Accredited Bluetooth™ Test Facility (BQTF)

Test report no.: 2_2860-01-01/02
FCC Part 15.247 / CANADA RSS-210
FCC ID : PY78505003

CETECOM – ICT Services GmbH
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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 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.

1.2 Testing laboratory

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66117 Saarbrücken
Germany
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Internet : www.cetecom.de
Accredited testing laboratory
DAR-registration number : TTI-P-G 166/98-30
Accredited Bluetooth™ Test Facility (BQTF)
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1.3 Details of applicant

Name : SonyEricsson Mobile Comunications AB
Street : Nya Vattentornet
City : SE-22188 Lund
Country : Sweden
Telephone : +46 46 193 242
Telefax : +46 46 193 295
Contact : Mr. Bo Johansson
Telephone : +46 46 193 242

1.4 Application details

Date of receipt of application : 10.04.2002
Date of receipt of test item : 12.04.2002
Date of test : 16.-17.04.2002

1.5 Test item

Type of equipment	:	**Bluetooth Headset**
Type designation	:	8505003
Manufacturer	:	applicant
Street	:	
City	:	
Country	:	
Serial number	:	-.-
Hardware	:	EP2
Software	:	CAH109737 R1A
Additional informations:	**:**	
Frequency	:	2400 – 2483.5 MHz
Type of modulation	:	1M00FXD / 79M8FXD (FHSS)
Number of channels	:	79
Antenna	:	integral antenna / print antenna
Power supply	:	2,4 DC NiMH Accu
Output power	:	EIRP: 0.473 mW
Temperature range	:	-10°C to +50°C
FCC ID	:	PY78505003

1.6 Test standards: FCC Part 15 §15.247
CANADA RSS-210

2 Technical test

2.1 Summary of test results

The radiated measurements were performed vertical andhorizontal over the whole frequency range.We start at 1 m high with vertical receiving antenna and rotate the dish continuously. During rotation we use the antenna lift system to vary the high from 1 to 4 m. So we find maximum radiation output. At this points we do manual remeasurements. After this we do the same measurements in horizontal position of the receiving antenna. This (horizontal and vertical) is made for all the three planes of the test sample. We use the maximum received results.

The detector function and selection of bandwidth are according ANSI C63.2-1996 item 8.2.1 and ANSI C63.4-1992 Item 4.2.

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

150 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 MHz, waveguide horn

The product fullfills also the requirements for CANACA RSS-210

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

Final verdict : PASS

Technical responsibility for area of testing :

Date	Section	Name	Signature
26.02.02	RSC 8411	Berg M.	

Technical responsibility for area of testing :

Date	Section	Name	Signature
26.02.02	RSC8412	Hausknecht D.	

2.2 Testreport

TEST REPORT

Testreport no. : 2_2860-01-01/02

TEST REPORT REFERENCE

LIST OF MEASUREMENTS

Paragraph	PARAMETER TO BE MEASURED	PAGE
	Transmitter parameters	
§ 15.204	Antenna gain	7
§ 15.247 (a)	Carrier frequency separation	8
§ 15.247 (a)	Number of hopping channels	9
§ 15.247 (a)	Time of occupancy (dwell time)	11
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Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

Antenna Gain **SUBCLAUSE § 15.204**

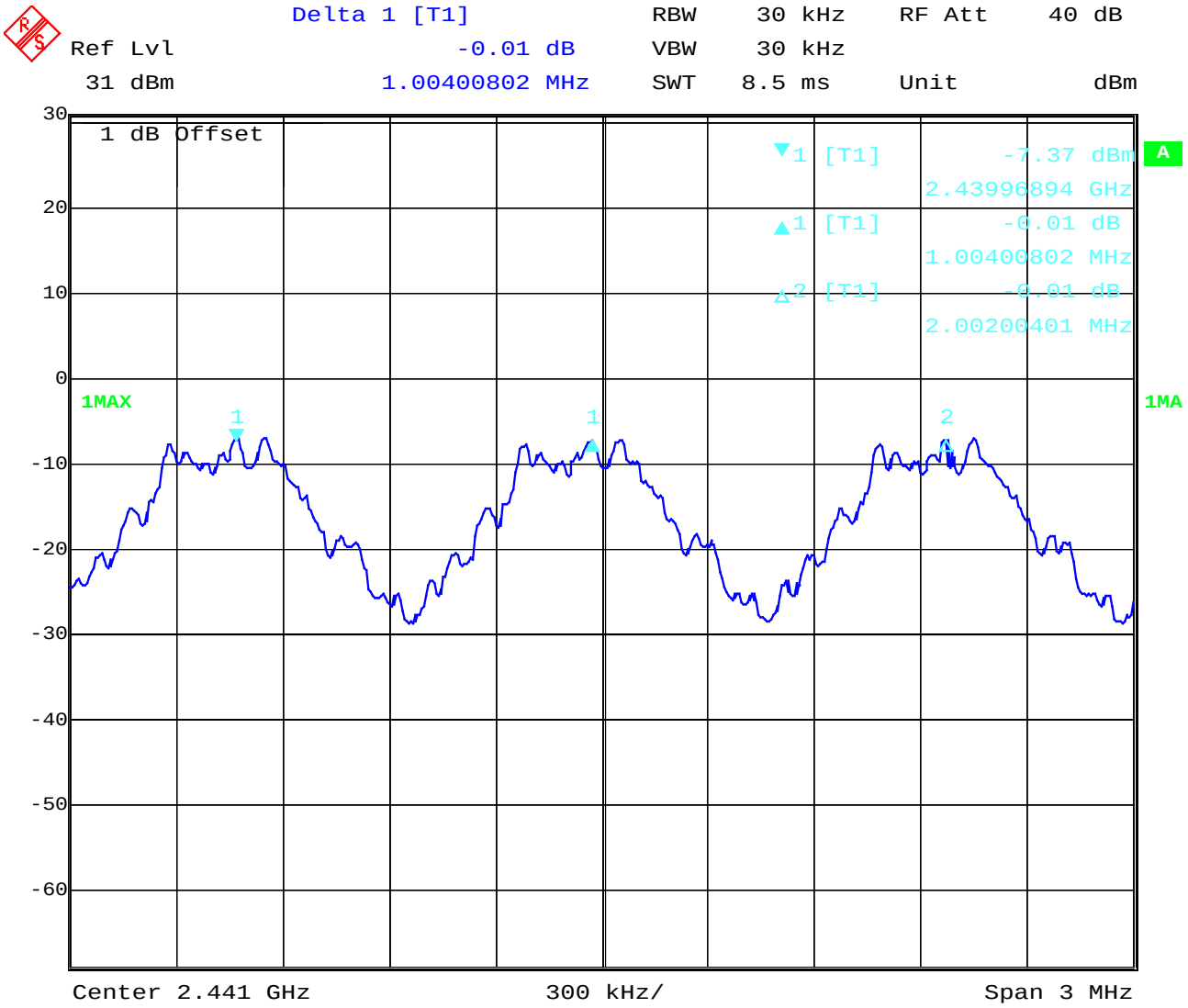
The gain is 0.0 dBi

(manufacturer declarartion)

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

Carrier frequency separation §15.247(a)

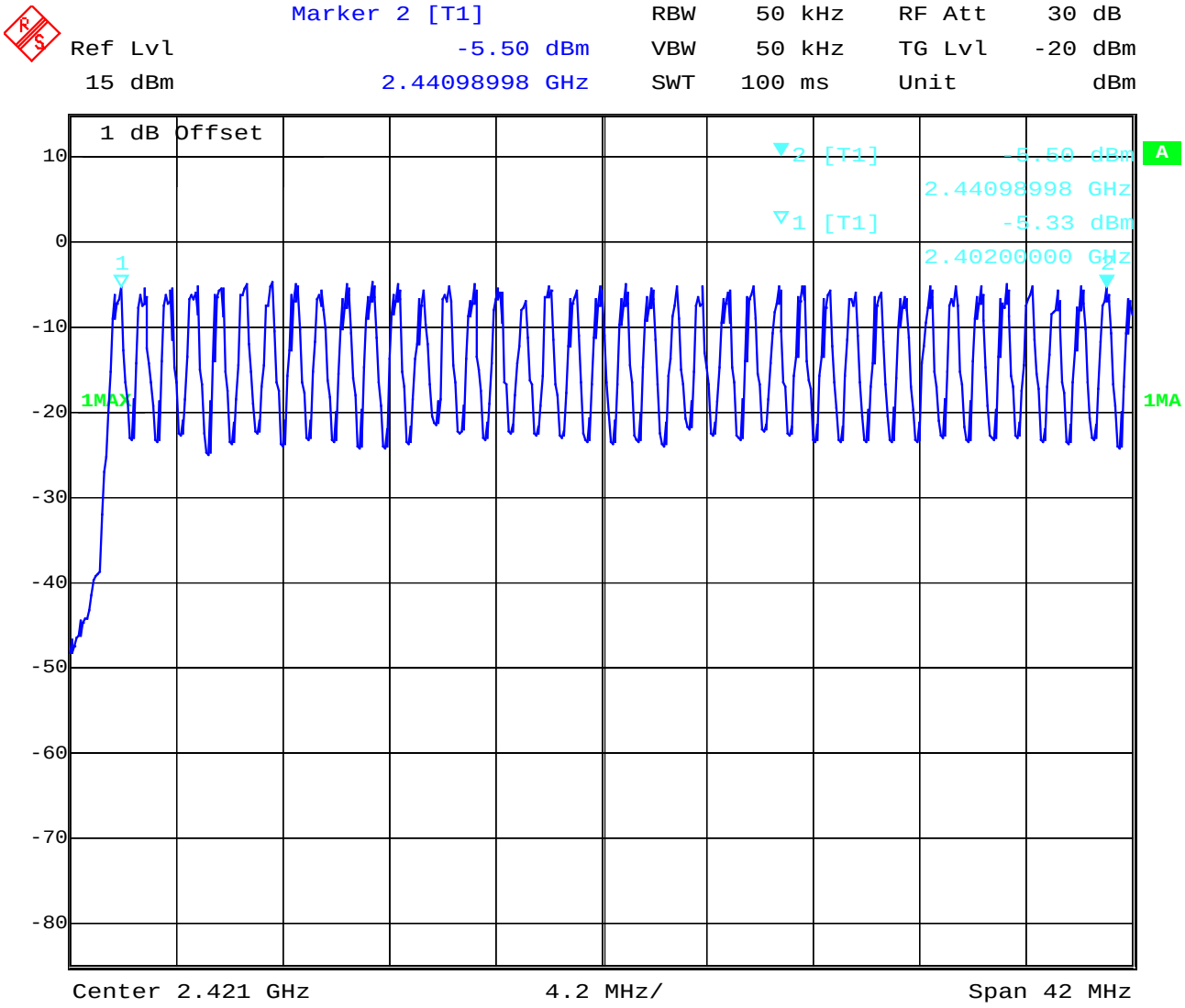


Date: 16.APR.2002 09:48:03

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

Number of hopping channels **§15.247(a)**
Channel 1 - 40

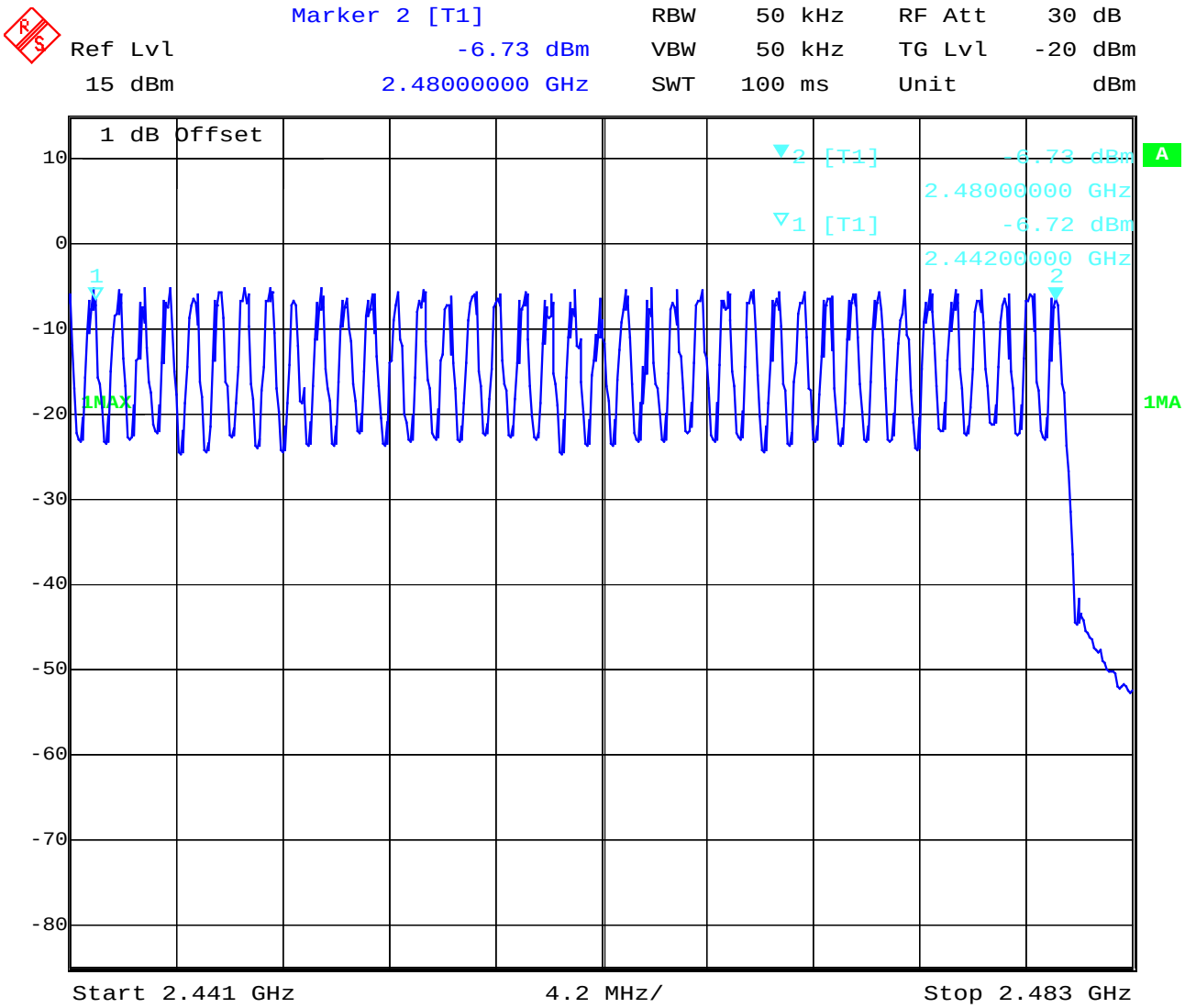


Date: 16.APR.2002 09:31:04

The number of hopping channels is 79.

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%
Number of hopping channels
Channel 41 - 79 **§15.247(a)**



Date: 16.APR.2002 09:34:02

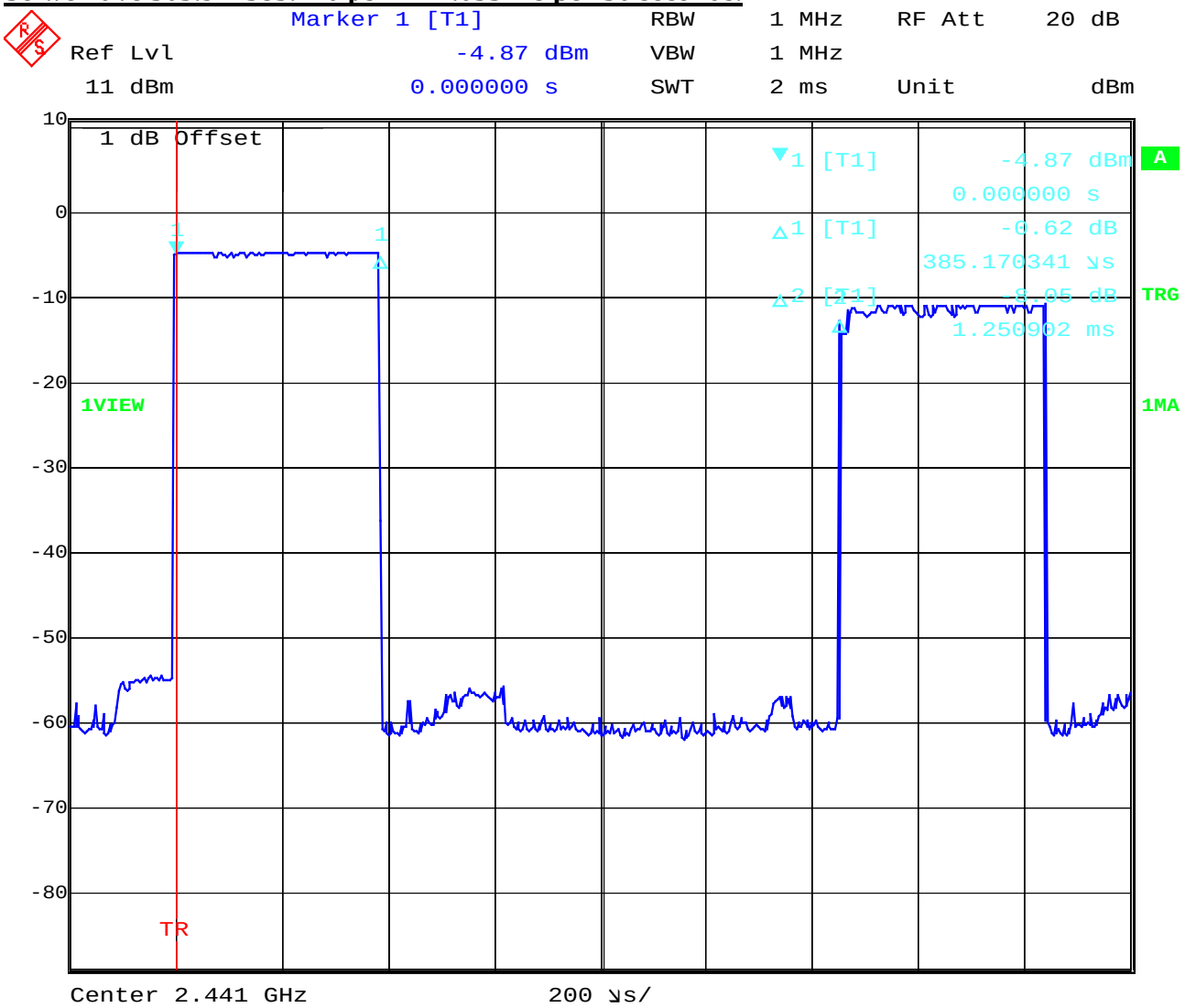
The number of hopping channels is 79.

