CETECOM ICT Services GmbH

Radio Satellite Communication
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TTI-P-G166/98-30

Accredited Testing Laboratory

DAR-Registration number:
TTI-P-G 166/98-20

Accredited Bluetooth™ Test Facility (BQTF)

Test Report No.: 5-4215-01-03/02
FCC Part 15.247/CANADA RSS-210
SIEMENS WDCT-PHONE
GIGASET SL 30 (Handset)
FCC ID : L82-SL3501

Table of Contents

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 ICT Services GmbH does not assume responsibility for any conclusions and generalisations 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 ICT Services GmbH.

Test Laboratory Manager:

2003-29-01	RSC8414	Ames H.	
Date	Section	Name	Signature

Technical Responsibility for Area of Testing:

2003-29-01	RSC8411	Berg M.	
Date	Section	Name	Signature

1.2 Testing laboratory

CETECOM ICT Services GmbH
Untertürkheimer Straße 6 - 10
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Germany
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Internet : www.cetecom.de
Accredited testing laboratory
DAR-registration number : TTI-P-G 166/98-20

1.3 Details of applicant

Name : SIEMENS AG
Street : Frankenstrasse 2
City : D-46395 Bocholt
Country : Germany
Telephone : +49 2871 91 0
Telefax : +49 2871 91 2495
Contact : Mr. Uwe Alt
Telephone: +49 2871 91 2948

1.4 Application details

Date of receipt of application : 2003-01-16
Date of receipt of test item : 2003-01-16
Date of test : 2003-01-21

1.5 Test item

Type of equipment	:	**WDCT - Phone , Handset**
Type designation	:	**GIGASET SL 30**
Manufacturer	:	applicant
Street	:	
City	:	
Country	:	
Serial number	:	
Additional information	**:**	
Frequency	:	2401.06 – 2482.28 MHz
Type of modulation	:	800KFXD / 79M8FXD (FHSS)
Number of channels	:	95
Antenna	:	integratedl antenna
Power supply	:	NiMH Battery 3.6V DC
Output power max	:	rad. 128.5 mW EIRP(21.09 dBm), cond. 267.9 mW (24.28 dBm)
Type of equipment	:	

1.6 Test standards: FCC Part 15 §15.247

CANADA RSS-210

2 Technical test

2.1 Summary of test results

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 20 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber.
The receiving antennas are conform with specifications ANSI C63.2-1987 clause 15 and ANSI C63.4-1992 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received.
The wanted and unwanted emissions are received by spectrum analyzers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63-4-1992 clause 4.2.

Antennas are conform with ANSI C63.2-1996 item 15.

9 kHz - 30 MHz: Quasi Peak measurement, 9kHz Bandwidth, passive loop antenna.

30 MHz - 200 MHz: Quasi Peak measurement, 120KHz Bandwidth, biconical antenna

200MHz - 1GHz: Quasi Peak measurement, 120KHz Bandwidth, log periodic antenna

1GHz: Average, RBW 1MHz, VBW 10 Hz, wave-guide horn

All measurements are done in accordance with the Filing and Measurement Guidelimes for Frequency Hopping Spread Spectrum Systems DA 00-705.

The product fullfills also the requirements for CANADA RSS-210.

Final verdict : PASS

2.2 Test Report

TEST REPORT

Test Report No. : 5-4215-01-03/02

TEST REPORT REFERENCE

LIST OF MEASUREMENTS

Antenna Gain (calculated) **SUBCLAUSE § 15.204**

GIGASET SL 30 Handset

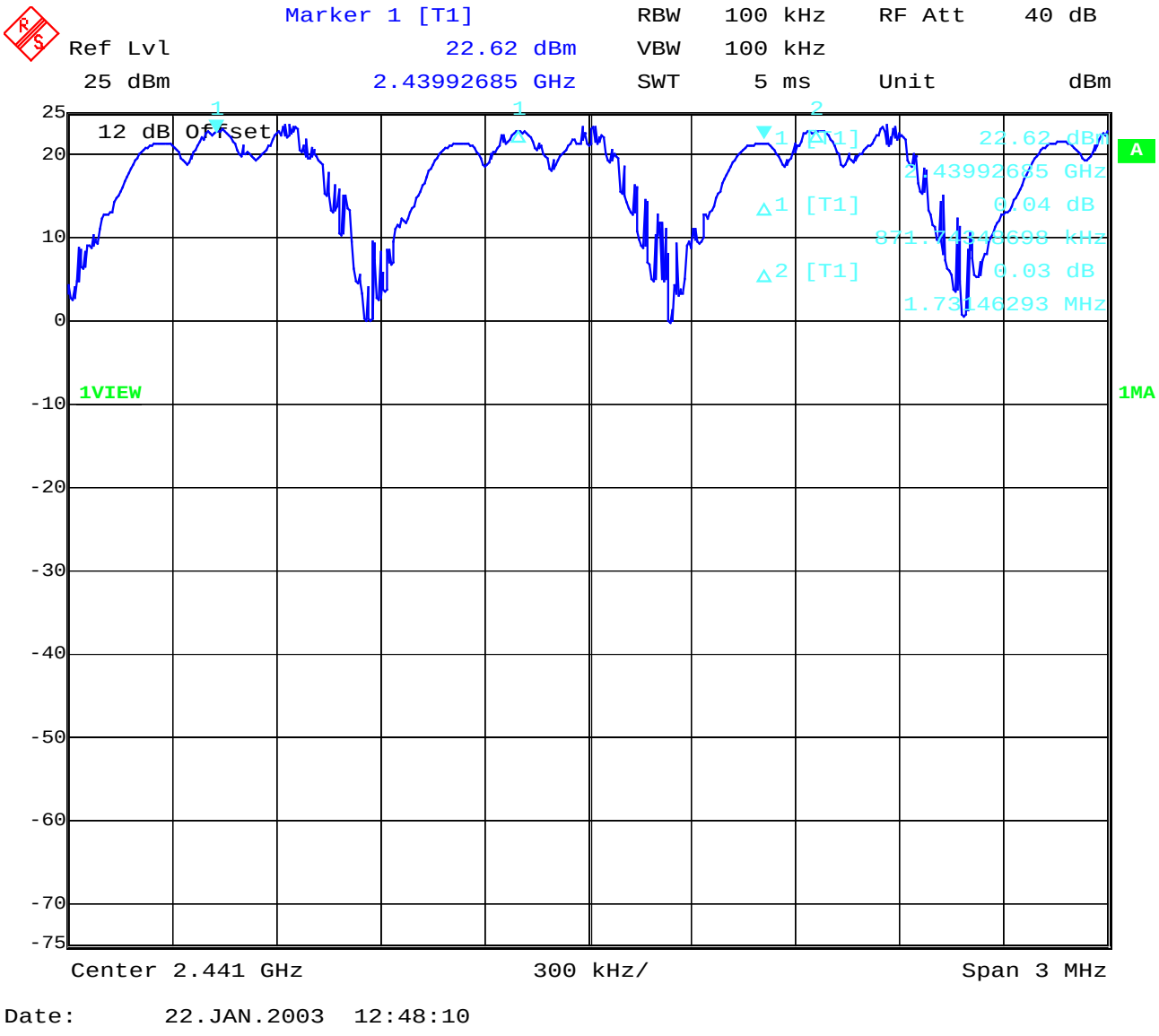
The antenna gain of the complete system is calculated by the difference of conducted power of the module and the radiated power in EIRP.

	low channel	mid channel	high channel
Conducted power	24.28 dBm	23.98 dBm	23.30 dBm
Radiated power	20.83 dBm	20.94 dBm	21.09 dBm
Gain	-3.45 dB	-3.04 dB	-2.21 dB

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Carrier frequency separation §15.247(a)(1)

Cursor 1 to cursor 2 ~ 871 kHz; cursor 2 to cursor 3 ~ 860 kHz



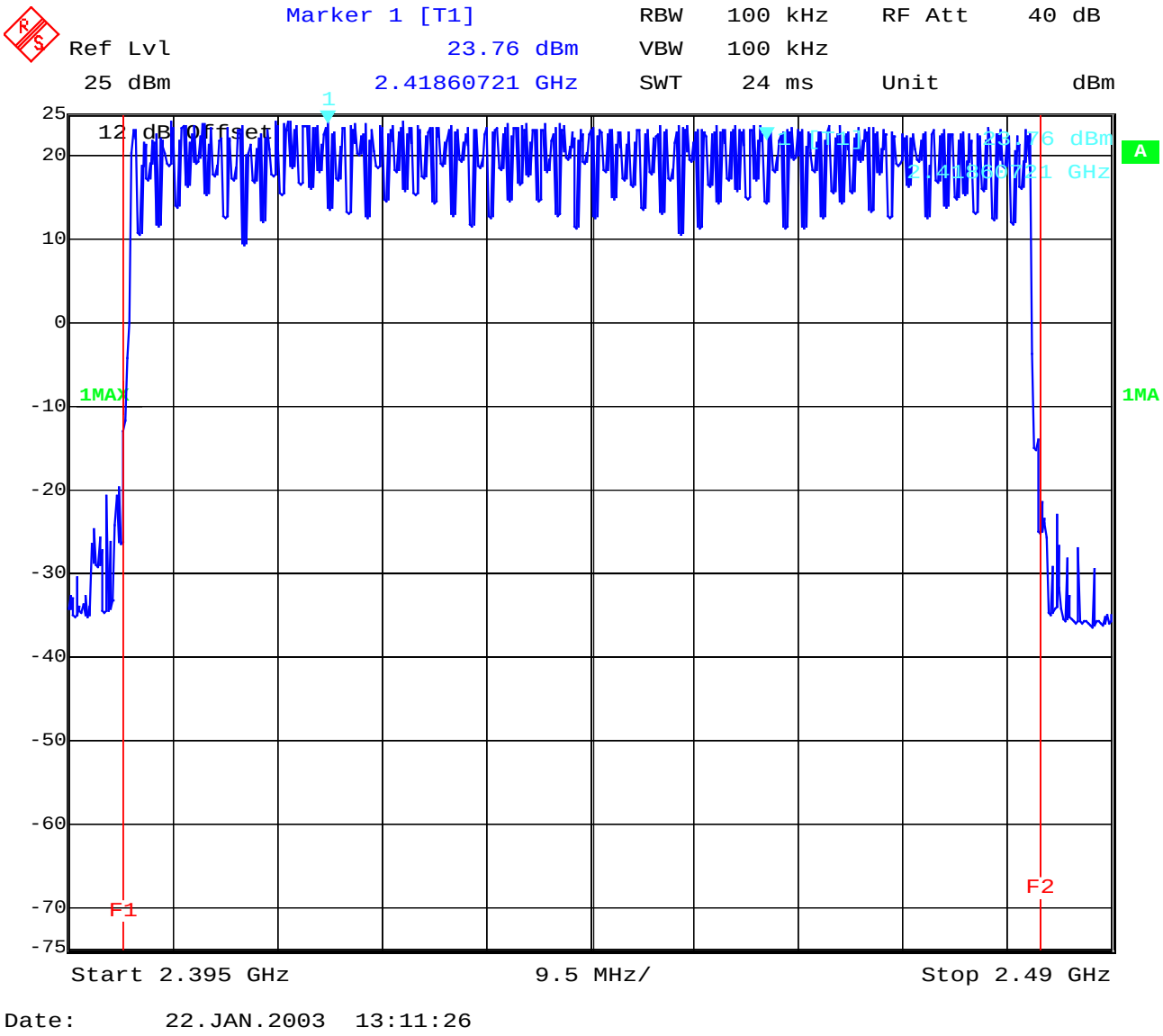
Limit: minimum 25 kHz or the 20 dB Bandwidth of the hopping system

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Number of hopping channels **§15.247(a)(1) iii**

The number of hopping channels is 95.

The red frequency lines show the limit of the band.

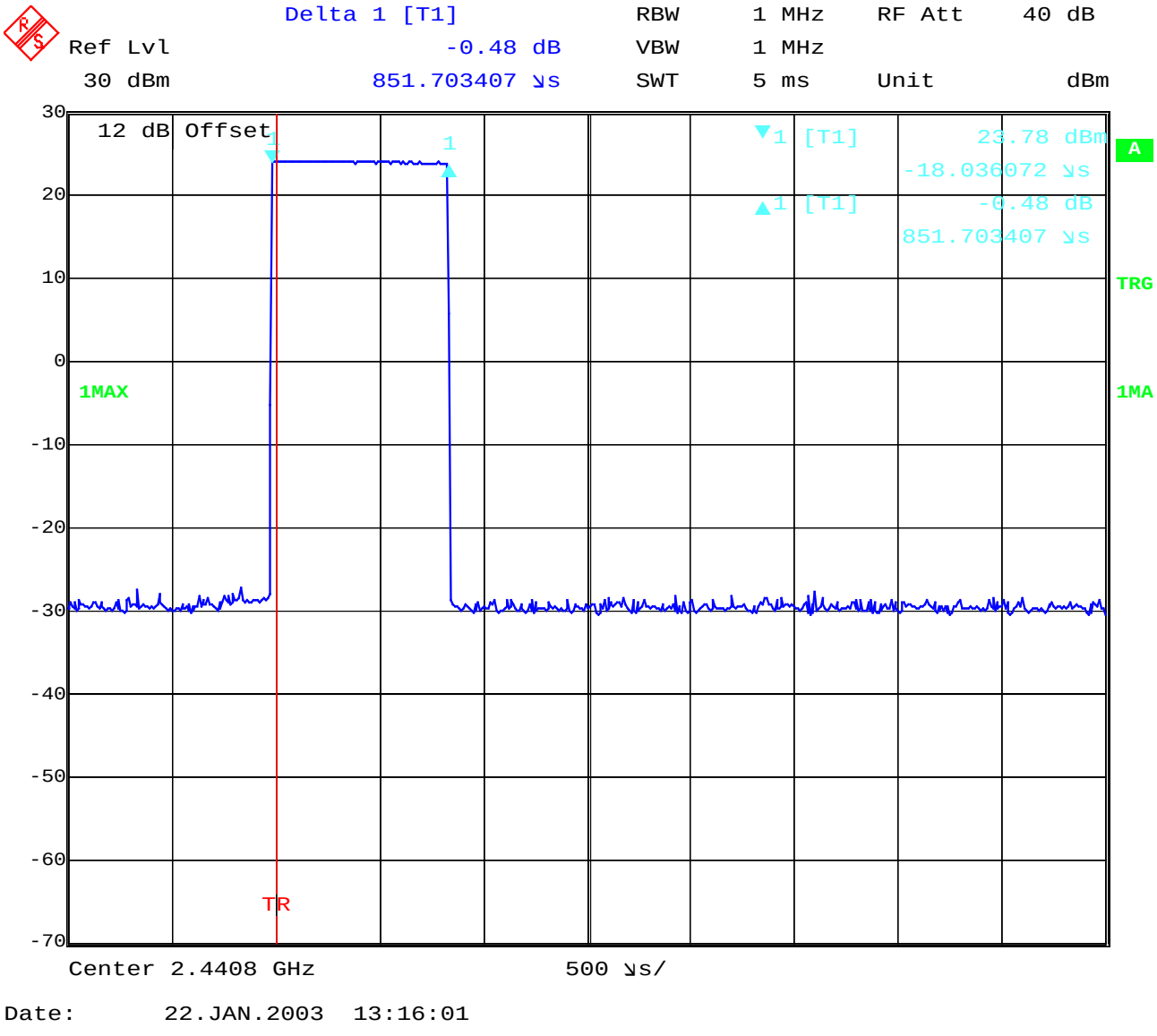


Limit: at least 15 non-overlapping channels

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Time of occupancy (dwell time) **§15.247(a)(1)iii**

The max. duration of signal is 0.852 ms.



Limit: the average time of occupancy on any channel shall not be grater than 0.4s within a period of 0.4s x number of hopping channels

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Time of occupancy (dwell time) **§15.247(a)(1) iii**

Dwell time

Dwell time = time slot length * hop rate / number of hopping channels *0.4s* number of hopping channels

Manufacturer declaration: 100 hopps/1s

[852 µs] *[100(1/s) / 95 channels] * [0.4 s]*[95 channels] = 34.08 ms

Limit: the average time of occupancy on any channel shall not be grater than 0.4s within a period of 0.4s x number of hopping channels

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Spectrum Bandwidth of a FHSS System **§15.247(a)**

20 dB bandwidth

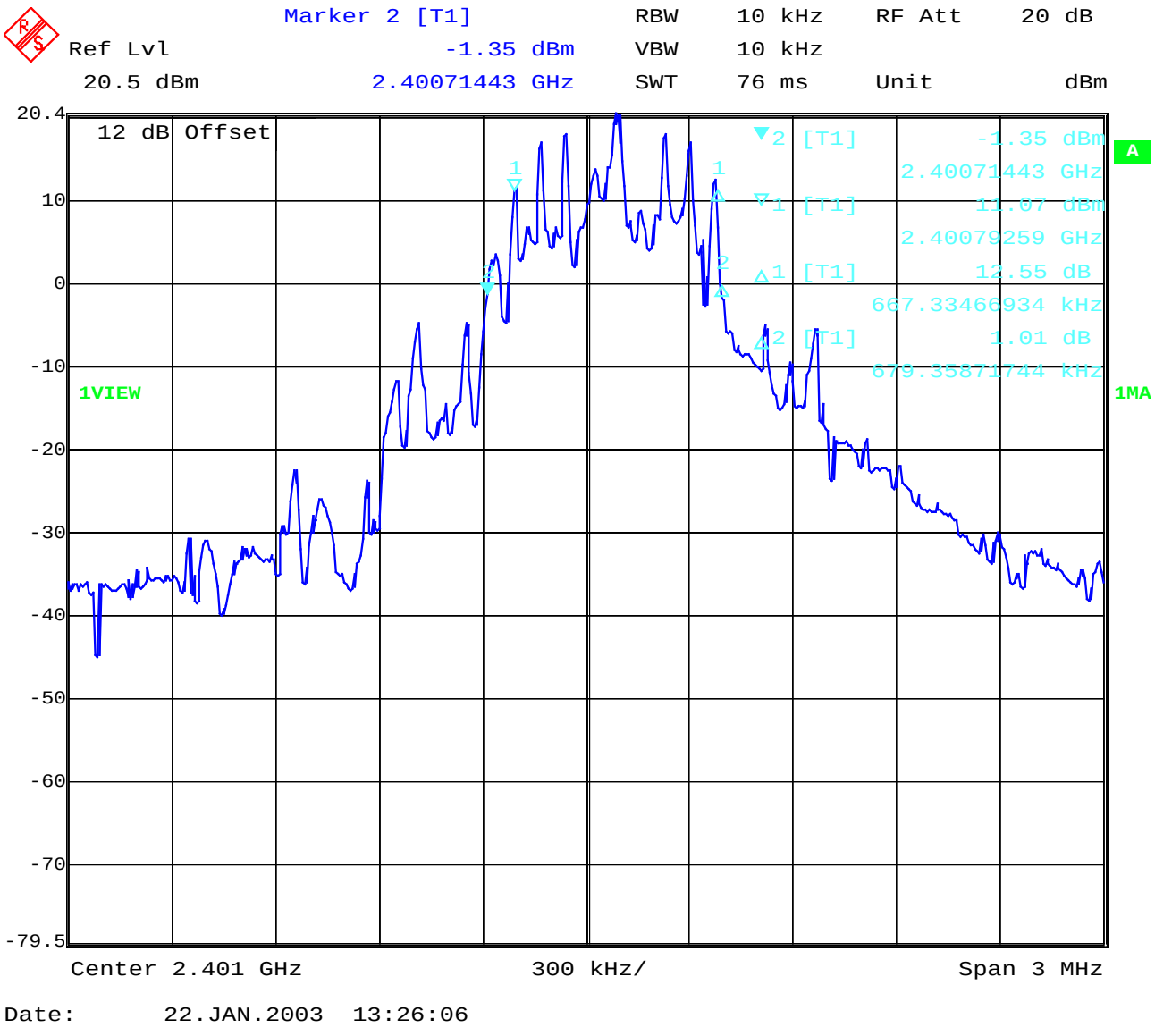
TEST CONDITIONS		20 dB BANDWIDTH (kHz)		
Frequency (MHz)		2401.06	2441.66	2482.28
T_{nom}(22)°C	V_{nom}(3.6)V	758	625	673
Measurement uncertainty		±1kHz		

