

CETECOM Inc.



CETECOM Inc.

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Issued test report consists of 65 Pages

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FCC LISTED, REG. NO.: 101450 & RECOGNIZED BY INDUSTRY CANADA IC – 3925

Test report no.: 375FCC15.247-2002
FCC Part 15.247 for FHSS systems / CANADA RSS-210
(T60X)
Tested with (T608)

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1	General information
1.1	Notes

The test results of this test report relate exclusively to the test item specified in 1.5. The CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM Inc USA.

TEST REPORT PREPARED BY:**EMC Engineer: Philip Kim****1.2 Testing laboratory****CETECOM Inc.****411 Dixon Landing Road, Milpitas, CA-95035, USA****Phone: +1 408 586 6200 Fax: +1 408 586 6299****E-mail: lothar.schmidt@cetecomusa.com****Internet: www.cetecom.com**

1.3 Details of applicant

Name : Sony Ericsson Mobile Communication
Street : 7001 Development Drive
City / Zip Code : Research Triangle Park, NC 27709
Country : USA
Contact : Patrick Bowen
Telephone : +1 (919) 472 1527
Tele-fax : +1 (919) 472 6382
e-mail : Patrick.bowen@sonyericsson.com

1.4 Application details

Date of receipt of application : 11/13/02
Date of receipt test item : 11/13/02
Date of test : 11/13/02

1.5 Test item

Manufacturer : See Applicant
Street Address :
City / Zip Code :
Country :
Marketing Name :
Model No. : T60x (x can be any number from 0-9) tested model **T608**
Description : [Blue Tooth Transceiver built in CDMA mobile phone.](#)
FCC-ID : PXITR-CA0802

Additional information

Frequency : 2402-2480MHz
Type of modulation : GFSK
Number of channels : 79
Antenna : Integral
Power supply : Battery
Output power : -2.65 dBm
Extreme vol. Limits : N/A
Extreme temp. Tolerance :

1.6 Test standards: **FCC Part 15 §15.247 (DA00-705)**

Note: All radiated measurements were made in all three orthogonal planes. The values reported are the maximum values.

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

No deviations from the technical specification(s) were ascertained in the course of the tests
Performed

Final Verdict:
(only "passed" if all single measurements are "passed")

Passed

Technical responsibility for area of testing:

2002-11-18 EC & Radio Lothar Schmidt (Manager)



Date

Section

Name

Signature

Responsible for test report and project leader:

2002-11-18 EMC & Radio Philip Kim (EMC Engineer)



Date

Section

Name

Signature

2.2 Test report

TEST REPORT

**Test report no. : EMC375FCC15.247/2002
(T60x)**

Test with model T608

TEST REPORT REFERENCE

LIST OF MEASUREMENTS		PAGE
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ANTENNA GAIN**§ 15.204**

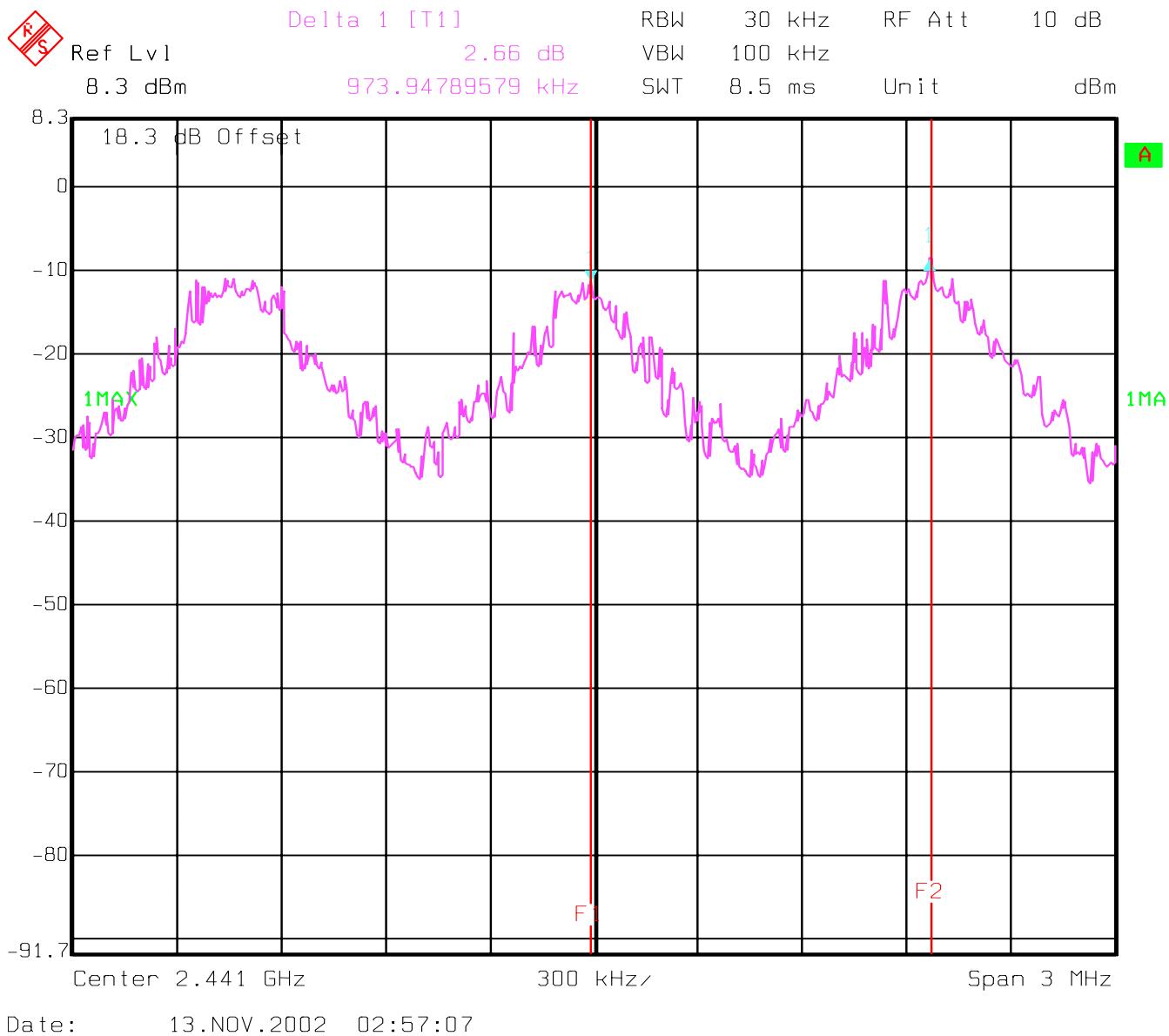
The antenna gain of the complete system is calculated by the difference of conducted power of the module and the radiated power in EIRP.

	Low channel	Mid channel	High channel
Conducted Power	-5.74 dBm	-6.13 dBm	-5.77 dBm
Radiated Power (EIRP)	-8.68 dBm	-2.65 dBm	-6.64 dBm
Antenna Gain	-2.94 dBi	-3.48 dBi	0.87 dBi

The calculated antenna gain is between -3.48 dBi and 0.87 dBi.

CARRIER FREQUENCY SEPERATION

§15.247(a)



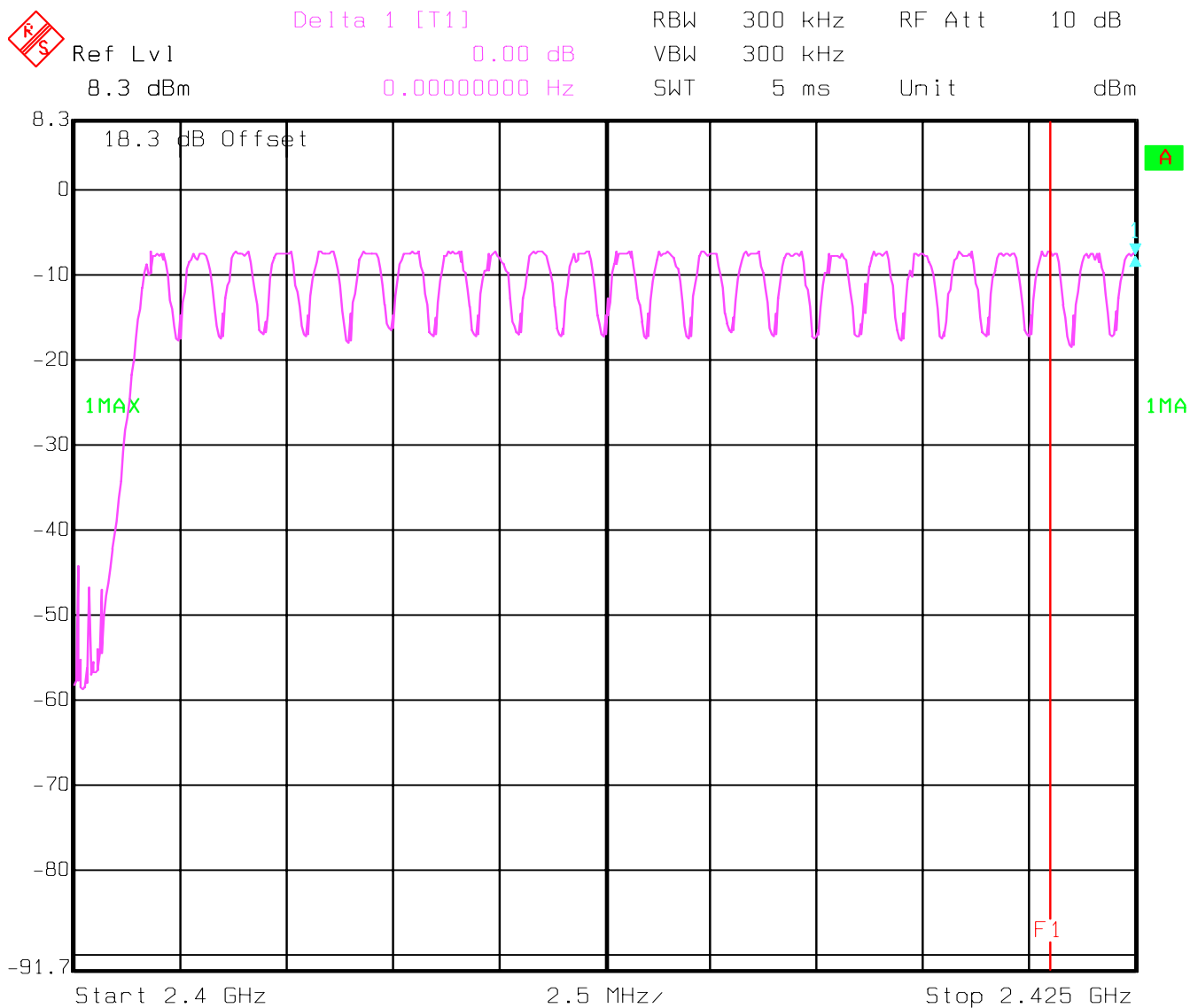
NUMBER OF HOPPING CHANNELS

§15.247(a)

The number of hopping channels is 79 (see next 4 plots)

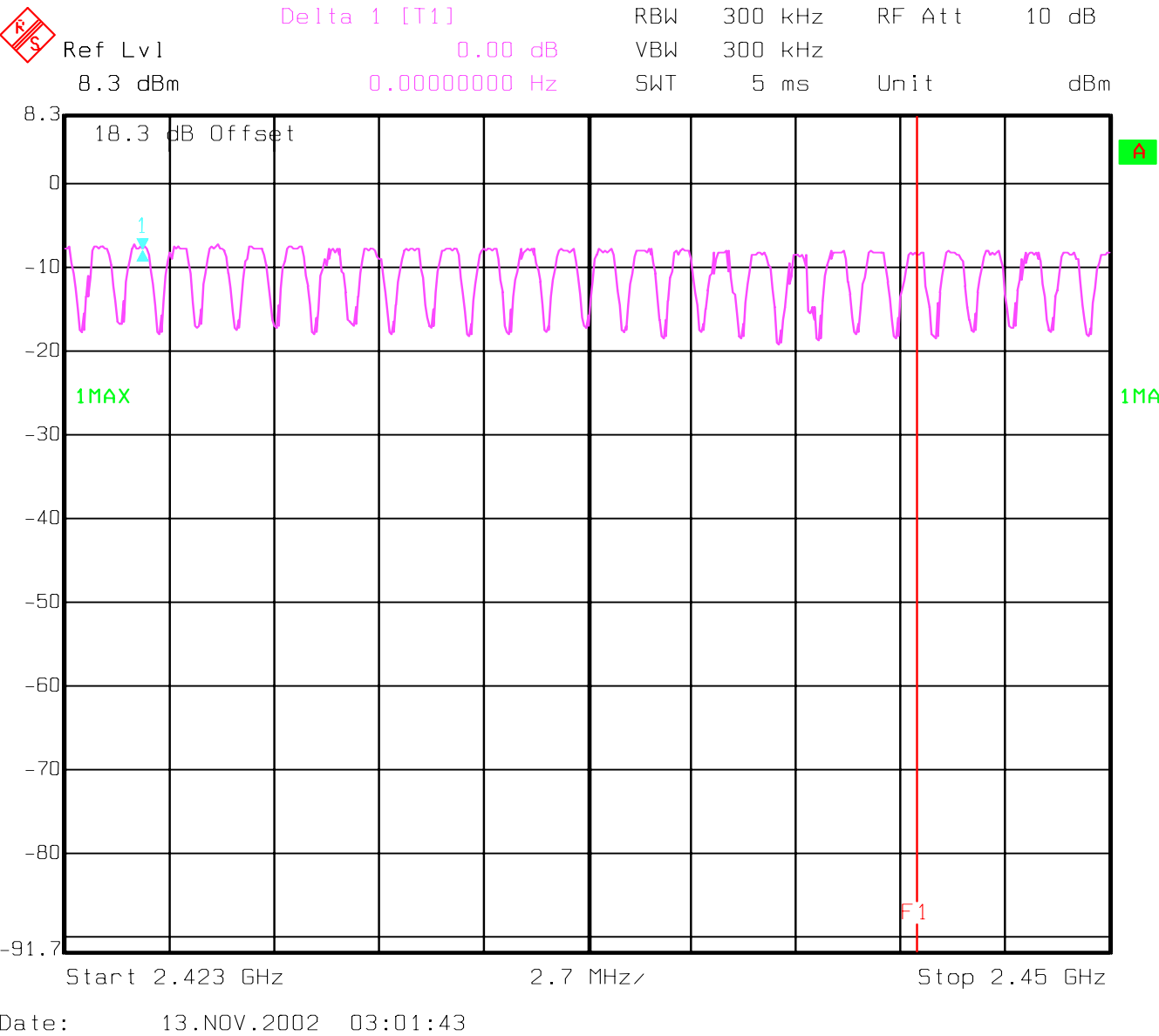
The right red line corresponds to the left red line from the next plot.

Plot 1: Total 22

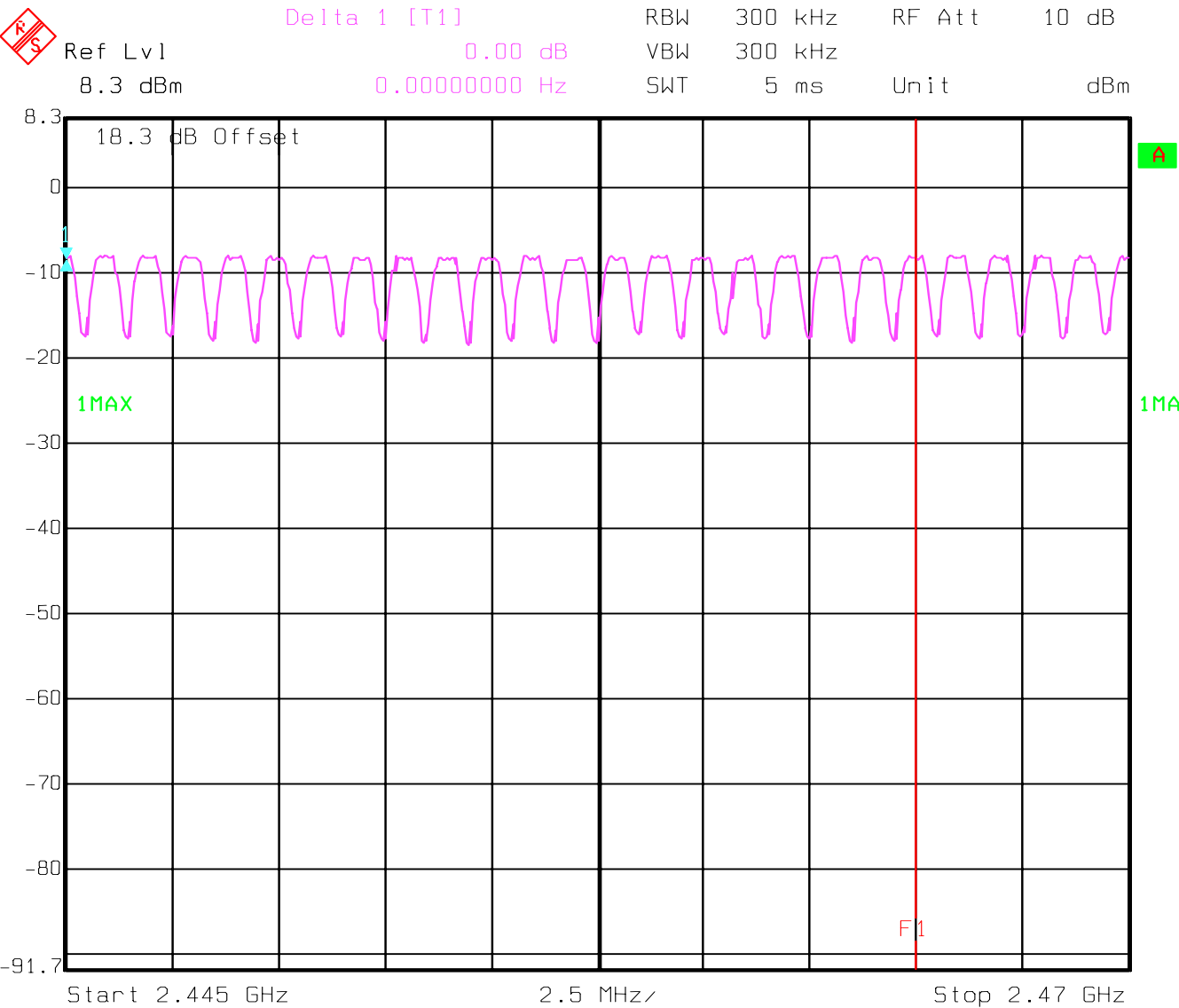


Date: 13.NOV.2002 03:03:22

Plot 2: Total 22

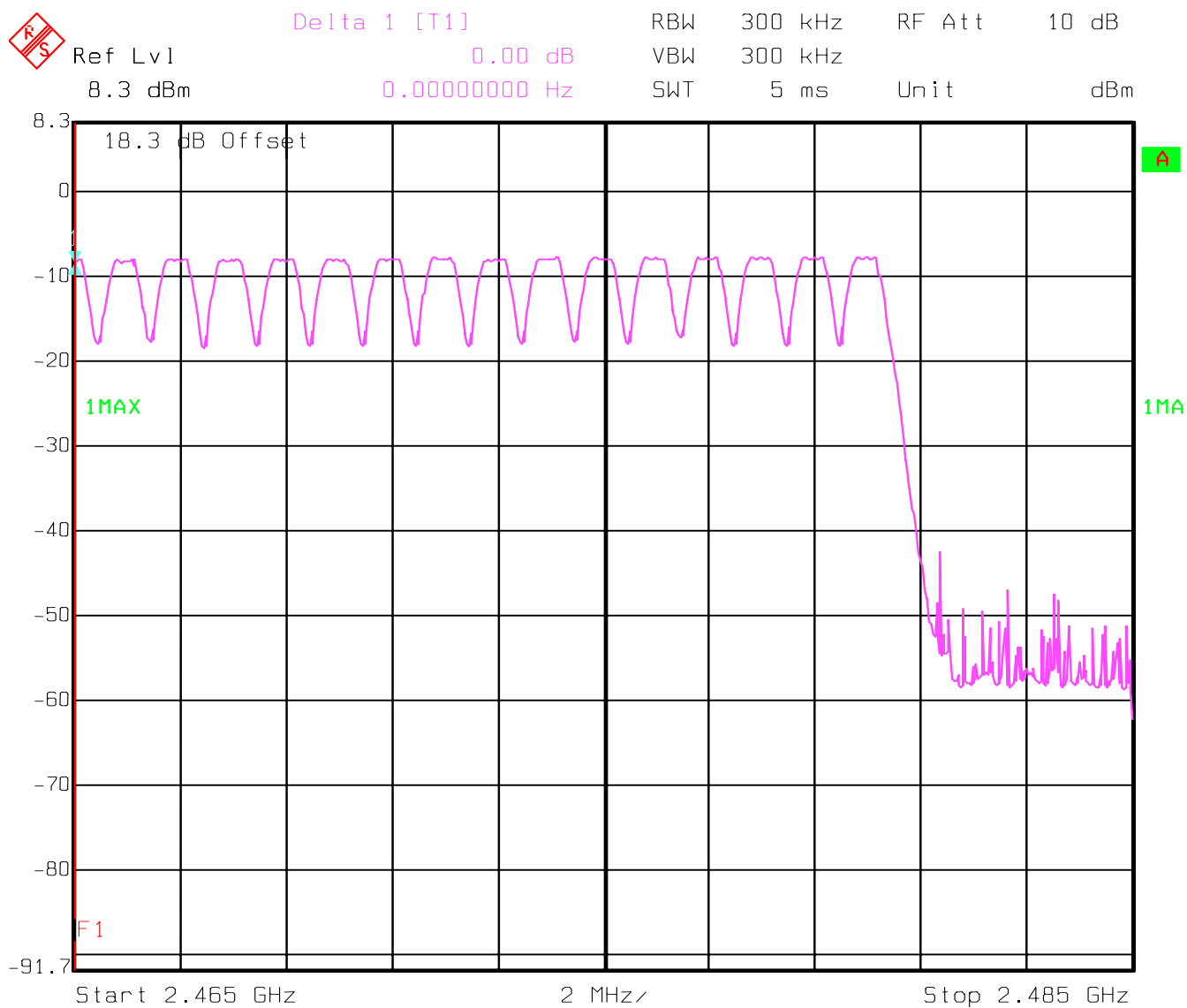


Plot 3: Total 20



Date: 13.NOV.2002 03:05:53

Plot 4: Total 15



Date: 13.NOV.2002 03:09:17

TIME OF OCCUPANCY (DWELL TIME)

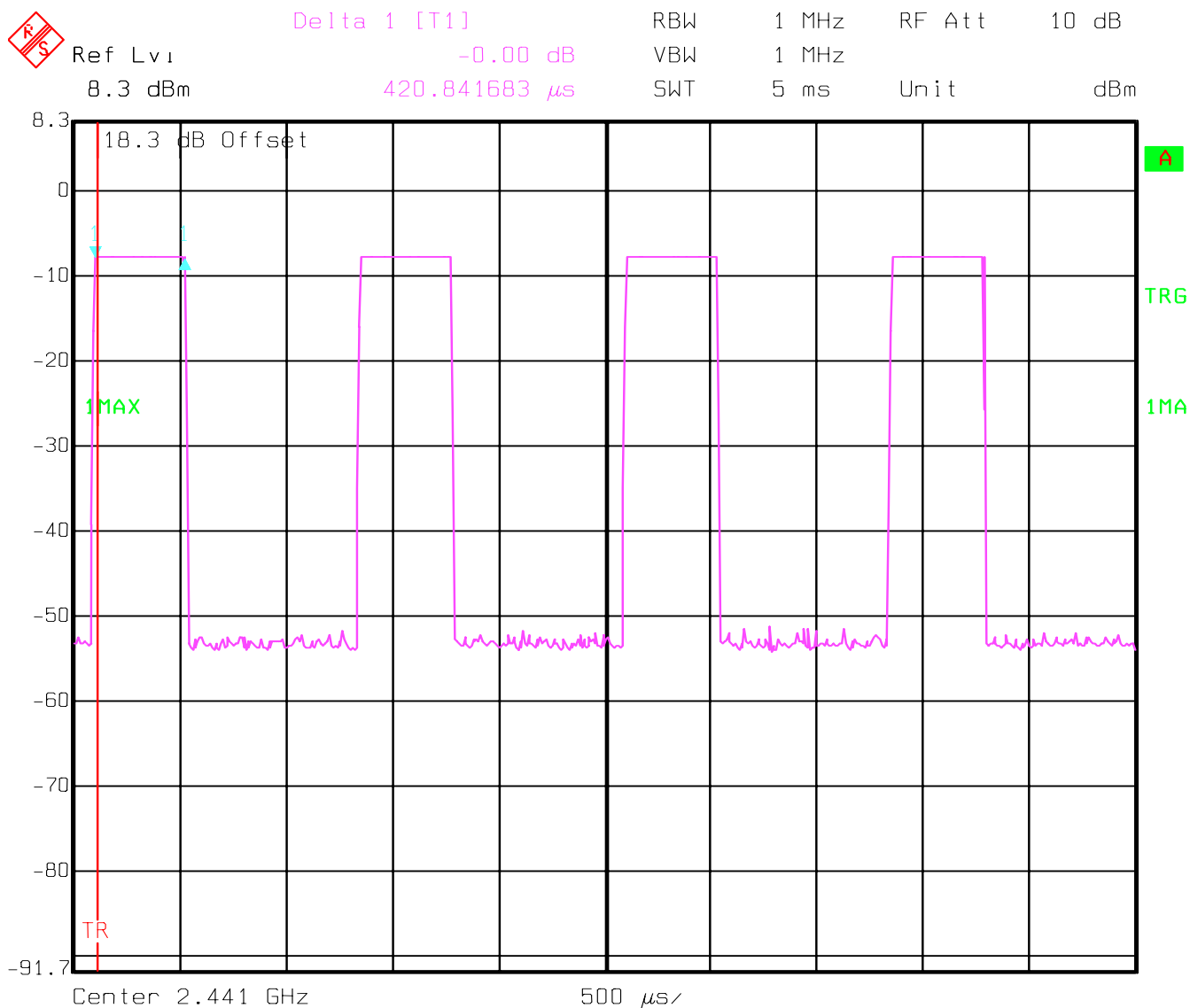
§15.247(a)

DH1 – Packet

The system makes worst case 1600 hops per second or 1 time slot has a length of 625µs with 79 channels. A DH1 Packet need 1 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case 800 hops per second with 79 channels. So you have each channel 10.13 times per second and so for 30 seconds you have 303.9 times of appearance .