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

Time of occupancy (dwell time) for DH1 **§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 for 30 seconds you have 303.9 times of appearence .
Each tx-time per appearence is 385.170 µs.
<u>So we have 303.9 * 385.170 µs = 117.053 ms per 30 seconds.</u>



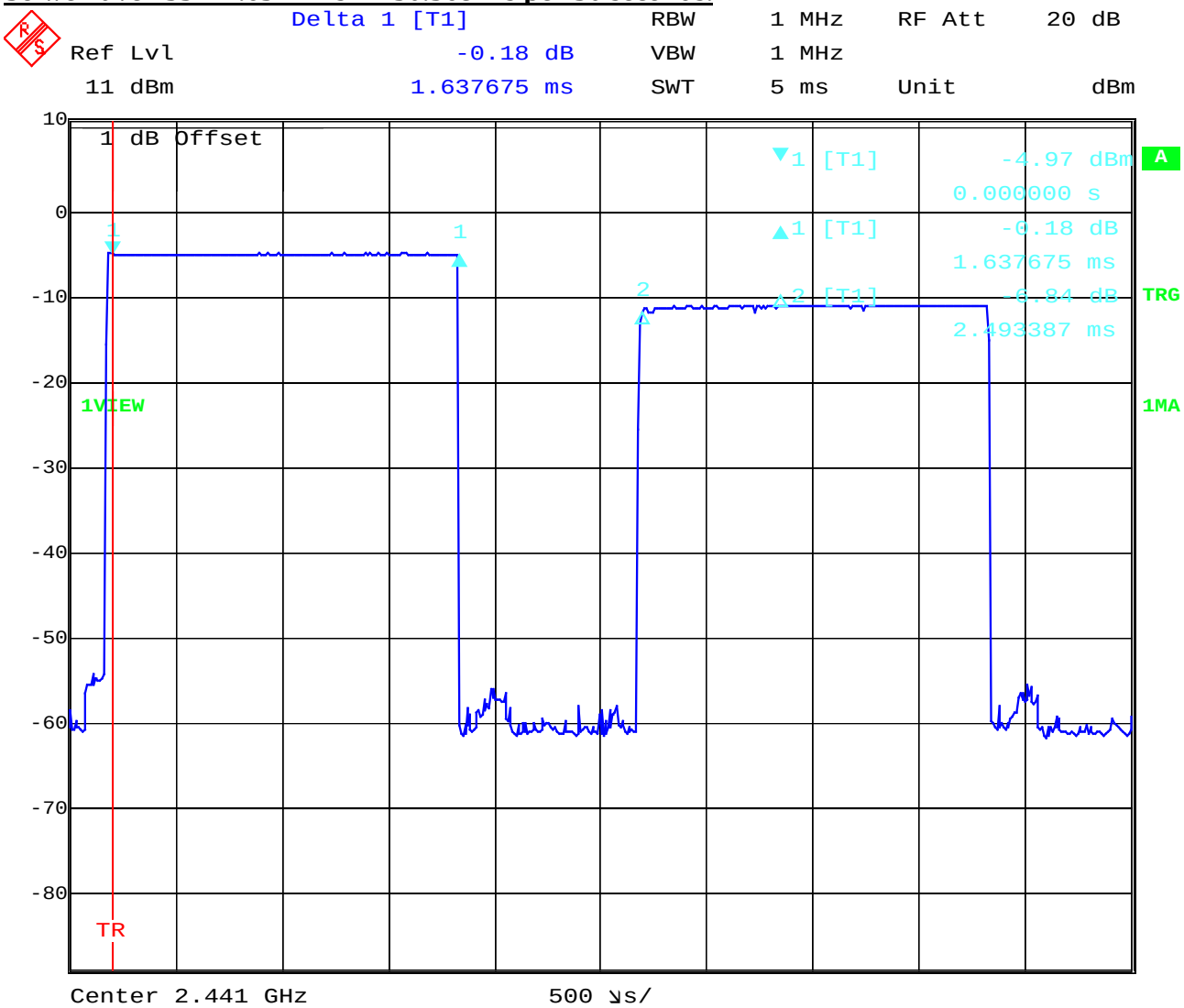
Date: 16.APR.2002 09:54:04

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

Time of occupancy (dwell time) for DH3 **§15.247(a)**

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 for 30 seconds you have 153 times of appearence .
Each tx-time per appearence is 1.6377 ms.
<u>So we have 153 * 1.6377 ms = 250.568 ms per 30 seconds.</u>



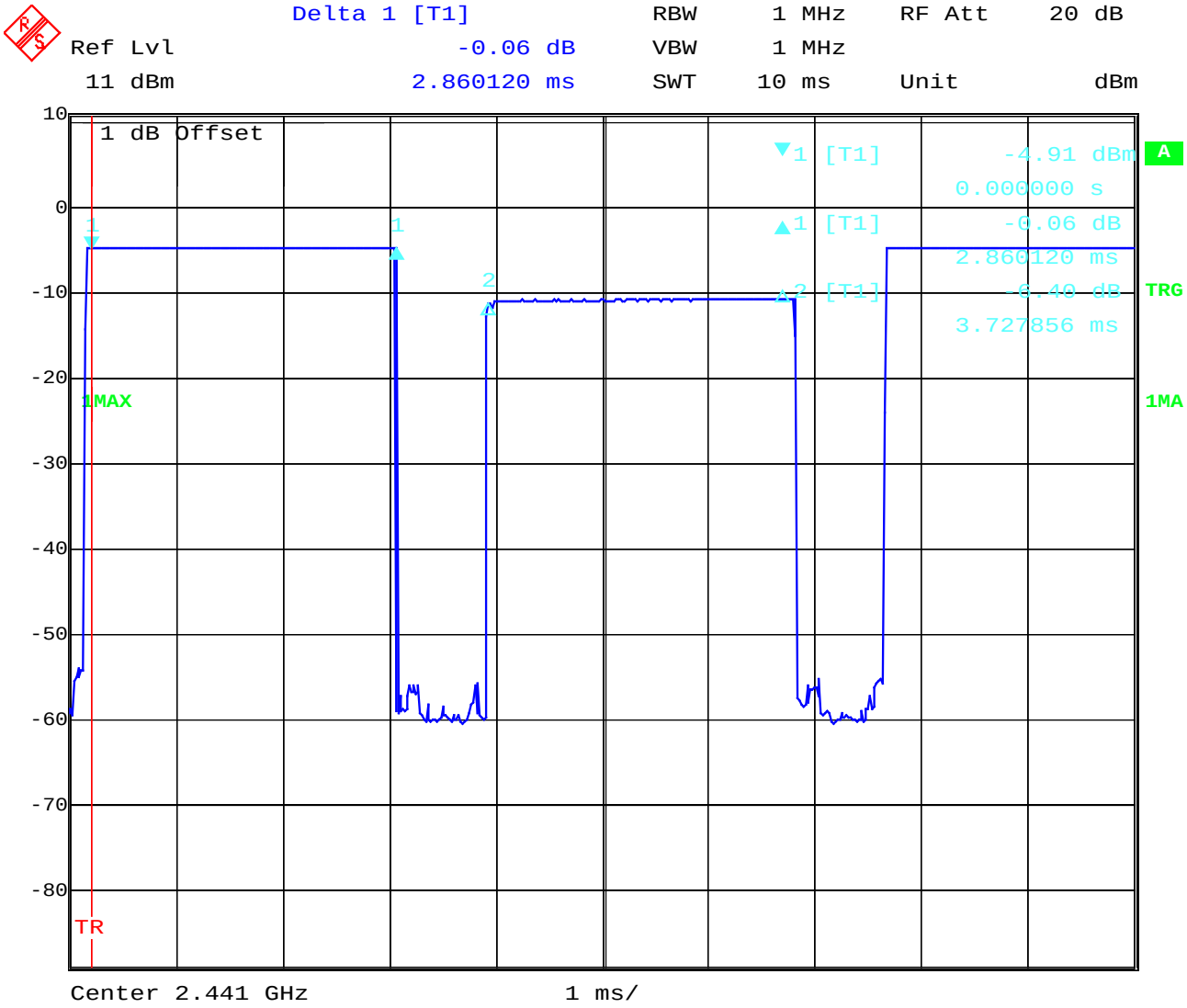
Date: 16.APR.2002 09:56:06

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

Time of occupancy (dwell time) for DH5 **§15.247(a)**

At DH5 Packets you need 5 time slots for transmit and 1 for receiving, so the system makes worst case 266,7 hops per second with 79 channels. So you have each channel 3.36 times per second and for 30 seconds you have 100,8 times of appearence .
Each tx-time per appearence is 2.8601 ms.
<u>So we have 100,8 * 2.8601 ms = 288.298 ms per 30 seconds.</u>

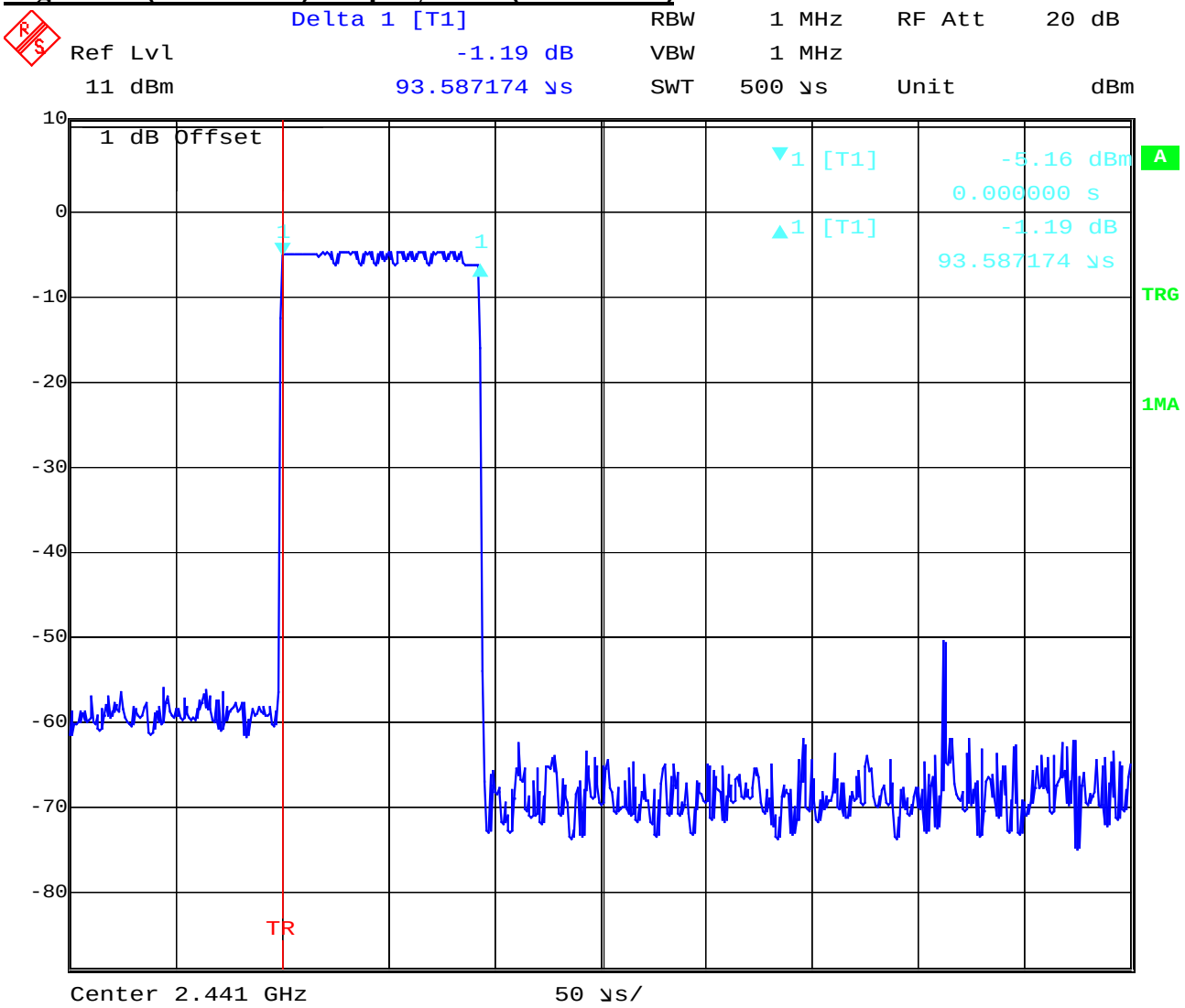


Date: 16.APR.2002 10:00:30

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%
Time of occupancy (dwell time) for page mode /Inquiry mode (TX-on time) §15.247(a)
At paging mode the system makes first hoping with 16 channels. One sequence(called train A) lasts 10 ms. Every 1.28s frequencies change and a second train A starts with different freqencies. After max 7*1.28 s 16 new more distance frequencies (Train B) are used.
So we have in the worst case (same frequency is in every train) the following time scedule.
First: 7*128*10ms. For the next 7 seconds train B with other frequencies.
Then train A and B changes frequently.
⇨ so we have 7*128*93.587µs, then 8.96 s other frequencies, then again 7*128*93.587µs
⇨ together in30 s maximal 2 sequences =>maximal 0.168 s per 30 second period.

Page mode (TX-on time) / Inquiry mode (TX-on time)

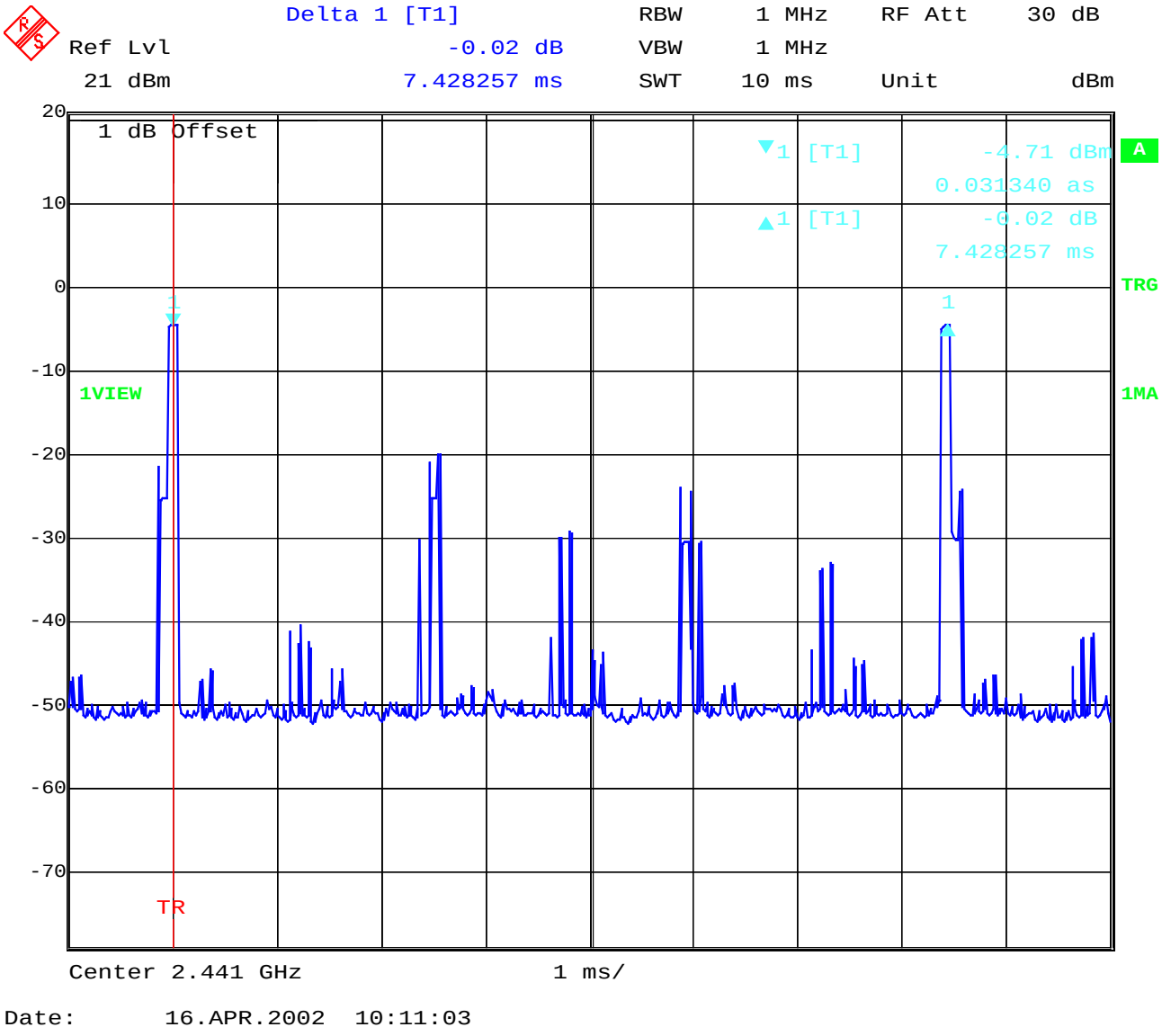


Date: 16.APR.2002 10:05:19

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

Page mode (complete sequence) / Inquiry mode (complete sequence)

