Test Report

FCC Part 15.247
Industry Canada RSS210

DTS Devices operating in range 2400-2483.5MHz

Model #: MT810SWM-IP

Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, MN 55112
USA

FCC ID: AU792U09G17827
IC ID: 125A-0036

TEST REPORT #: EMC_MULTI_040_09001_15_247
DATE: 2009-09-21

ilac-MRA A2LA ACCREDITED Certificate # 2135.01

Bluetooth

Bluetooth Qualification Test Facility (BQTF)

CTIA Authorized Test Lab
LAB CODE 20020328-00

FCC listed: A2LA accredited

IC recognized # 3462B

***CETECOM* Inc.**
411 Dixon Landing Road ◆ Milpitas, CA 95035 ◆ U.S.A.
Phone: + 1 (408) 586 6200 ◆ Fax: + 1 (408) 586 6299 ◆ E-mail: info@cetecomusa.com ◆ http://www.cetecom.com
CETECOM Inc. is a Delaware Corporation with Corporation number: 2113686
Board of Directors: Dr. Harald Ansorge, Dr. Klaus Matkey, Hans Peter May

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 #
Multi-Tech Systems, Inc.	**Serial to WiFi device server**	**MT810SWM-IP**

This report is reviewed by:

Date	Section	Name	Signature
2009-09-21	**EMC & Radio**	**Marc Douat (Test Lab Manager)**	Marc Douat I am approving this document

This report is prepared by:

Date	Section	Name	Signature
2009-09-21	**EMC & Radio**	**Josie Sabado (EMC Project Engineer)**	Josie Sabado I am the author of this document

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:	**Marc Douat**
Responsible Project Leader:	**Josie Sabado**

2.2 Identification of the Client

APPLICANT	
Applicant (Company Name)	**Multi-Tech Systems, Inc.**
Street Address	**2205 Woodale Drive**
City/Zip Code	**Mounds View / 55112**
Country	**USA**
Contact Person	**Thomas Hofstede**
Telephone	**763.717.5505**
Fax	**763.717.5814**
e-mail	**thofstede@multitech.com**

2.3 Identification of the Manufacturer

Same as above applicant.

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

EUT	
Marketing Name of EUT (if not same as Model No.):	**SocketWireless WiFi**
Description:	**Serial to WiFi device server**
Model No:	**MT810SWM-IP**
FCC ID:	**AU792U09G17827**
IC ID:	**125A-0036**

Frequency Range:	**2.4 to 2.484GHz**
Type(s) of Modulation:	**OFDM**
Antenna Type:	**5 dBi gain**
Max Output Power:	**Sub-band 1, 2400-2483.5MHz 802.11b:** **Conducted: 11.62 dBm (14.52mW)** **Radiated: 16.62 dBm (45.92mW) EIRP** **Sub-band 1, 2400-2483.5MHz 802.11g:** **Conducted: 17.8dBm (60.26mW)** **Radiated: 22.8dBm (190.55mW) EIRP**

3.2 Identification of the Equipment under Test (EUT)

EUT #	TYPE	MANF.	MODEL	SERIAL #
1	EUT	Multi-Tech Systems, Inc.	MT810SWM-IP	N/A

3.3 Identification of Accessory equipment

No accessory equipment.

4 Subject Of Investigation

All testing was performed on the product referred to in Section 3 as EUT. EUT operates in the band 2400-2483.5MHz in 802.11b/g mode.

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT operating under all operating modes as per 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 Conducted Measurements

5.1 6dB bandwidth and 99% bandwidth

5.1.1 Limit

FCC15.247(a)(2) Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

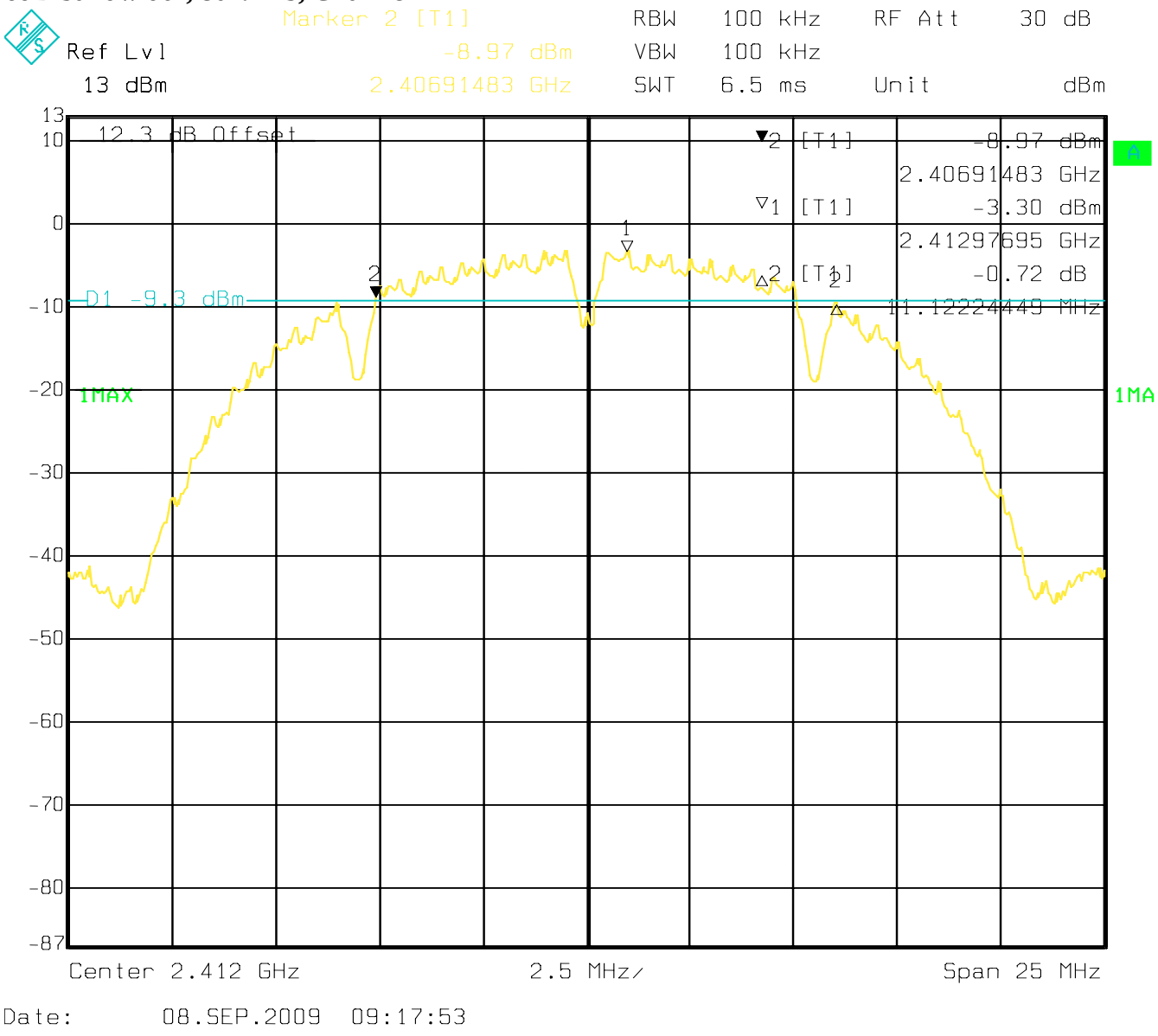
RSS210 A8.2 (a): The minimum 6 dB bandwidth shall be at least 500 kHz.

5.1.2 Measurement Result:

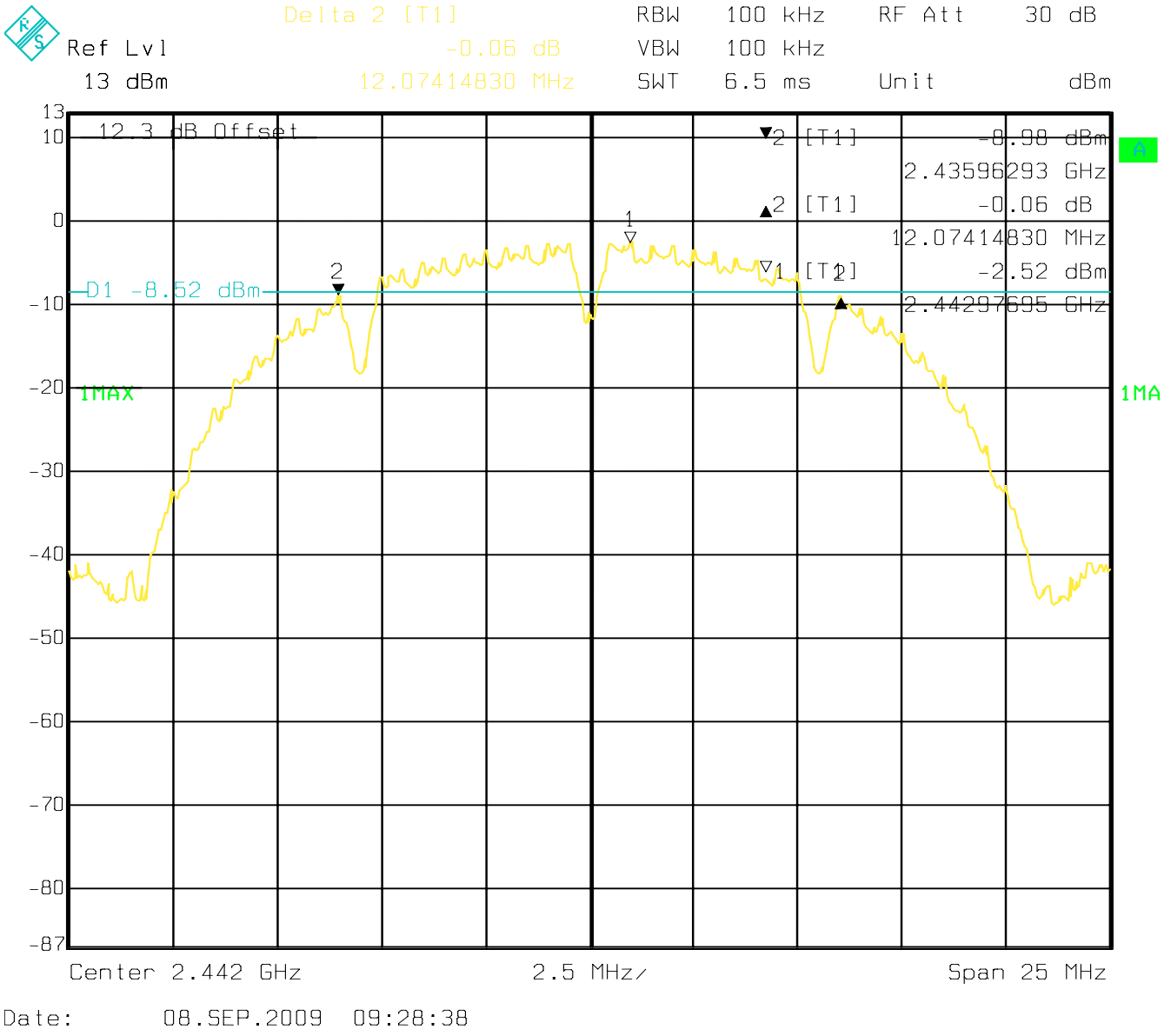
	Channel Frequency (MHz)	6dB Bandwidth (MHz)	20dB/99% Bandwidth (MHz)
2400-2483.5 MHz (802.11 b)	2412	11.12	15.68
	2442	12.07	15.63
	2472	12.07	15.63
2400-2483.5 MHz (802.11 g)	2412	16.08	18.79
	2442	17.08	18.79
	2472	17.18	18.74