Each Tx-time per appearance is 421 µs.

So we have $303.9 * 420.84 \mu s = 128 \text{ ms}$ per 30 seconds.



Date: 13.NOV.2002 03:17:03

TIME OF OCCUPANCY (DWELL TIME)

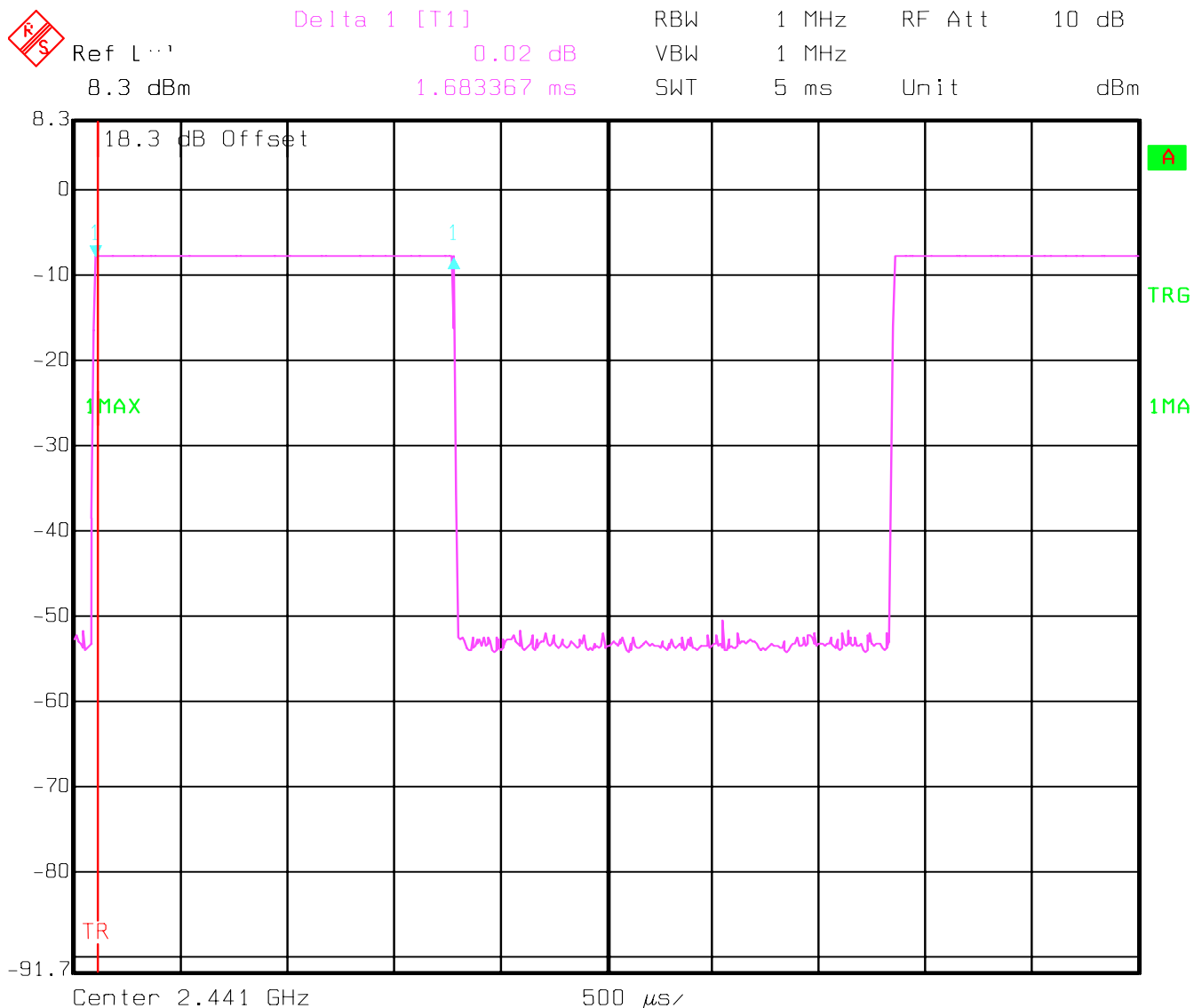
§15.247(a)

DH3 – Packet

A DH3 Packets need 3 time slots for transmit and 1 for receiving, then the system makes worst case 400 hops per second with 79 channels. So you have each channel 5.1 times per second and so for 30 seconds you have 153 times of appearance .

Each Tx-time per appearance is 1.68 ms.

So we have $153 * 1.683 \text{ ms} = 257\text{ms}$ per 30 seconds.



Date: 13.NOV.2002 03:15:15

TIME OF OCCUPANCY (DWELL TIME)

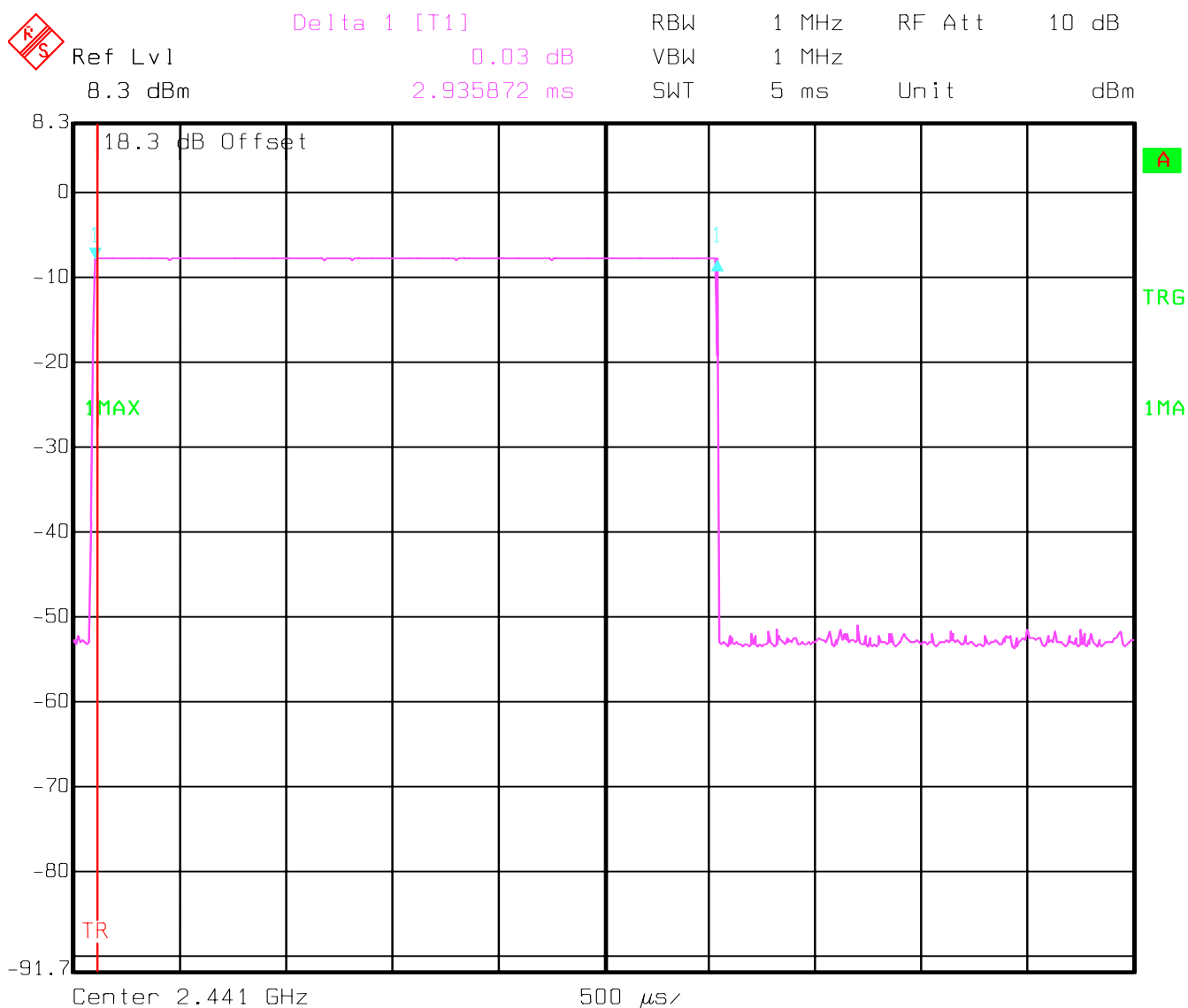
§15.247(a)

DH5 – Packet

At DH5 Packets you need 5 time slots for transmit and 1 for receiving, then the system makes worst case 266,7 hops per second with 79 channels. So you have each channel 3.36 times per second and so for 30 seconds you have 100.8 times of appearance .

Each tx-time per appearance is 2.936 ms.

So we have $100.8 * 2.936\text{ms} = 296\text{ms}$ per 30 seconds.



Date: 13.NOV.2002 03:13:32

SPECTRUM BANDWIDTH OF FHSS SYSTEM
20 dB bandwidth

§15.247(a)

TEST CONDITIONS		20 dB BANDWIDTH (kHz)		
Frequency (MHz)		2402	2440	2480
T _{nom} (23)°C	V _{nom} (3.8)VDC	921.84	925.85	921.84

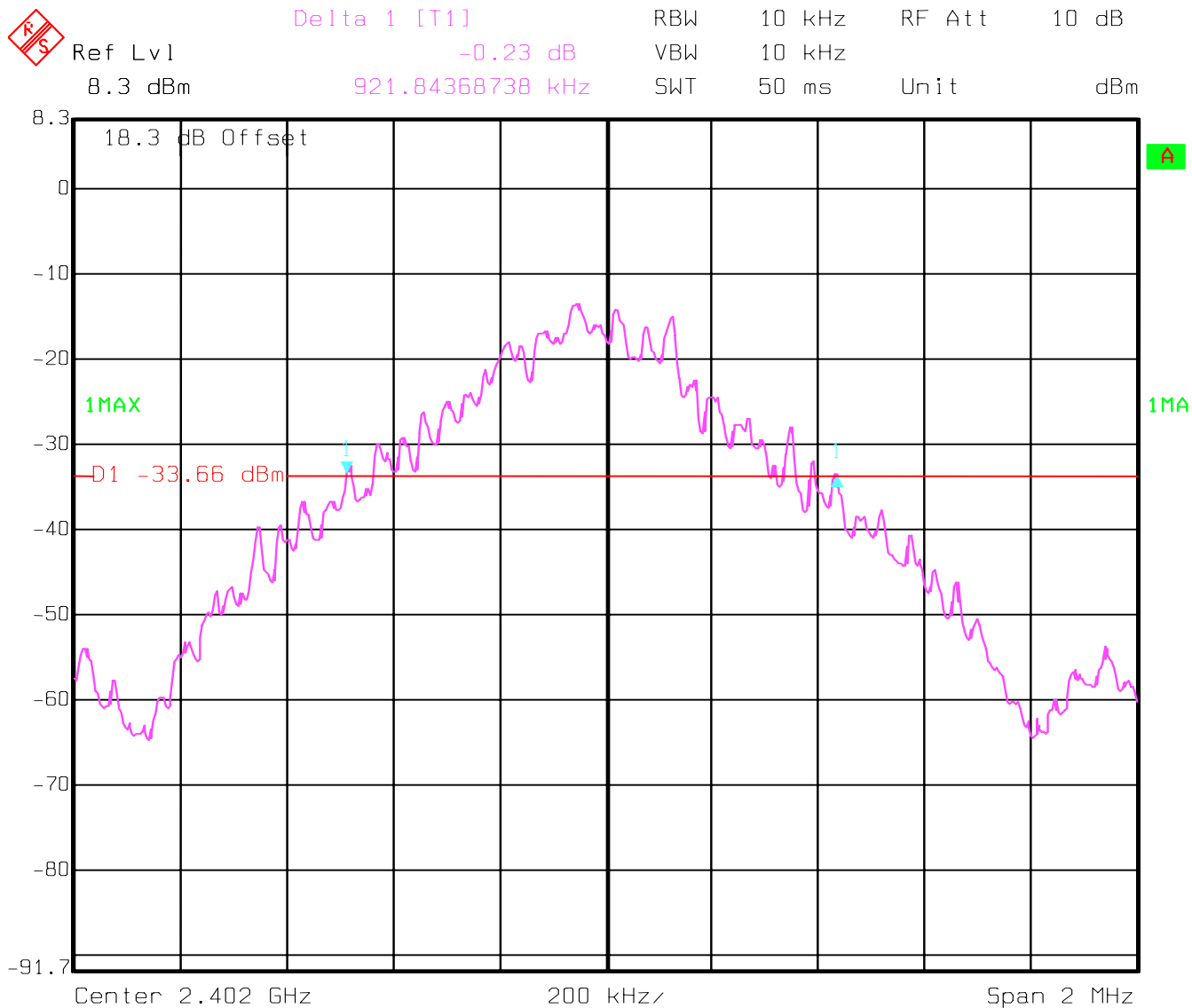
RBW / VBW as provided in the "Measurement Guidelines" (DA 00-705, March 30, 2000)

LIMIT**SUBCLAUSE §15.247(a) (1)****The maximum 20dB bandwith shall be at maximum 1000 KHz**

SPECTRUM BANDWIDTH OF FHSS SYSTEM 20 dB bandwidth

§15.247(a)

Lowest Channel: 2402MHz



Date: 13.NOV.2002 03:41:13

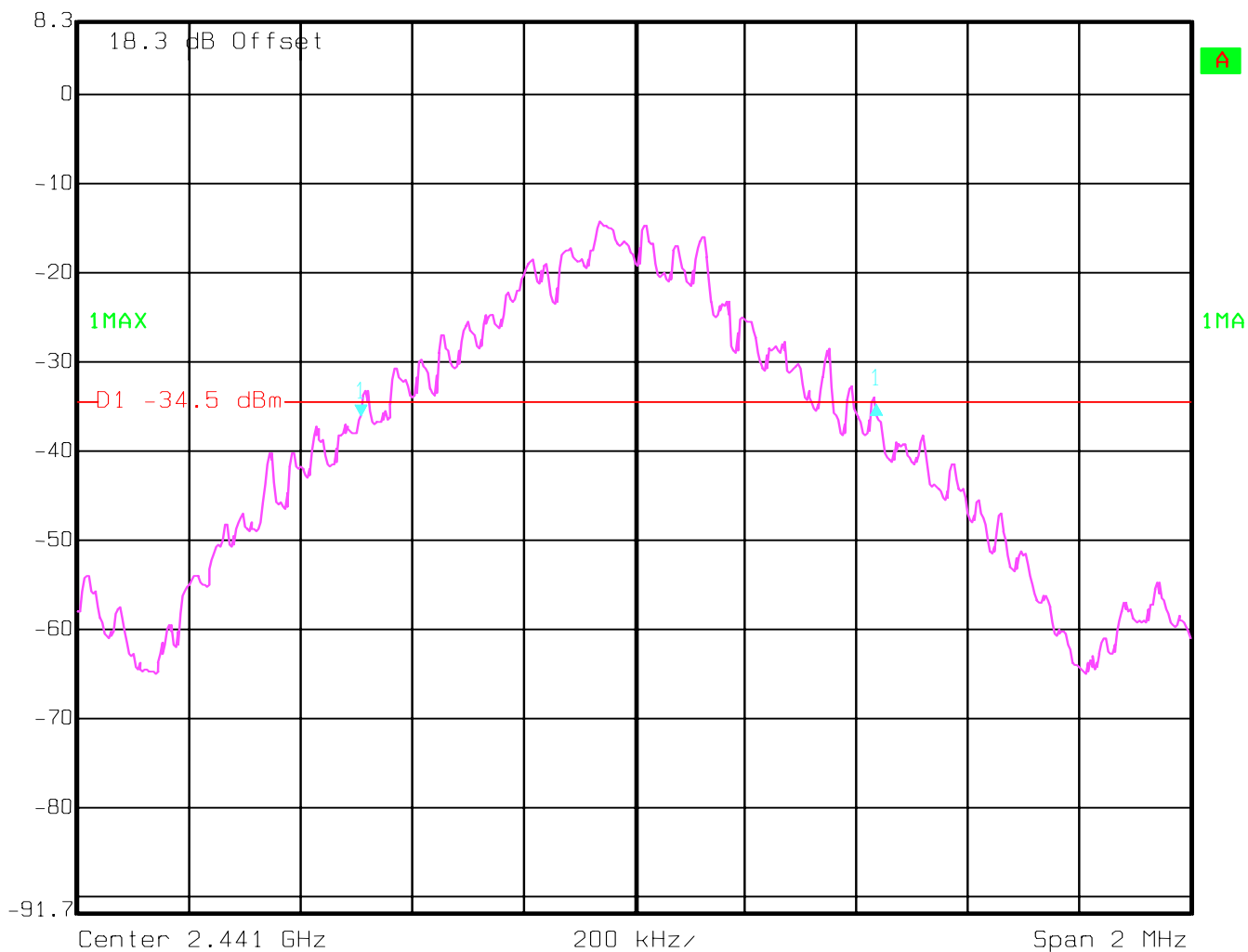
SPECTRUM BANDWIDTH OF FHSS SYSTEM 20 dB bandwidth

§15.247(a)

Mid Channel: 2440MHz



Ref Lvl	Delta 1 [T1]	RBW	10 kHz	RF Att	10 dB
8.3 dBm	1.55 dB	VBW	10 kHz		
	925.85170341 kHz	SWT	50 ms	Unit	dBm

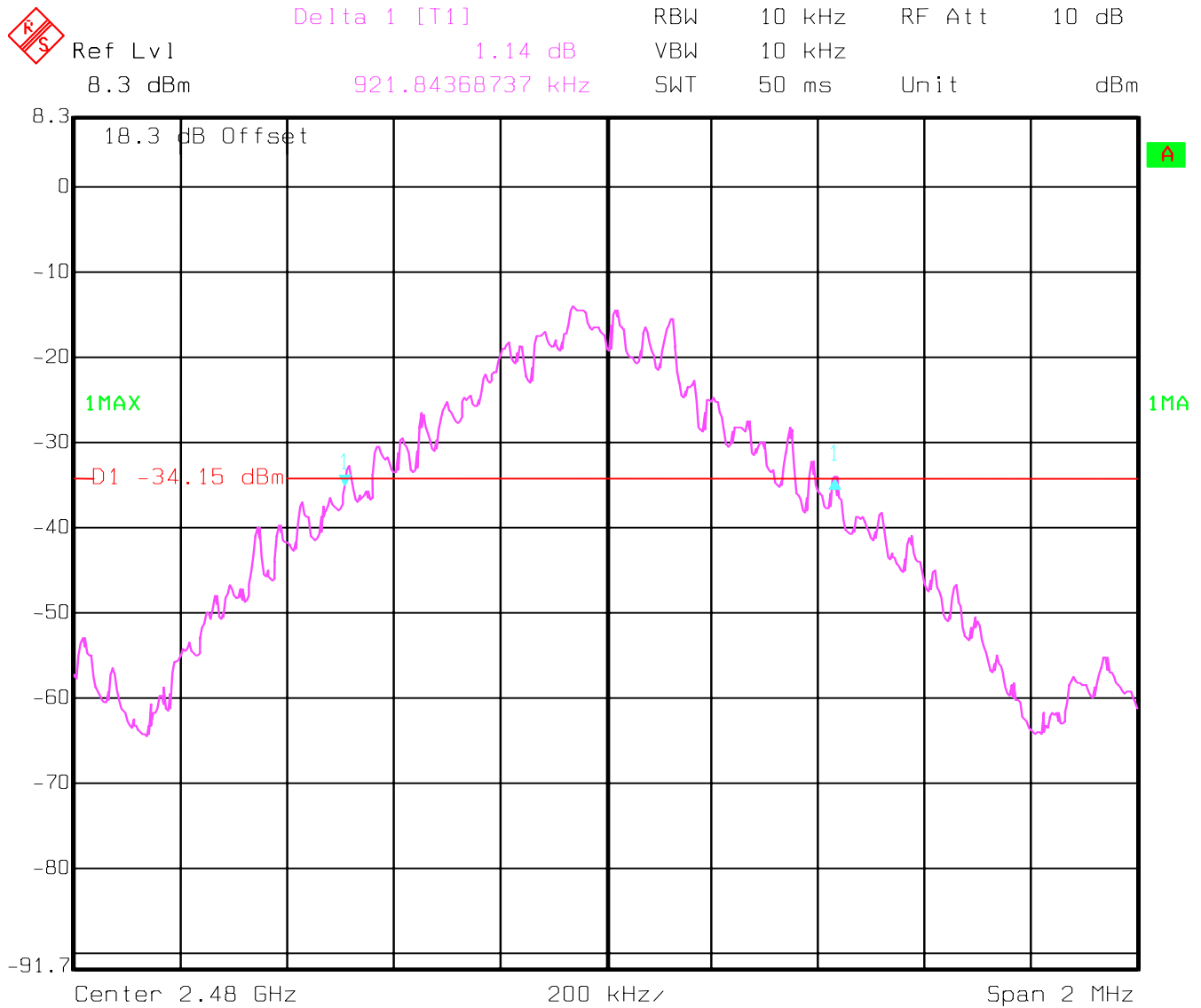


Date: 13.NOV.2002 03:44:41

SPECTRUM BANDWIDTH OF FHSS SYSTEM 20 dB bandwidth

§15.247(a)

Highest Channel: 2480MHz



Date: 13.NOV.2002 03:48:11

POWER SPECTRAL DENSITY**§15.247 (d)**

TEST CONDITIONS		POWER SPECTRAL DENSITY (dBm)		
Frequency (MHz)		2402	2440	2480
T _{nom} (23)°C	V _{nom} (3.8)VDC	-18.97	-20.12	-19.56

LIMIT**SUBCLAUSE §15.247(d)**

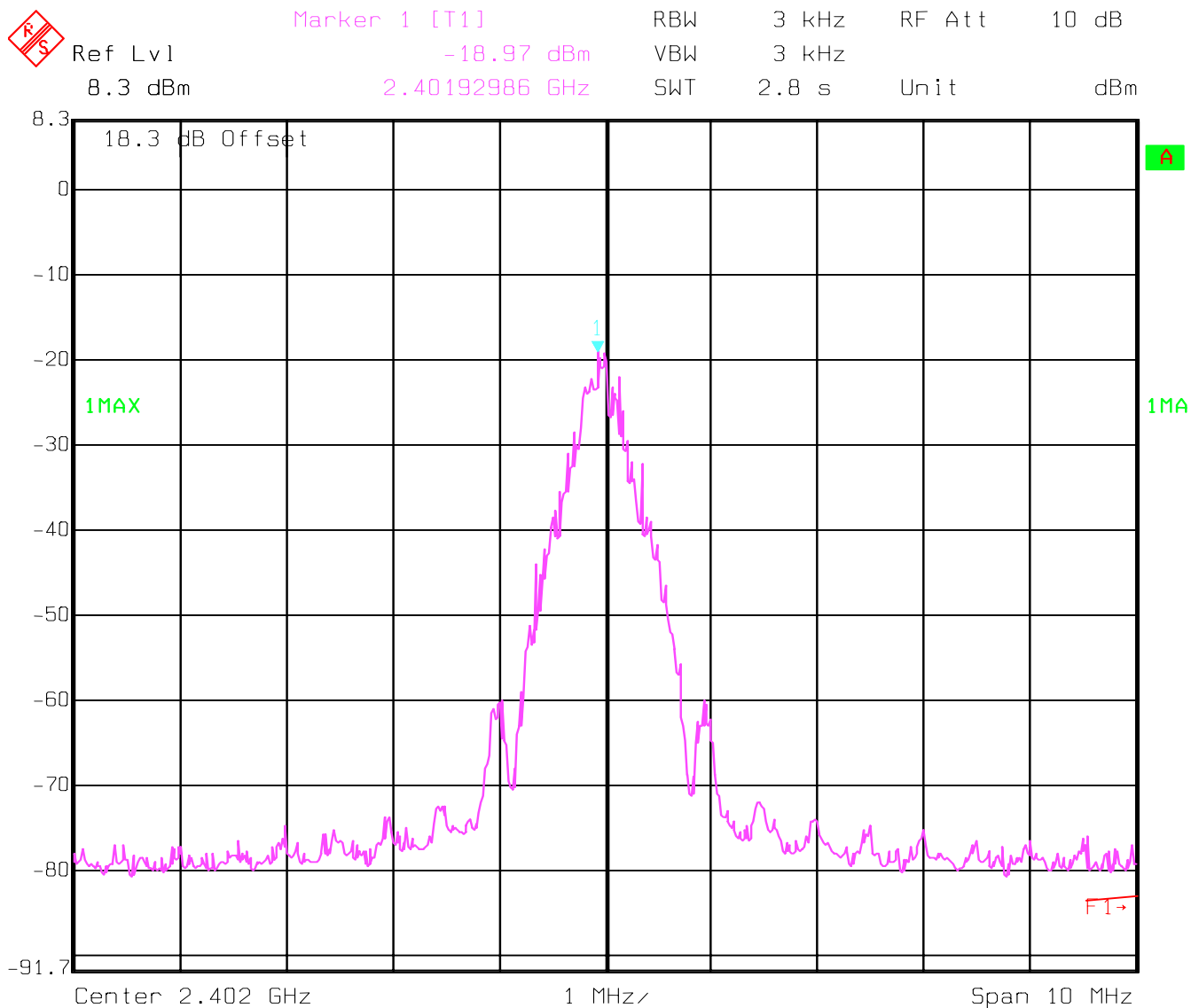
The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band