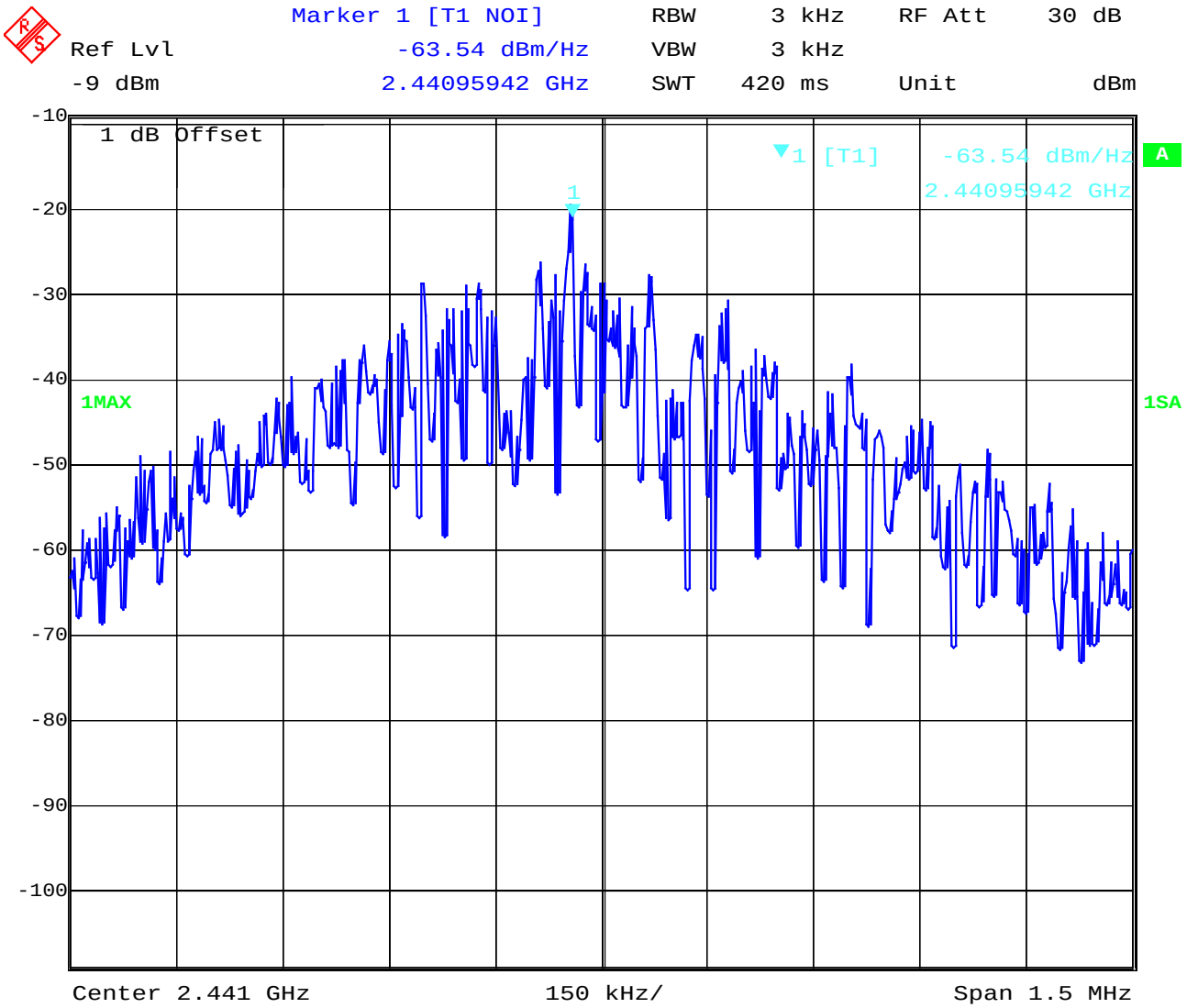


Date: 16.APR.2002 10:11:03

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

Power Spectral density (Hybrid system in Inquiry mode / Page scan) §15.247(d)



Date: 16.APR.2002 10:22:32

Power density : -63.54 dBm/Hz = -28.74 dBm / 3 KHz

Correction factor from dBm/Hz to dBm/3KHz is +34,8 dB

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

Spectrum Bandwidth of a FHSS System

§15.247(a)

20 dB bandwidth

TEST CONDITIONS		20 dB BANDWIDTH (kHz)		
Frequency (MHz)		2402	2441	2480
T_{nom}(23)°C	V_{nom}(2.4)V	928.858	933.868	965.932
Measurement uncertainty		±1kHz		

RBW / VBW as provided in the „Measurement Guidelines“ (DA 00-705, March 30, 2000)
RBW: 10 kHz / VBW 10 kHz

LIMIT **SUBCLAUSE §15.247(a) (1)**

The maximum 20dB bandwith shall be at maximum 1000 KHz

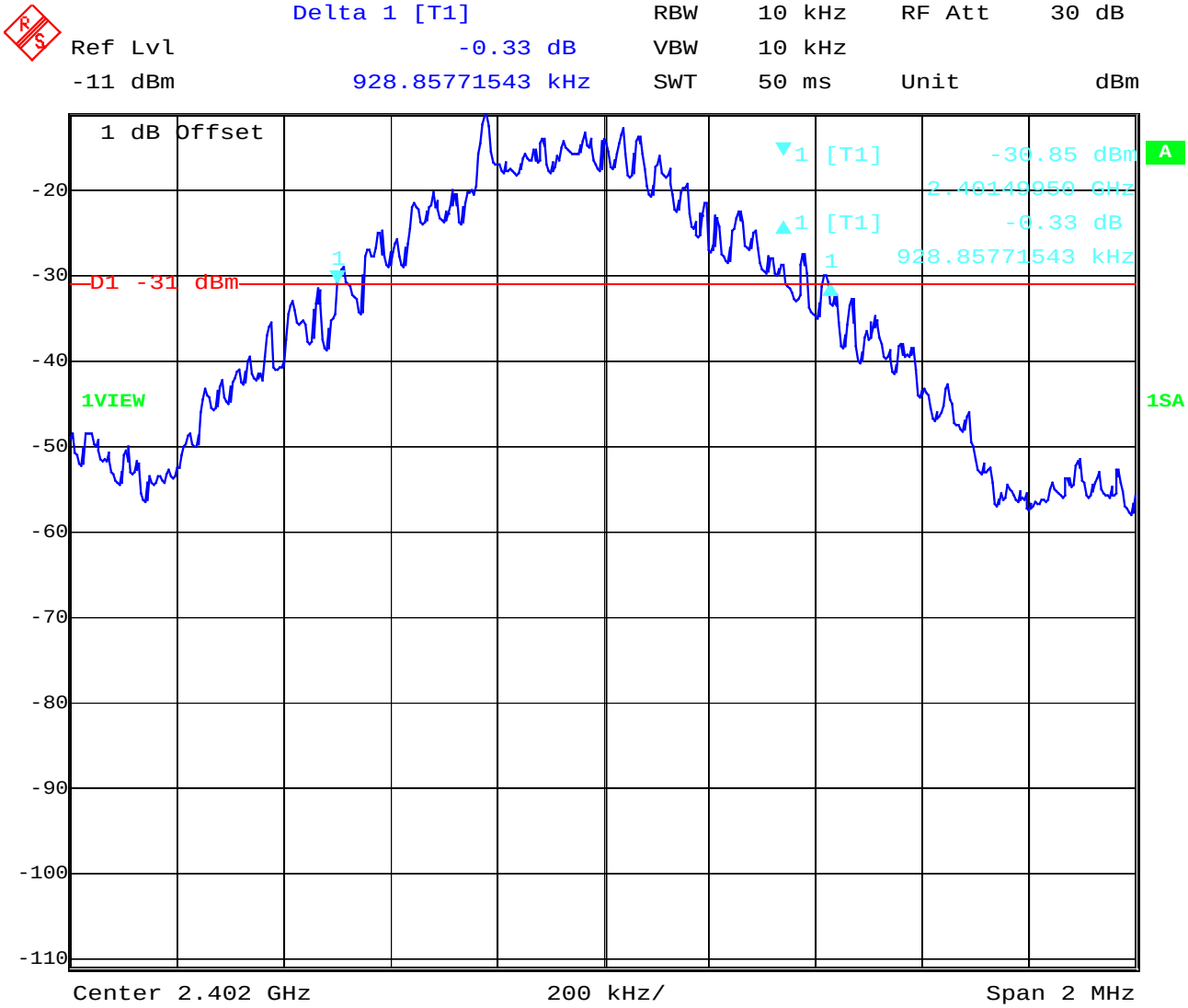
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

20 dB bandwidth

Channel 1



Date: 16.APR.2002 10:27:50

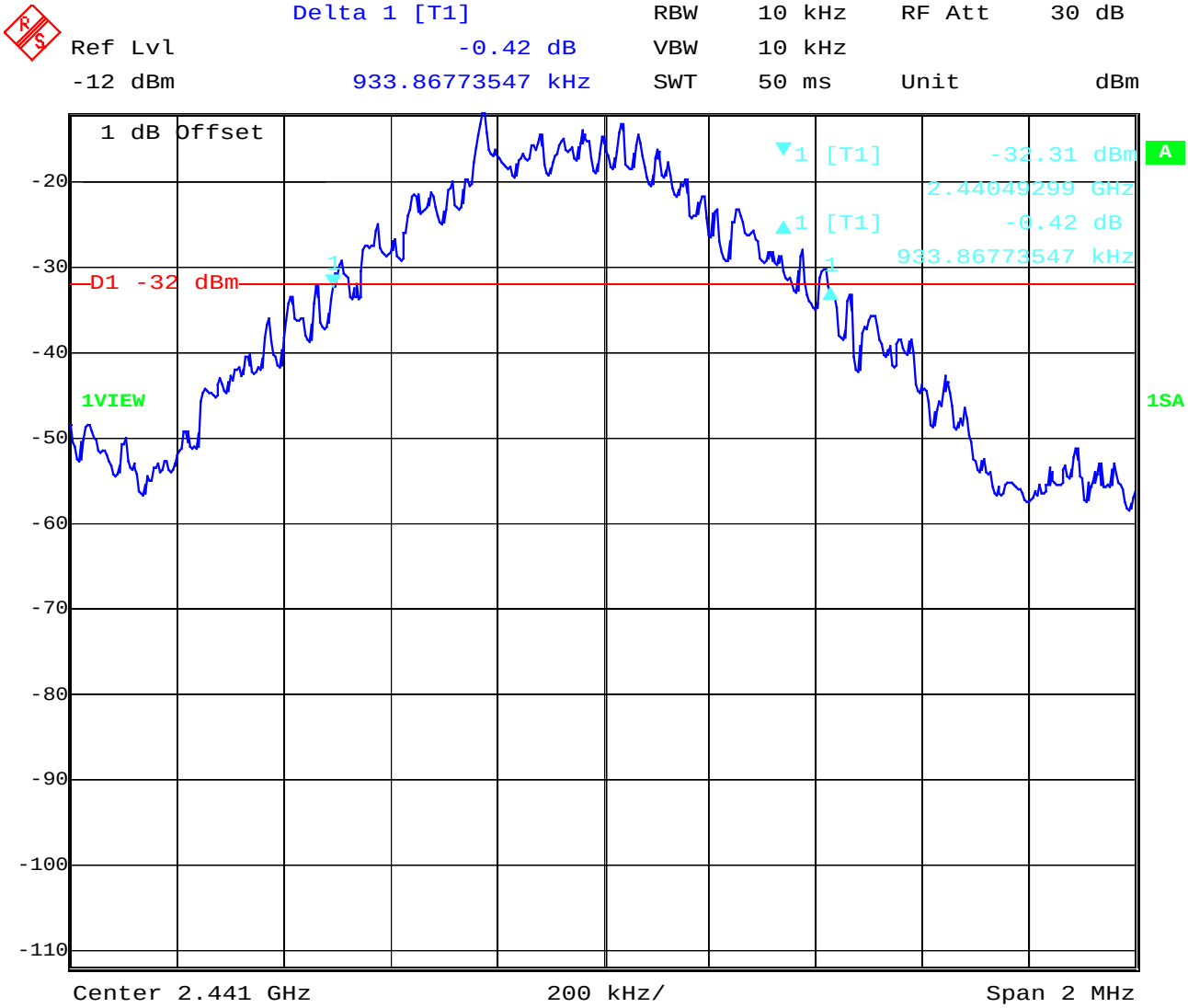
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

20 dB bandwidth

Channel 2



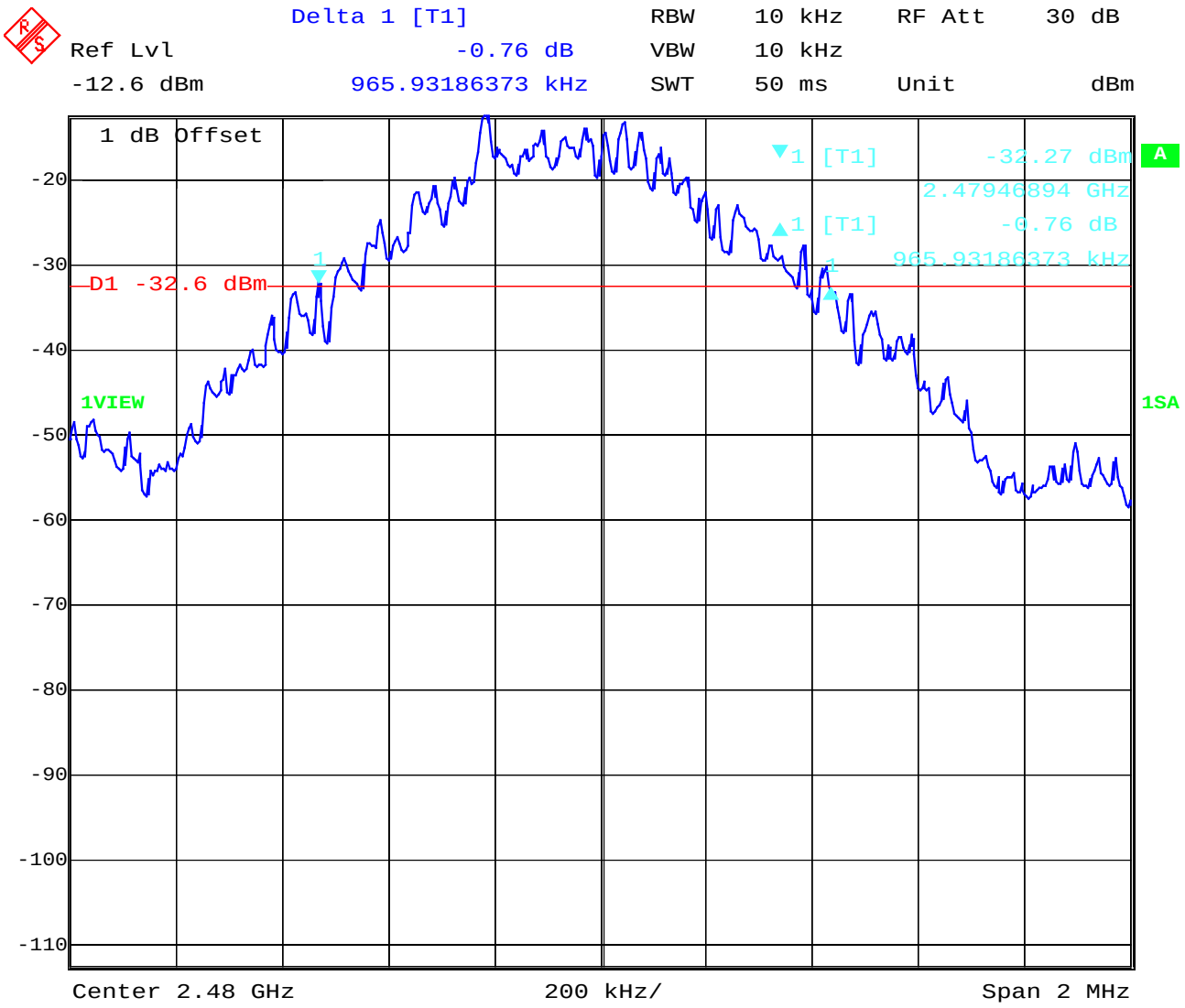
Date: 16.APR.2002 10:29:53

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

Channel 3:



Date: 16.APR.2002 10:32:03

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (mW)			
Frequency (MHz)			2402	2442	2480
T_{nom}(25)°C	V_{nom}(2.4)V	PK	0.482	0.421	0.407
		AV	0.469	0.410	0.397
De facto EIRP (Antenna gain 0.0 dBi)			0.482 (-3.17 dBm)	0.421 (-3.76 dBm)	0.407 (-3.90 dBm)
Measurement uncertainty		±3dB			

RBW / VBW : 3 MHz

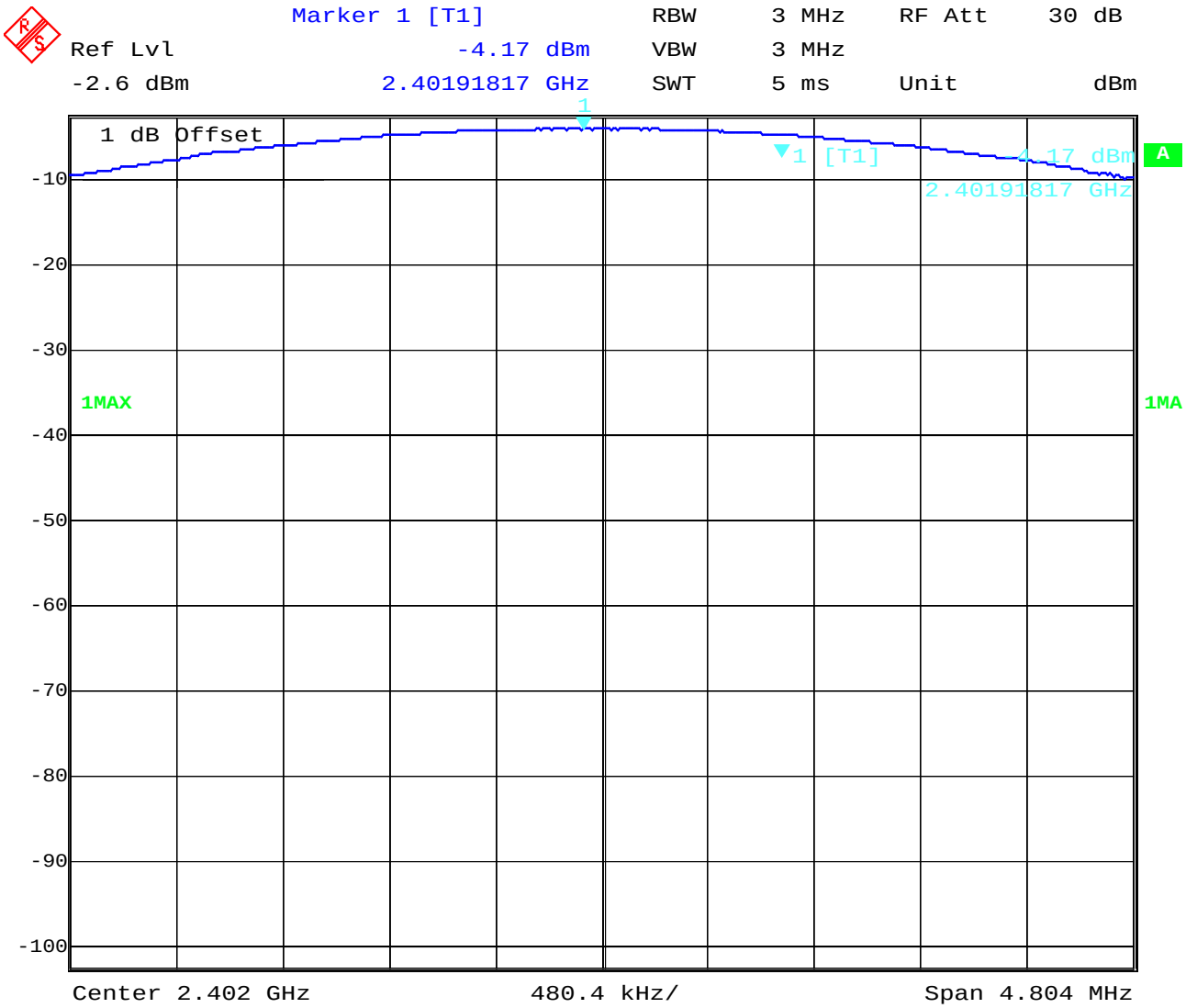
LIMIT **SUBCLAUSE § 15.247 (b) (1)**

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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



