



FCC Test Report

Test report no.: EMC_521FCC15.247_2003_SX1

FCC Part 15.247 for FHSS systems / CANADA RSS-210

Model: (SX1)

FCC ID: PWX-SX1

IC ID: 267E-SX1



TTI-P-G 081/94-A0

Accredited according to **ISO/IEC 17025**



FCC listed # 101450

IC recognized # 3925

CETECOM Inc.

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Table of Contents

1	General information
1.1	Notes
1.2	Testing laboratory
1.3	Details of applicant
1.4	Application details
1.5	Test item
1.6	Test standards
2	Technical test
2.1	Summary of test results
2.2	Test report
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: Harpreet Sidhu**

1.2 Testing laboratory
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Internet: www.cetecom.com

1.3 Details of applicant

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Street : 16745 West Bernardo Drive
City / Zip Code : San Diego CA 92127
Country : U.S.A
Contact : David McPherson
Telephone : +1 858-521-3387
Tele-fax : +1 858-521-3106
e-mail : david.mcpherson@icm.siemens.com

1.4 Application details

Date of receipt test item : 2003-07-16
Date of test : 2003-07-16/18/21

1.5 Test item

Manufacturer : SIEMENS
Street Address : Suedstr. 9
City / Zip Code : 47475 Kamp-Lintfort
Country : Germany
Marketing Name : SX1
Model No. : SX1
Description : [GSM 1900 Mobile Phone with Bluetooth](#)
FCC-ID : PWX-SX1
IC ID : 267E-SX1

Additional information

Frequency : 2402MHz – 2480MHz
Type of modulation : GFSK
Number of channels : 79
Antenna : Embedded
Power supply : Battery (AC adaptor)
Output power : 1.59dBm (1.442mW) conducted peak power
Extreme vol. Limits : 3.6VDC to 4.5VDC (nominal: 4.0VDC)
Extreme temp. Tolerance : -30°C to +50°C

1.6 Test standards: FCC Part 15 §15.247 (DA00-705) / RSS 210

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:

2003-07-30 EMC & Radio

Siegfried Lehmann
(Technical Manager)



Date

Section

Name

Signature

Responsible for test report and project leader:

2003-07-30 EMC & Radio

Harpreet Sidhu (EMC Engineer)



Date

Section

Name

Signature

2.2 Test report

TEST REPORT

**Test report no.: EMC_521FCC15.247_2003_SX1
(Model: SX1)**

TEST REPORT REFERENCE

LIST OF MEASUREMENTS		PAGE
CARRIER FREQUENCY SEPERATION	§15.247(a)	7
NUMBER OF HOPPING CHANNELS	§15.247(a)	8
TIME OF OCCUPANCY (DWELL TIME)	§15.247(a)	12
SPECTRUM BANDWIDTH OF FHSS SYSTEM	§15.247(a)	15
POWER SPECTRAL DENSITY	§15.247 (d)	19
MAXIMUM PEAK OUTPUT POWER	§ 15.247 (b) (1)	23
BAND EDGE COMPLIANCE	§15.247 (c)	31
EMISSION LIMITATIONS	§ 15.247 (c) (1)	35
CONDUCTED EMISSIONS	§ 15.107/207	49
RECEIVER SPURIOUS RADIATION	§ 15.209	51
TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS		56
BLOCK DIAGRAMS		57

CARRIER FREQUENCY SEPERATION

§15.247(a)



Marker 1 [T1]

RBW 30 kHz

RF Att 30 dB

Ref Lvl

-0.64 dBm

VBW 100 kHz

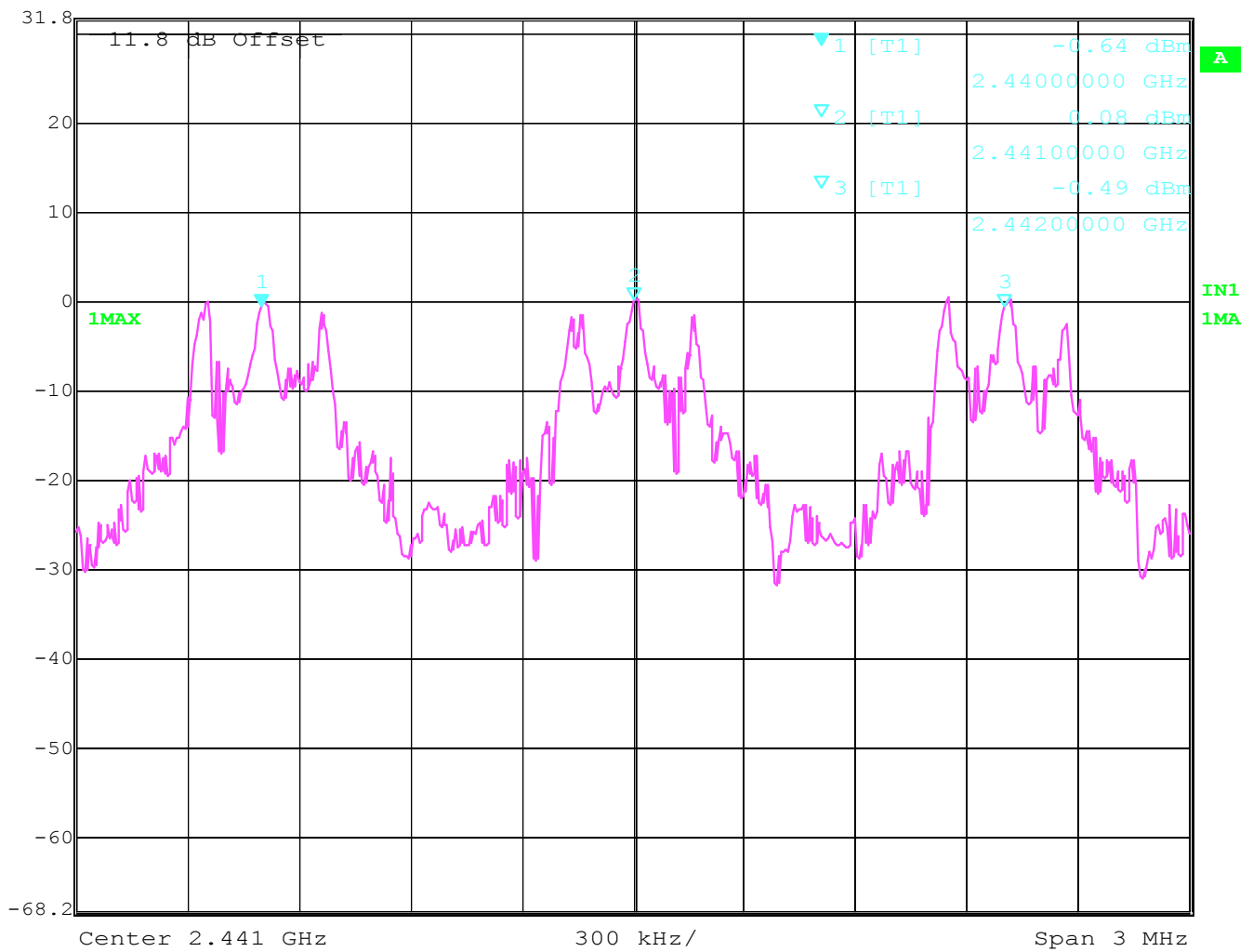
31.8 dBm

2.44000000 GHz

SWT 8.5 ms

Unit

dBm



Date: 18.JUL.2003 15:25:50

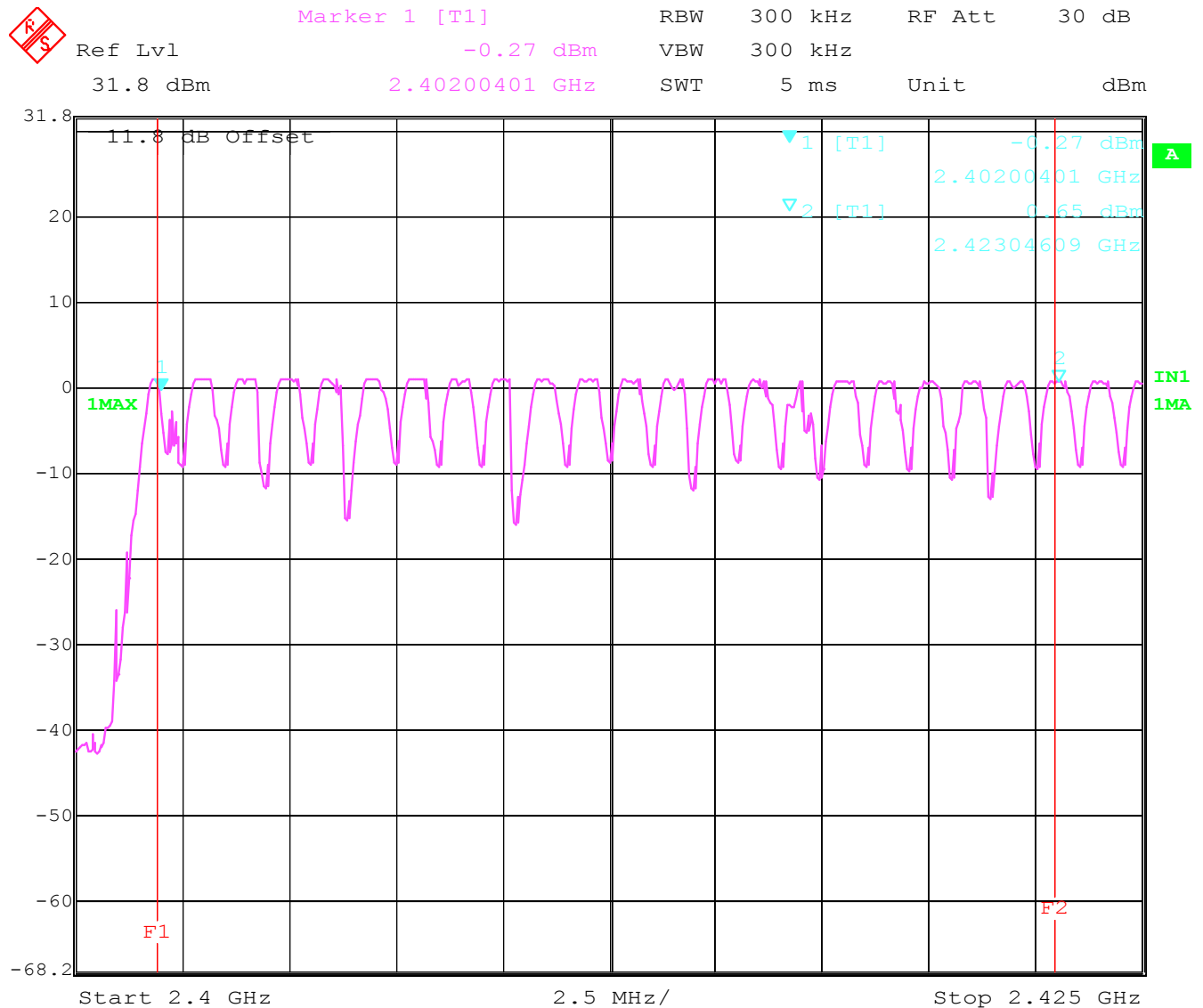
NUMBER OF HOPPING CHANNELS

§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 23



Date: 18.JUL.2003 15:29:31

Plot 2: Total 25



Marker 2 [T1]

RBW 300 kHz RF Att 30 dB

Ref Lvl 0.64 dBm

VBW 300 kHz

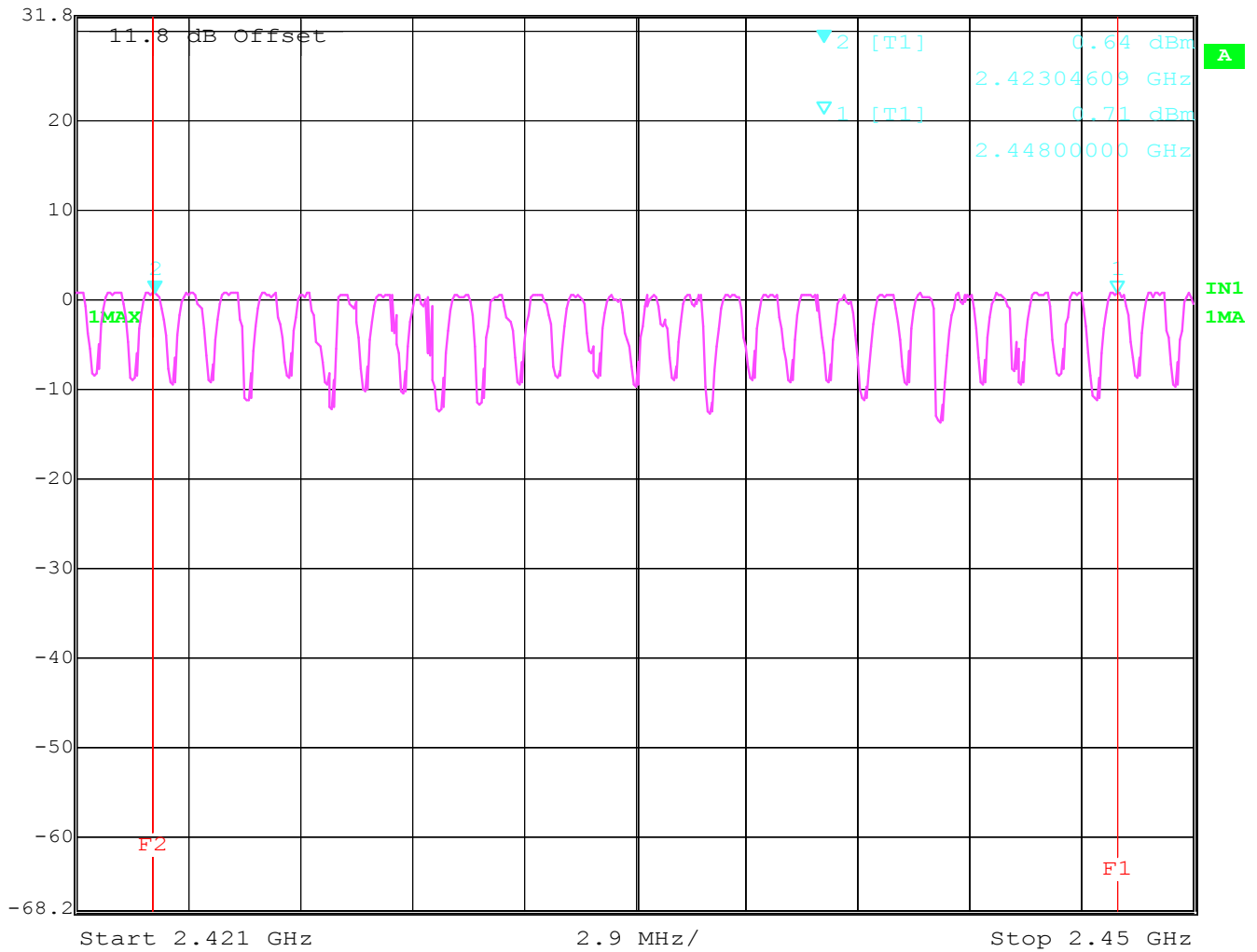
31.8 dBm

2.42304609 GHz

SWT 5 ms

Unit

dBm



Date: 18.JUL.2003 15:32:53

Plot 3: Total 21



Marker 1 [T1]