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

POWER SPECTRAL DENSITY

§15.247(d)

Lowest Channel: 2402MHz

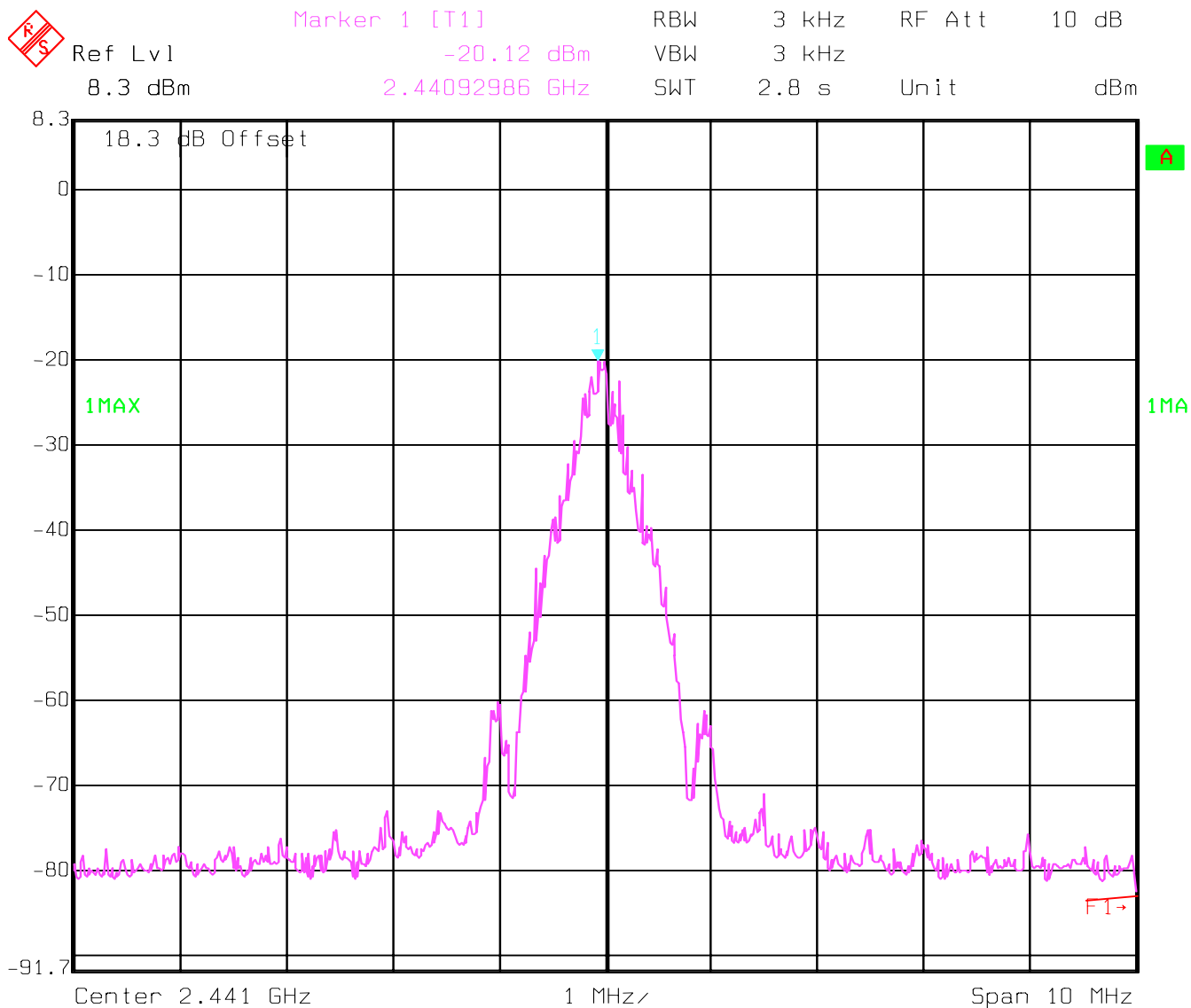


Date: 13.NOV.2002 03:21:06

POWER SPECTRAL DENSITY

§15.247(d)

Middle Channel: 2440MHz

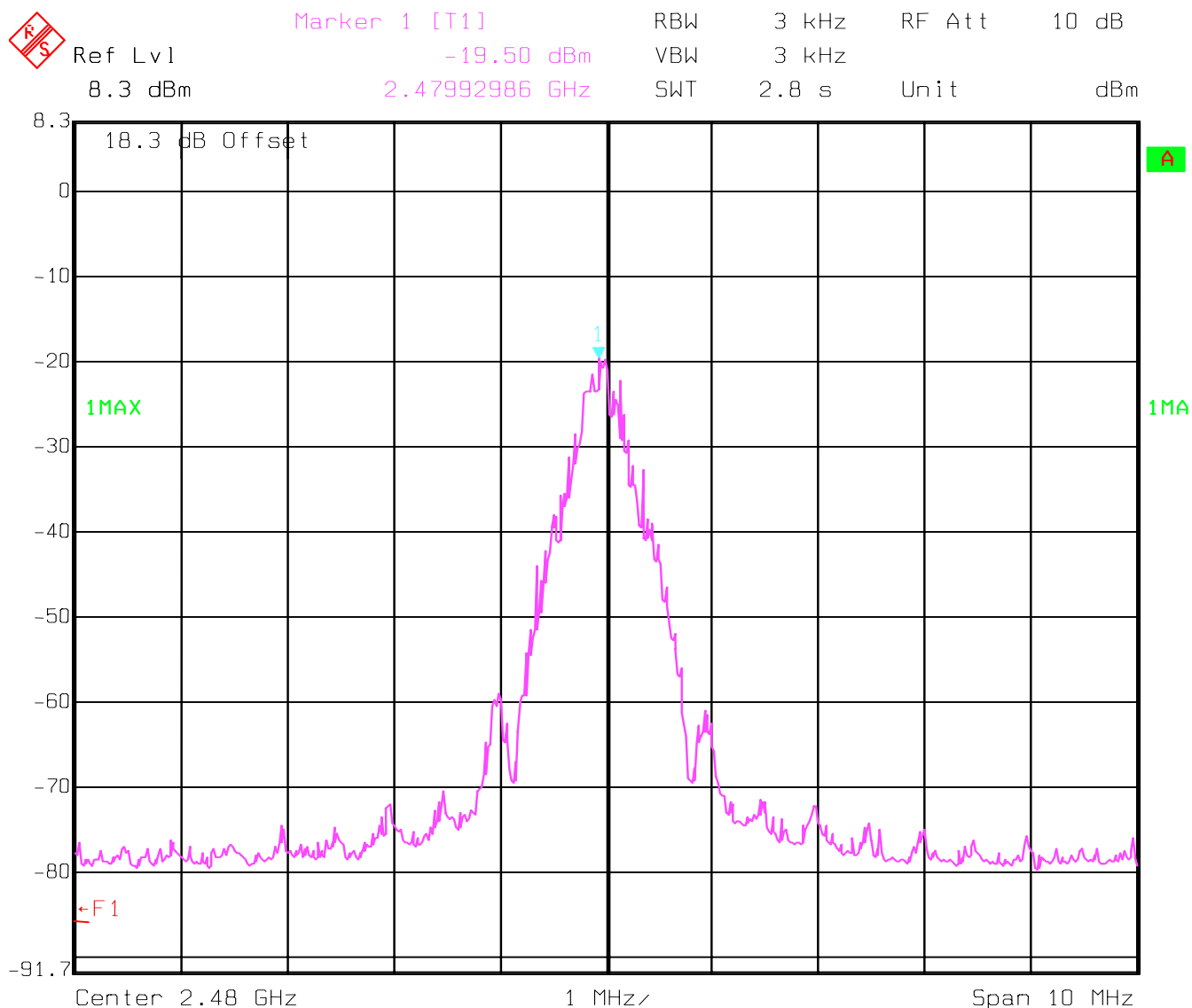


Date: 13.NOV.2002 03:23:02

POWER SPECTRAL DENSITY

§15.247(d)

Highest Channel: 2480MHz



Date: 13.NOV.2002 03:29:02

**MAXIMUM PEAK OUTPUT POWER
(conducted)****§ 15.247 (b) (1)**

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2402	2440	2480
T _{nom} (23)°C	V _{nom} (3.8)VDC	-5.74	-6.13	-5.77
Measurement uncertainty		±0.5dBm		

RBW / VBW : 3 MHz

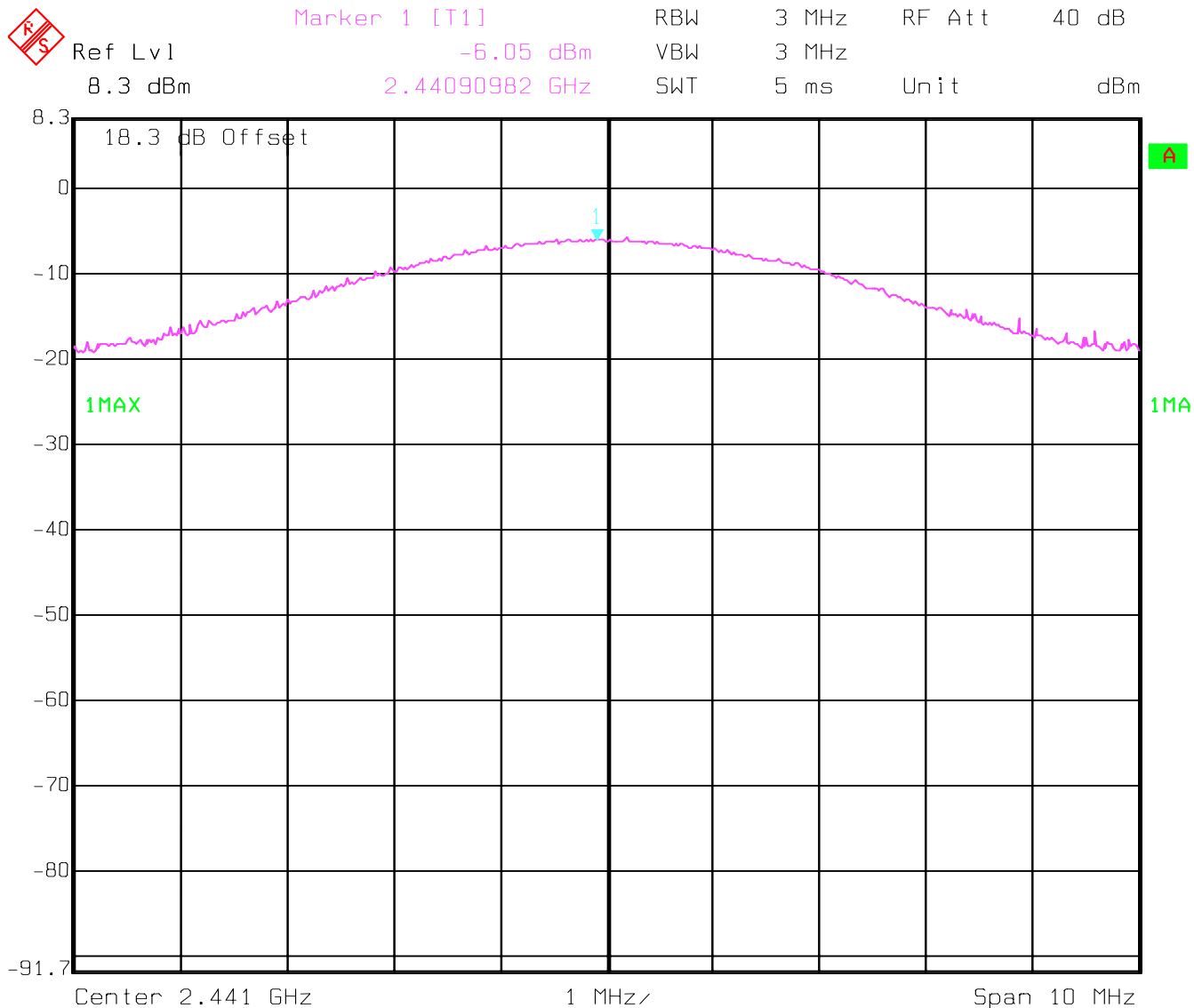
LIMIT**SUBCLAUSE § 15.247 (b) (1)**

Frequency range	RF power output
2400-2483.5 MHz	1.0 Watt

PEAK OUTPUT POWER (CONDUCTED)

§15.247 (b)

Lowest Channel: 2402MHz

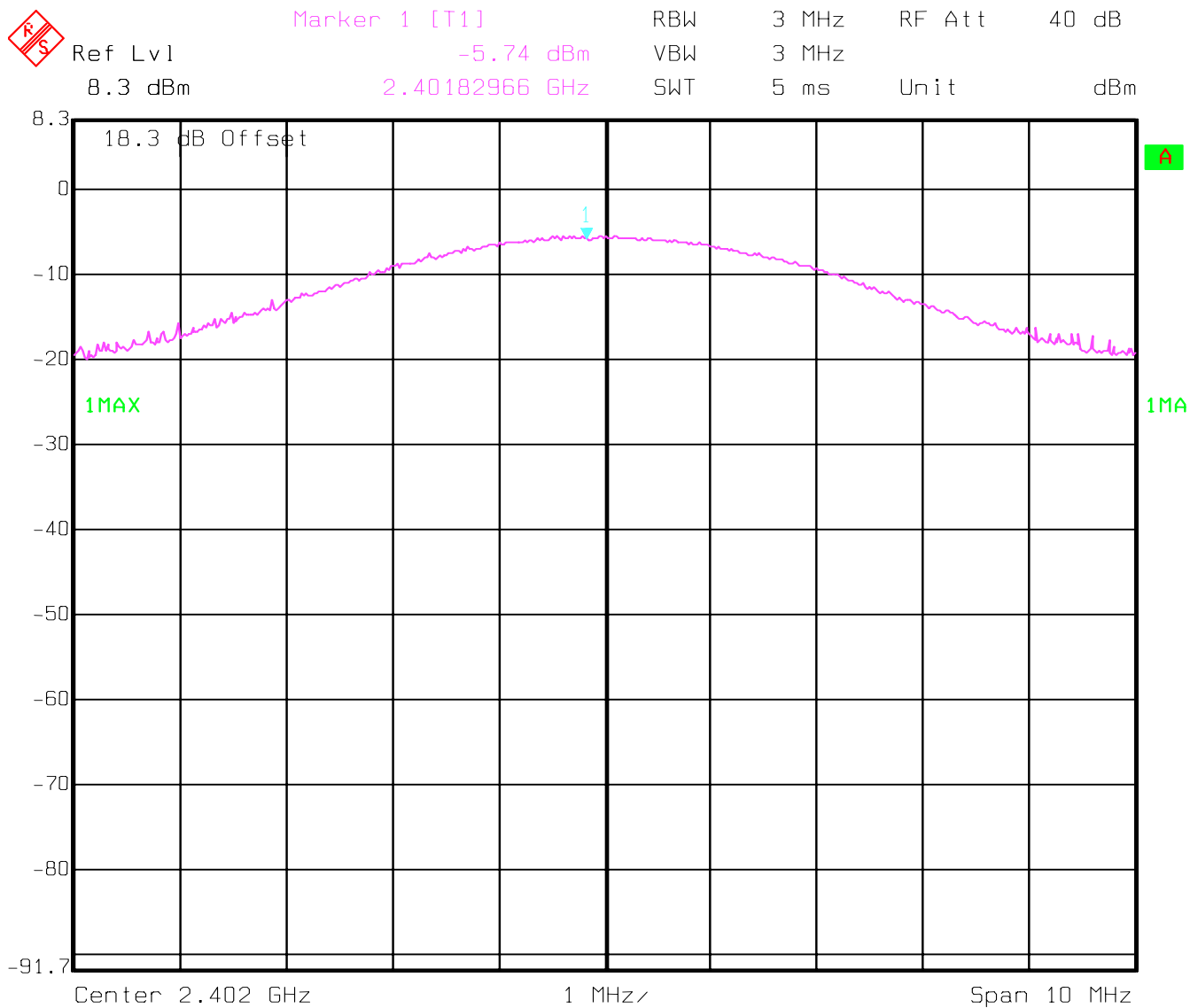


Date: 13.NOV.2002 02:03:53

PEAK OUTPUT POWER (CONDUCTED)

§15.247 (b)

Mid Channel: 2440MHz

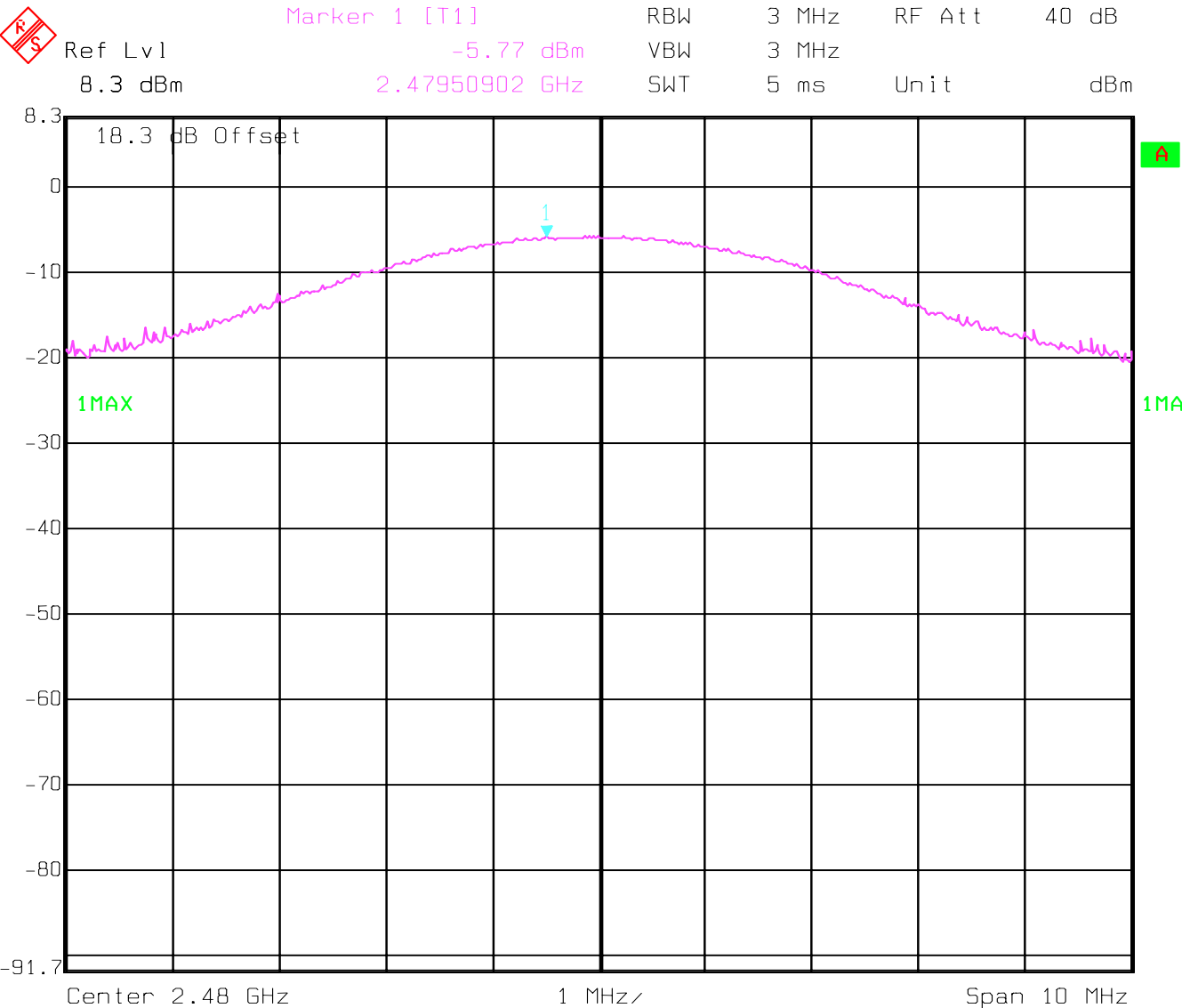


Date: 13.NOV.2002 02:19:03

PEAK OUTPUT POWER (CONDUCTED)

§15.247 (b)

Highest Channel: 2480MHz



Date: 13.NOV.2002 02:23:43

**MAXIMUM PEAK OUTPUT POWER
(RADIATED)****§ 15.247 (b) (1)****EIRP:**

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2402	2440	2480
T _{nom} (23)°C	V _{nom} (3.8)VDC	-8.68	-2.65	-6.64
Measurement uncertainty		±0.5dBm		

RBW/VBW : 3 MHz

Note: All radiated measurements were made in all three orthogonal planes. The values reported are the maximum values.