Date: 16.APR.2002 10:37:17

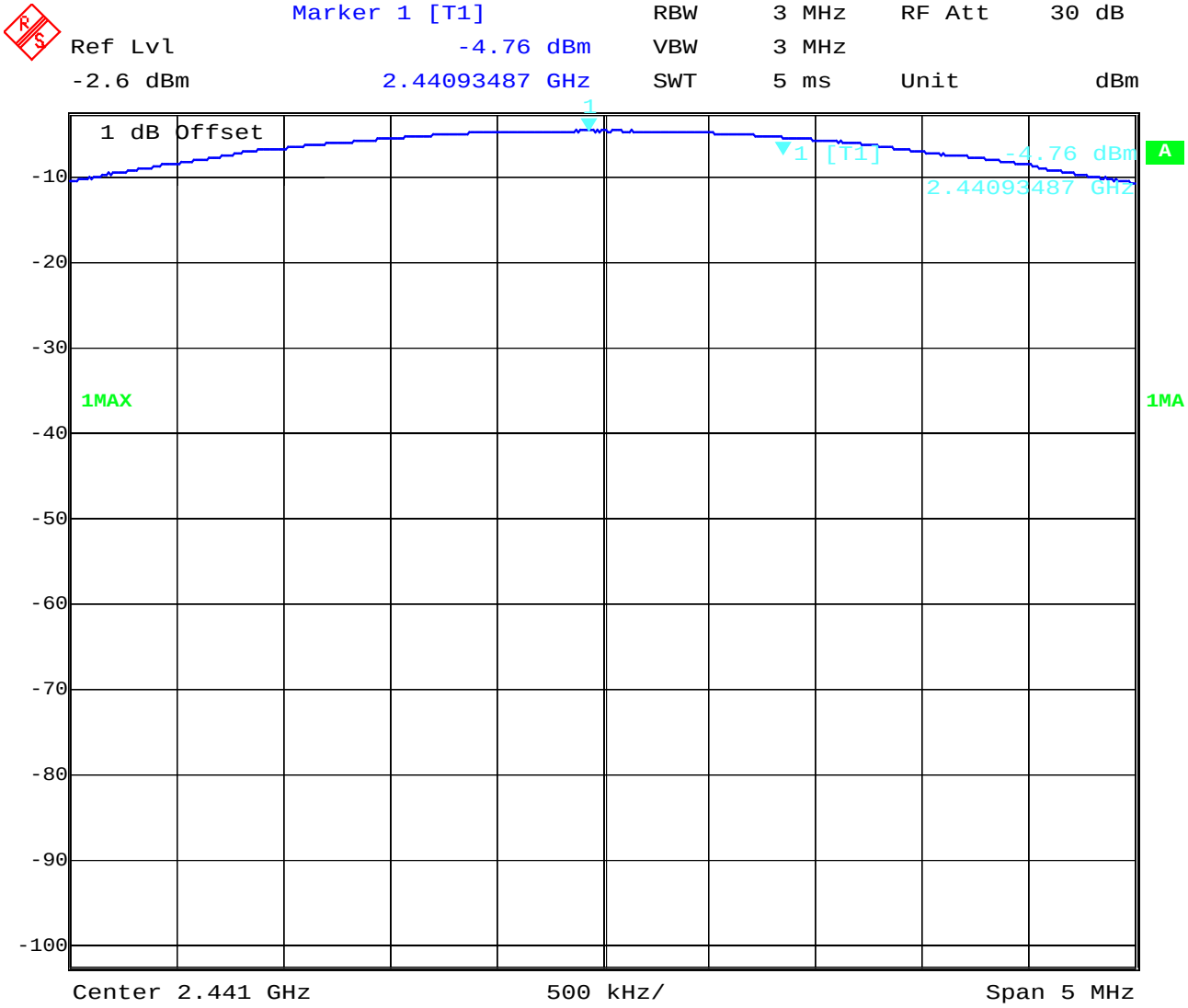
LIMIT **SUBCLAUSE § 15.247 (b) (1)**

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

MAXIMUM PEAK OUTPUT POWER **SUBCLAUSE § 15.247 (b) (1)**
(conducted)
Channel 2



Date: 16.APR.2002 10:36:03

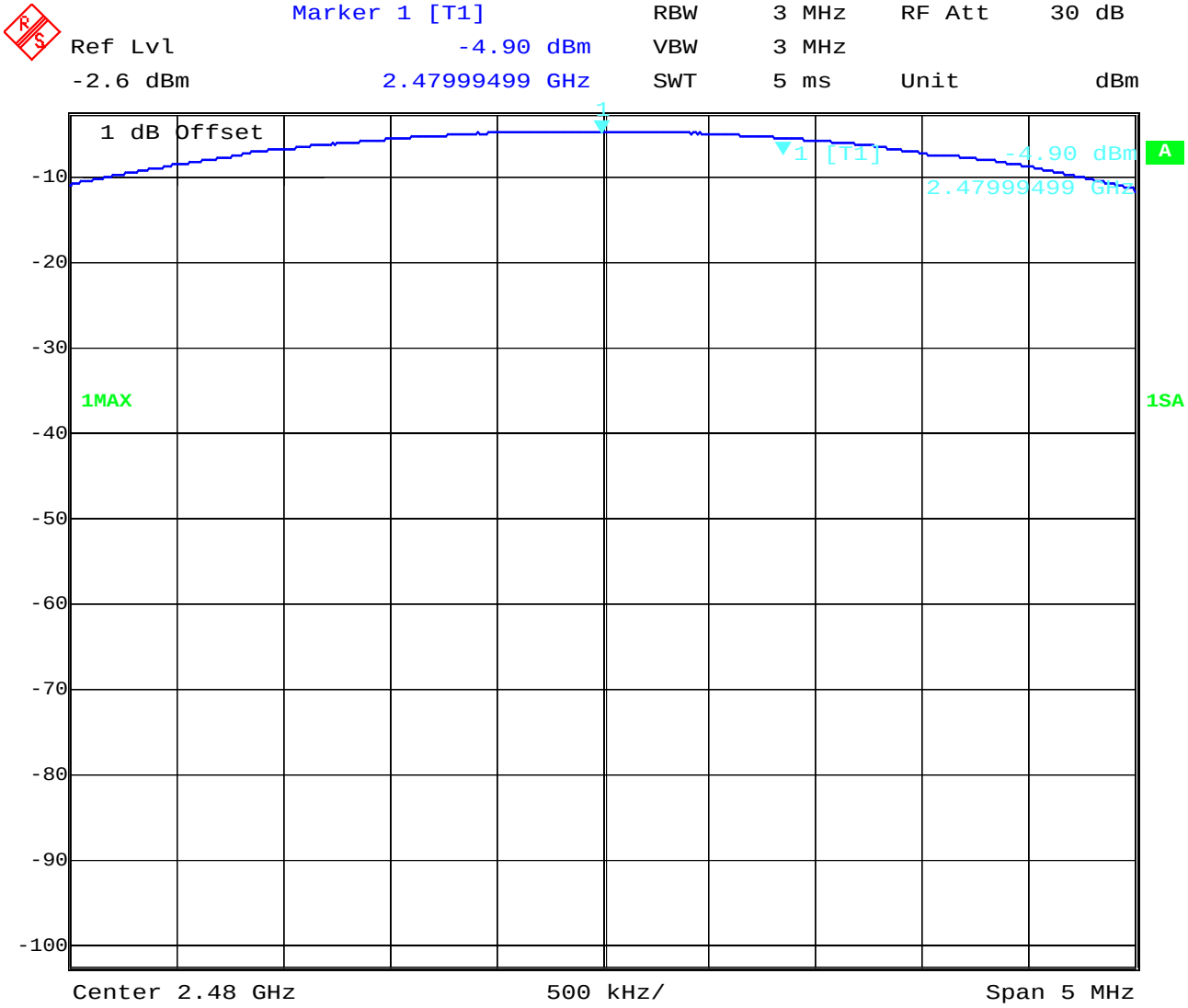
LIMIT **SUBCLAUSE § 15.247 (b) (1)**

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

MAXIMUM PEAK OUTPUT POWER **SUBCLAUSE § 15.247 (b) (1)**
(conducted)
Channel 3



Date: 16.APR.2002 10:34:42

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (mW)		
Frequency (MHz)		2402	2441	2480
T_{nom}(23,4)°C	V_{nom}(2.4)V	0.473	0.417	0.412
Maximum deviation from output power under extreme test conditions (dBc)		not applicable	not applicable	not applicable
Measurement uncertainty		±3dB		

RBW/VBW : 3 MHz

Measured at a distance of 3m

LIMIT **SUBCLAUSE § 15.247 (b) (1)**

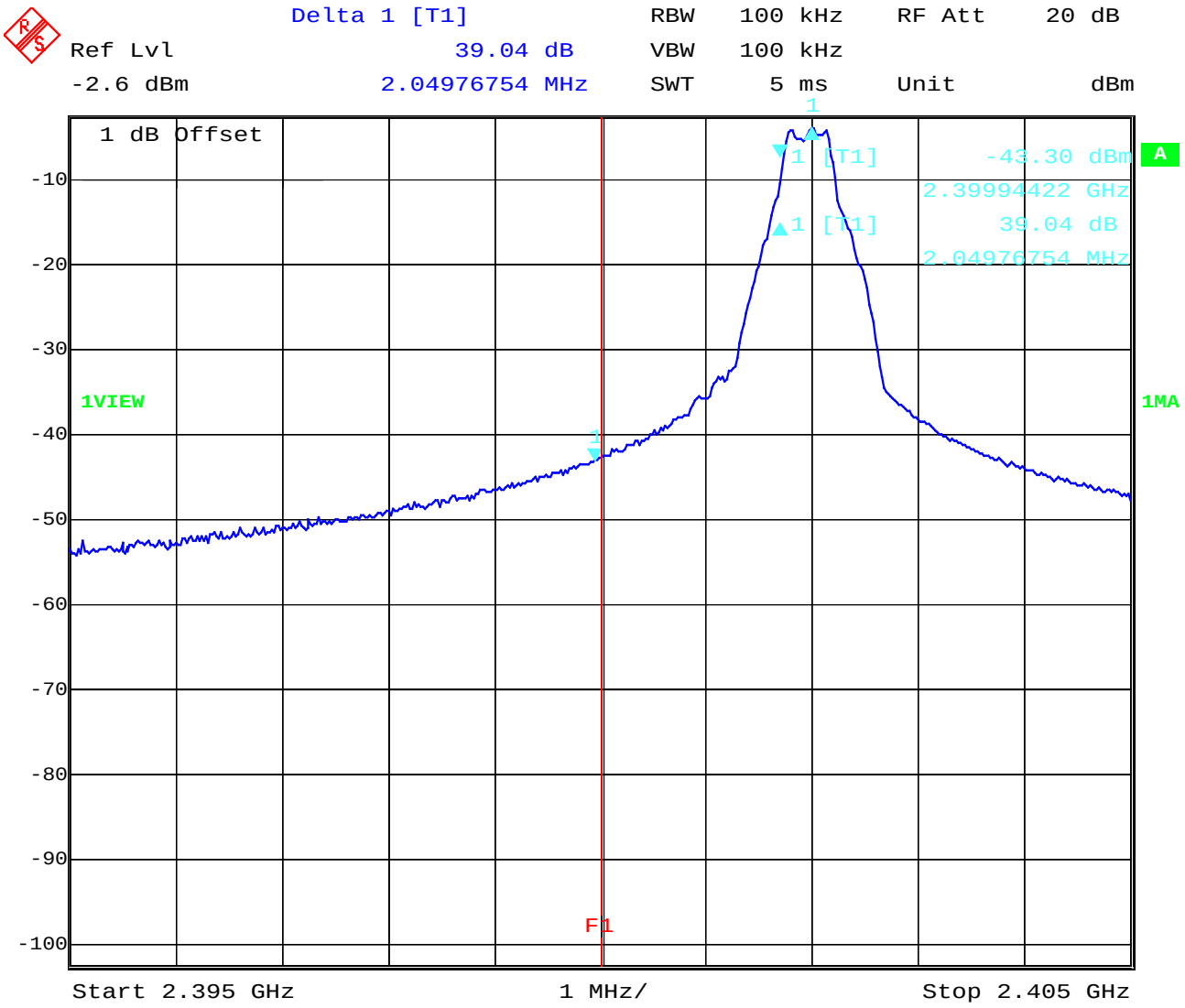
Frequency range	RF power output
2400-2483.5 MHz	1.0 Watt

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

Low frequency section (hopping off)



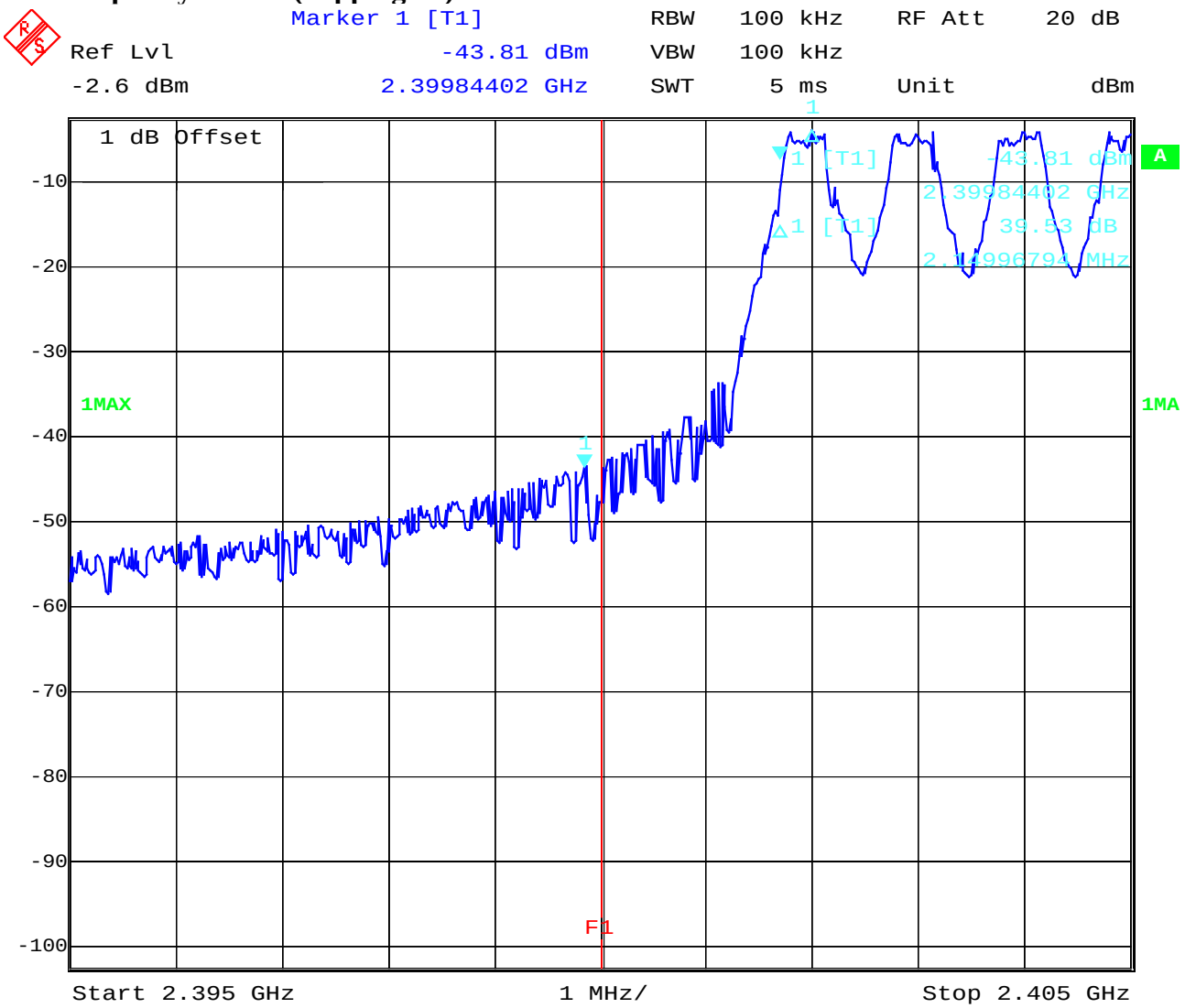
Date: 16.APR.2002 10:42:01

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

Low frequency section (hopping on)