RBW 300 kHz RF Att 30 dB

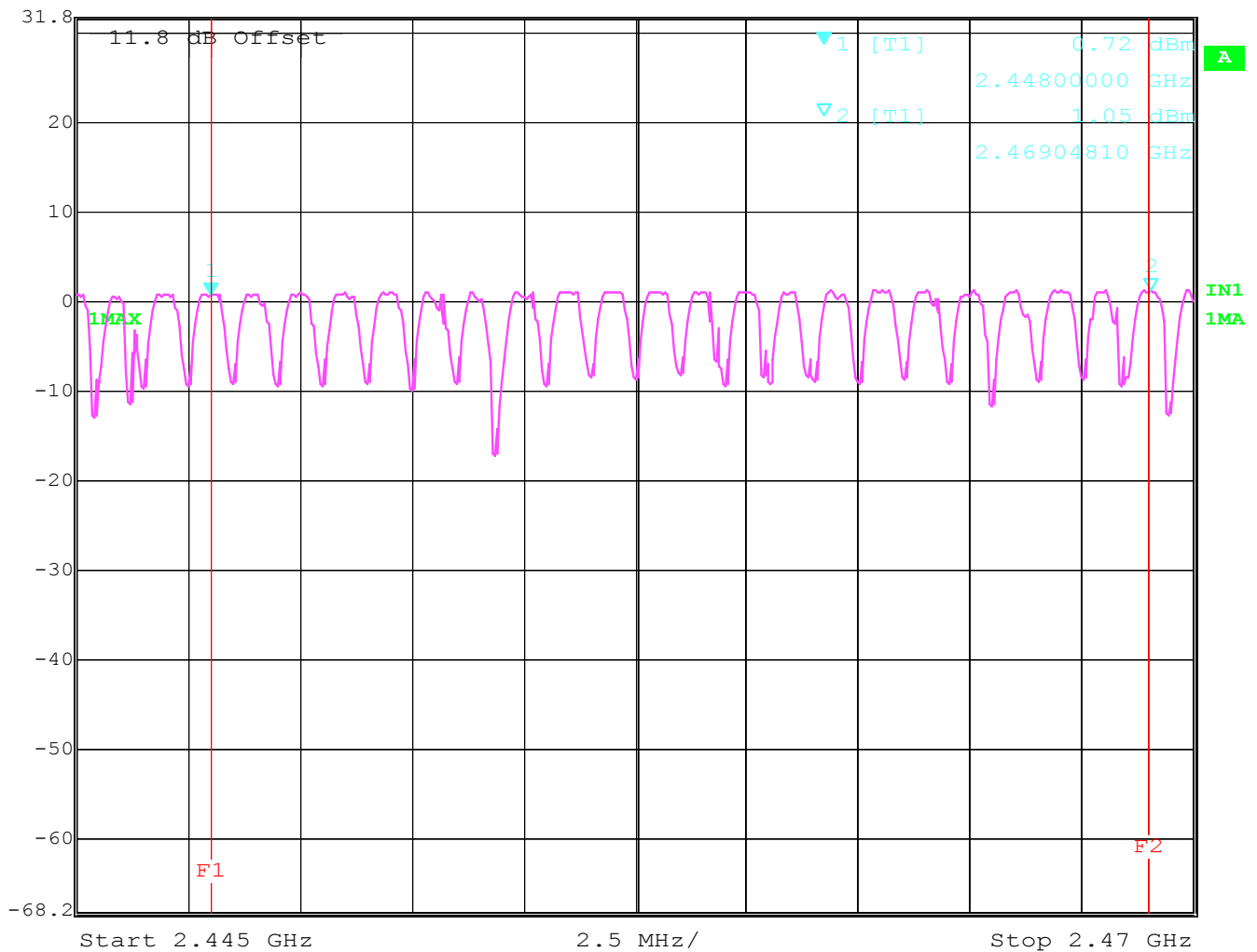
Ref Lvl 0.72 dBm

VBW 300 kHz

31.8 dBm 2.44800000 GHz

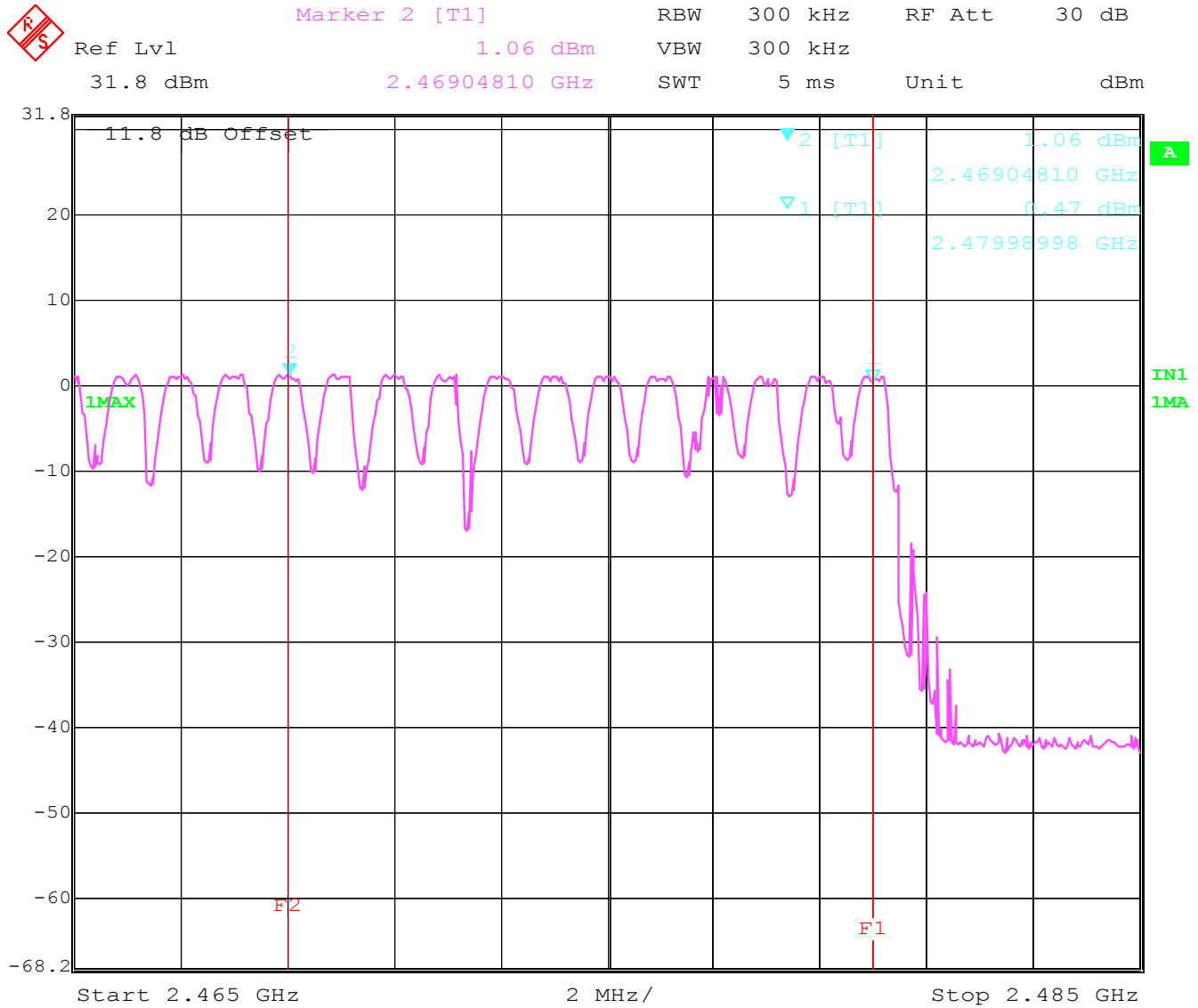
SWT 5 ms

Unit dBm



Date: 18.JUL.2003 15:35:50

Plot 4: Total 11



Date: 18.JUL.2003 15:38:27

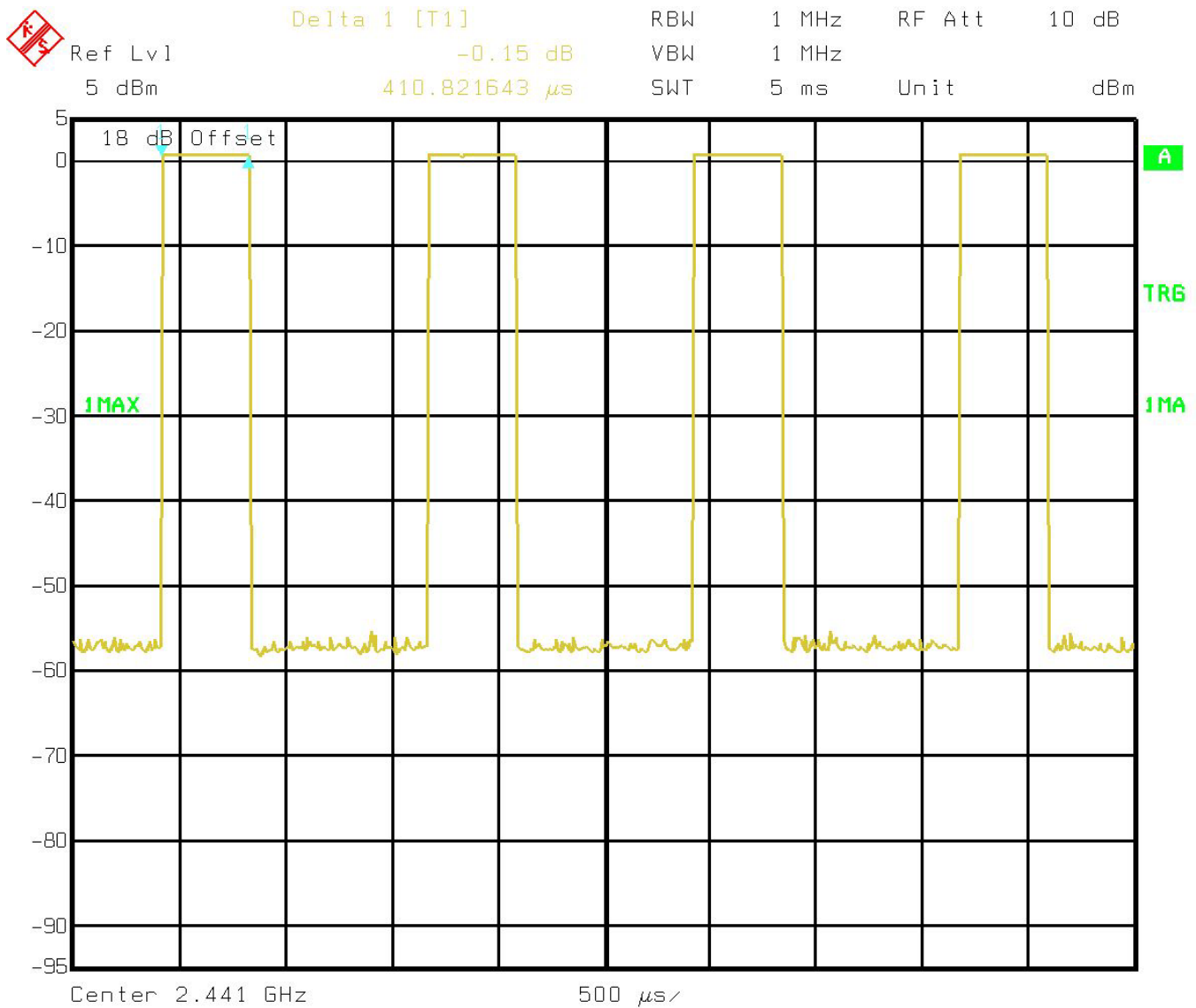
TIME OF OCCUPANCY (DWELL TIME) DH1 – Packet

§15.247(a)

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 31.6 seconds you have 320.10 times of appearance.

Each Tx-time per appearance is 420.84µs.

So we have $320.10 * 410.82\mu s = 131.50ms$ per 31.6 seconds.



Date: 4.JUL.2003 16:16:21

TIME OF OCCUPANCY (DWELL TIME)

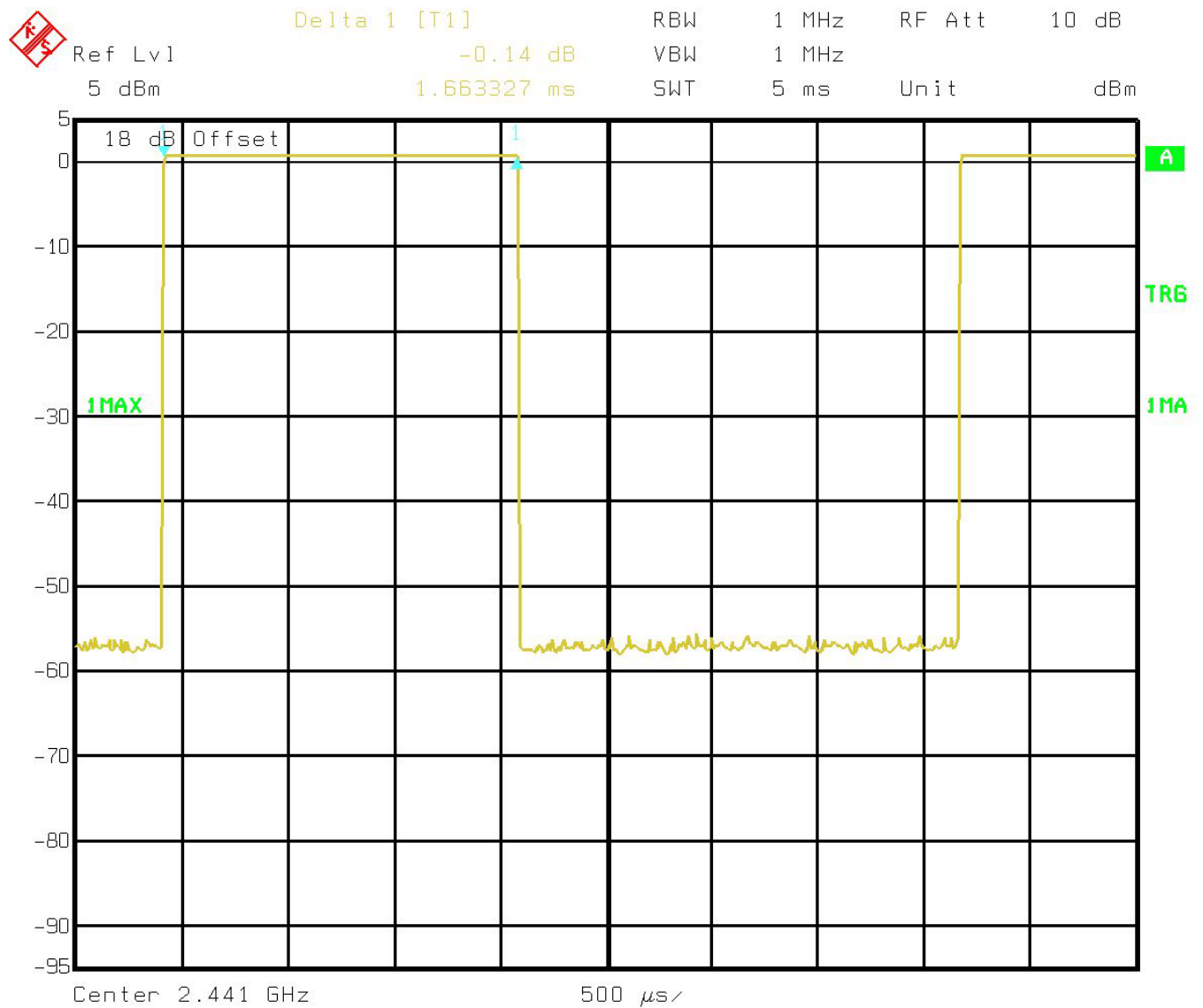
§15.247(a)

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 31.6 seconds you have 161.16 times of appearance.

Each Tx-time per appearance is 1.66ms.

So we have $161.16 * 1.66\text{ms} = 267.52\text{ms}$ per 31.6 seconds.



Date: 4.JUL.2003 16:14:22

TIME OF OCCUPANCY (DWELL TIME)

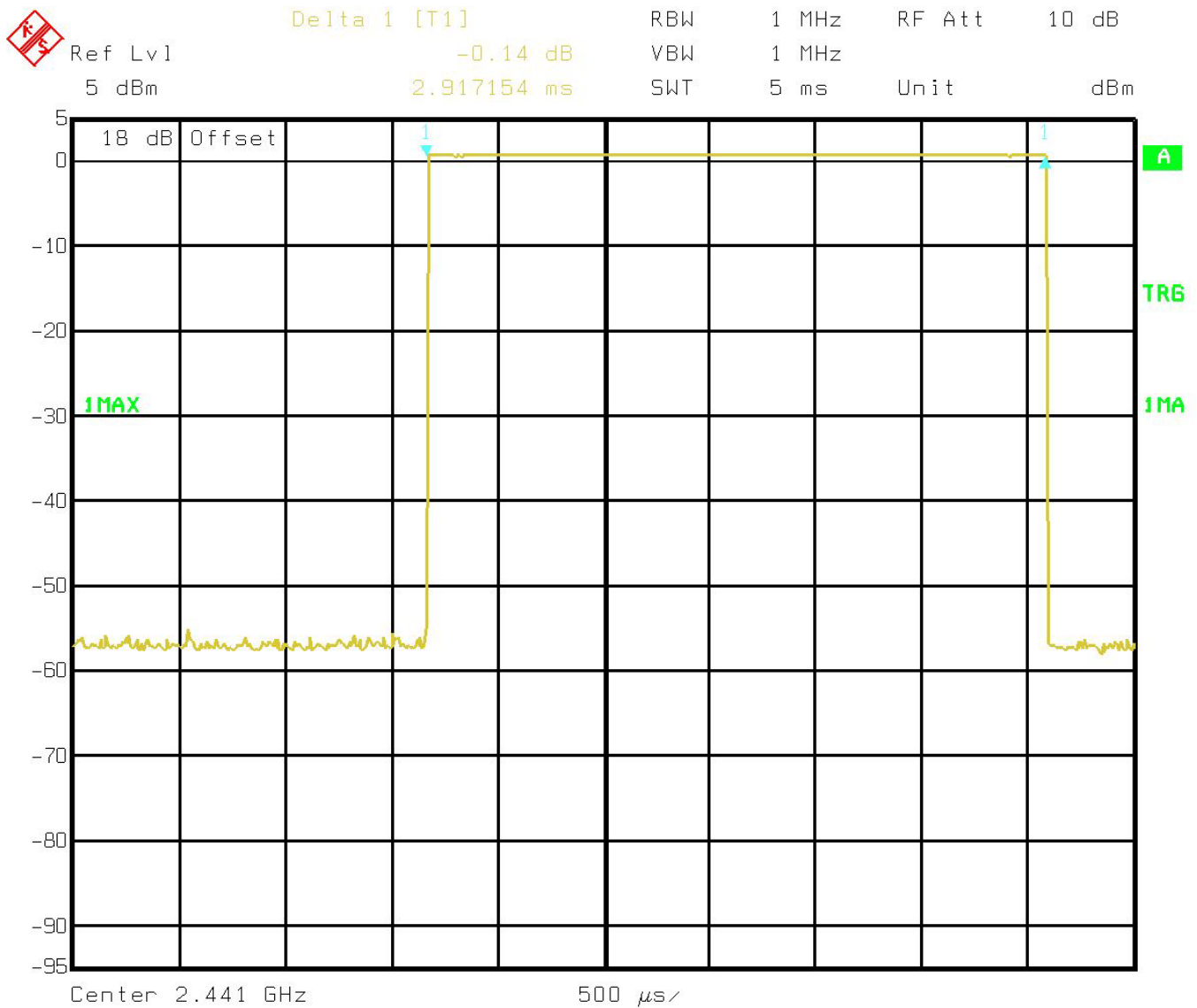
§15.247(a)

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 31.6 seconds you have 106.176 times of appearance.

Each Tx-time per appearance is 2.917ms.

So we have $106.176 * 2.917\text{ms} = 309.71\text{ms}$ per 31.6 seconds.



Date: 4.JUL.2003 16:12:42

SPECTRUM BANDWIDTH OF FHSS SYSTEM
20 dB bandwidth**§15.247(a)**

TEST CONDITIONS		20 dB BANDWIDTH (kHz)		
Frequency (MHz)		2402	2441	2480
T _{nom} (23)°C	V _{nom} (4.0)VDC	681.36	681.36	677.35

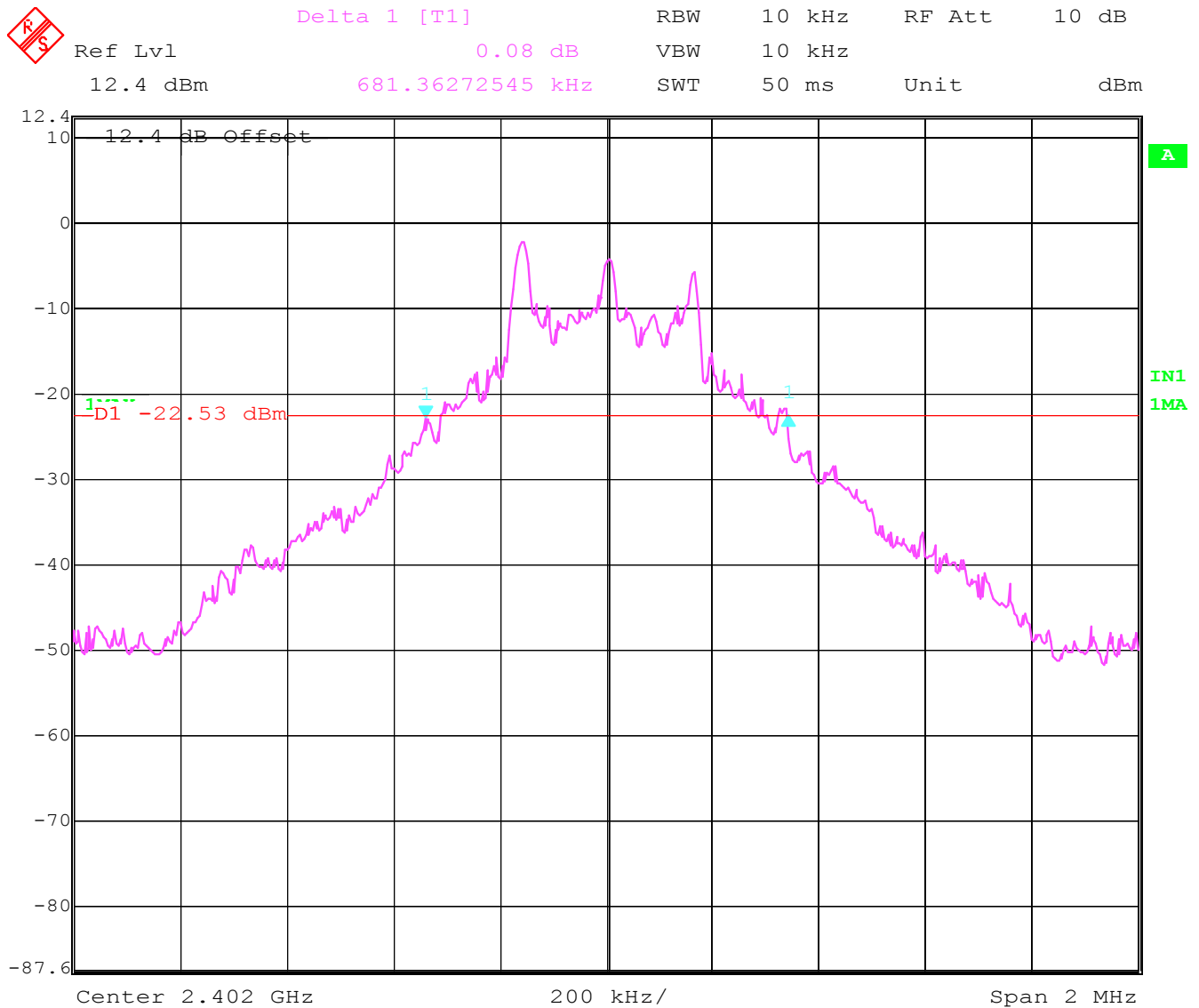
RBW / VBW as provided in the "Measurement Guidelines" (DA 00-705, March 30, 2000)

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

SPECTRUM BANDWIDTH OF FHSS SYSTEM 20 dB bandwidth

§15.247(a)

Lowest Channel: 2402MHz



Date: 18.JUL.2003 14:41:55

SPECTRUM BANDWIDTH OF FHSS SYSTEM 20 dB bandwidth

§15.247(a)

Mid Channel: 2441MHz



Delta 1 [T1]