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

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Spectrum Bandwidth of a FHSS System **§15.247(a)**
20 dB bandwidth

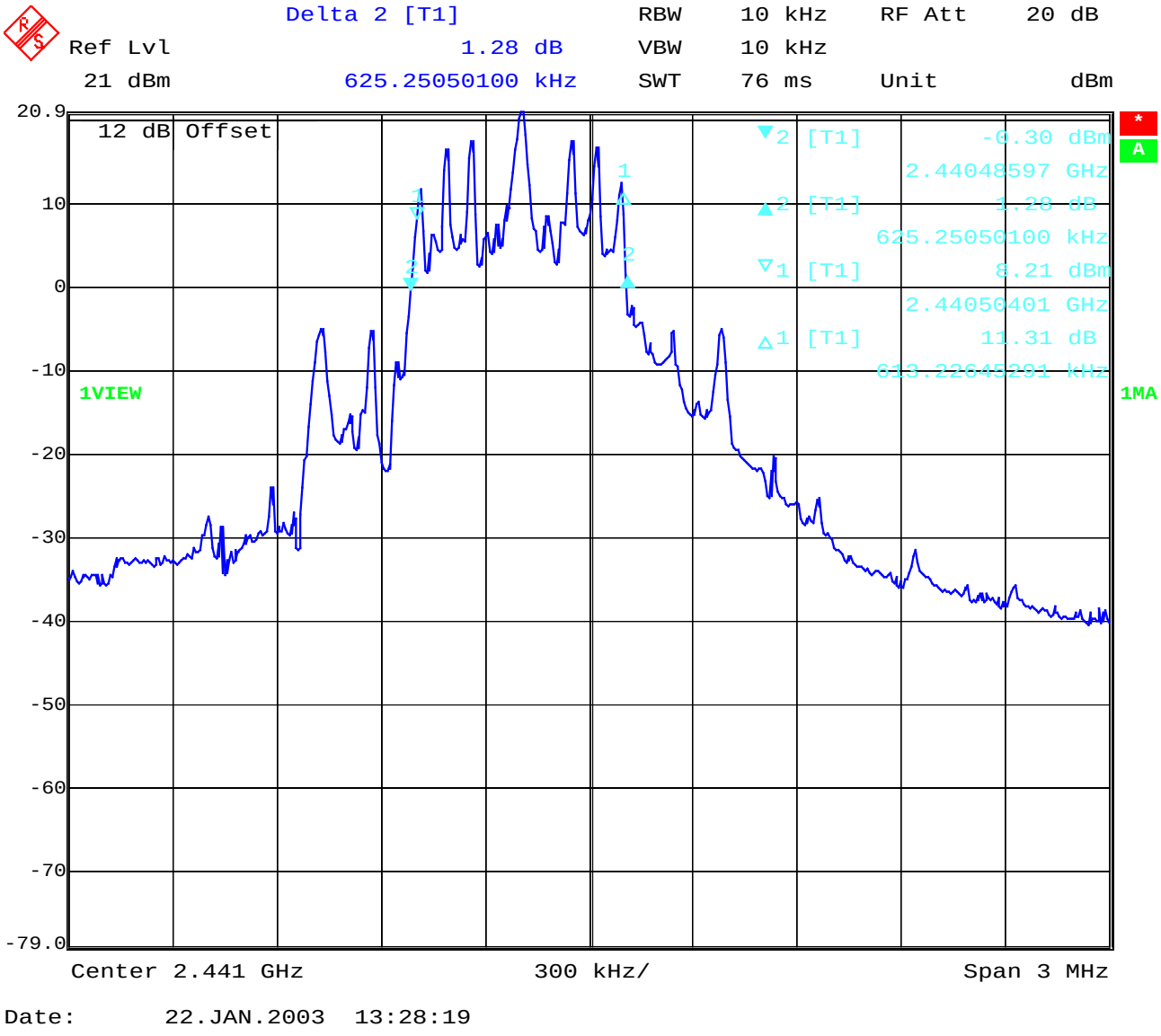
Channel 1 (lowest Channel)



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Spectrum Bandwidth of a FHSS System **§15.247(a)**
20 dB bandwidth

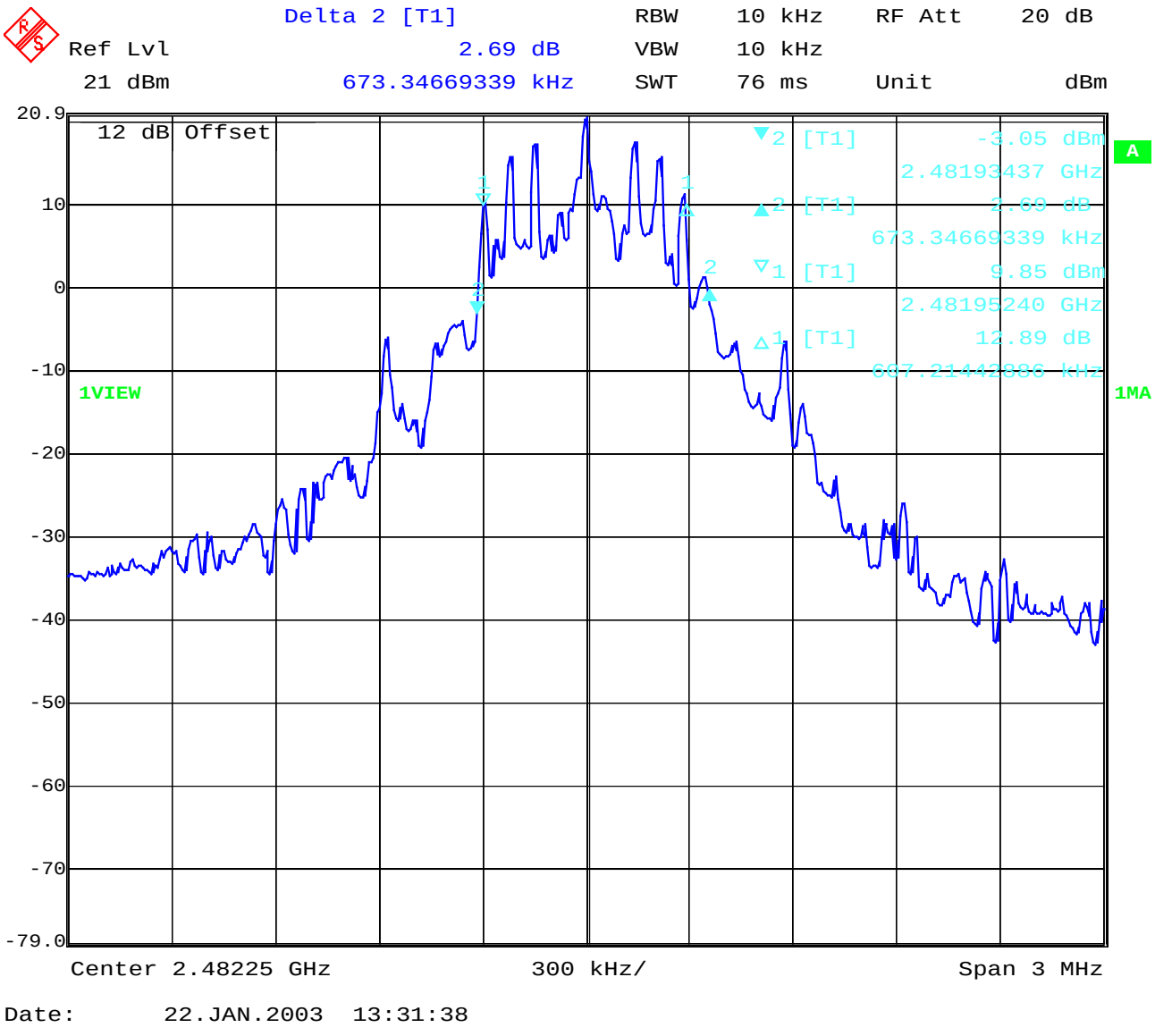
Channel 2 (middle Channel)



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Spectrum Bandwidth of a FHSS System **§15.247(a)**
20 dB bandwidth

Channel 3 (highest Channel)



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

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

The conducted measurements were performed with a temporary coax connector.

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm) GIGASET SL 30 Handset			
Frequency (MHz)			2401.06	2441.66	2482.28
T_{nom}(22)°C	V_{nom}(3.6)V	PK	24.28 (267.9 mW)	23.98 (250.0 mW)	23.30 (213.8 mW)
Measurement uncertainty		±3dB			

RBW / VBW : 1 MHz

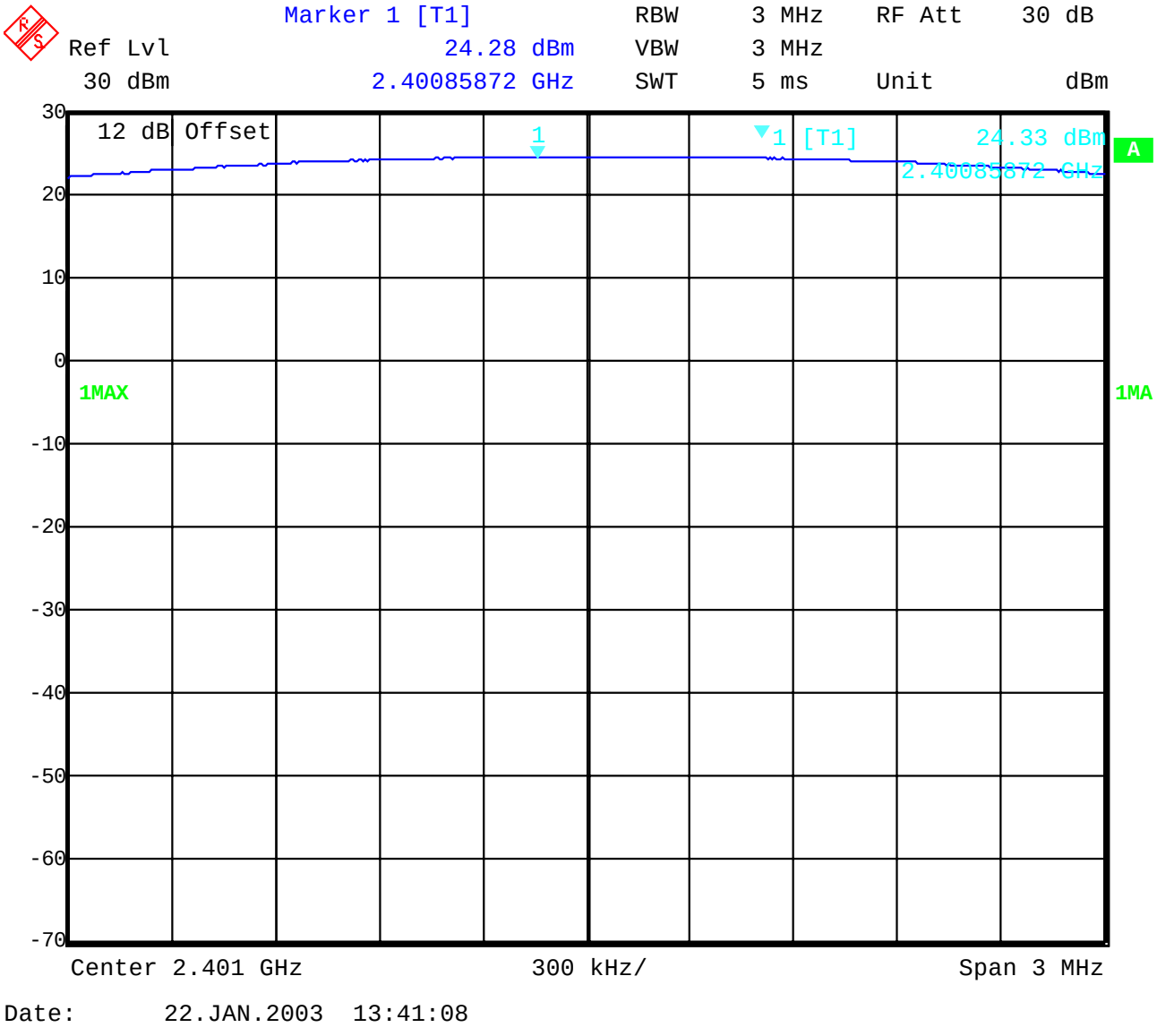
LIMIT **SUBCLAUSE § 15.247 (b) (1)**

Frequency range	RF power output
2400-2483.5 MHz	1.0 Watt

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Peak output power (conducted) **§15.247 (b) (1)**

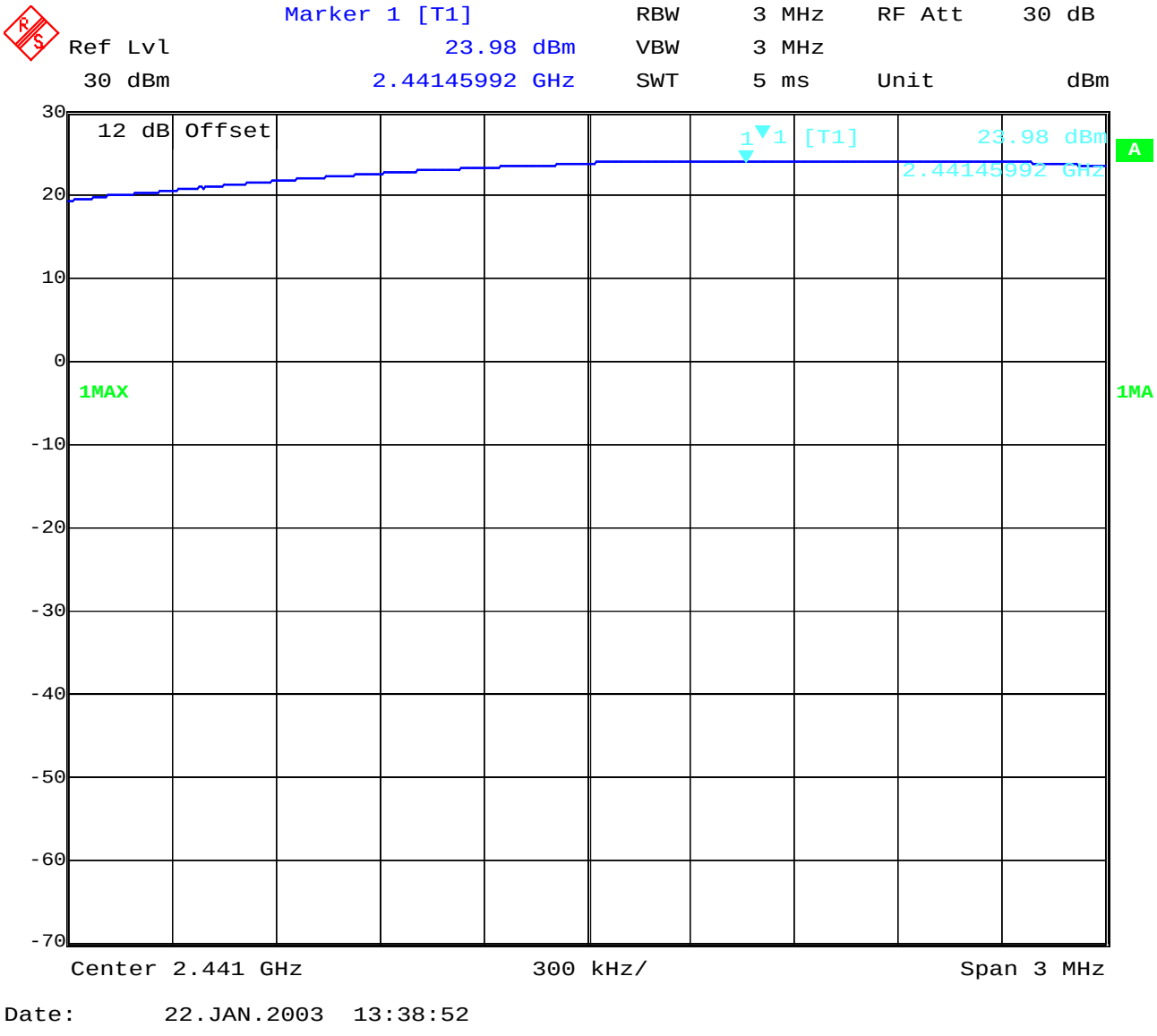
Channel 1 (lowest Channel): 24.28 dBm
De facto EIRP with -3.45 dbi max. antenna gain is +20.83 dBm



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Peak output power (conducted) **§15.247 (b) (1)**

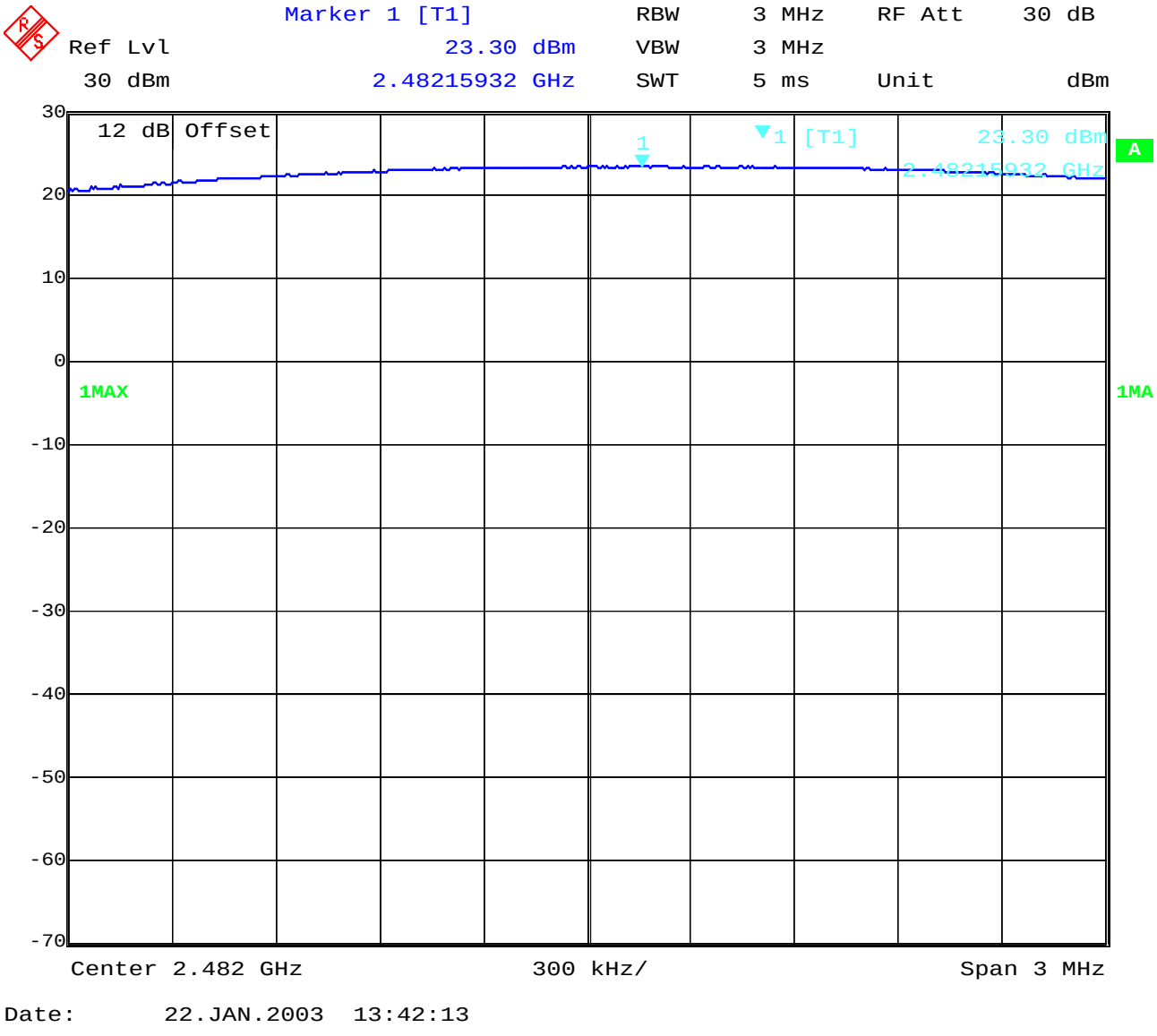
Channel 2 (middle Channel): 23.98Bm
De facto EIRP with -3.04 dbi max. antenna gain is +20.94 dBm