LIMIT**SUBCLAUSE § 15.247 (b) (1)**

Frequency range	RF power output
2400-2483.5 MHz	1.0 Watt

PEAK OUTPUT POWER (RADIATED)

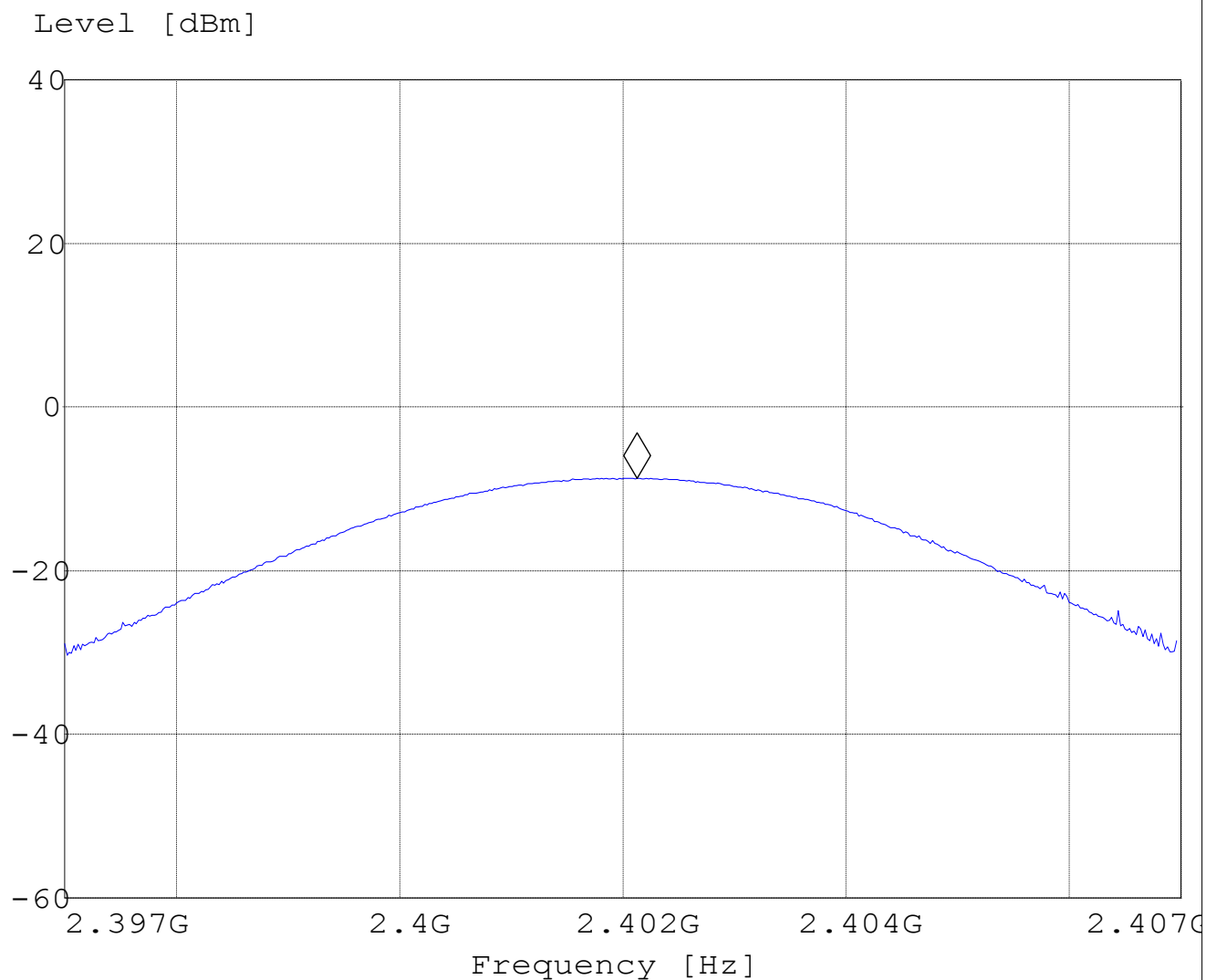
§15.247 (b) (1)

Lowest Channel: 2402MHz

SWEEP TABLE: "EIRP BT low channel"

Short Description:		EIRP Bluetooth channel-2402MHz		
Start	Stop	Detector	Meas.	IF
Frequency	Frequency	Time	BW	
2.397GHz	2.407GHz	MaxPeak	Coupled	3 MHz

Marker: 2.402130261 GHz -8.68 dBm



PEAK OUTPUT POWER (RADIATED)

§15.247 (b) (1)

Mid Channel: 2441MHz

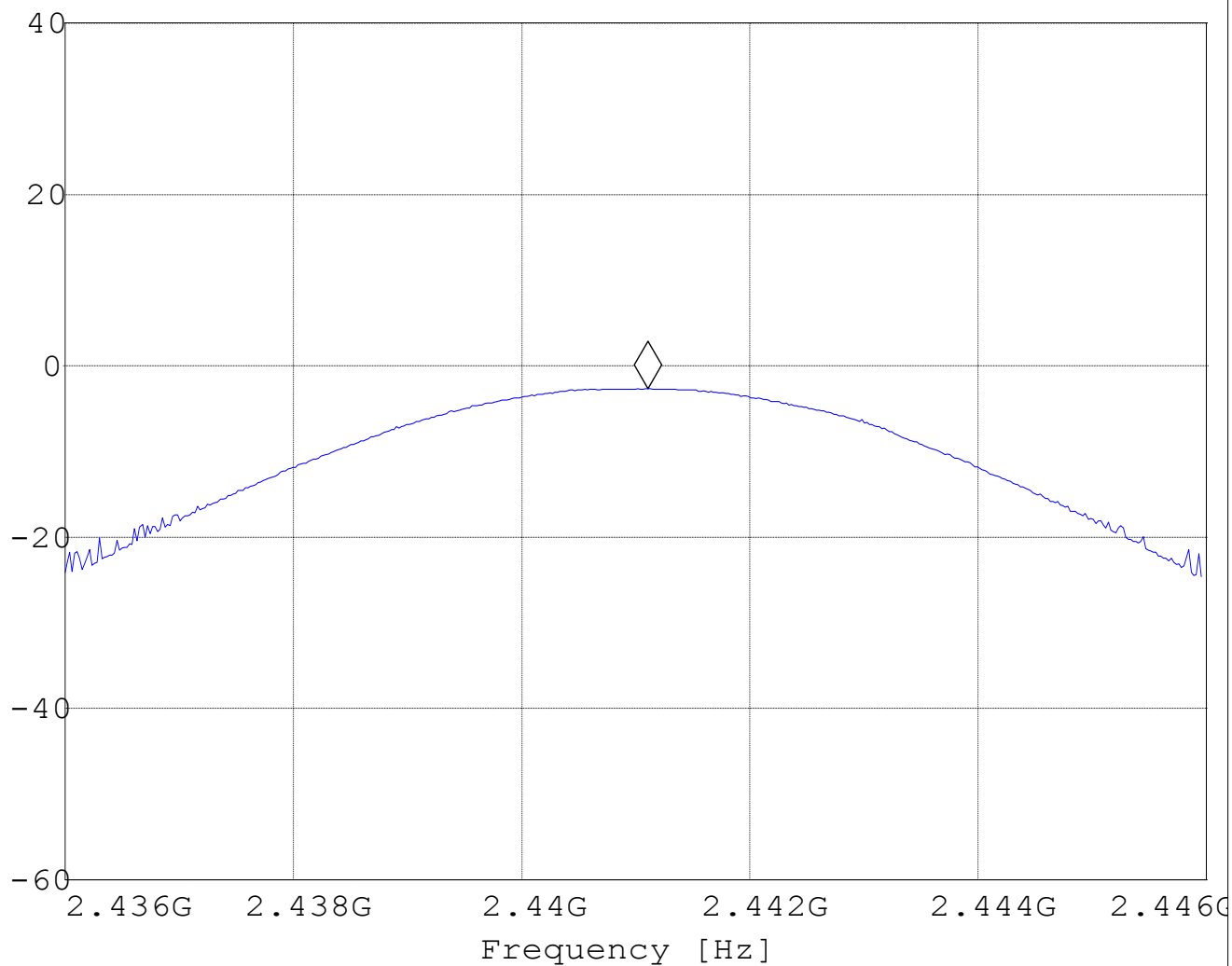
SWEEP TABLE: "EIRP BT Mid channel"

Short Description: EIRP Bluetooth channel-2441MHz

Start Frequency	Stop Frequency	Detector	Meas. Time	IF BW
2.435GHz	2.445GHz	MaxPeak	Coupled	3 MHz

Marker: 2.441106212 GHz -2.65 dBm

Level [dBm]



PEAK OUTPUT POWER (RADIATED)

§15.247 (b) (1)

Highest Channel: 2480MHz

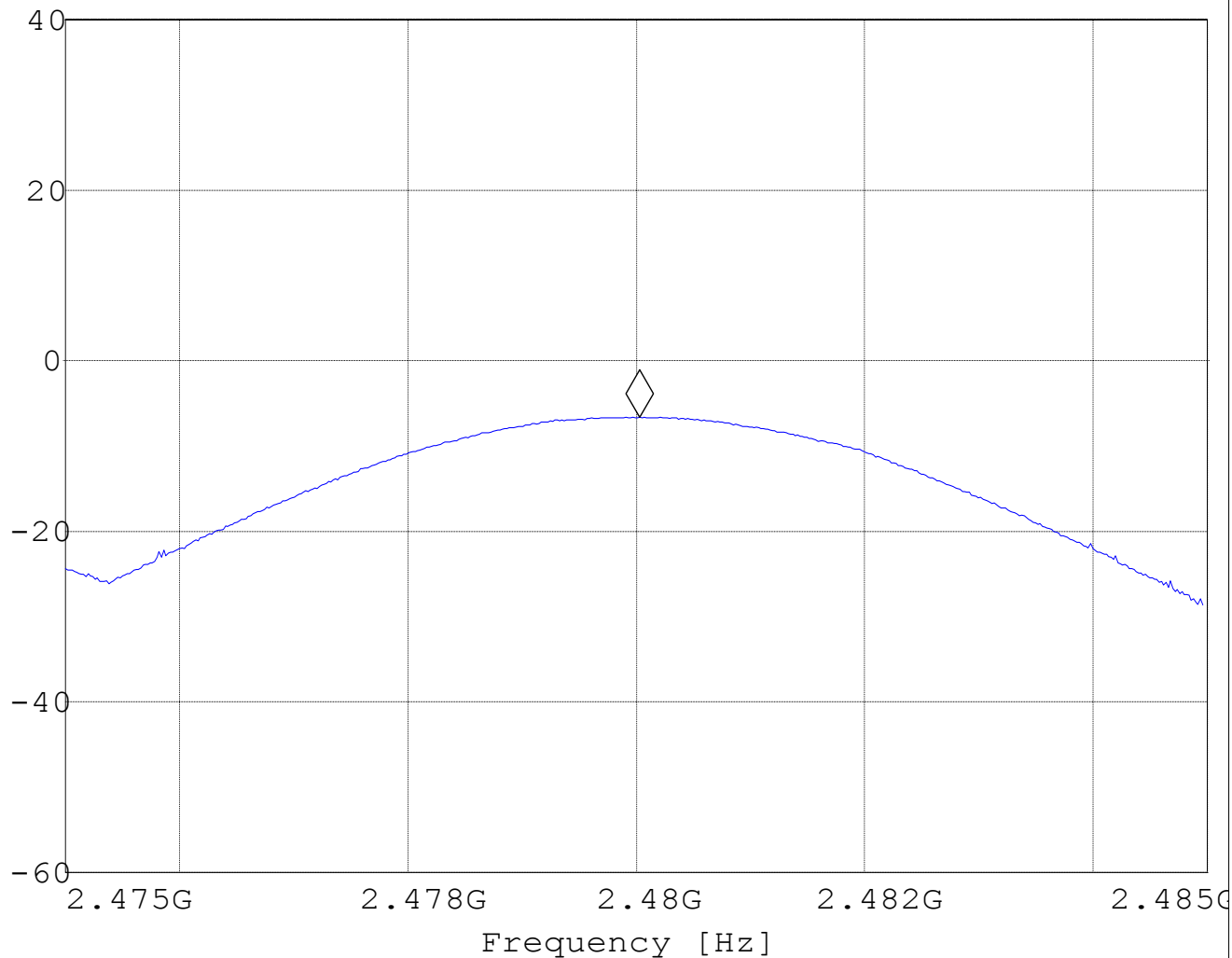
SWEEP TABLE: "EIRP BT High channel"

Short Description: EIRP Bluetooth channel-2480MHz

Start	Stop	Detector	Meas.	IF
Frequency	Frequency		Time	BW
2.475GHz	2.485GHz	MaxPeak	Coupled	3 MHz

Marker: 2.48003006 GHz -6.64 dBm

Level [dBm]



BAND EDGE COMPLIANCE

§15.247 (c)

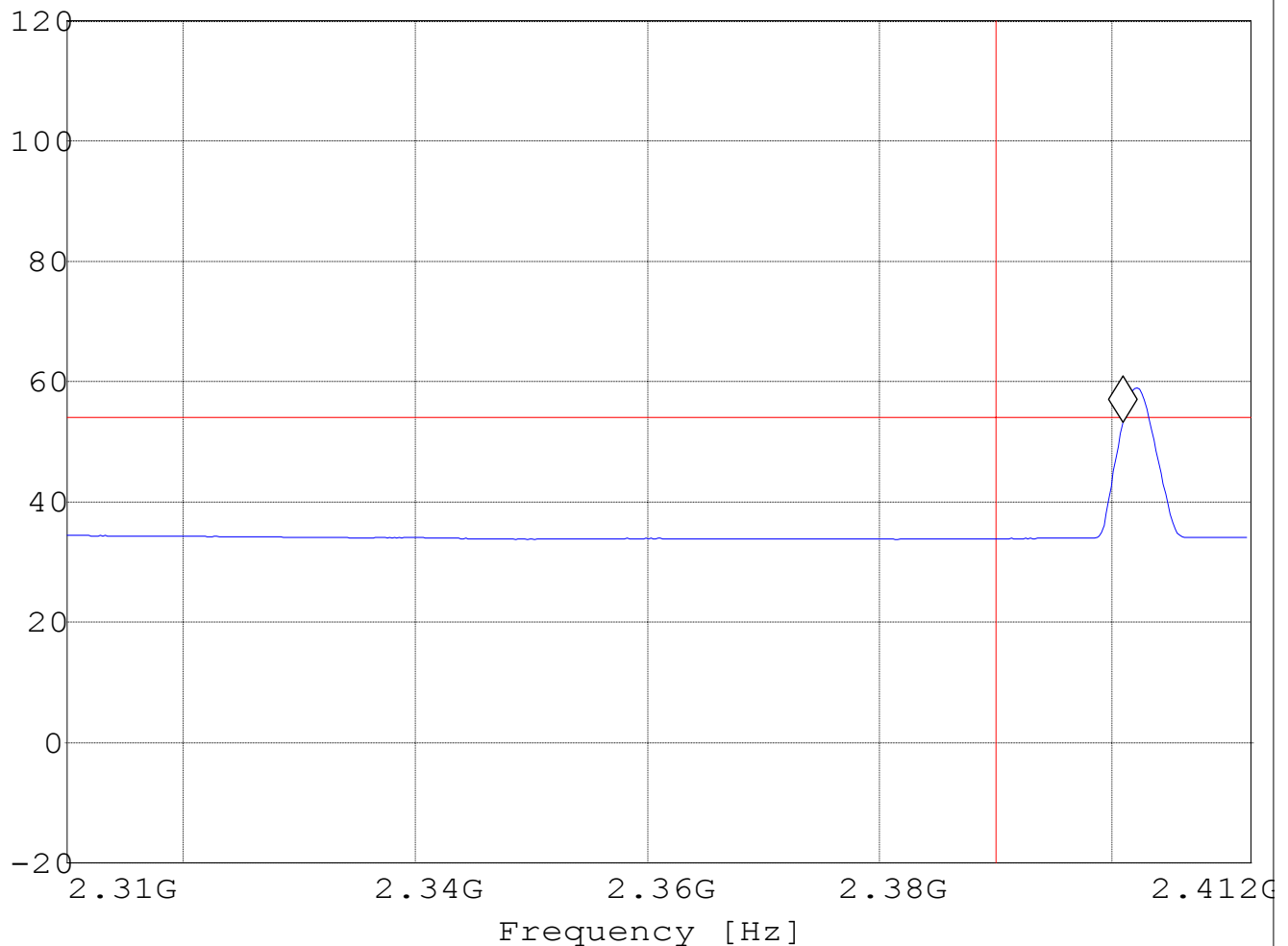
Low frequency section (spurious in the restricted band 2310 – 2390 MHz)
(Hopping – OFF, Average measurement)

Operating condition : Tx at 2402MHz
 SWEEP TABLE : "FCC15.247 LBE_AVG"
 Short Description : FCC15.247 BT Low-band-edge
 Limit Line : 54dBμV

Start Frequency	Stop Frequency	Detector	Meas. Bandw.	RBW	VBW	Transducer
2.31 GHz	2.412 GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)

Marker: 2.400961924 GHz 53.17 dBμV/m

Level [dBμV/m]



BAND EDGE COMPLIANCE

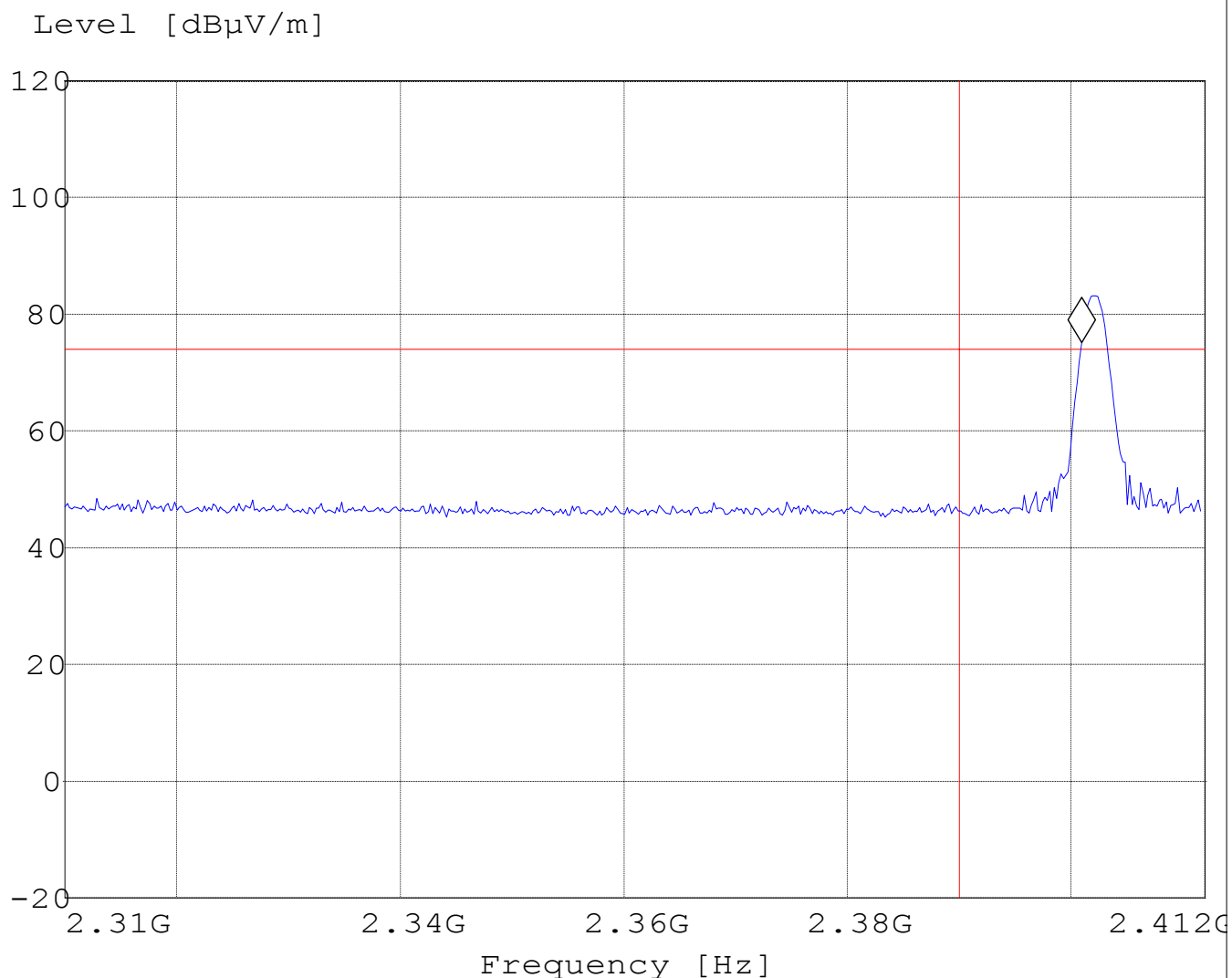
§15.247 (c)

Low frequency section (spurious in the restricted band 2310 – 2390 MHz)
(Hopping – OFF, Peak measurement)

Operating condition : Tx at 2402MHz
 SWEEP TABLE : "FCC15.247 LBE_Pk"
 Short Description : FCC15.247 BT Low-band-edge
 Limit Line : 74dBμV

Start Frequency	Stop Frequency	Detector	Meas. Bandw.	RBW	VBW	Transducer
2.31 GHz	2.412 GHz	MaxPeak	Coupled	1 MHz	1MHz	#326 horn (dBi)

Marker: 2.400961924 GHz 75.18 dBμV/m



BAND EDGE COMPLIANCE

§15.247 (c)

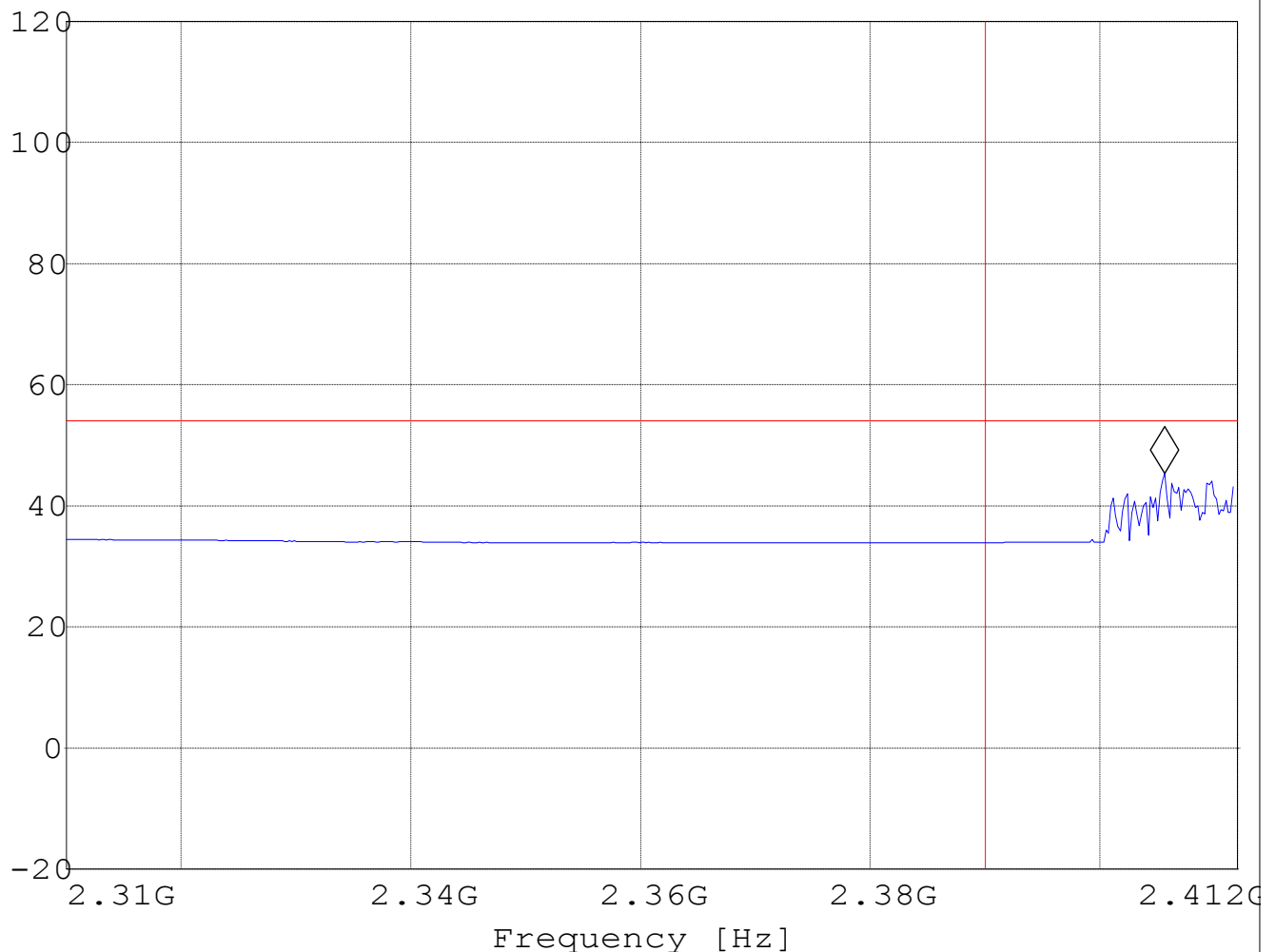
Low frequency section (spurious in the restricted band 2310 – 2390 MHz)
(Hopping – ON, Average measurement)

Operating condition : Tx at 2402MHz
 SWEEP TABLE : "FCC15.247 LBE_AVG"
 Short Description : FCC15.247 BT Low-band-edge
 Limit Line : 54dBμV

Start Frequency	Stop Frequency	Detector	Meas. Bandw.	RBW	VBW	Transducer
2.31 GHz	2.412 GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)

Marker: 2.405663327 GHz 45.33 dBμV/m

Level [dBμV/m]



BAND EDGE COMPLIANCE

§15.247 (c)