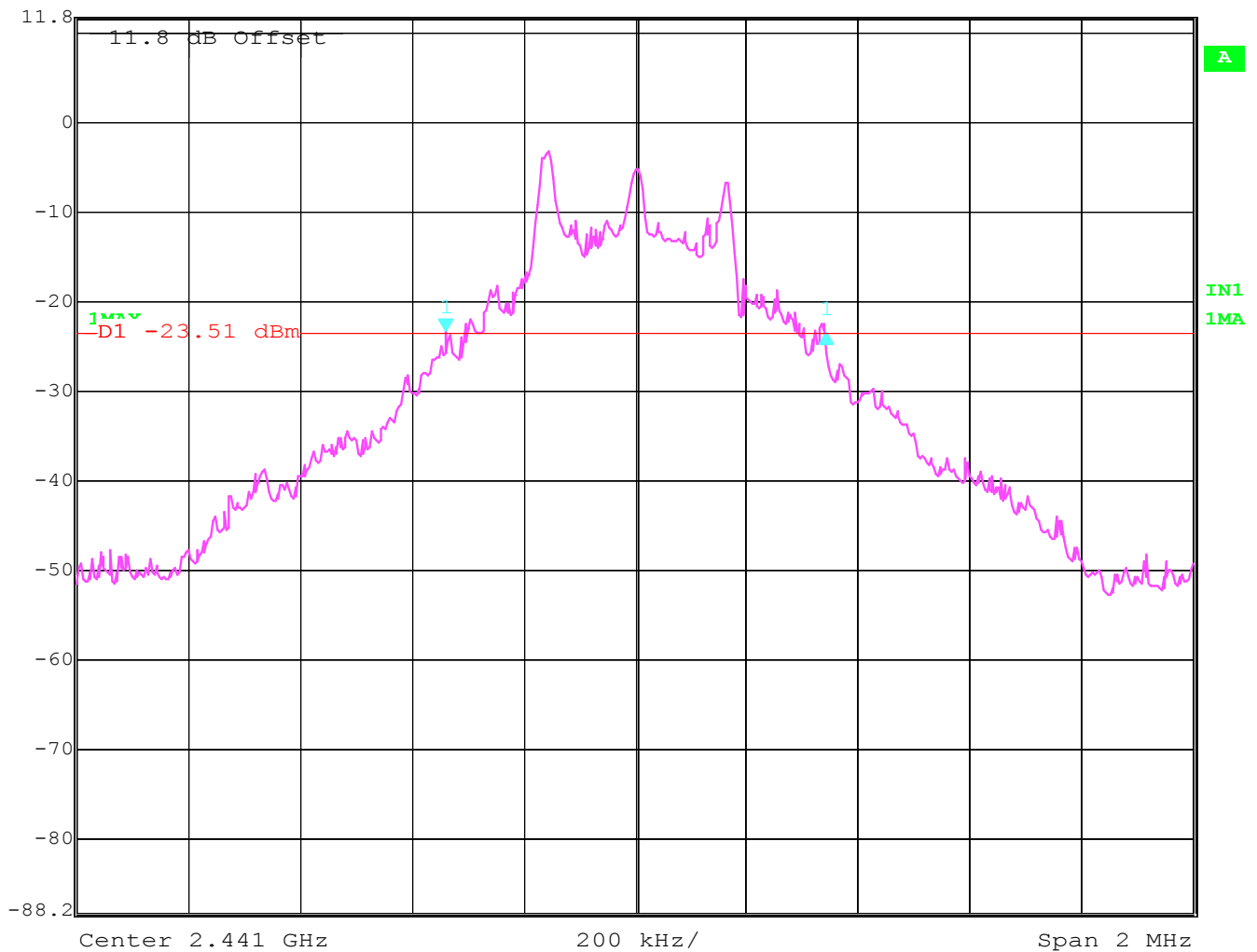
RBW 10 kHz RF Att 10 dB

Ref Lvl -0.19 dB

VBW 10 kHz

11.8 dBm 681.36272545 kHz

SWT 50 ms Unit dBm

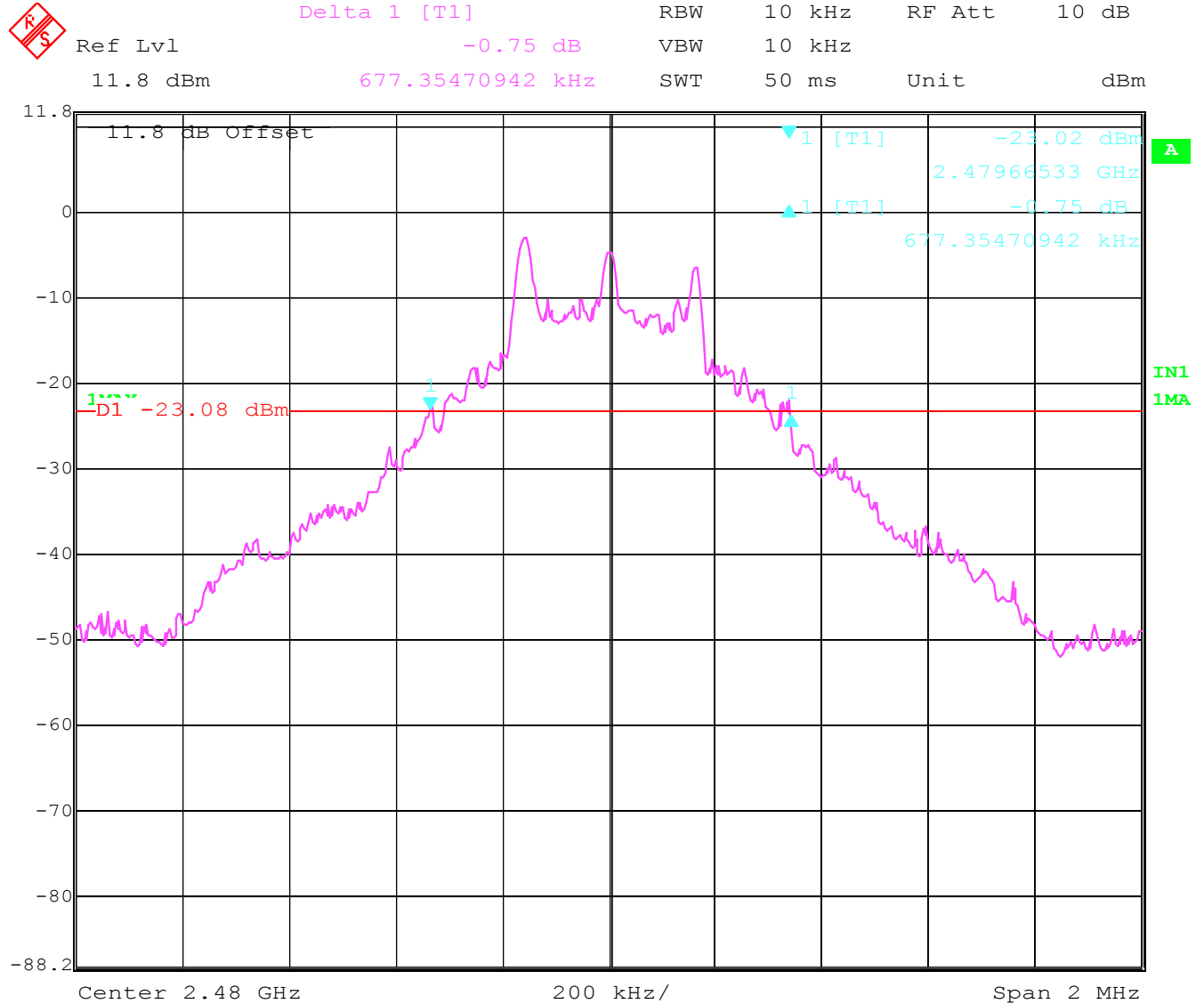


Date: 18.JUL.2003 14:58:20

SPECTRUM BANDWIDTH OF FHSS SYSTEM 20 dB bandwidth

§15.247(a)

Highest Channel: 2480MHz



Date: 18.JUL.2003 15:12:15

POWER SPECTRAL DENSITY**§15.247 (d)**

TEST CONDITIONS		POWER SPECTRAL DENSITY (dBm)		
Frequency (MHz)		2402	2441	2480
T _{nom} (23)°C	V _{nom} (4.0)VDC	-10.40	-10.57	-10.71

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



Marker 1 [T1]

RBW 3 kHz RF Att 10 dB

Ref Lvl -10.40 dBm

VBW 3 kHz

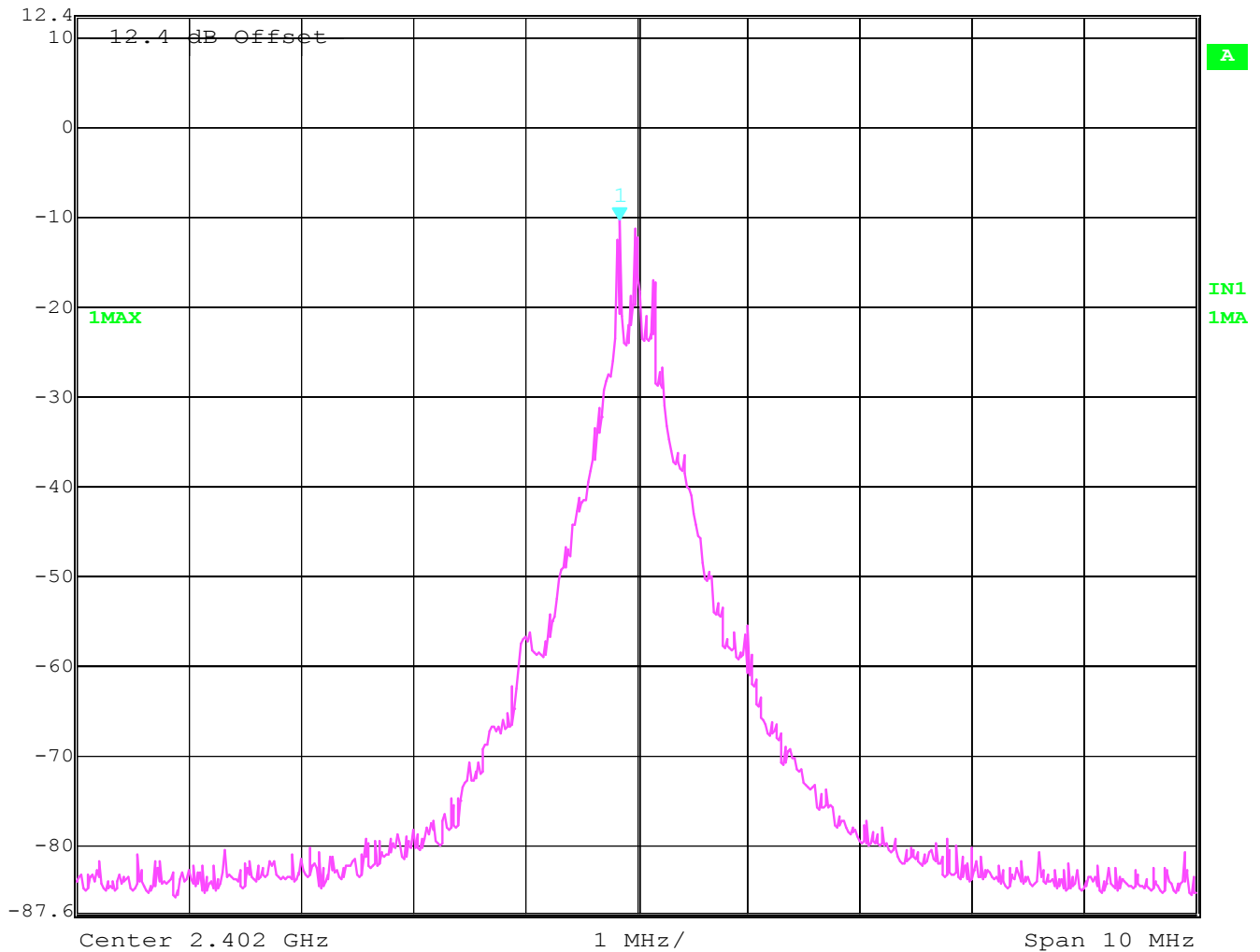
12.4 dBm

2.40184970 GHz

SWT 2.8 s

Unit

dBm



Date: 18.JUL.2003 14:47:56

POWER SPECTRAL DENSITY

§15.247(d)

Middle Channel: 2441MHz



Marker 1 [T1]

RBW 3 kHz RF Att 10 dB

Ref Lvl -10.57 dBm

VBW 3 kHz

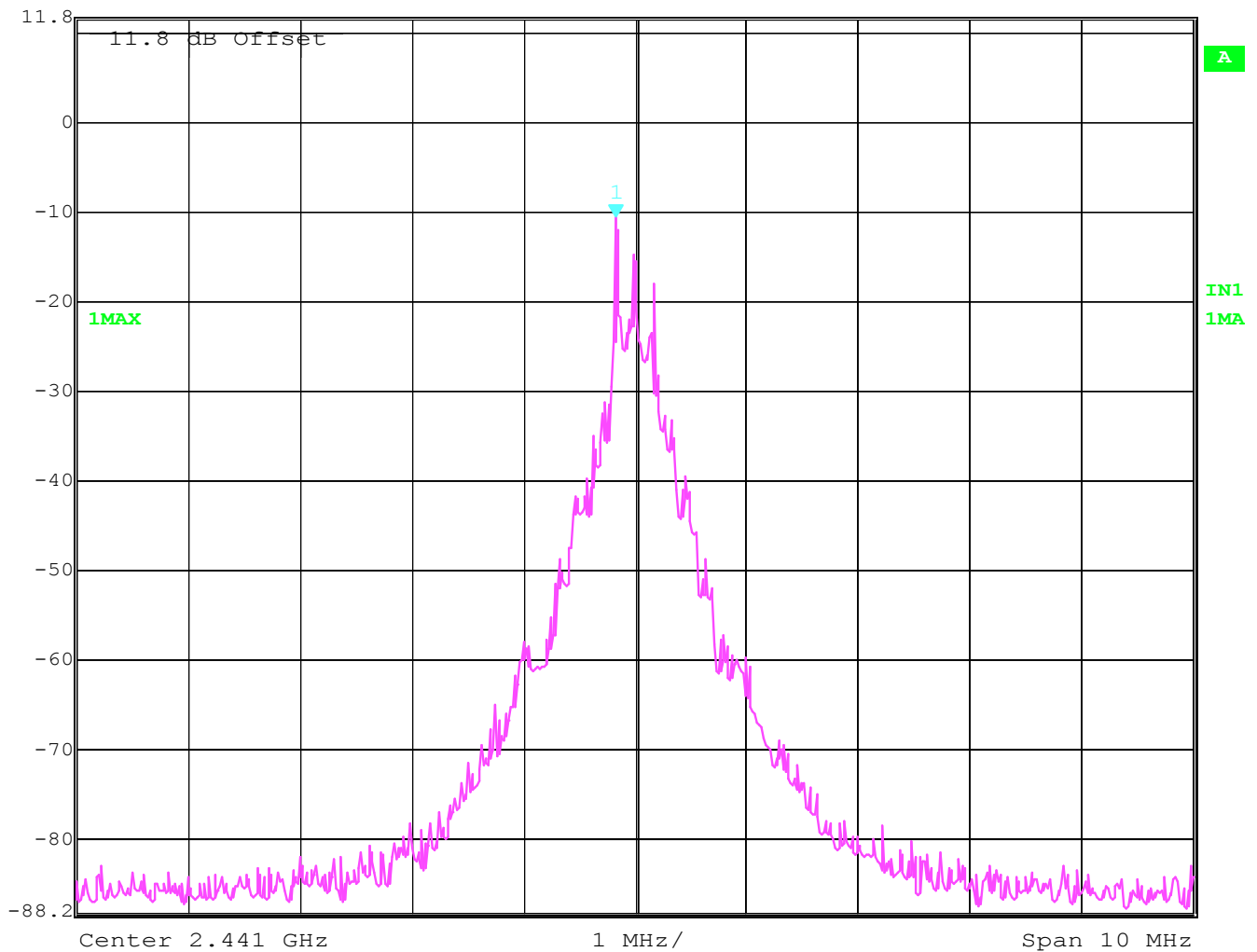
11.8 dBm

2.44082966 GHz

SWT 2.8 s

Unit

dBm

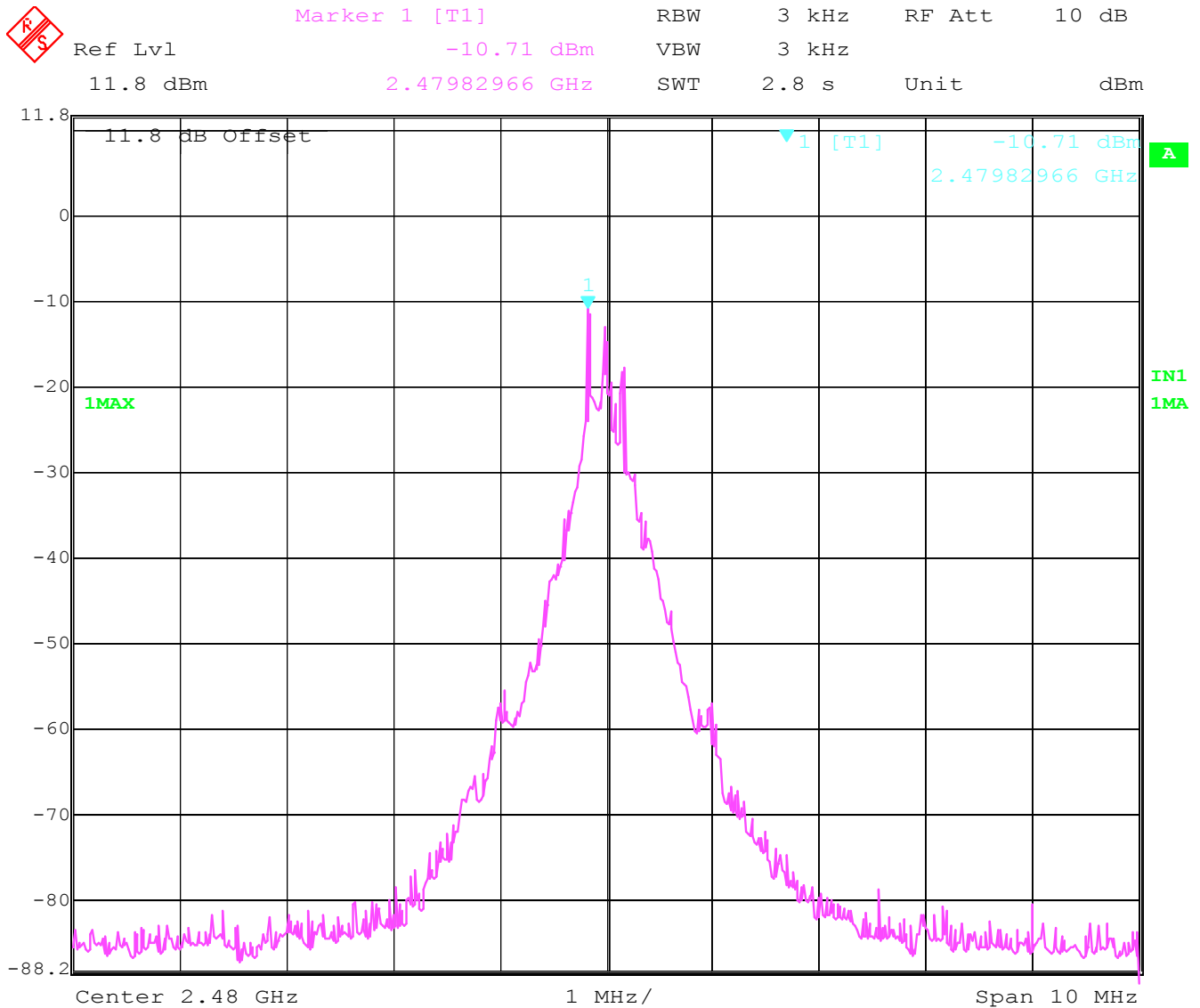


Date: 18.JUL.2003 14:59:33

POWER SPECTRAL DENSITY

§15.247(d)

Highest Channel: 2480MHz



Date: 18.JUL.2003 15:13:22

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

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2402	2441	2480
T _{nom} (23)°C	V _{nom} (4.0)VDC	1.59	0.68	1.14
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



Marker 1 [T1]

RBW 3 MHz RF Att 10 dB

Ref Lvl 1.59 dBm

VBW 3 MHz

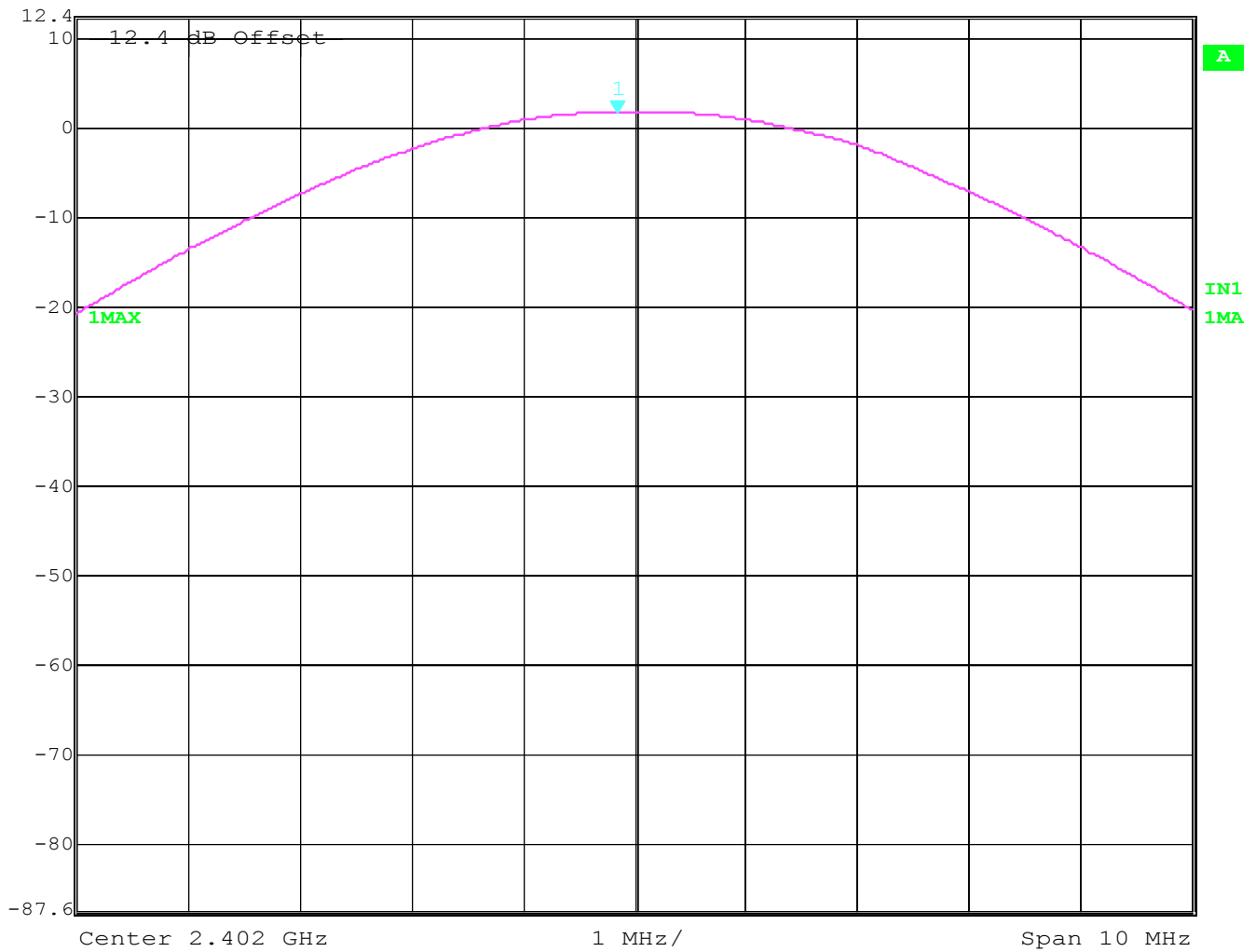
12.4 dBm

2.40184970 GHz

SWT 5 ms

Unit

dBm



Date: 18.JUL.2003 14:39:37

PEAK OUTPUT POWER (CONDUCTED)