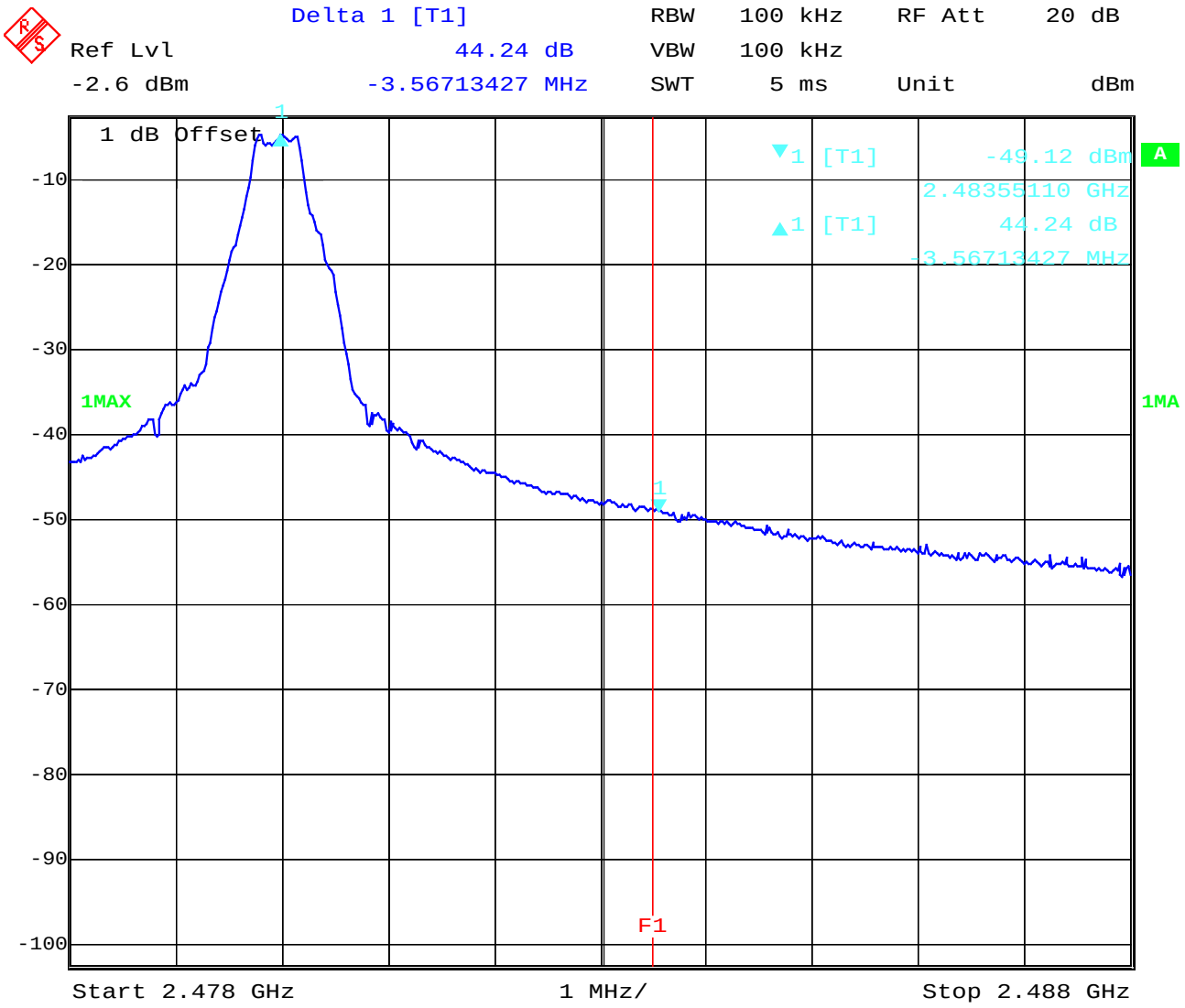
Date: 16.APR.2002 10:47:59

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

high frequency section (hopping off)



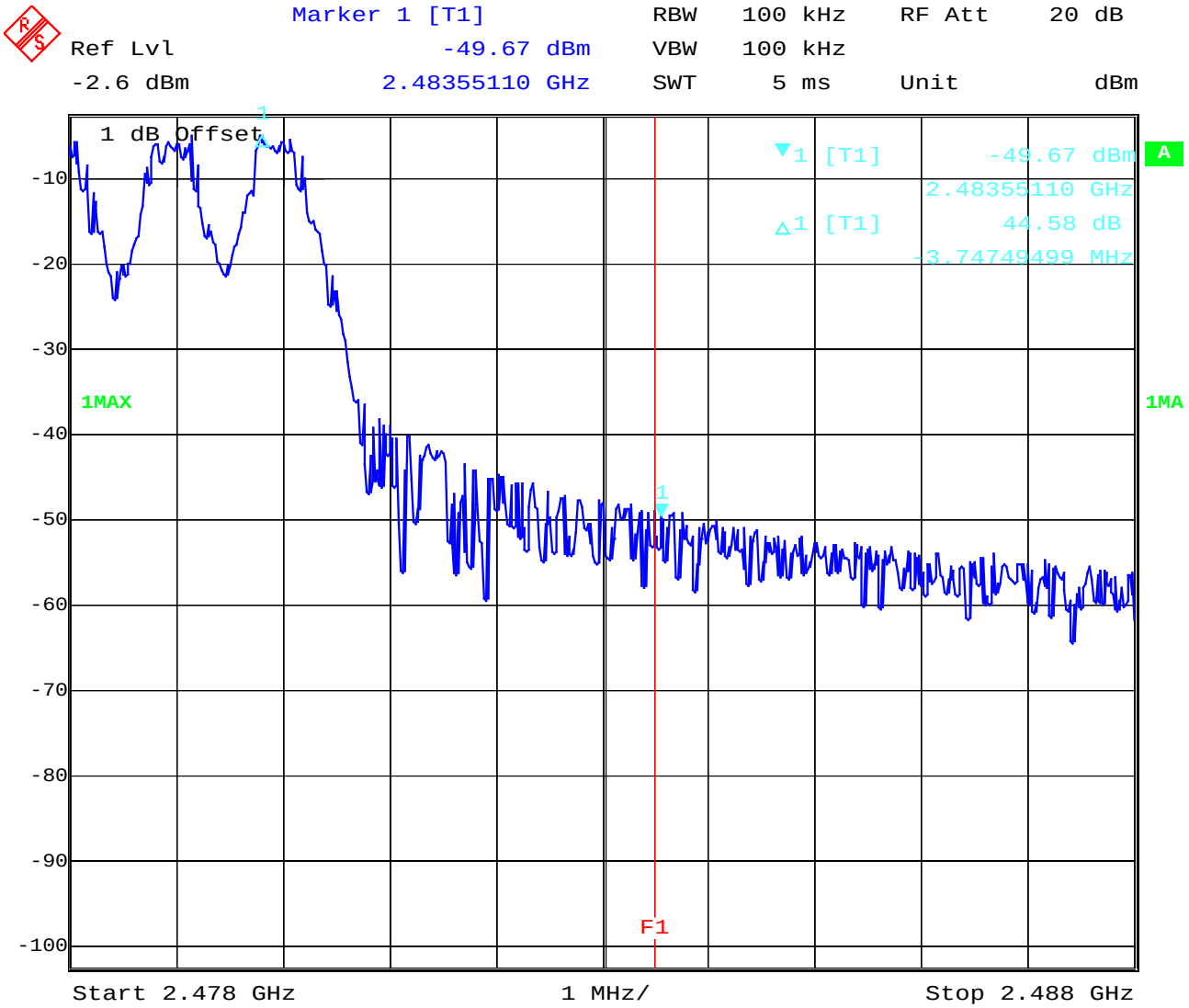
Date: 16.APR.2002 10:52:04

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

high frequency section (hopping on)

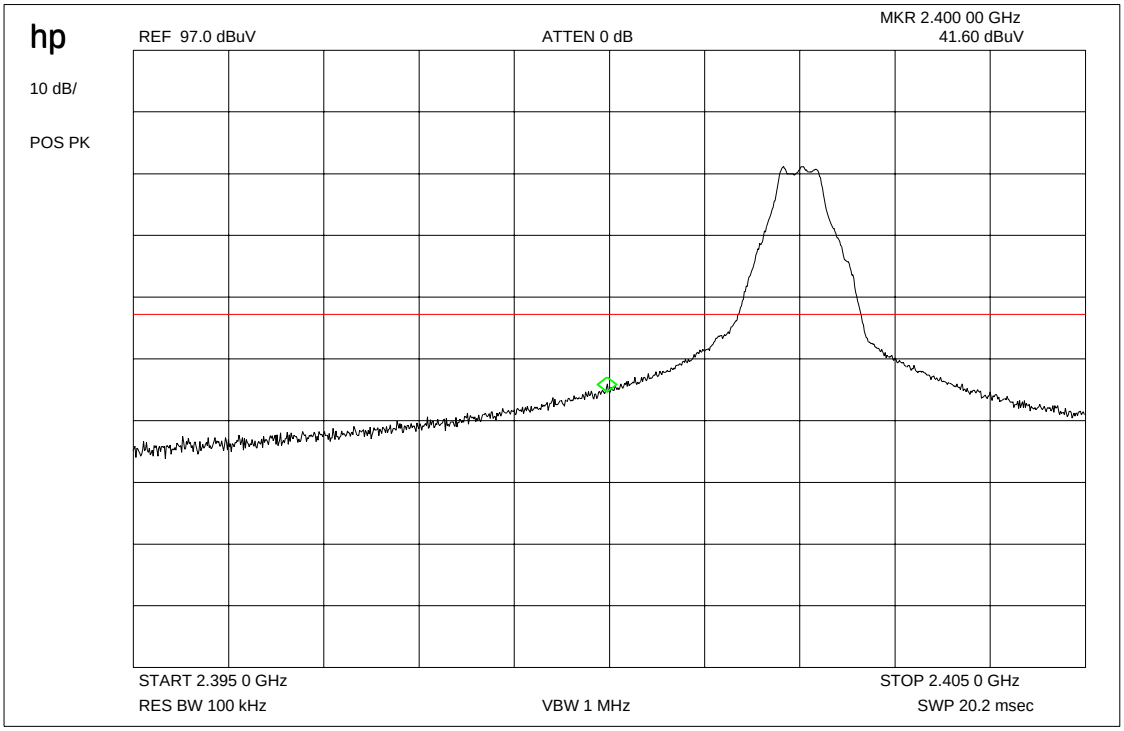


Date: 16.APR.2002 10:50:58

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

Band-edge compliance radiated

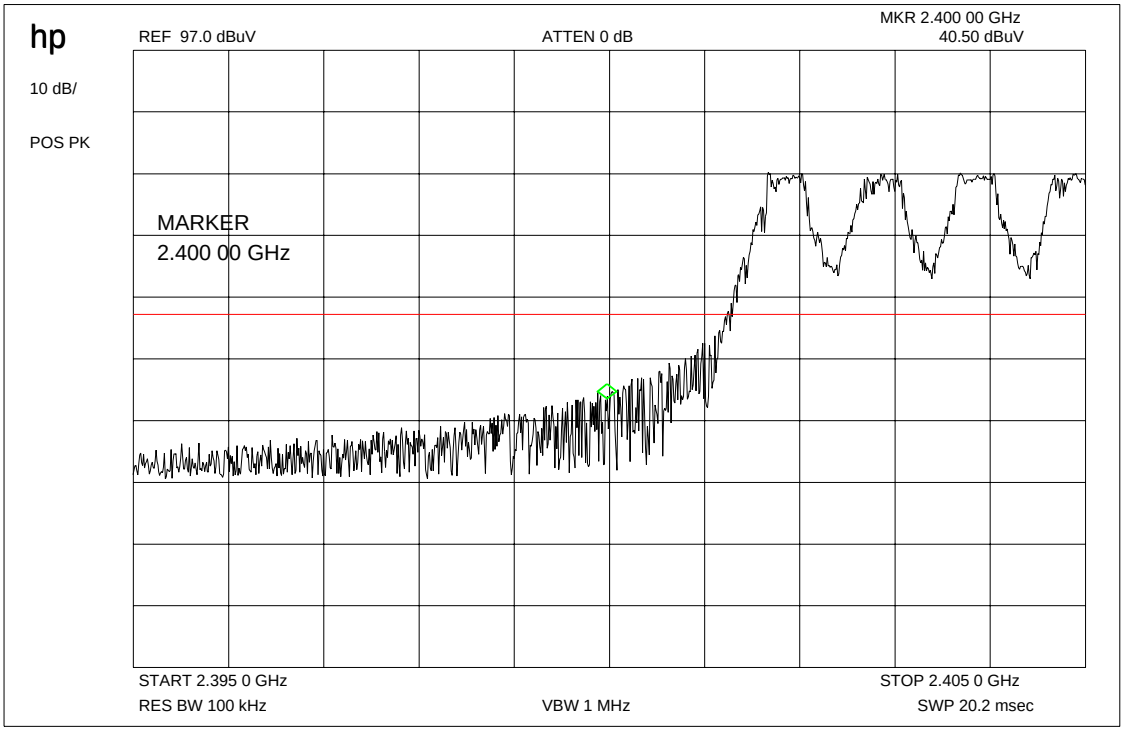


Limit Line 54 dBµV/m

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

Band-edge compliance radiated



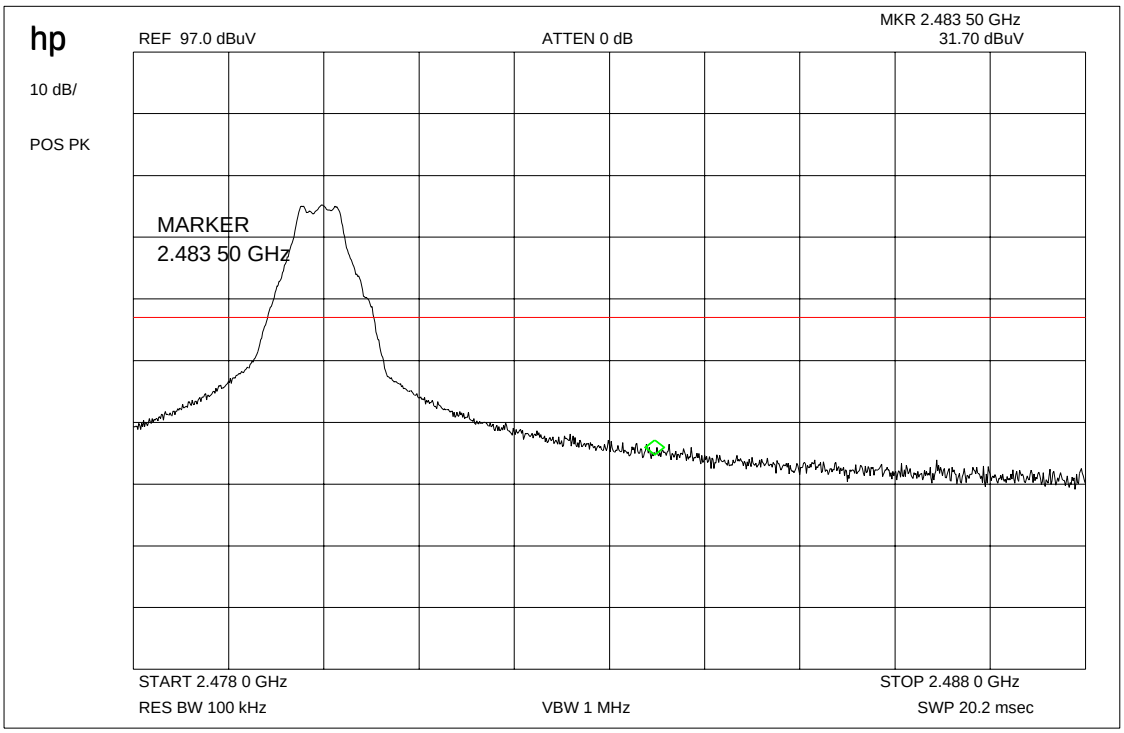
This measurement was made to show that the behavior of the system is conform to

FCC 15.205 (restricted bands)

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

Band-edge compliance radiated



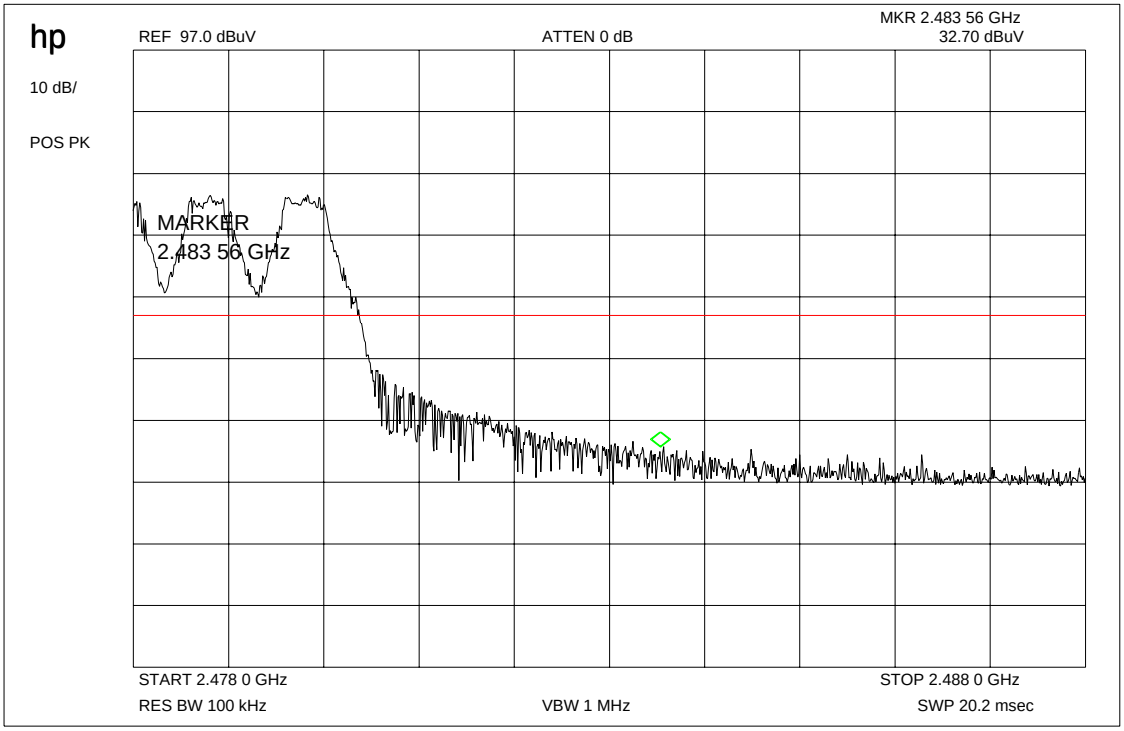
This measurement was made to show that the behavior of the system is conform to