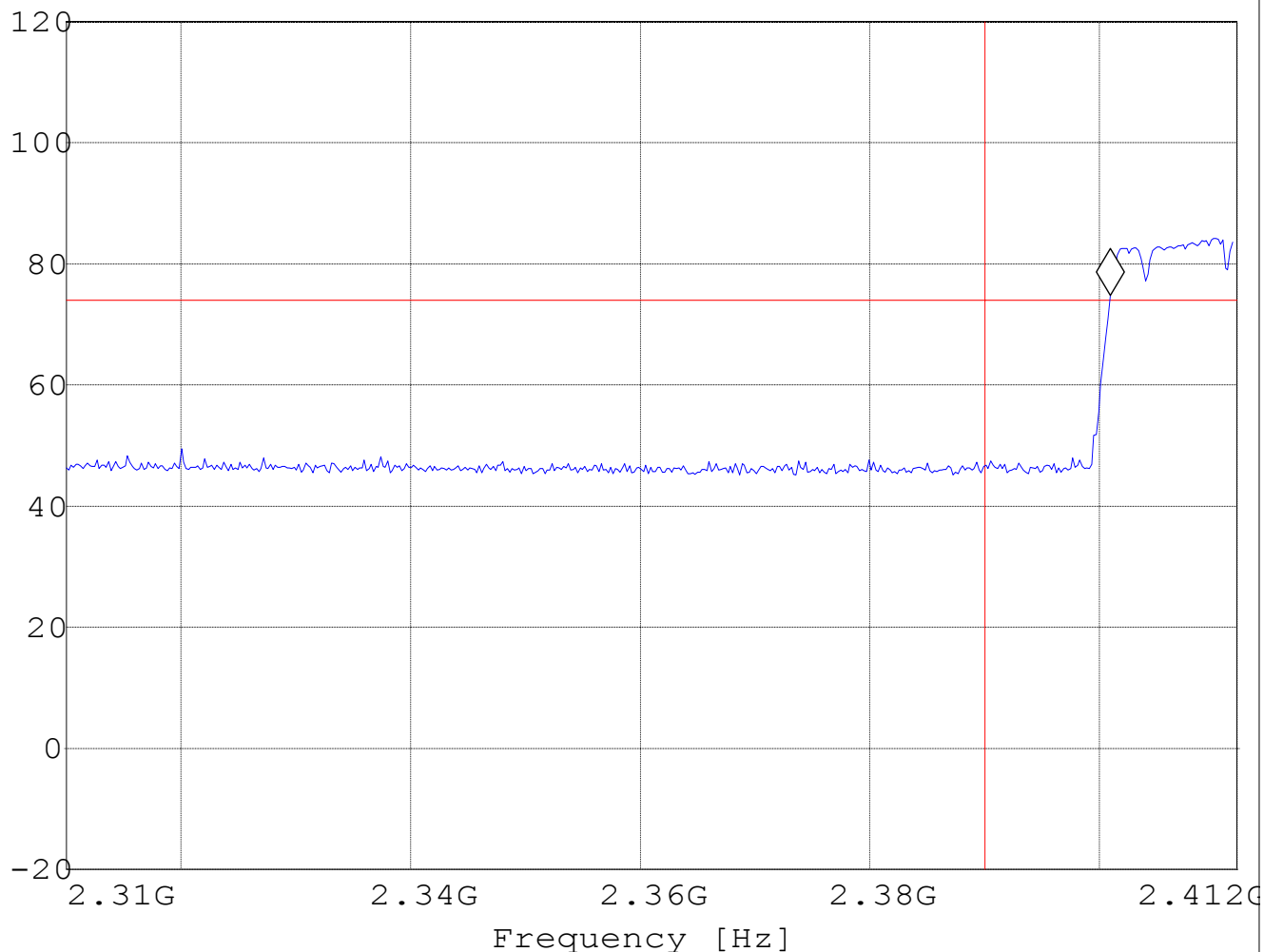
Low frequency section (spurious in the restricted band 2310 – 2390 MHz)
(Hopping – ON, Peak measurement)

Operating condition : Tx at 2402MHz
 SWEEP TABLE : "FCC15.247 LBE_Pk"
 Short Description : FCC15.247 BT Low-band-edge
 Limit Line : 74dBμV

Start Frequency	Stop Frequency	Detector	Meas. Bandw.	RBW	VBW	Transducer
2.31 GHz	2.412 GHz	MaxPeak	Coupled	1 MHz	1MHz	#326 horn (dBi)

Marker: 2.400961924 GHz 74.77 dBμV/m

Level [dBμV/m]



BAND EDGE COMPLIANCE

§15.247 (c)

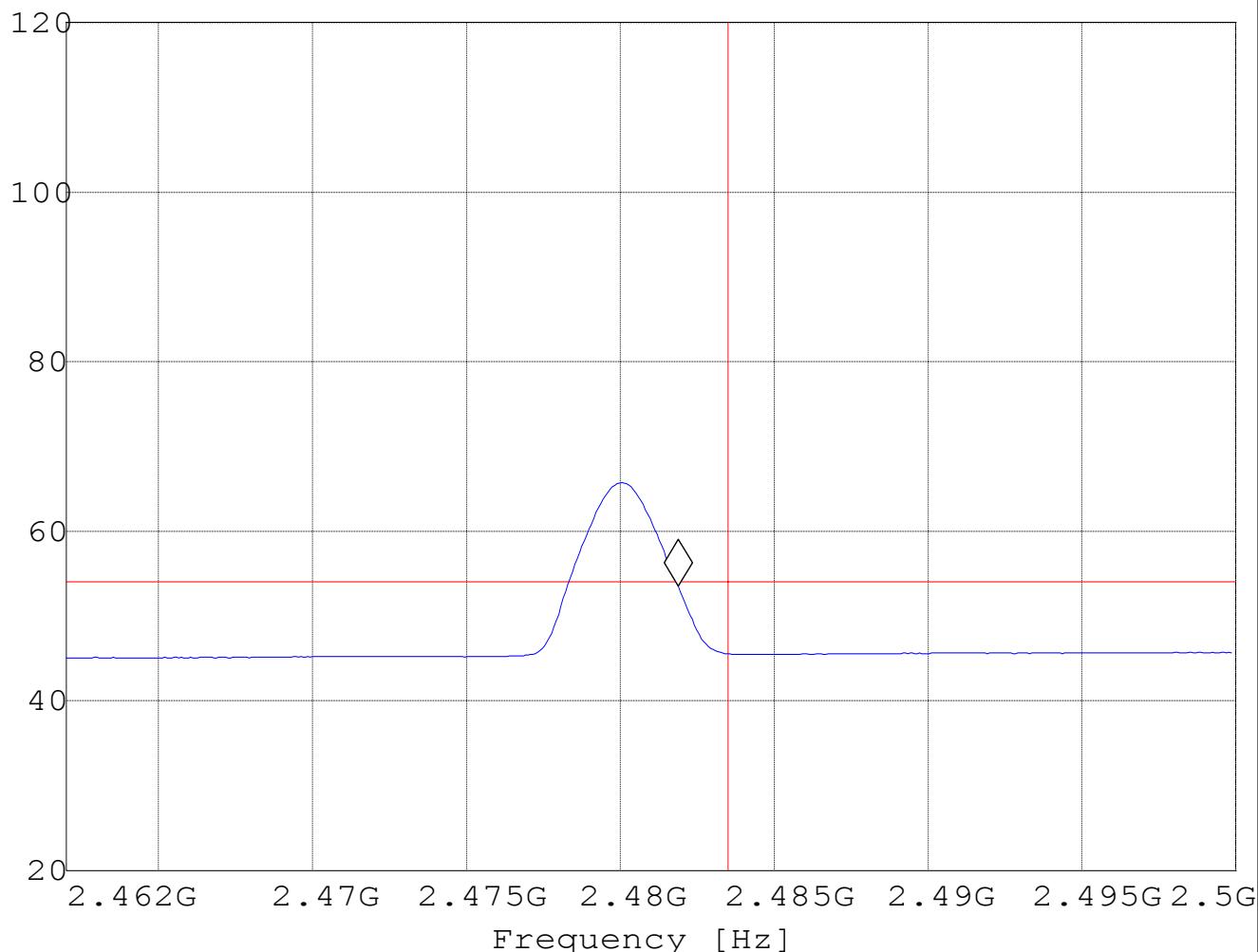
High frequency section (spurious in the restricted band 2483.5 – 2500 MHz)
(Hopping – OFF, Average measurement)

Operating condition : Tx at 2480MHz
 SWEEP TABLE : "FCC15.247 HBE_AVG"
 Short Description : FCC15.247 BT High-band-edge
 Limit Line : 54dB μ V

Start Frequency	Stop Frequency	Detector	Meas. Bandw.	RBW	VBW	Transducer
2.472 GHz	2.5 GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)

Marker: 2.481875752 GHz 53.53 dB μ V/m

Level [dB μ V/m]



BAND EDGE COMPLIANCE

§15.247 (c)

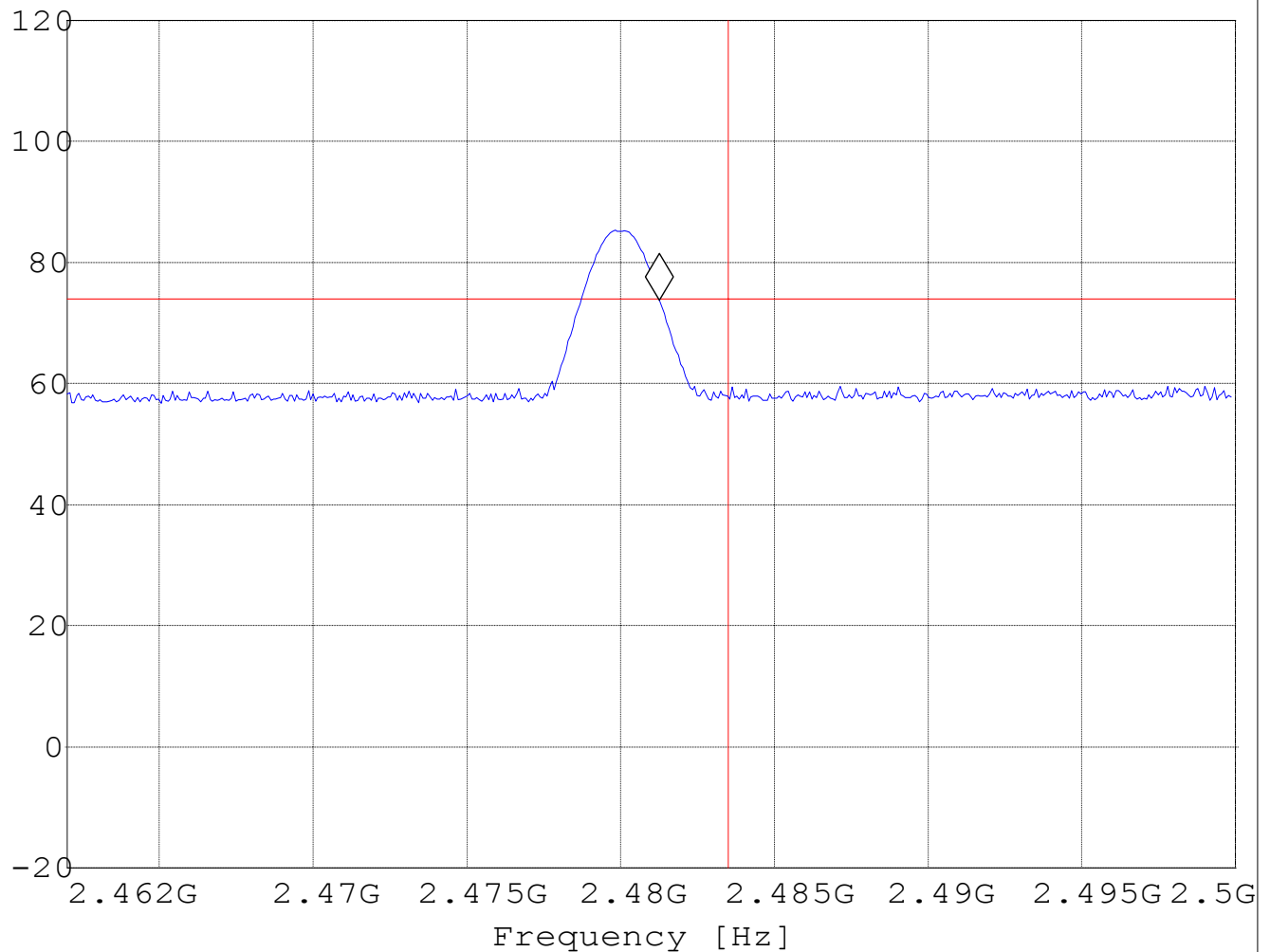
High frequency section (spurious in the restricted band 2483.5 – 2500 MHz) (Hopping – OFF, Peak measurement)

Operating condition : Tx at 2480MHz
 SWEEP TABLE : "FCC15.247 HBE_PK"
 Short Description : FCC15.247 BT High-band-edge
 Limit Line : 74dBμV

Start Frequency	Stop Frequency	Detector	Meas. Bandw.	RBW	VBW	Transducer
2.472 GHz	2.5 GHz	MaxPeak	Coupled	1 MHz	1MHz	#326 horn (dBi)

Marker: 2.481266533 GHz 73.72 dBμV/m

Level [dBμV/m]



BAND EDGE COMPLIANCE

§15.247 (c)

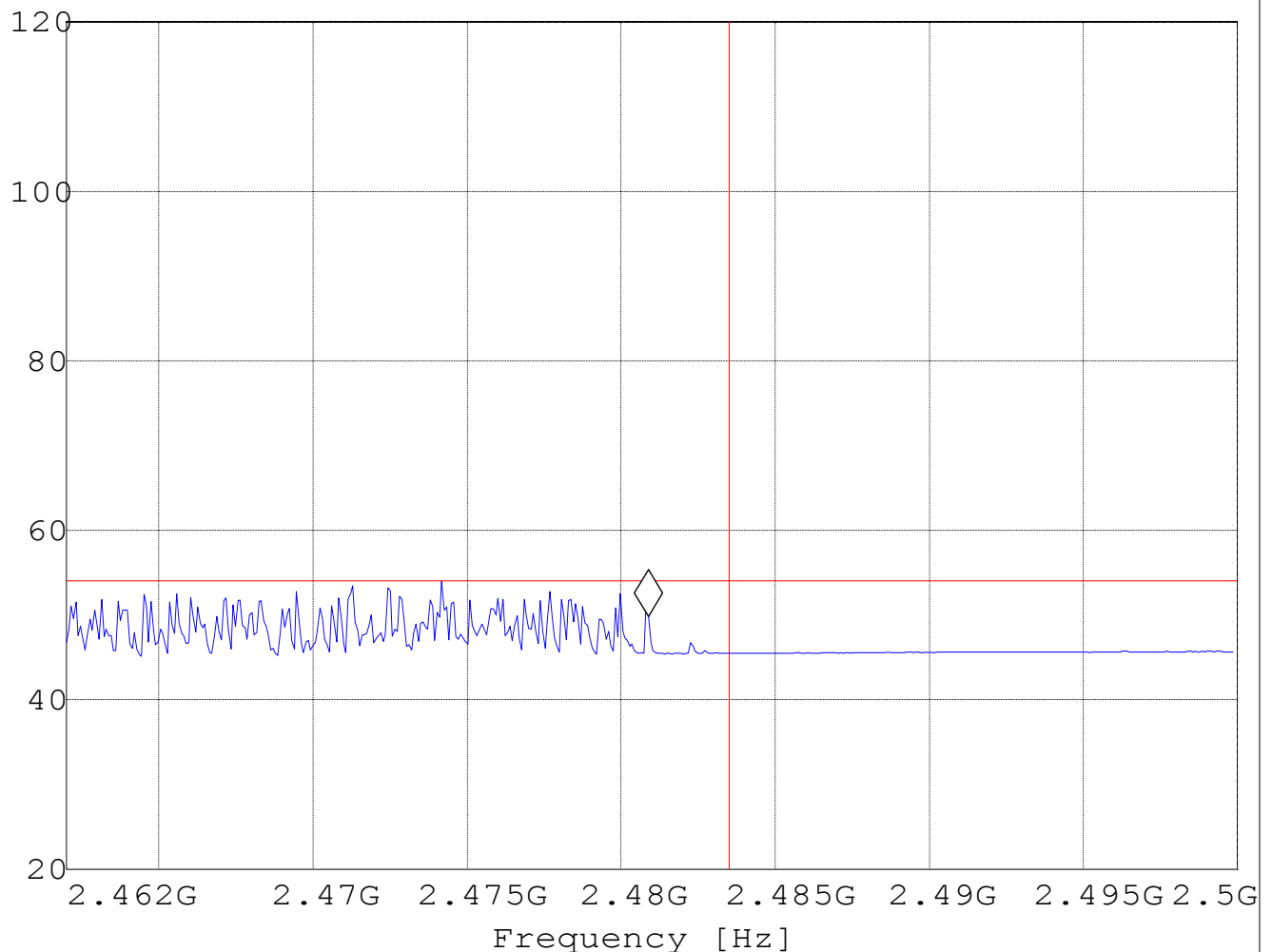
High frequency section (spurious in the restricted band 2483.5 – 2500 MHz)
(Hopping – ON, Average measurement)

Operating condition : Tx at 2480MHz
 SWEEP TABLE : "FCC15.247 HBE_AVG"
 Short Description : FCC15.247 BT High-band-edge
 Limit Line : 54dBμV

Start Frequency	Stop Frequency	Detector	Meas. Bandw.	RBW	VBW	Transducer
2.472 GHz	2.5 GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)

Marker: 2.480885772 GHz 49.88 dBμV/m

Level [dBμV/m]



BAND EDGE COMPLIANCE

§15.247 (c)

High frequency section (spurious in the restricted band 2483.5 – 2500 MHz)

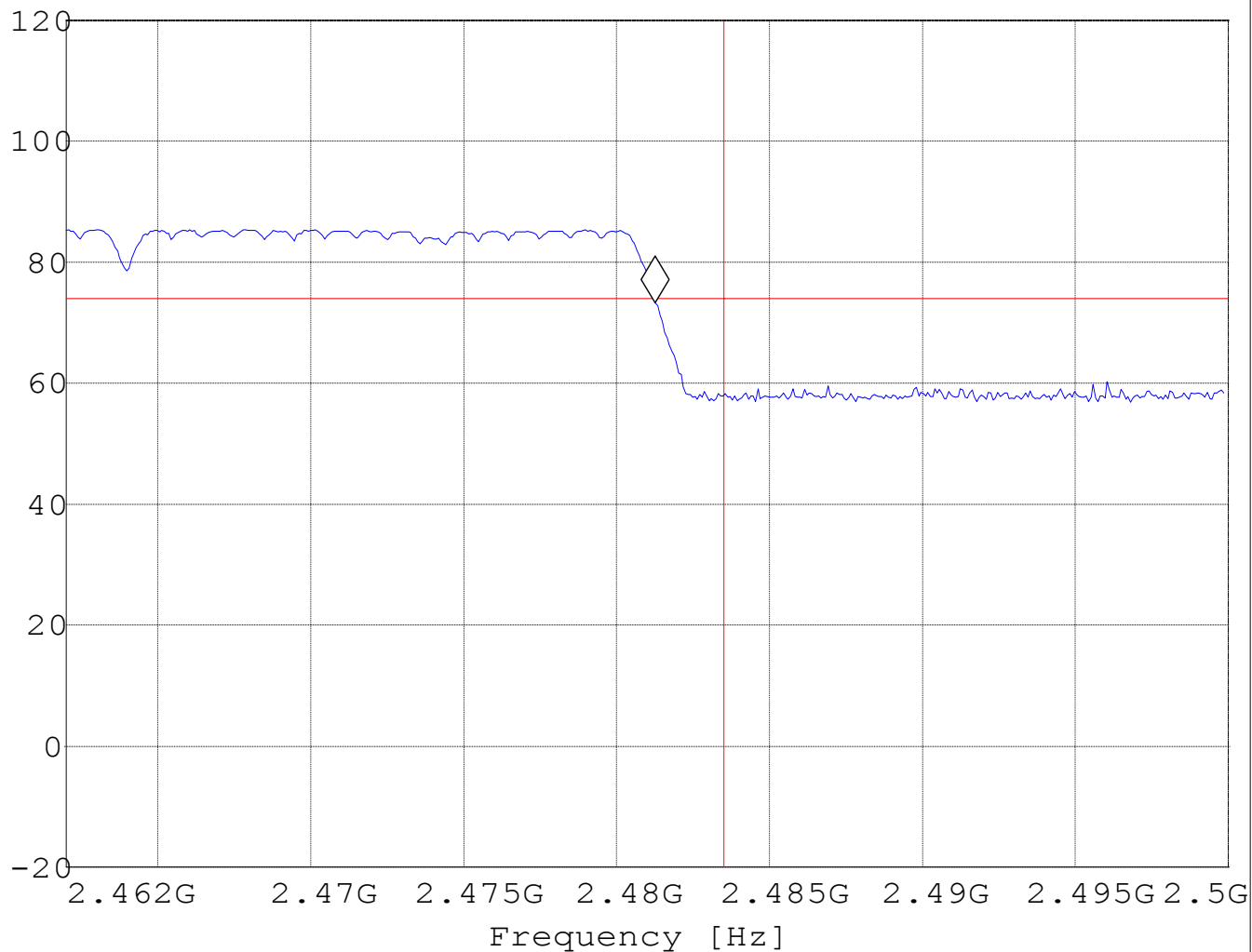
(Hopping – ON, Peak measurement)

Operating condition : Tx at 2480MHz
 SWEEP TABLE : "FCC15.247 HBE_PK"
 Short Description : FCC15.247 BT High-band-edge
 Limit Line : 74dBμV

Start Frequency	Stop Frequency	Detector	Meas. Bandw.	RBW	VBW	Transducer
2.472 GHz	2.5 GHz	MaxPeak	Coupled	1 MHz	1MHz	#326 horn (dBi)

Marker: 2.481266533 GHz 73.25 dBμV/m

Level [dBμV/m]



EMISSION LIMITATIONS**§ 15.247 (c) (1)****Transmitter (Conducted)****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)).

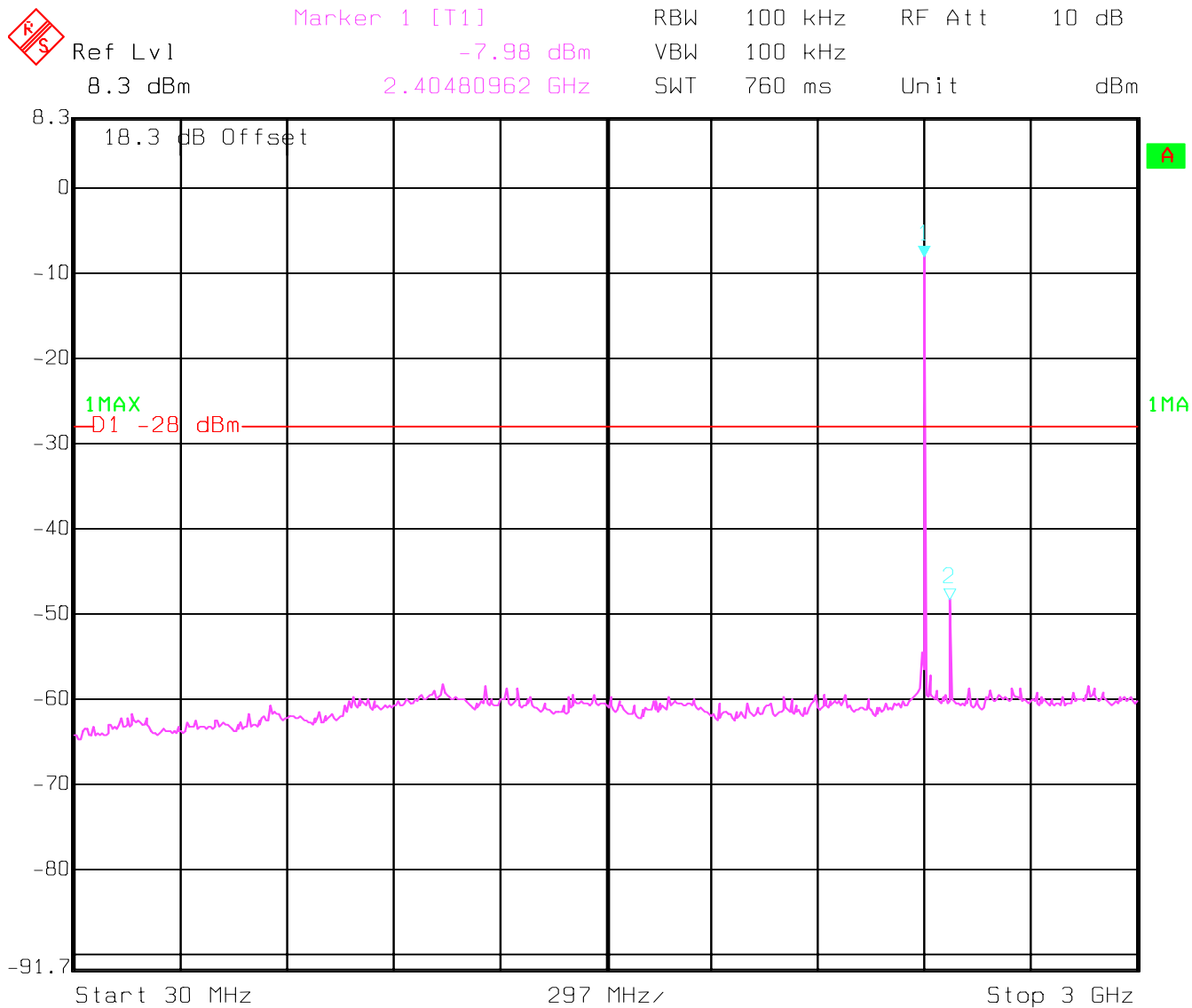
NOTE: Frequency resolution is not fine enough to show the exact frequency of the carrier, refer to plots under EIRP.

EMISSION LIMITATIONS - Conducted (Transmitter)

§ 15.247 (c) (1)

Lowest Channel(2402MHz): 30MHz - 3GHz

NOTE: The peak above the limit line is the carrier frequency.