§15.247 (b)

Mid Channel: 2441MHz



Marker 1 [T1]

RBW

3 MHz

RF Att

10 dB

Ref Lvl

0.68 dBm

VBW

3 MHz

11.8 dBm

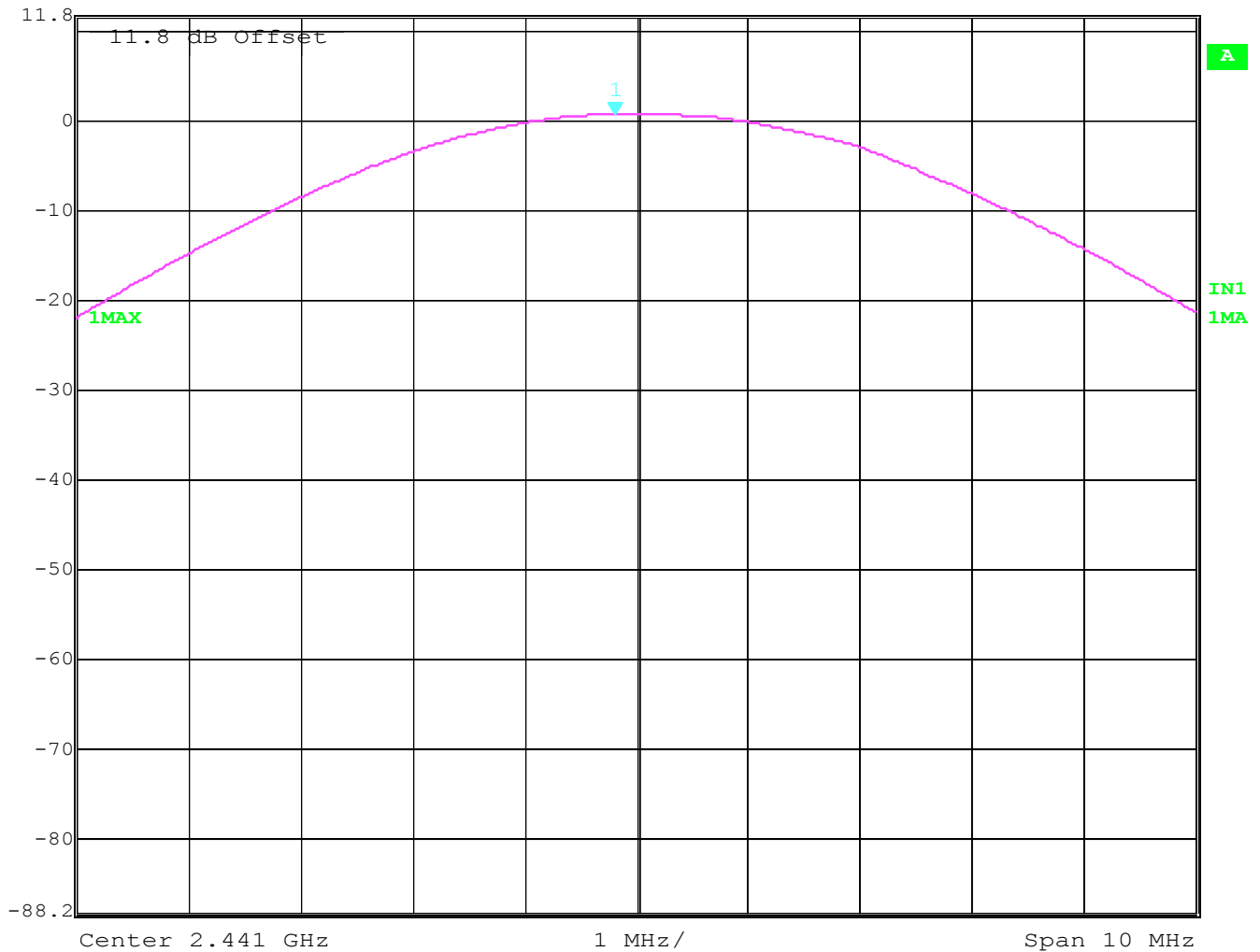
2.44080962 GHz

SWT

5 ms

Unit

dBm



Date: 18.JUL.2003 14:57:11

PEAK OUTPUT POWER (CONDUCTED)

§15.247 (b)

Highest Channel: 2480MHz



Marker 1 [T1]

RBW

3 MHz

RF Att

10 dB

Ref Lvl

1.14 dBm

VBW

3 MHz

11.8 dBm

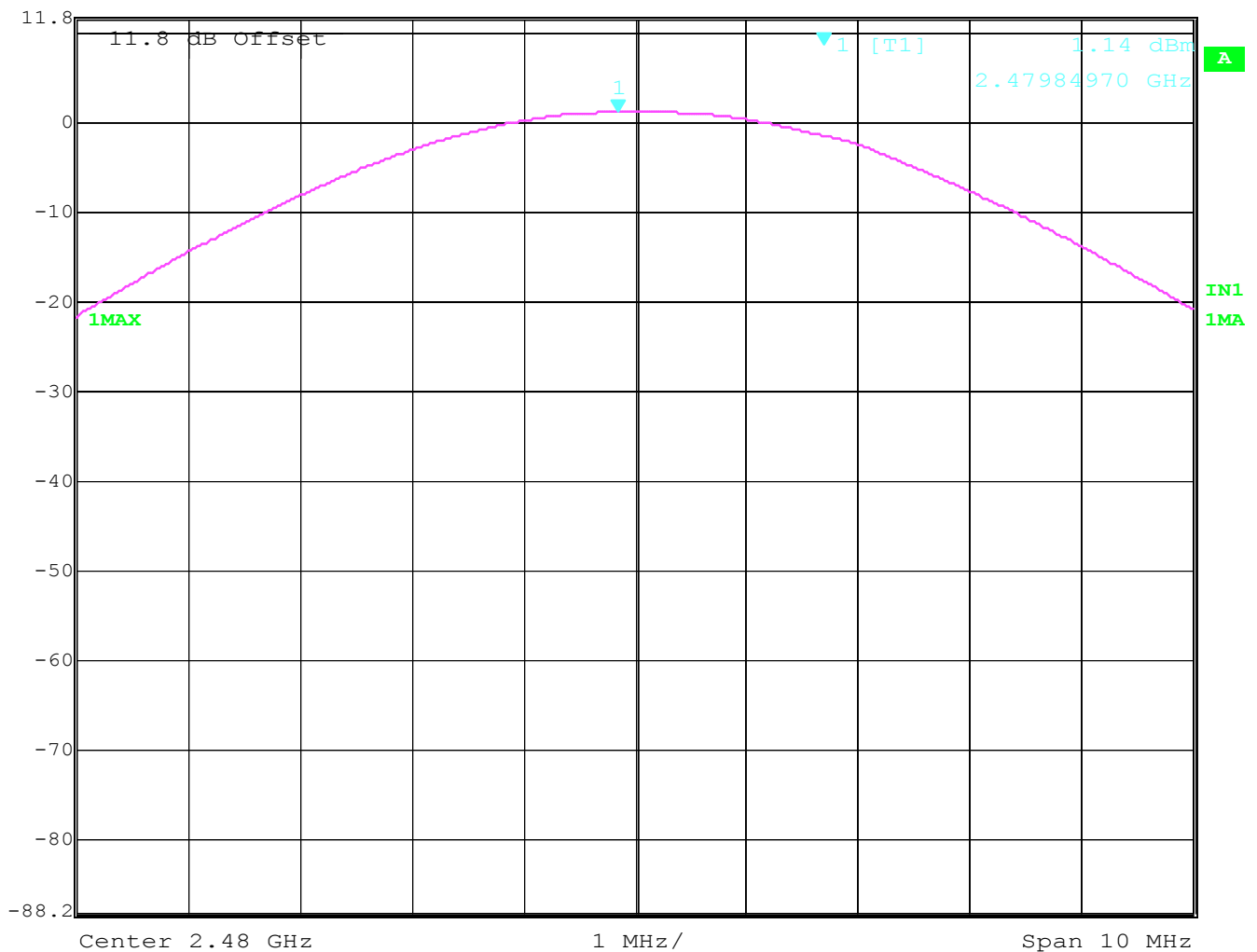
2.47984970 GHz

SWT

5 ms

Unit

dBm



Date: 18.JUL.2003 15:10:24

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

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2402	2441	2480
T _{nom} (23)°C	V _{nom} (4.0)VDC	-0.97	-0.59	+1.75
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

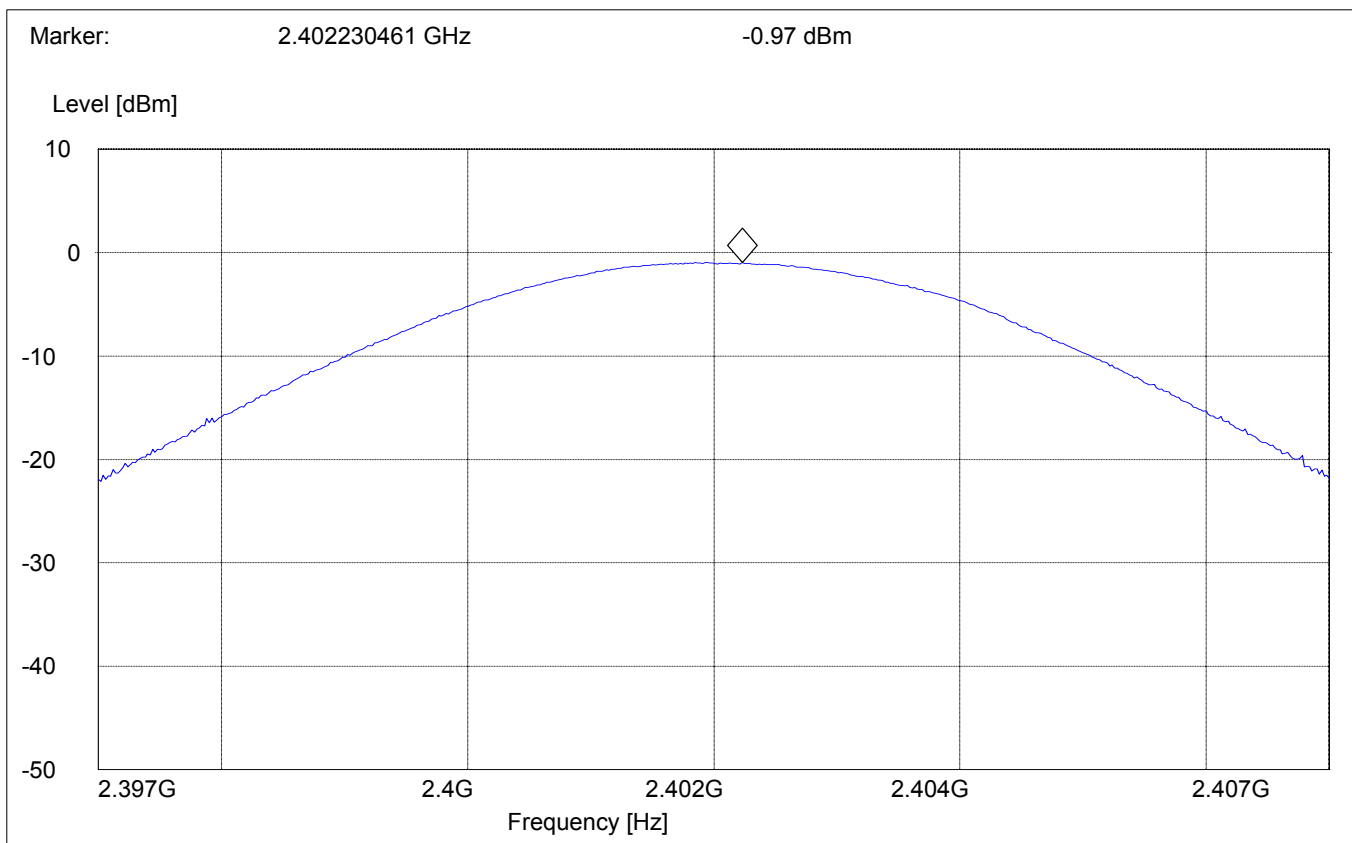
PEAK OUTPUT POWER (RADIATED)

§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



PEAK OUTPUT POWER (RADIATED)

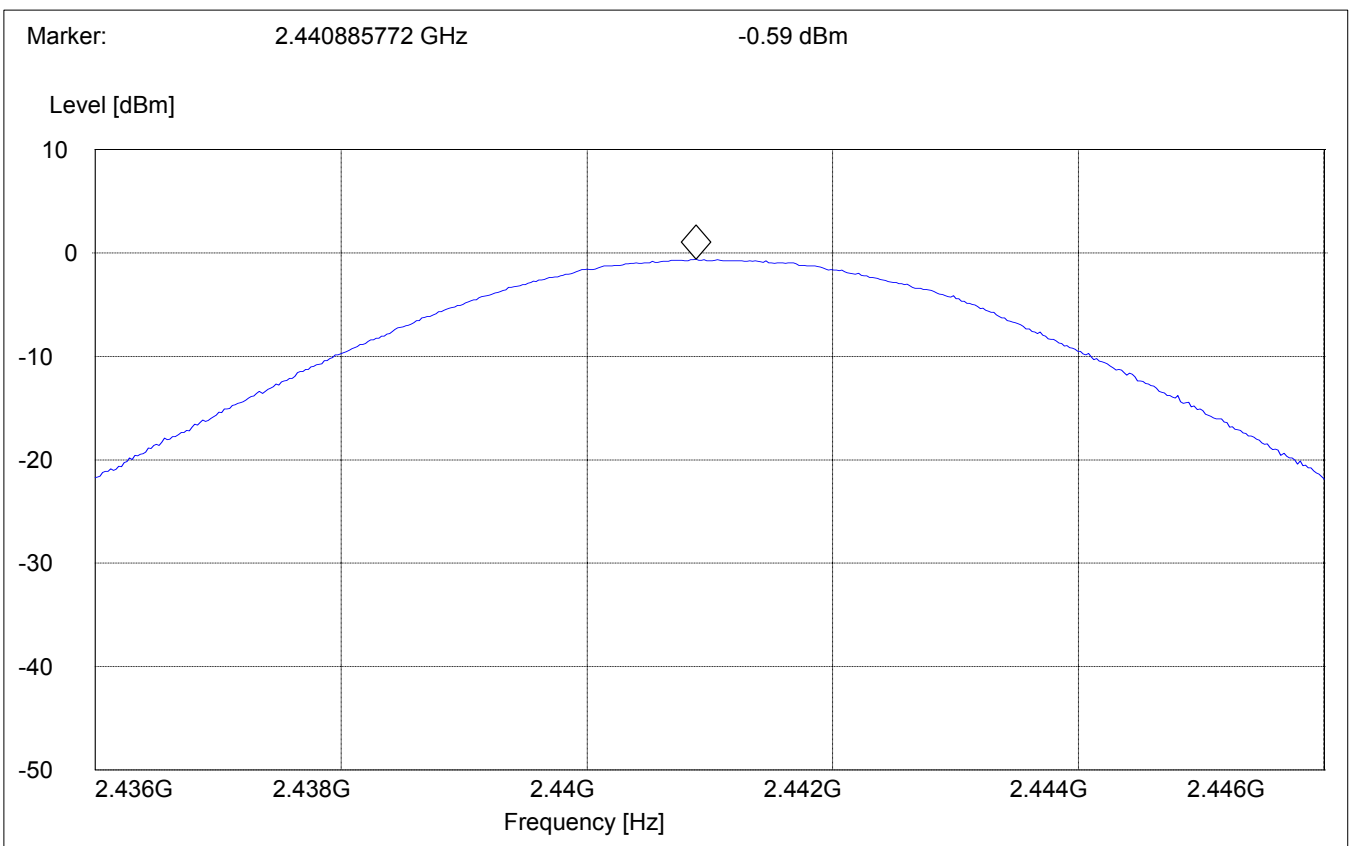
§15.247 (b) (1)

Mid Channel: 2441MHz

SWEEP TABLE: "EIRP BT Mid channel"

Short Description: EIRP Bluetooth channel-2441MHz

Start	Stop	Detector	Meas.	IF
Frequency	Frequency		Time	BW
2.436GHz	2.446GHz	MaxPeak	Coupled	3 MHz



PEAK OUTPUT POWER (RADIATED)

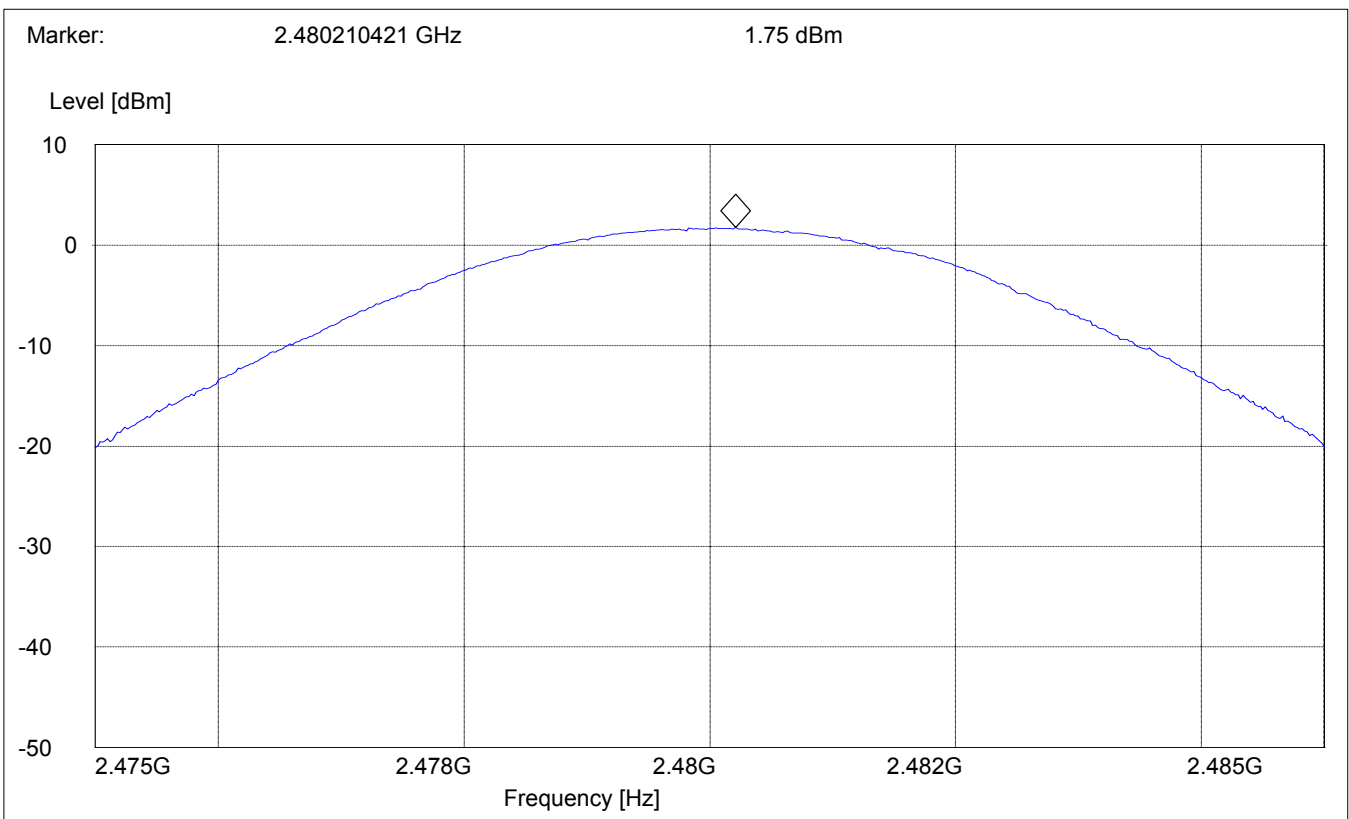
§15.247 (b) (1)