5.1.3 Plots:

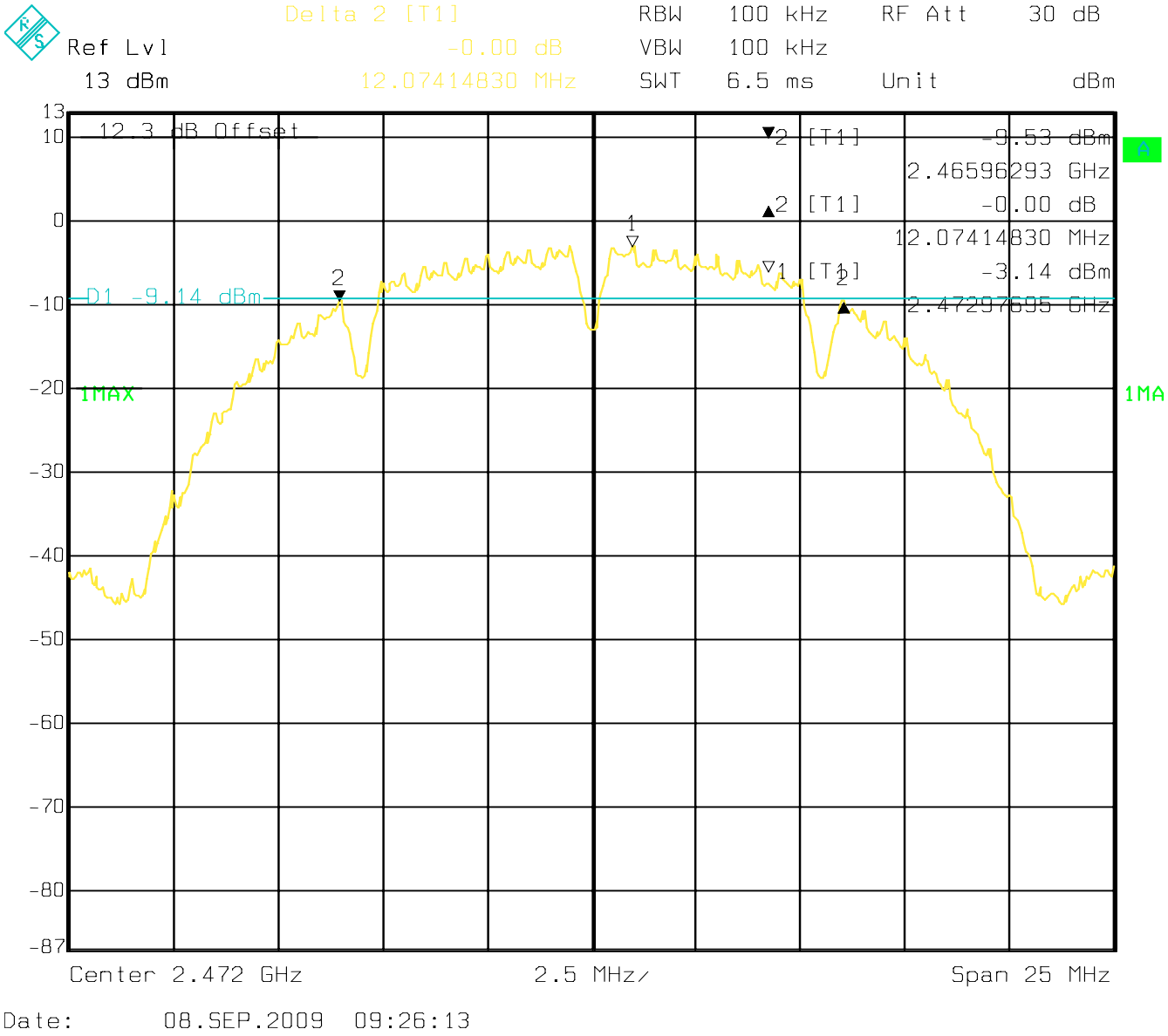
6dB bandwidth, 802.11 b, Channel 1



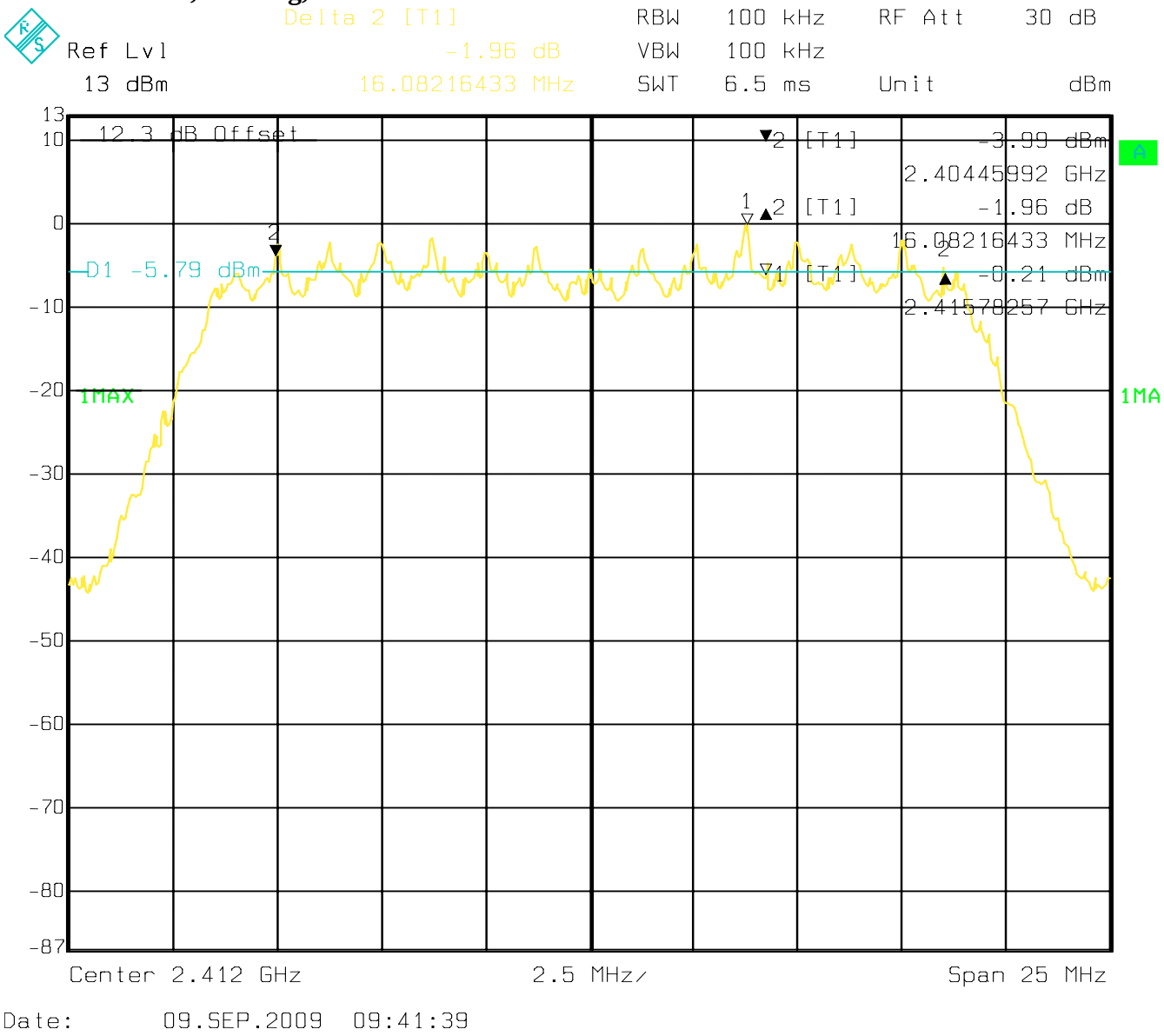
6dB bandwidth, 802.11 b, Channel 6



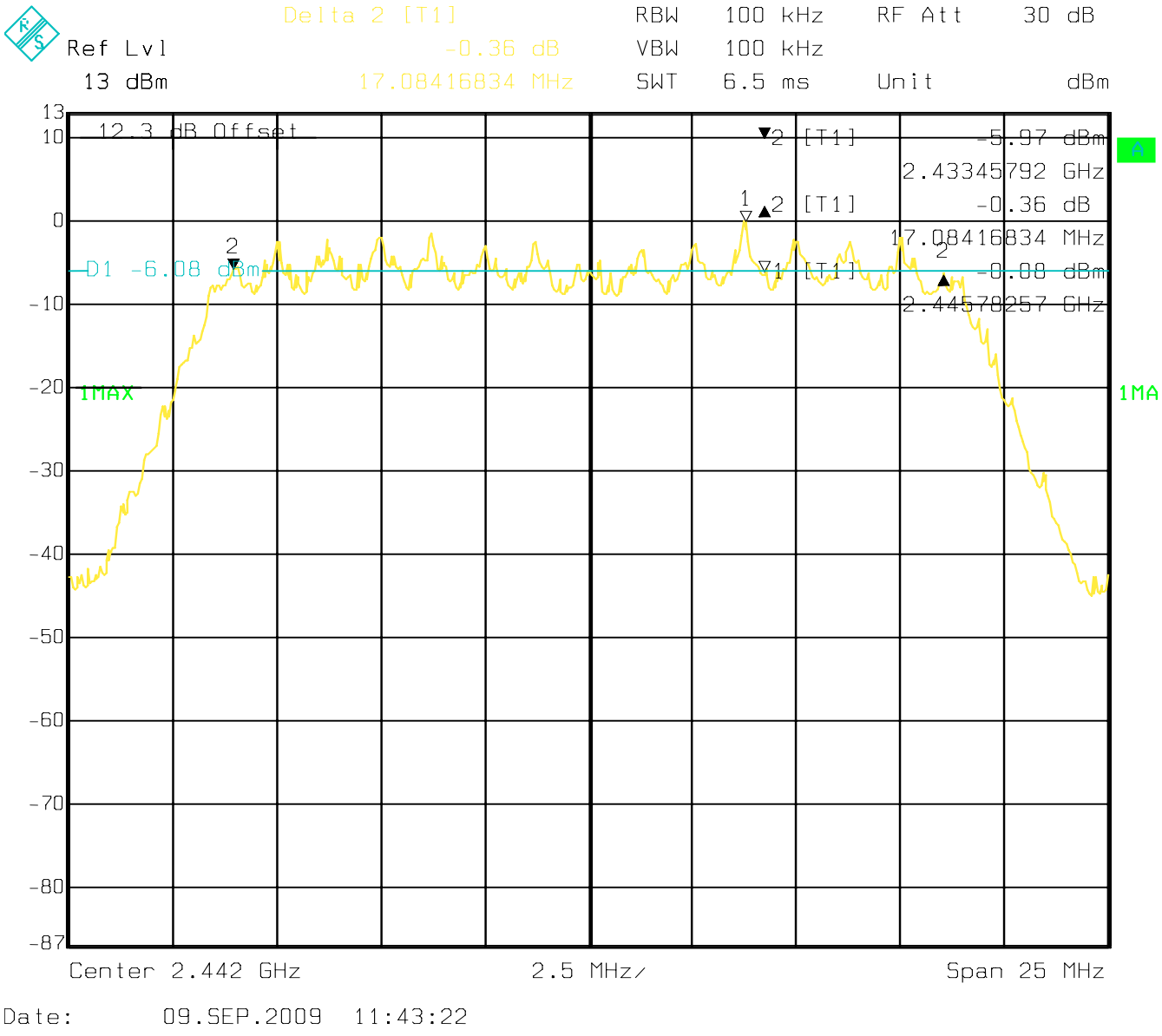
6dB Bandwidth, 802.11 b, Channel 11



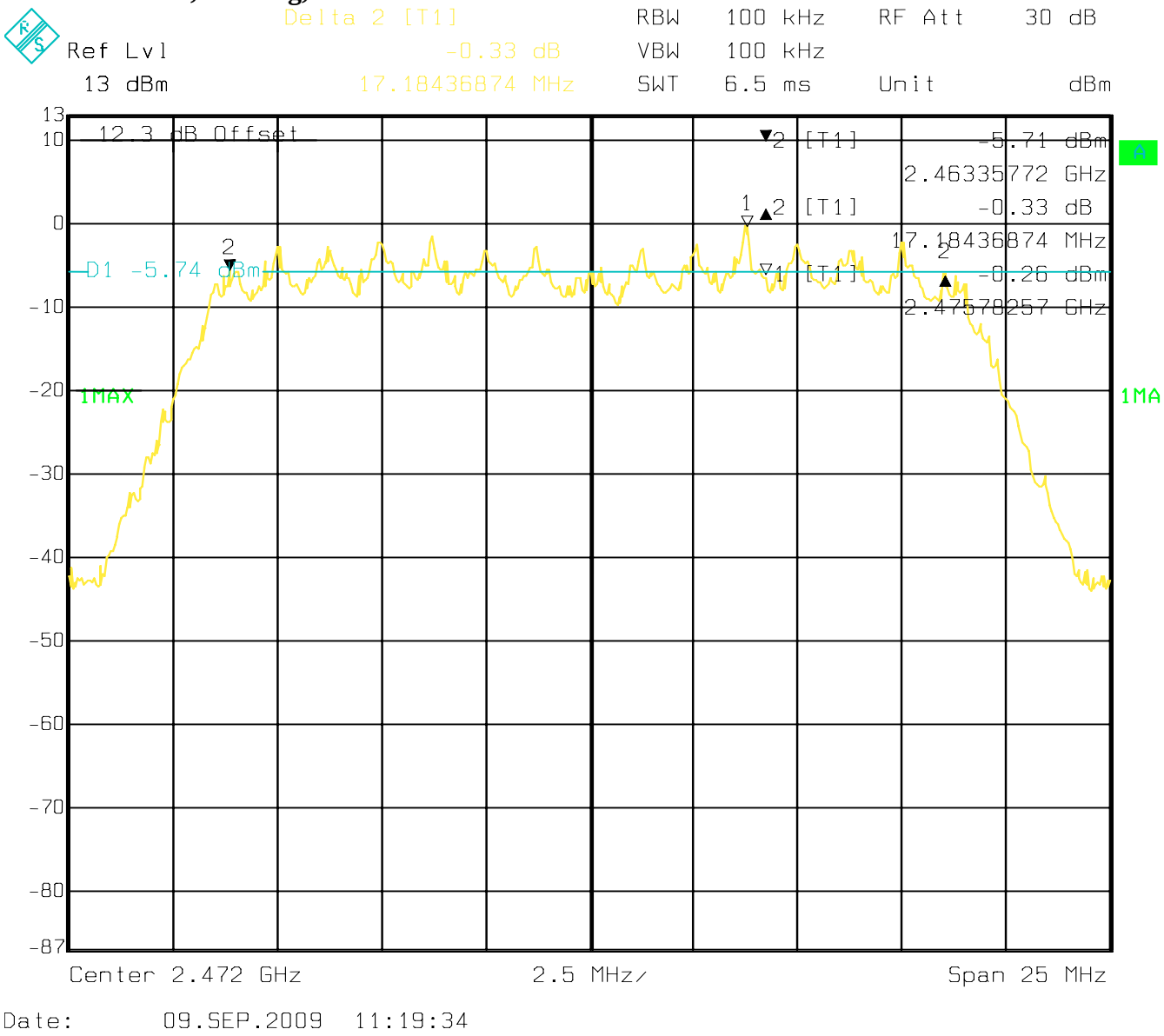
6dB Bandwidth, 802.11 g, Channel 1



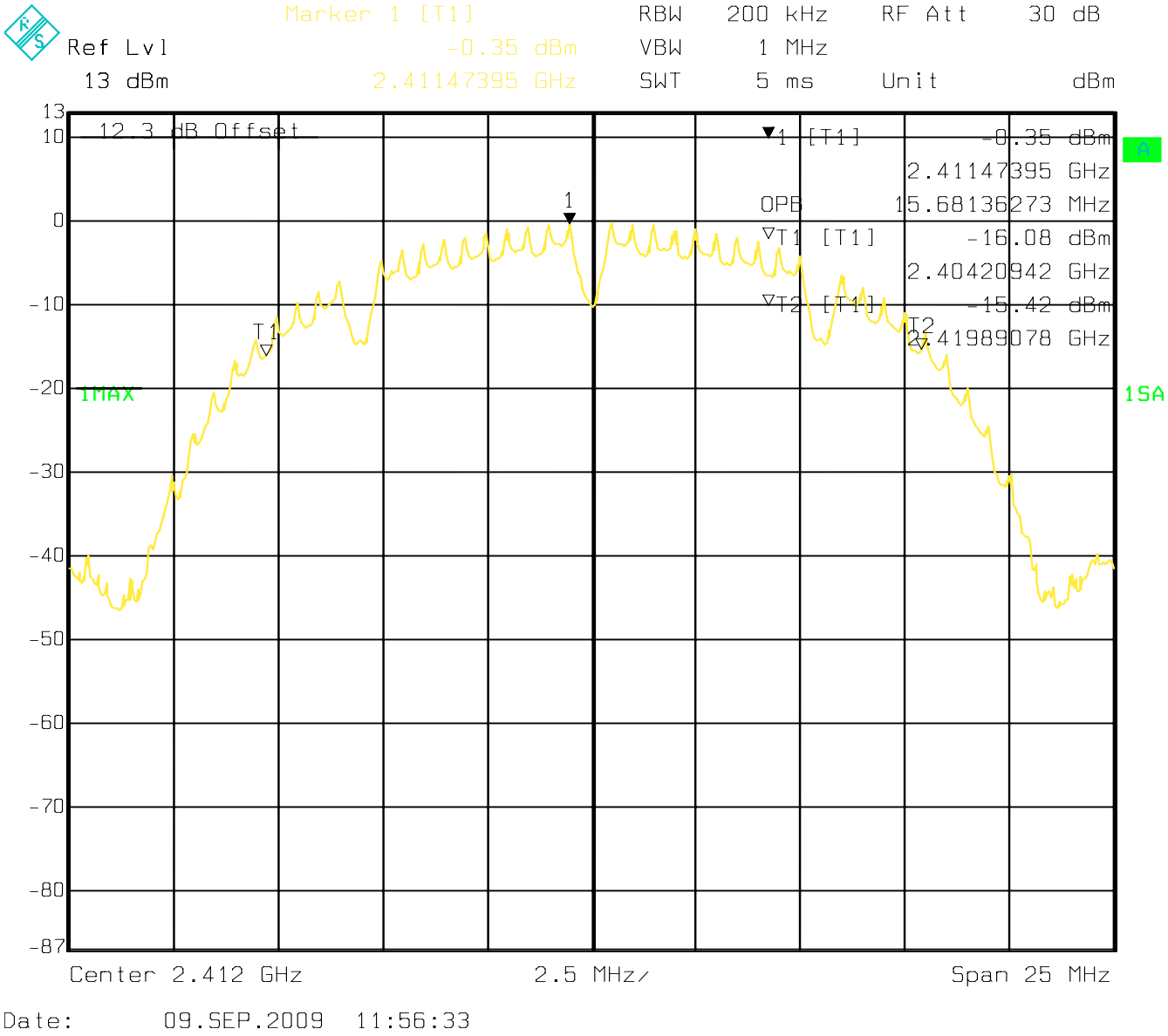
6dB Bandwidth, 802.11 g, Channel 6



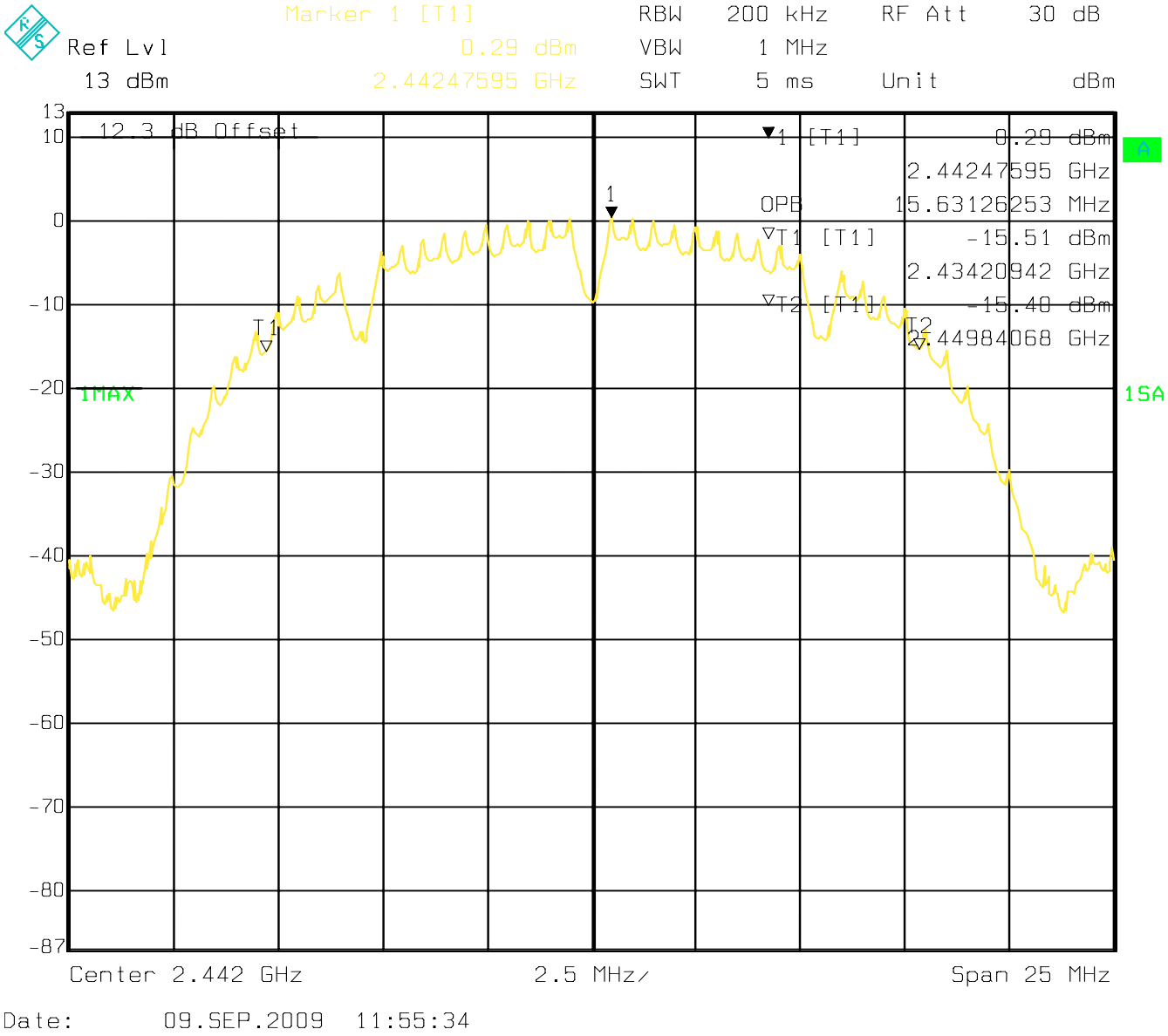
6dB Bandwidth, 802.11 g, Channel 11



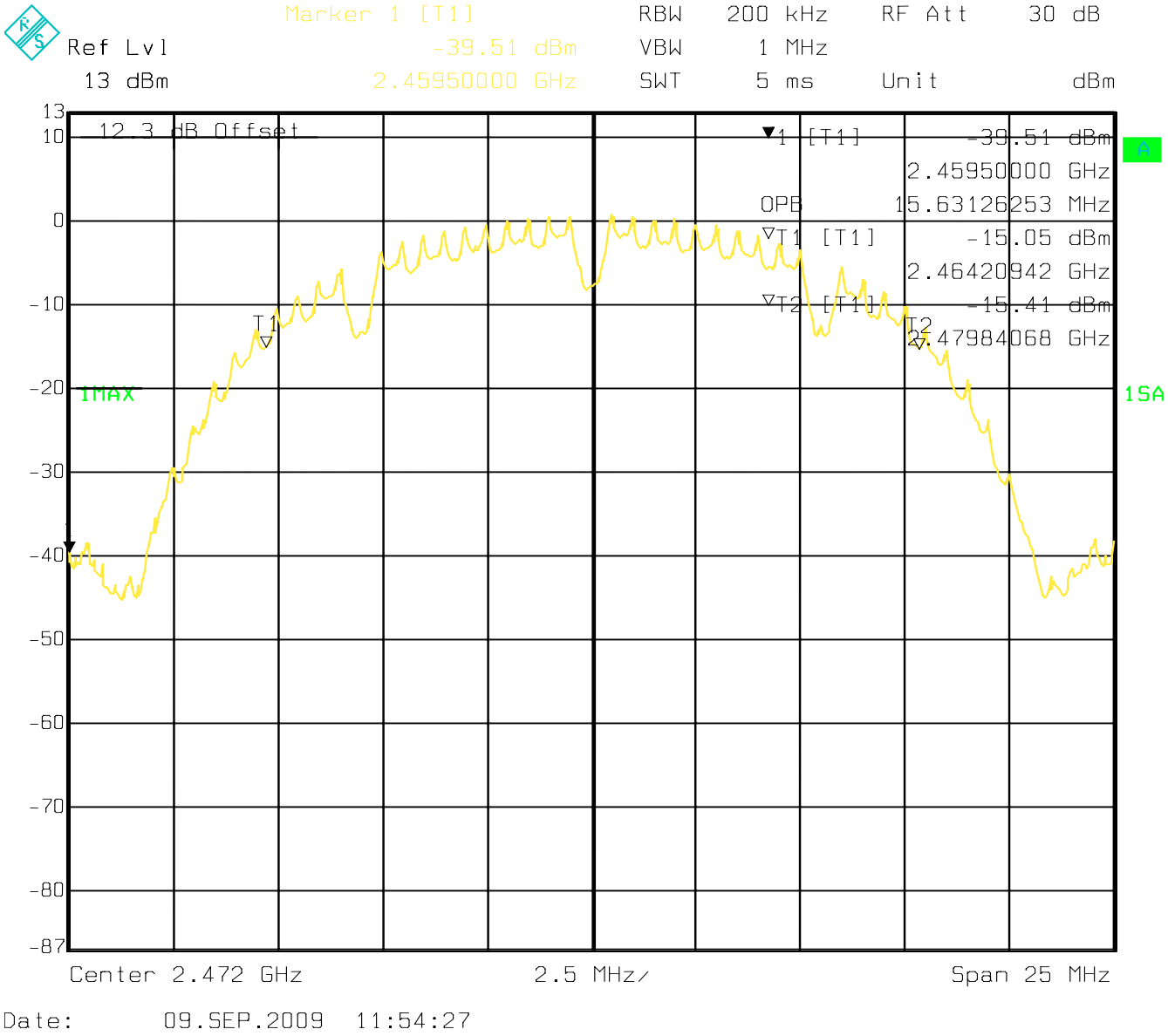
99% Bandwidth, 802.11 b, Channel 1



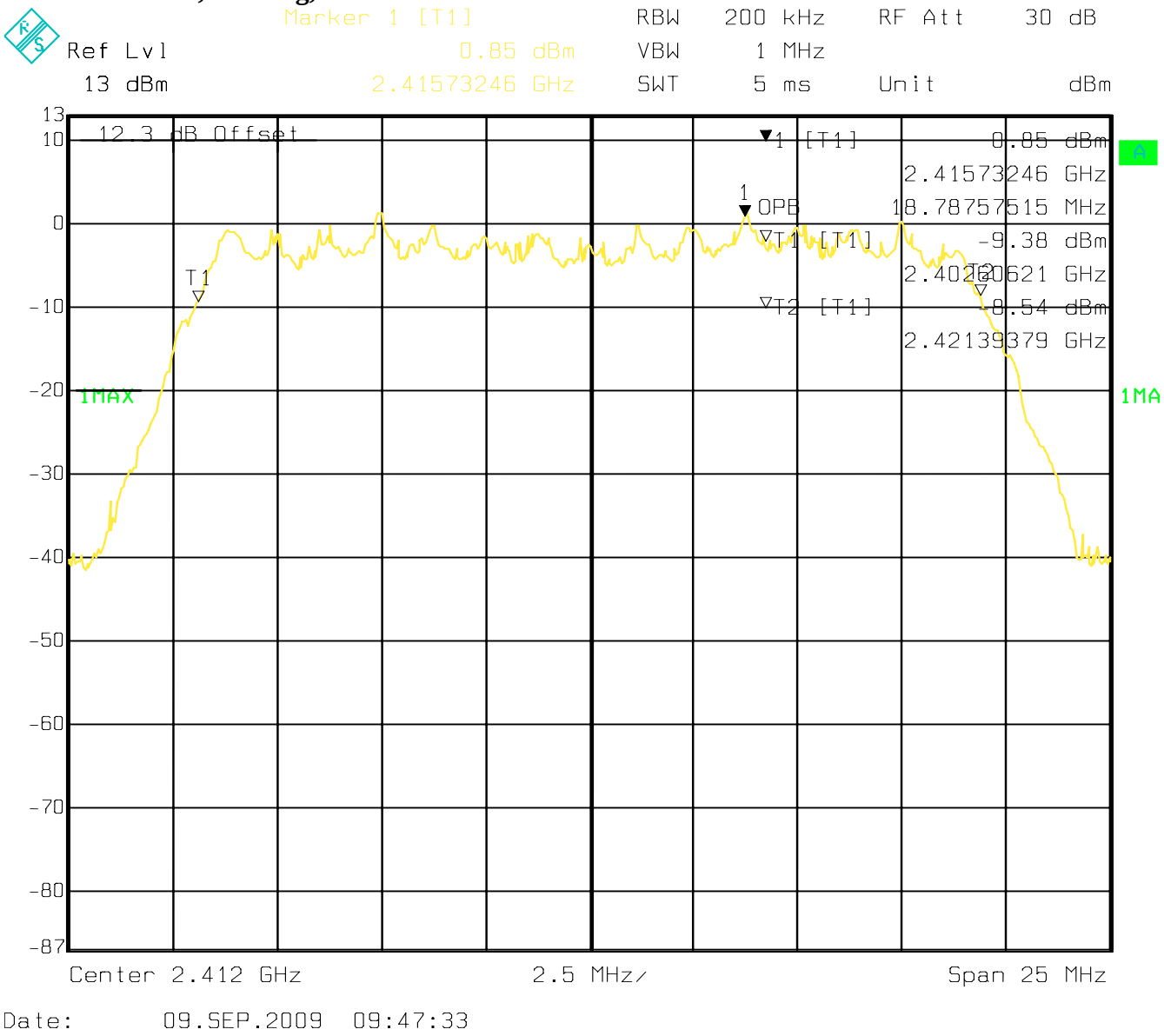
99% Bandwidth, 802.11 b, Channel 7



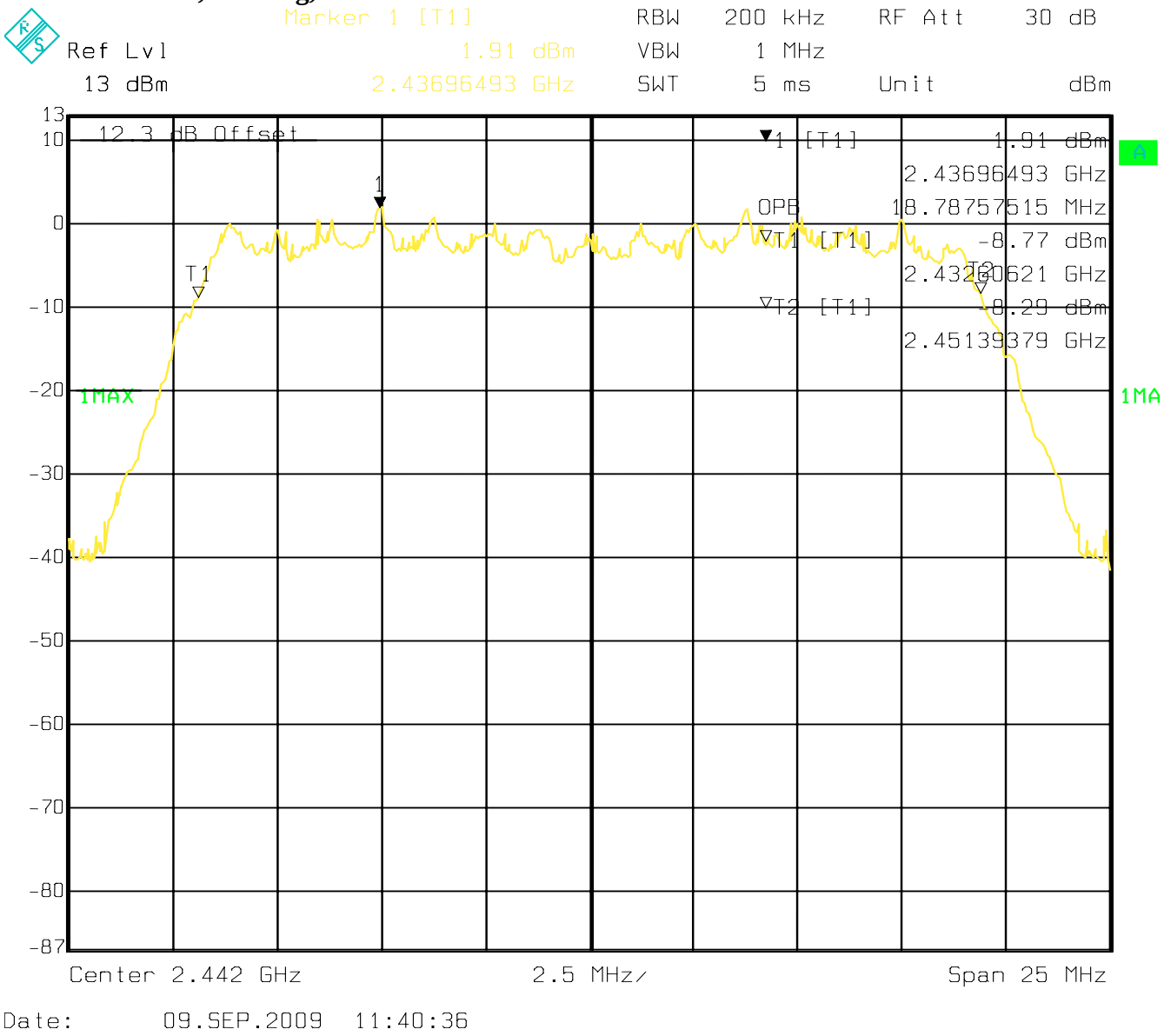
99% Bandwidth, 802.11 b, Channel 13



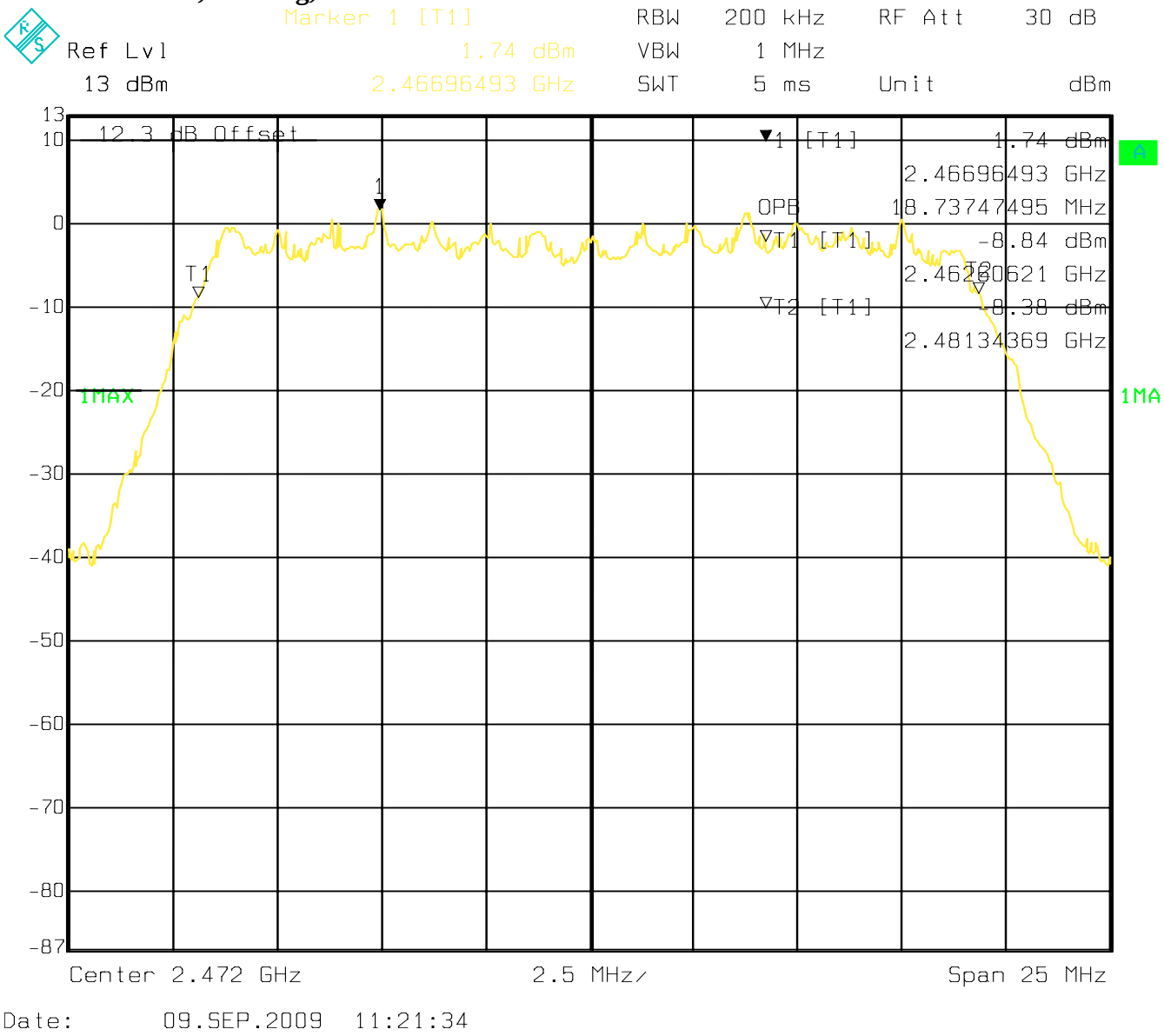
99% Bandwidth, 802.11 g, Channel 1



99% Bandwidth, 802.11 g, Channel 7



99% Bandwidth, 802.11 g, Channel 13



5.2 Conducted Power Measurement

5.2.1 Limit

FCC15.247 (b)(3): For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt

RSS210 A8.4(4): For systems employing digital modulation techniques operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz, the maximum peak conducted output power shall not exceed 1 W. Except as provided in Section A8.4(5), the e.i.r.p. shall not exceed 4 W.

5.2.2 Results

Conducted power measurements were made using a peak power meter.