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Peak output power (conducted) **§15.247 (b) (1)**

Channel 3 (highest Channel): 23.30 dBm
De facto EIRP with -2.21 db max. antenna gain is +21.09dBm



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

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

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm) GIGASET SL 30		
Frequency (MHz)		2401	2441	2482
T_{nom}(22)°C	V_{nom}(3.6)V	20.83 (121.1 mW)	20.94 (124.2 mW)	21.09 (128.5 mW)
Measurement uncertainty		±3dB		

RBW/VBW : 3 MHz

Measured at a distance of 3m

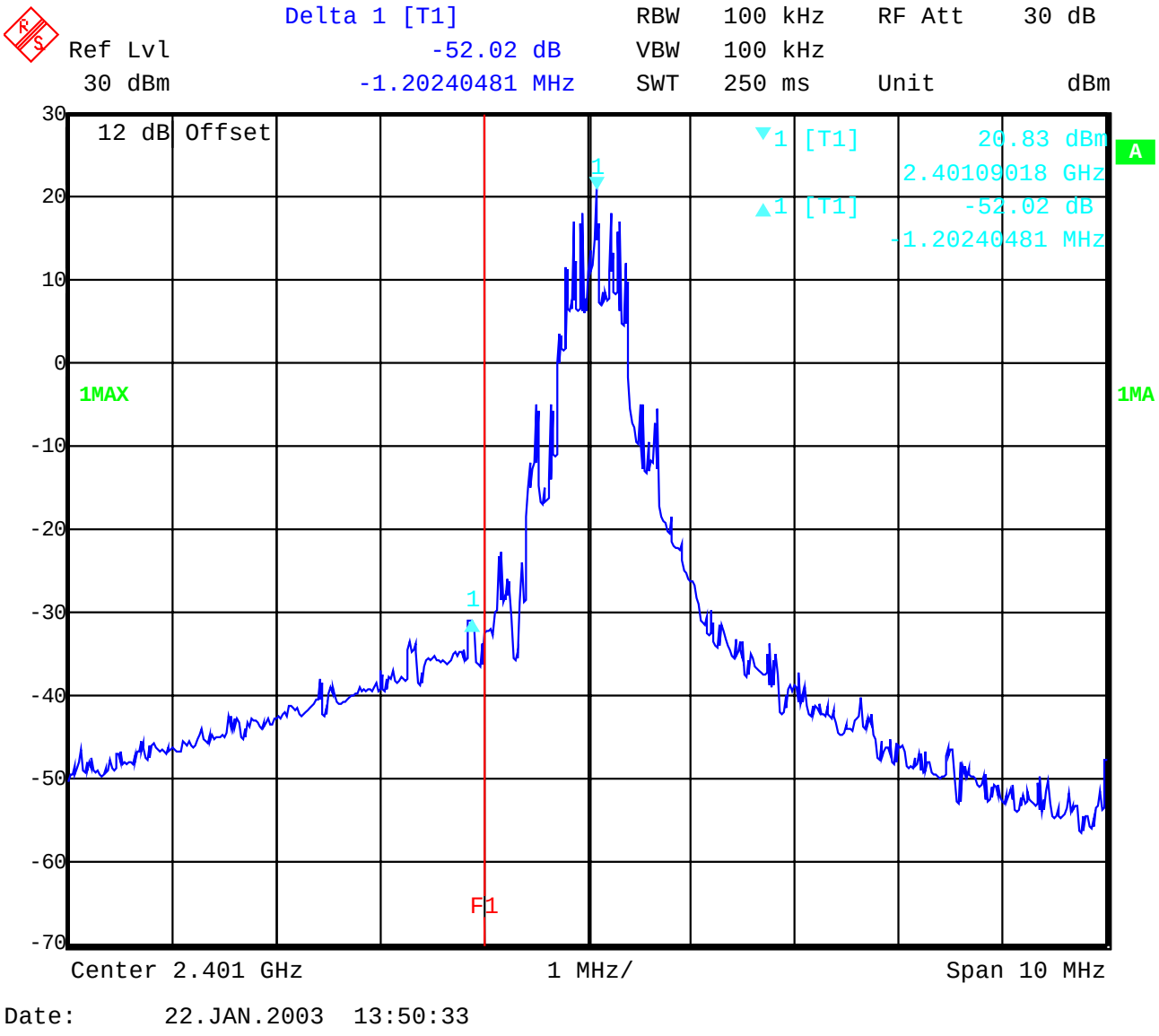
LIMIT **SUBCLAUSE § 15.247 (b) (1)**

Frequency range	RF power output
2400-2483.5 MHz	1.0 Watt

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 - 24

Band-edge compliance of conducted emissions **§15.247 (c)**

Low frequency section (hopping off) :

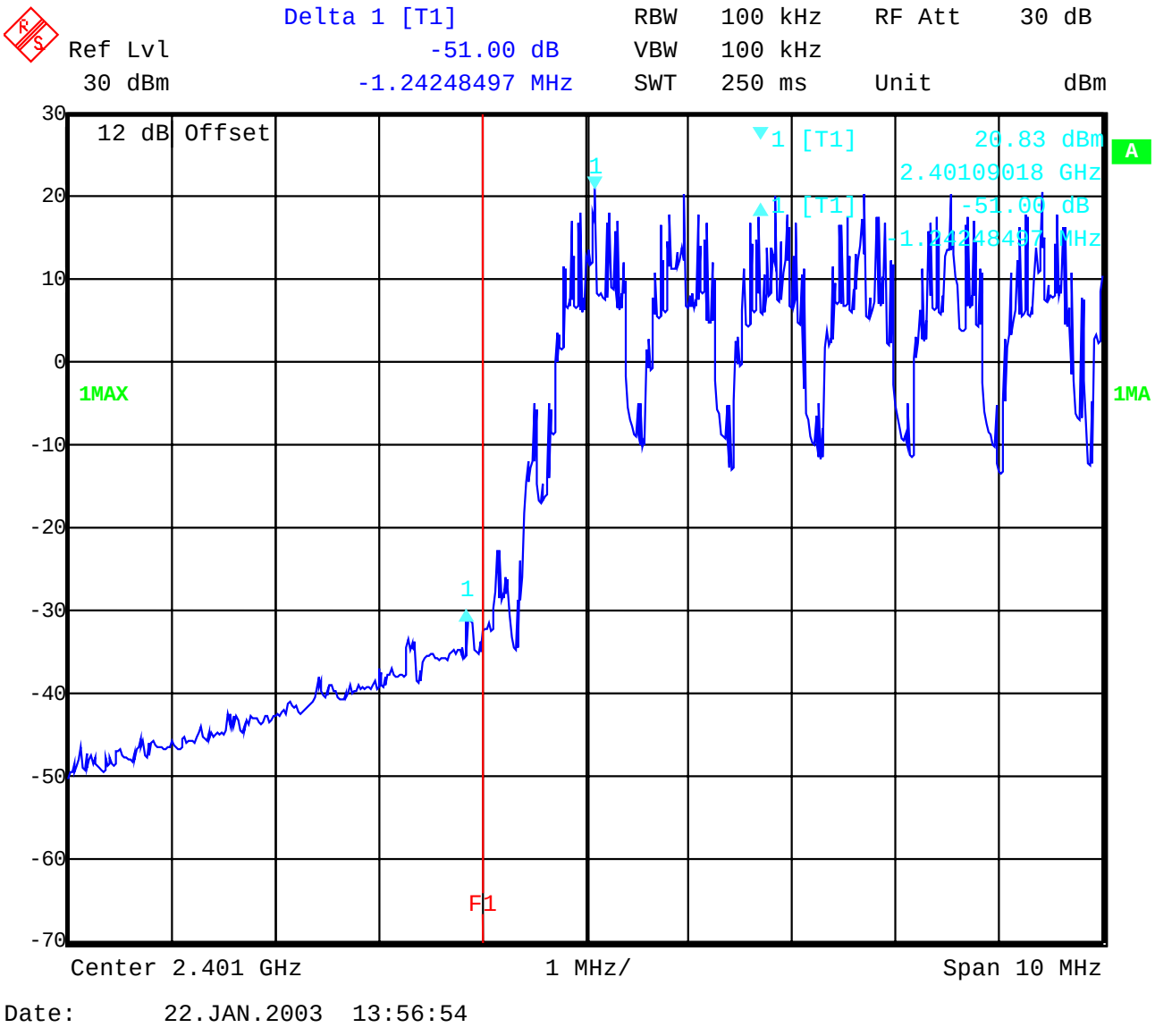


Limit: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Band-edge compliance of conducted emissions **§15.247 (c)**

Low frequency section (hopping on):

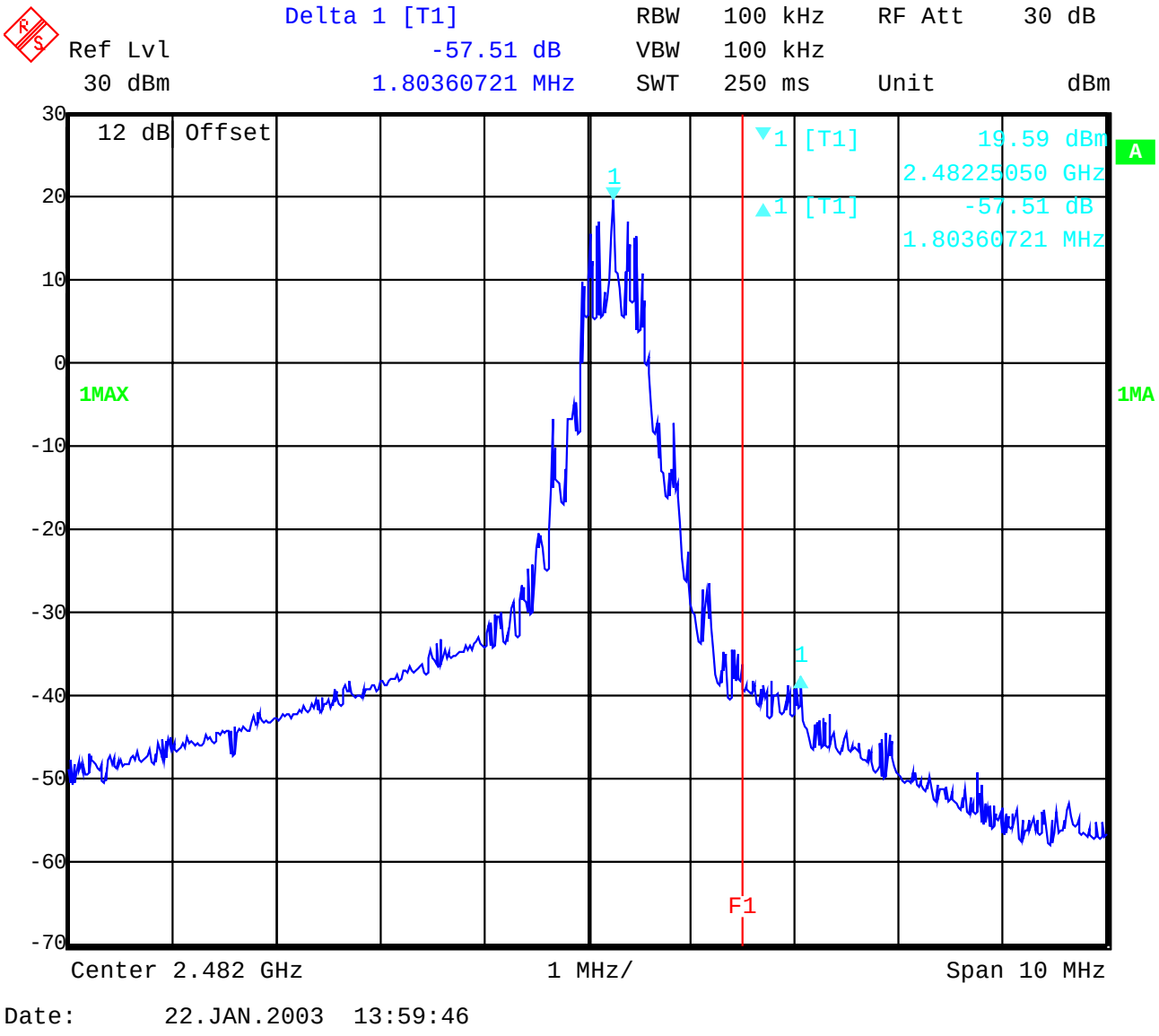


Limit: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Band-edge compliance of conducted emissions **§15.247 (c)**

high frequency section (hopping off):

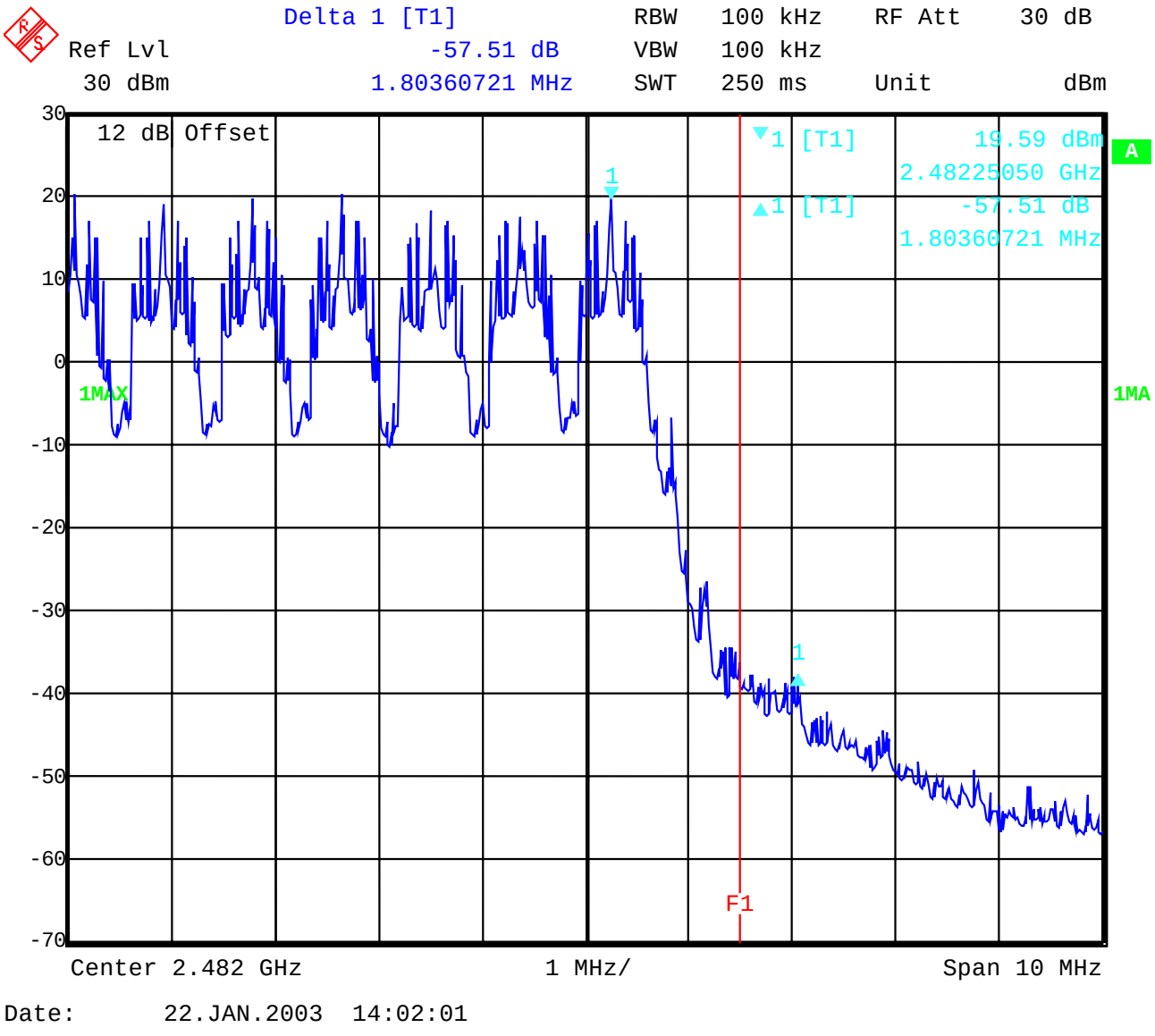


Limit: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Band-edge compliance of conducted emissions **§15.247 (c)**

high frequency section (hopping on):



Limit: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Band-edge compliance of radiated emissions **§15.205**

Radiated field strength

The field strength was measured with an EMI measuring receiver and 1 MHz RBW / VBW for peak and with 1MHz RBW / 10Hz VBW for average at a distance of 3m.