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



BAND EDGE COMPLIANCE

§15.247 (c)

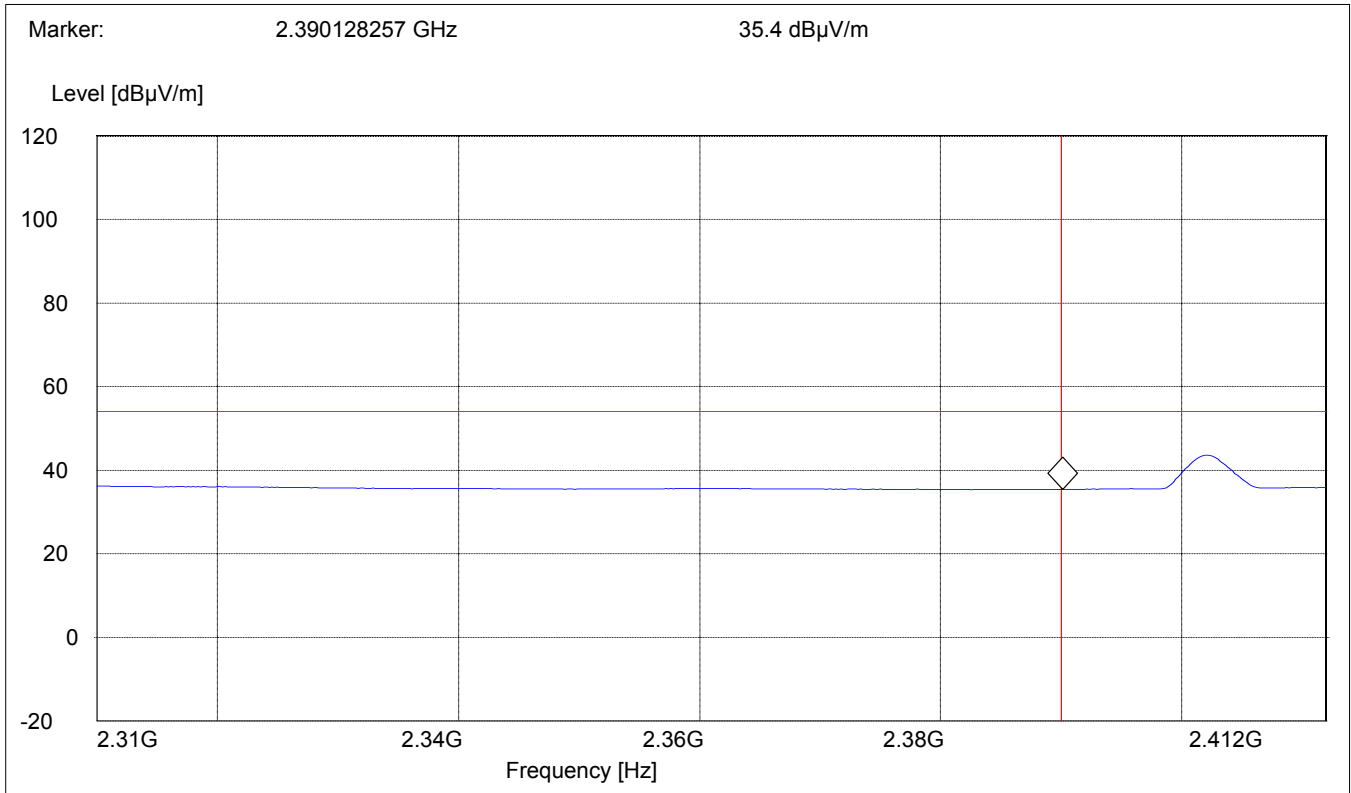
Low frequency section (spurious in the restricted band 2310 – 2390 MHz)

Average Measurement

(This plot is valid for both Hopping ON & OFF)

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)



BAND EDGE COMPLIANCE

§15.247 (c)

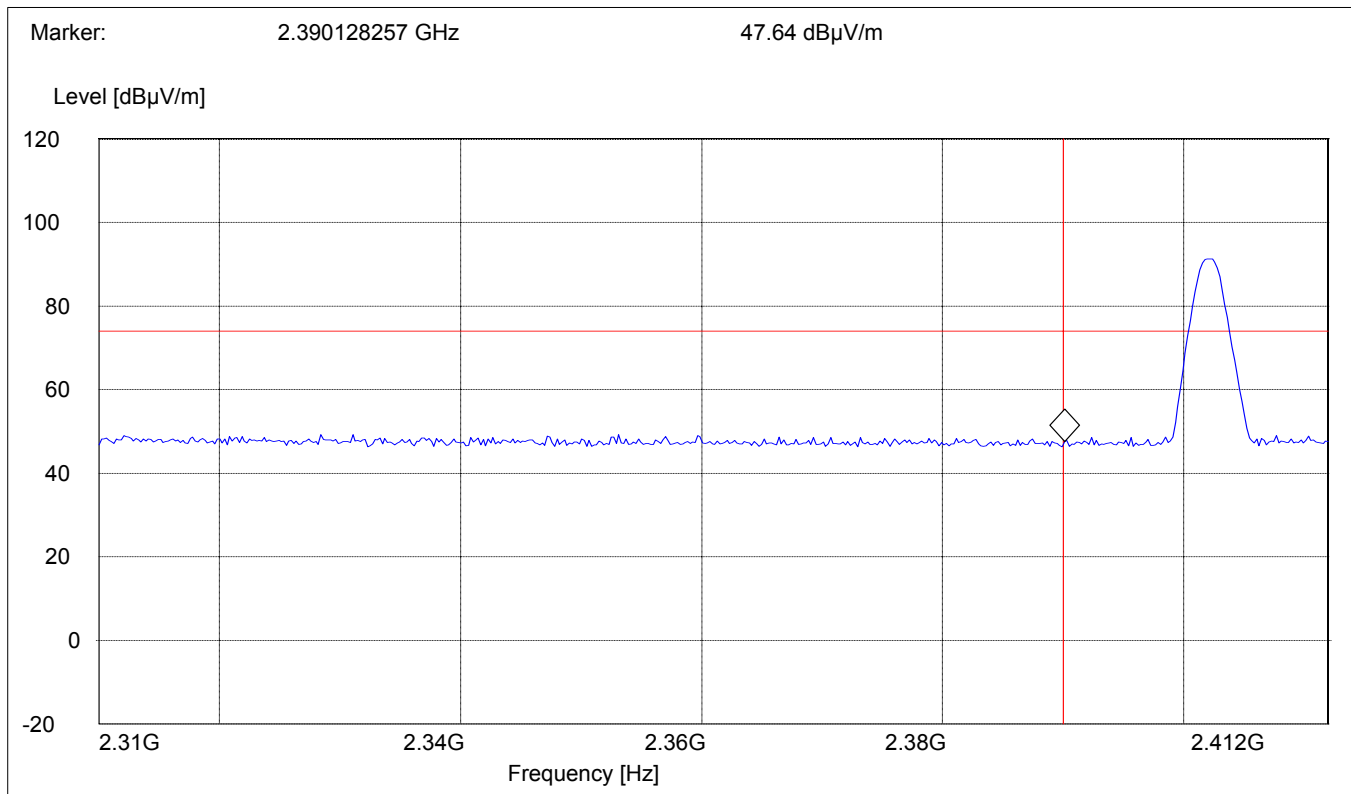
Low frequency section (spurious in the restricted band 2310 – 2390 MHz)

Peak Measurement

(This plot is valid for both Hopping ON & OFF)

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

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



BAND EDGE COMPLIANCE

§15.247 (c)

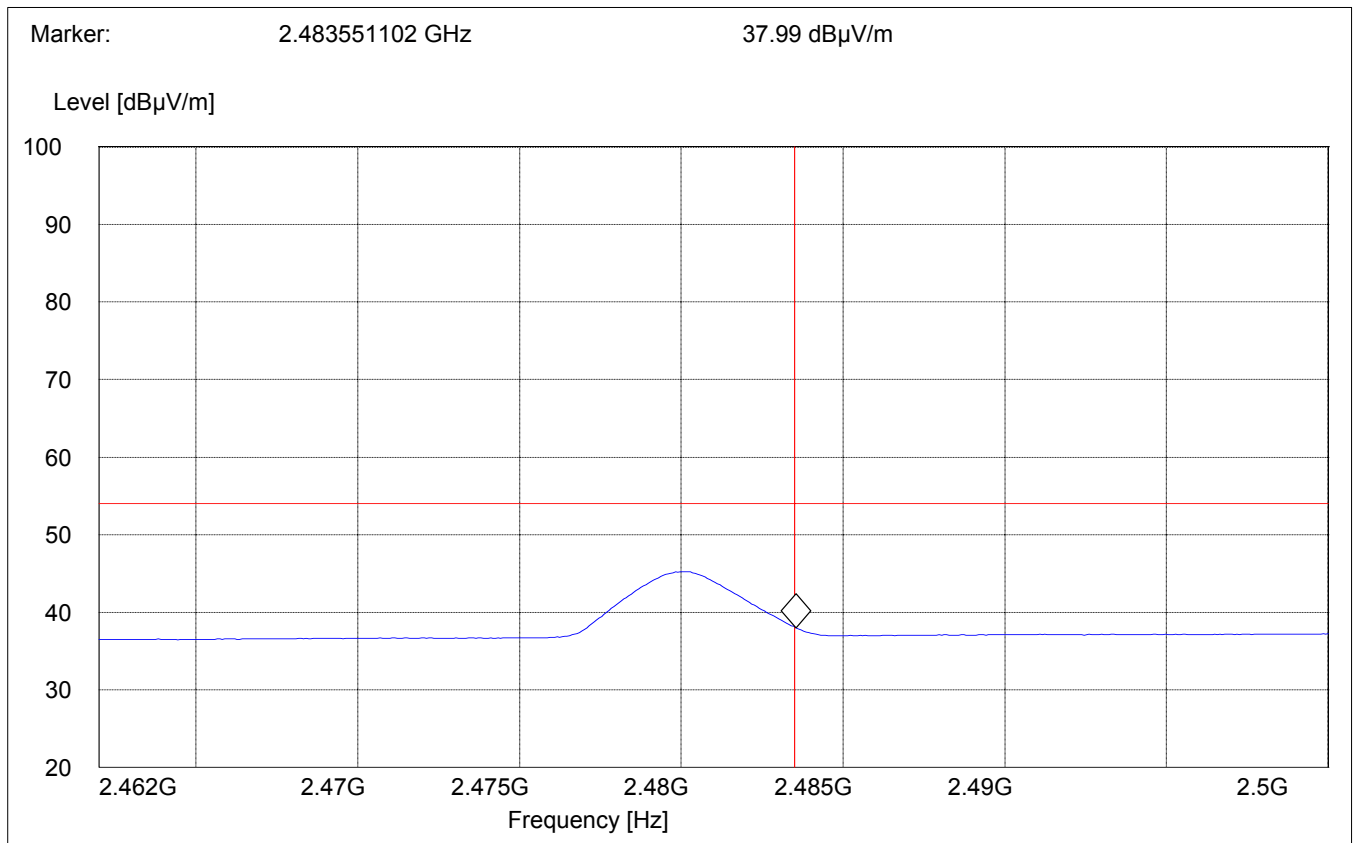
High frequency section (spurious in the restricted band 2483.5 – 2500 MHz)

Average Measurement

(This plot is valid for both Hopping ON & OFF)

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 Time	Meas. Bandw.	RBW	VBW	Transducer
2.462 GHz	2.5 GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)



BAND EDGE COMPLIANCE

§15.247 (c)

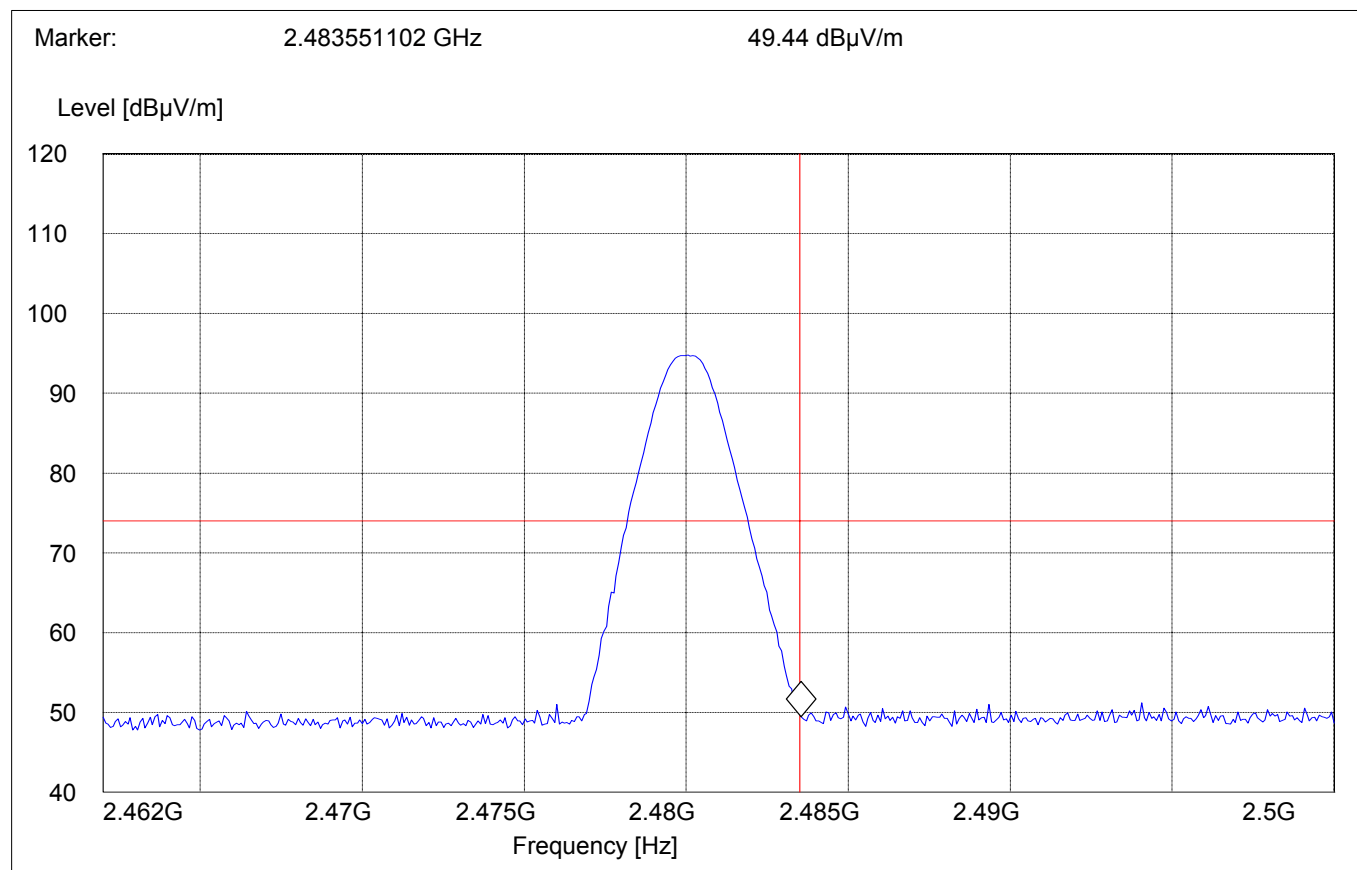
High frequency section (spurious in the restricted band 2483.5 – 2500 MHz)

Peak Measurement

(This plot is valid for both Hopping ON & OFF)

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 Time	Meas. Bandw.	RBW	VBW	Transducer
2.462 GHz	2.5 GHz	MaxPeak	Coupled	1 MHz	1MHz	#326 horn (dBi)



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

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions that 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)).

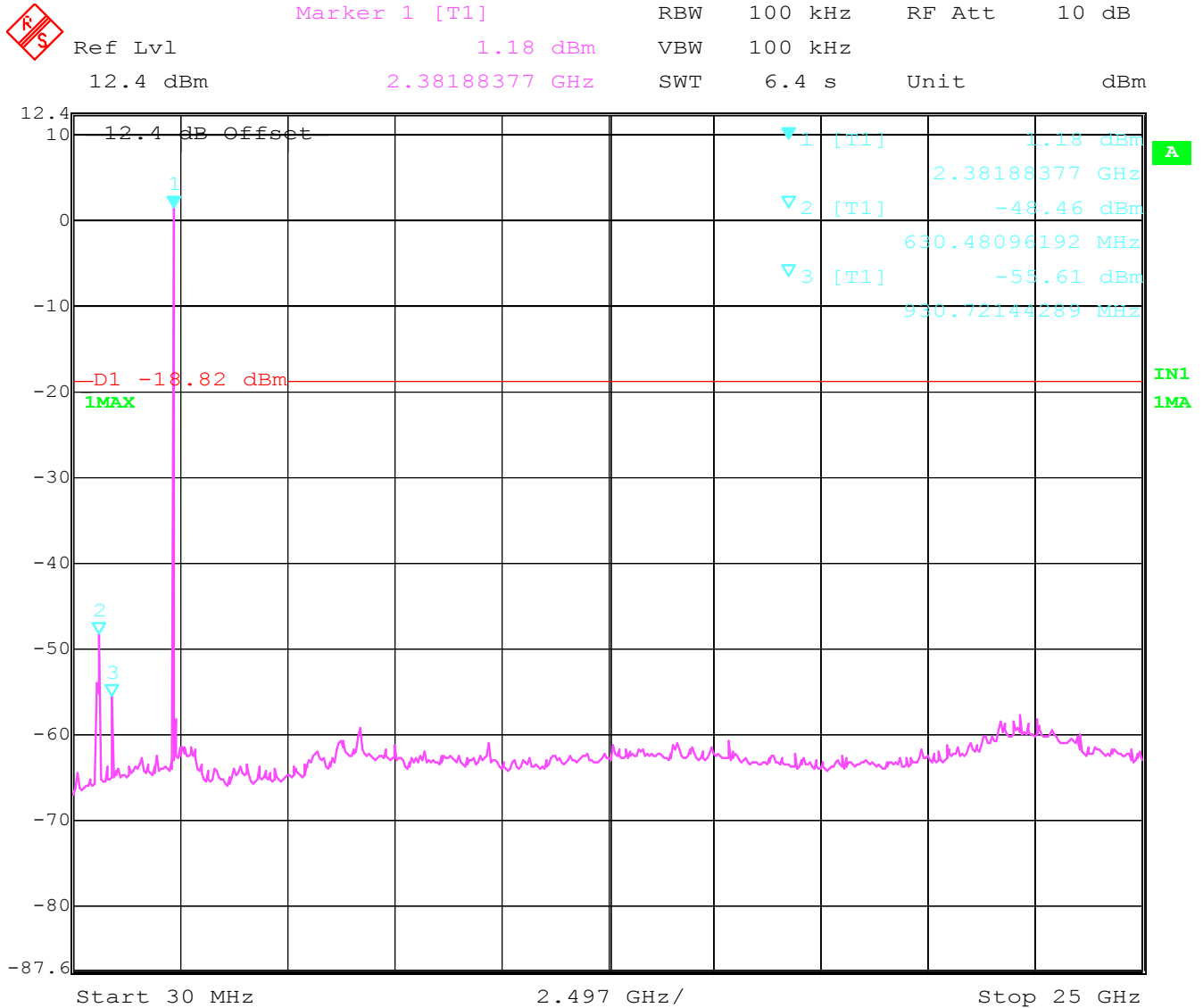
NOTE: Frequency resolution is not fine enough to show the exact frequency of the carrier, refer to plots under EIRP.