TEST CONDITIONS T_{nom}(23)°C, V_{nom}VDC	Channel Frequency	Peak (dBm)	Peak (mW)	Verdict
Sub-band 1: 2400-2483.5MHz (802.11b)	2412	**11.34**	**13.61**	PASS
	2442	**11.62**	**14.52**	PASS
	2472	**11.2**	**13.18**	PASS
Sub-band 1: 2400-2483.5MHz (802.11g)	2412	**17.8**	**60.26**	PASS
	2442	**17.8**	**60.26**	PASS
	2472	**17.5**	**56.23**	PASS

5.3 Power Spectral Density

5.3.1 Limit

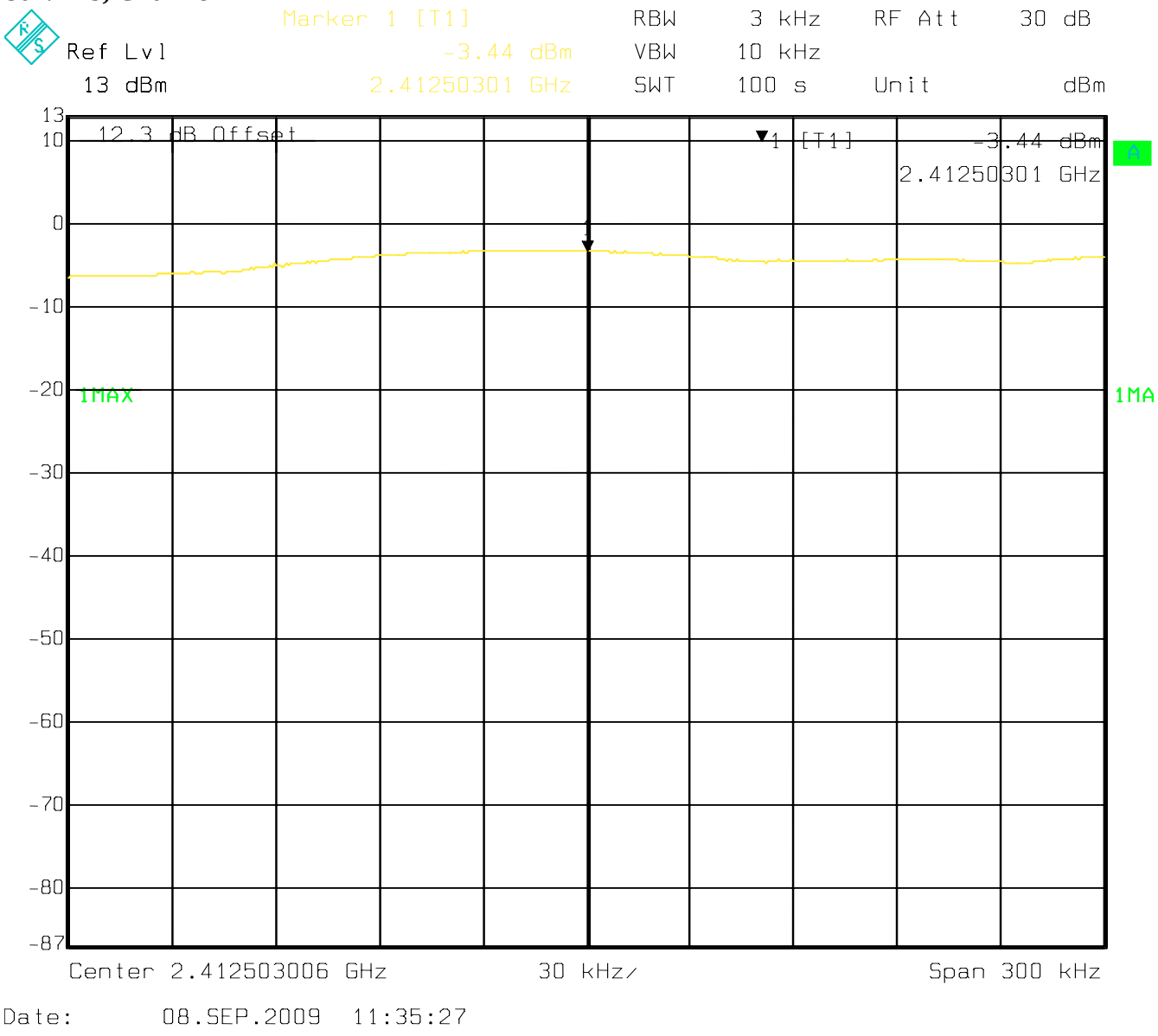
FCC 15.247 (e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.3.2 Results

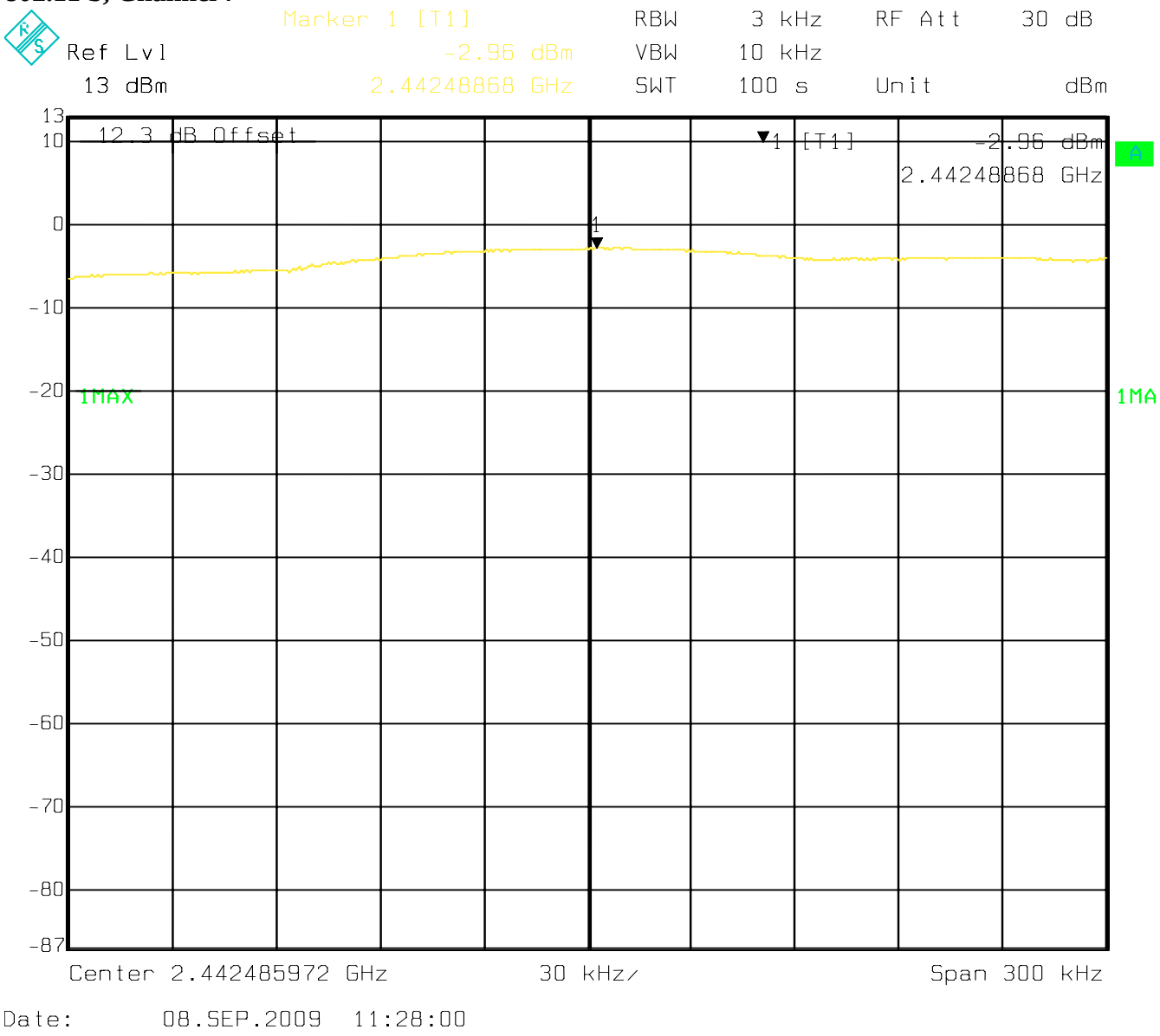
TEST CONDITIONS T_{nom}(23)°C, V_{nom}VDC	Channel Frequency	PSD (dBm)	Verdict
Sub-band 1: 2400-2483.5MHz (802.11b)	2412	**-3.44**	PASS
	2442	**-2.96**	PASS
	2472	**-3.31**	PASS
Sub-band 1: 2400-2483.5MHz (802.11g)	2412	**-0.67**	PASS
	2442	**-0.12**	PASS
	2472	**-0.44**	PASS