The correction factor is the summation of antenna factor, cable loss and amplifier gain.

high channel	setup	measured value (3m)	correction factor	calculated value (3m)
Peak value	1 MHz RBW 1 MHz VBW	115.7 dBµV/m	+0.6 dB	116.3 dBµV/m
Average value (calculated)	1 MHz RBW 10 Hz VBW	Duty cycle 0.08266 => -21.6 dB	-21.6 dB	94.7 dBµV/m
Delta value	Peak 100 kHz RBW/VBW 30 kHz hopping 100 kHz	 45.7 dB 55.8 dB 45.3 dB	-	-
Value at band edge 100 kHz RBW 30 kHz RBW hopping	limit 54 dBµV/m			 49.0 dBµV/m 38.9 dBµV/m 49.4 dBµV/m
Statement:				Complies

<u>The product complies with the limit of the restricted bands.</u>

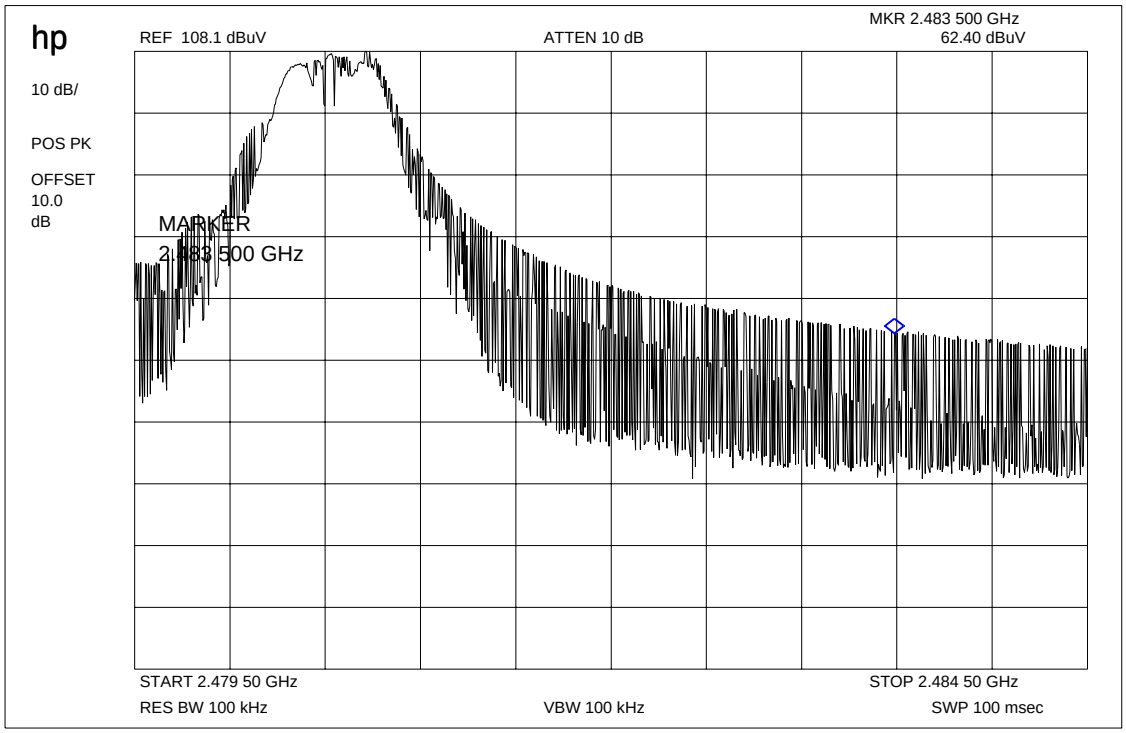
Delta marker plots see next pages

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17-24

Band-edge compliance of radiated emissions §15.205

This measurement was made to show, that the radiated emissions complies to the rules.

RBW/VBW 100 kHz



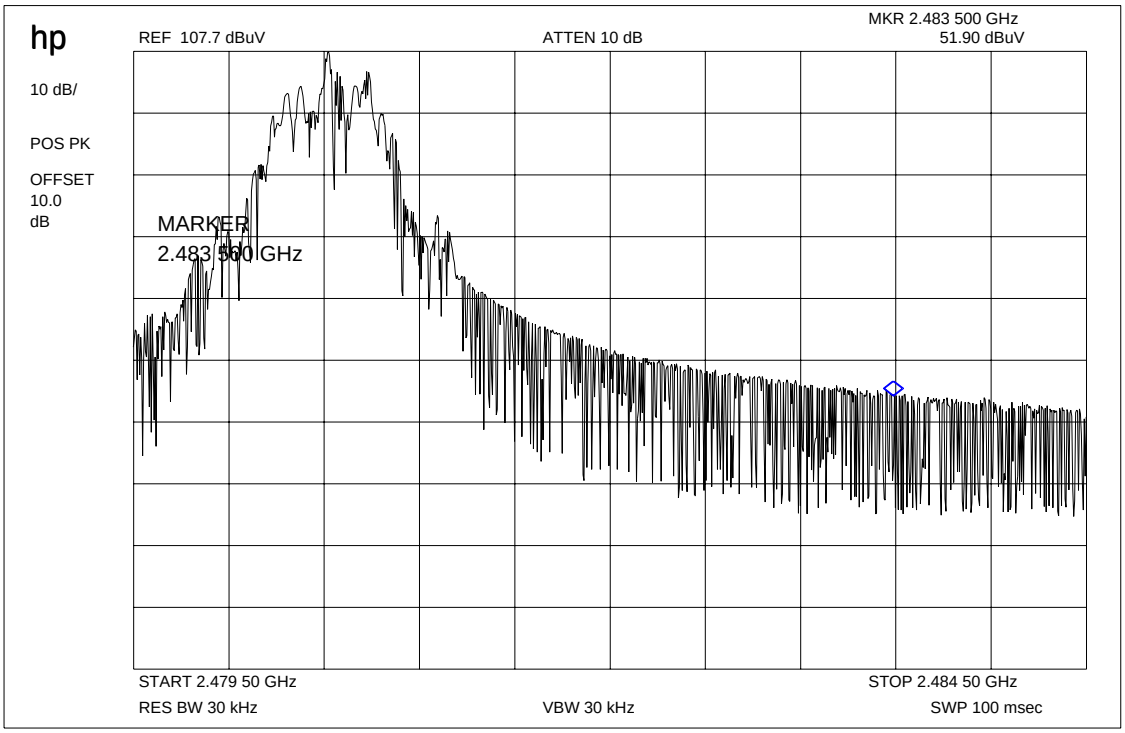
The marker shows the highest level in the restricted band.

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17-24

Band-edge compliance of radiated emissions §15.205

This measurement was made to show, that the radiated emissions complies to the rules.

RBW/VBW 30 kHz



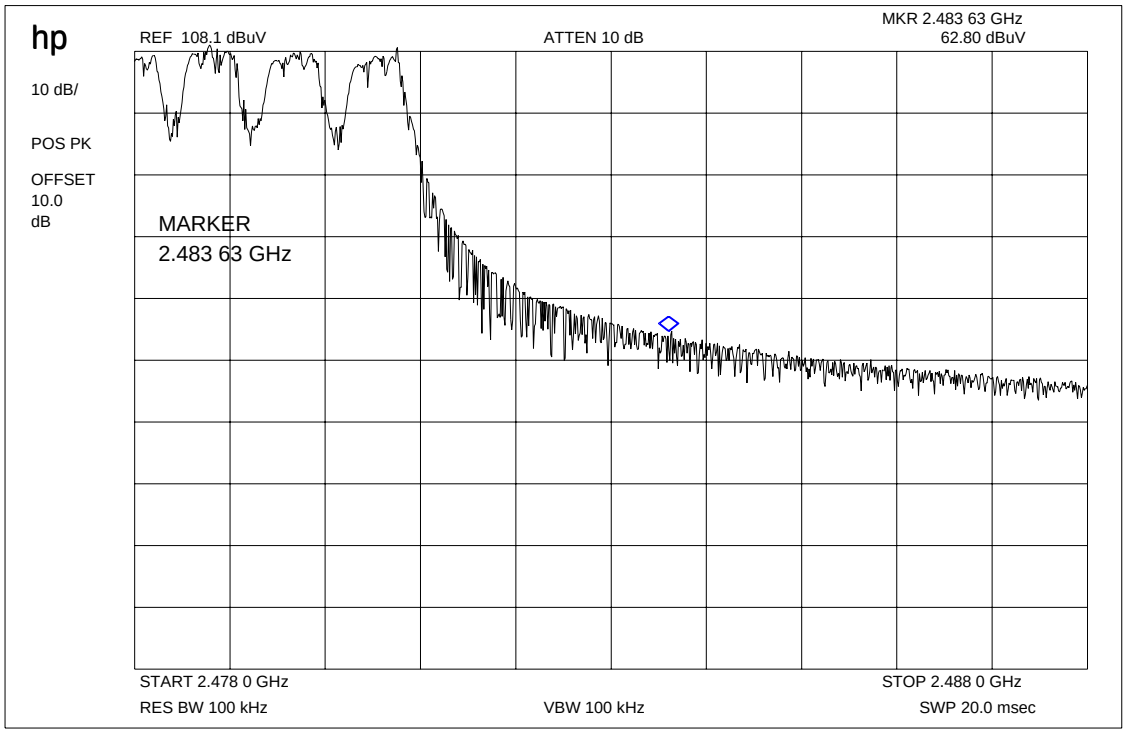
The marker shows the highest level in the restricted band.

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17-24

Band-edge compliance of radiated emissions §15.205

This measurement was made to show, that the radiated emissions complies to the rules.

RBW/VBW 100 kHz hopping



The marker shows the highest level in the restricted band.

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17-24

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

EMISSION LIMITATIONS					
f (MHz)		amplitude of emission (dBm)	limit max. allowed emmision power	actual attenuation below frequency of operation (dB)	results
2401		+24.28	30 dBm	-	Operating frequency
all peaks <<limit			-20 dBc	see plots	complies
2441		+23.98	30 dBm	-	Operating frequency
all peaks <<limit			-20 dBc	see plots	complies
2482		+23.30	30 dBm		Operating frequency
all peaks <<limit			-20 dBc	see plot	complies
Measurement uncertainty		± 3dB			

RBW : 100 kHz VBW: 1 MHz

For emissions that fall into restricted bands you find the radiated emissions later in the report.

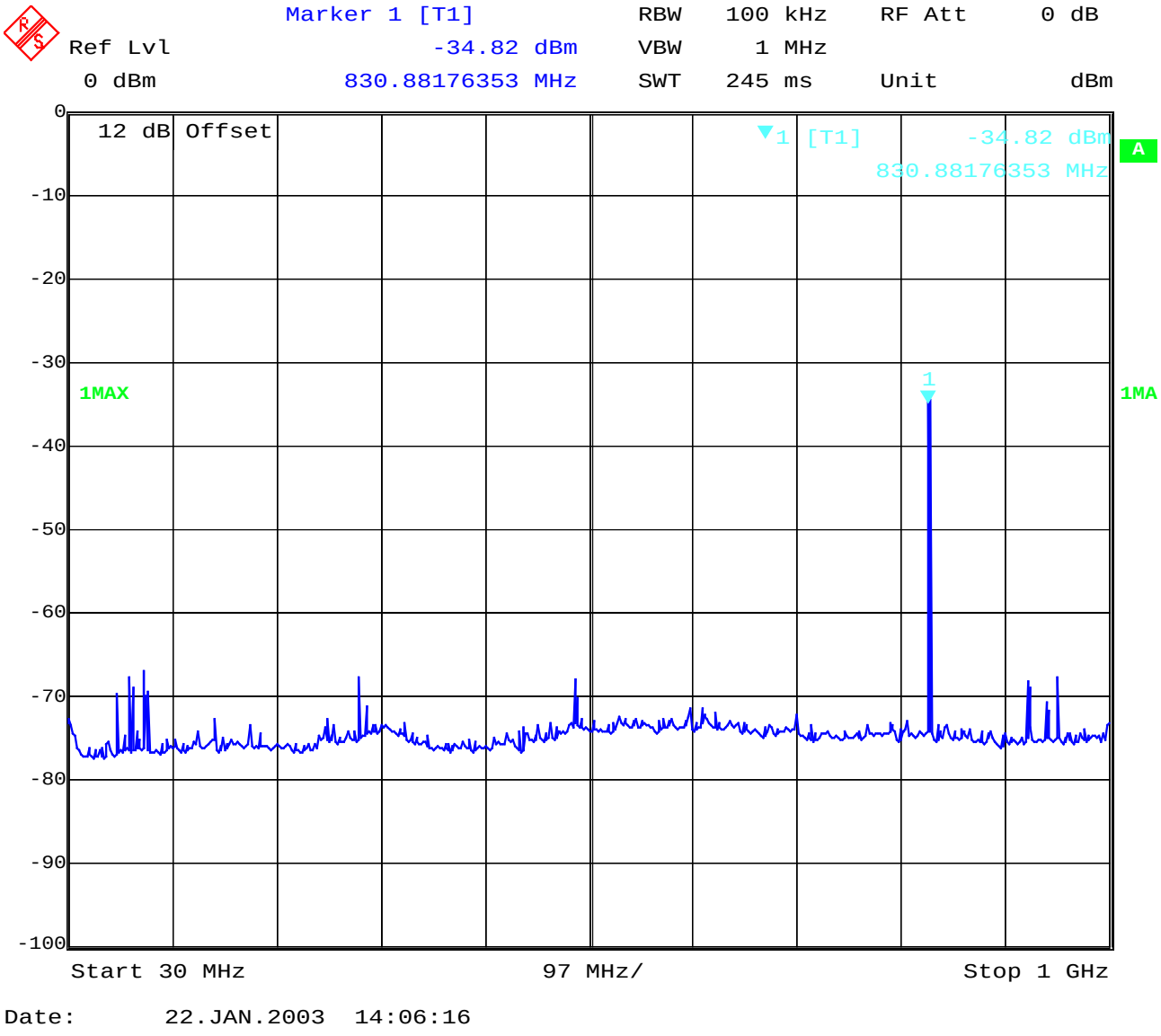
LIMITS SUBCLAUSE § 15.247 (c)

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)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

EMISSION LIMITATIONS- Conducted (Transmitter) **§ 15.247 (c) (1)**
Channel 1 (lowest Channel): 30 MHz - 1 GHz peak

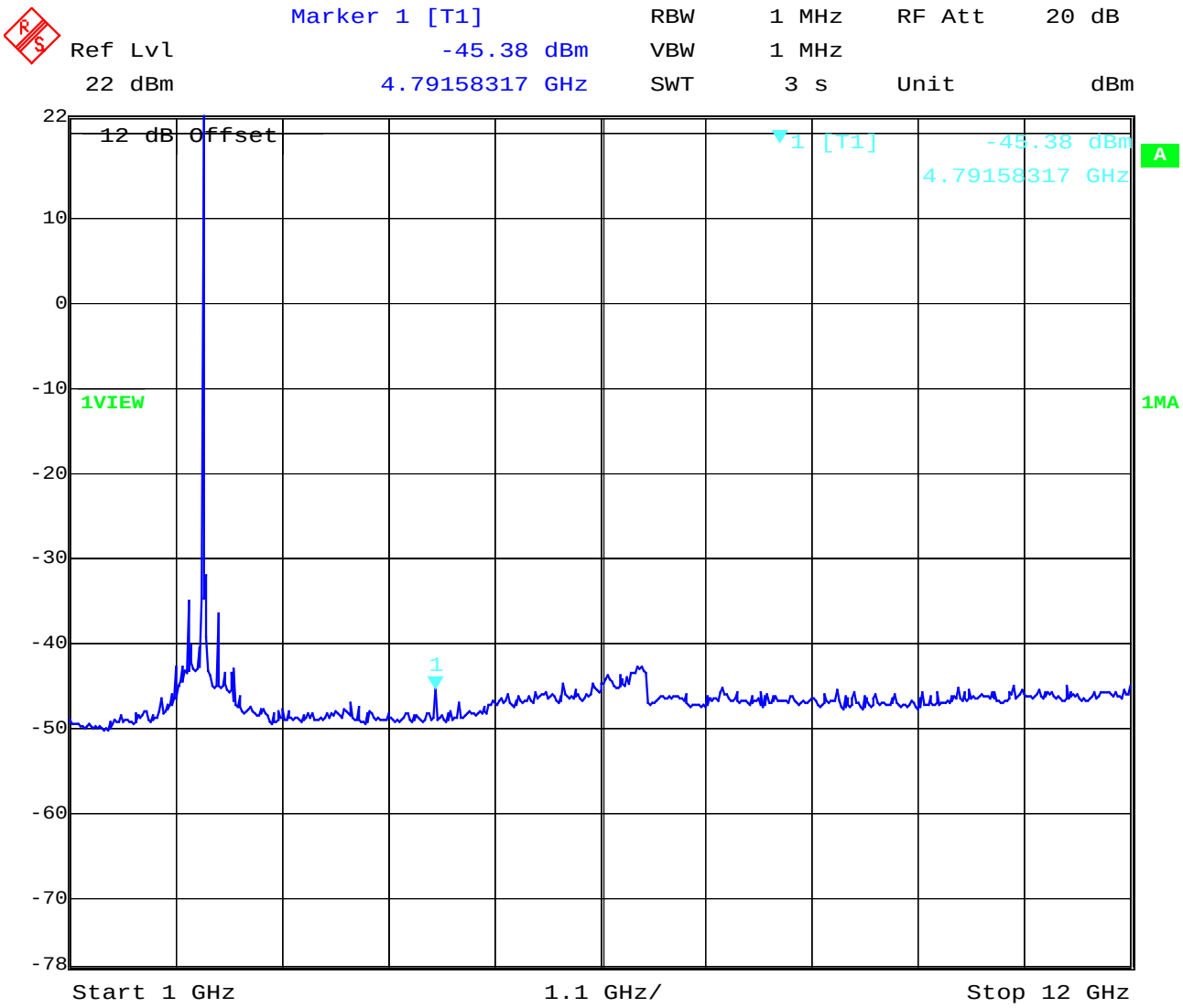
The ref-line is referenced to the max. output at 2401 MHz in the next plot.



The peak at 832.3 MHz is at –34.8 dBm, > 20 dB below carrier

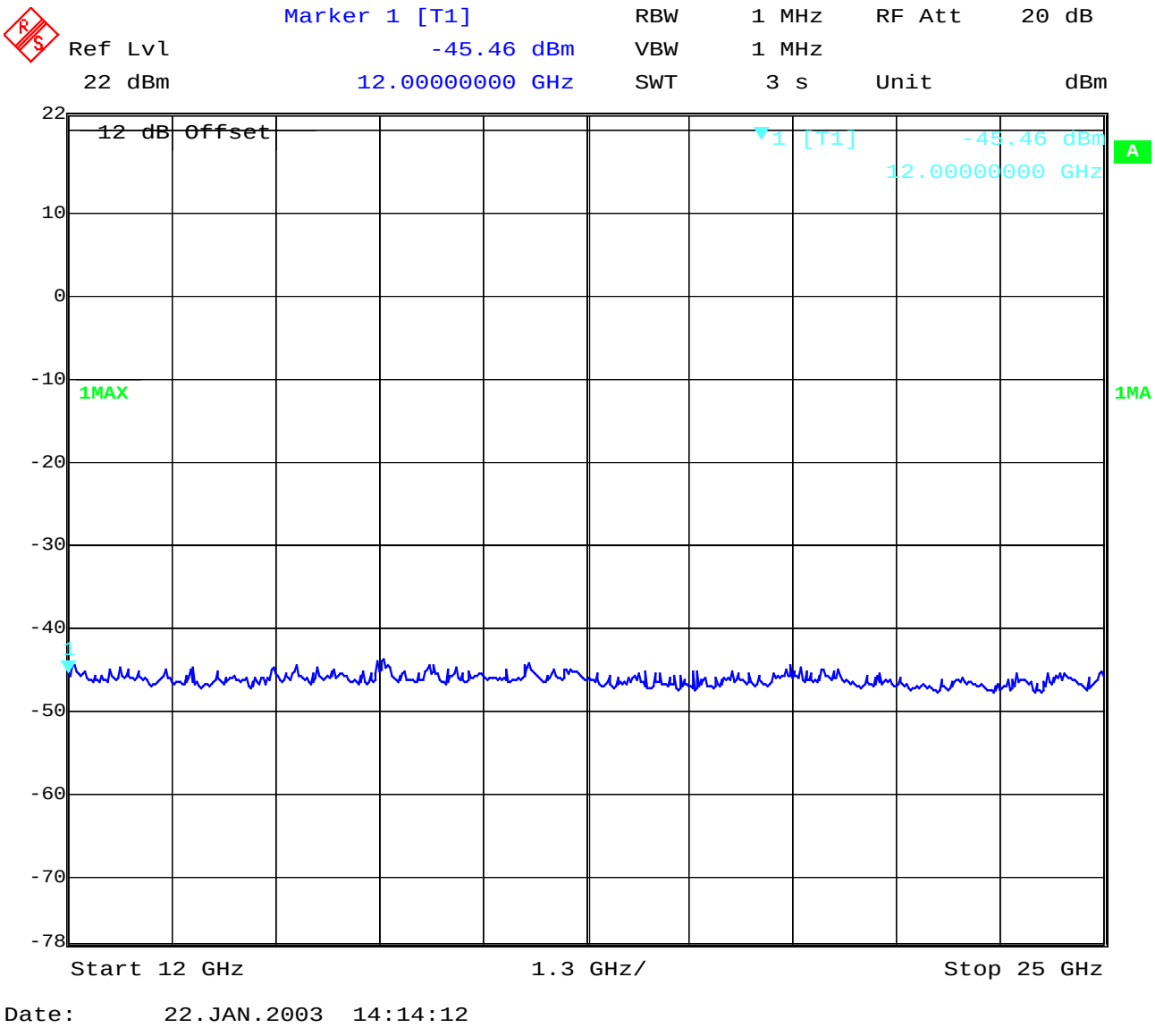
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