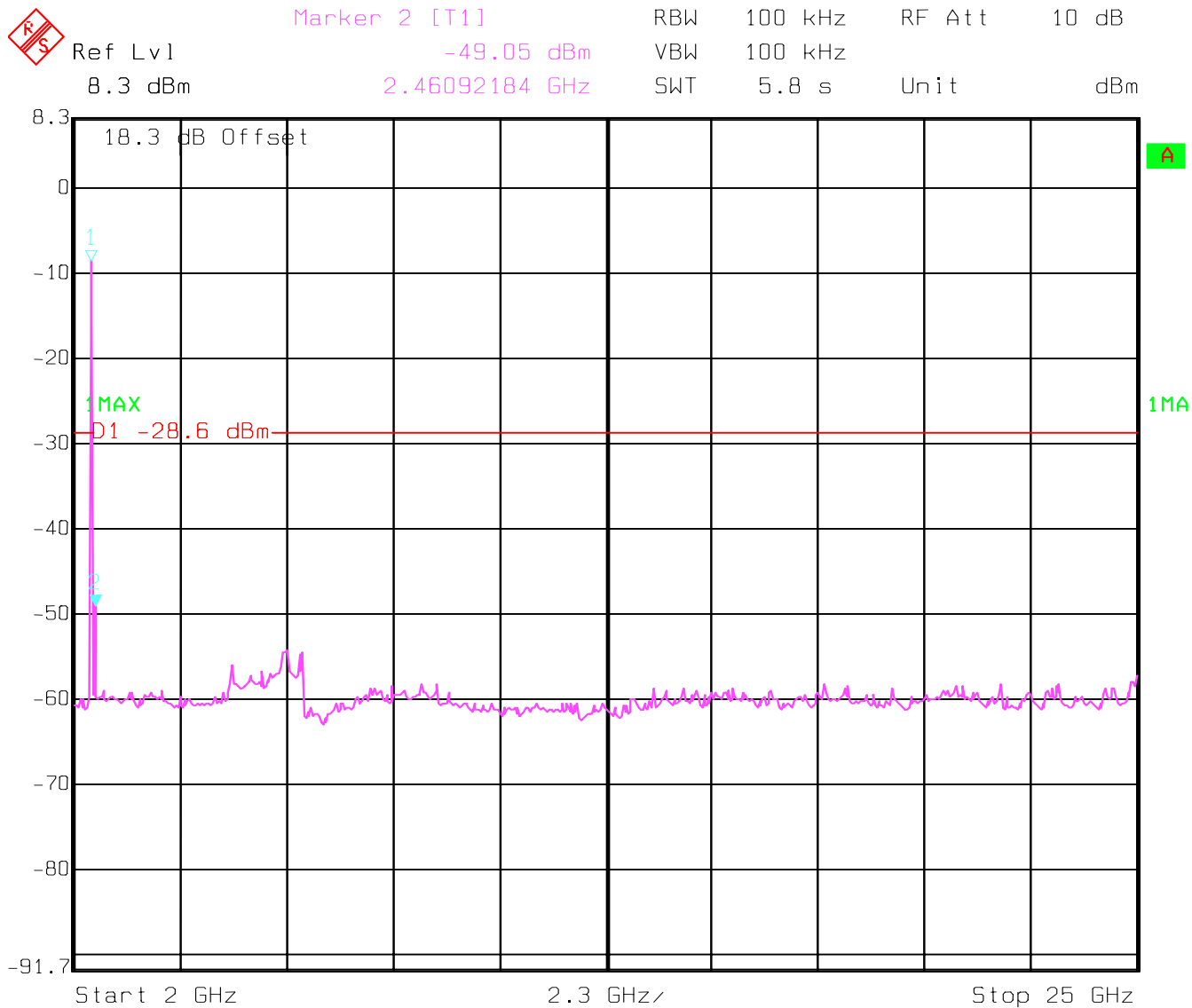
Date: 13.NOV.2002 02:46:48

EMISSION LIMITATIONS - Conducted (Transmitter)

§ 15.247 (c) (1)

Lowest Channel(2402MHz): 2GHz - 25GHz

NOTE: The peak above the limit line is the carrier frequency.



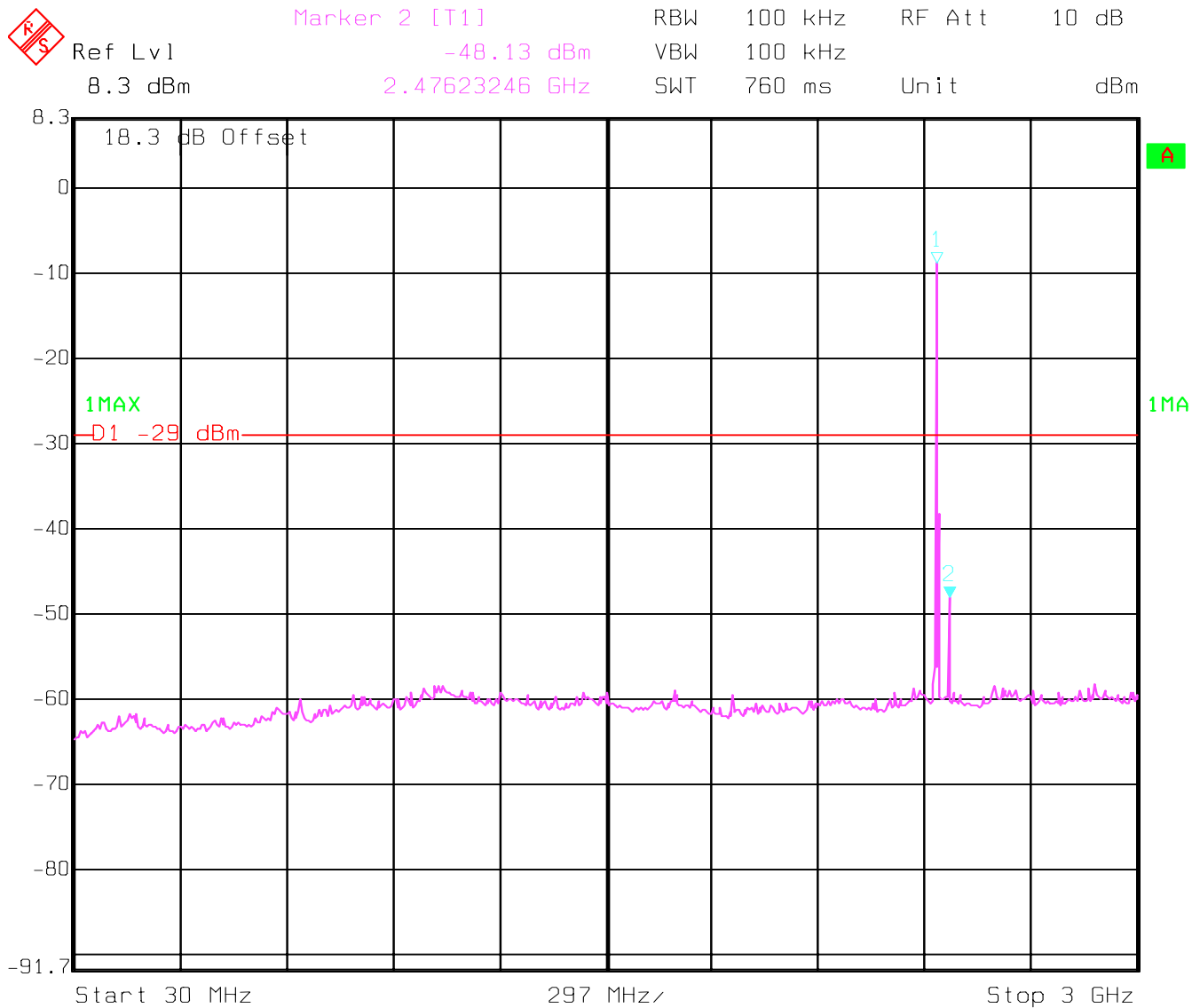
Date: 13.NOV.2002 02:49:15

EMISSION LIMITATIONS - Conducted (Transmitter)

§ 15.247 (c) (1)

Mid Channel(2440MHz): 30MHz - 3GHz

NOTE: The peak above the limit line is the carrier frequency.



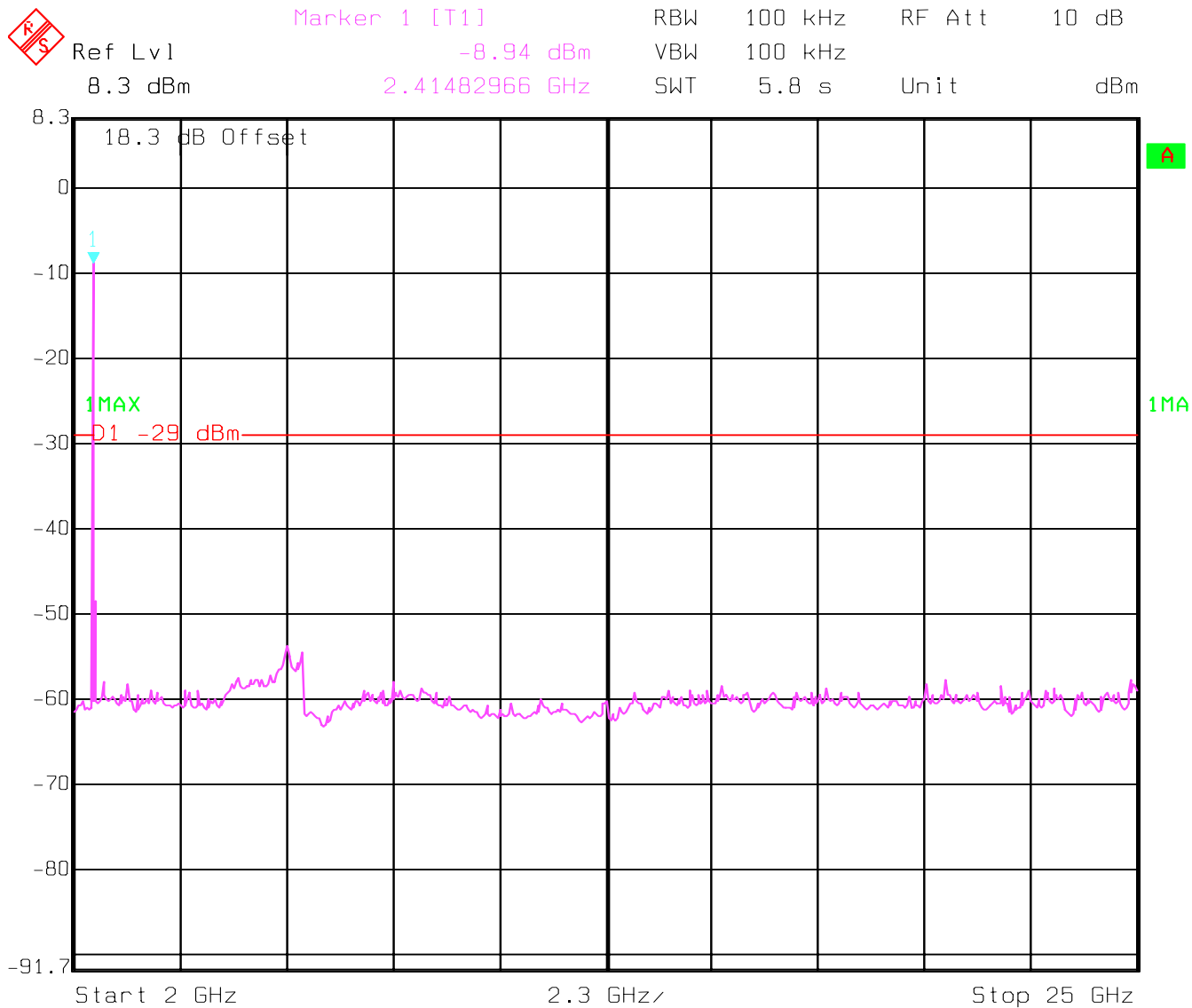
Date: 13.NOV.2002 02:38:02

EMISSION LIMITATIONS - Conducted (Transmitter)

§ 15.247 (c) (1)

Mid Channel(2440MHz): 2GHz - 25GHz

NOTE: The peak above the limit line is the carrier frequency.



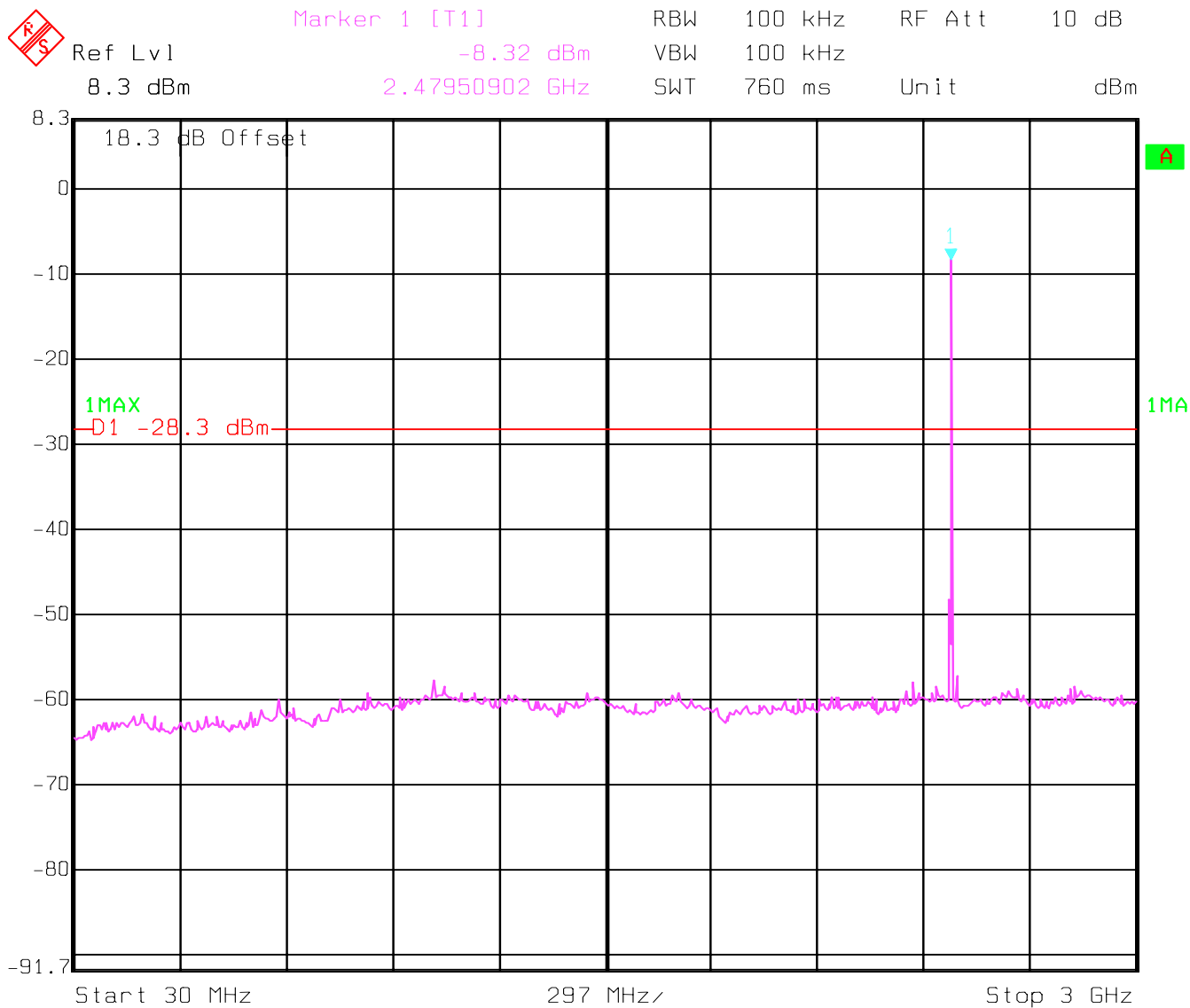
Date: 13.NOV.2002 02:40:05

EMISSION LIMITATIONS - Conducted (Transmitter)

§ 15.247 (c) (1)

Highest Channel(2480MHz): 30MHz - 3GHz

NOTE: The peak above the limit line is the carrier frequency.



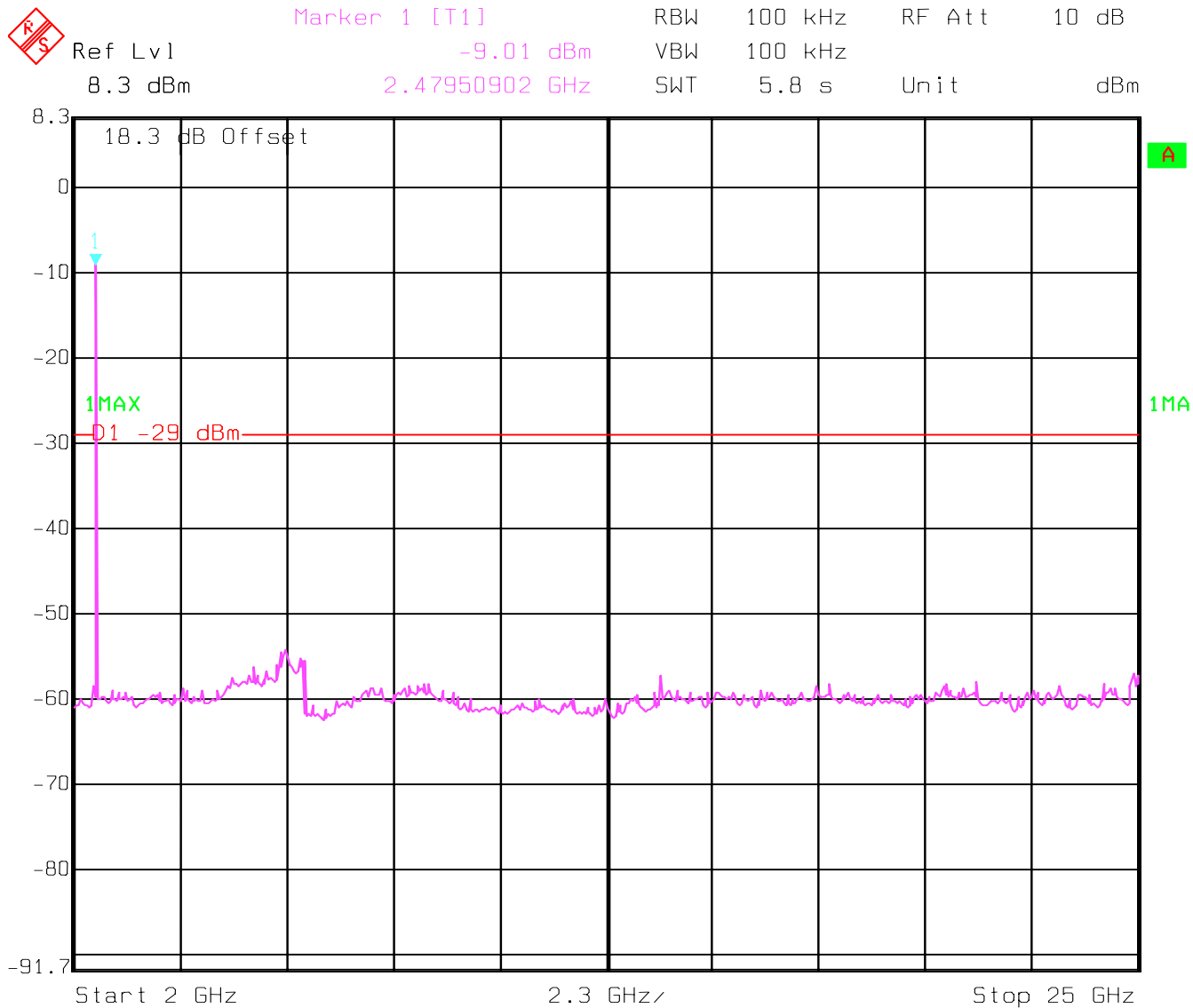
Date: 13.NOV.2002 02:30:44

EMISSION LIMITATIONS - Conducted (Transmitter)

§ 15.247 (c) (1)

Highest Channel(2480MHz): 2GHz - 25GHz

NOTE: The peak above the limit line is the carrier frequency.



Date: 13.NOV.2002 02:33:45

EMISSION LIMITATIONS

§ 15.247 (c) (1)

Transmitter (Radiated)**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)).

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 18 and 25 GHz very short cable connections to the antenna was used to minimize the noise level.
2. Frequency resolution is not fine enough to show the exact frequency of the carrier, refer to plots under EIRP.

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

§ 15.247 (c) (1)

[illegible]

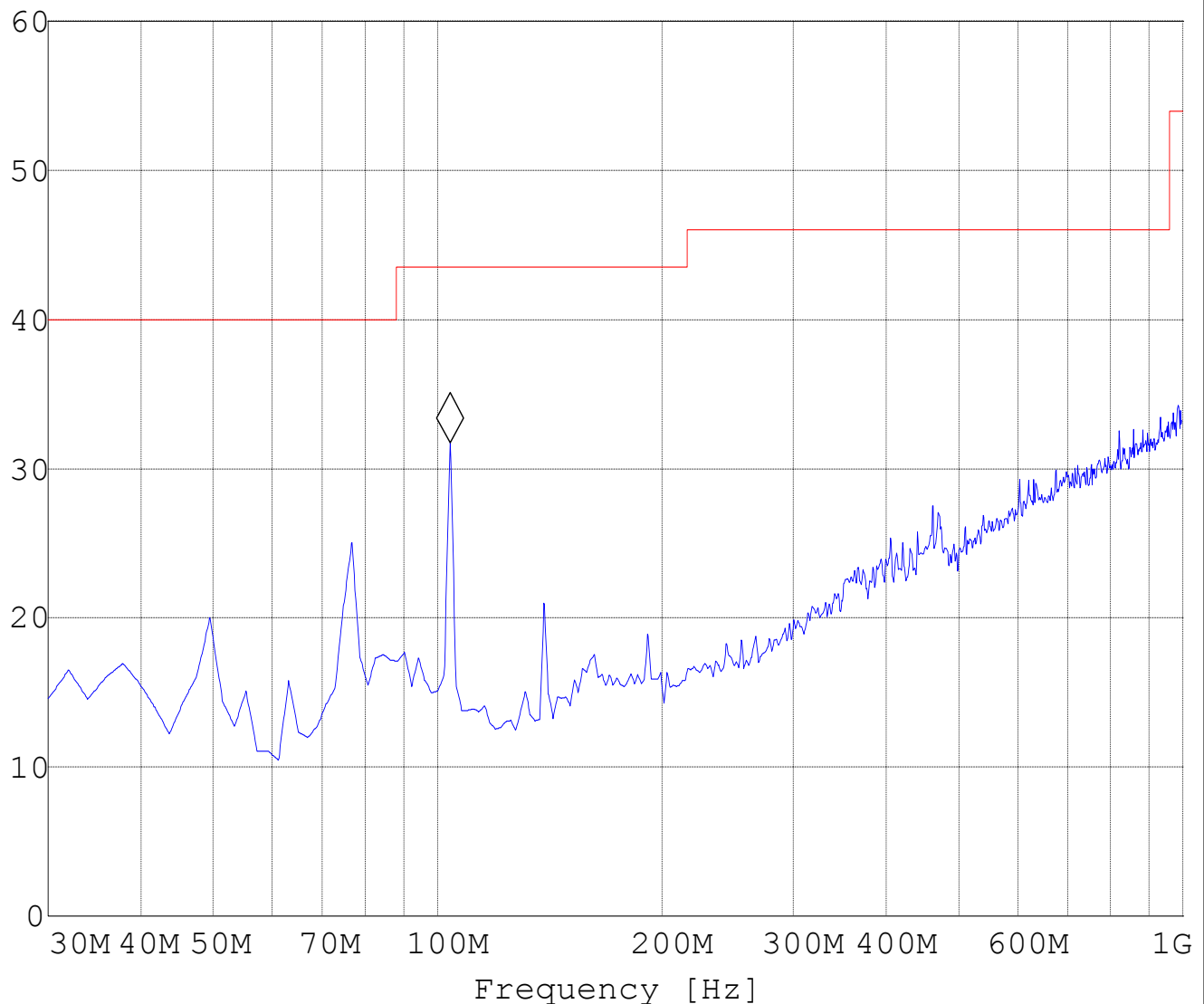
EMISSION LIMITATIONS - Radiated (Transmitter) Lowest Channel(2402MHz): 30MHz – 1GHz

§ 15.247 (c) (1)

SWEEP TABLE:		"BT Spuri hi 30-1G"			
Short Description:		Bluetooth 30MHz-1GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency		Time	VBW	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186

Marker: 103.867735 MHz 31.75 dB μ V/m

Level [dB μ V/m]



EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

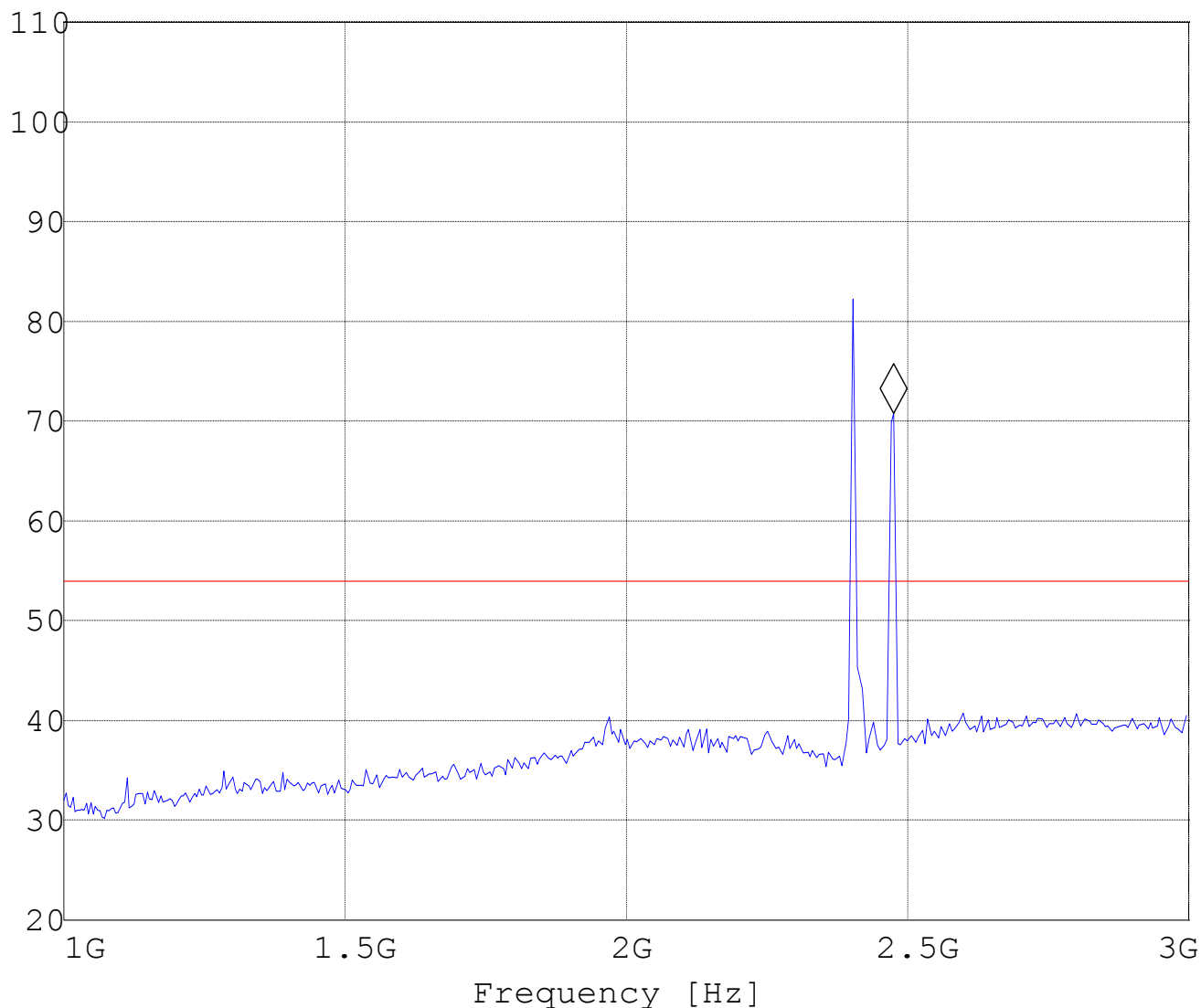
Lowest Channel(2402MHz): 1GHz – 3GHz

NOTE: The peak above the limit is the carrier frequency. Marked frequency is downlink of our base station.