FCC 15.205 (restricted bands)

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

Band-edge compliance radiated



This measurement was made to show that the behavior of the system is conform to FCC 15.205 (restricted bands)

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%
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
2402		-3.17	30 dBm	-	Operating frequency
1201		-51.75	-20 dBc	-48.58	complies
2441		-3.76	30 dBm	-	Operating frequency
1220.5		-53.07	-20 dBc	-49.31	complies
3661.5		-63.71	-20 dBc	-59.95	complies
2480		-3.90	30 dBm		Operating frequency
1240		-53.19	-20 dBc	-49.29	complies
3720		-60.85	-20 dBc	-56.95	complies
Measurement uncertainty		± 3dB			

RBW : 100 kHz VBW: 1 MHz

<u>For emissions that fall into restricted bands you find the radiated emissions later in the report.</u>

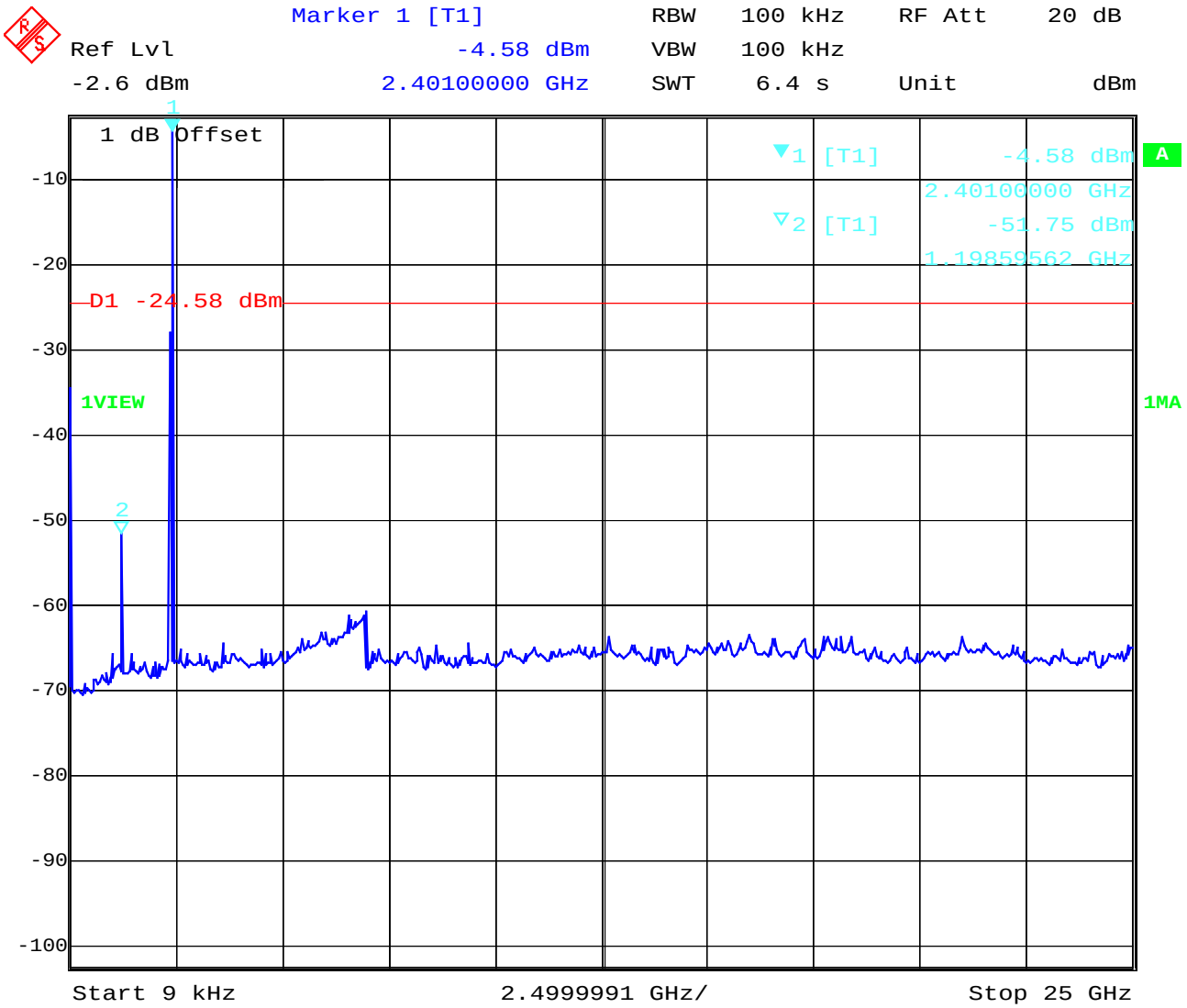
LIMITS SUBCLAUSE § 15.247 (c)

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

EMISSION LIMITATIONS- Conducted (Transmitter) § 15.247 (c) (1)
Channel 1: - 25 GHz



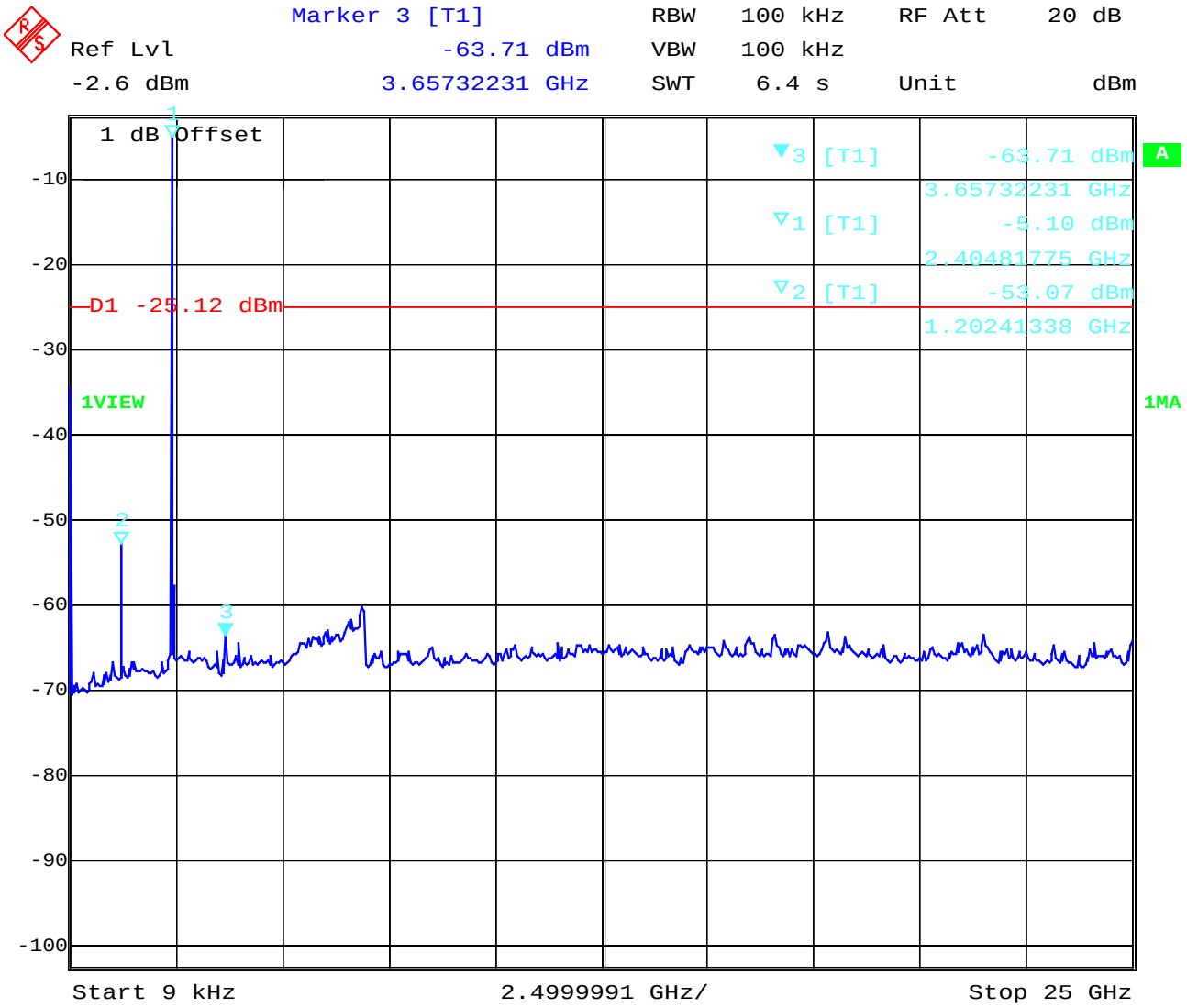
Date: 16.APR.2002 11:07:11

RBW:100 kHz / VBW: 1MHz

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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



Date: 16.APR.2002 11:01:32

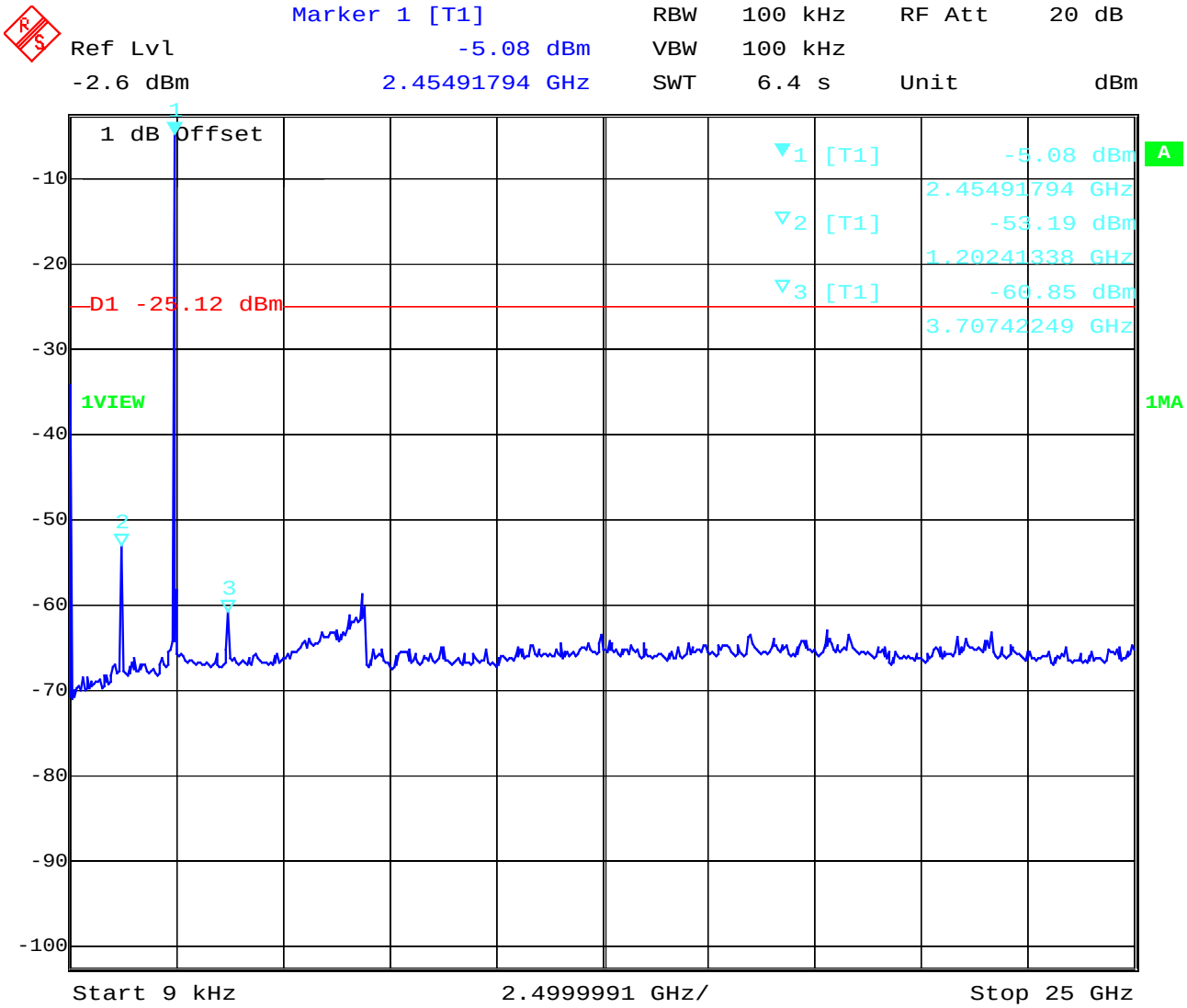
RBW:100 kHz / VBW: 1MHz

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

Channel 3: 30 MHz – 25 GHz



Date: 16.APR.2002 10:58:09

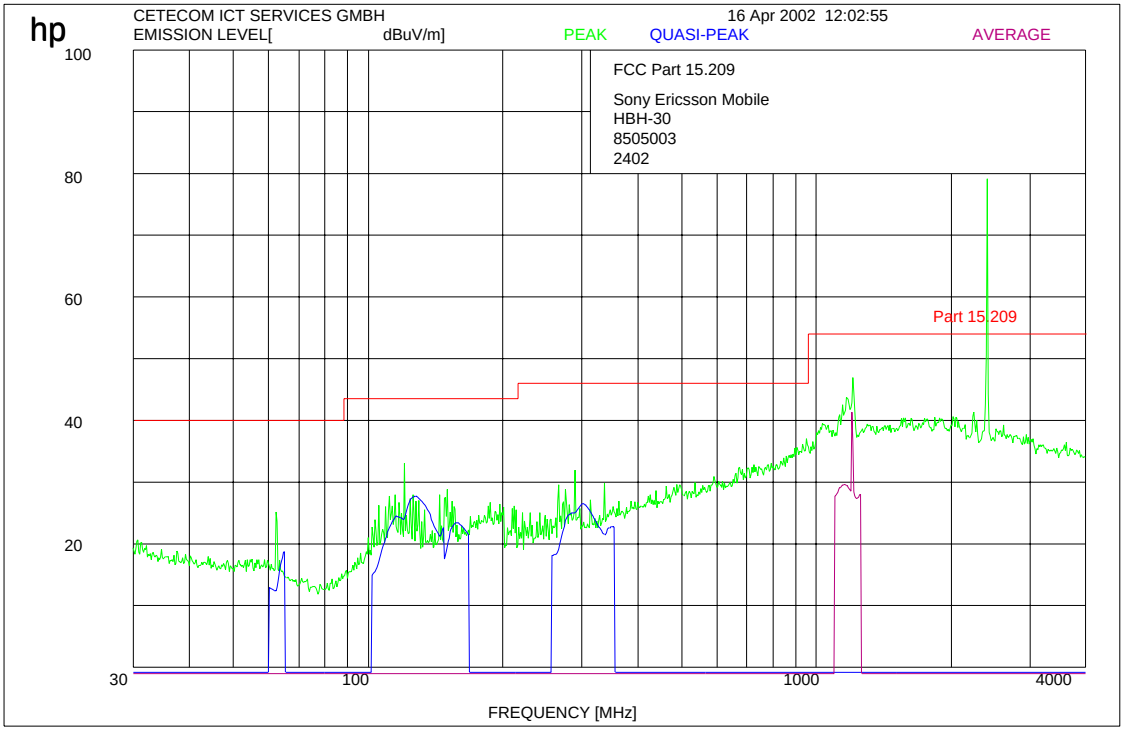
RBW:100 kHz / VBW: 1MHz

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

2402 MHz



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

Frequency	Level QP (dBµV/m)	Level AV (dBµV/m)	Limit (dBµV/m)
127.49	27.7		43.5
301.36	26.5		46.0
1201		41.3	54.0

LIMITS **SUBCLAUSE § 15.247 (c)**

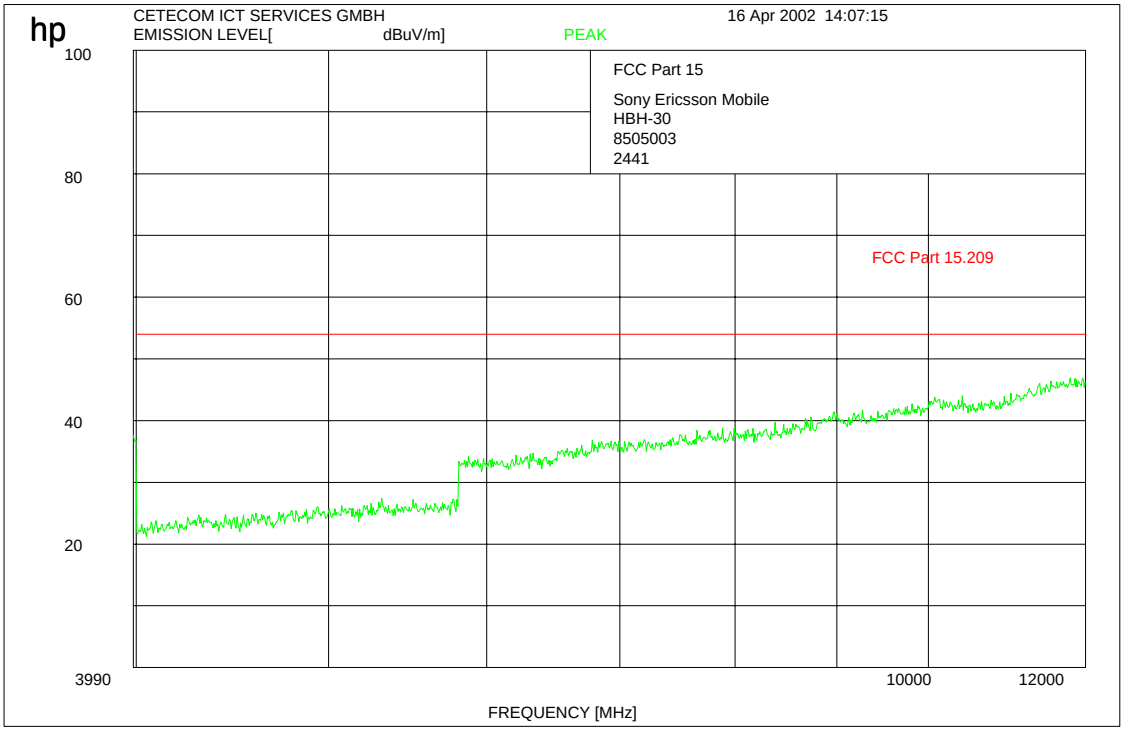
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