5.3.3 Plots

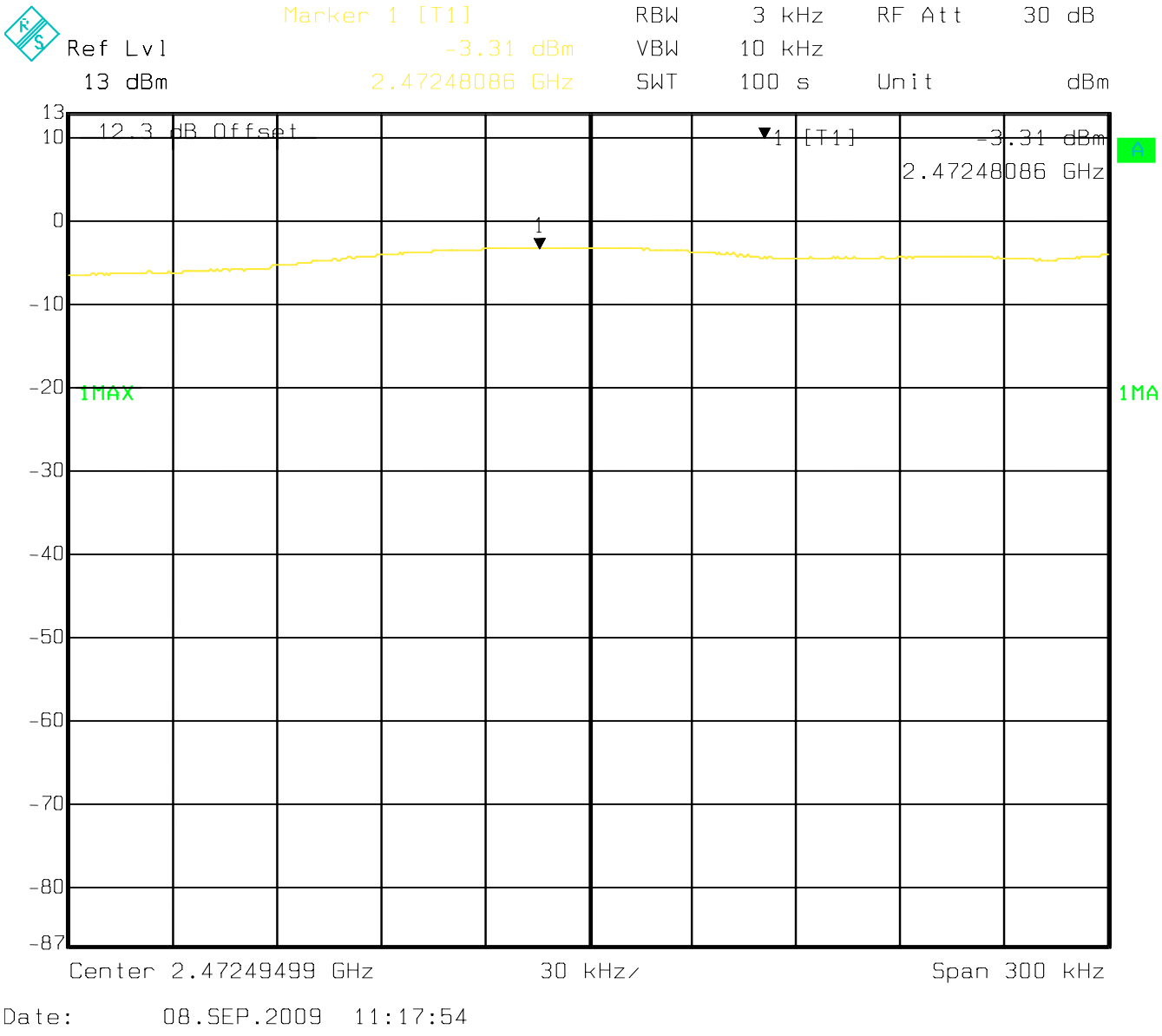
802.11 b, Channel 1



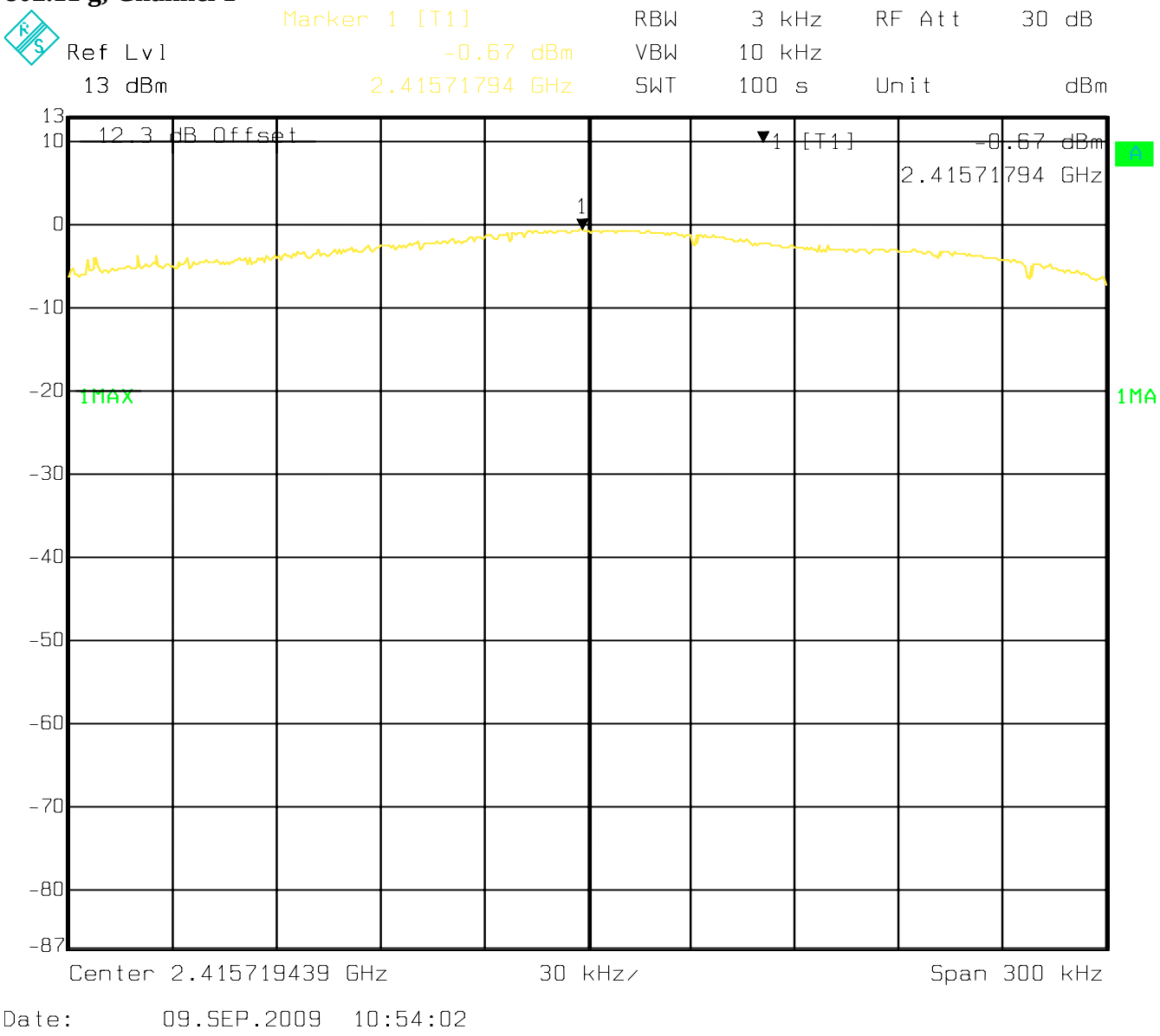
802.11 b, Channel 7



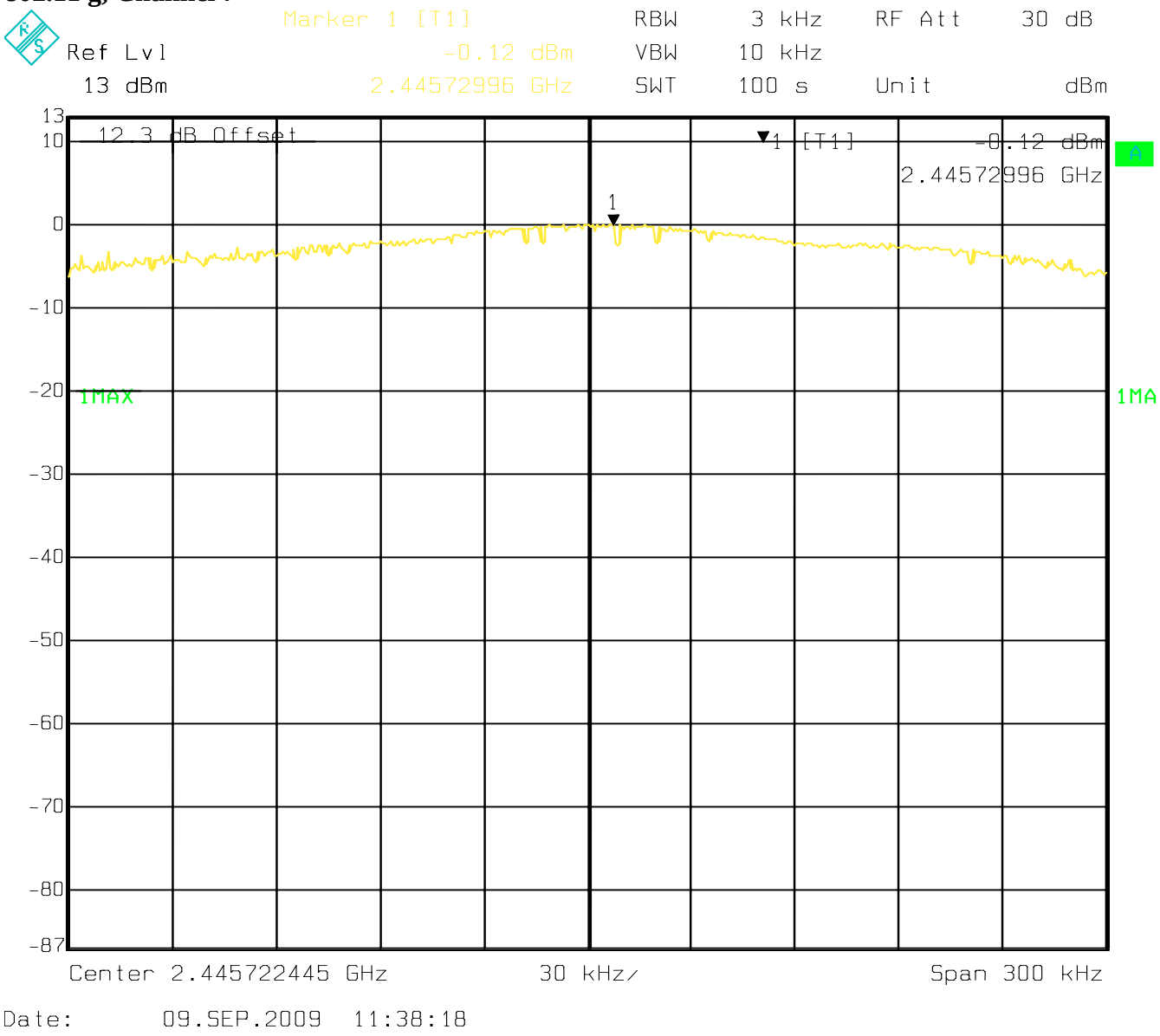
802.11 b, Channel 13



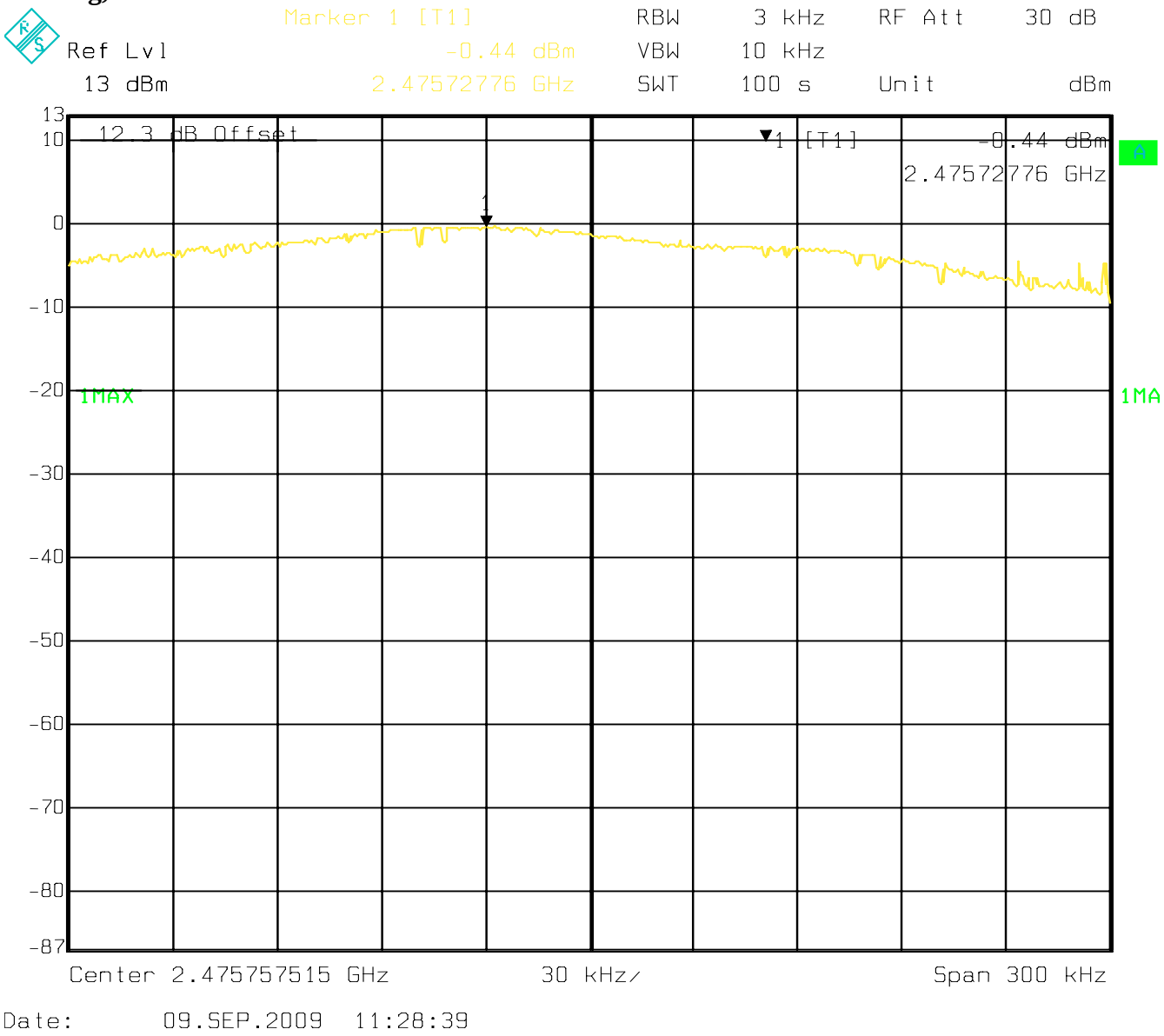
802.11 g, Channel 1



802.11 g, Channel 7



802.11 g, Channel 13



5.4 Conducted Spurious Emission

5.4.1 Limit

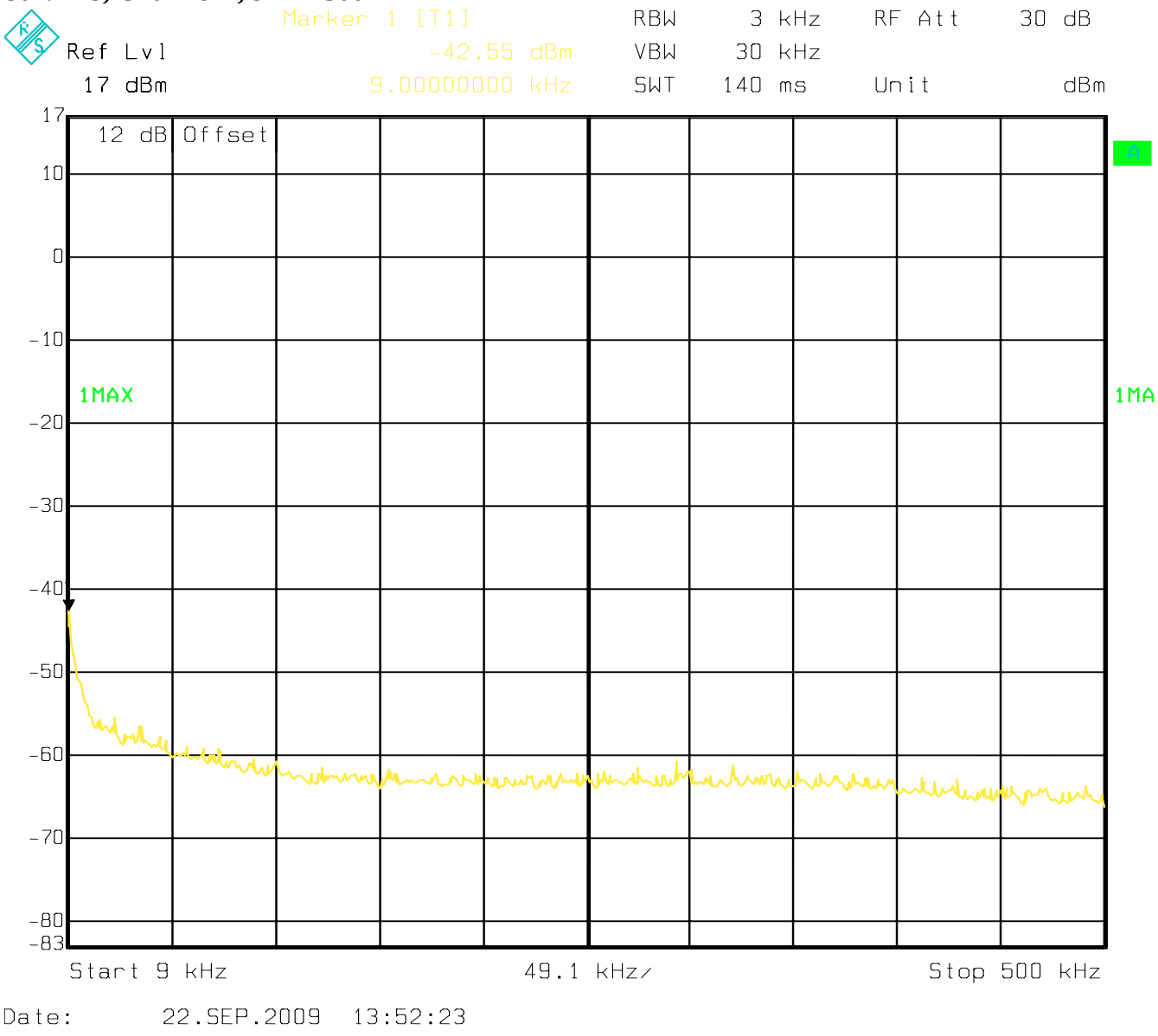
§15.247(d) & RSS-210 (A8.5): -30dBc

5.4.2 Results:

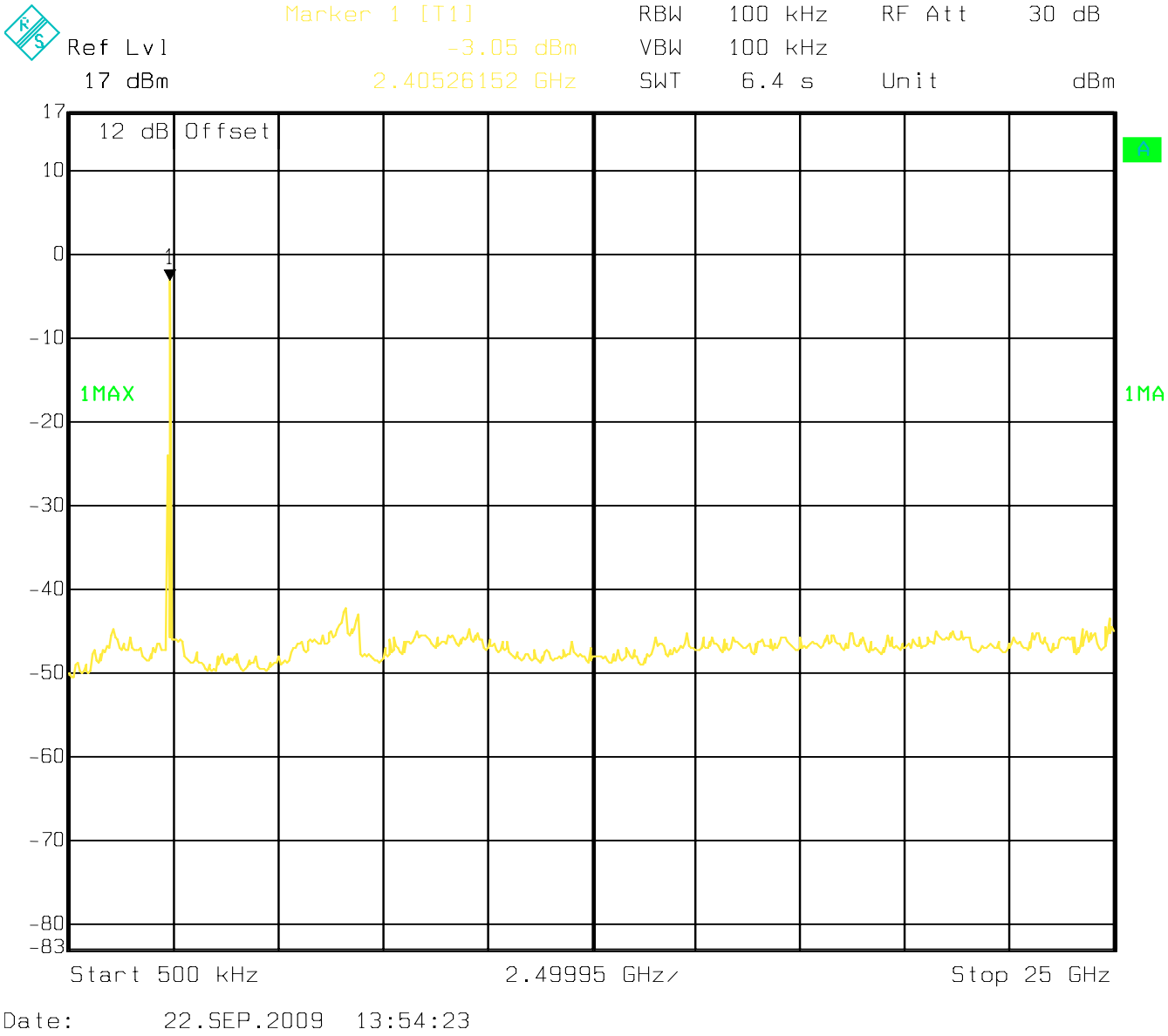
TEST CONDITIONS T_{nom}(23)°C, V_{nom}VDC	Channel Frequency	Verdict
Sub-band 1: 2400-2483.5MHz (802.11b)	2412	PASS
	2442	PASS
	2472	PASS
Sub-band 1: 2400-2483.5MHz (802.11g)	2412	PASS
	2442	PASS
	2472	PASS

