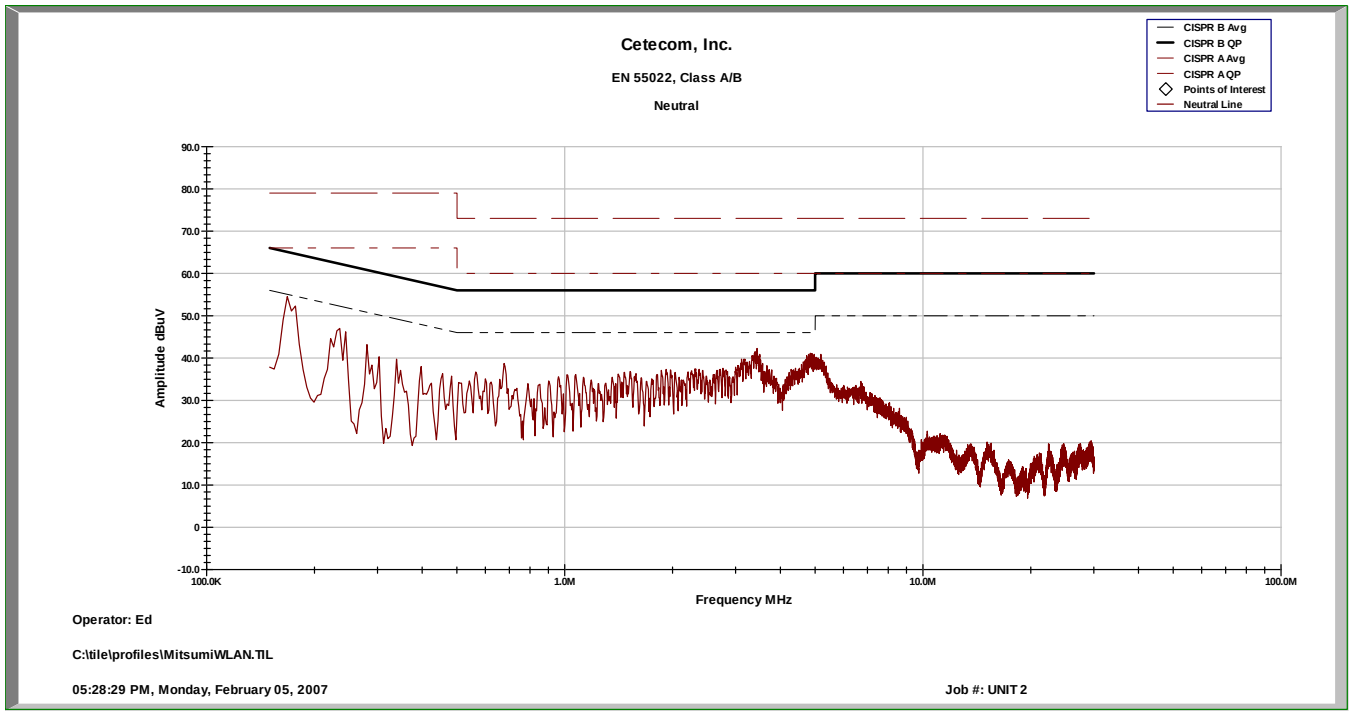
Conducted AC emissions testing was performed with 110 VAC @ 60 Hz with the EUT in battery charging mode. During the testing an uncharged battery was installed in the EUT.

5.7.2 Results Mitsumi Charger

Line:

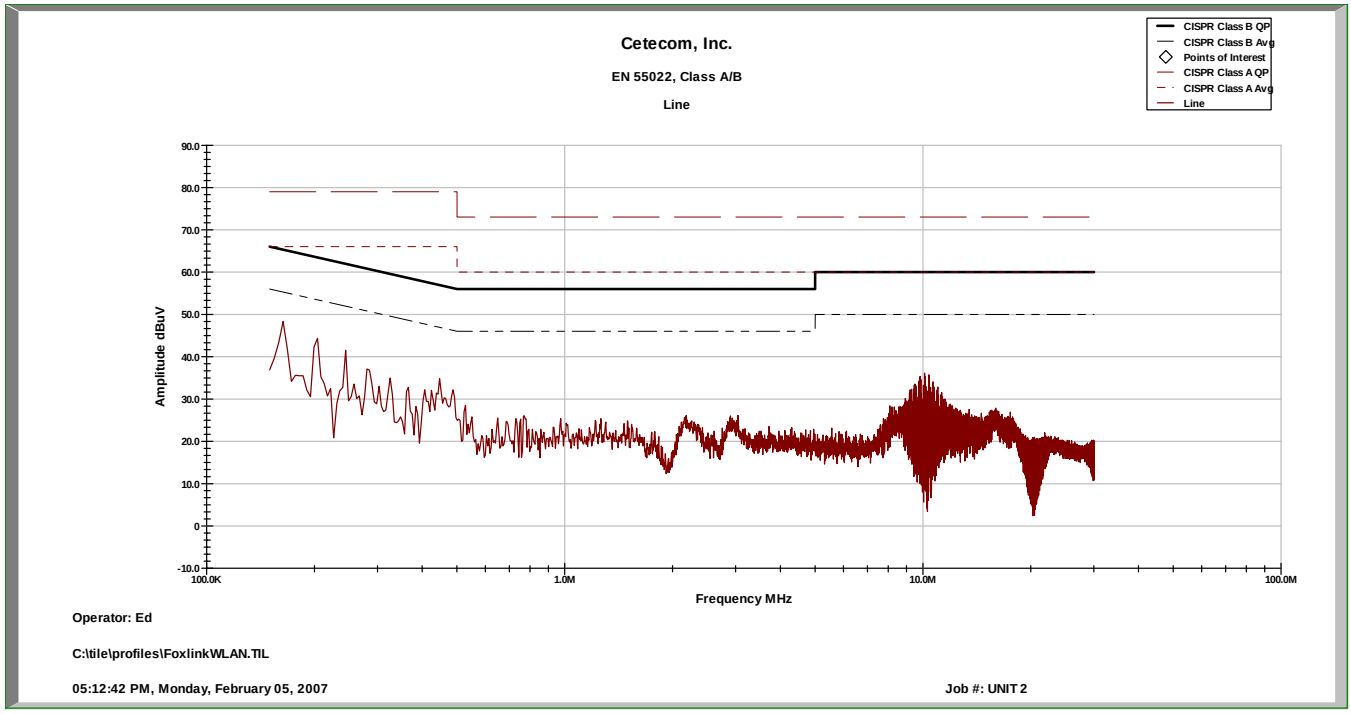


Neutral:

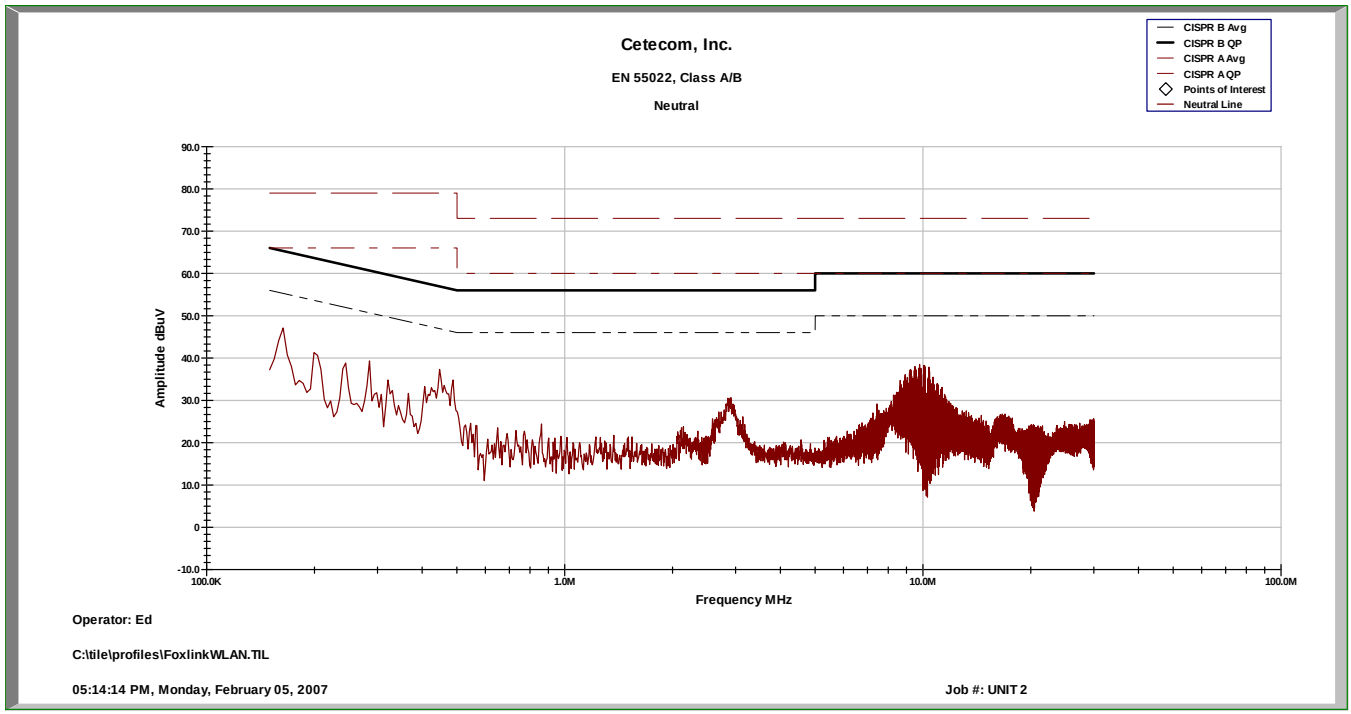


5.7.3 Results Foxlink Charger

Line:



Neutral:

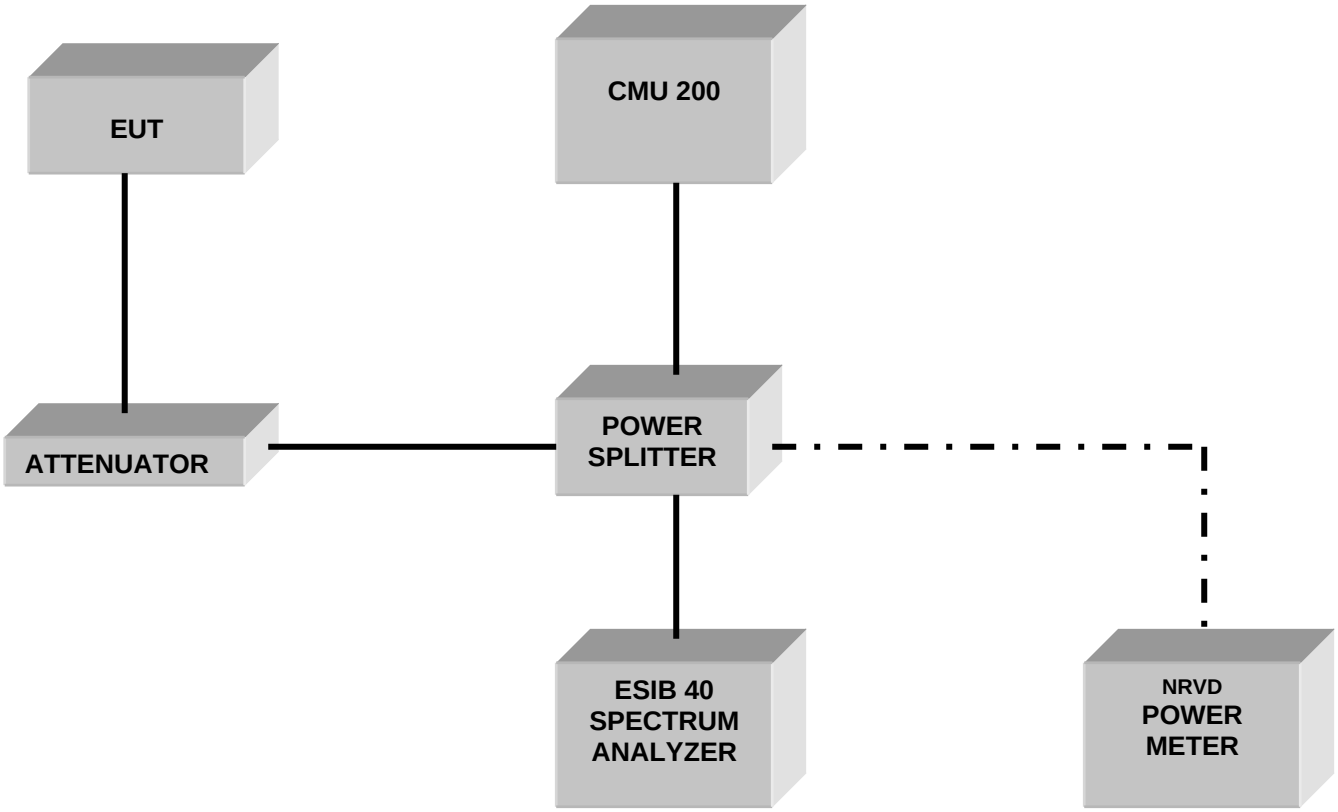


6 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal Due	Interval
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 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

7 BLOCK DIAGRAMS

Conducted Testing



Radiated Testing