EMISSION LIMITATIONS- Conducted (Transmitter) **§ 15.247 (c) (1)**
Channel 1 (lowest Channel): 1 – 12 GHz peak



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

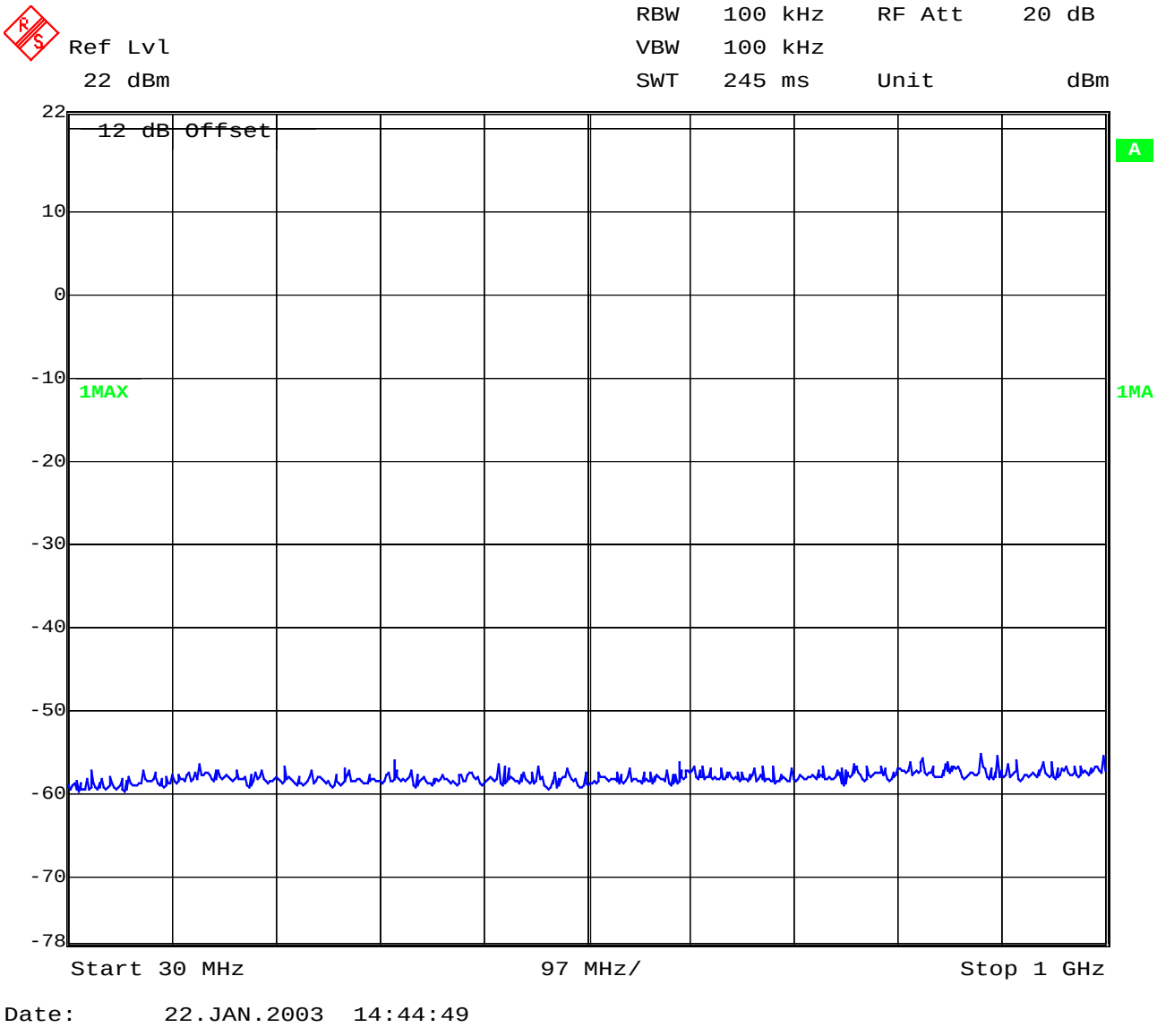
EMISSION LIMITATIONS- Conducted (Transmitter) **§ 15.247 (c) (1)**
Channel 1 (lowest Channel): 12 - 25 GHz peak



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

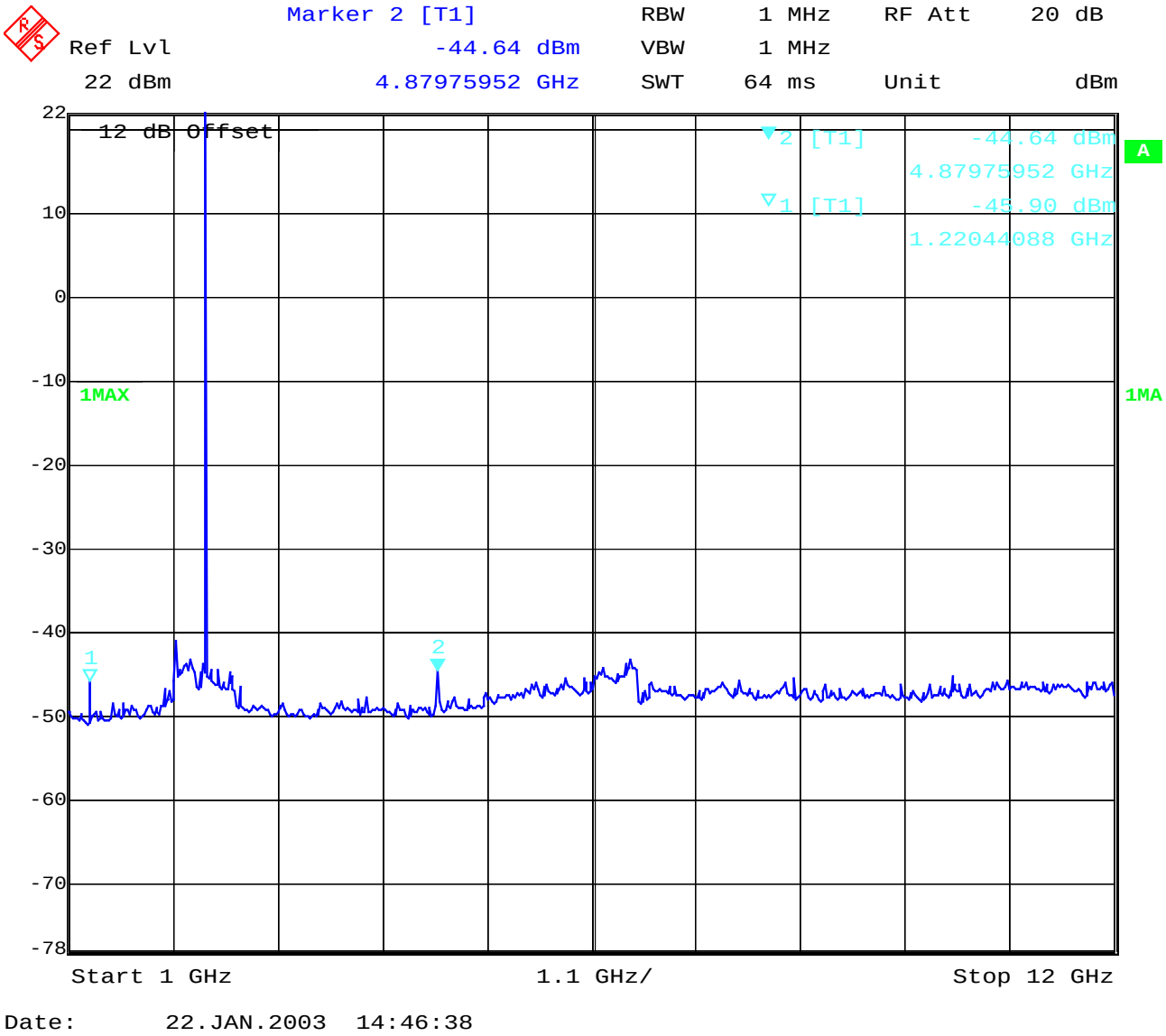
EMISSION LIMITATIONS- Conducted (Transmitter) § 15.247 (c) (1)
Channel 2 (middle Channel): 30 MHz - 1GHz peak

The ref-line is referenced to the max. output at 2441 MHz in the next plot.



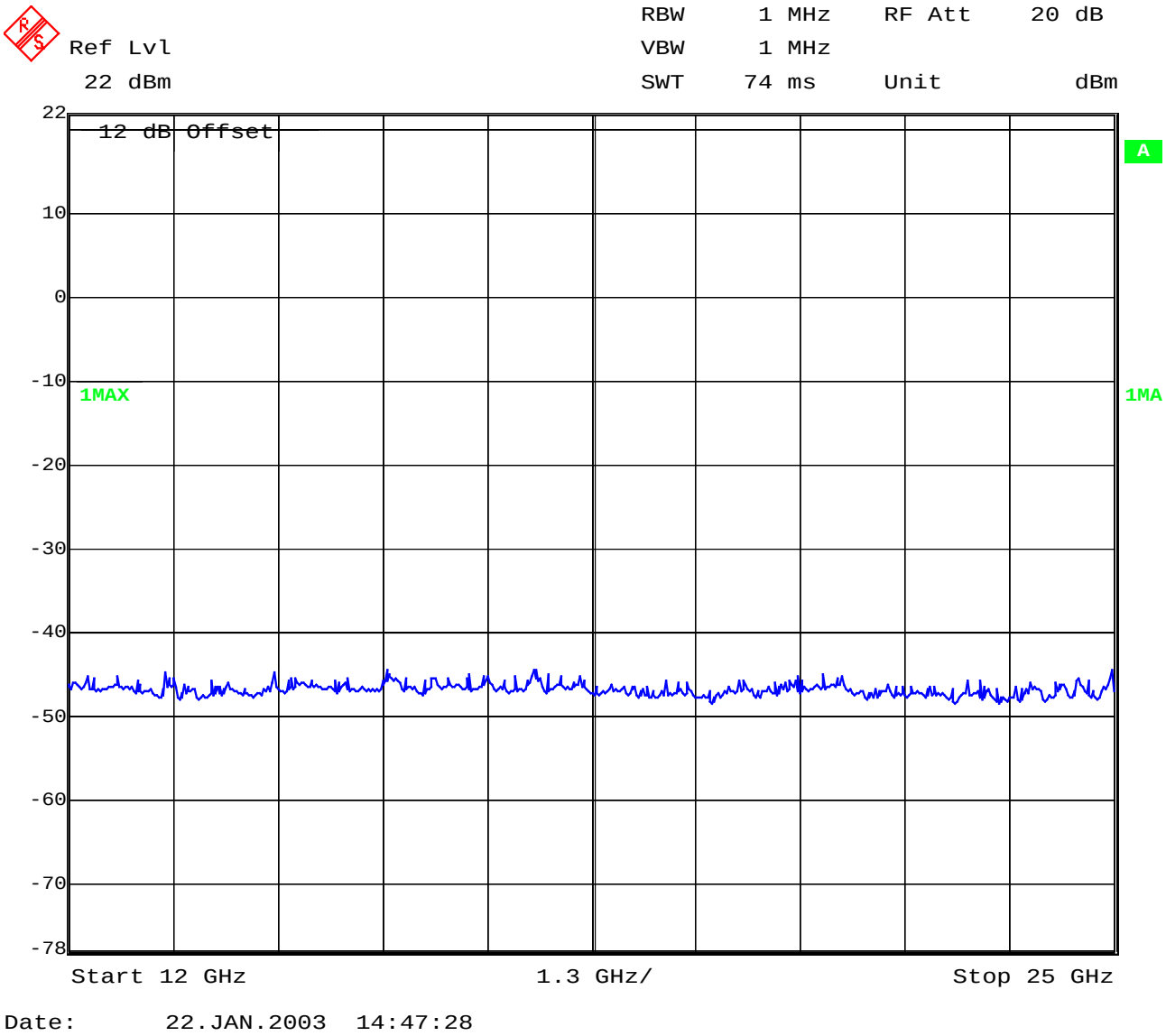
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

EMISSION LIMITATIONS- Conducted (Transmitter) **§ 15.247 (c) (1)**
Channel 2 (middle Channel): 1 –12 GHz peak



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

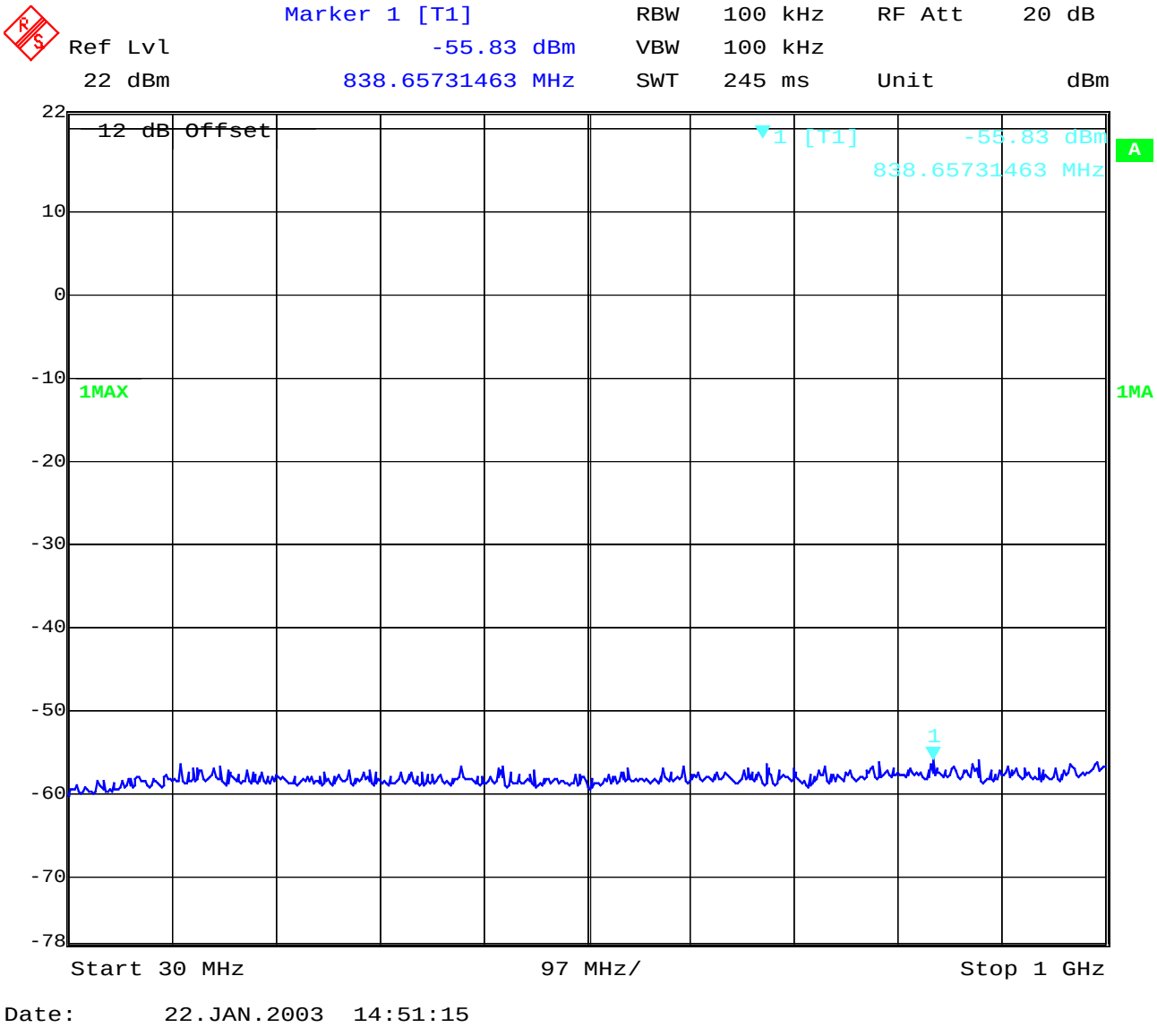
EMISSION LIMITATIONS- Conducted (Transmitter) **§ 15.247 (c) (1)**
Channel 2 (middle Channel): 12 – 25 GHz peak



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

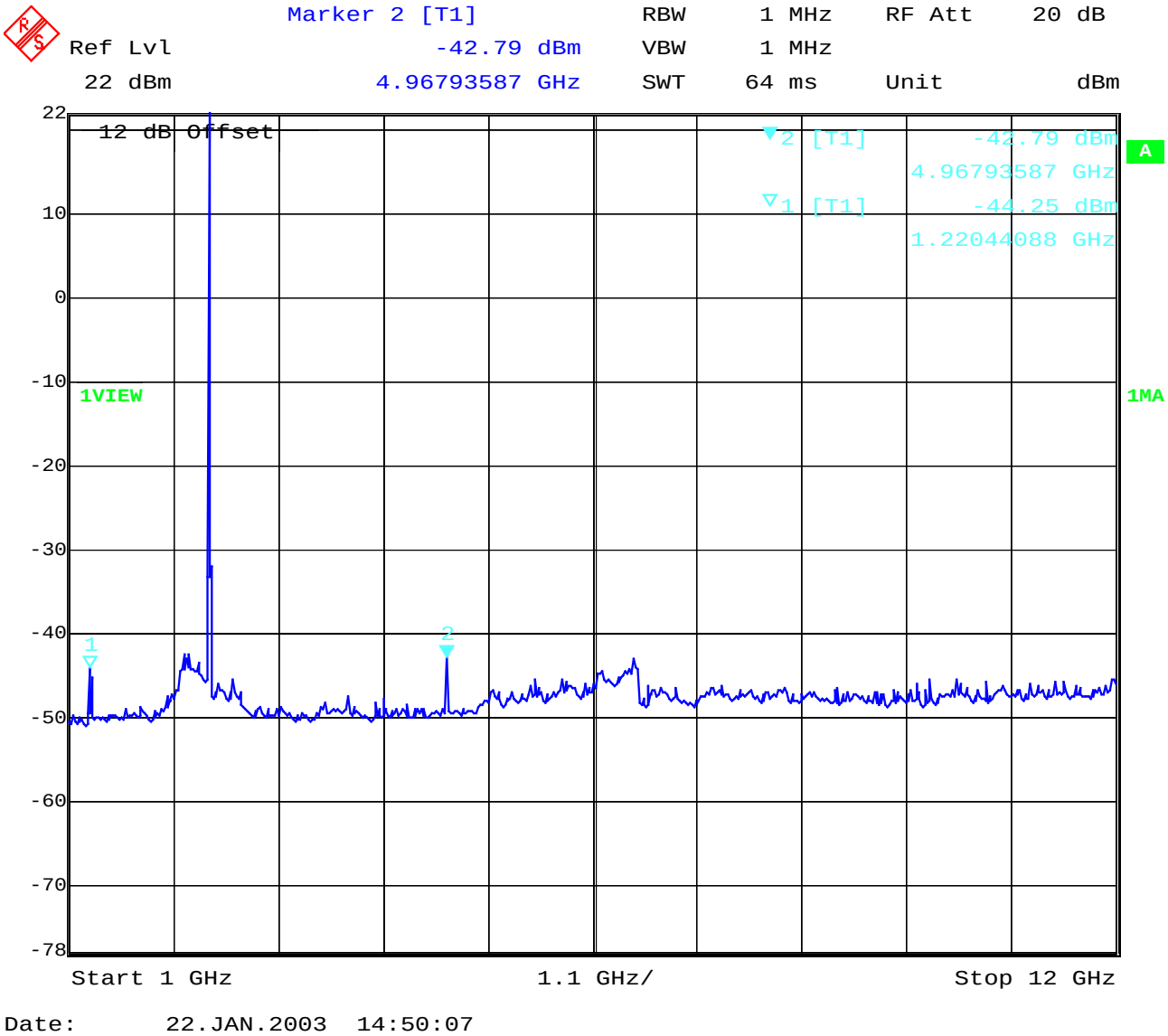
EMISSION LIMITATIONS- Conducted (Transmitter) § 15.247 (c) (1)
Channel 3 (highest Channel): 30 MHz - 1 GHz peak

The upper line is referenced to the max. output at 2482 MHz in the next plot.