5.4.3 Plots

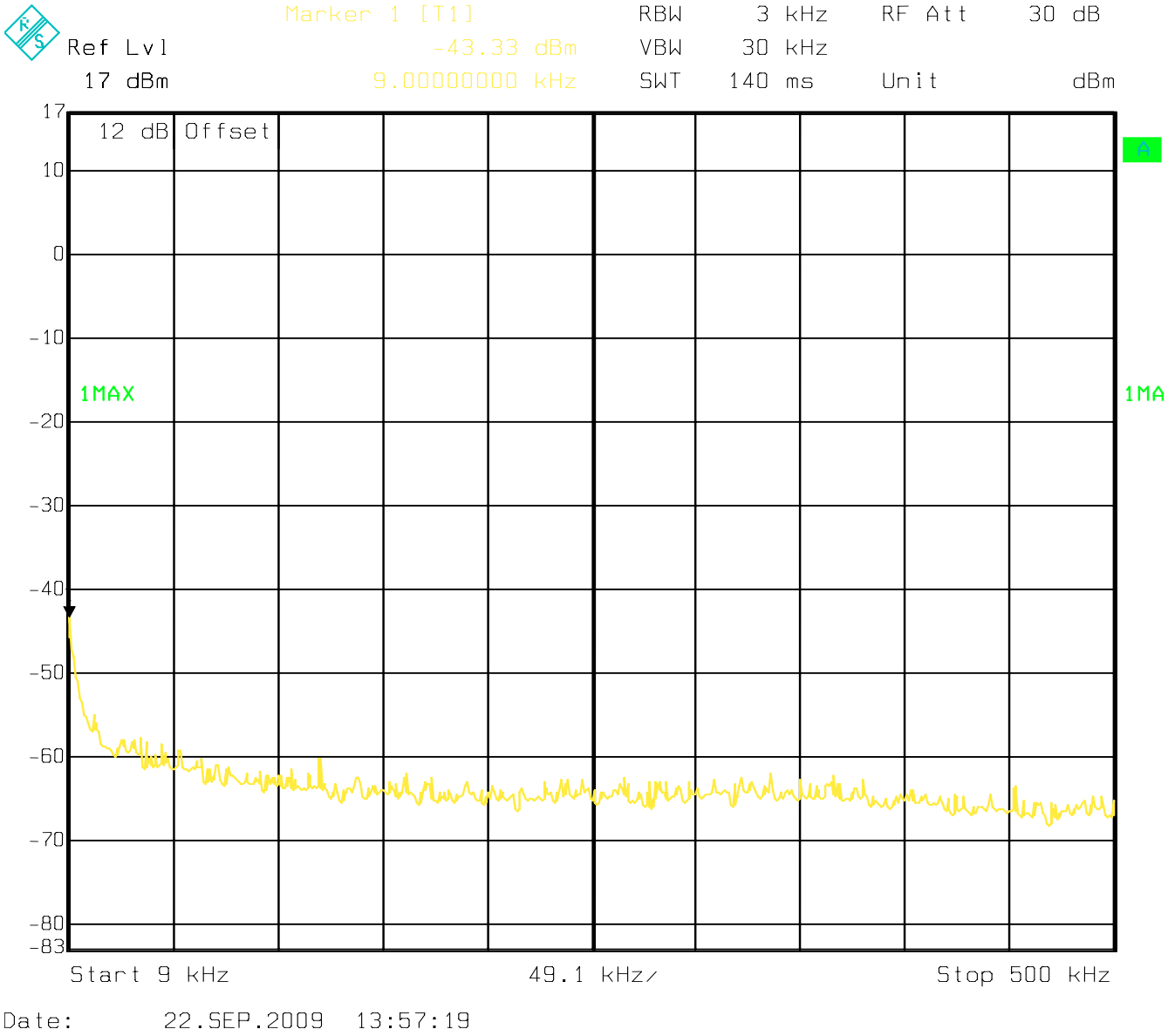
802.11 b, Channel 1, 9kHz-500kHz



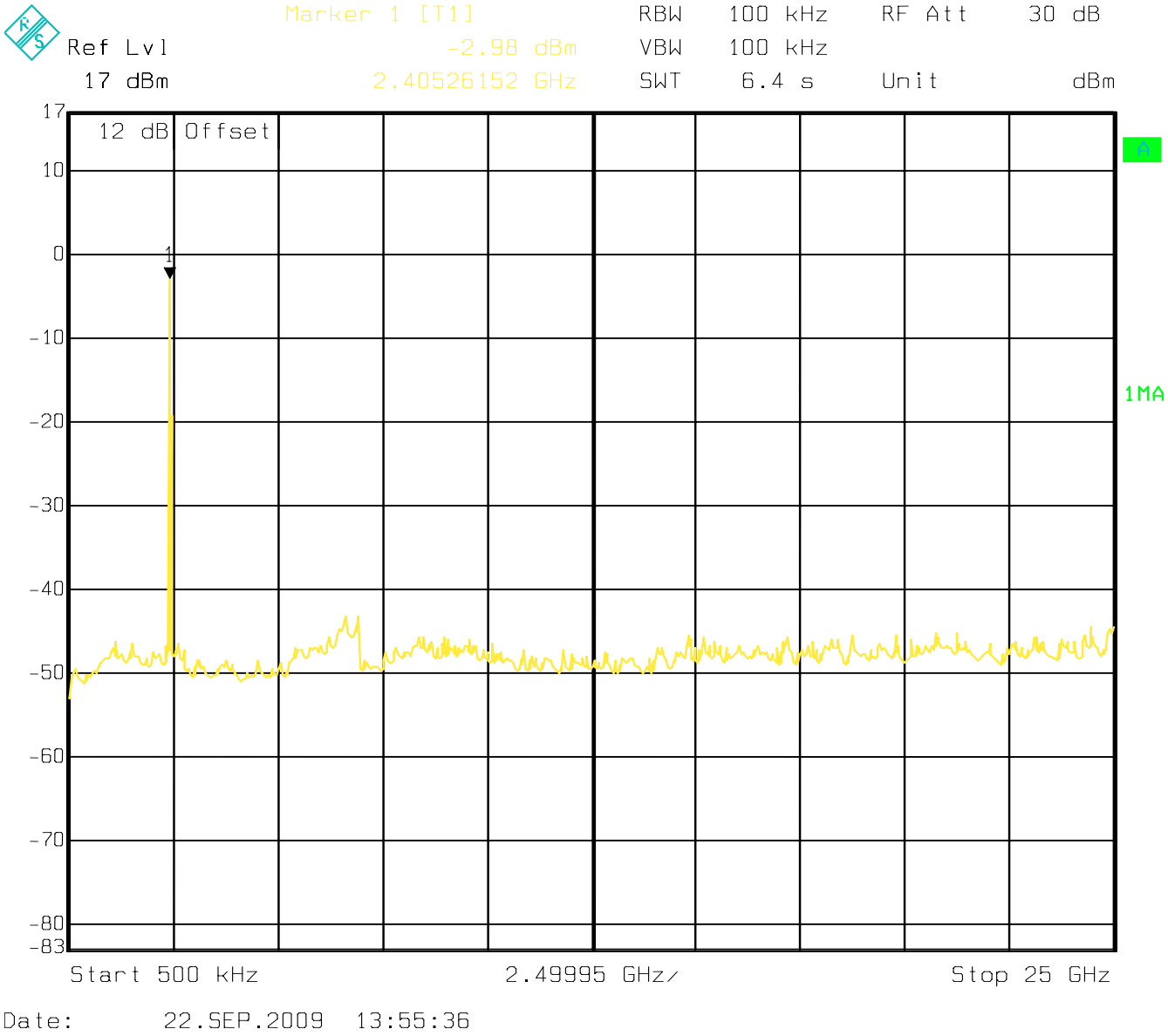
802.11 b, Channel 1, 500kHz-25GHz



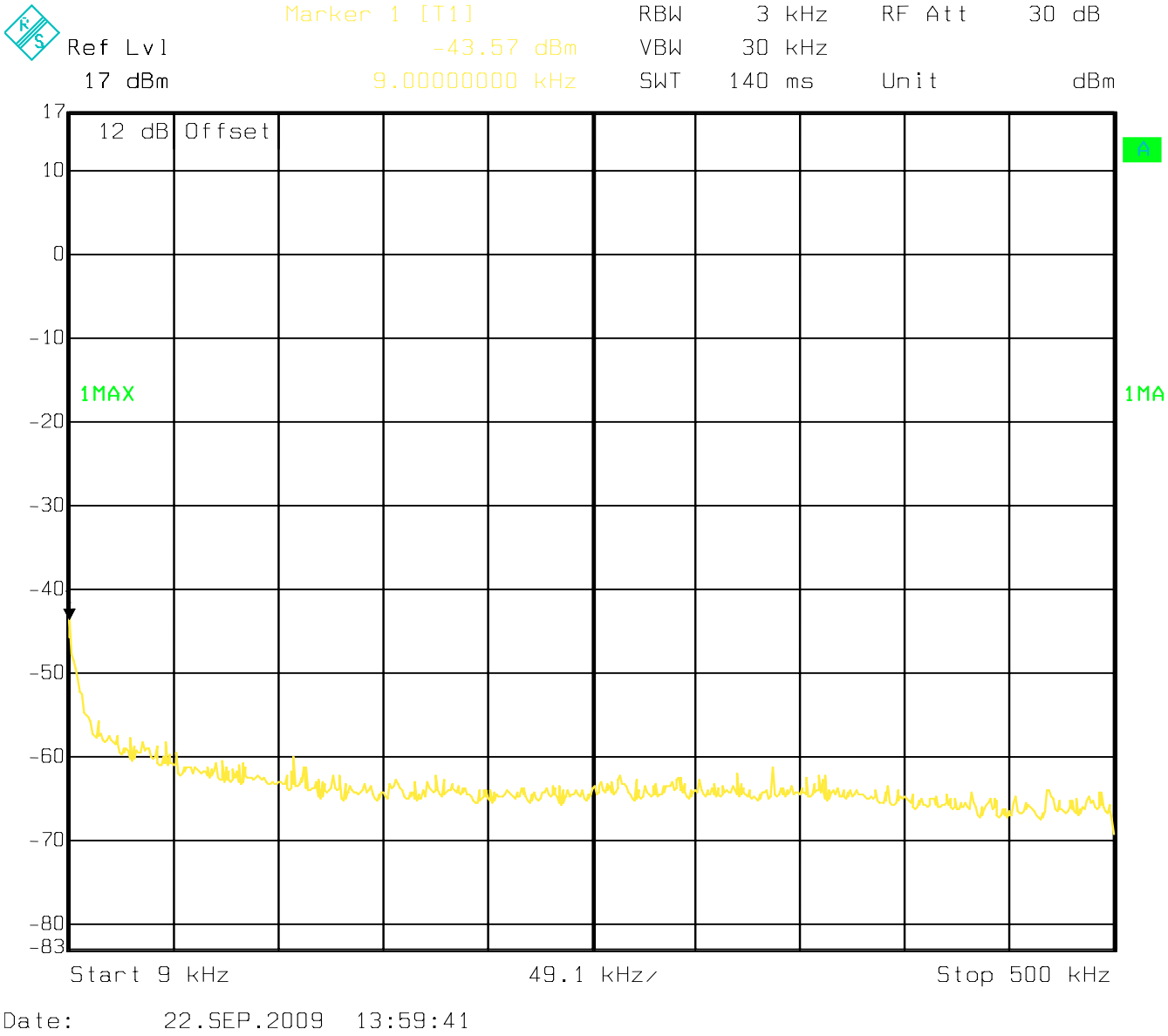
802.11 b, Channel 7, 9kHz-500kHz



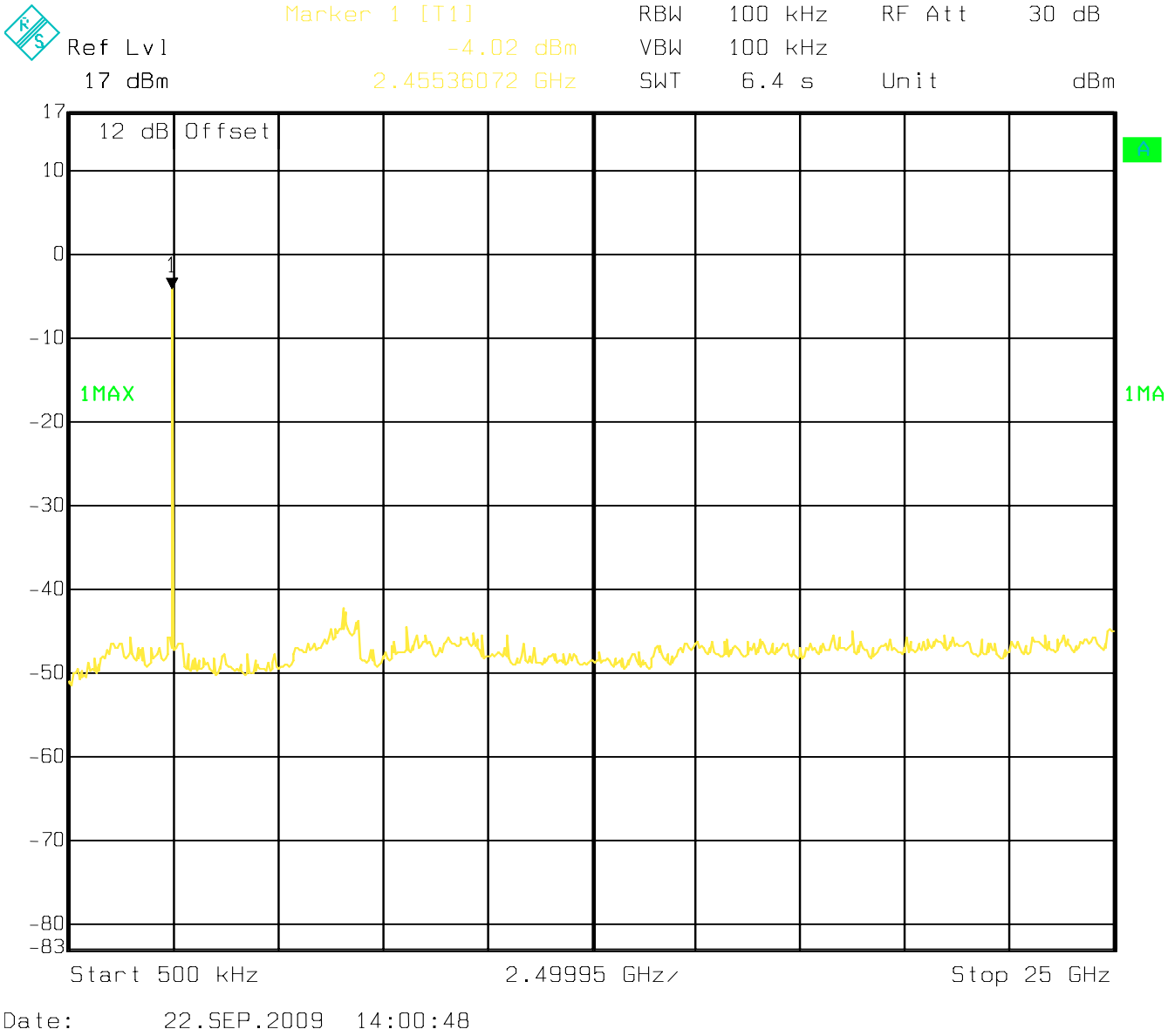
802.11 b, Channel 7, 500kHz-25GHz



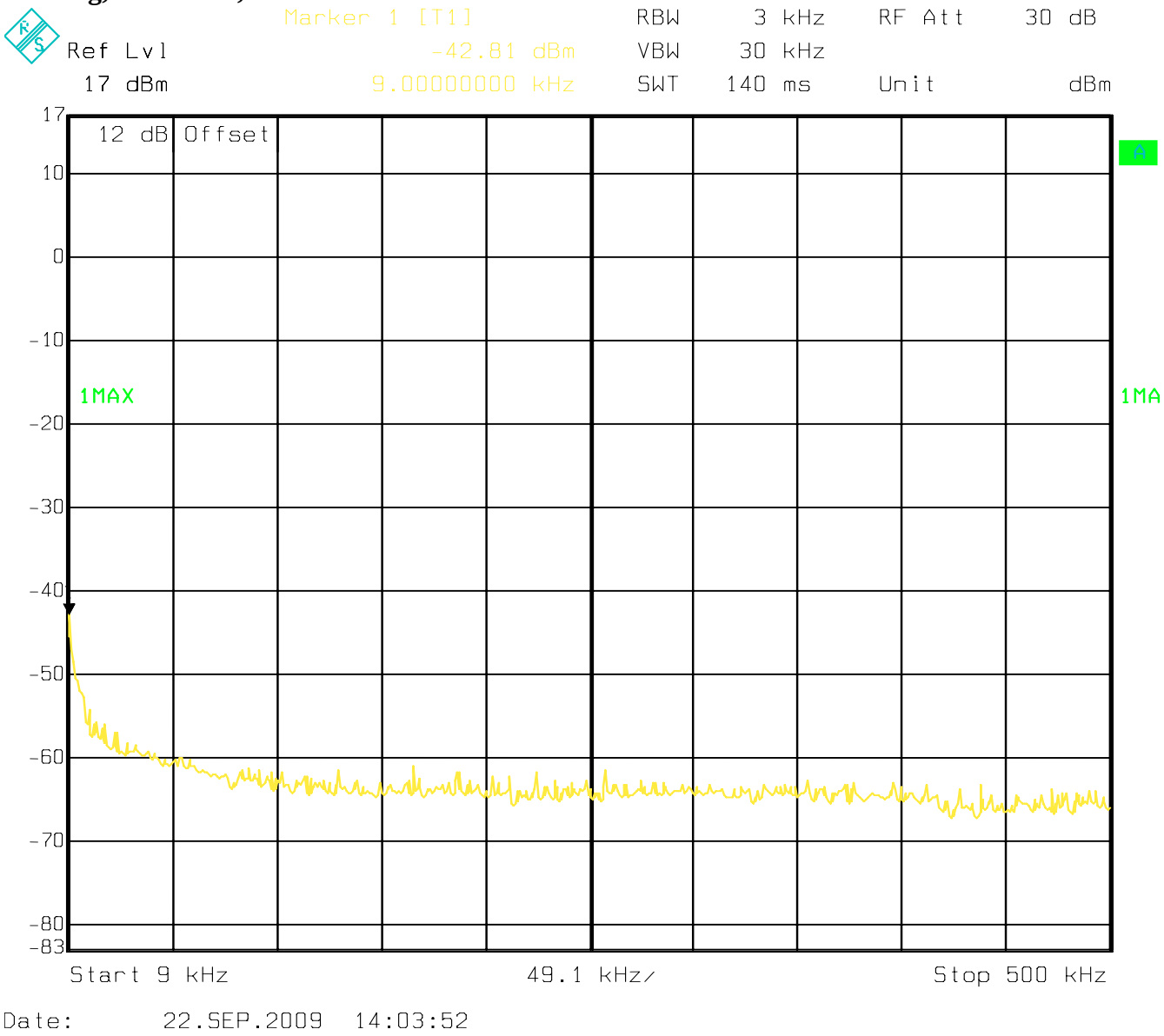
802.11 b, Channel 13, 9kHz-500kHz



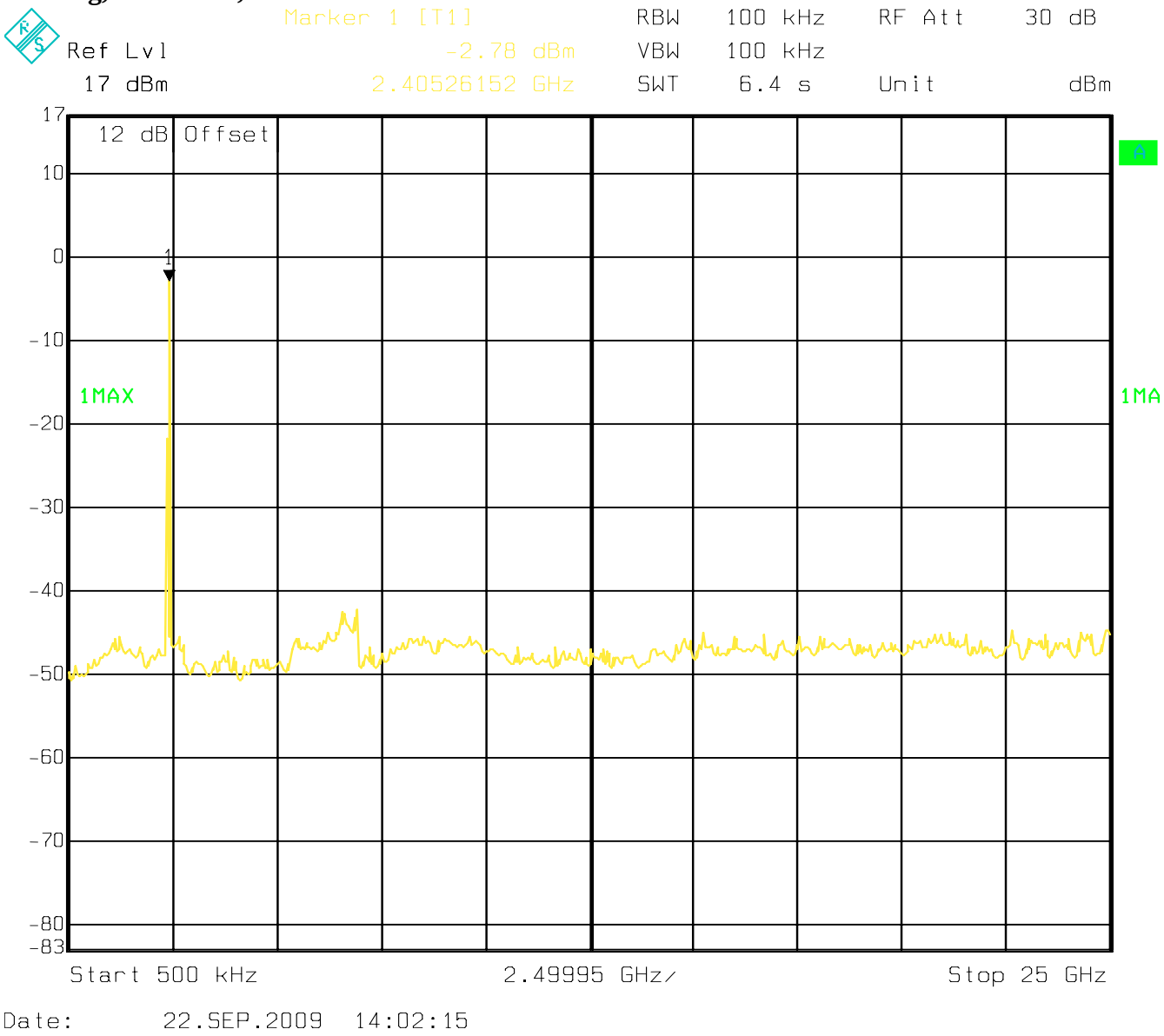
802.11 b, Channel 13, 500kHz-25GHz



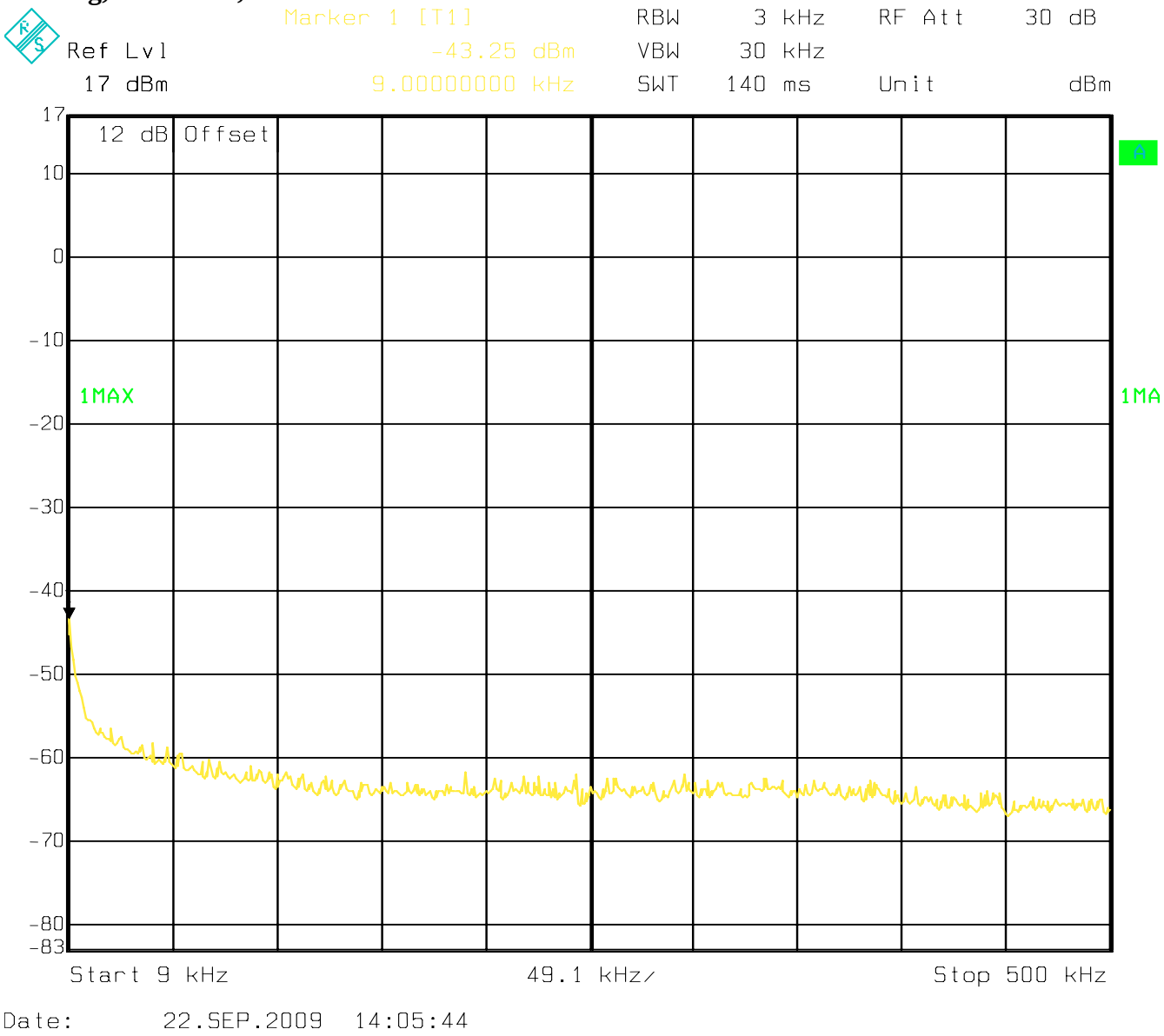
802.11 g, Channel 1, 9kHz-500kHz



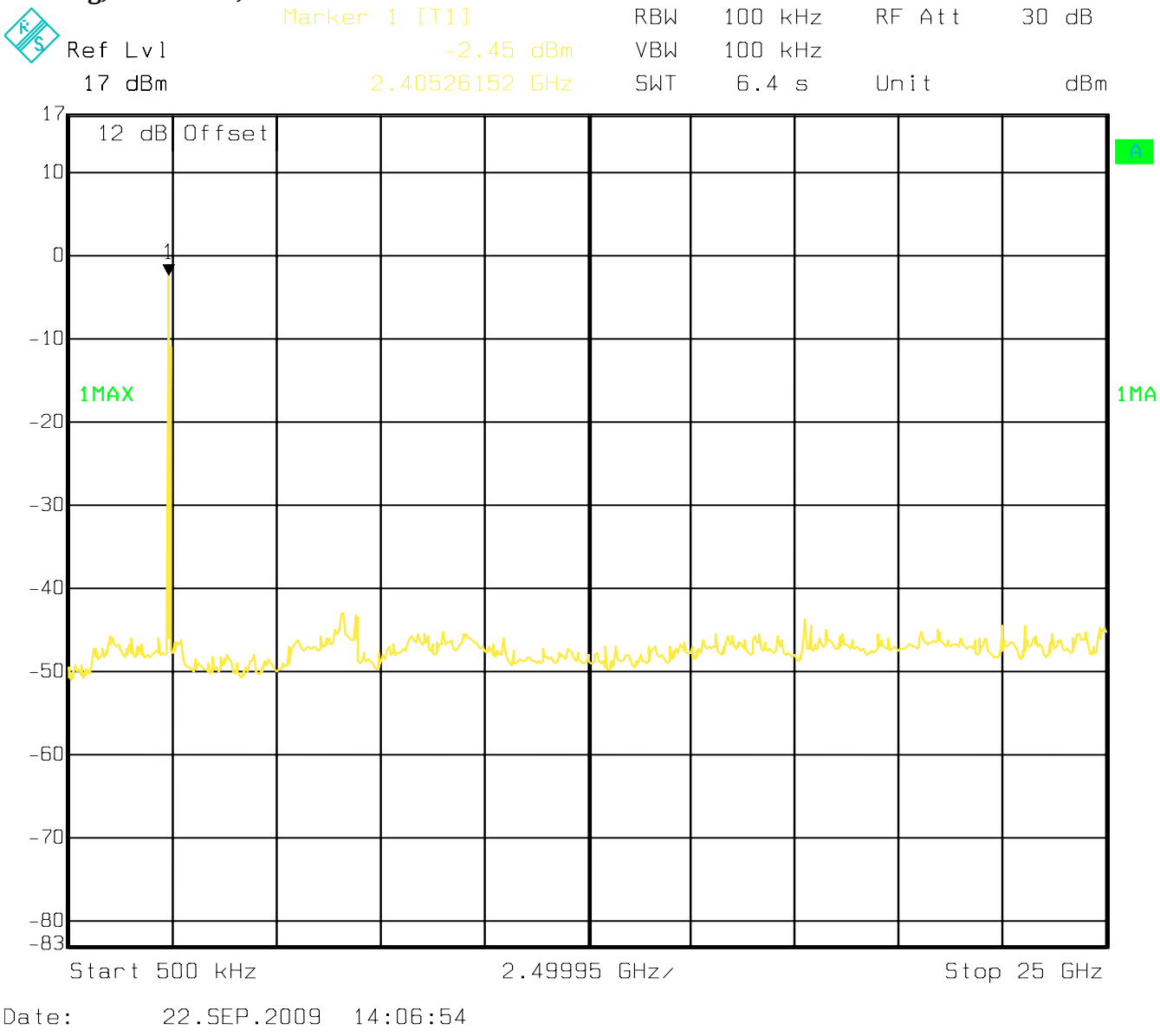
802.11 g, Channel 1, 500kHz-25GHz



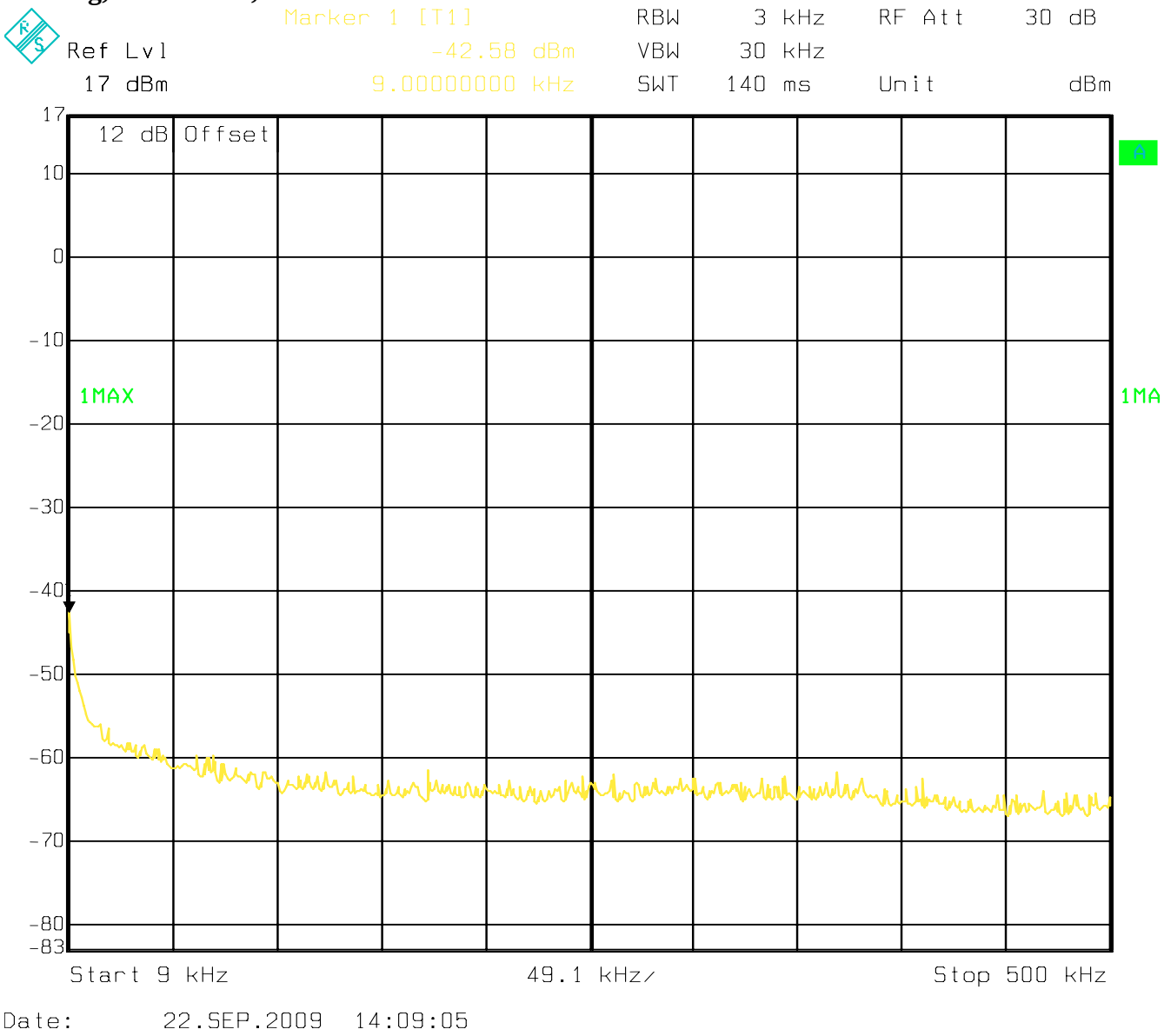
802.11 g, Channel 7, 9kHz-500kHz



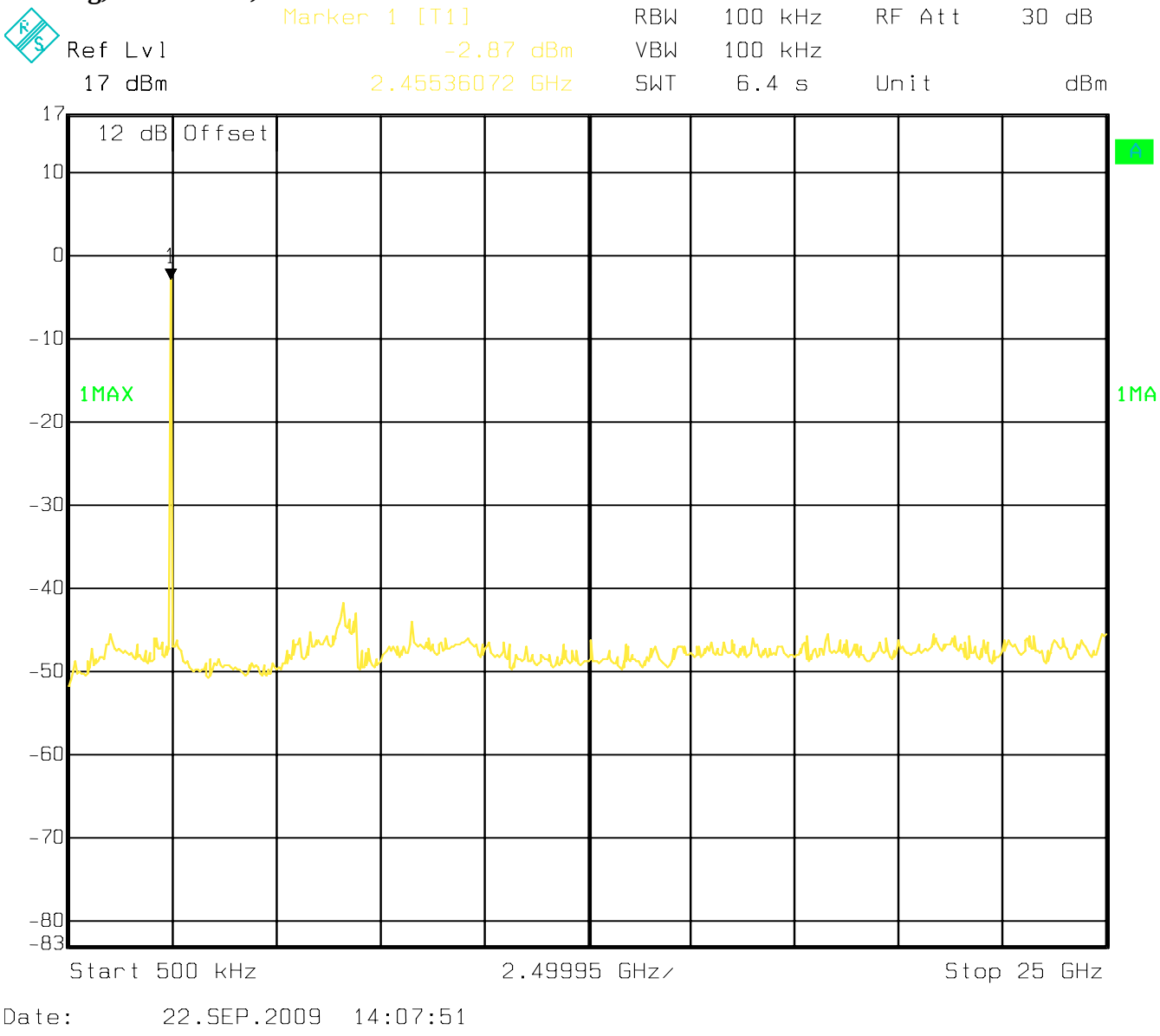
802.11 g, Channel 7, 500kHz-25GHz



802.11 g, Channel 13, 9kHz-500kHz



802.11 g, Channel 13, 500kHz-25GHz



5.5 AC POWER LINE CONDUCTED EMISSIONS § 15.107/207

5.5.1 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

Note: AC Line Conducted Emission reported here are the worse cases among all operating modes.

5.5.2 RESULT:

	Frequency (MHz)	
Frequency Range	**150kHz – 30MHz**	
LISN Setting	**Result Saved**	**Result (Fail/Pass)**
TRANSMIT MODE		
Line	**TXLISN-L**	Pass
Neutral	**TXLISN-N**	Pass
RECEIVE MODE		
Line	**RXLISN-L**	Pass
Neutral	**RXLISN-N**	Pass

5.5.3 PLOTS
TRANSMIT LINE

Line 1 / 1

EUT Information

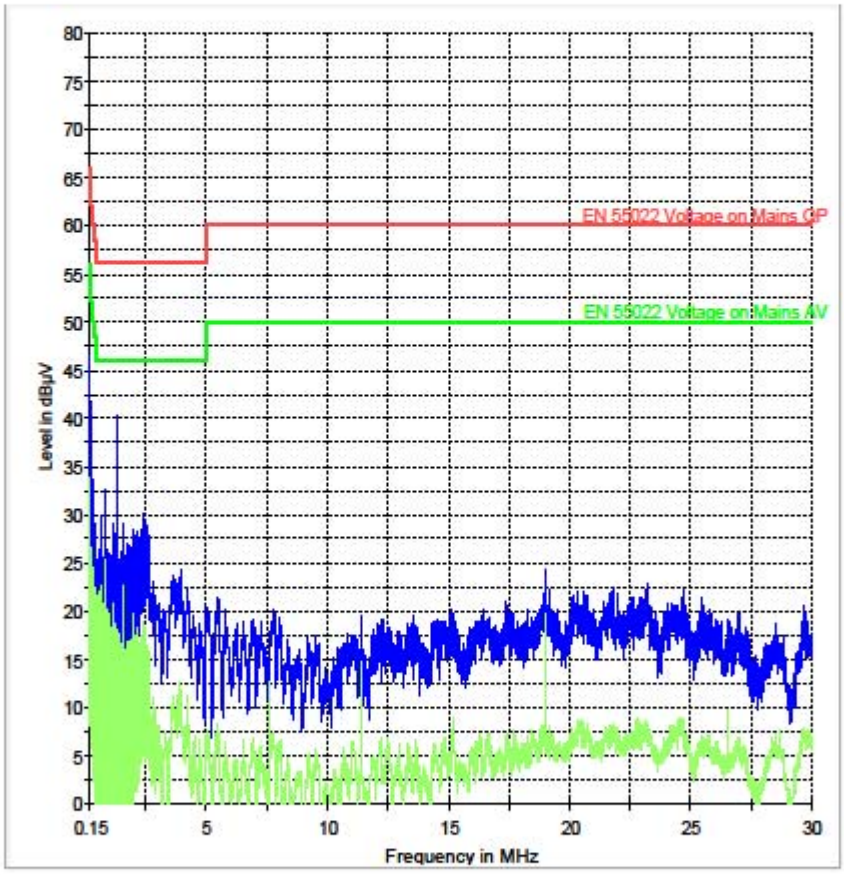
Description:

EUT Name: MT810SWM

Manufacturer: Multitech

Line

CISPR 22 Mains Conducted - L



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TRANSMIT NEUTRAL

Neutral 1 / 1

EUT Information

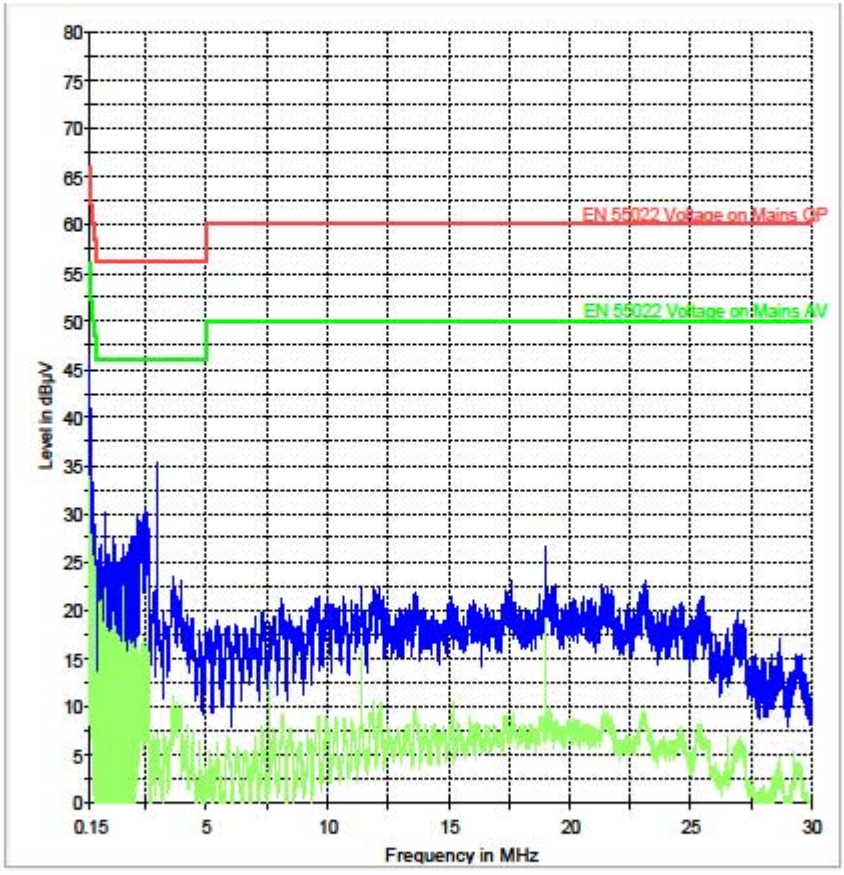
Description:

EUT Name: MT810SWM

Manufacturer: Multitech

Neutral

CISPR 22 Mains Conducted - N



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RECEIVE LINE

Line 1 / 1

EUT Information

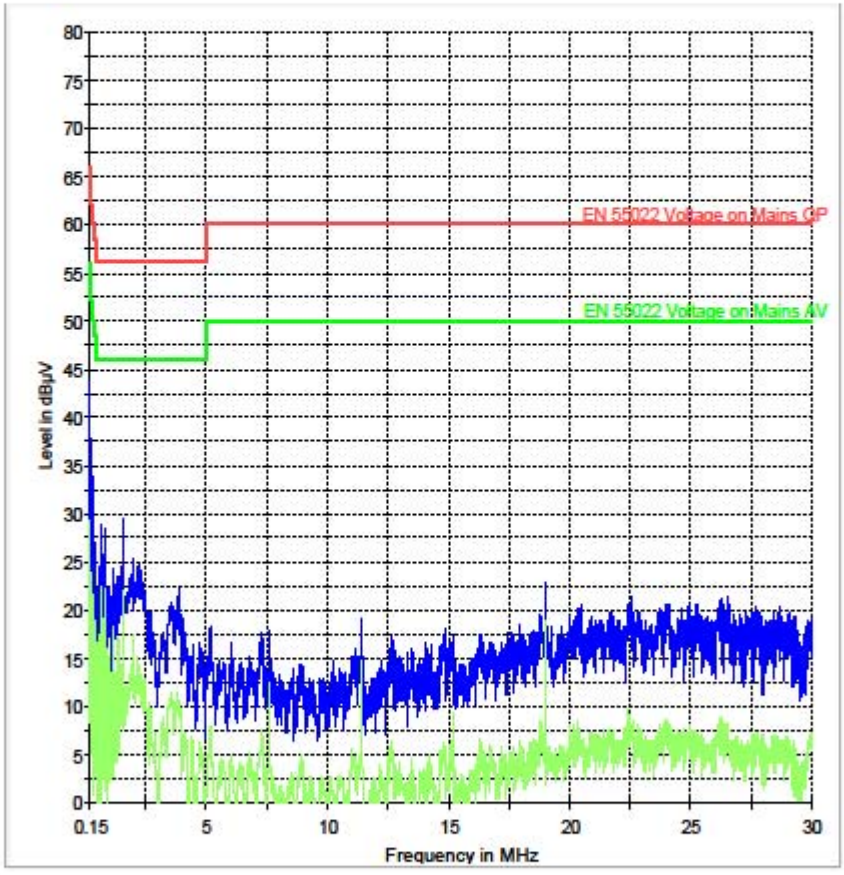
Description:

EUT Name: MT810SWM

Manufacturer: Multitech

Line

CISPR 22 Mains Conducted - L



EN 55022 Voltage on Mains QP.LimitLine

Preview Result 1

EN 55022 Voltage on Mains AV.LimitLine

Preview Result 2

8/13/2009 emcuser EMC32 V8.10.10 6:10:57

RECEIVE NEUTRAL

Neutral 1 / 1

EUT Information

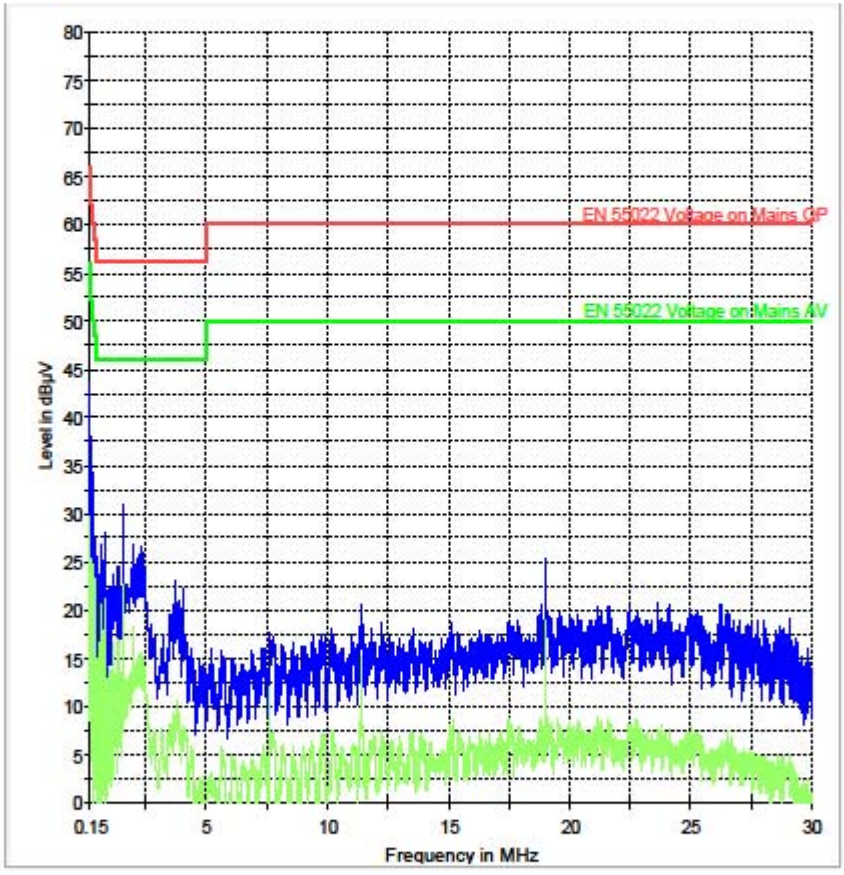
Description:

EUT Name: MT810SWM

Manufacturer: Multitech

Neutral

CISPR 22 Mains Conducted - N



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6 Radiated Measurements

6.1 Maximum Peak Output Power § 15.247 (b)(1) (Radiated)

6.1.1 Limits

FCC15.247 (b) (1): 4W (36dBm), with antenna gain < 6dBi.
RSS-210 A8.4 (4): 4W (36dBm)

6.1.2 Results:

EIRP is calculated as EIRP = Conducted Peak Power (dBm) + Peak Antenna Gain (dBi)

EIRP 802.11 b/g Mode:

TEST CONDITIONS T_{nom}(23)°C, V_{nom}VDC	Channel Frequency	EIRP (dBm)	EIRP (mW)	Verdict
Sub-band 1: 2400-2483.5MHz (802.11b)	2412	**16.34**	**43.05**	PASS
	2442	**16.62**	**45.92**	PASS
	2472	**16.2**	**41.69**	PASS
Sub-band 1: 2400-2483.5MHz (802.11g)	2412	**22.8**	**190.55**	PASS
	2442	**22.8**	**190.55**	PASS
	2472	**22.5**	**177.83**	PASS

6.2 Restricted Band Edge Compliance §15.247/15.205

6.2.1 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:

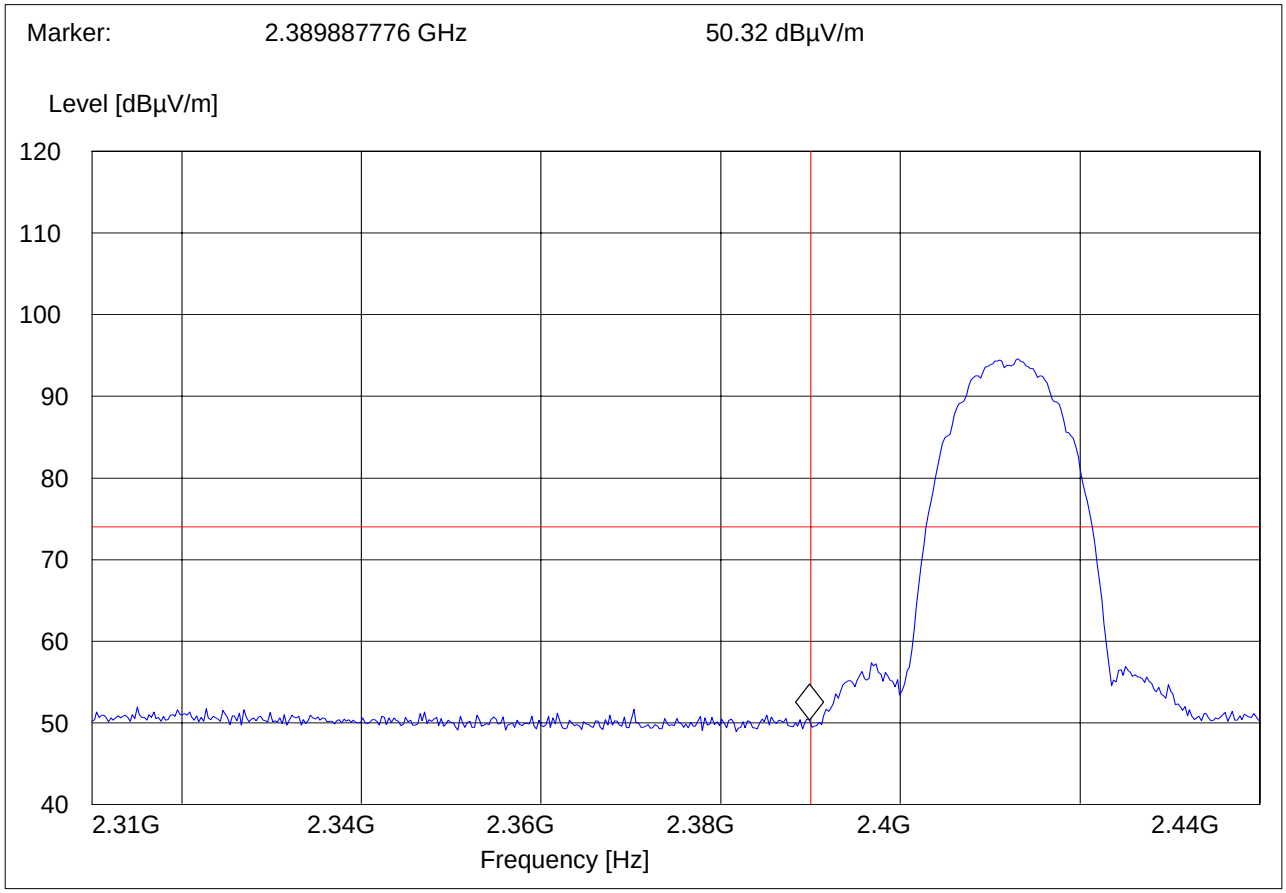
1. Radiated emissions are maximized by rotating the EUT 360° at 0.5 meter height increments between 1 and 4 meters.
2. Measurements were performed with the EUT in X, Y and Z orientations with the measurement antenna in both horizontal and vertical polarity. The plots below show the results of the worst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

6.2.2 Sub-band 1 802.11b

Lower band edge PEAK
EUT: MT810SWM
Customer:: MULTITECH
Test Mode: WLAN CH1, B MODE
ANT Orientation: H
EUT Orientation: H
Test Engineer: JOSIE
Voltage: AC Adapter
Comments:

SWEEP TABLE: "FCC15.247 LBE_PK"

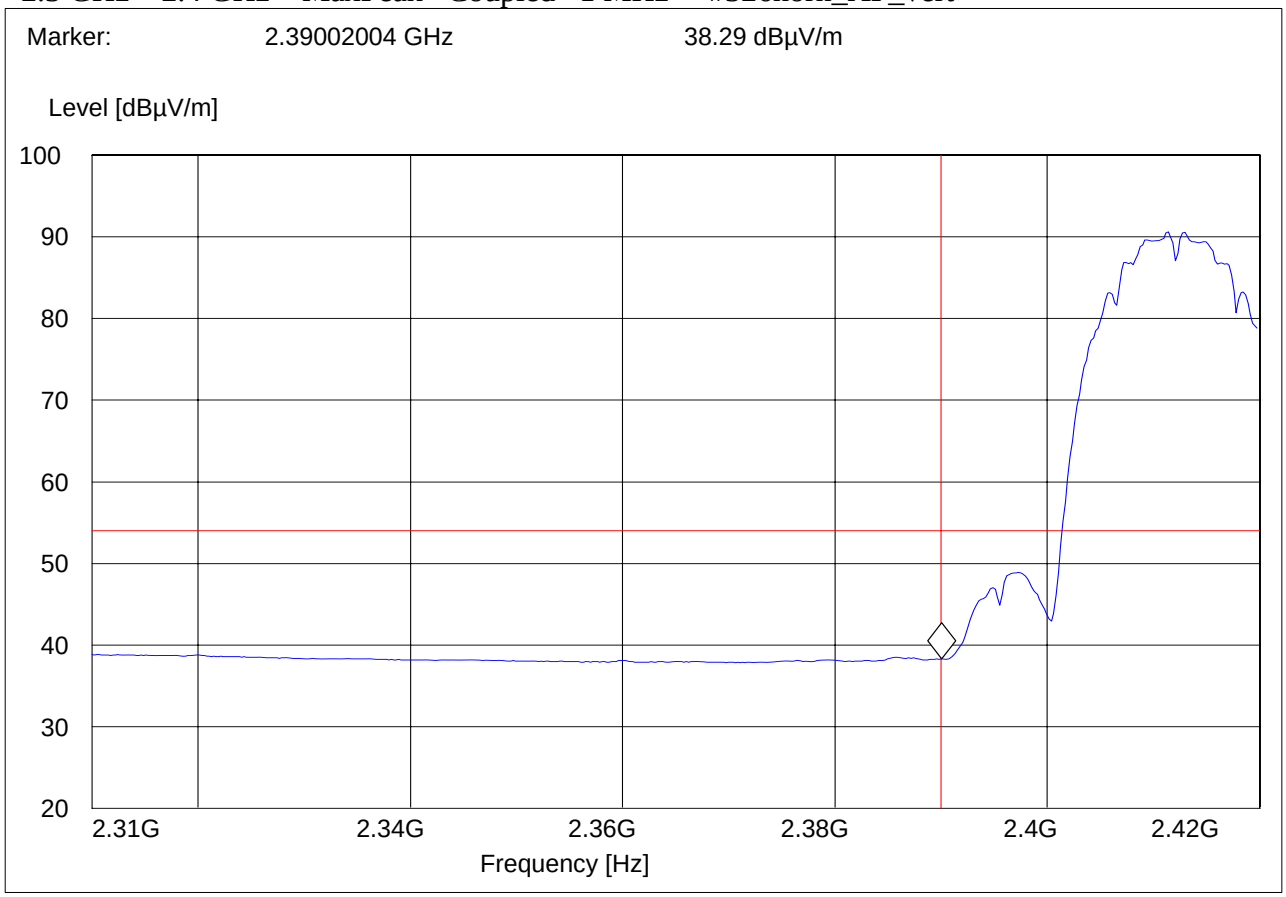
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.3 GHz	2.4 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert
		MaxPeak			



Lower band edge Average
EUT: MT810SWM
Customer:: MULTITECH
Test Mode: WLAN CH1, B MODE
ANT Orientation: H
EUT Orientation: H
Test Engineer: JOSIE
Voltage: 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

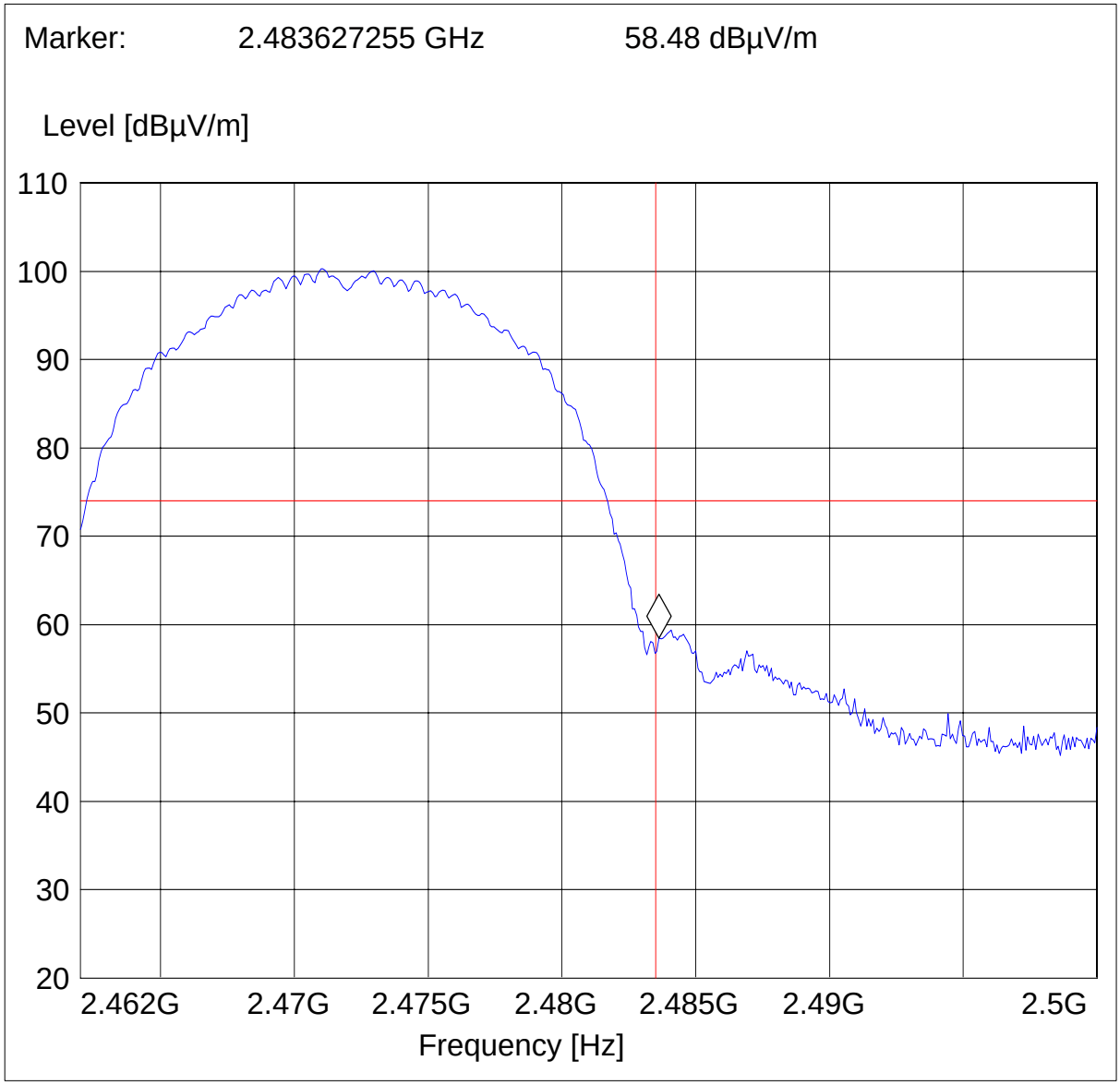


High band edge PEAK

EUT: MT810SWM
Customer:: Multitech
Test Mode: 802.11b
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: AC
Comments:

SWEEP TABLE: "FCC15.247 HBE_PK"

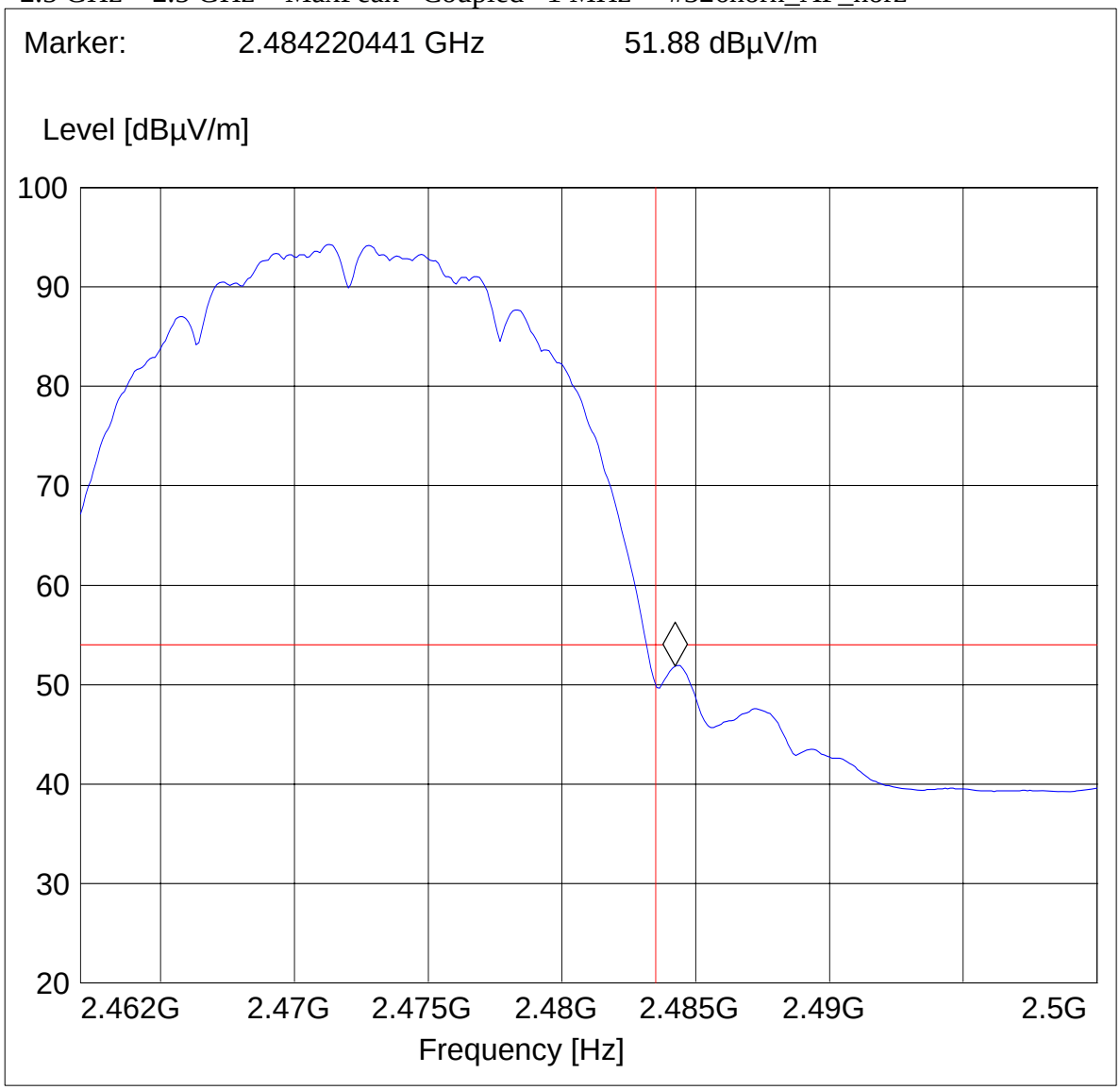
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.5 GHz	2.5 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert MaxPeak



High band edge Average
EUT: MT810SWM
Customer:: Multitech
Test Mode: 802.11b
ANT Orientation: H
EUT Orientation: H
Test Engineer: SAM
Voltage: AC
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



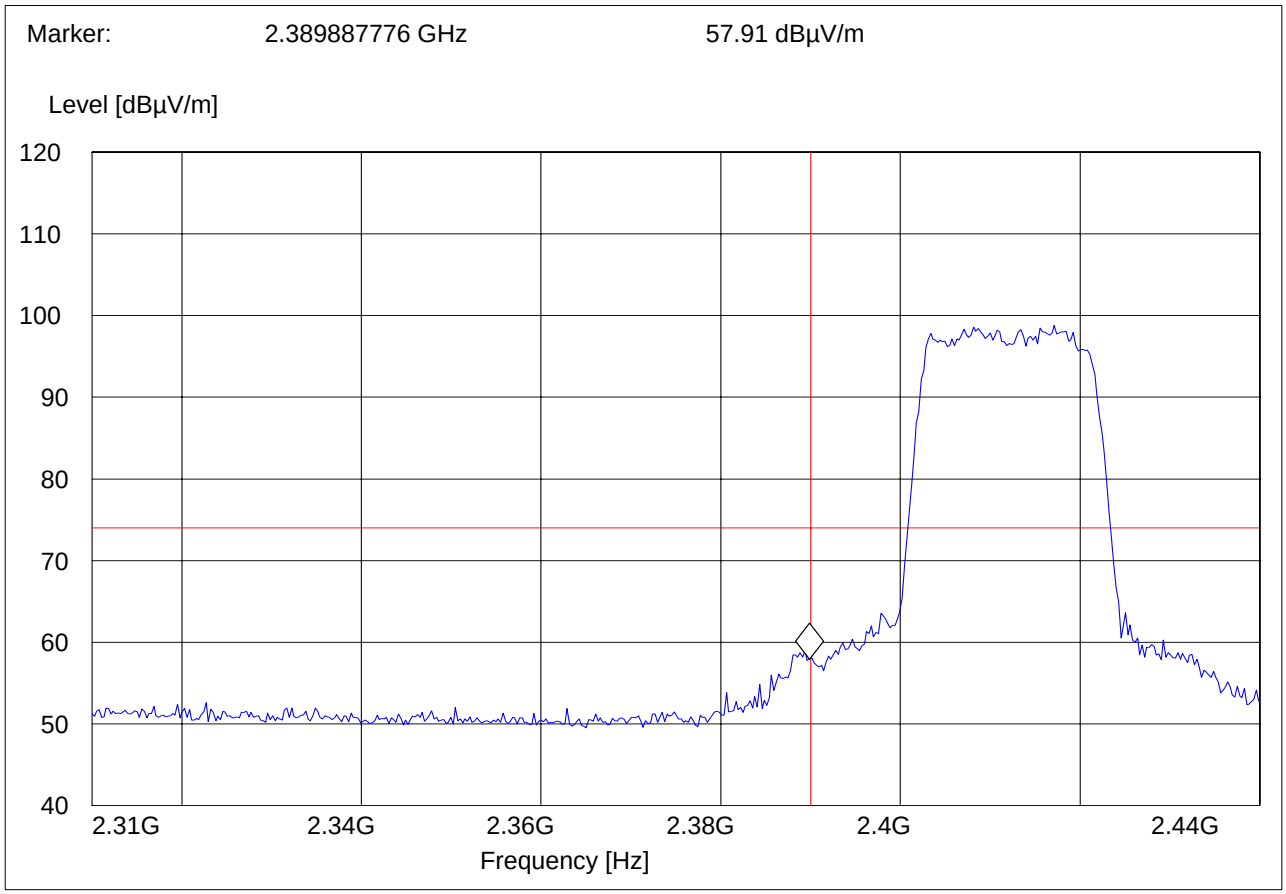
6.2.3 Sub-band 1 802.11g

Lower band edge PEAK

EUT: MT810SWM
Customer:: MULTITECH
Test Mode: WLAN CH1, G MODE
ANT Orientation: V
EUT Orientation: H
Test Engineer: JOSIE
Voltage: 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
		MaxPeak			

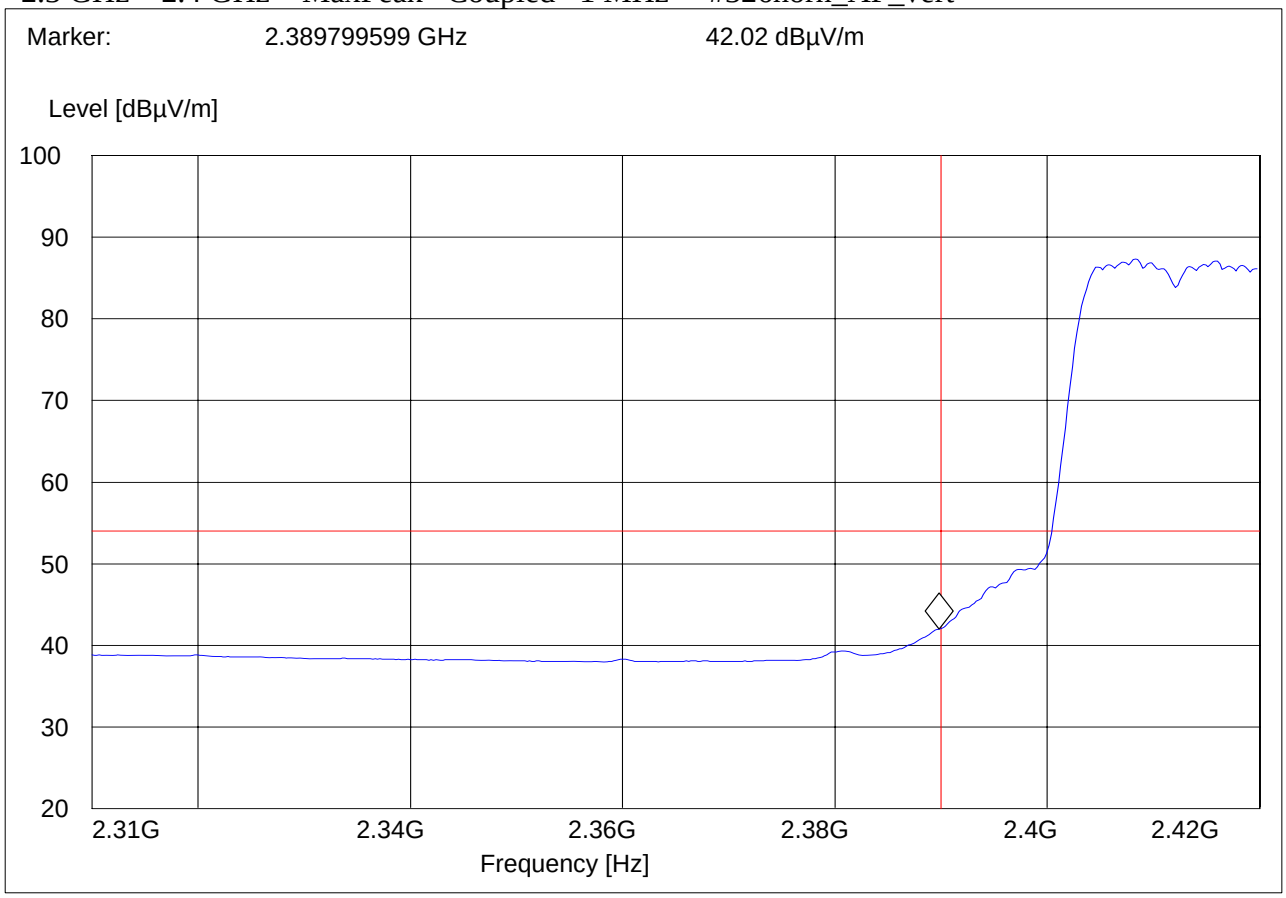


Lower band edge Average

EUT: MT810SWM
Customer:: MULTITECH
Test Mode: WLAN CH1, G MODE
ANT Orientation: V
EUT Orientation: H
Test Engineer: JOSIE
Voltage: 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