SWEEP TABLE:		"BT Spuri hi 1-8G"			
Short Description:		Bluetooth Spurious 1-8 GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
1.0 GHz	8.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)

Marker: 2.4749499 GHz 70.74 dBμV/m

Level [dBμV/m]



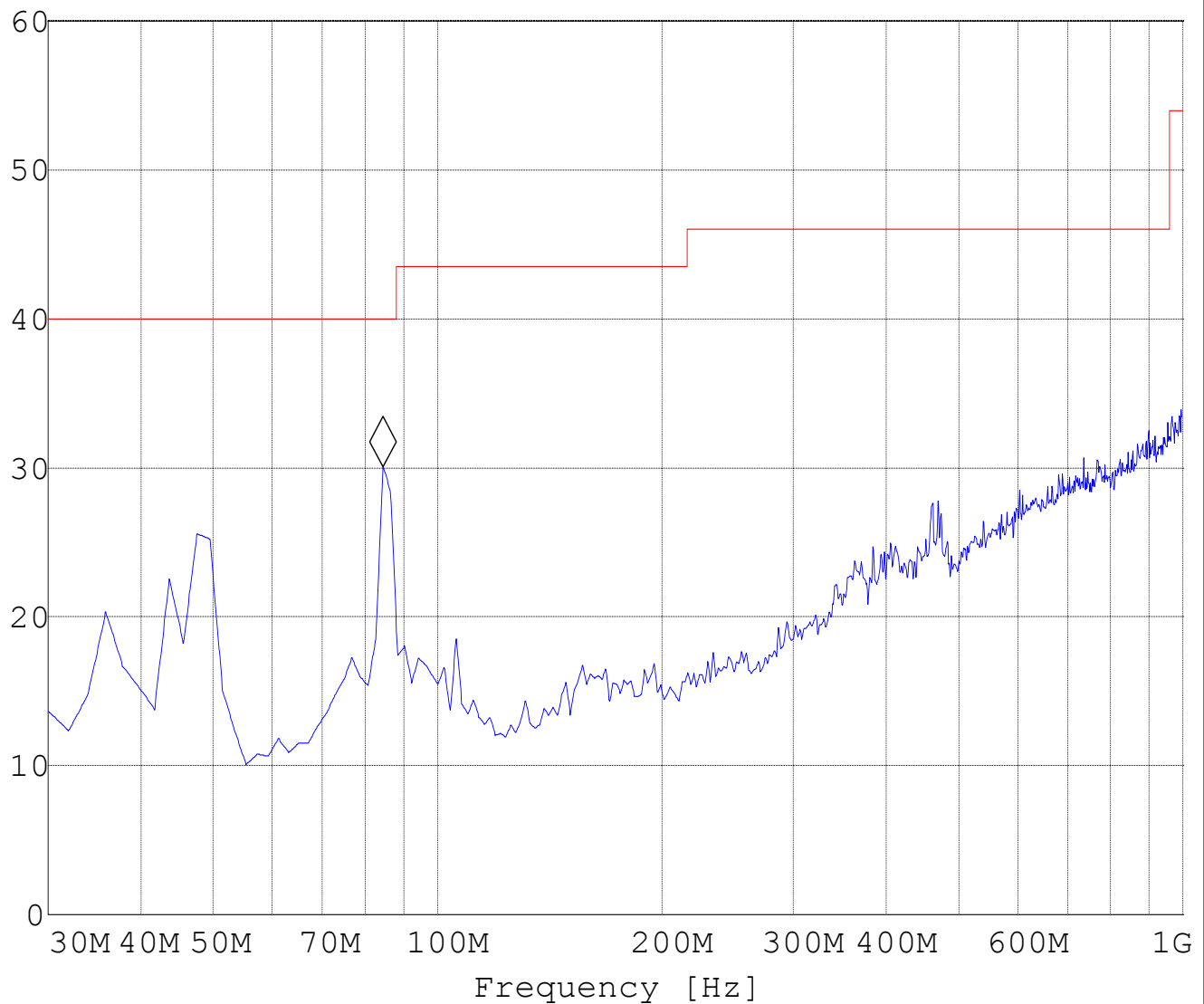
EMISSION LIMITATIONS - Radiated (Transmitter) Middle Channel(2440MHz): 30MHz – 1GHz

§ 15.247 (c) (1)

SWEEP TABLE:		"BT Spuri hi 30-1G"			
Short Description:		Bluetooth 30MHz-1GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency		Time	VBW	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186

Marker: 84.428858 MHz 30.06 dB μ V/m

Level [dB μ V/m]



EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

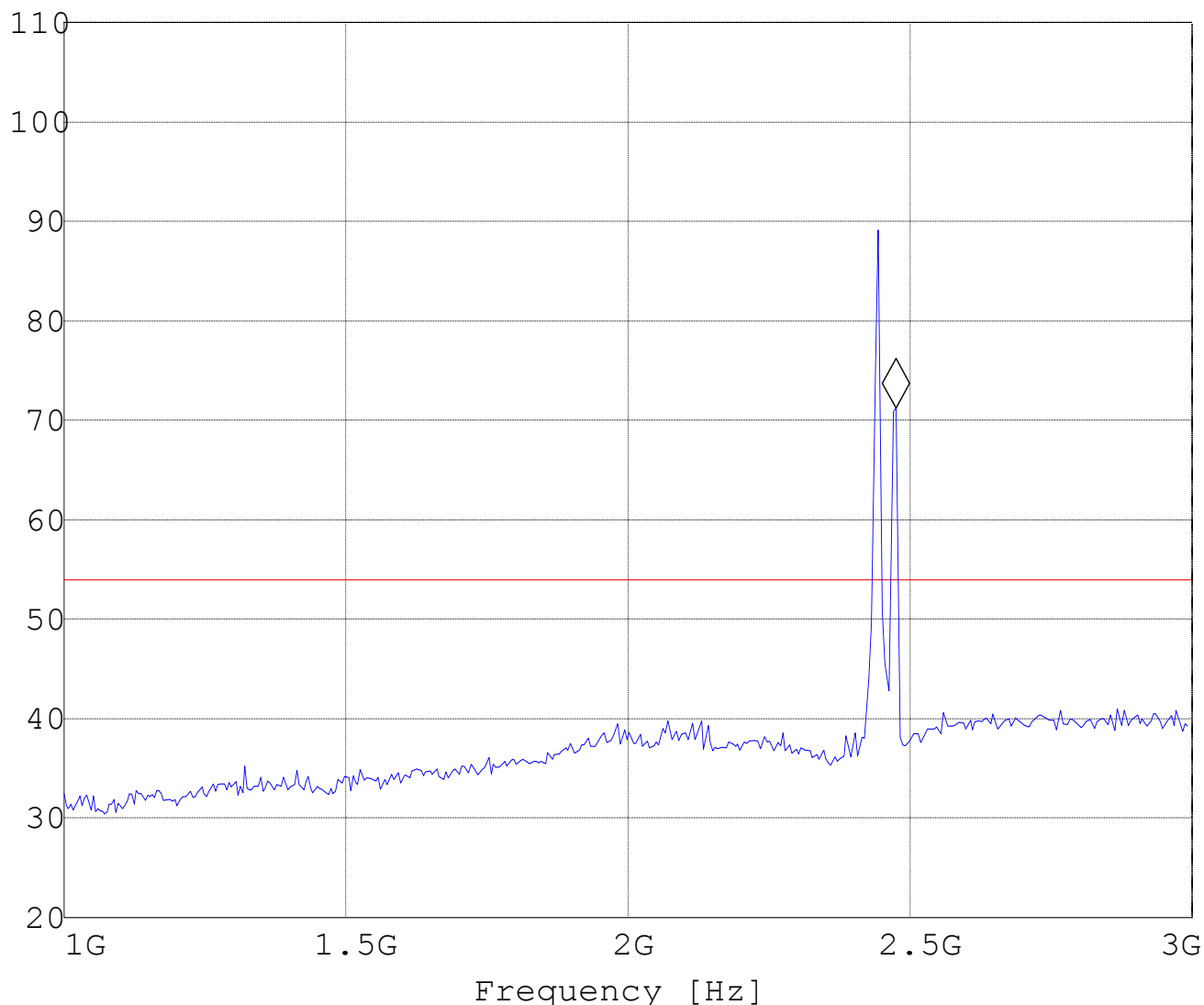
Middle Channel(2440MHz): 1GHz – 3GHz

NOTE: The peak above the limit is the carrier frequency. Marked frequency is downlink of our base station.

SWEEP TABLE:		"BT Spuri hi 1-8G"			
Short Description:		Bluetooth Spurious 1-8GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
1.0 GHz	8.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)

Marker: 2.4749499 GHz 71.2 dBμV/m

Level [dBμV/m]



EMISSION LIMITATIONS - Radiated (Transmitter)

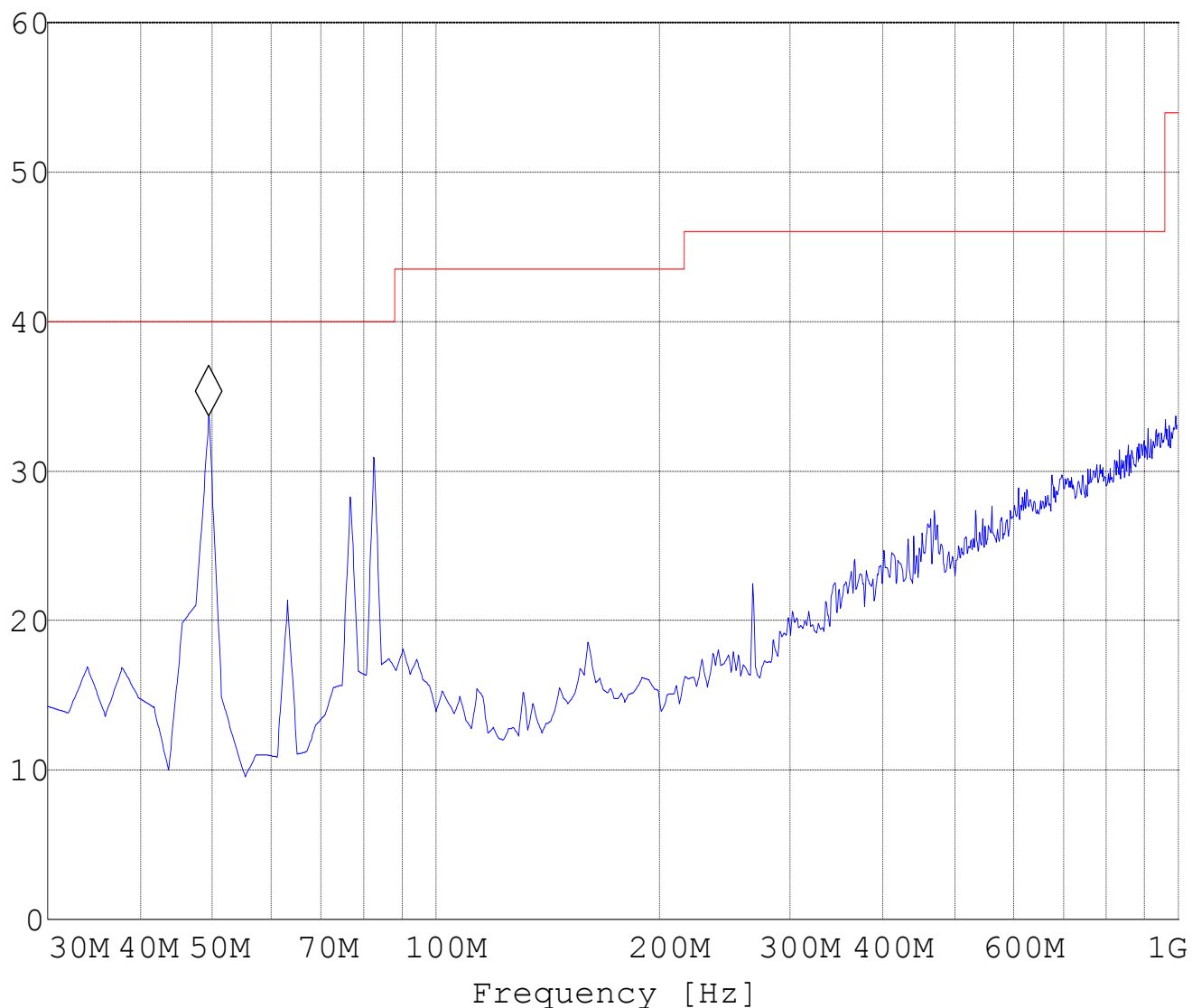
§ 15.247 (c) (1)

Highest Channel(2480MHz): 30MHz – 1GHz

SWEEP TABLE:		"BT Spuri hi 30-1G"			
Short Description:		Bluetooth 30MHz-1GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency		Time	VBW	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186

Marker: 49.438878 MHz 33.68 dBµV/m

Level [dBµV/m]



EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

Highest Channel(2480MHz): 1GHz – 3GHz

NOTE: The peak above the limit is the carrier frequency.

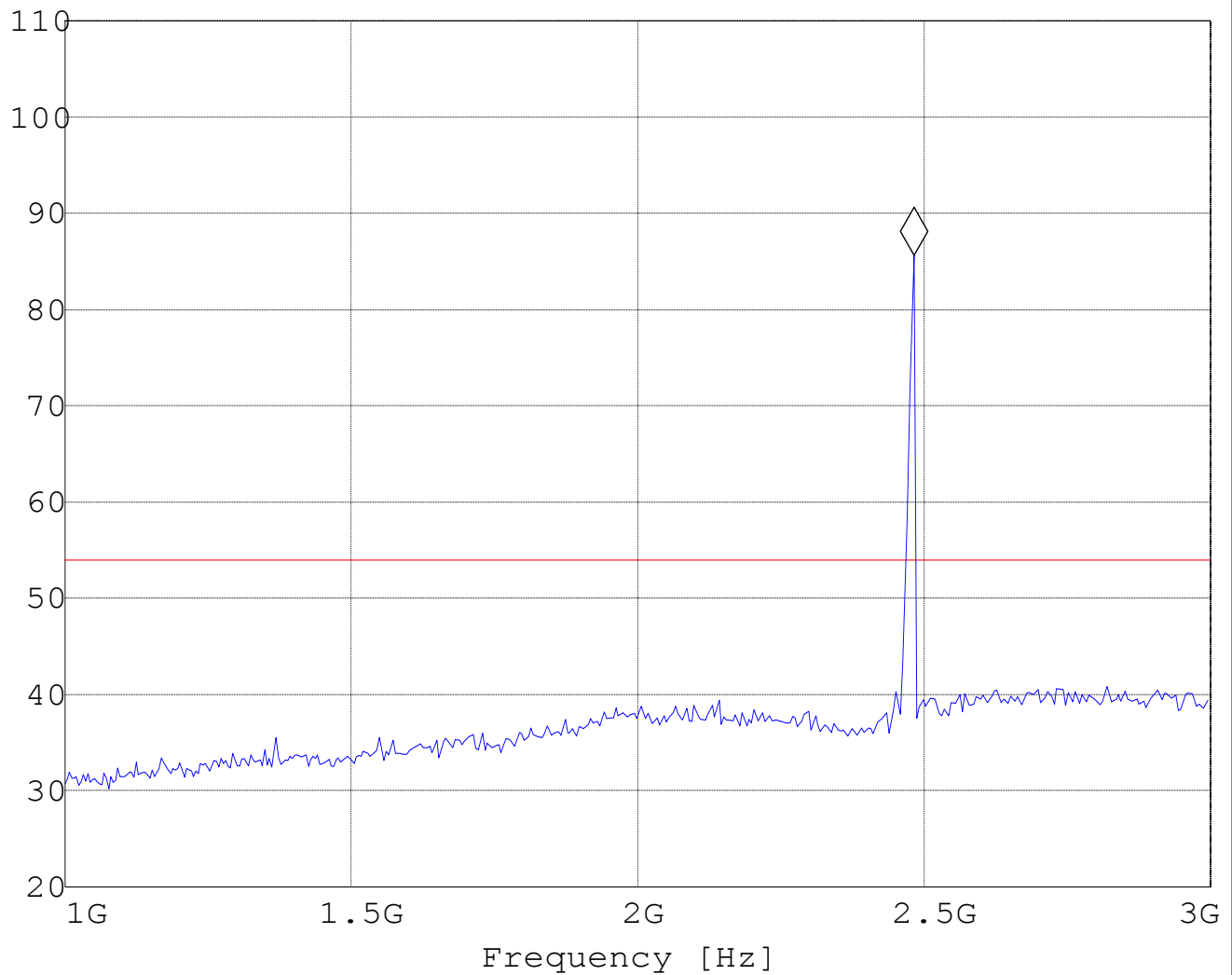
SWEEP TABLE: "BT Spuri hi 1-8G"

Short Description: Bluetooth Spurious 1-8GHz

Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
1.0 GHz	8.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)

Marker: 2.482965932 GHz 85.63 dBμV/m

Level [dBμV/m]



EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

3GHz – 18GHz

(This plot is valid for all three channels)

SWEEP TABLE:

"BT Spuri hi 8-18G"

Short Description:

Bluetooth Spurious 8-18GHz

Start Stop

Detector

Meas.

RBW

Transducer

Frequency Frequency

Time

Bandw.

VBW

8.0 GHz

18 GHz

MaxPeak

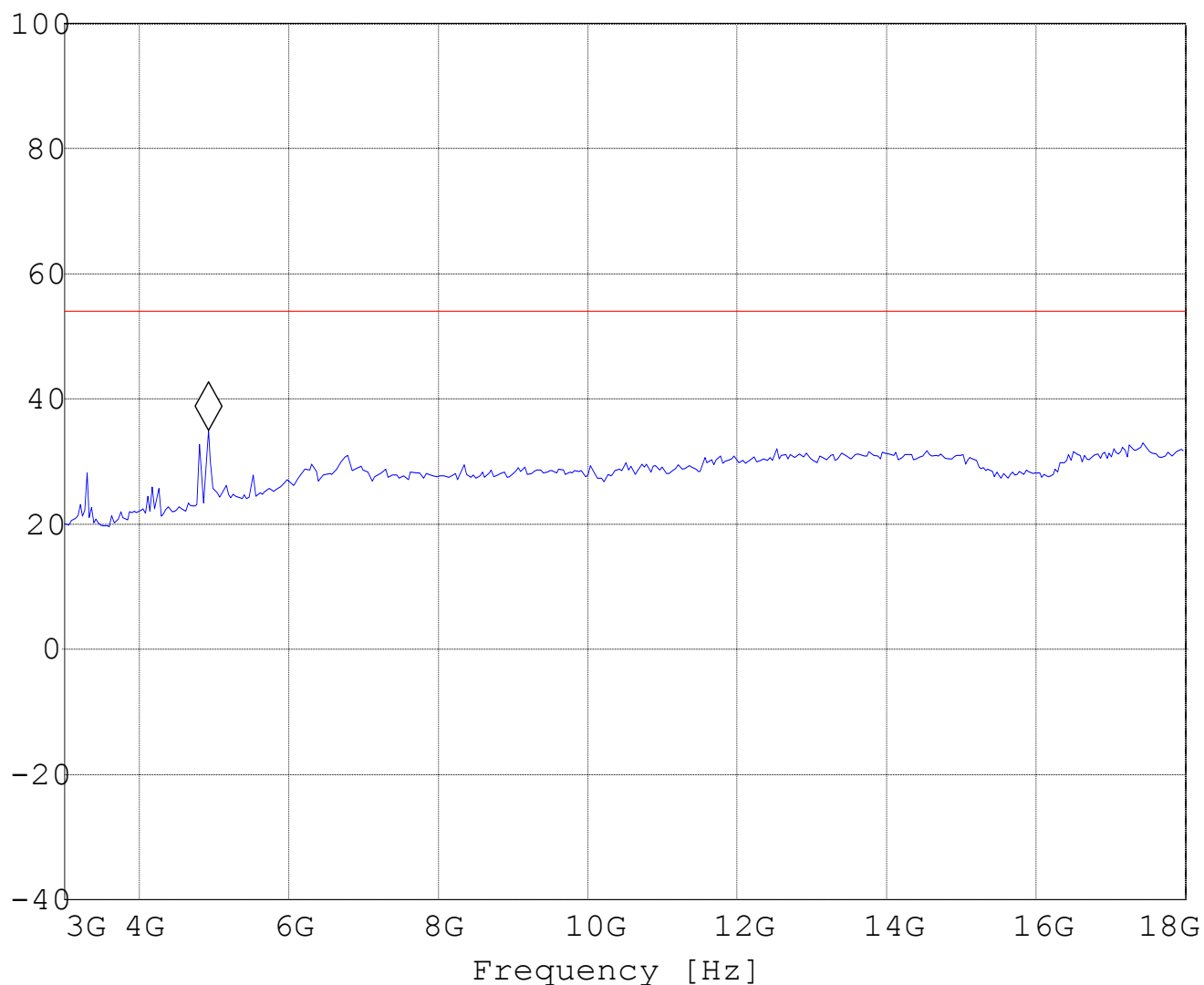
Coupled

1 MHz

#326 horn (dBi)

Marker: 4.923847695 GHz 34.99 dB μ V/m

Level [dB μ V/m]



EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

18GHz – 26.5GHz

(This plot is valid for all three channels)