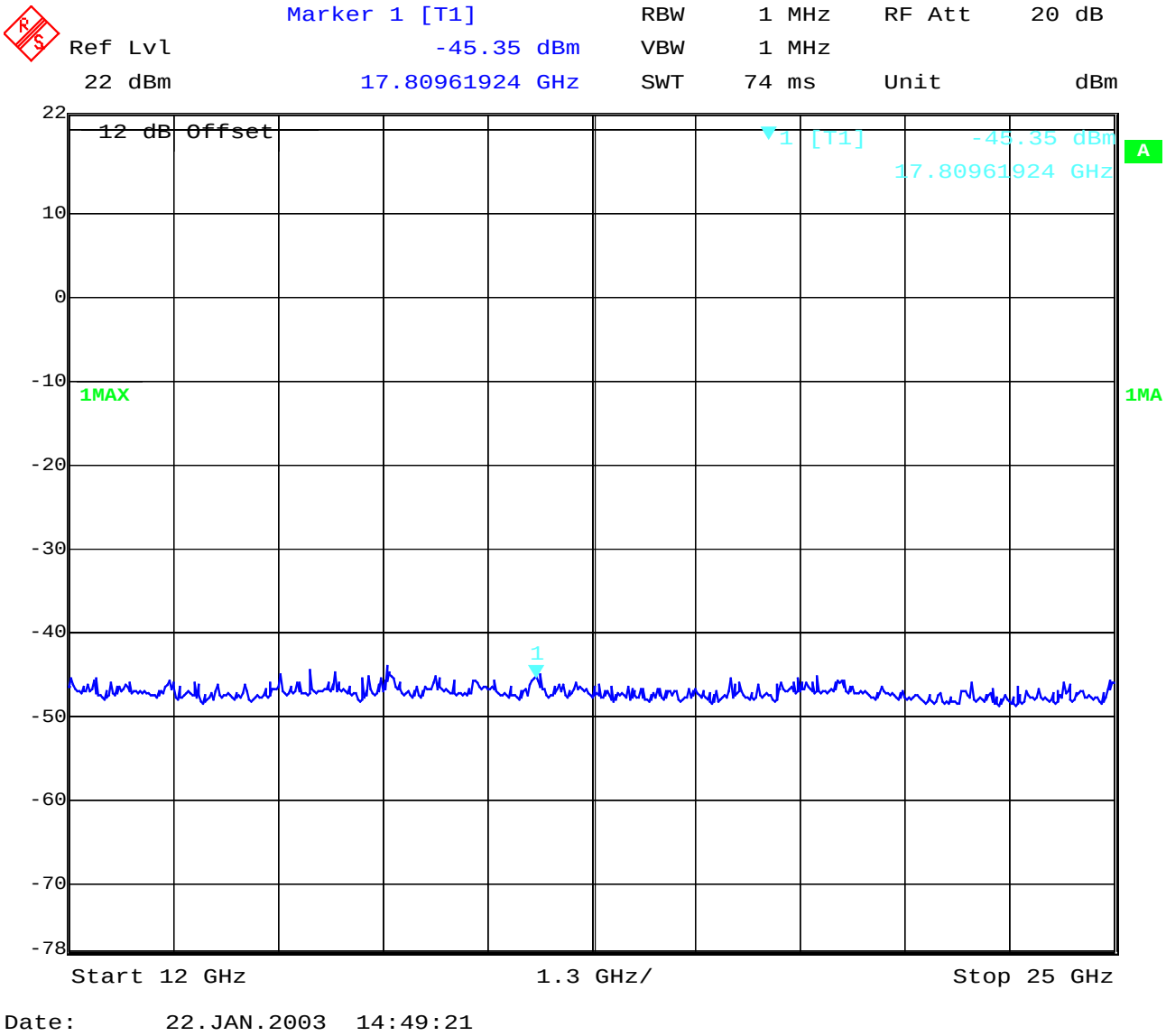
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

EMISSION LIMITATIONS- Conducted (Transmitter) **§ 15.247 (c) (1)**
Channel 3 (highest Channel): 1 - 12 GHz peak



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

EMISSION LIMITATIONS- Conducted (Transmitter) **§ 15.247 (c) (1)**
Channel 3 (highest Channel): 12 - 25 GHz peak



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

SPURIOUS RADIATED EMISSION **§ 15.247 (c) (1)**

The measurements below 1 GHz were performed with an CISPR Quasi Peak Adapter. We did manual measurements on the harmonics.

EMISSION LIMITATIONS					
f (MHz)	polari-zation	amplitude of emission (dBµV/m) QP/Peak	amplitude of emission (dBµV/m) average	limit max. allowed emmision power (dBµV/m)	results
2401 MHz					
1201	vertical		30.9	54.0	complies
4802	vertical		23.2	54.0	complies
2441 MHz					
no	peaks	found	< 20 dB	below	limit
2482 MHz					
4964	vertical		20.0	54.0	complies
7446	vertical		29.5	54.0	complies
Measurement uncertainty		± 3dB			

Horizontal measurements were more then 7 dB lower

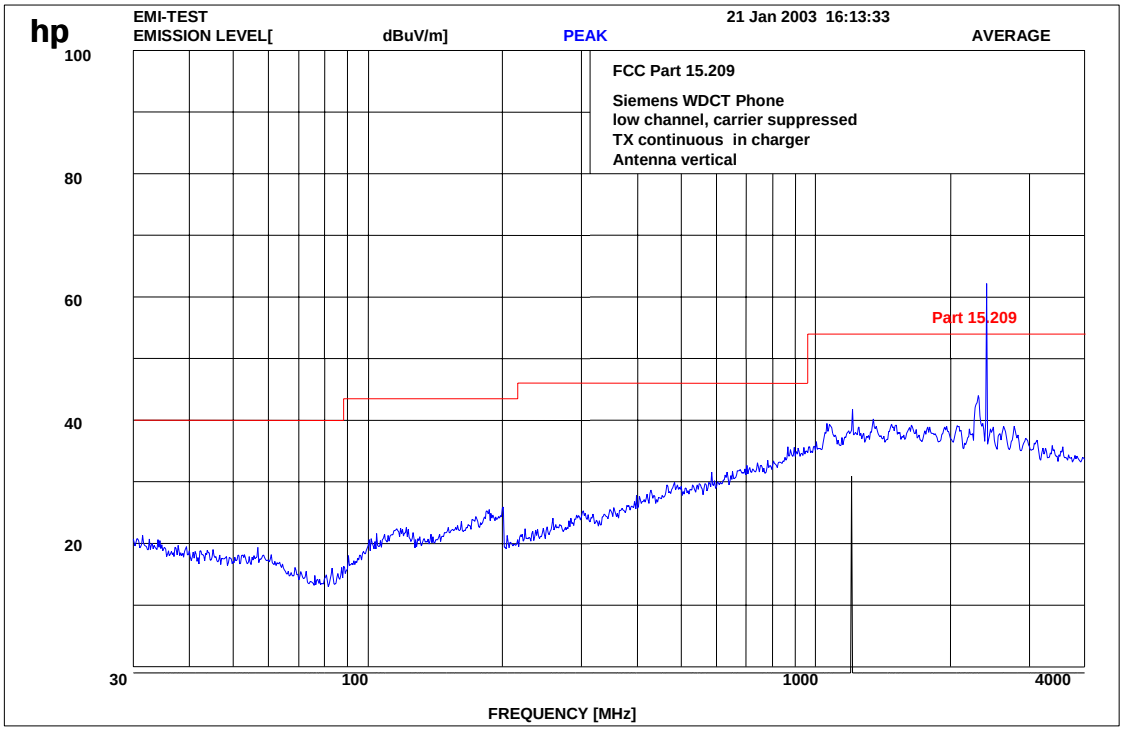
LIMITS **SUBCLAUSE § 15.247 (c)**

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)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17-24

EMISSION LIMITATIONS (Transmitter) **SUBCLAUSE § 15.247 (c) (1)**

30-4000 MHz, vertical, lowest channel



f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW: 1 MHz**

Carrier was suppressed by a stubb tuner to avoid overload of the system.

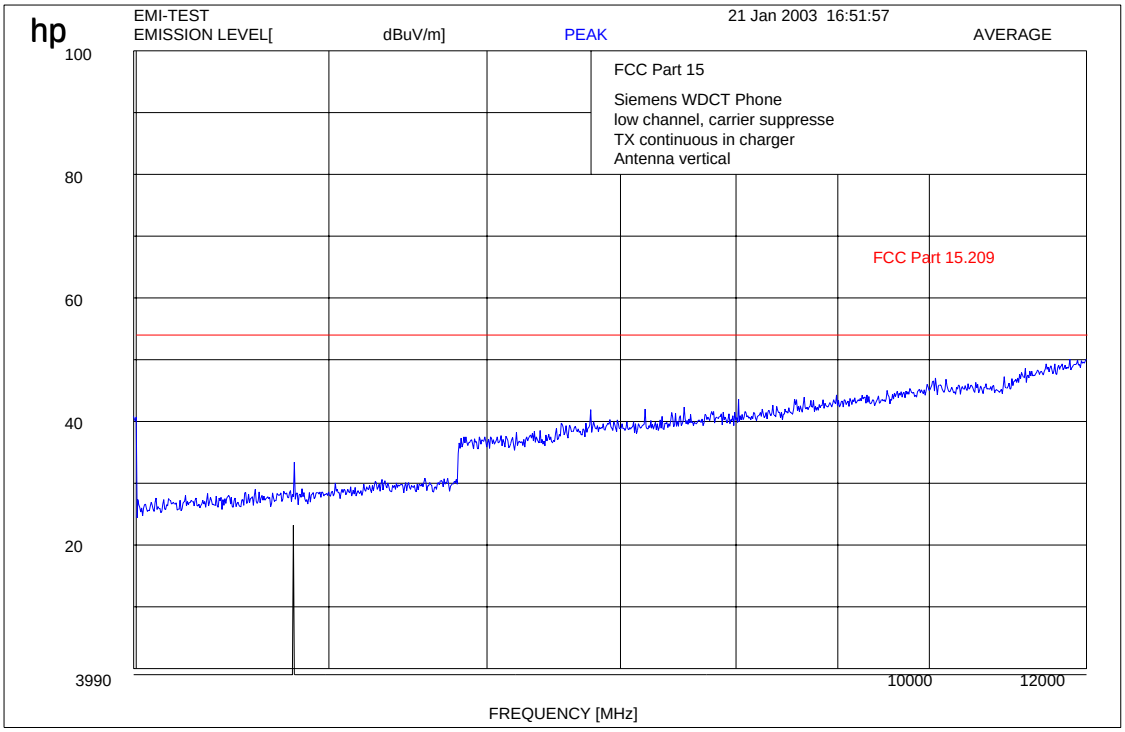
LIMITS **SUBCLAUSE § 15.247 (c)**

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)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17-24

EMISSION LIMITATIONS (Transmitter) **SUBCLAUSE § 15.247 (c) (1)**

4000 - 12000 MHz, vertical, lowest channel



f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW: 1 MHz**

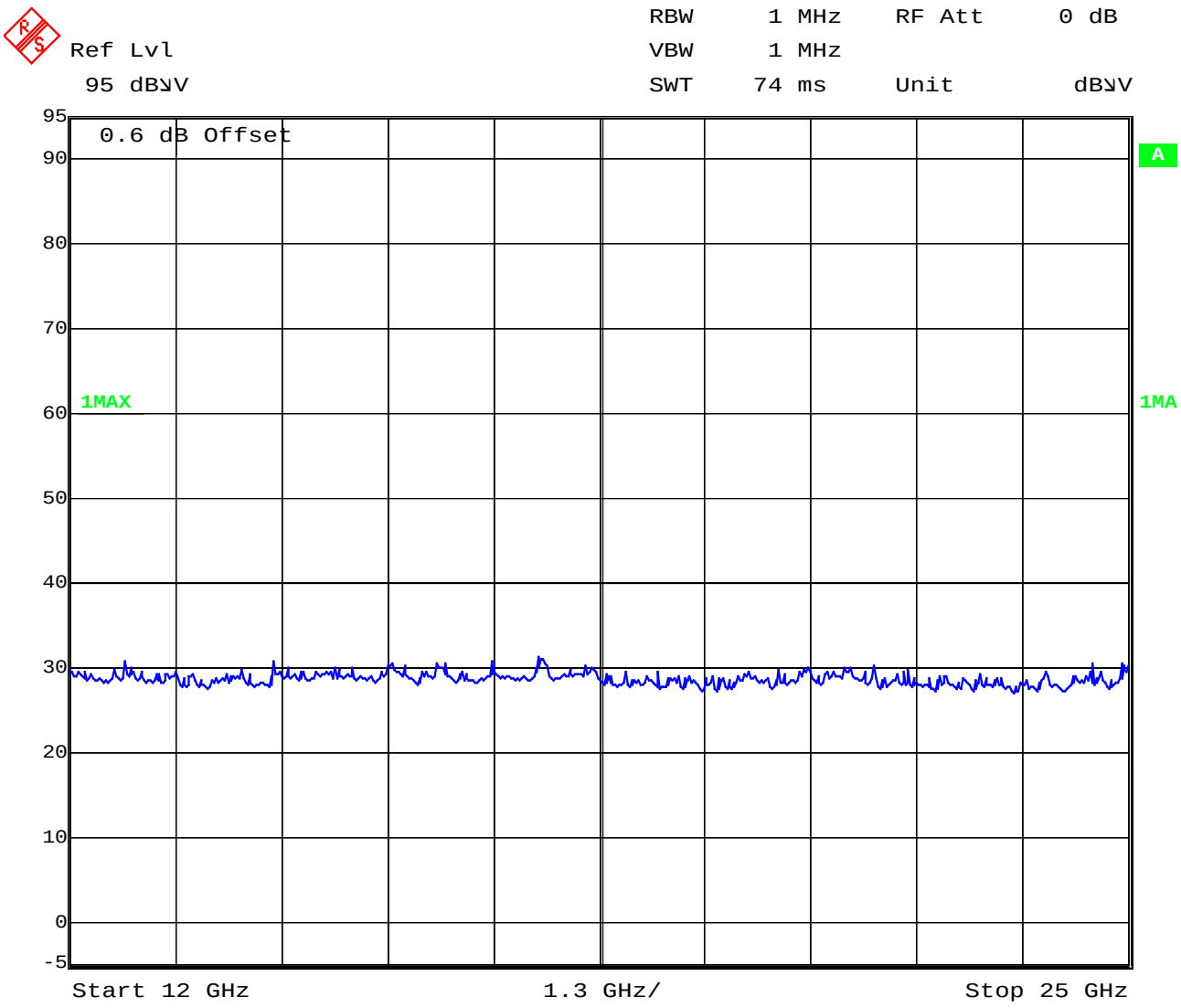
LIMITS **SUBCLAUSE § 15.247 (c)**

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)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17-24

EMISSION LIMITATIONS (Transmitter) **SUBCLAUSE § 15.247 (c) (1)**

12000 - 25000 MHz, vertical, peak, valid for all three channels



Date: 23.JAN.2003 09:31:00

f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW: 1 MHz**

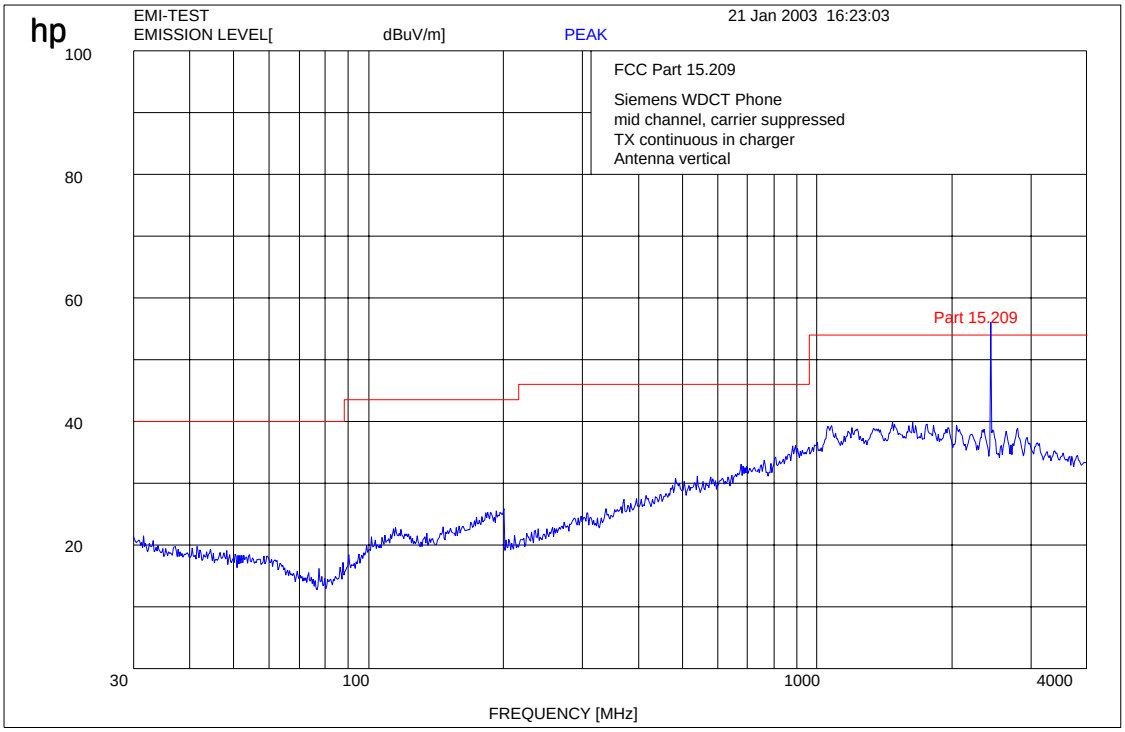
LIMITS **SUBCLAUSE § 15.247 (c)**

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)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17-24