2402 MHz



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

LIMITS **SUBCLAUSE § 15.247 (c)**

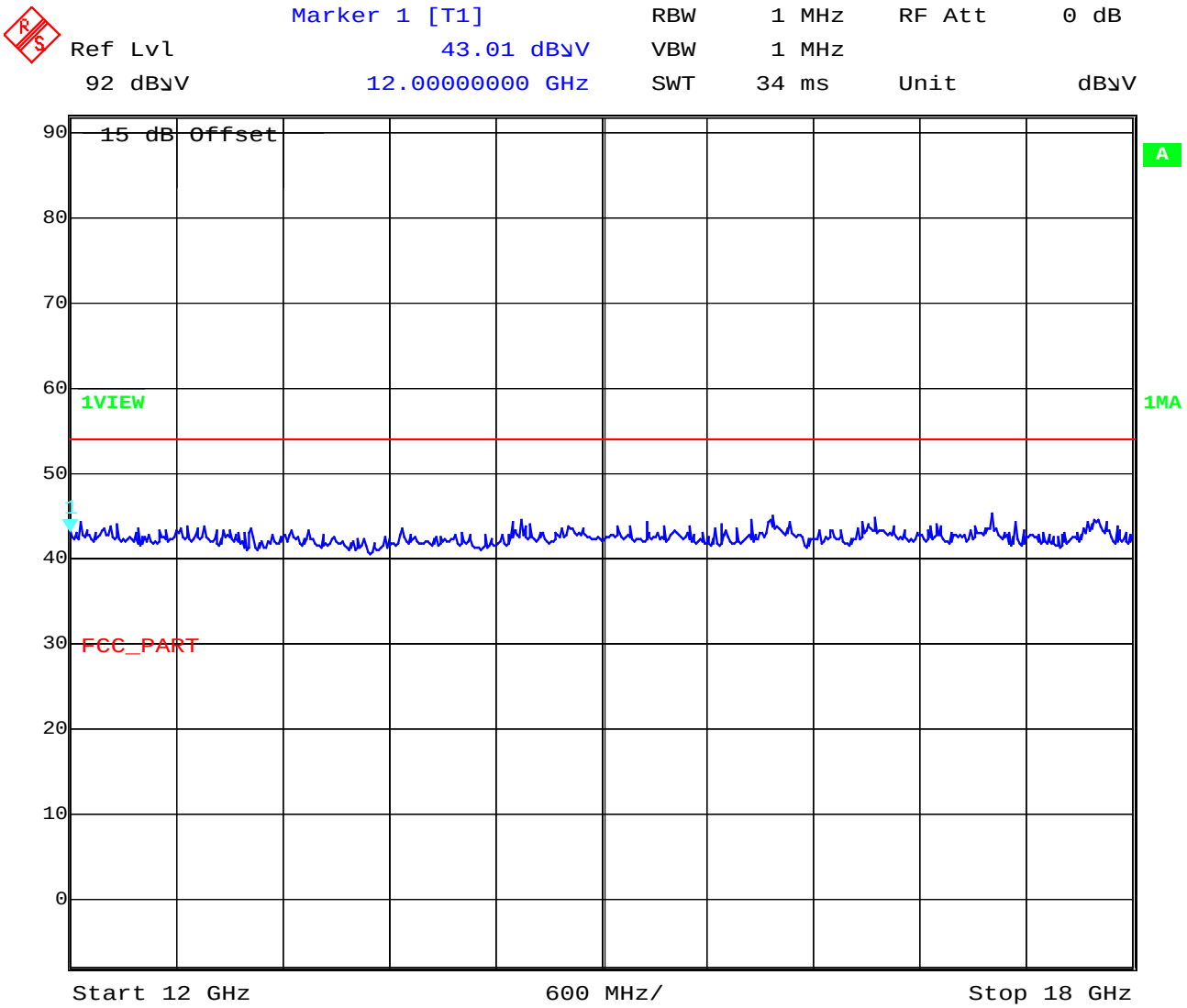
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

2402 MHz



Date: 16.APR.2002 11:12:45

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

LIMITS **SUBCLAUSE § 15.247 (c)**

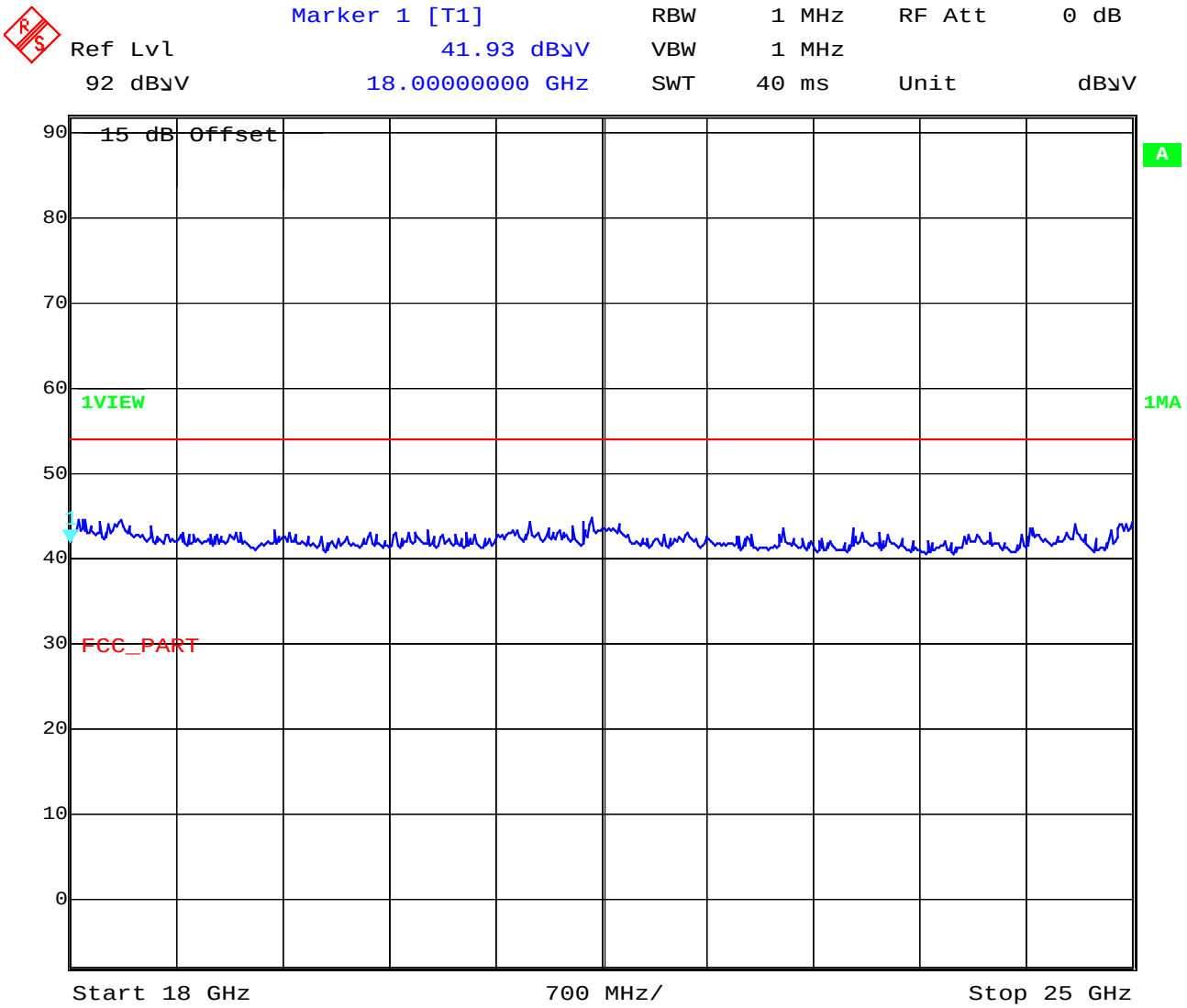
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

2402 MHz



Date: 16.APR.2002 11:13:13

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

LIMITS SUBCLAUSE § 15.247 (c)

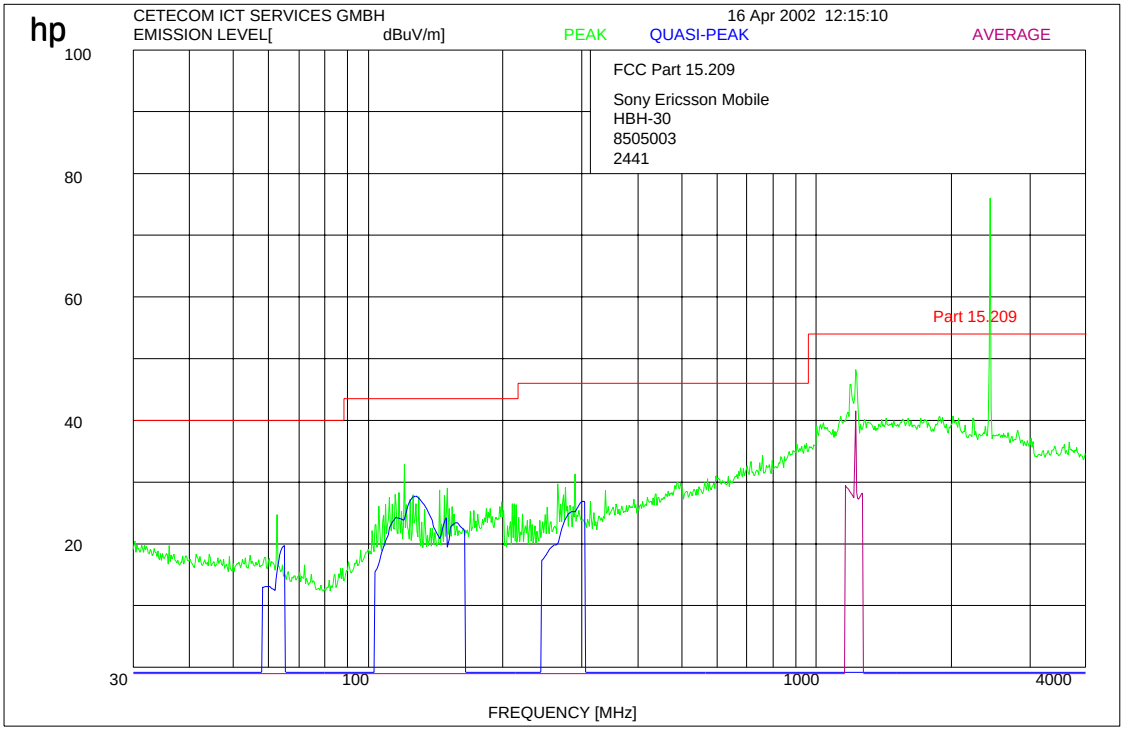
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

2441 MHz



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

Frequency	Level QP (dBµV/m)	Level AV (dBµV/m)	Limit (dBµV/m)
127.49	27.7		43.5
301.36	26.9		46.0
1220.5		41.5	54.0

LIMITS SUBCLAUSE § 15.247 (c)

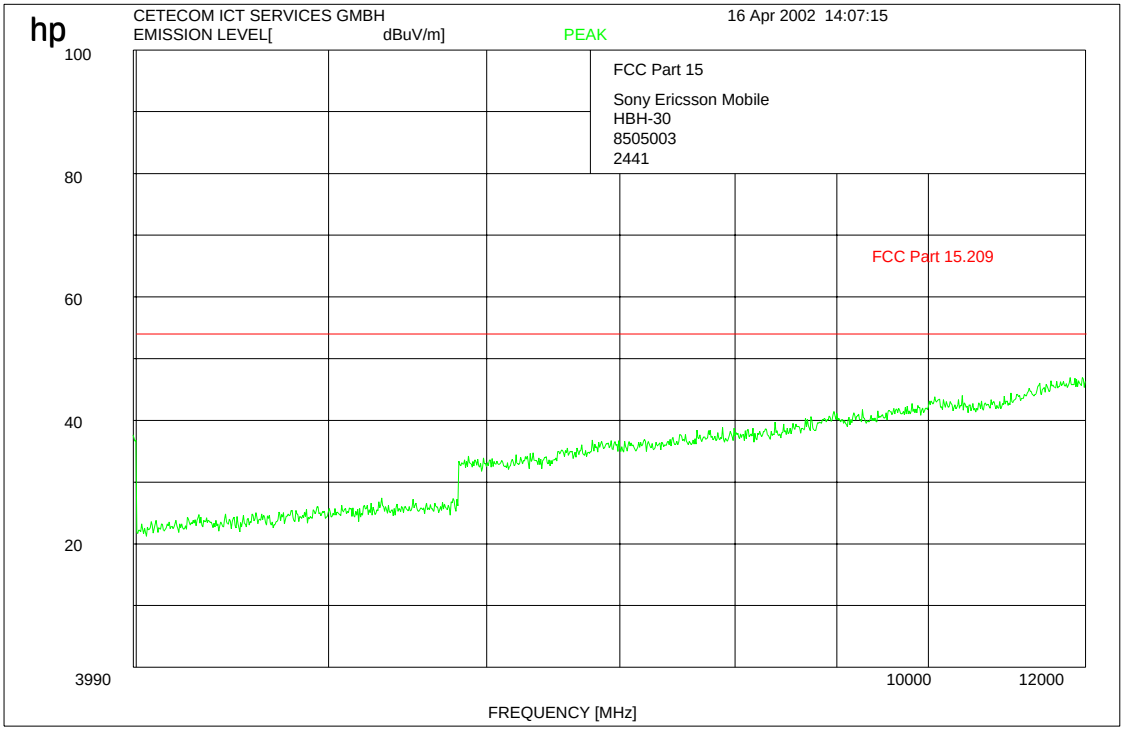
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

2441 MHz



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

LIMITS **SUBCLAUSE § 15.247 (c)**

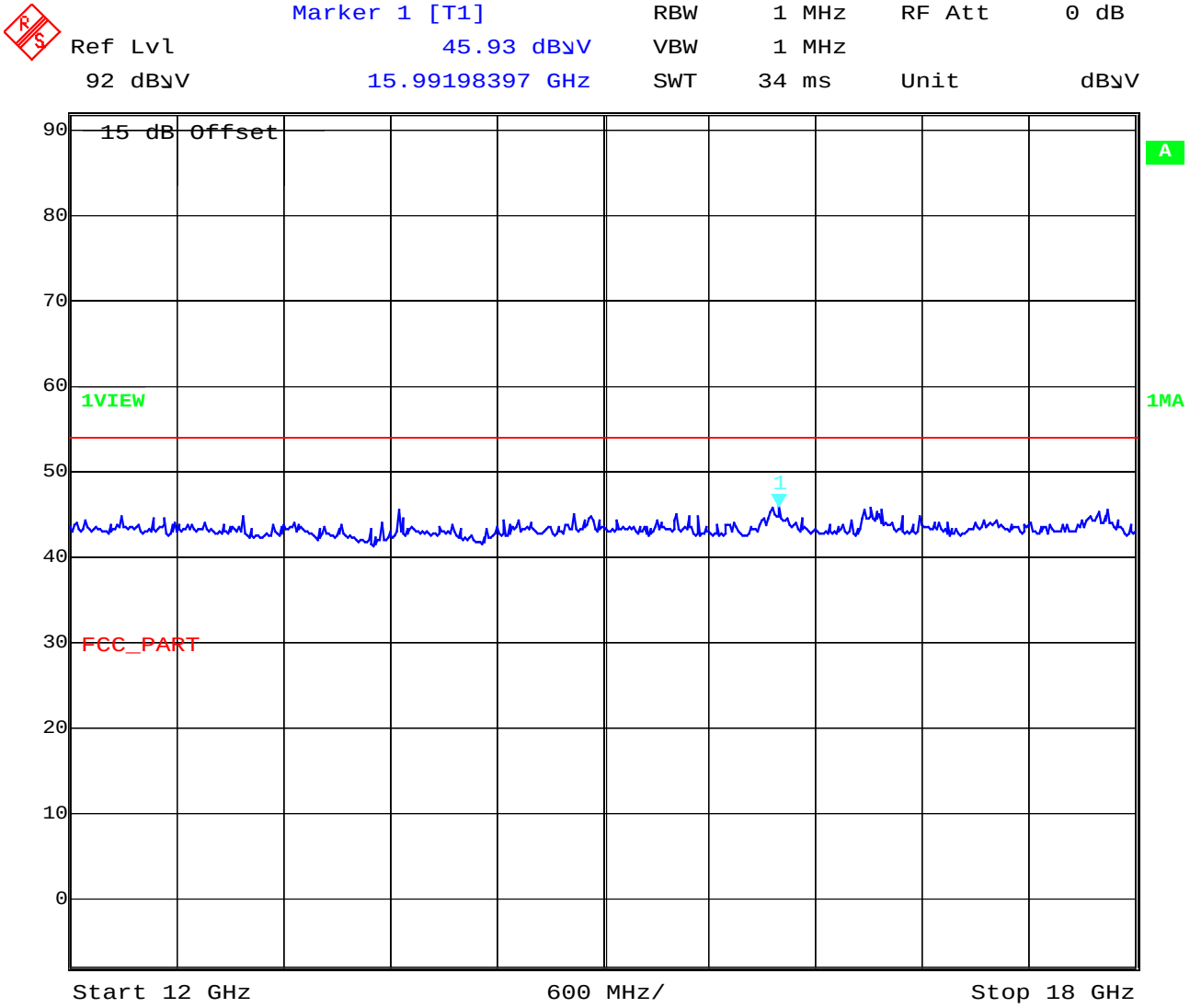
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