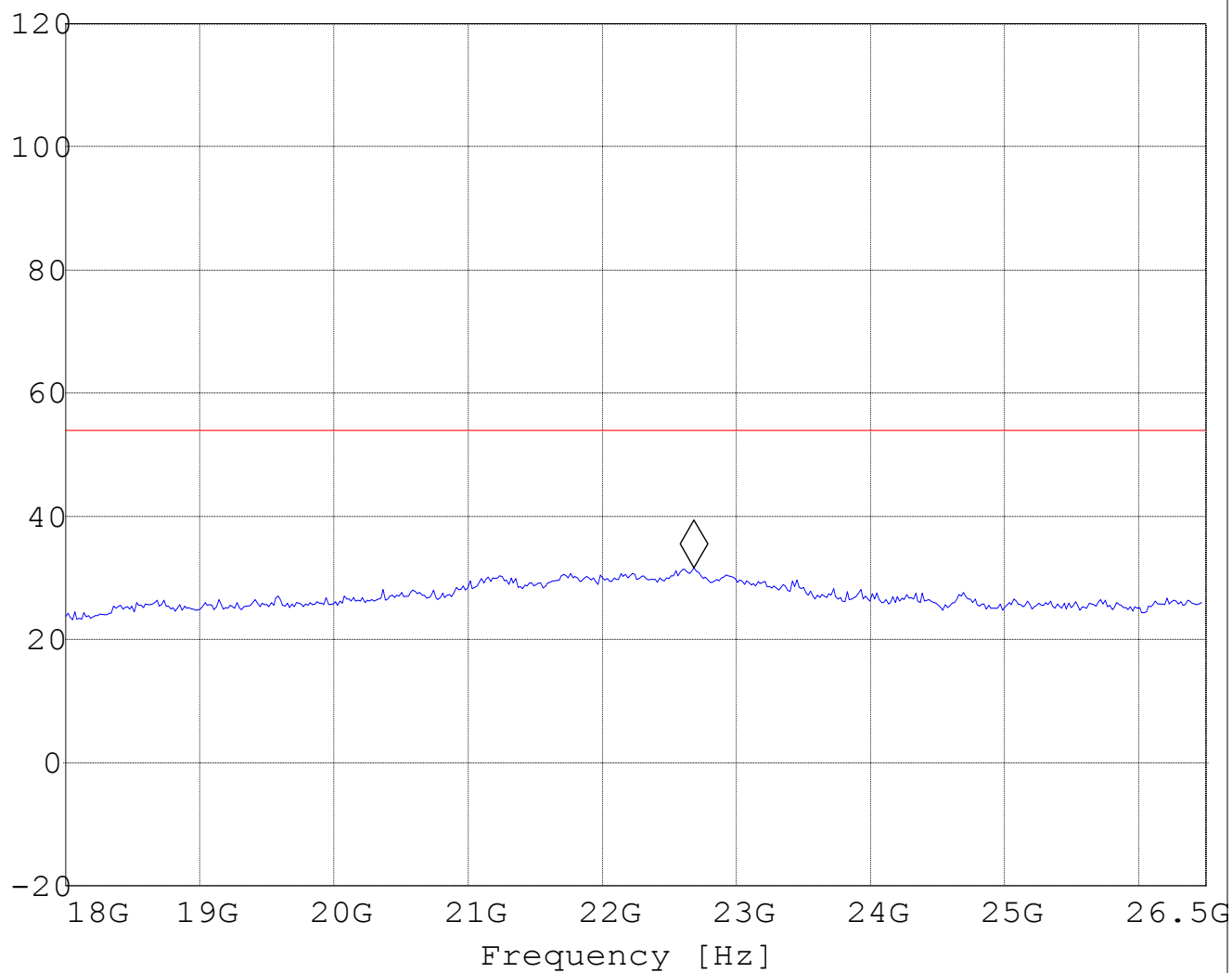
SWEEP TABLE: "BT Spuri hi 18-25G"

Short Description: Bluetooth Spurious 18-25GHz

Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
18 GHz	25 GHz	MaxPeak	Coupled	1 MHz	#141 horn (dBi)

Marker: 22.684368737 GHz 31.69 dBμV/m

Level [dBμV/m]



CONDUCTED EMISSIONS

§ 15.107/207

Measured with AC/DC power adapter

Technical specification : 15.107 / 15.207 (Revised as of August 20, 2002)

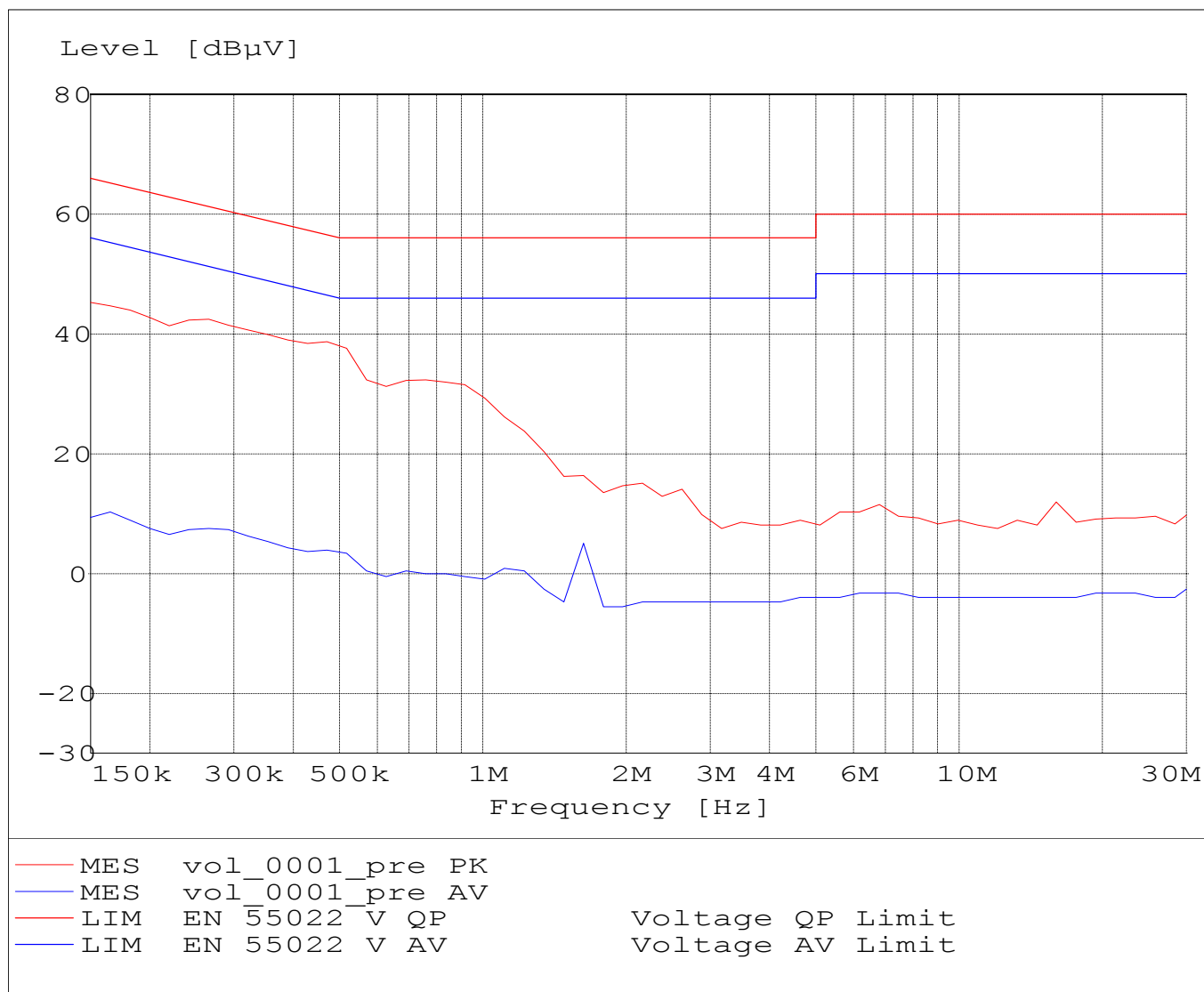
Limit

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



RECEIVER SPURIOUS RADIATION**§ 15.209****Limits**

Frequency (MHz)	Field strength ($\mu\text{V/m}$)	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:

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 18 and 25 GHz very short cable connections to the antenna was used to minimize the noise level.

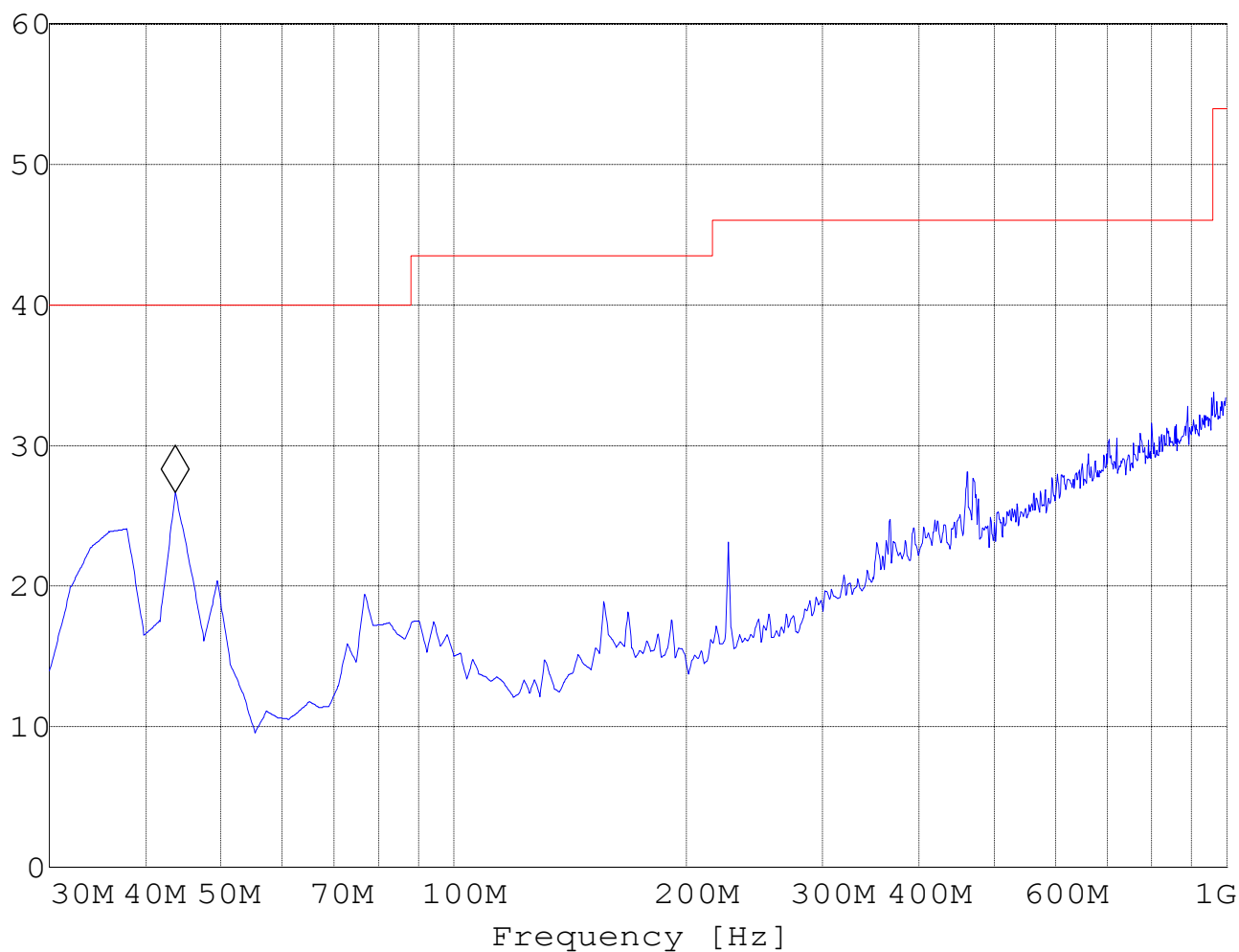
RECEIVER SPURIOUS RADIATION 30MHz – 1GHz

§ 15.209

SWEEP TABLE:		"BT Spuri hi 30-1G"			
Short Description:		Bluetooth 30MHz-1GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency		Time	VBW	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186

Marker: 43.607214 MHz 26.64 dBµV/m

Level [dBµV/m]



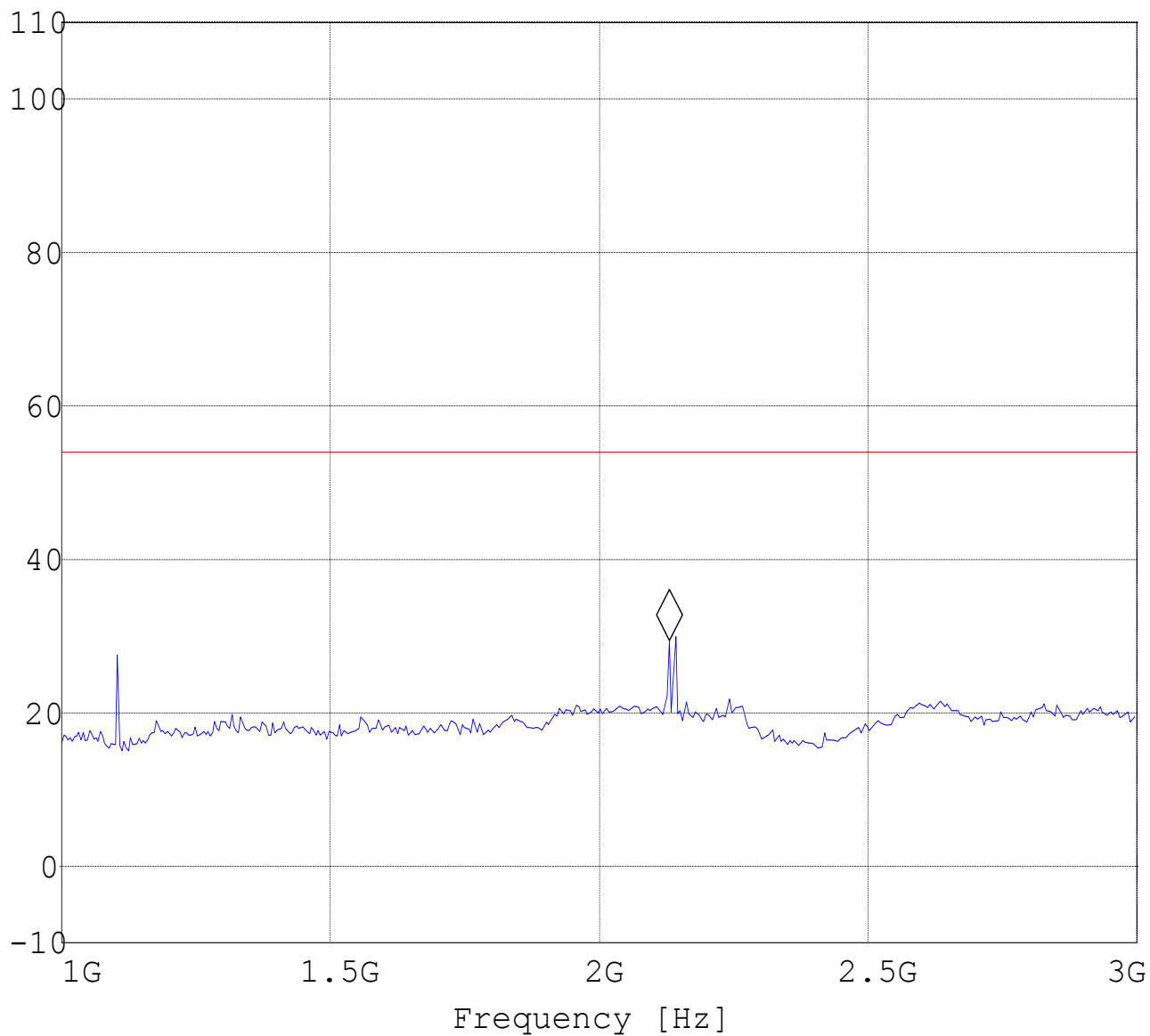
RECEIVER SPURIOUS RADIATION 1GHz – 3GHz

§ 15.209

SWEEP TABLE:		"BT Spuri hi 1-8G"			
Short Description:		Bluetooth Spurious 1-8 GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
1.0 GHz	8.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)

Marker: 2.130260521 GHz 29.46 dB μ V/m

Level [dB μ V/m]



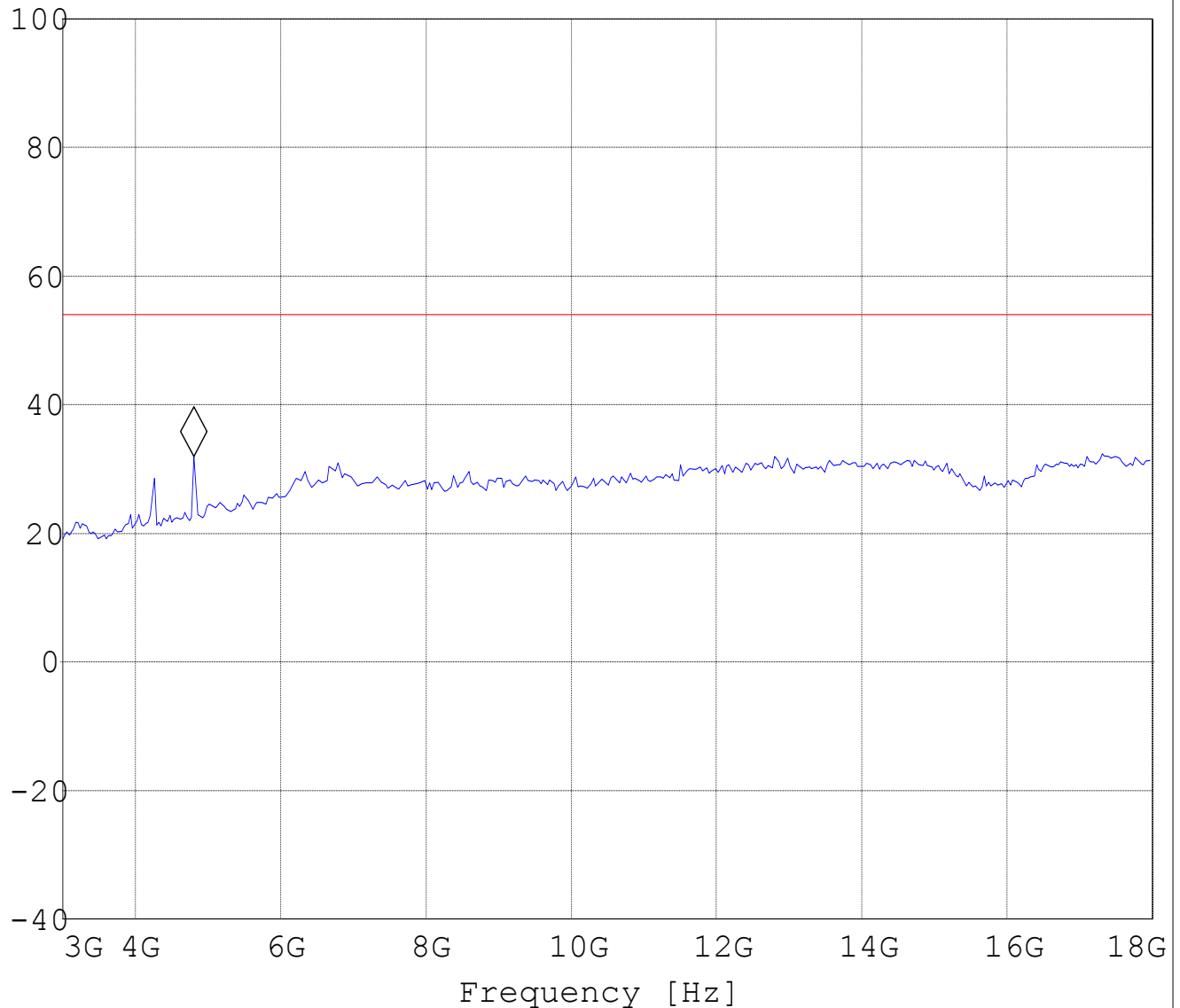
RECEIVER SPURIOUS RADIATION 3GHz – 18GHz

§ 15.209

SWEEP TABLE:		"BT Spuri hi 8-18G"			
Short Description:		Bluetooth Spurious 8-18GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
8.0 GHz	18 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)

Marker: 4.803607214 GHz 31.95 dB μ V/m

Level [dB μ V/m]



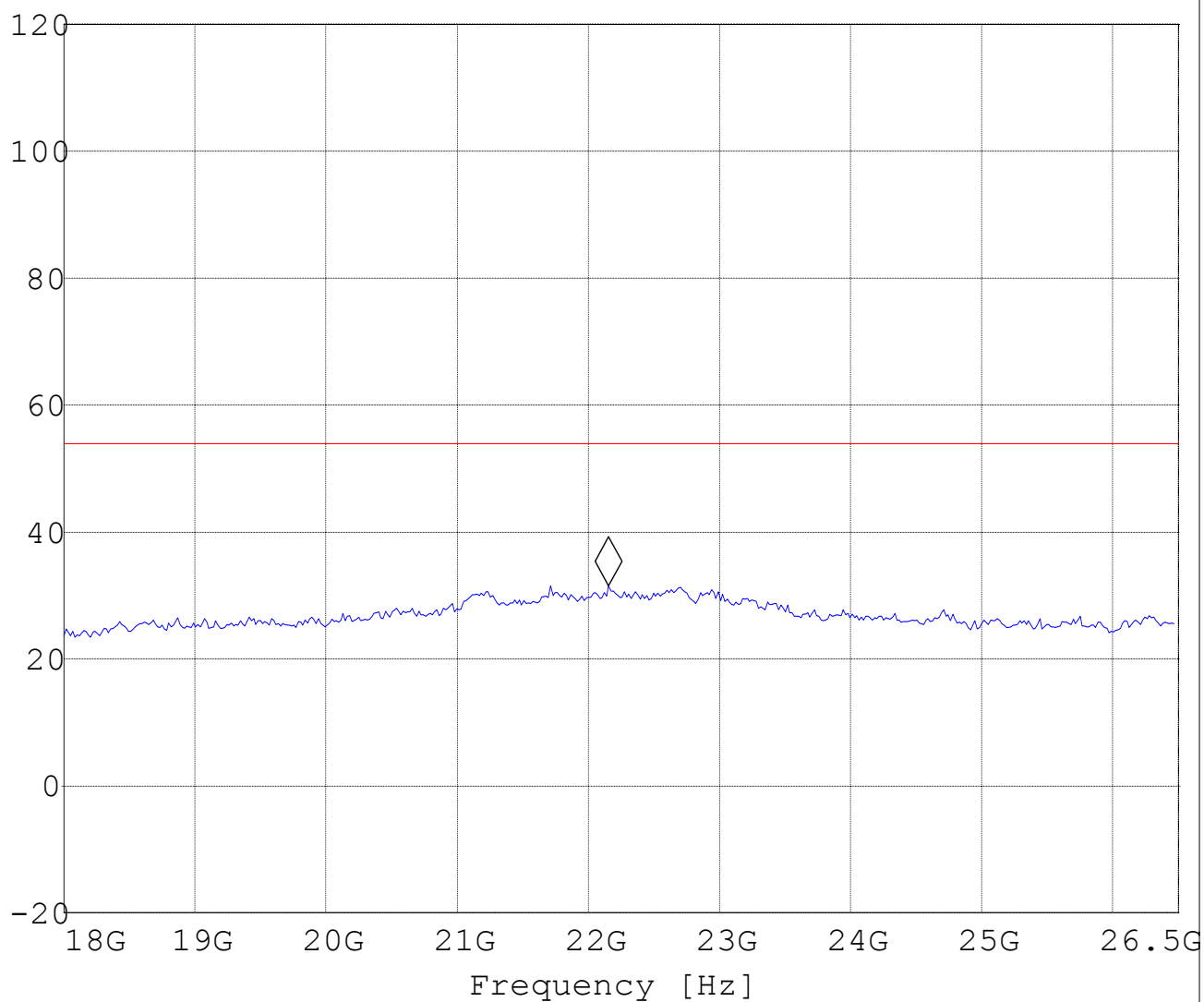
RECEIVER SPURIOUS RADIATION 18GHz – 26.5GHz

§ 15.209

SWEEP TABLE:		"BT Spuri hi 18-25G"			
Short Description:		Bluetooth Spurious 18-25GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
18 GHz	25 GHz	MaxPeak	Coupled	1 MHz	#141 horn (dBi)

Marker: 22.156312625 GHz 31.5 dB μ V/m

Level [dB μ V/m]

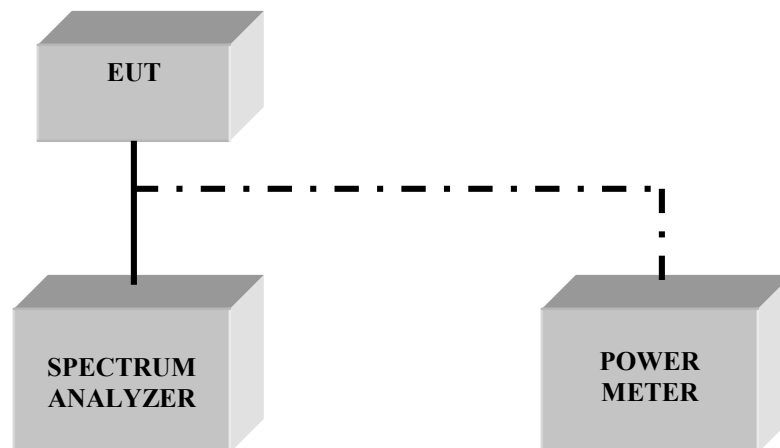


TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal due date
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	6/4/2003
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	826880/010	5/1/2003
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	5/1/2003
06	Biconilog Antenna	3141	EMCO	0005-1186	11/3/2003
07	Horn Antenna	SAS-200/571	AH Systems	325	8/12/2003
11	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	5/1/2003
12	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	2/28/2003

This list shows all the devices used for testing.

BLOCK DIAGRAMS
Conducted Testing



Radiated Testing

ANECHOIC CHAMBER