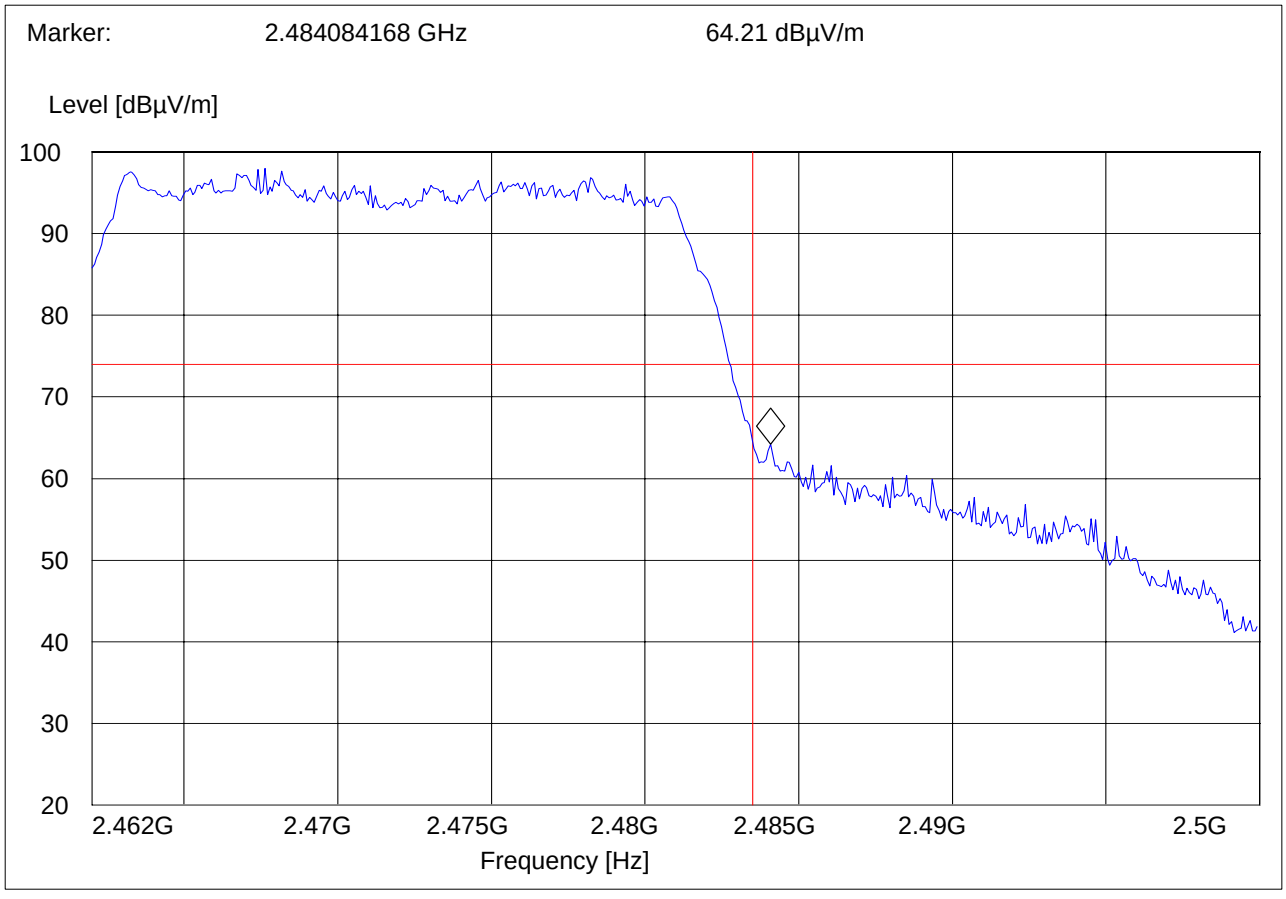


High band edge PEAK

EUT: MT810SWM
Customer:: MULTITECH
Test Mode: WLAN CH13, G MODE
ANT Orientation: V
EUT Orientation: H
Test Engineer: JOSIE
Voltage: 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 MaxPeak

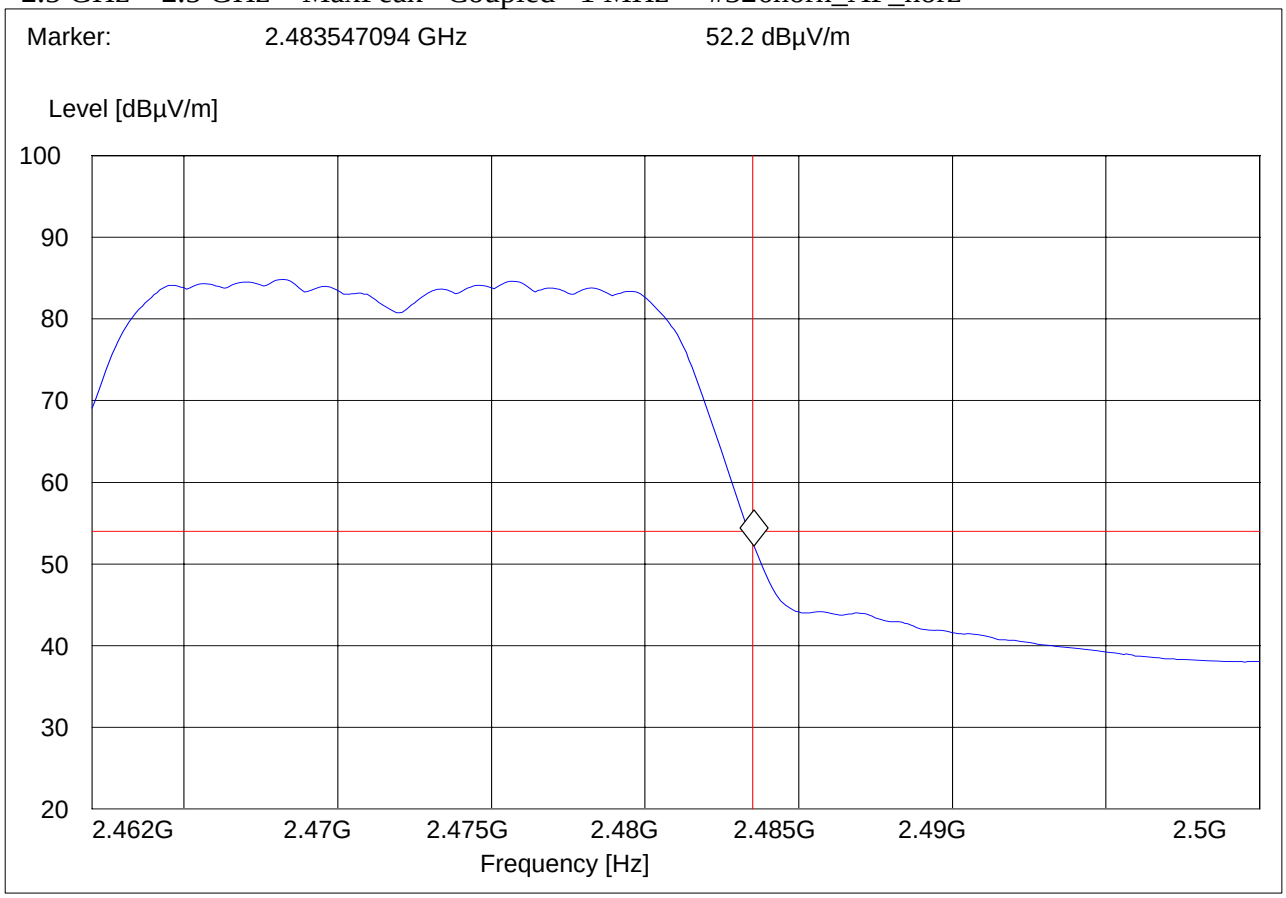


High band edge Average

EUT: MT810SWM
Customer:: MULTITECH
Test Mode: WLAN CH13, G MODE
ANT Orientation: V
EUT Orientation: H
Test Engineer: JOSIE
Voltage: 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



6.3 Transmitter Spurious Emission § 15.247/15.205/15.209

6.3.1 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

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

6.3.2 RESULTS Sub-band 1 802.11b/g MODE

Emissions reported here are worse cases emissions for all operation modes.
30MHz – 1GHz, Channel 1

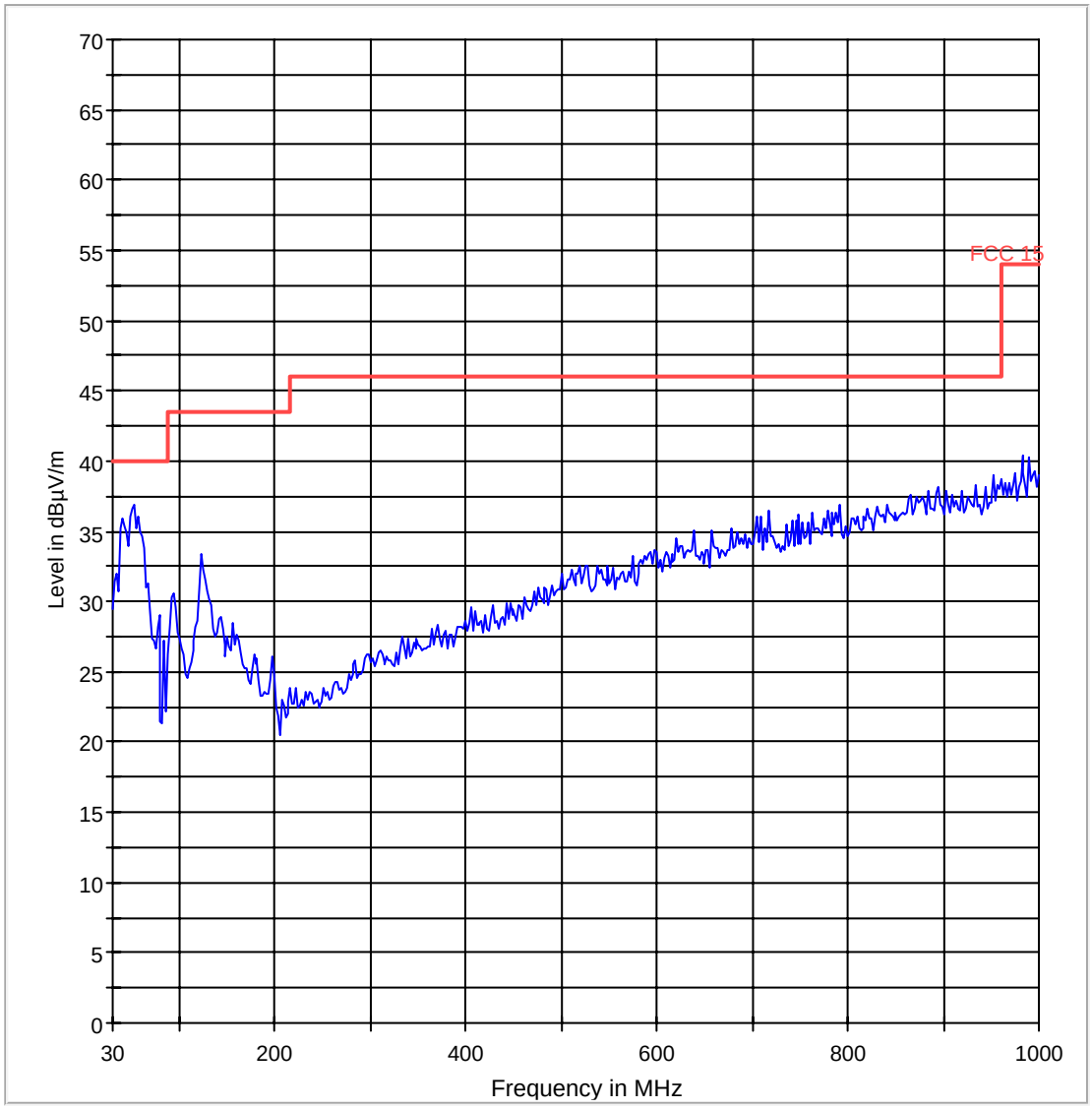
EUT Information

Description:

EUT Name:	MT810SWM
Manufacturer:	Multitech
Operating Mode:	G mode

Test

FCC 15 30-1000MHz



30MHz – 1GHz, Channel 7

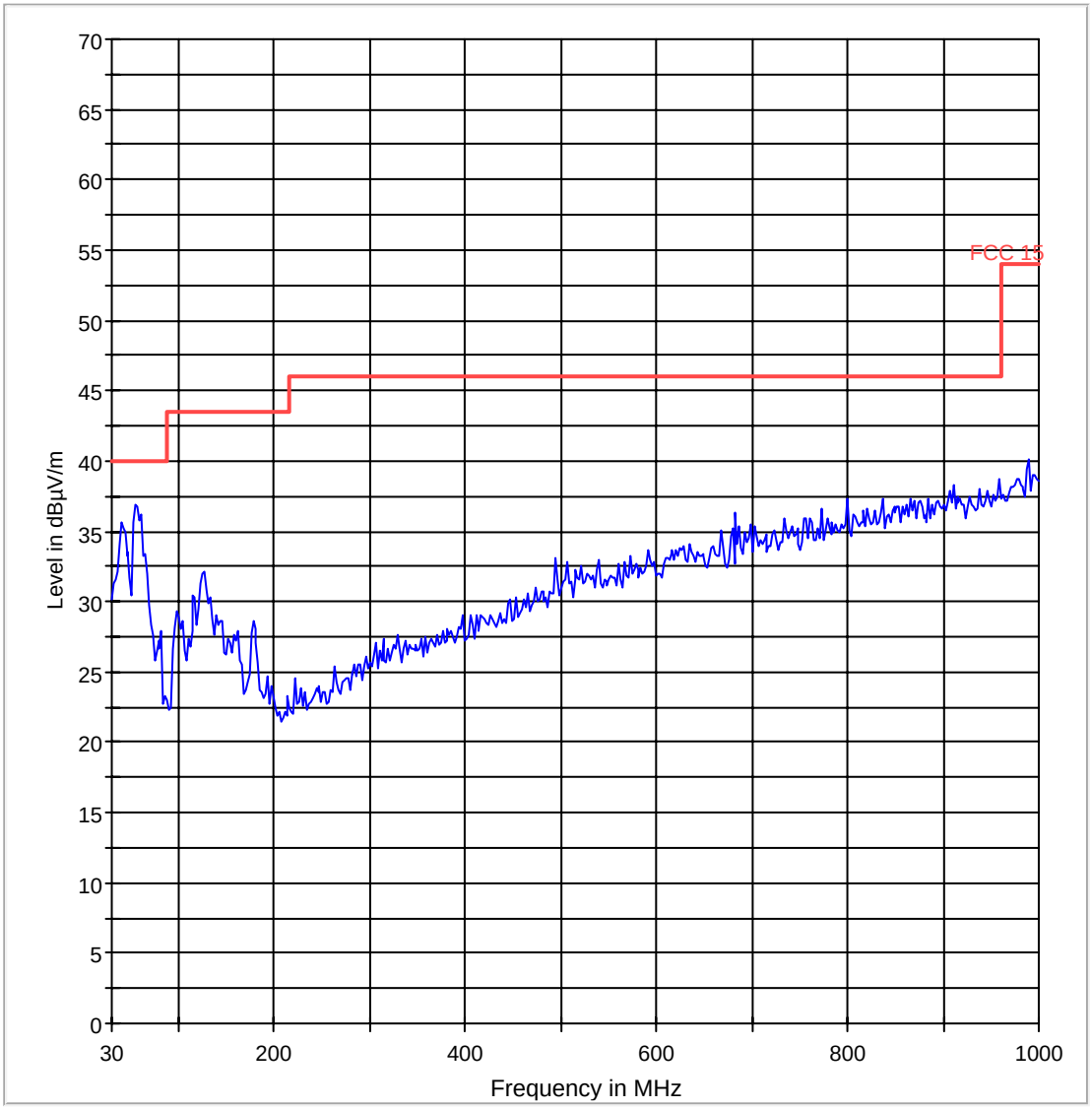
EUT Information

Description:

EUT Name:	MT810SWM
Manufacturer:	Multitech
Operating Mode:	G mode

Test

FCC 15 30-1000MHz



30MHz – 1GHz, Channel 13

EUT Information

Description:

EUT Name:	MT810SWM
Manufacturer:	Multitech
Operating Mode:	G mode

Test

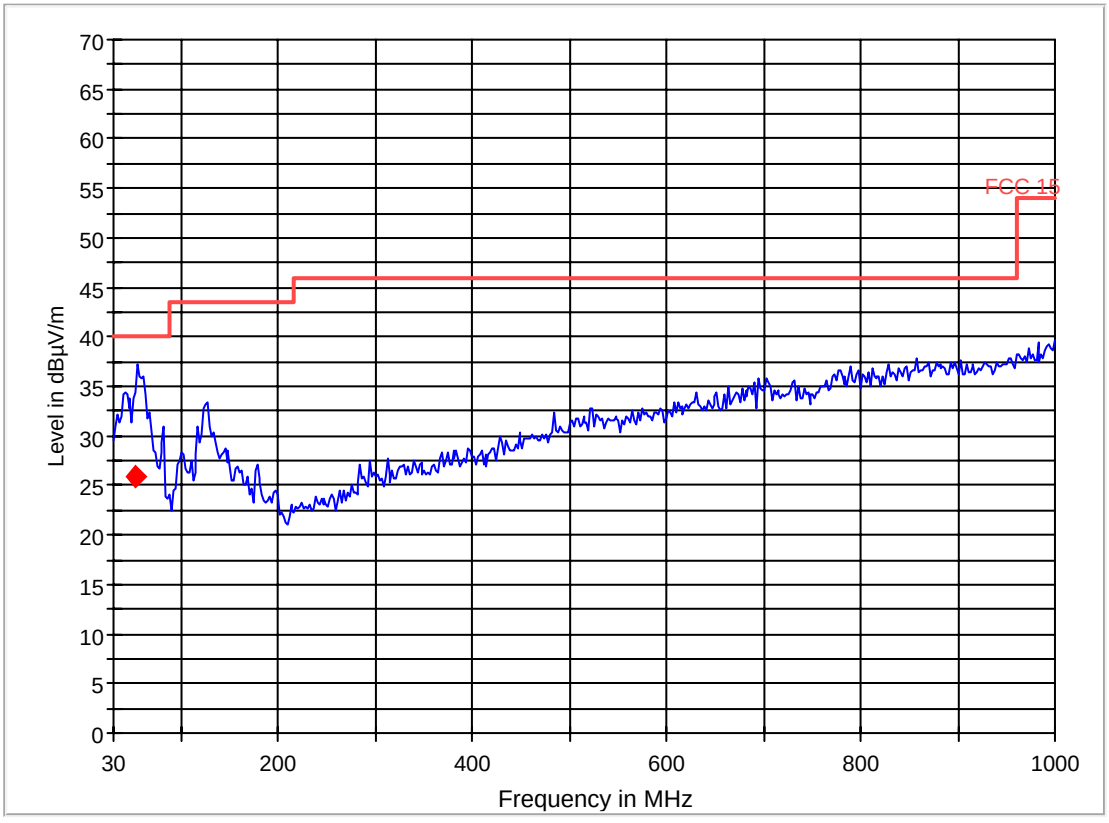
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
53.597194	25.9	20.000	120.000	120.0	V	107.0	7.2	14.1	40.0

(continuation of the "Final Result 1" table from column 10 ...)

Frequency (MHz)	Comment
53.597194	

FCC 15 30-1000MHz



1-18GHz (2422MHz)

Note: The peak above the limit line is the carrier freq.

EUT Information

Description:

EUT Name: MT810SWM

Manufacturer: Multitech

Operating Mode: G mode

Test

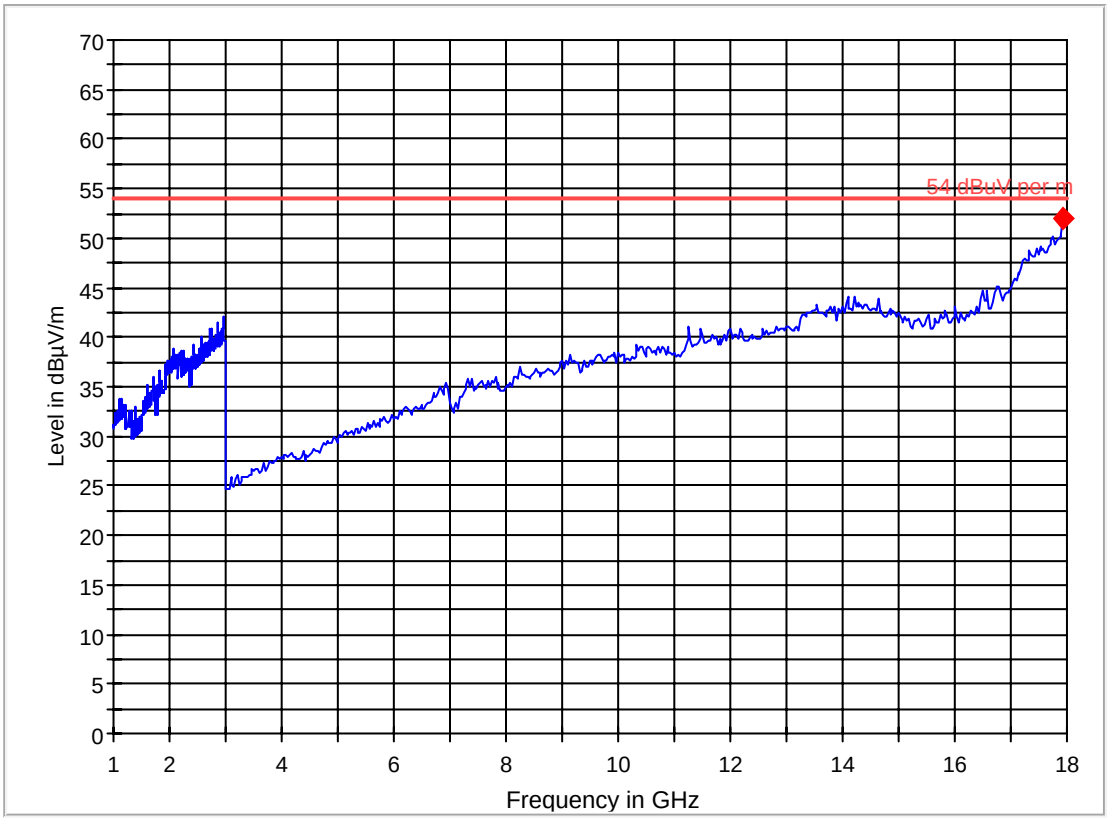
Final Result 1

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
17938.466934	52.1	20.000	1000.000	152.0	V	249.0	29.3	1.9	54.0

(continuation of the "Final Result 1" table from column 10 ...)

Frequency (MHz)	Comment
17938.466934	

FCC 15 1-18GHz



1-18GHz (2442MHz)

Note: The peak above the limit line is the carrier freq.

EUT Information

Description:

EUT Name:	MT810SWM
Manufacturer:	Multitech
Operating Mode:	G Mode

Test

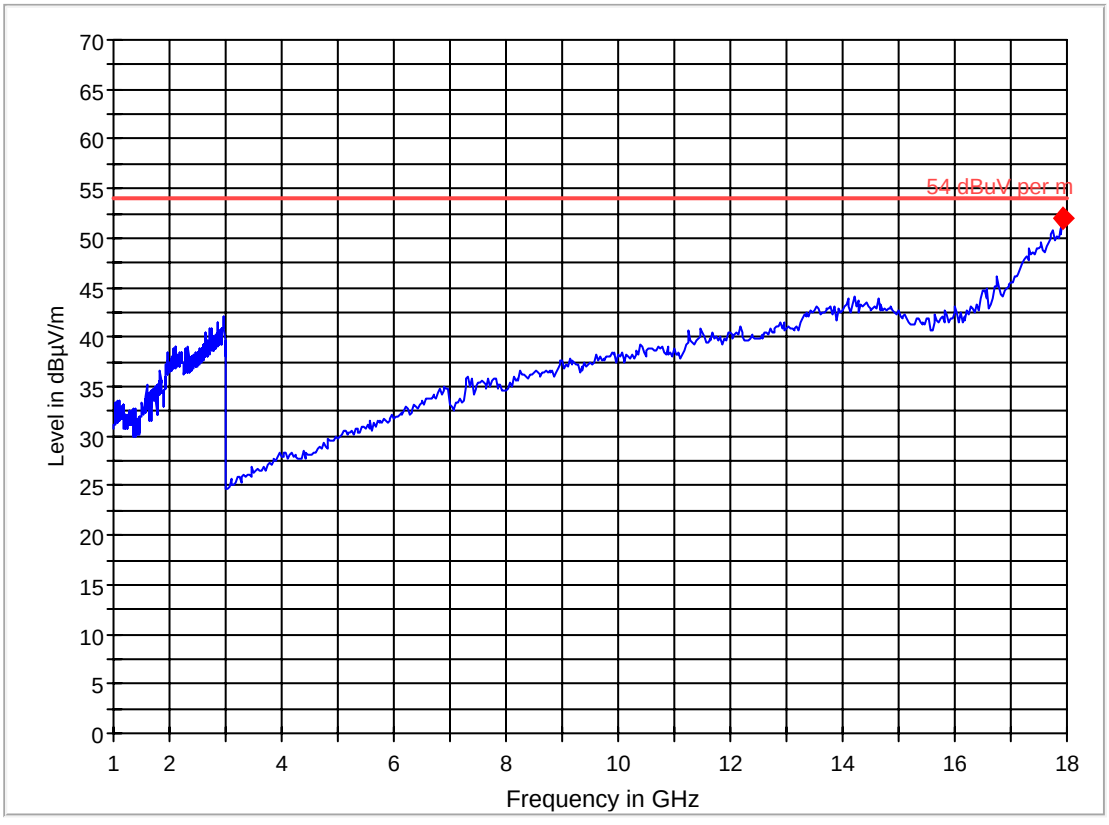
Final Result 1

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
17942.915832	52.1	20.000	1000.000	151.0	H	22.0	29.3	1.9	54.0

(continuation of the "Final Result 1" table from column 10 ...)