EMISSION LIMITATIONS - Conducted (Transmitter)

§ 15.247 (c) (1)

Lowest Channel (2402MHz): 30MHz - 25GHz

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



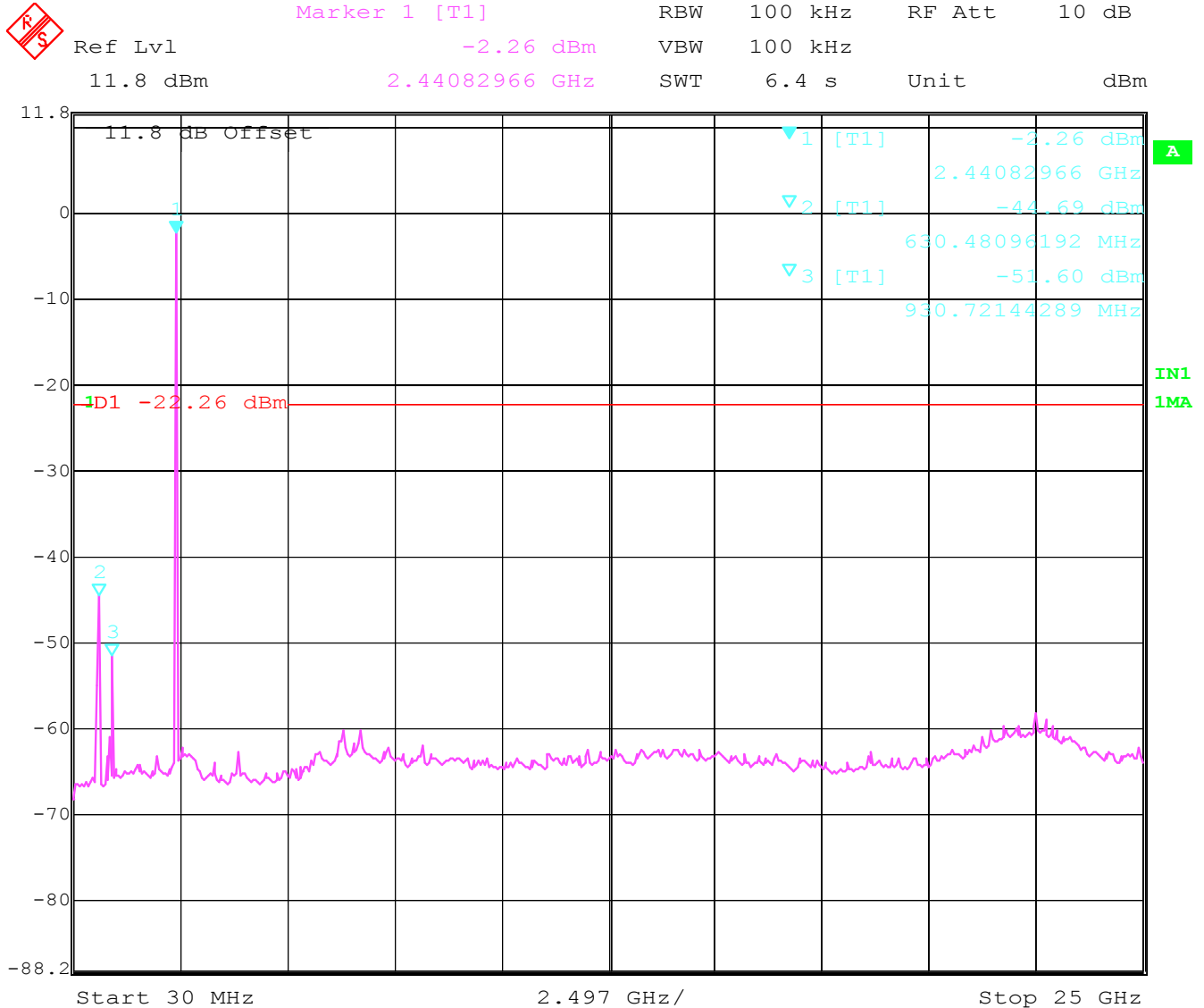
Date: 18.JUL.2003 14:46:00

EMISSION LIMITATIONS - Conducted (Transmitter)

§ 15.247 (c) (1)

Mid Channel (2441MHz): 30MHz - 25GHz

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



Date: 18.JUL.2003 15:01:11

EMISSION LIMITATIONS - Conducted (Transmitter)

§ 15.247 (c) (1)

Highest Channel (2480MHz): 30MHz - 25GHz

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



Marker 1 [T1]

RBW 100 kHz RF Att 10 dB

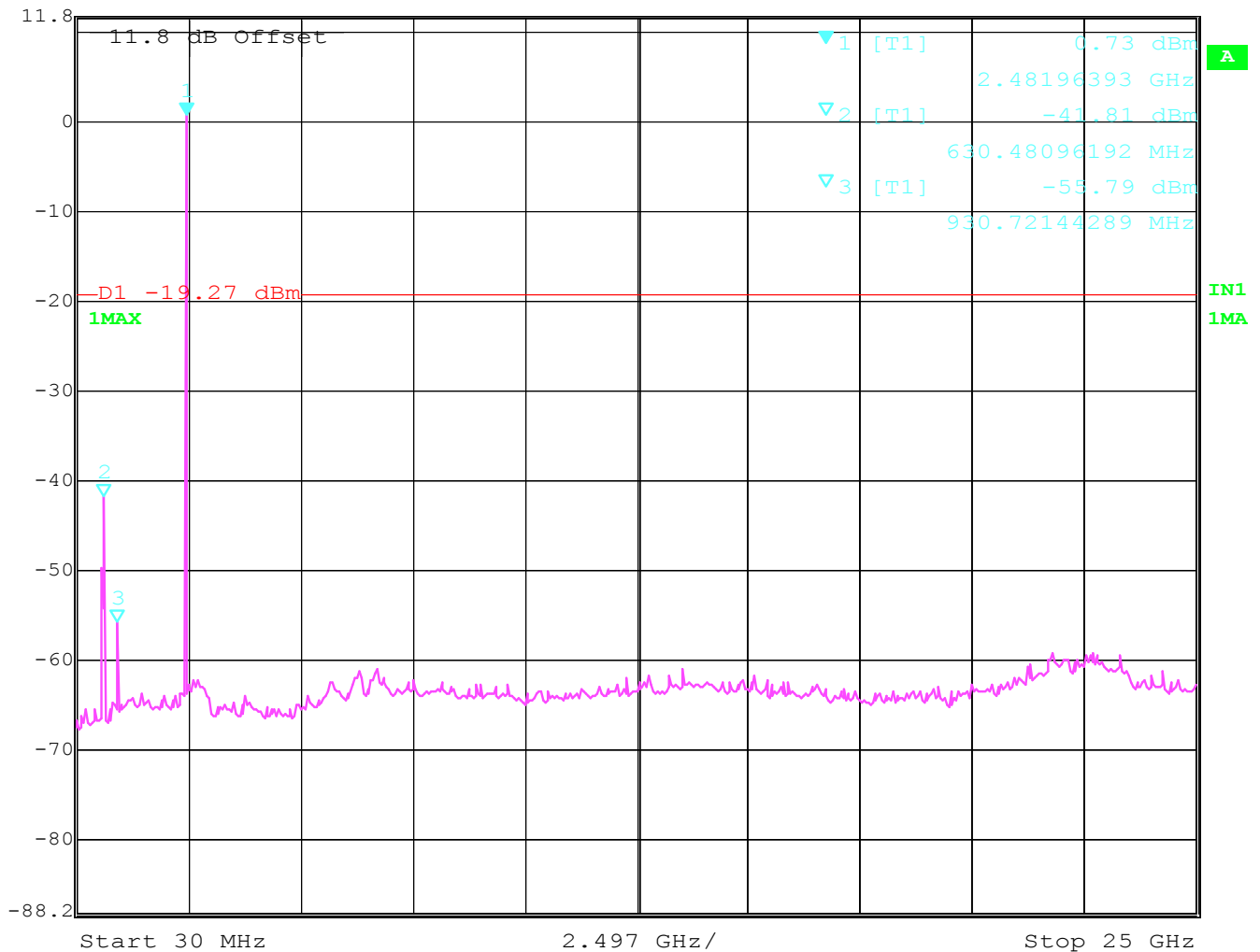
Ref Lvl 0.73 dBm

VBW 100 kHz

11.8 dBm 2.48196393 GHz

SWT 6.4 s

Unit dBm



Date: 18.JUL.2003 15:09:32

EMISSION LIMITATIONS
Transmitter (Radiated)

§ 15.247 (c) (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 that 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 3 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.
3. All measurements are done in peak mode unless specified with plots.

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

EMISSION LIMITATIONS - Radiated (Transmitter)**§ 15.247 (c) (1)**

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

Transmit at Lowest channel Frequency 2402MHz			
Frequency (MHz)	Level (dB μ V/m)		
	Peak	Quasi-Peak	Average
3991.9	34.52		
Transmit at Middle channel Frequency 2441MHz			
Frequency (MHz)	Level (dB μ V/m)		
	Peak	Quasi-Peak	Average
4052.1	36.52		
7839.67	37.88		
Transmit at Highest channel Frequency 2480MHz			
Frequency (MHz)	Level (dB μ V/m)		
	Peak	Quasi-Peak	Average
4112.2	34.05		
7418.8	39.19		

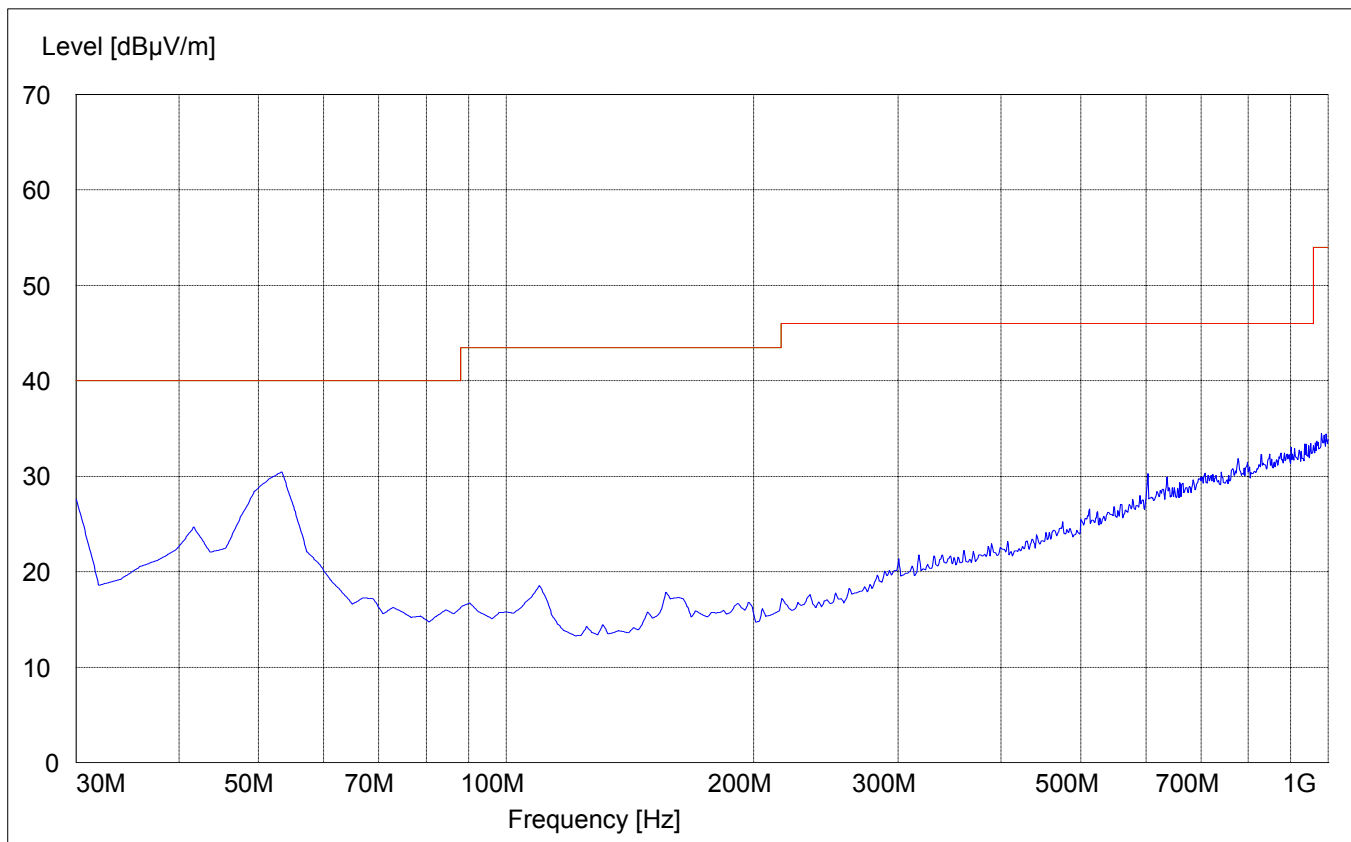
EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

30MHz – 1GHz

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

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

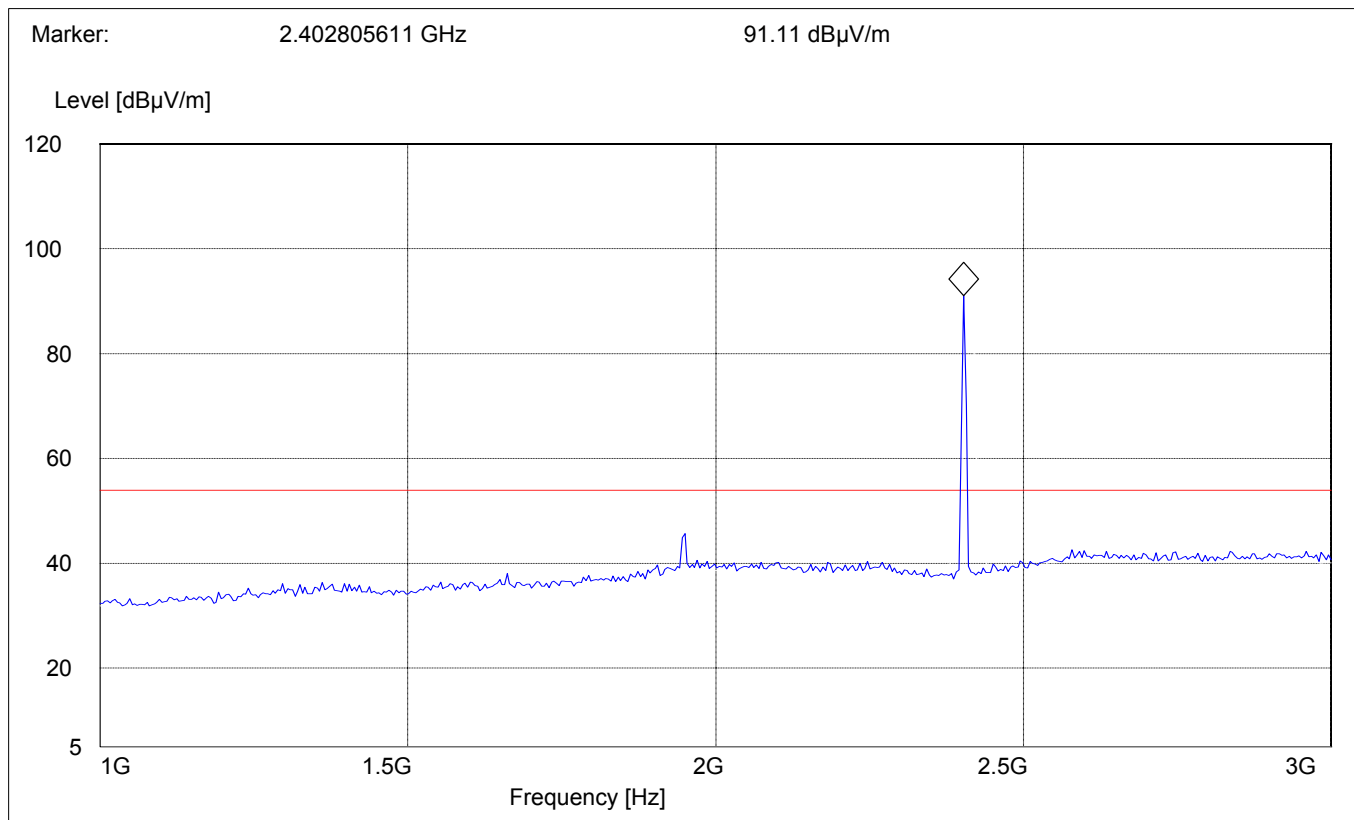


EMISSION LIMITATIONS - Radiated (Transmitter)
Lowest Channel (2402MHz): 1GHz – 3GHz

§ 15.247 (c) (1)

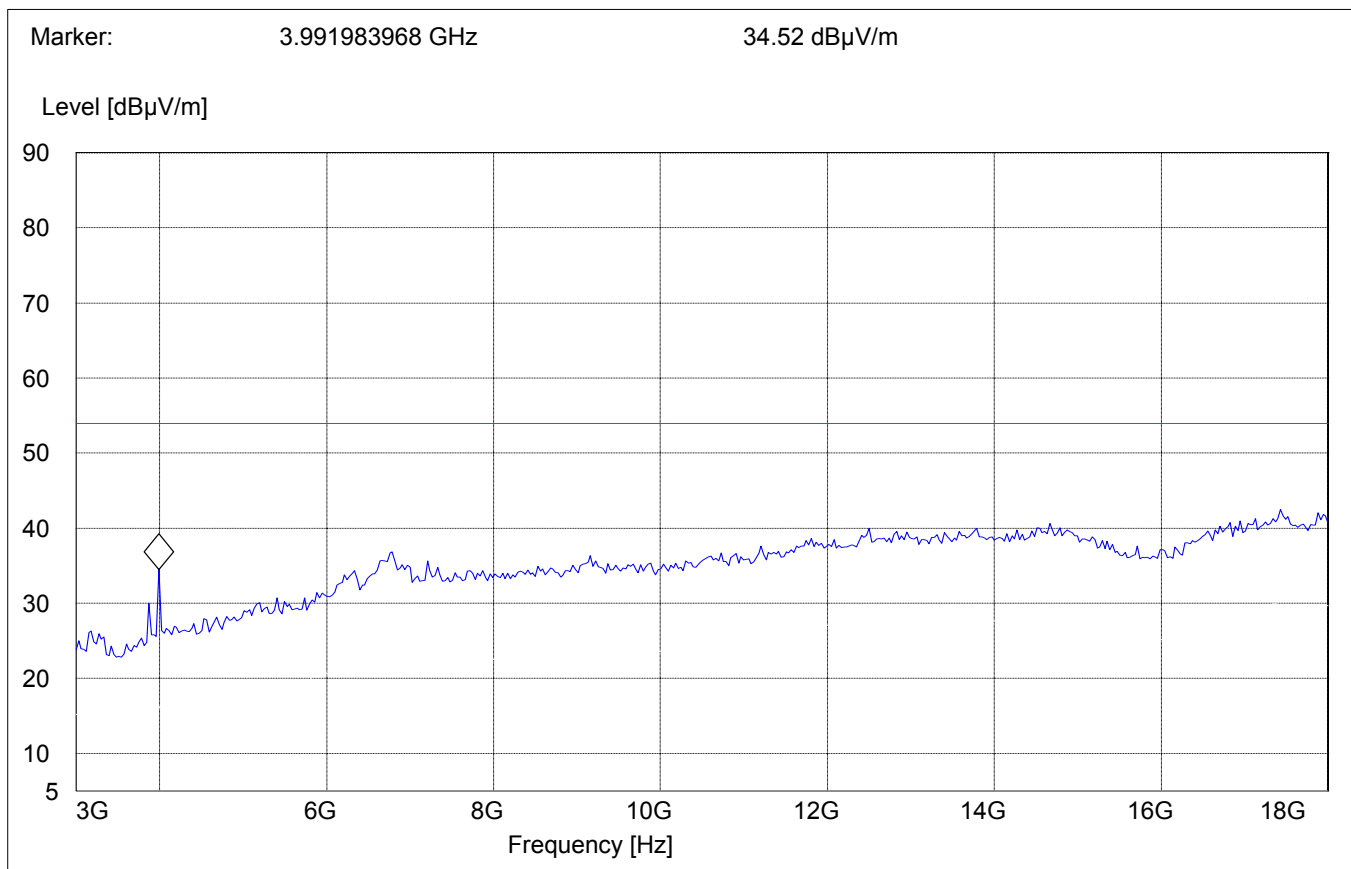
NOTE: The peak above the limit is the carrier frequency.