EMISSION LIMITATIONS (Transmitter) **SUBCLAUSE § 15.247 (c) (1)**

30-4000 MHz, vertical, middle channel



f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW: 1 MHz**

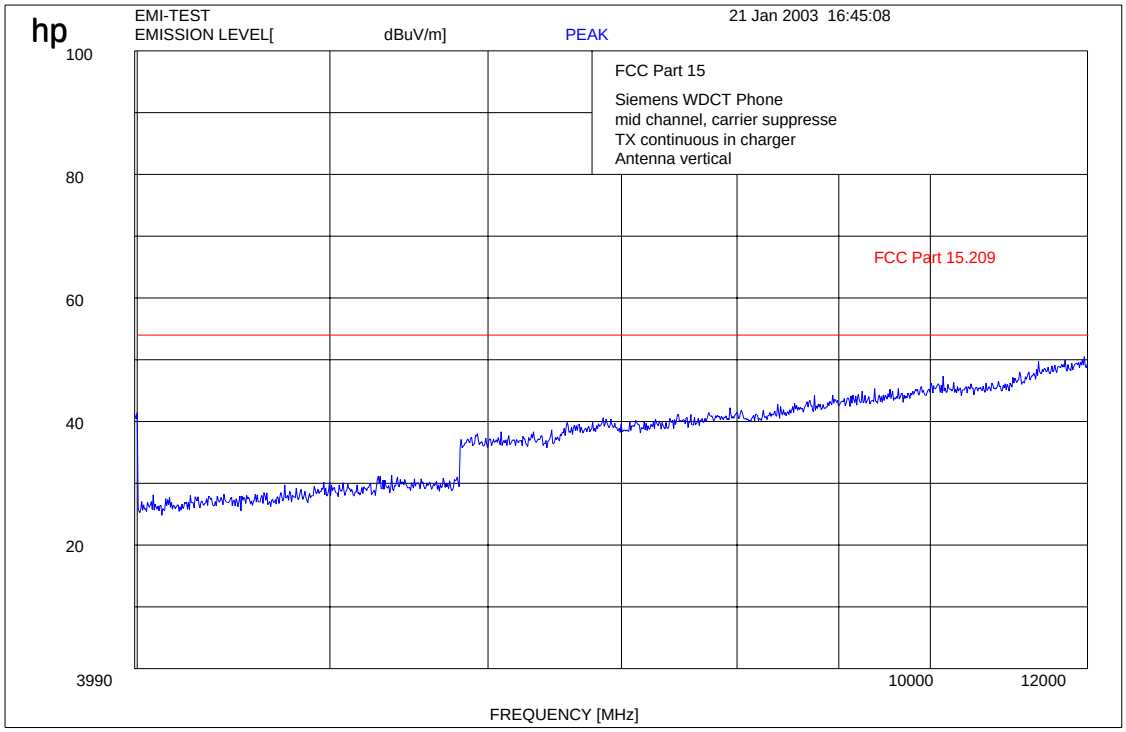
LIMITS **SUBCLAUSE § 15.247 (c)**

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)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17-24

EMISSION LIMITATIONS (Transmitter) **SUBCLAUSE § 15.247 (c) (1)**

4000 - 12000 MHz, vertical, middle channel



f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW: 1 MHz**

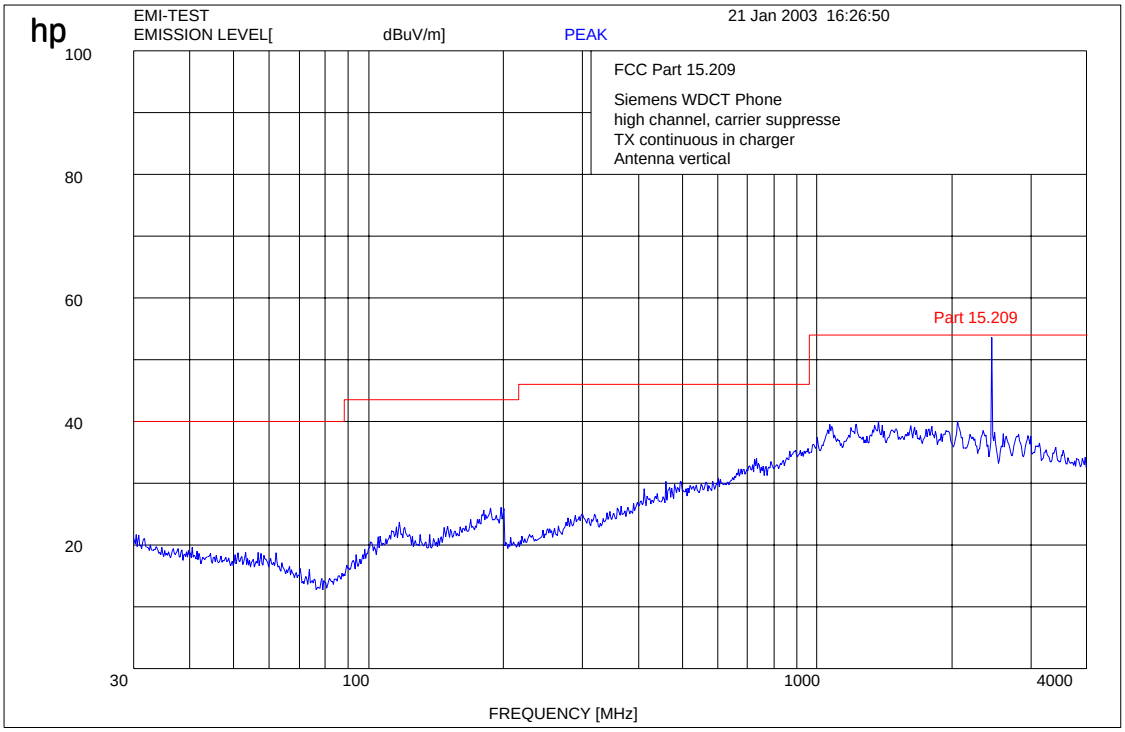
LIMITS **SUBCLAUSE § 15.247 (c)**

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)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17-24

EMISSION LIMITATIONS (Transmitter) **SUBCLAUSE § 15.247 (c) (1)**

30-4000 MHz, vertical, highest channel



f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW: 1 MHz**

Carrier was suppressed by a stubb tuner to avoid overload of the system.

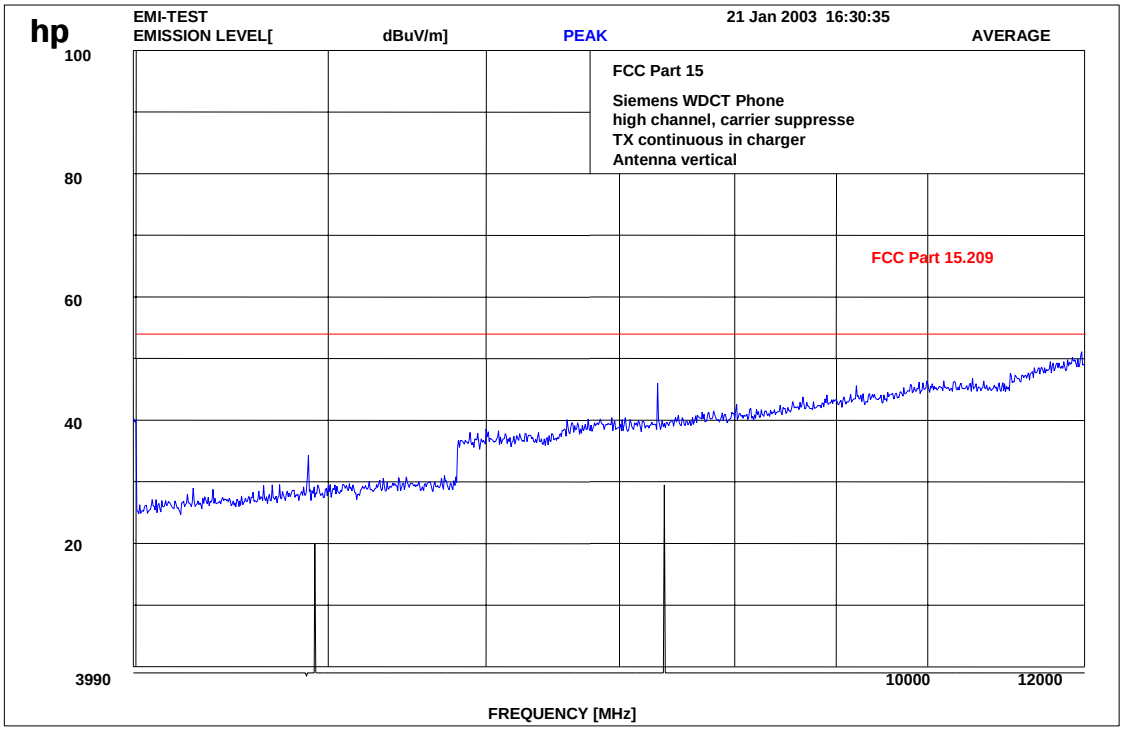
LIMITS **SUBCLAUSE § 15.247 (c)**

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)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17-24

EMISSION LIMITATIONS (Transmitter) **SUBCLAUSE § 15.247 (c) (1)**

4000-12000 MHz, vertical, highest channel



f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW: 1 MHz**

Carrier was suppressed by a stubb tuner to avoid overload of the system.

LIMITS **SUBCLAUSE § 15.247 (c)**

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)).

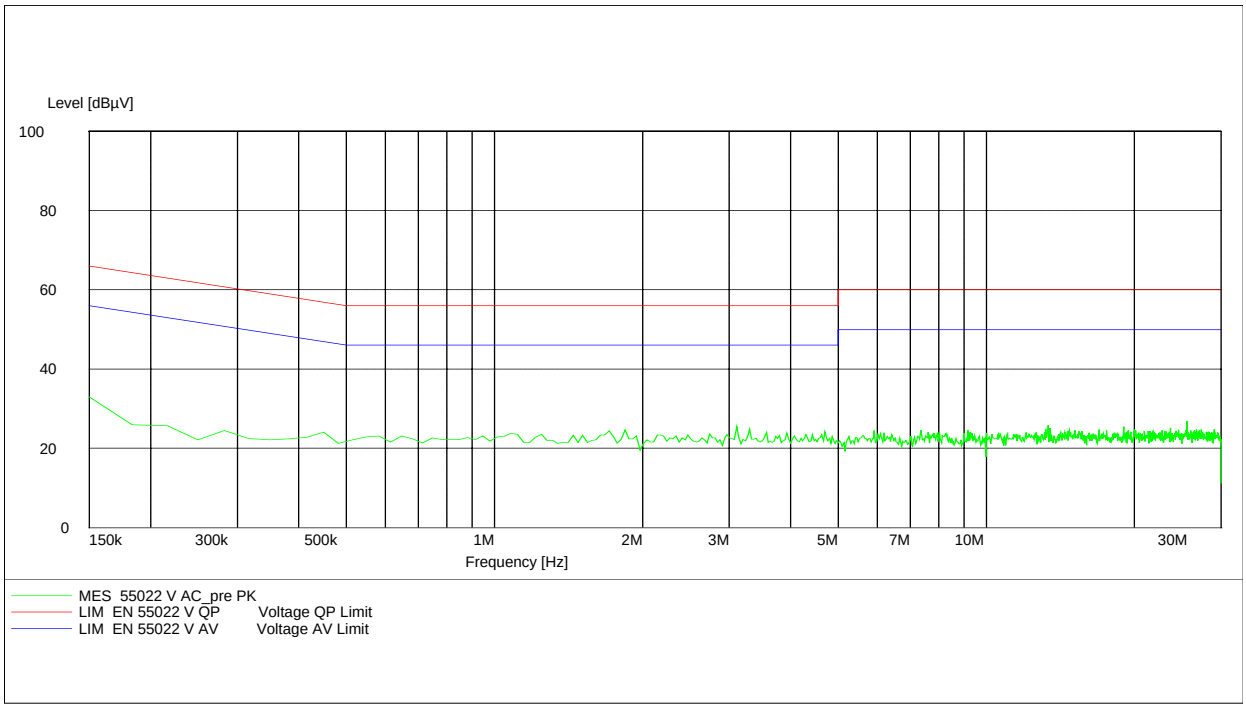
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17-24

Low frequency emissions (conducted) § 15.107/207

```
EUT:                  WDCT Phone Mobile station
Manufacturer:         Siemens
Operating Condition:  Traffic  mode
Test Site:            Room 006
Operator:             Ames
Comment:              110 V AC / 60 Hz L1 and N
```

SCAN TABLE: "EN 55022 V"

```
Short Description:              Voltage Mains 1.60
  Start      Stop       Step       Detector  Meas.     IF      Transducer
  Frequency  Frequency  Width                Time      Bandw.
  150.0 kHz  30.0 MHz   7.5 kHz    MaxPeak   100.0 ms  10 kHz  ESH3-Z5 L1 1458
                                   Average
```



Limit § 15.207

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

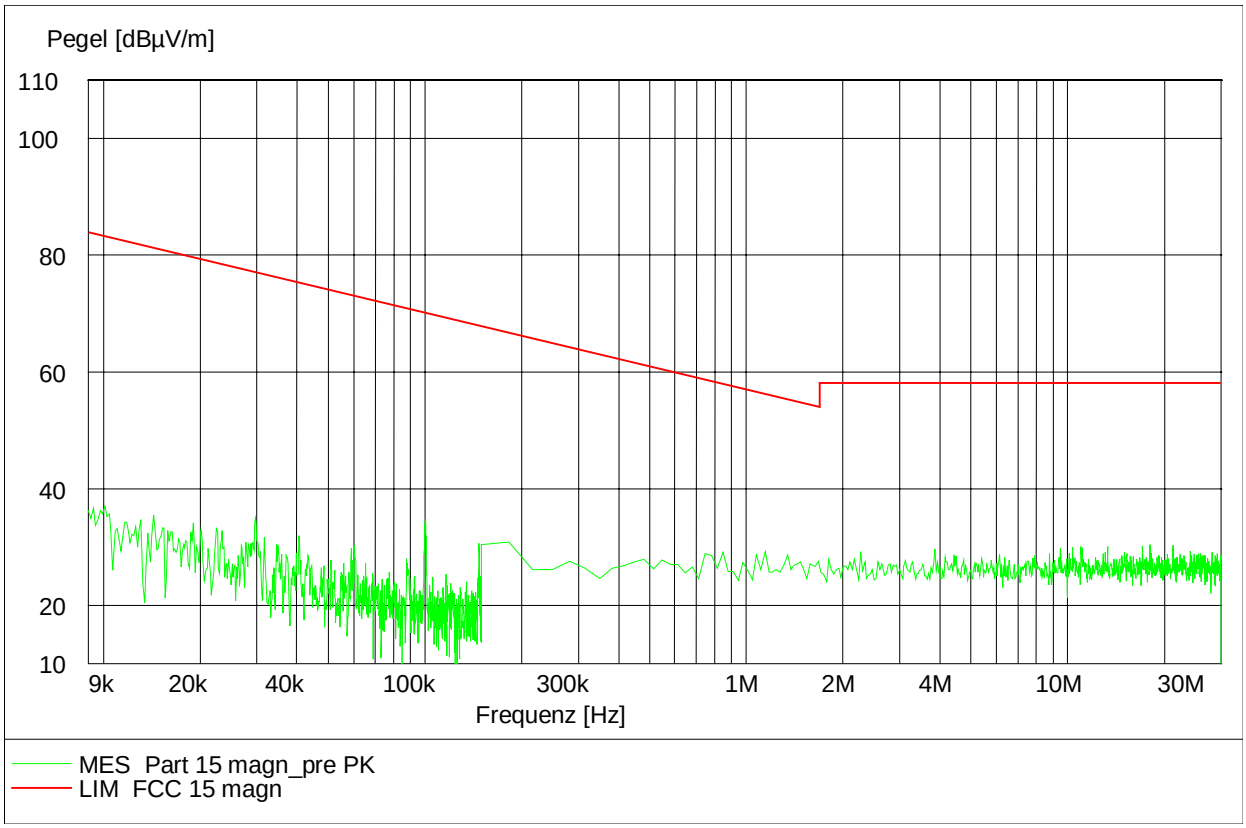
* Decreases with the logarithm of the frequency.

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
52-63

Low frequency emissions (radiated)

measured at 10 m distance.

Values recalculated with 40 dB/decade according to FCC rules.



Limits **SUBCLAUSE § 15.109**

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 / 29.5 dBµV/m	30
30 - 88	100 / 40 dBµV/m	3
88 - 216	150 / 43.5 dBµV/m	3
216 - 960	200 / 46 dBµV/m	3
above 960	500 / 54 dBµV/m	3

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
52-63

RECEIVER SPURIOUS RADIATION **§ 15.209**

SPURIOUS EMISSIONS LEVEL (µV/m)								
f (MHz)	Detector	Level (dBµV/m)	f (MHz)	Detector	Level (dBµV/m)	f (MHz)	Detector	Level (dBµV/m)
no	peaks	found						
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW: 1 MHz**

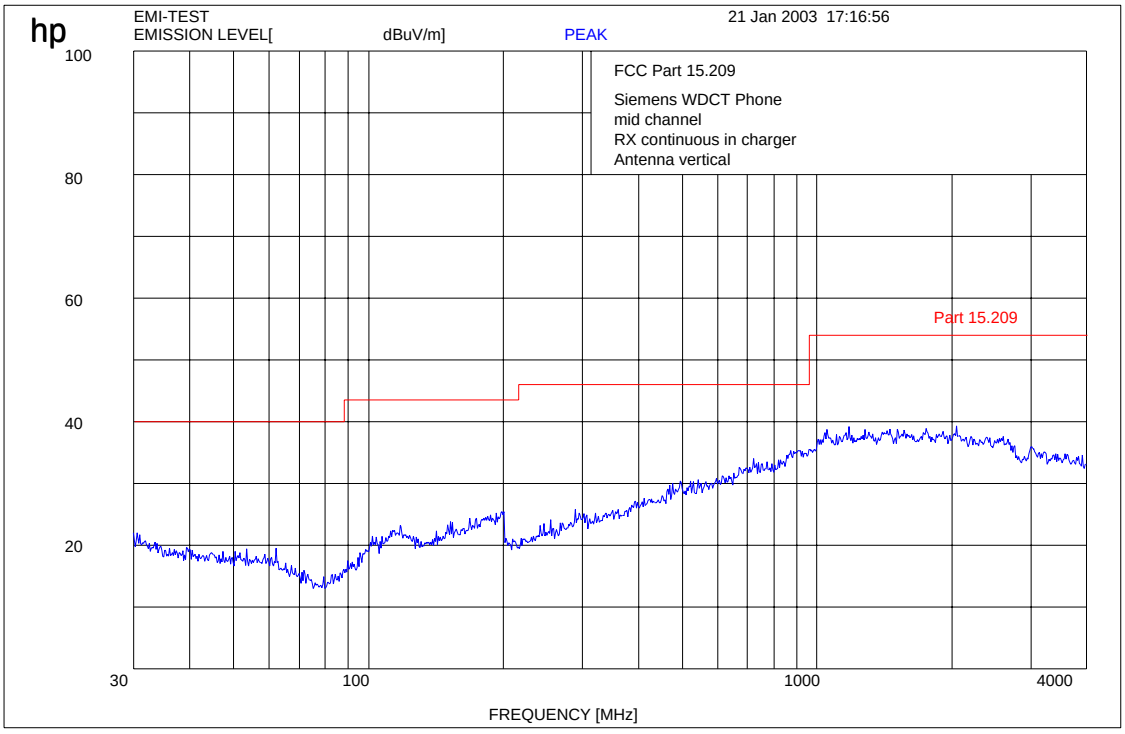
Measurement distance see table

Limits **SUBCLAUSE § 15.209**

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17-24; 64

RECEIVER SPURIOUS RADIATION § 15.209



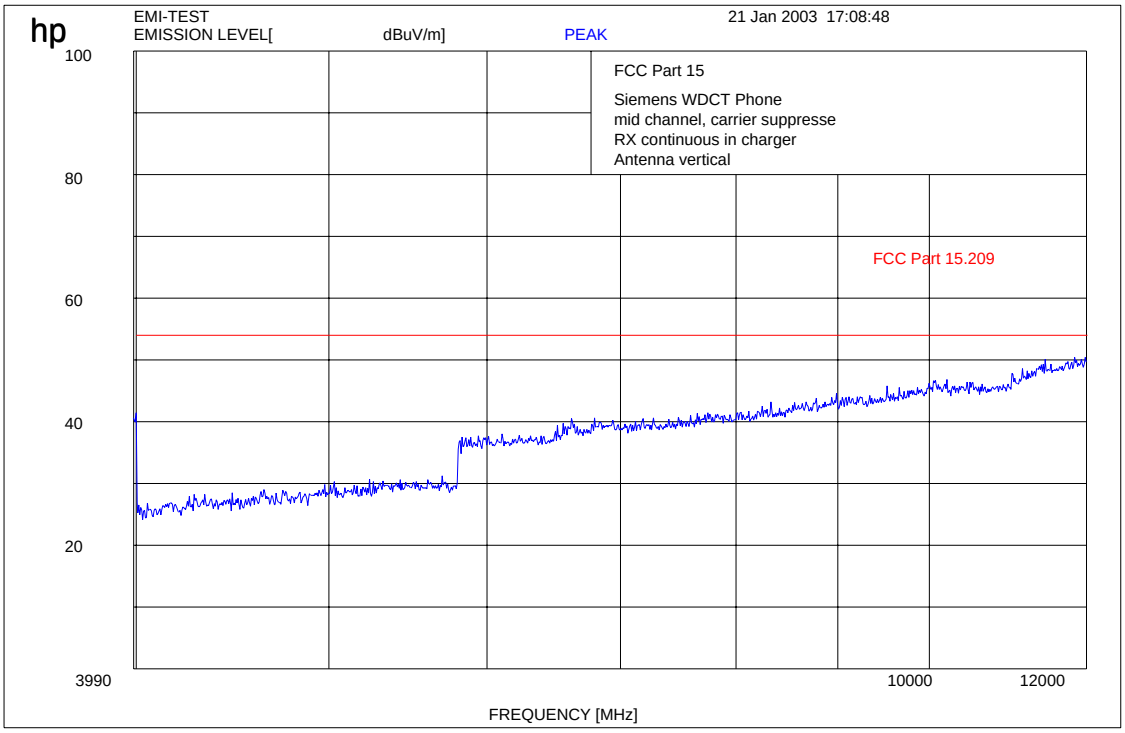
f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW: 1 MHz**