Frequency (MHz)	Comment
17942.915832	

FCC 15 1-18GHz



1-18GHz (2472MHz)

Note: The peak above the limit line is the carrier freq.

EUT Information

Description:

EUT Name:	MT810SWM
Manufacturer:	Multitech
Operating Mode:	G mode

Test

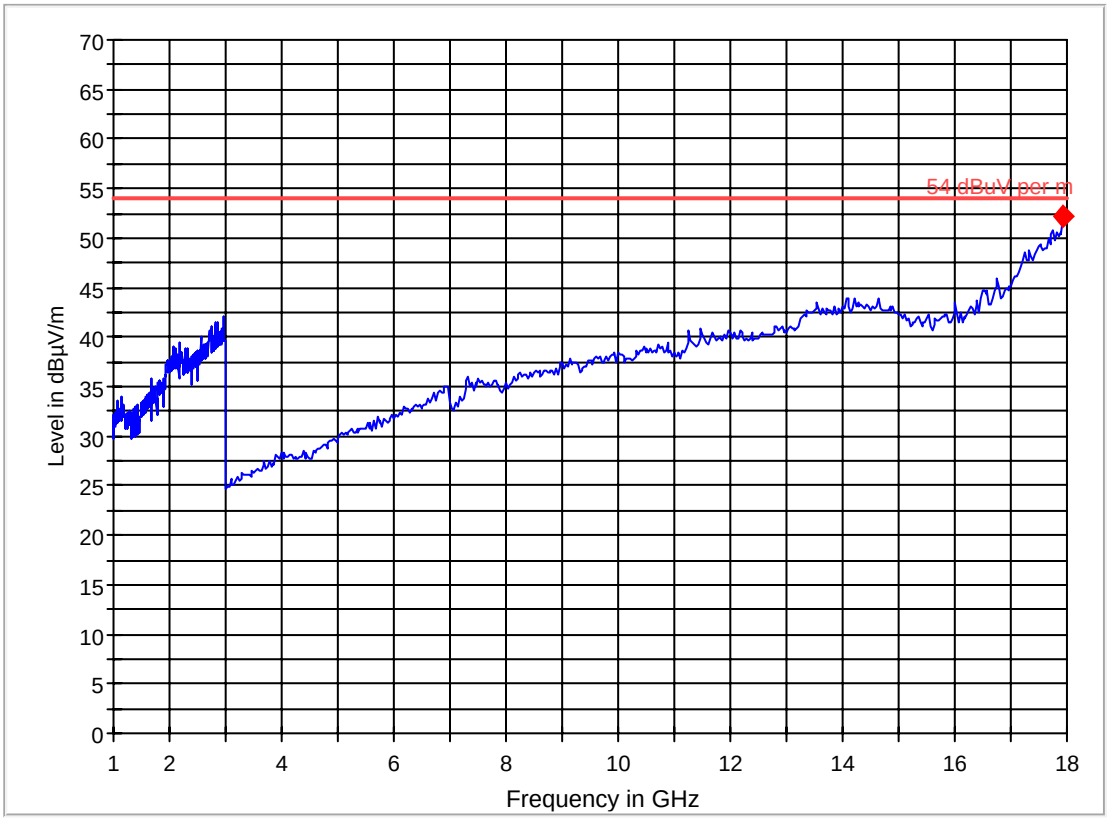
Final Result 1

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
17942.294590	52.2	20.000	1000.000	143.0	V	167.0	29.4	1.8	54.0

(continuation of the "Final Result 1" table from column 10 ...)

Frequency (MHz)	Comment
17942.294590	

FCC 15 1-18GHz



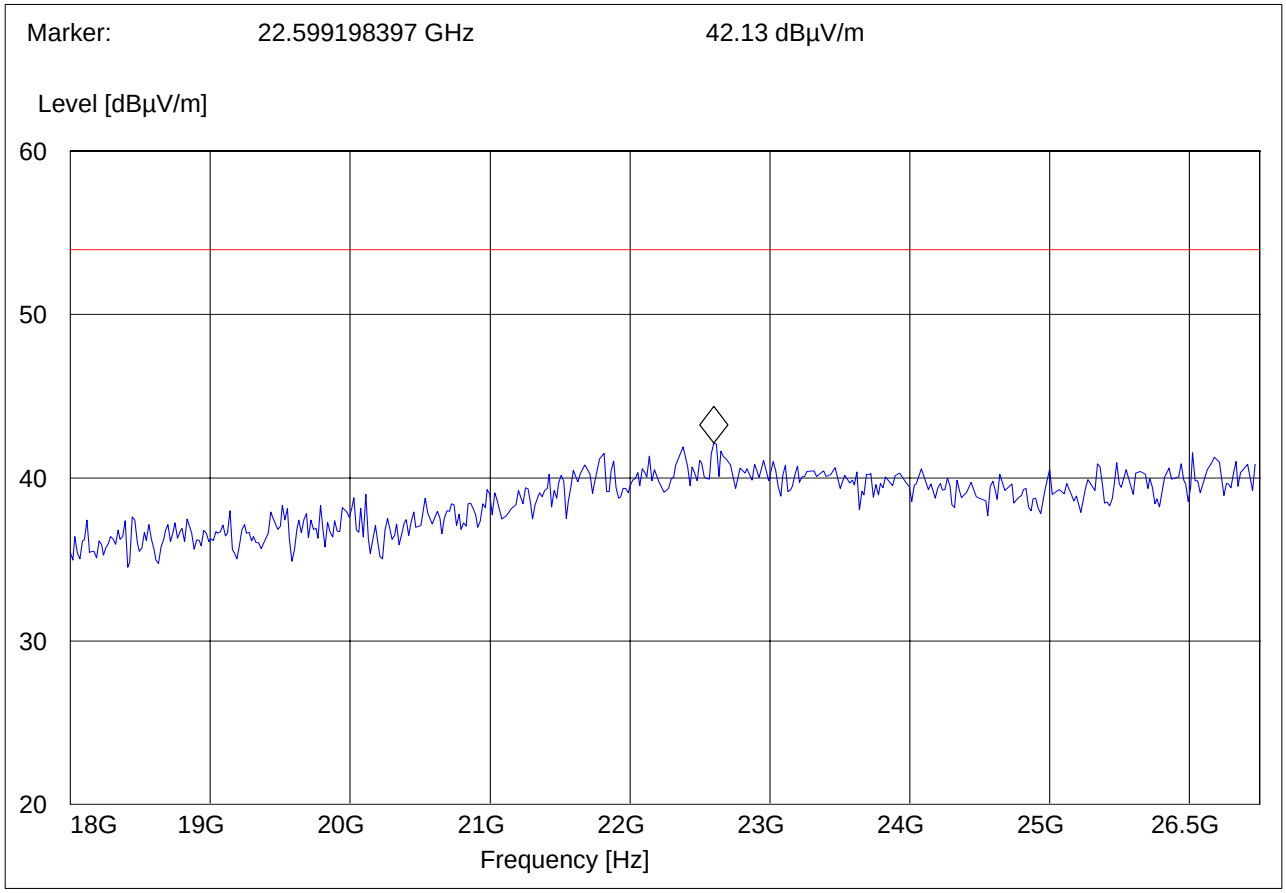
18-26.5GHz

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

EUT: MT810SWM
Customer:: MULTITECH
Test Mode: WLAN CH7, G MODE
ANT Orientation: H
EUT Orientation: H
Test Engineer: JOSIE
Voltage: 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	100 kHz	Horn # 3116_18-40G
		MaxPeak			



6.4 Receiver Spurious Emission § 15.209/RSS210

6.4.1 Limits

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/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 an average limit unless specified with the plots.
3. There are no measurable emissions up to 18GHz in Rx mode.
4. Receiver spurious emissions reported here are the worse case emissions for all receiver modes and between two receiving chains.

6.4.2 RESULTS

30MHz – 1GHz

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

EUT Information

Description:

EUT Name: MT810SWM

Manufacturer: Multitech

Test

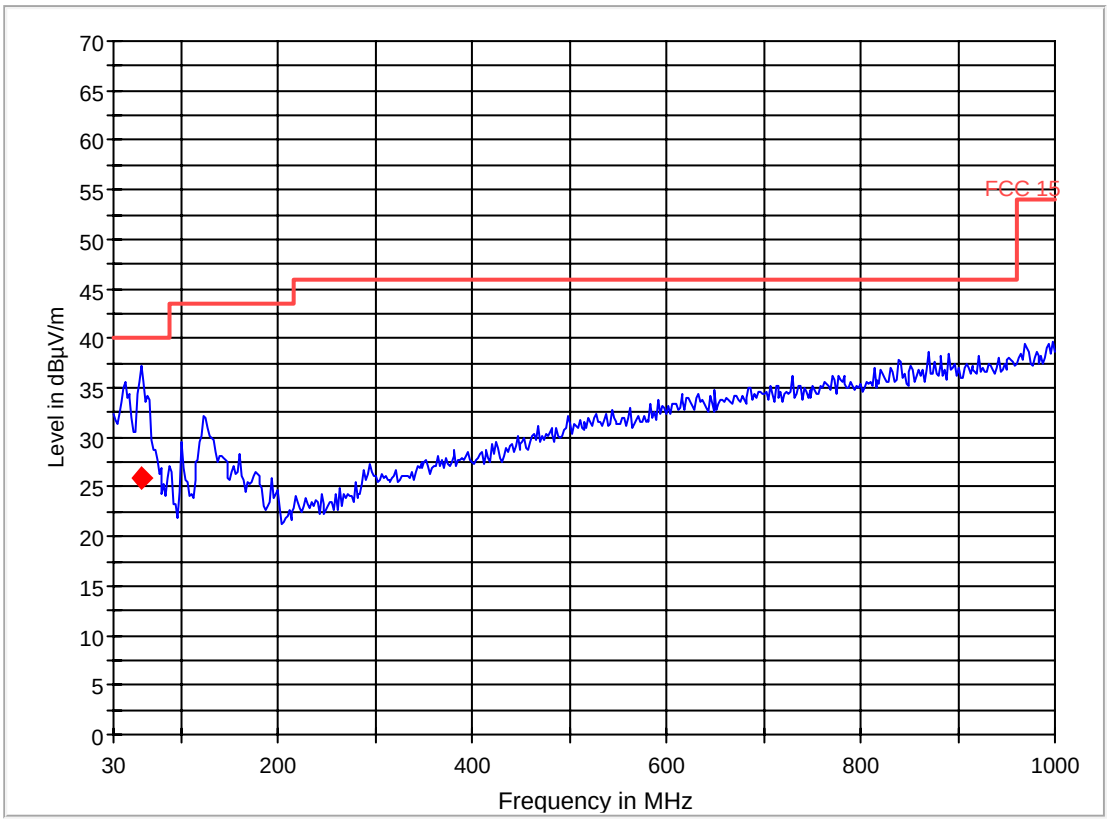
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
58.627255	25.8	20.000	120.000	120.0	V	22.0	7.8	14.2	40.0

(continuation of the "Final Result 1" table from column 10 ...)

Frequency (MHz)	Comment
58.627255	

FCC 15 30-1000MHz



1-18GHz
Note: Peak Reading vs. Average limit

EUT Information

Description:
EUT Name: MT810SWM
Manufacturer: Multitech

Test

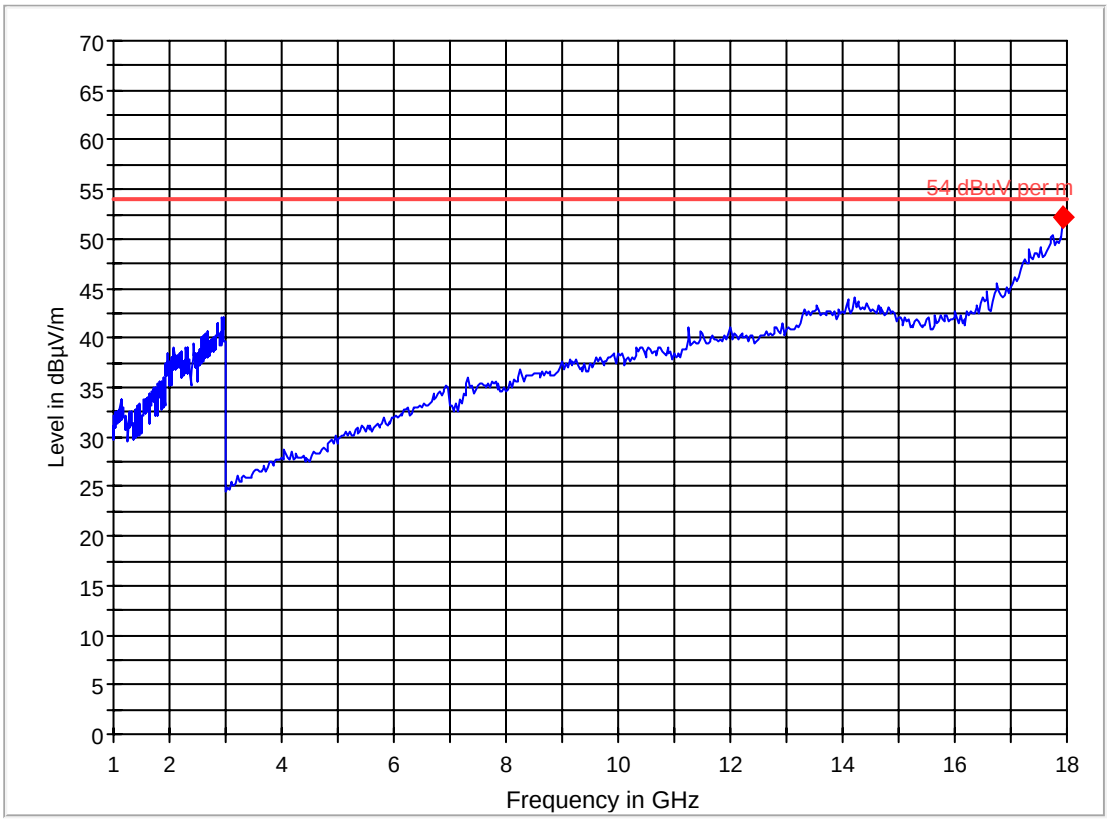
Final Result 1

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
17943.917836	52.3	20.000	1000.000	151.0	V	10.0	29.5	1.7	54.0

(continuation of the "Final Result 1" table from column 10 ...)

Frequency (MHz)	Comment
17943.917836	

FCC 15 1-18GHz

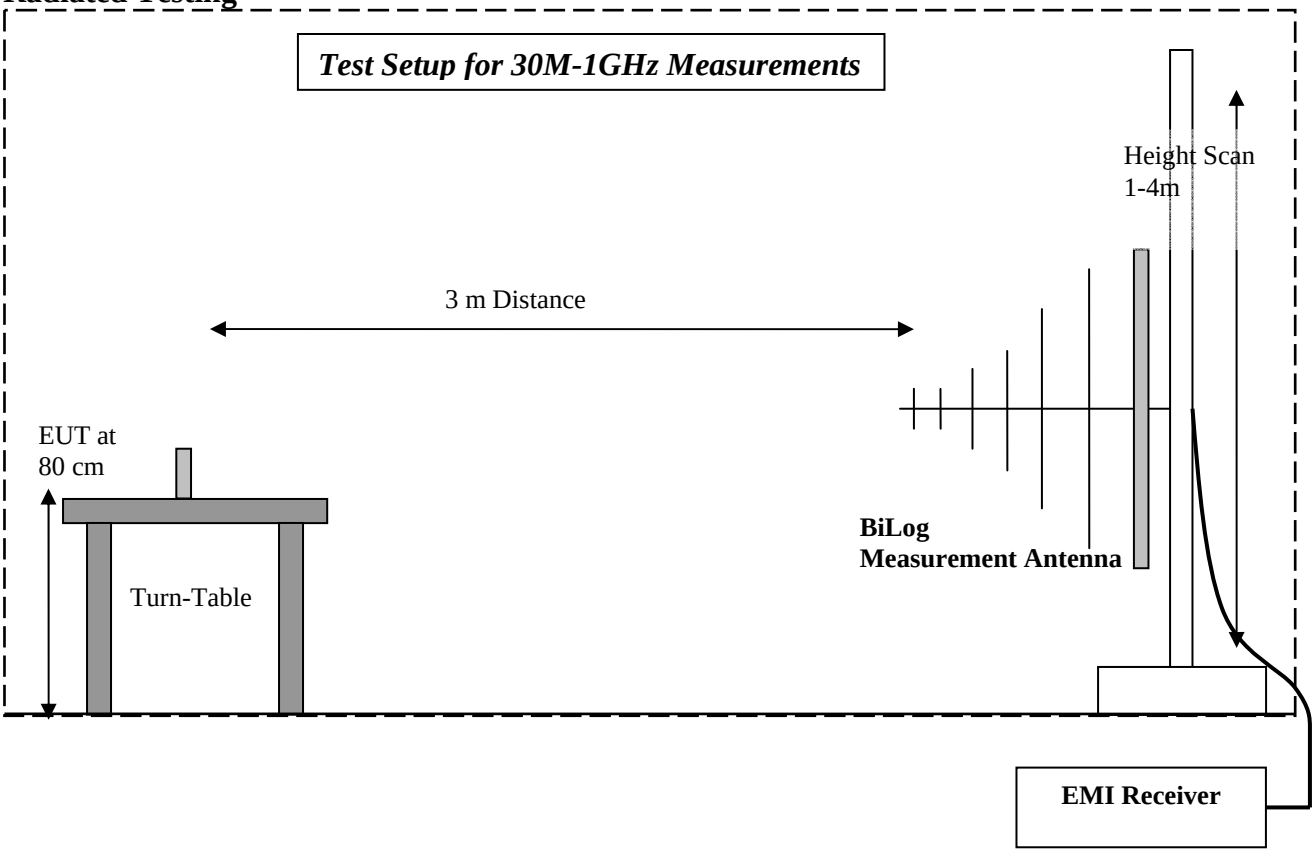


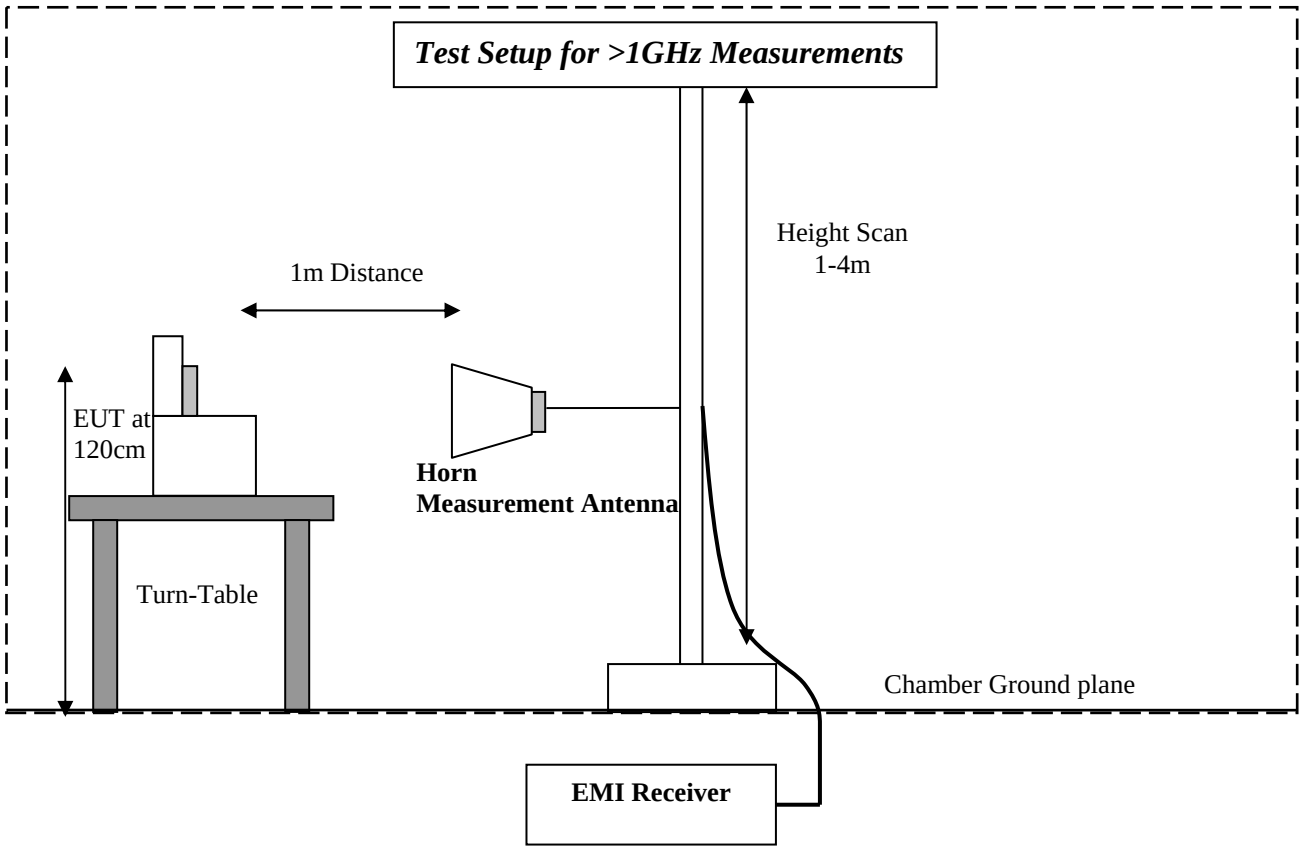
7 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal Due	Interval
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2010	1 year
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	August 2010	1 year
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2010	1 year
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2010	1 year
05	Biconilog Antenna	3141	EMCO	0005-1186	June 2010	1 year
06	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	June 2010	1 year
07	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240	June 2010	1 year
08	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
09	Climatic Chamber	VT4004	Voltsch	G1115	May 2010	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 2010	1 year
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2010	1 year
14	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008	May 2010	1 year
15	Universal Radio Comm. Tester	CMU 200	Rohde & Schwarz	832221/06	May 2010	1 year
16	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	May 2010	1 year
17	Loop Antenna	6512	EMCO	00049838	July 2011	2 years

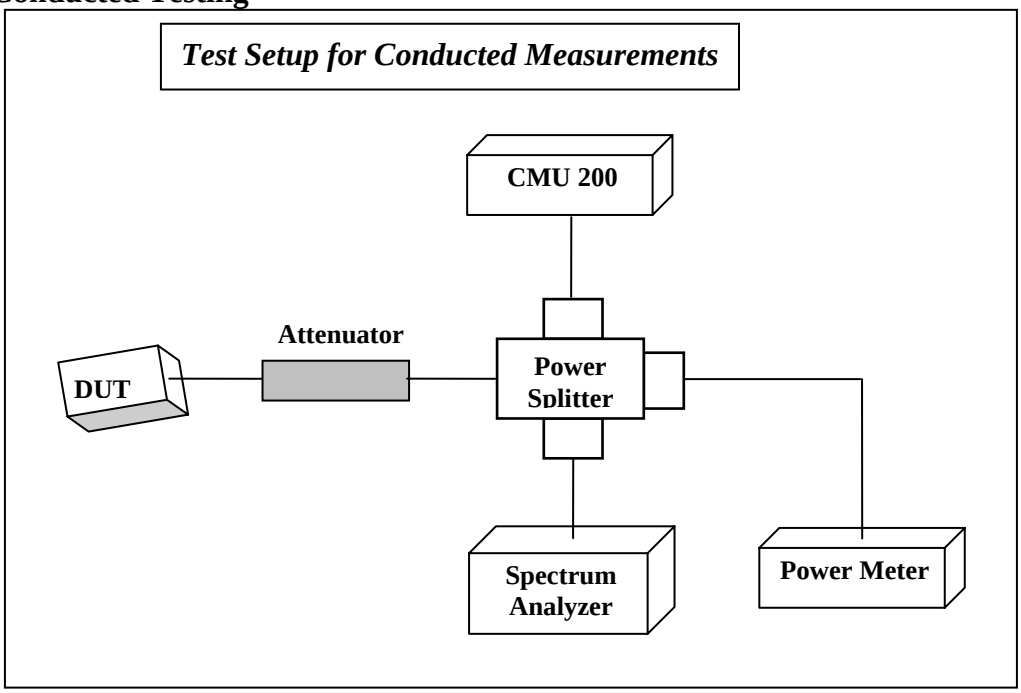
8 BLOCK DIAGRAMS

Radiated Testing




Test Setup for >1GHz Measurements
Height Scan
1-4m
1m Distance
EUT at
120cm
Horn
Measurement Antenna
Turn-Table
Chamber Ground plane
EMI Receiver

Conducted Testing



9 Revision History

2009-09-21: First Issue