SWEEP TABLE:		"BT Spuri hi 1-3G"			
Short Description:		Bluetooth Spurious 1-3GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



EMISSION LIMITATIONS - Radiated (Transmitter)
§ 15.247 (c) (1)
Lowest Channel (2402MHz): 3GHz – 18GHz

SWEEP TABLE:		"BT Spuri hi 3-18G"			
Short Description:		Bluetooth Spurious 3-18 GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



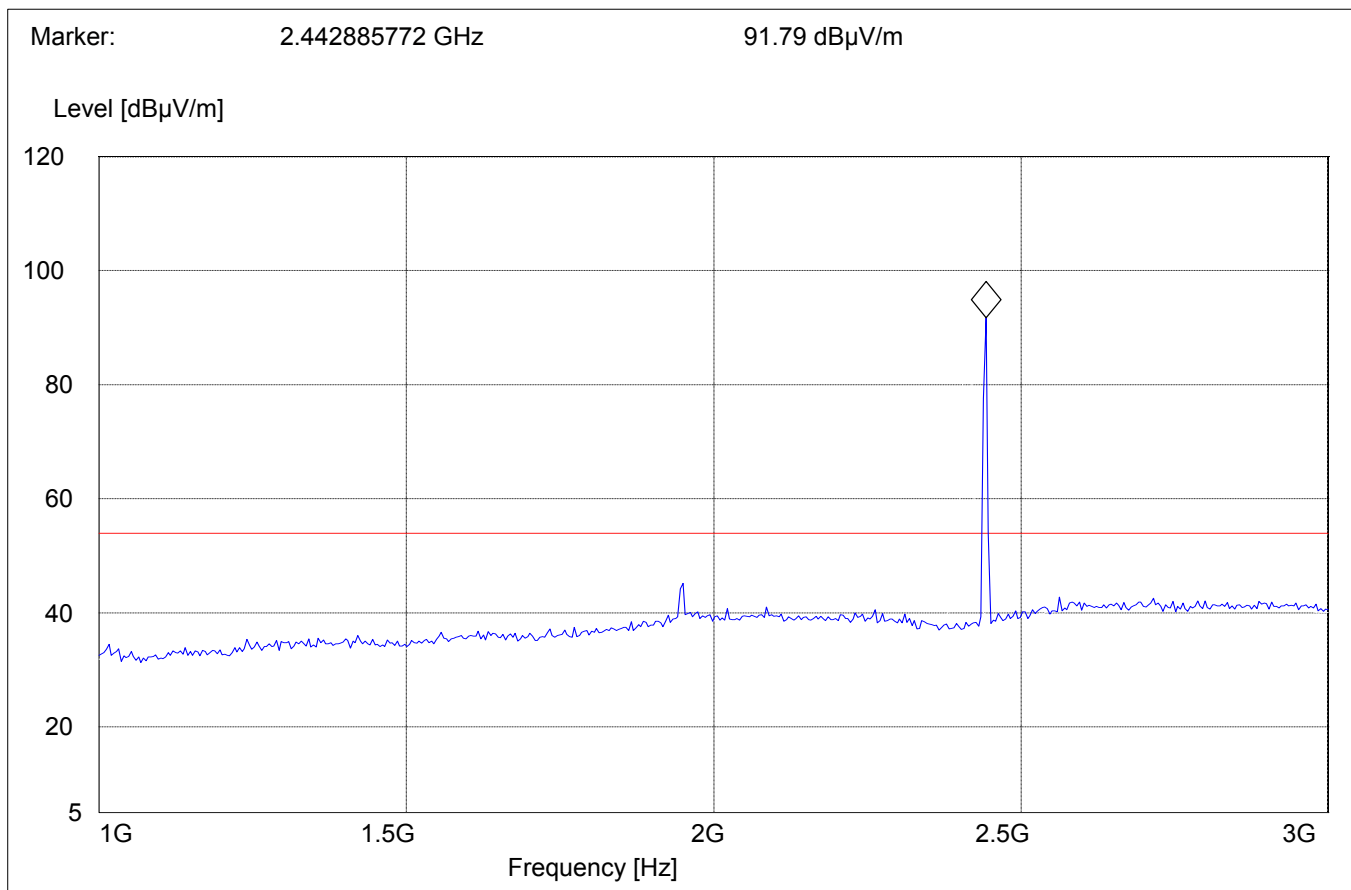
EMISSION LIMITATIONS - Radiated (Transmitter)

Middle Channel (2441MHz): 1GHz – 3GHz

§ 15.247 (c) (1)

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

SWEEP TABLE:		"BT Spuri hi 1-3G"			
Short Description:		Bluetooth Spurious 1-3GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



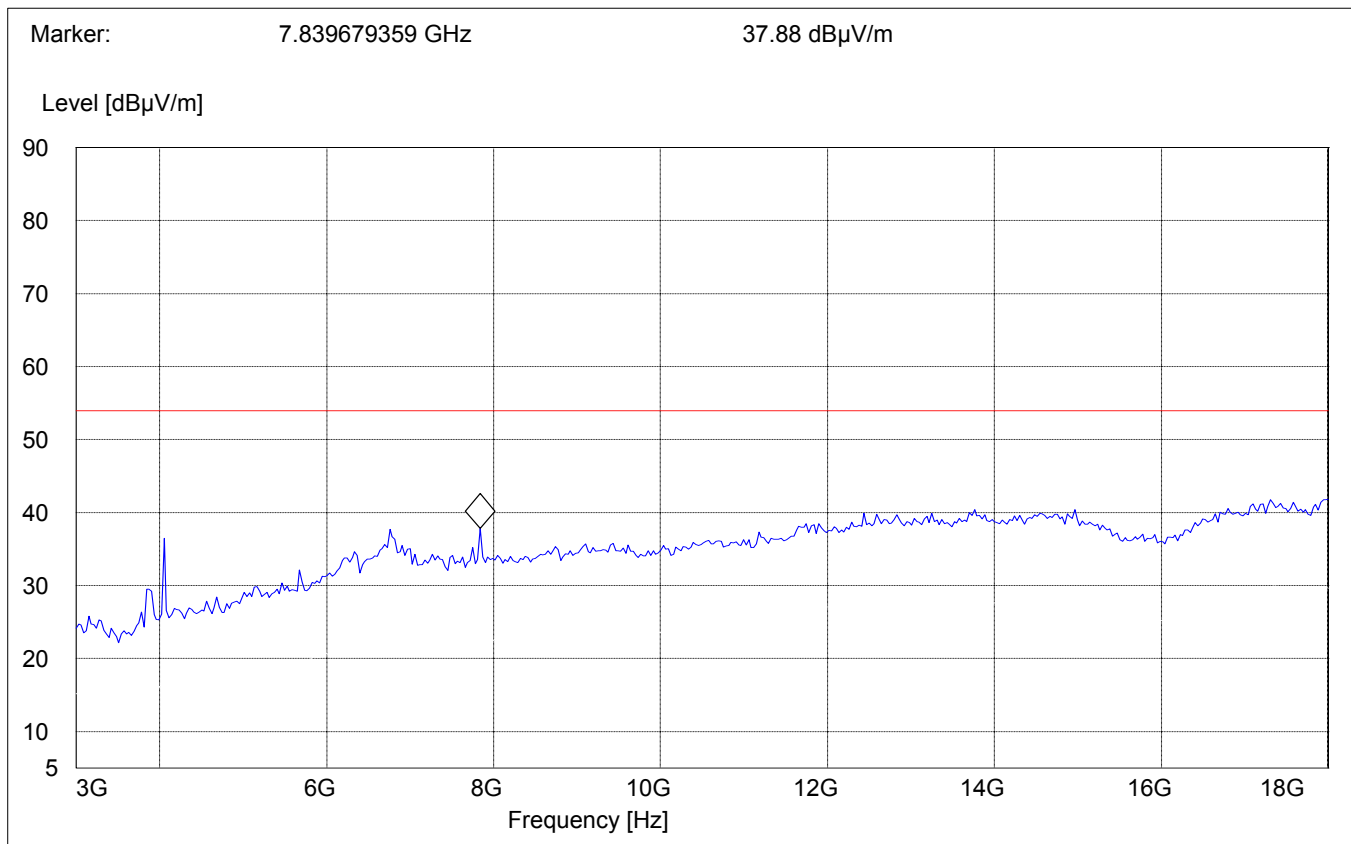
EMISSION LIMITATIONS - Radiated (Transmitter)

Middle Channel (2441MHz): 3GHz – 18GHz

§ 15.247 (c) (1)

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

SWEEP TABLE:		"BT Spuri hi 3-18G"			
Short Description:		Bluetooth Spurious 3-18GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



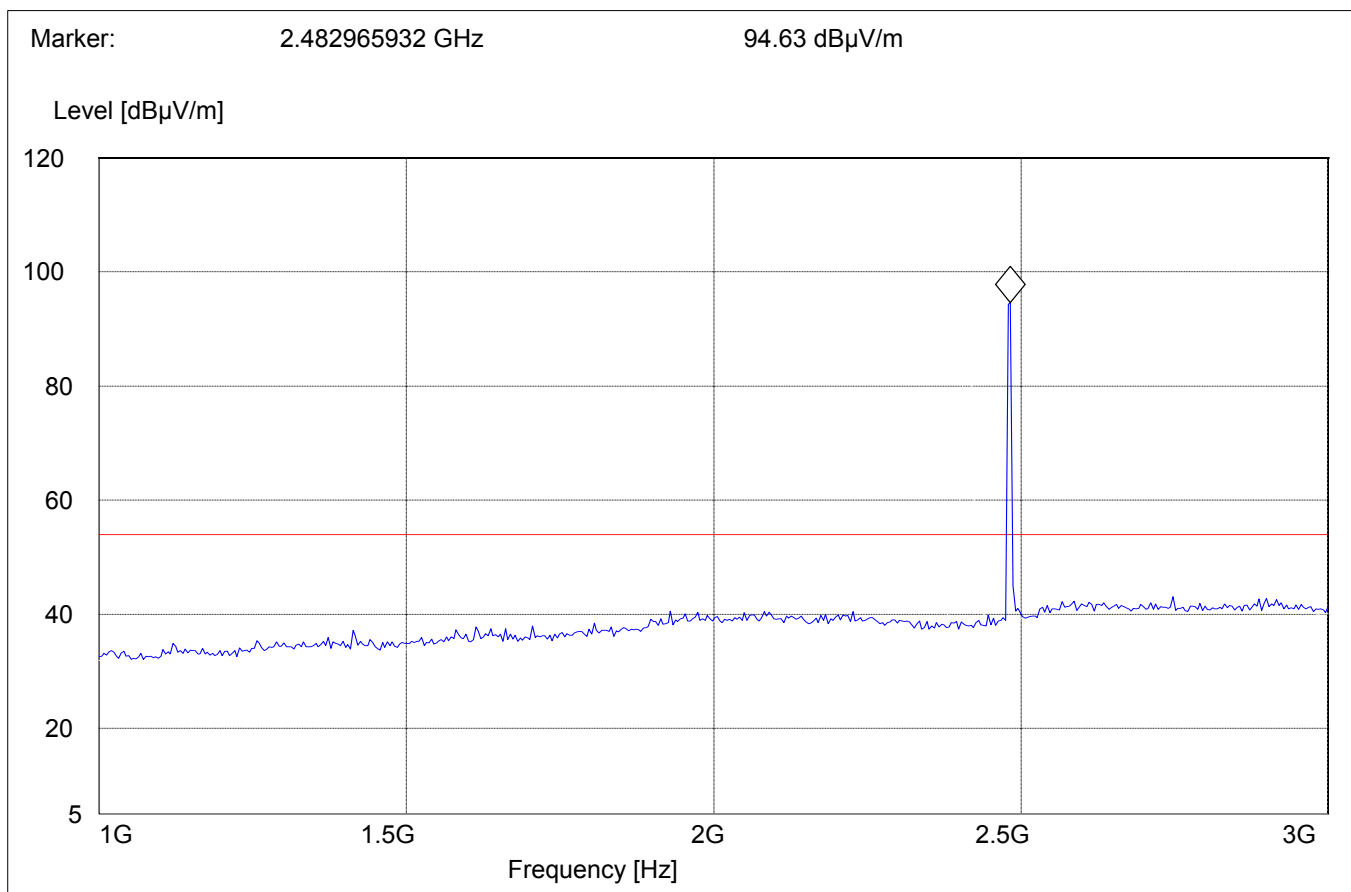
EMISSION LIMITATIONS - Radiated (Transmitter)

Highest Channel (2480MHz): 1GHz – 3GHz

§ 15.247 (c) (1)

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

SWEEP TABLE:		"BT Spuri hi 1-3G"			
Short Description:		Bluetooth Spurious 1-3GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)

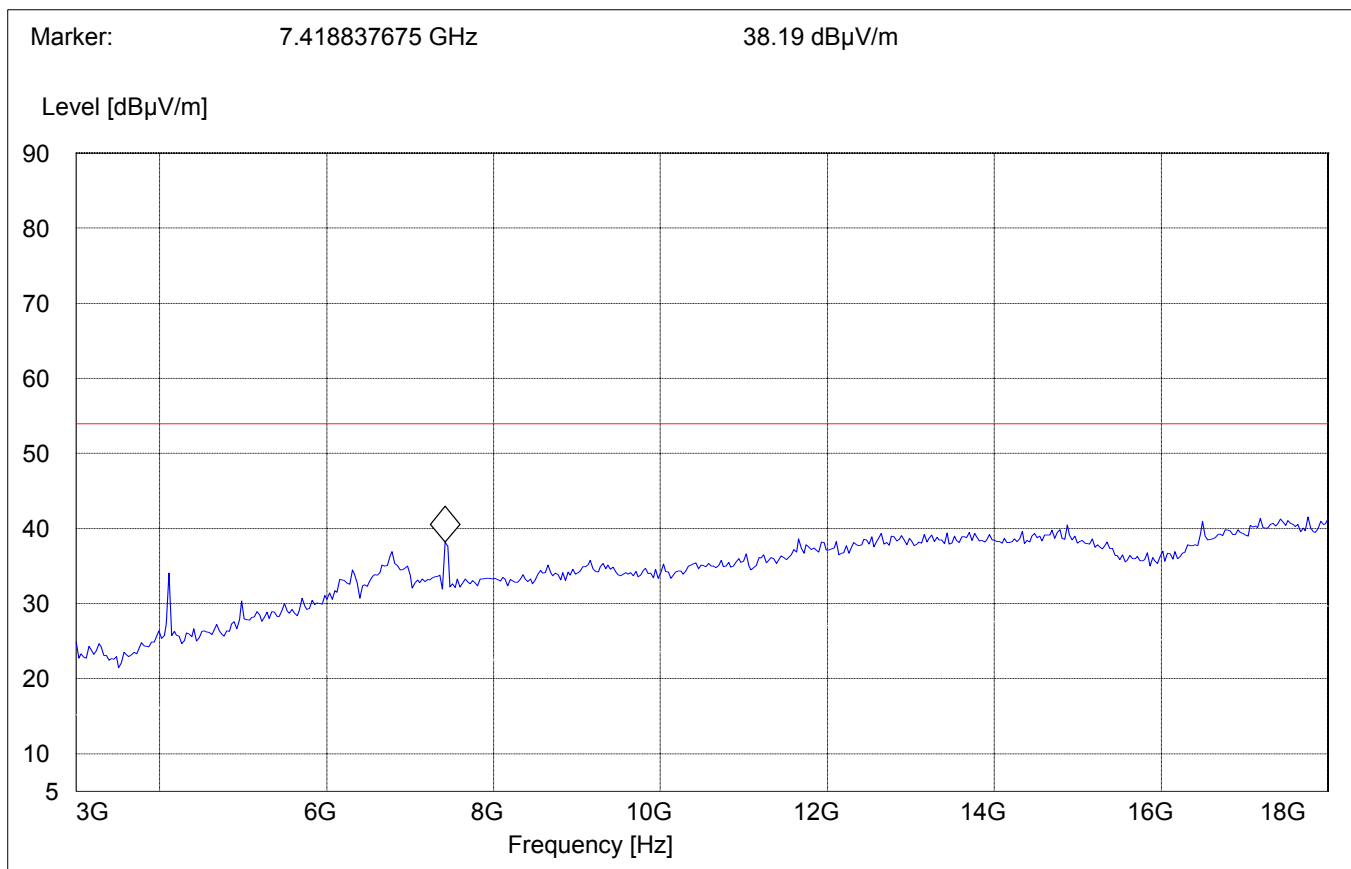


EMISSION LIMITATIONS - Radiated (Transmitter)

Highest Channel (2480MHz): 3GHz – 18GHz

§ 15.247 (c) (1)

SWEEP TABLE:		"BT Spuri hi 3-18G"			
Short Description:		Bluetooth Spurious 3-18GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



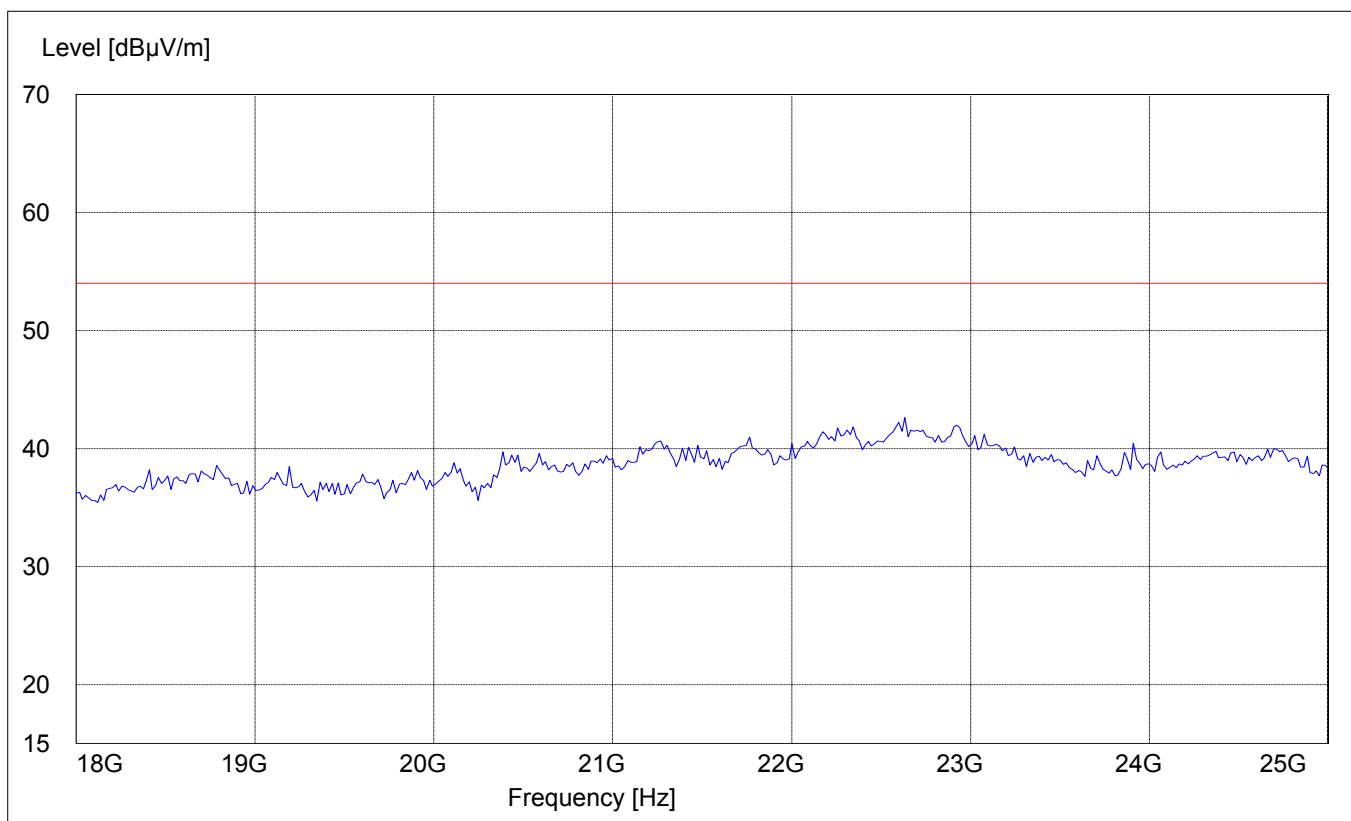
EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

18GHz – 25GHz

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

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)