Limits **SUBCLAUSE § 15.209**

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17-24

RECEIVER SPURIOUS RADIATION § 15.209



f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW: 1 MHz**

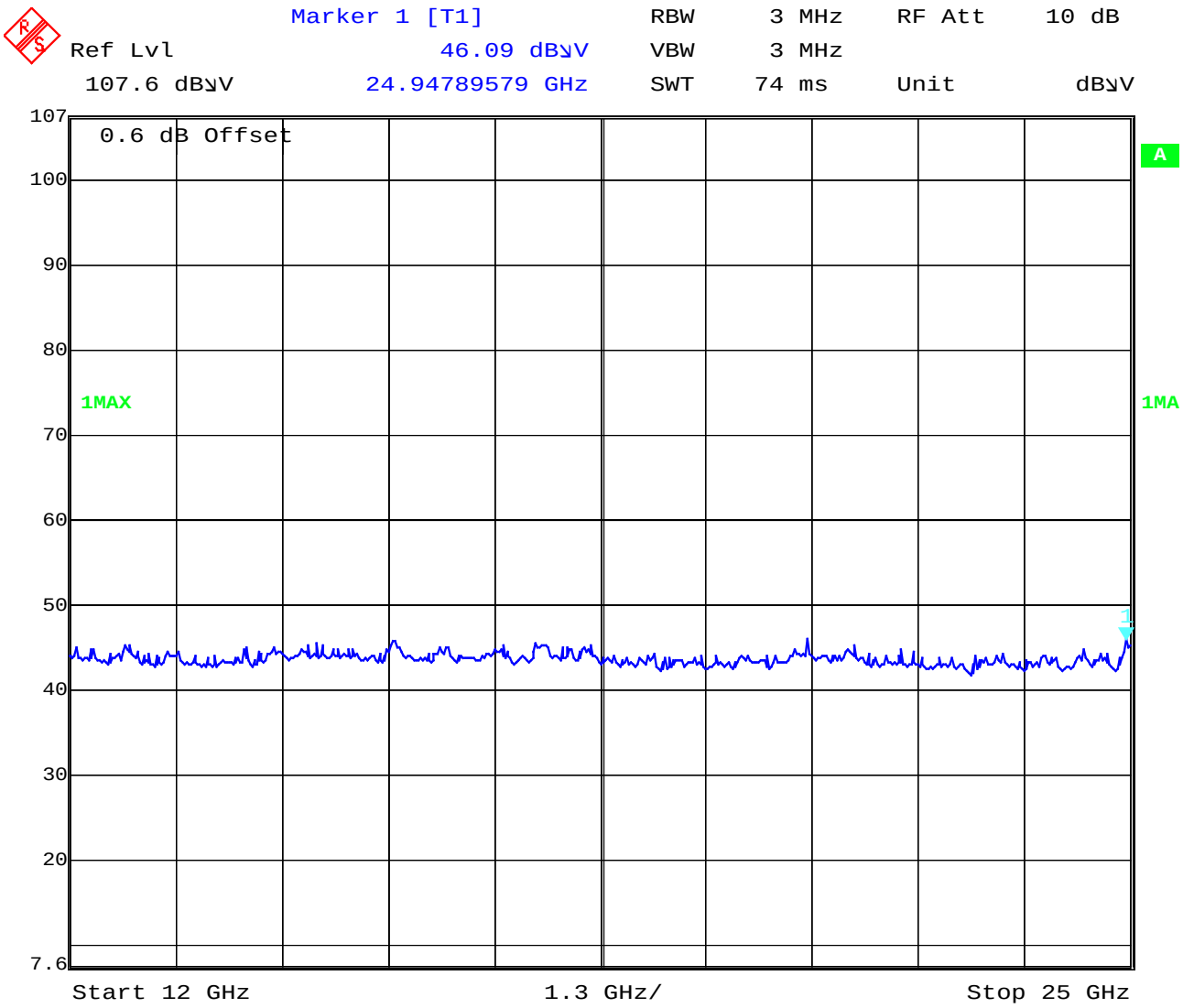
Limits **SUBCLAUSE § 15.209**

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17-24

RECEIVER SPURIOUS RADIATION § 15.209

This measurement was made with a low noise analyzer FSIQ from R&S with an additional lownoise amplifier to reduce system noise.



f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW: 1 MHz**

Limits **SUBCLAUSE § 15.209**

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

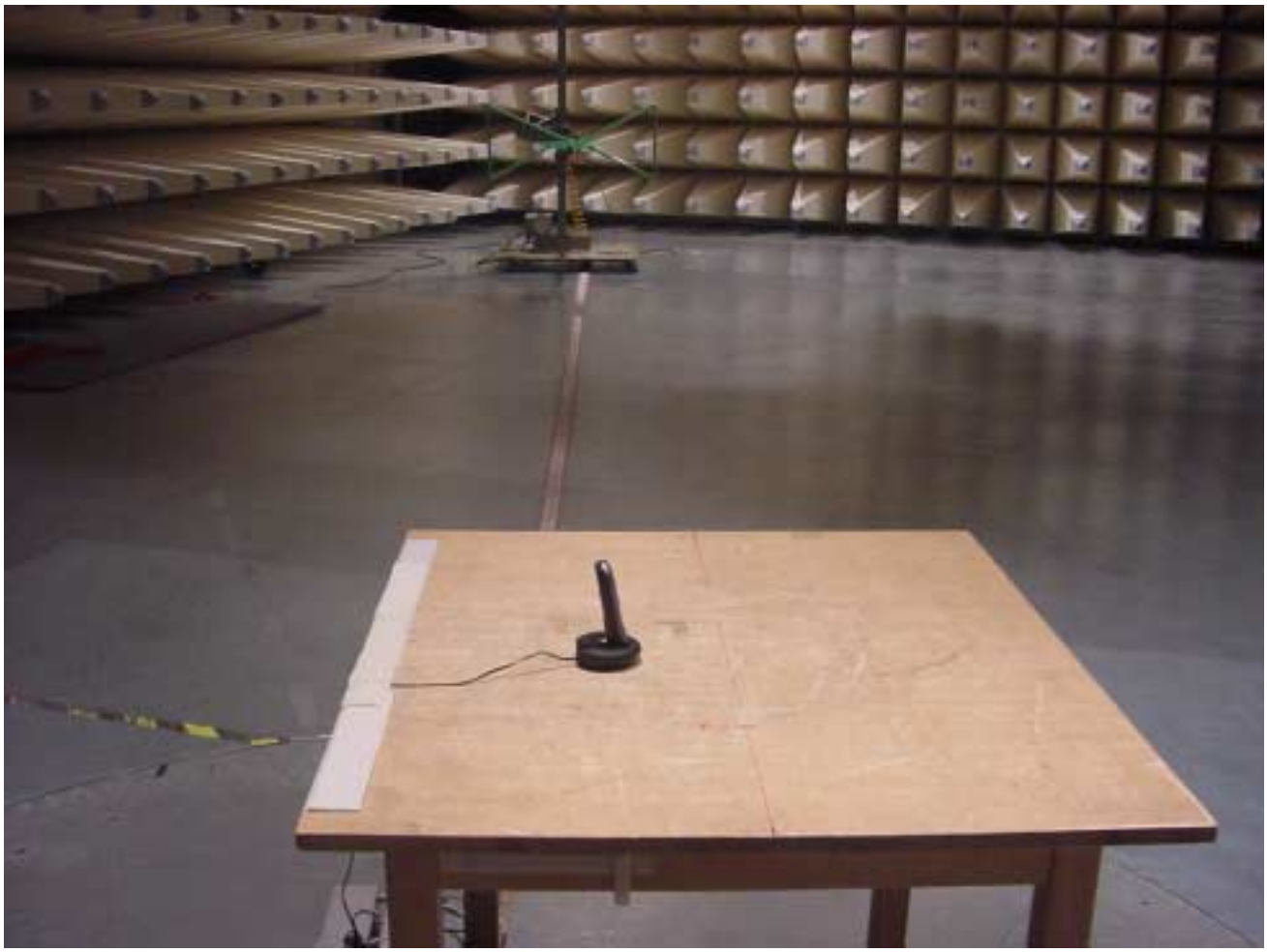
No	Instrument/Ancillary	Type	Manufacturer	Serial No.
01	Spectrum Analyzer	8566 A	Hewlett-Packard	1925A00257
02	Analyzer Display	8566 A	Hewlett-Packard	1925A00860
03	Oscilloscope	7633	Tektronix	230054
04	Radio Analyzer	CMTA 54	Rohde & Schwarz	894 043/010
05	System Power Supply	6038 A	Hewlett-Packard	2848A07027
06	Signal Generator	8111 A	Hewlett-Packard	2215G00867
07	Signal Generator	8662 A	Hewlett-Packard	2224A01012
08	Signal Generator	AFGU	Rohde & Schwarz	862 480/032
09	Transformer	MPL	Erfi	91350
10	AC-Line Simulator	NNLA 8120	Schwarzbeck	8120331
11	Relais-Matrix	PSU	Rohde & Schwarz	893 285/020
12	Power-Meter	436 A	Hewlett-Packard	2101A12378
13	Power-Sensor	8484 A	Hewlett-Packard	2237A10156
14	Power-Sensor	8482 A	Hewlett-Packard	2237A00616
15	Deviation meter	9008	Racal-Dana	2647
16	Frequency counter	5340 A	Hewlett-Packard	1532A03899
17	Anechoic chamber	---	MWB	87400/002
18	Spectrum Analyzer	85660 B	Hewlett-Packard	2747A05306
19	Analyzer Display	85662 A	Hewlett-Packard	2816A16541
20	Quasi Peak Adapter	85650 A	Hewlett-Packard	2811A01131
21	RF-Preselector	85685 A	Hewlett-Packard	2833A00768
22	Biconical Antenne	3104	Emco	3758
23	Log. Per. Antenne	3146	Emco	2130
24	Double Ridge Horn	3115	Emco	3088
25	EMI-Testreceiver	ESAI	Rohde & Schwarz	863 180/013
26	EMI-Analyzer-Display	ESAI-D	Rohde & Schwarz	862 771/008
27	Biconical Antenne	HK 116	Rohde & Schwarz	888 945/013
28	Log. Per. Antenne	HL 223	Rohde & Schwarz	825 584/002
29	Relais-Switch-Unit	RSU	Rohde & Schwarz	375 339/002
30	Highpass	HM985955	FSY Microwave	001
31	Amplifier	P42-GA29	Tron-Tech	B 23602
32	Anechoic chamber		Frankonia	
33	Controler	PSM 7	Rohde & Schwarz	834 621/004
34	EMI Test Reciever	ESMI	Rohde & Schwarz	827 063/010
35	EMI Test Receiver	Display	Rohde & Schwarz	829 808/010

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
36	Controler	HD 100	Deisel	100/322/93
37	Relais Matrix	PSN	Rohde & Schwarz	829 065/003
38	Control Unit	GB 016 A2	Rohde & Schwarz	344 122/008
39	Relais Switch Unit	RSU	Rohde & Schwarz	316 790/001
40	Power Supply	6032A	Hewlett Packard	2846A04063
41	Spectrum Monitor	EZM	Rohde & Schwarz	883 720/006
42	Receiver	ESH 3	Rohde & Schwarz	890 174/002
43	Reiciver	ESVP	Rohde & Schwarz	891 752/005
44	Biconi Ant. 20-300MHz	HK 116	Rohde & Schwarz	833 162/011
45	Logper Ant. 0.3-1 GHz	HL 223	Rohde & Schwarz	832 914/010
46	Amplifier 0.1-4 GHz	AFS4	Miteq Inc.	206461
47	Logper Ant. 1-18 GHz	HL 024 A2	Rohde & Schwarz	342 662/002
48	Polarisationsnetwork	HL 024 Z1	Rohde & Schwarz	341 570/002
49	Double Ridge G Horn Antenn0 1-26.5 GHz	3115	EMCO	9107-3696
50	Microw. Sys. Amplifier 0.5- 26.5 GHz	8317A	Hewlett Packard	3123A00105
51	Audio Analyzer	UPD	Rohde & Schwarz	1030.7500.04
52	Controler	PSM 7	Rohde & Schwarz	883 086/026
53	DC V-Network	ESH3-Z6	Rohde & Schwarz	861 406/005
54	DC V-Network	ESH3-Z6	Rohde & Schwarz	893 689/012
55	AC 2 Phasen V-Network	ESH3-Z5	Rohde & Schwarz	861 189/014
56	AC 2 Phasen V-Network	ESH3-Z5	Rohde & Schwarz	894 981/019
57	AC-3 Phasen V-Network	ESH2-Z5	Rohde & Schwarz	882 394/007
58	Power supply	6032A	Rohde & Schwarz	2933A05441
59	Receiver	ESVP.52	Rohde & Schwarz	881 487/021
60	Spectrum Monitor	EZM	Rohde & Schwarz	883 086/026
61	Receiver	ESH3	Rohde & Schwarz	881 515/002
62	Relais Matrix	PSU	Rohde & Schwarz	882 943/029
63	Relais Matrix	PSU	Rohde & Schwarz	828 628/007
64	Spectrum Analyzer	FSIQ 26	Rohde & Schwarz	119.6001.27
65	Spectrum Analyzer	HP 8565E	Hewlett Packard	3473A00773
66				

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Test site
RADIATED EMISSIONS

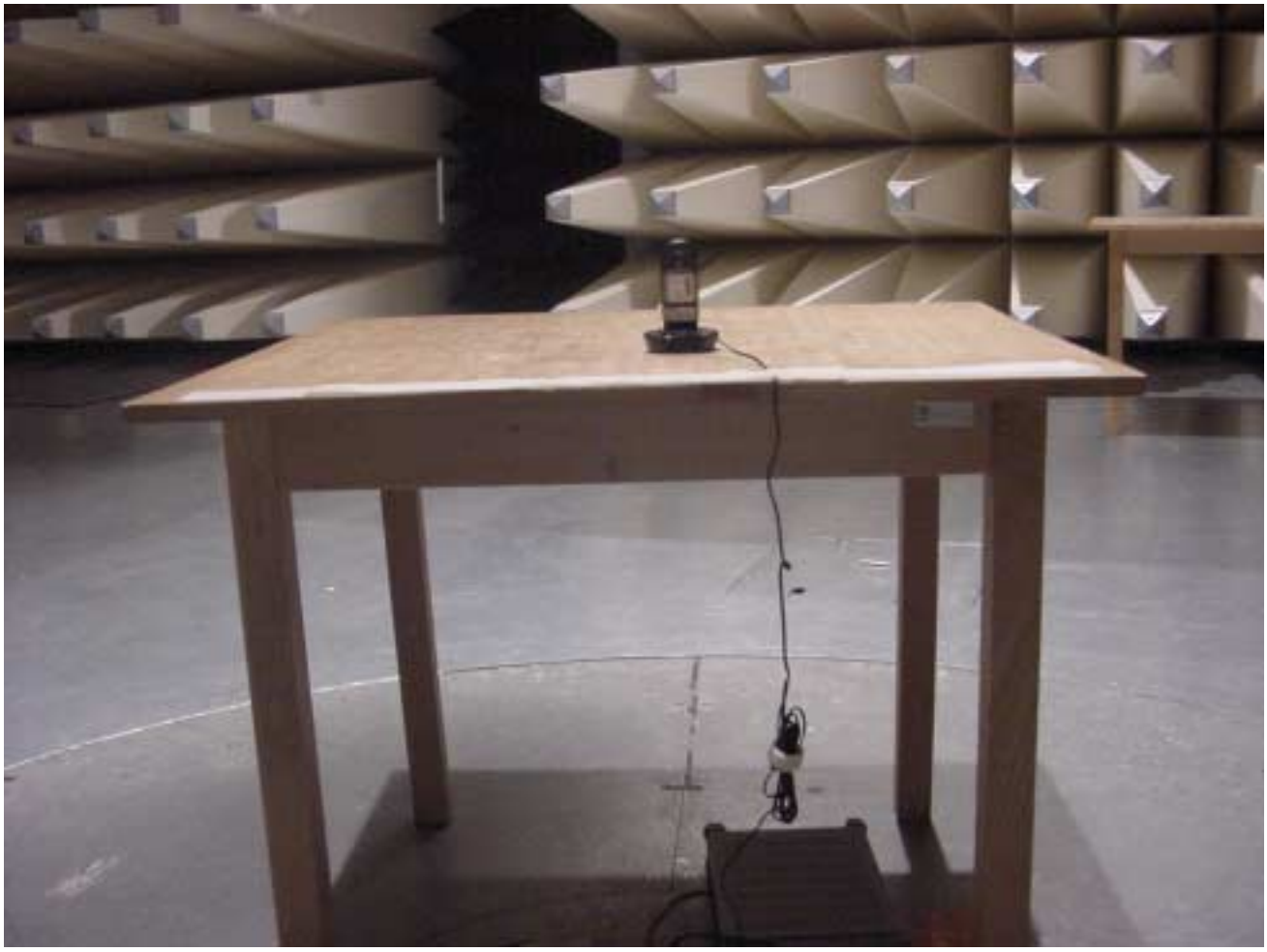


REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Test site
RADIATED EMISSIONS

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Test site
RADIATED EMISSIONS



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Test site
CONDUCTED EMISSIONS

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Photographs of the equipment

Photograph no.: 1

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Photographs of the equipment

Photograph no.: 2

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Photographs of the equipment

Photograph no.: 3

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Photographs of the equipment

Photograph no.: 4

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64