CONDUCTED EMISSIONS

§ 15.107/207

Measured with AC/DC power adapter

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

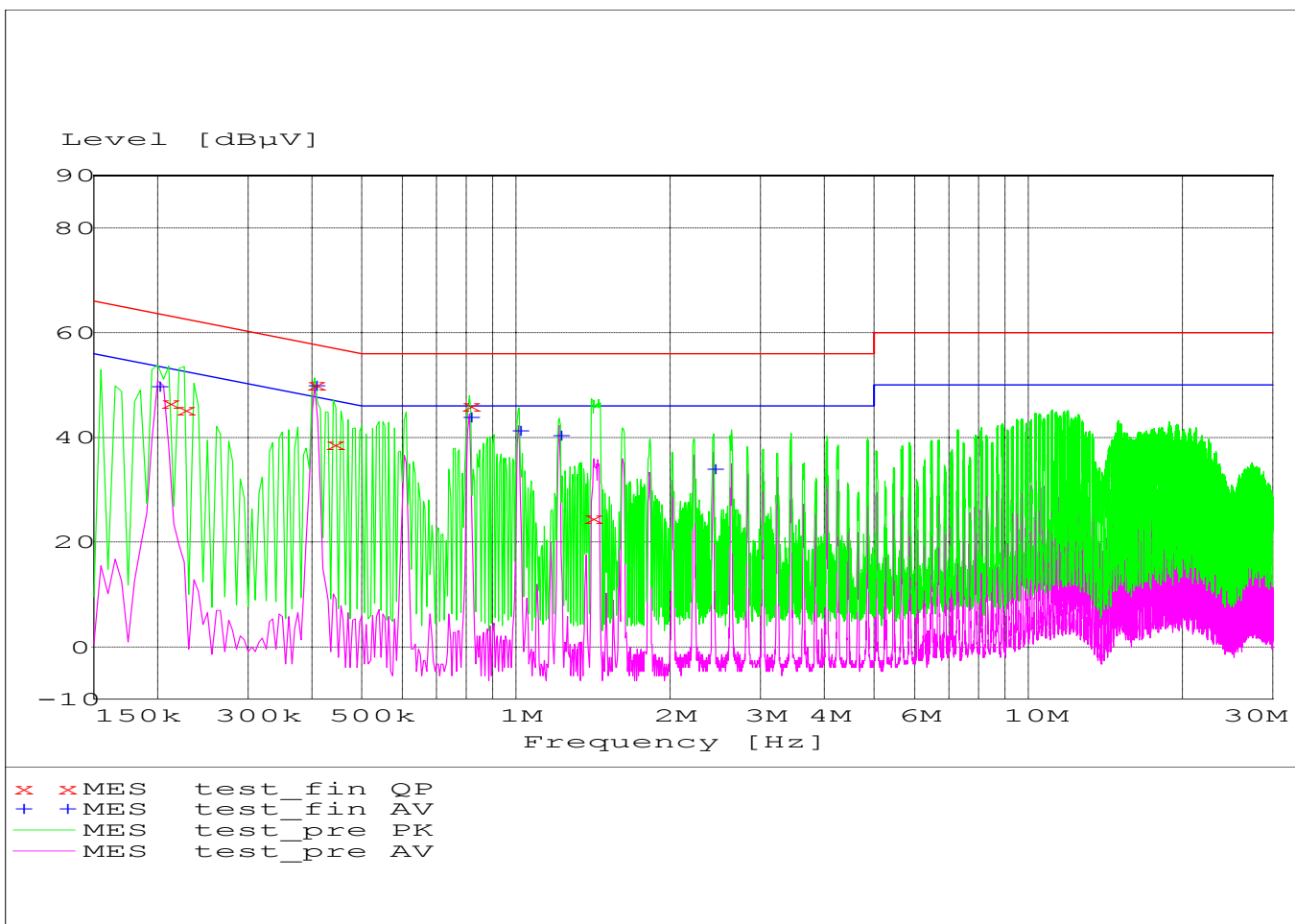
Limit

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



MEASUREMENT RESULT: "test_fin QP"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.210000	46.60	0.0	63	16.6	L1	GND
0.225000	45.40	0.0	63	17.2	N	GND
0.405000	50.20	0.0	58	7.5	N	GND
0.440000	38.80	0.0	57	18.3	N	GND
0.810000	46.20	0.0	56	9.8	N	GND
1.405000	24.60	0.0	56	31.4	N	GND

MEASUREMENT RESULT: "test_fin AV"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.200000	49.70	0.0	54	3.9	N	GND
0.405000	50.00	0.0	48	-2.2	L1	GND
0.810000	44.00	0.0	46	2.0	N	GND
1.010000	41.40	0.0	46	4.6	N	GND
1.215000	40.50	0.0	46	5.5	N	GND
2.430000	33.90	0.0	46	12.1	N	GND

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:

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 unless specified with the plots.

RECEIVER SPURIOUS RADIATION

§ 15.209

30MHz – 1GHz

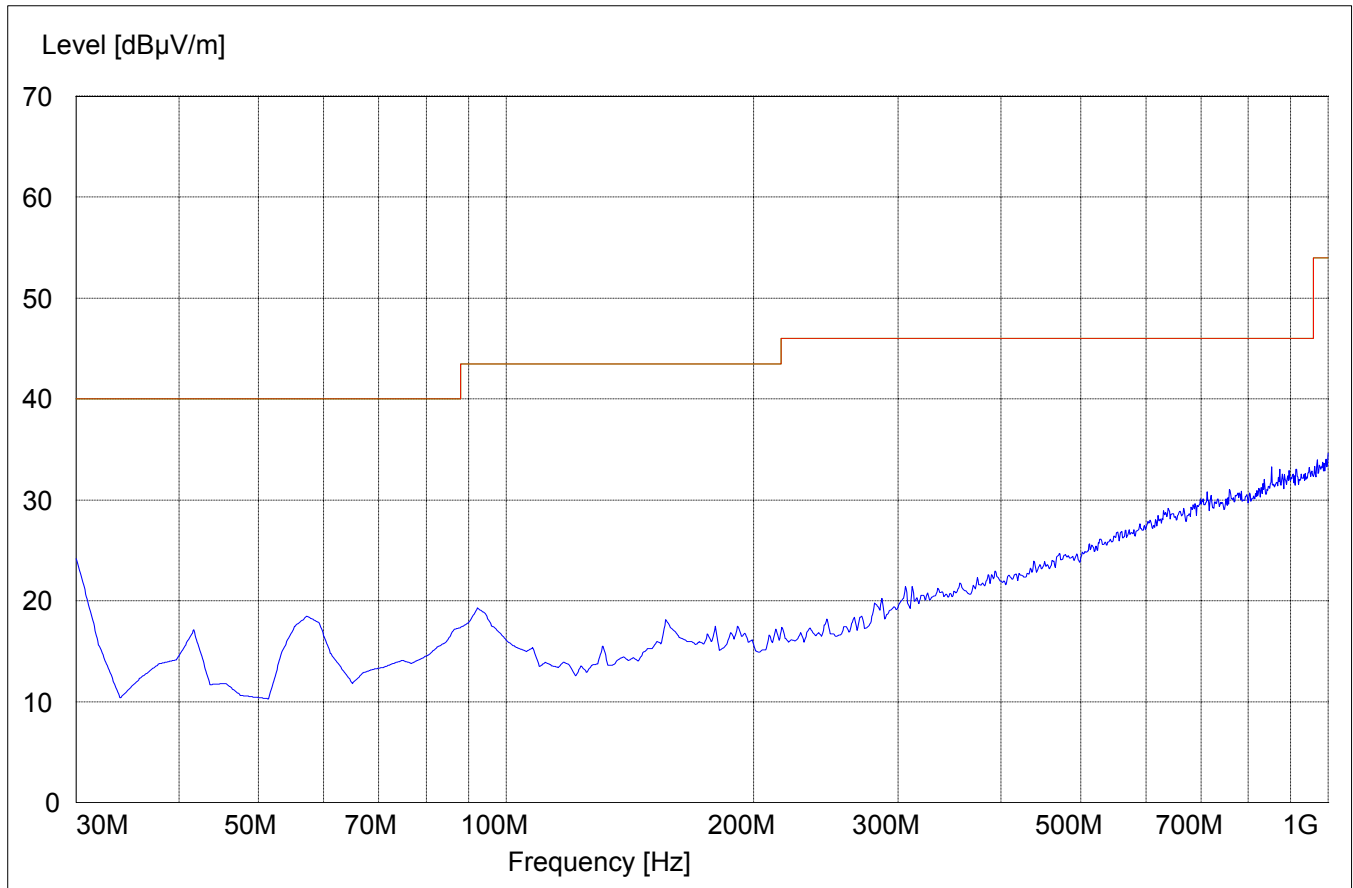
SWEEP TABLE:

"BT Spuri hi 30-1G"

Short Description:

Bluetooth 30MHz-1GHz

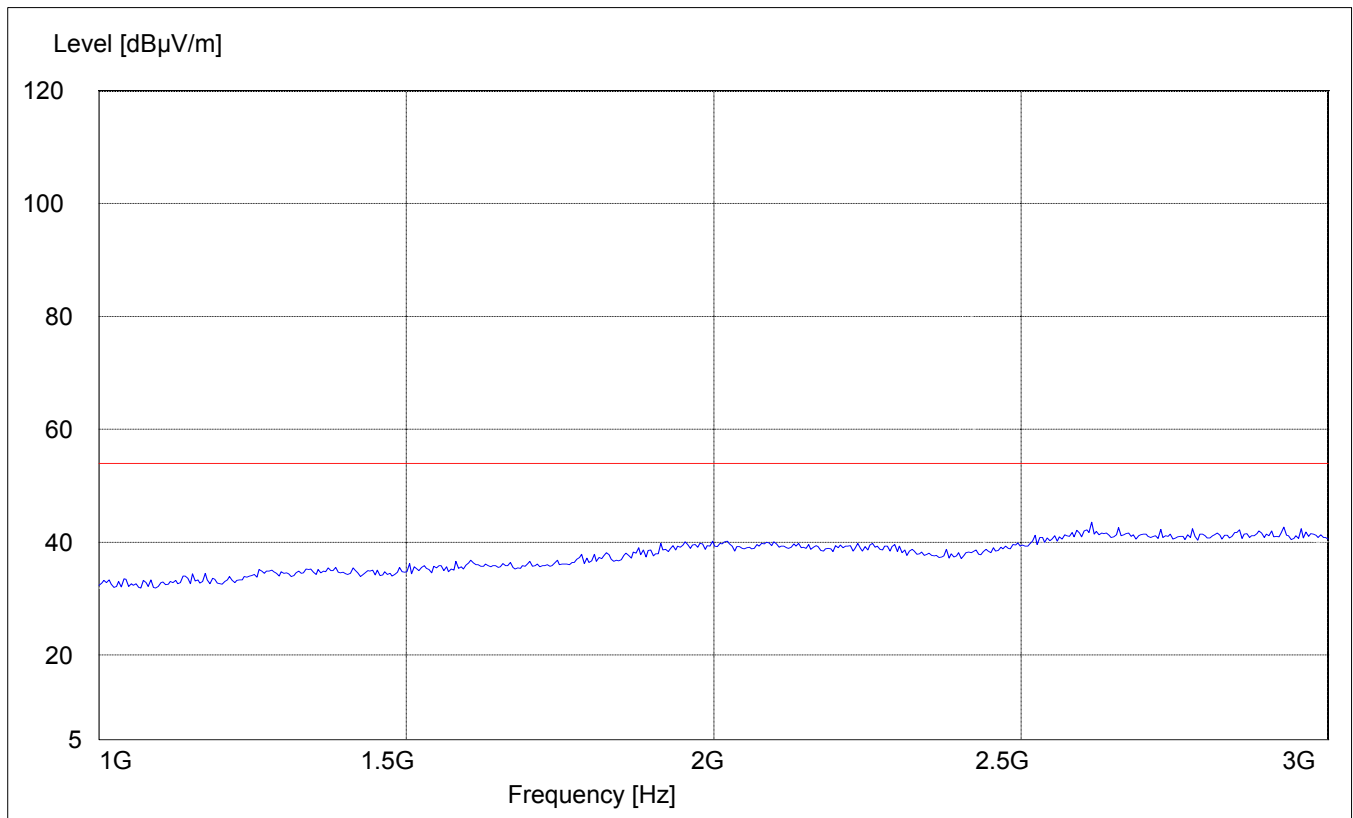
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency		Time	VBW	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186



RECEIVER SPURIOUS RADIATION
1GHz – 3GHz

§ 15.209

SWEEP TABLE:		"BT Spuri hi 1-3G"			
Short Description:		Bluetooth Spurious 1-3GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)

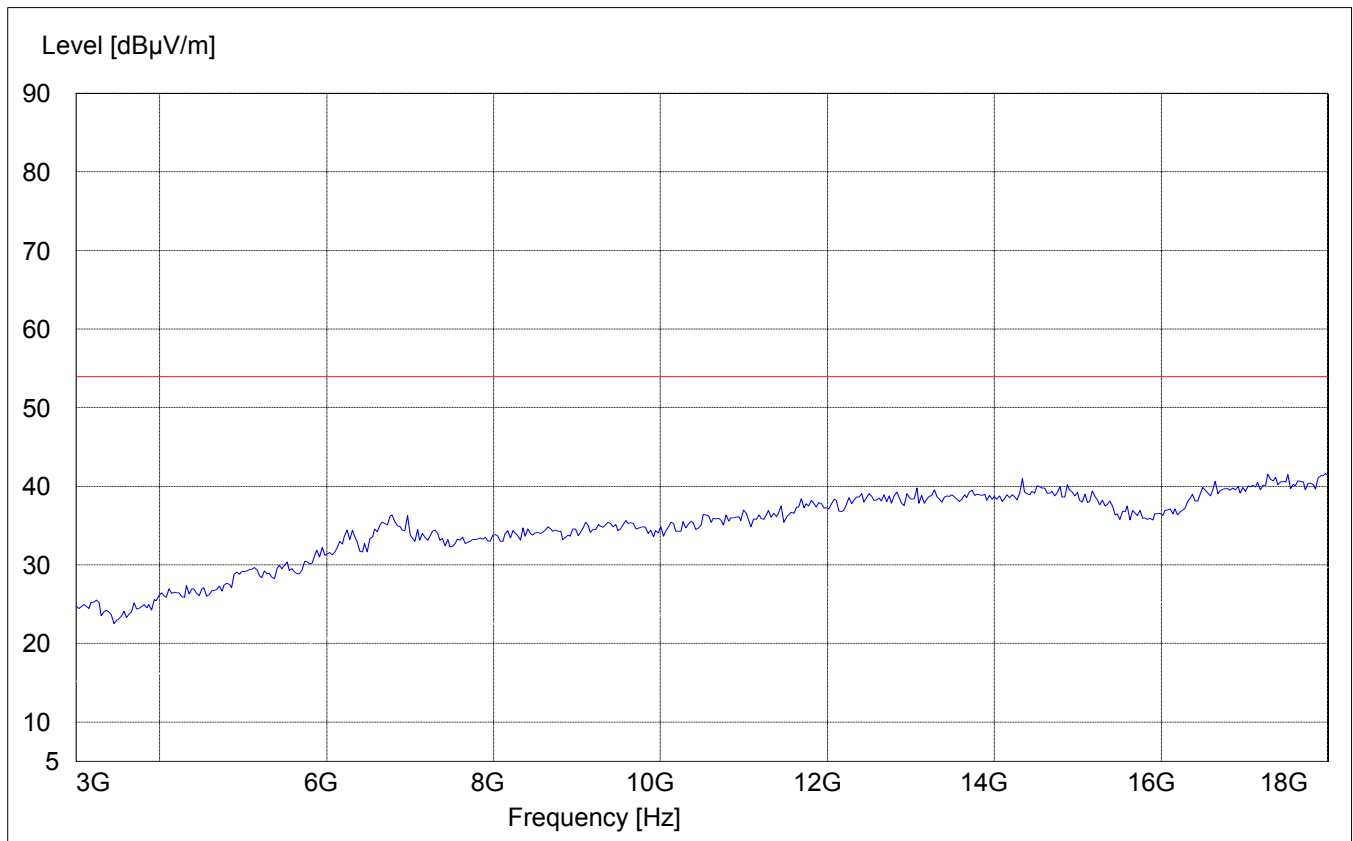


RECEIVER SPURIOUS RADIATION

3GHz – 18GHz

§ 15.209

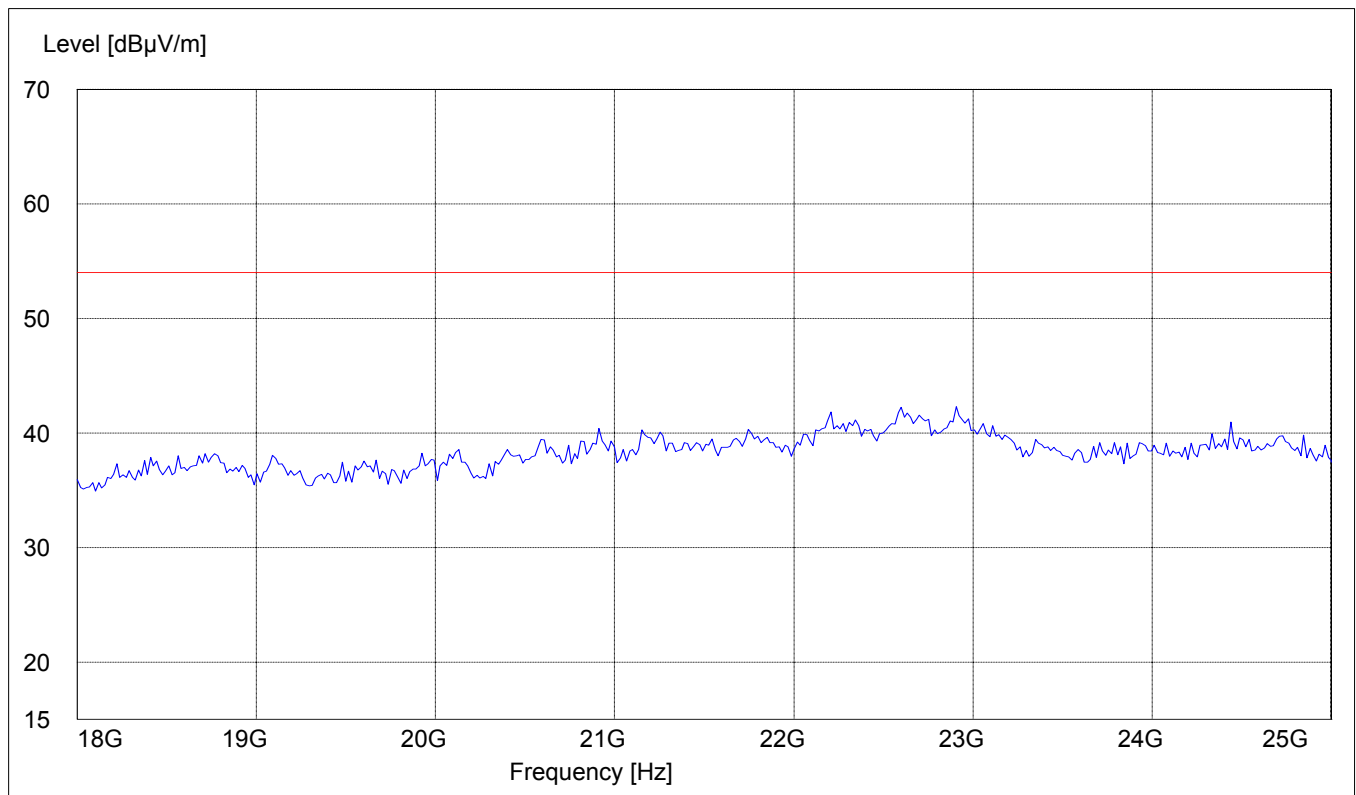
SWEEP TABLE:		"BT Spuri hi 3-18G"			
Short Description:		Bluetooth Spurious 3-18 GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



RECEIVER SPURIOUS RADIATION
18GHz – 25GHz

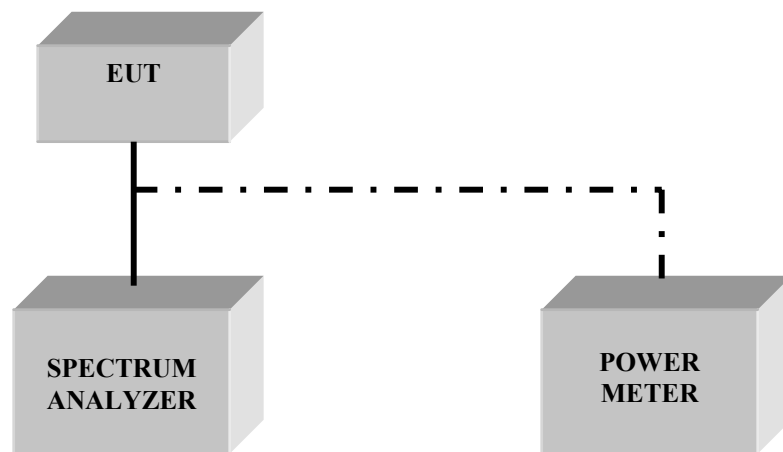
§ 15.209

SWEEP TABLE:		"BT Spuri hi 18-25G"			
Short Description:		Bluetooth Spurious 18-25GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
18.0 GHz	25 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	826880/010
03	Biconilog Antenna	3141	EMCO	0005-1186
04	Horn Antenna (700M-18GHz)	SAS-200/571	AH Systems	325
05	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240
06	2-3GHz Band reject filter	BRM50701	Microtronics	6
07	Pre-Amplifier	TS-ANA	Rohde & Schwarz	--
08	Pre-Amplifier	JS4-00102600	Miteq	00616

BLOCK DIAGRAMS
Conducted Testing

Radiated Testing

ANECHOIC CHAMBER