2441 MHz



Date: 16.APR.2002 11:16:15

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

LIMITS **SUBCLAUSE § 15.247 (c)**

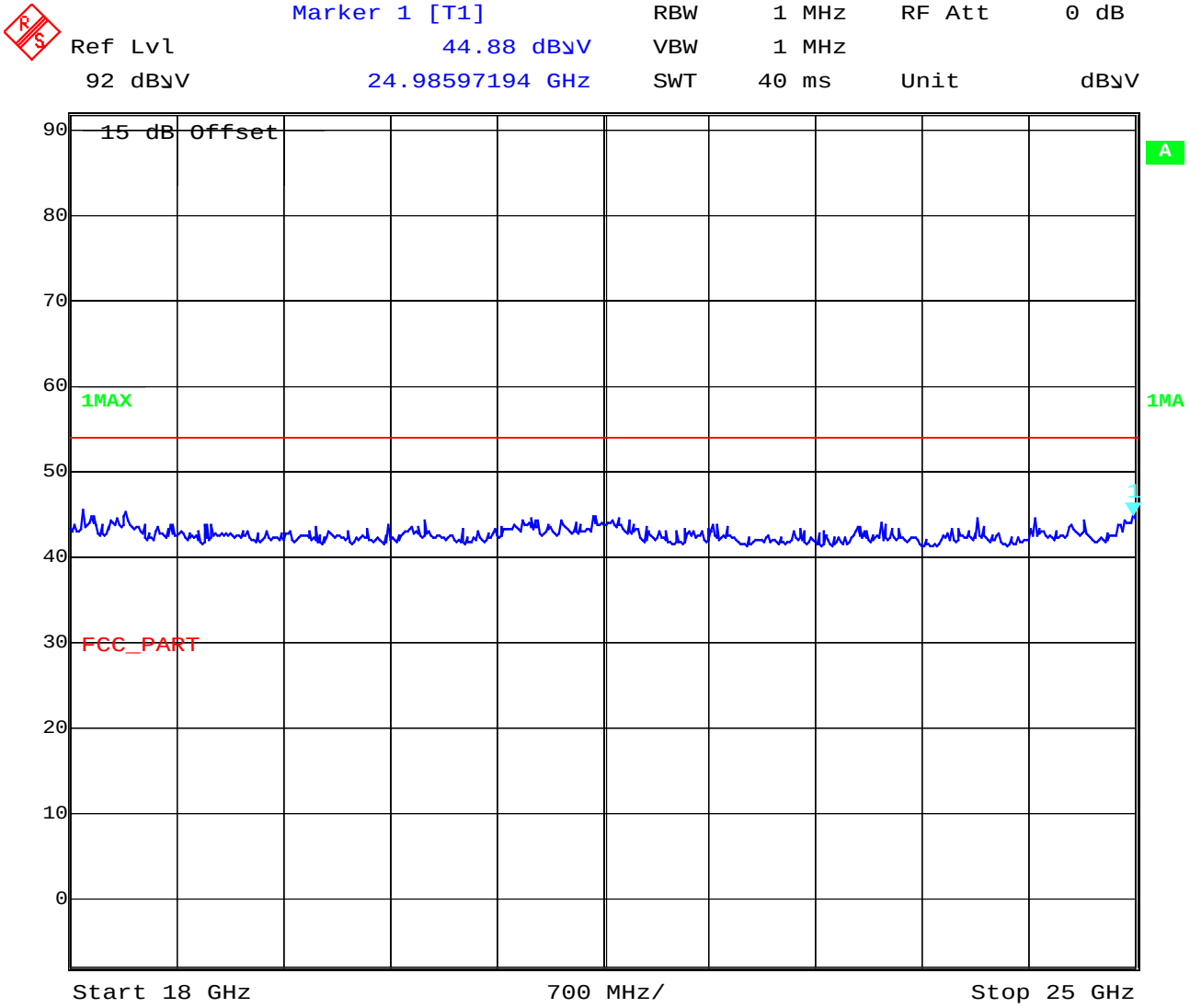
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

2441 MHz



Date: 16.APR.2002 11:13:51

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

LIMITS **SUBCLAUSE § 15.247 (c)**

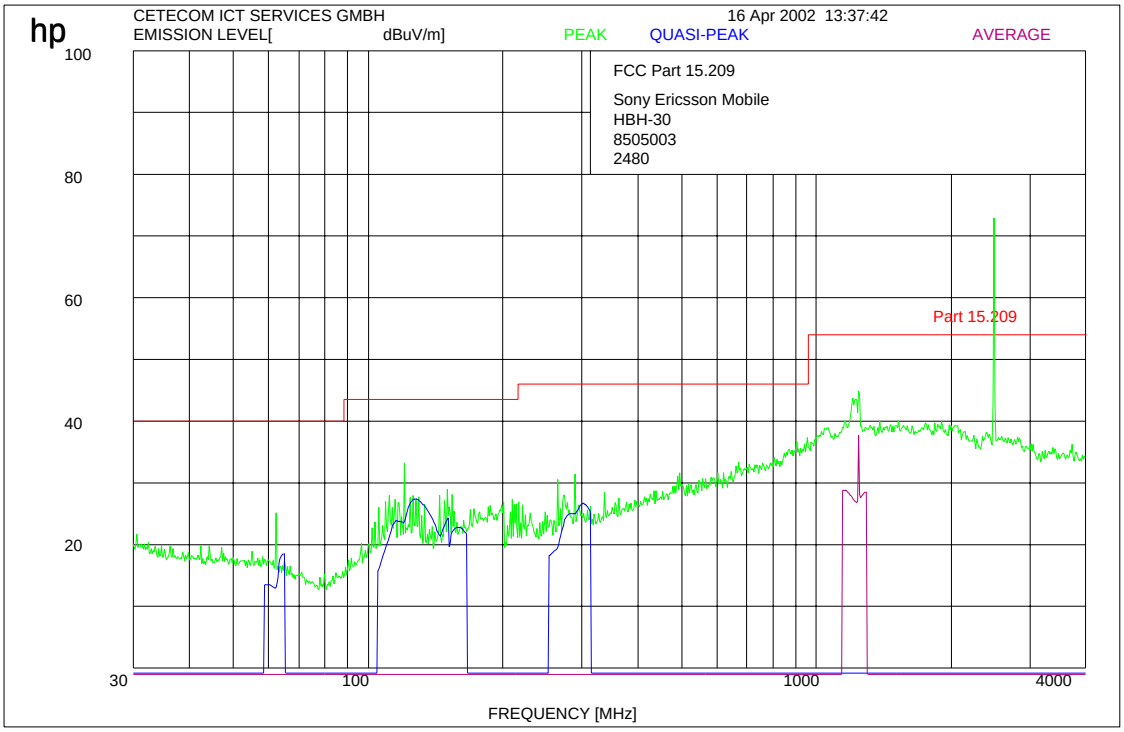
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

2480 MHz



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

Frequency	Level QP (dBµV/m)	Level AV (dBµV/m)	Limit (dBµV/m)
127.49	27.4		43.5
301.36	26.7		46.0
1240.0		37.7	54.0

LIMITS SUBCLAUSE § 15.247 (c)

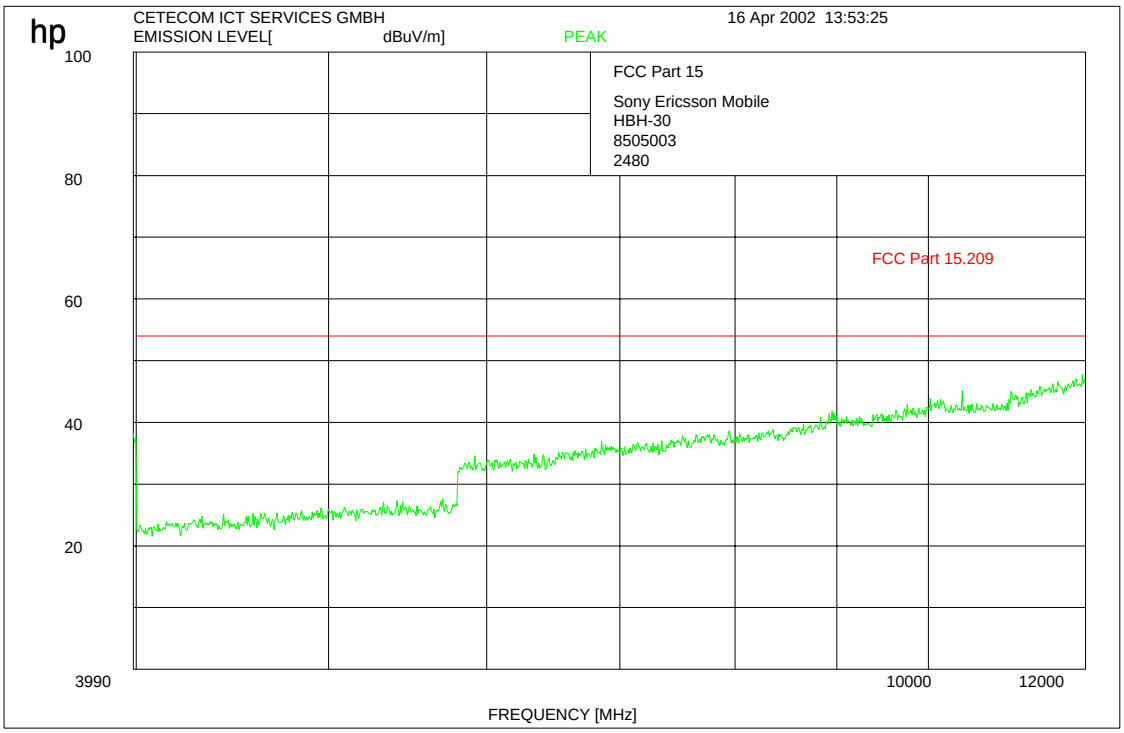
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

2480 MHz



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

LIMITS **SUBCLAUSE § 15.247 (c)**

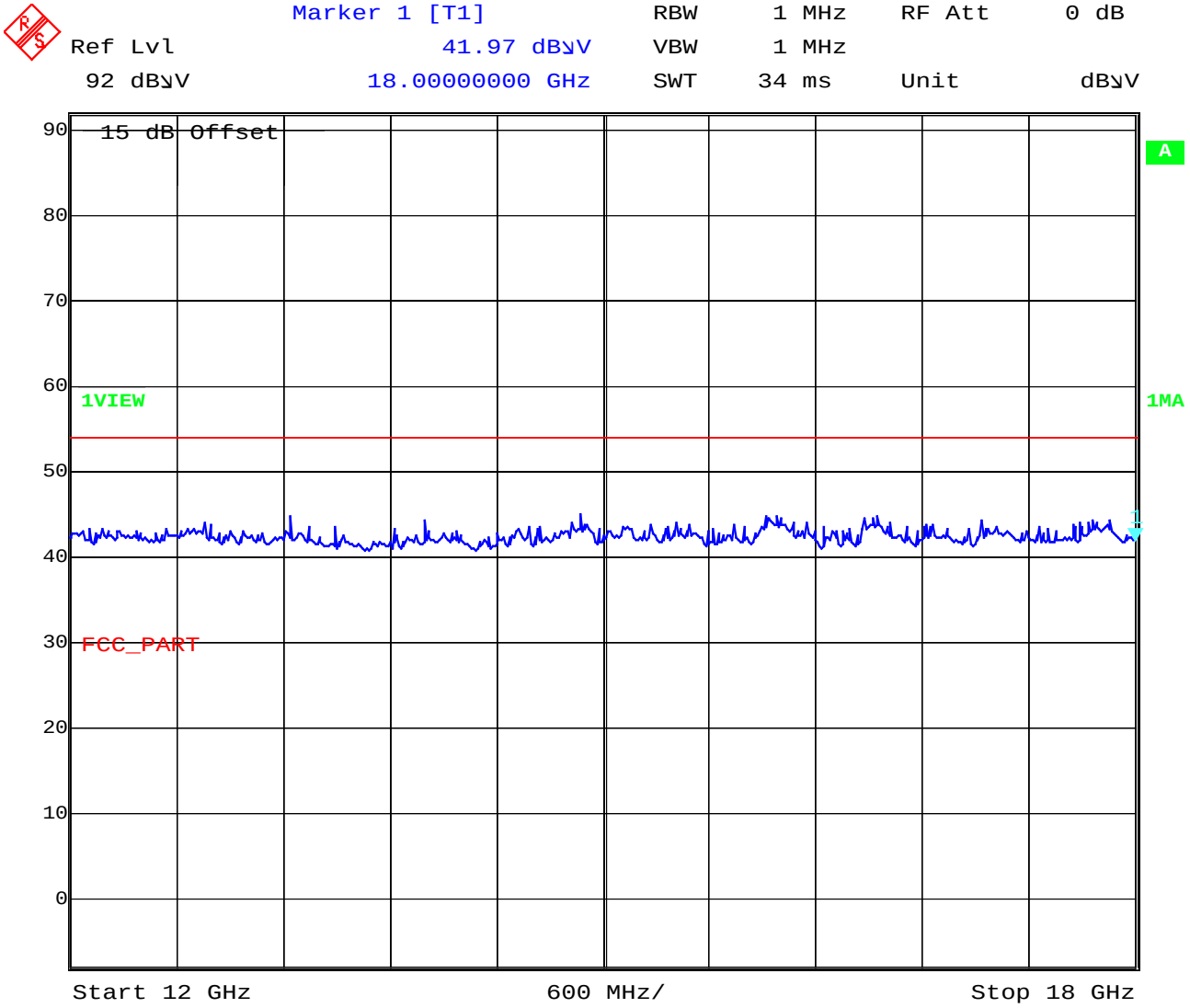
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

2480 MHz



Date: 16.APR.2002 11:15:32

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

LIMITS **SUBCLAUSE § 15.247 (c)**

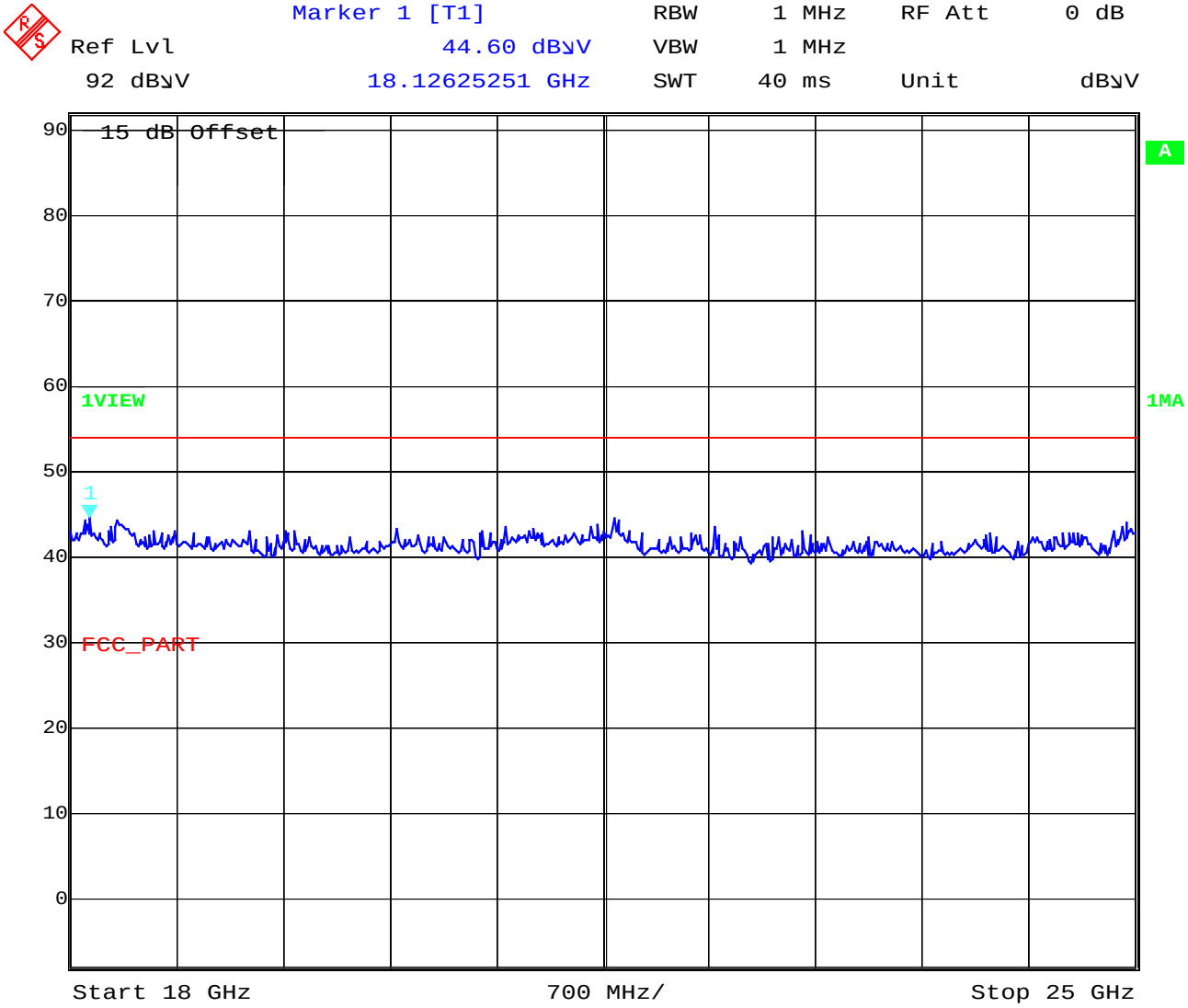
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

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

2480 MHz



Date: 16.APR.2002 11:15:08

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

RECEIVER SPURIOUS RADIATION **§ 15.109**
Radiated

SPURIOUS EMISSIONS LEVEL (µV/m)								
CH 1 / 2 / 3								
f (MHz)	Detector	Level (µV/m)	f (MHz)	Detector	Level (µV/m)	f (MHz)	Detector	Level (µV/m)
no	peak	found						
Measurement uncertainty			±3 dB					

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

Measurement distance see table

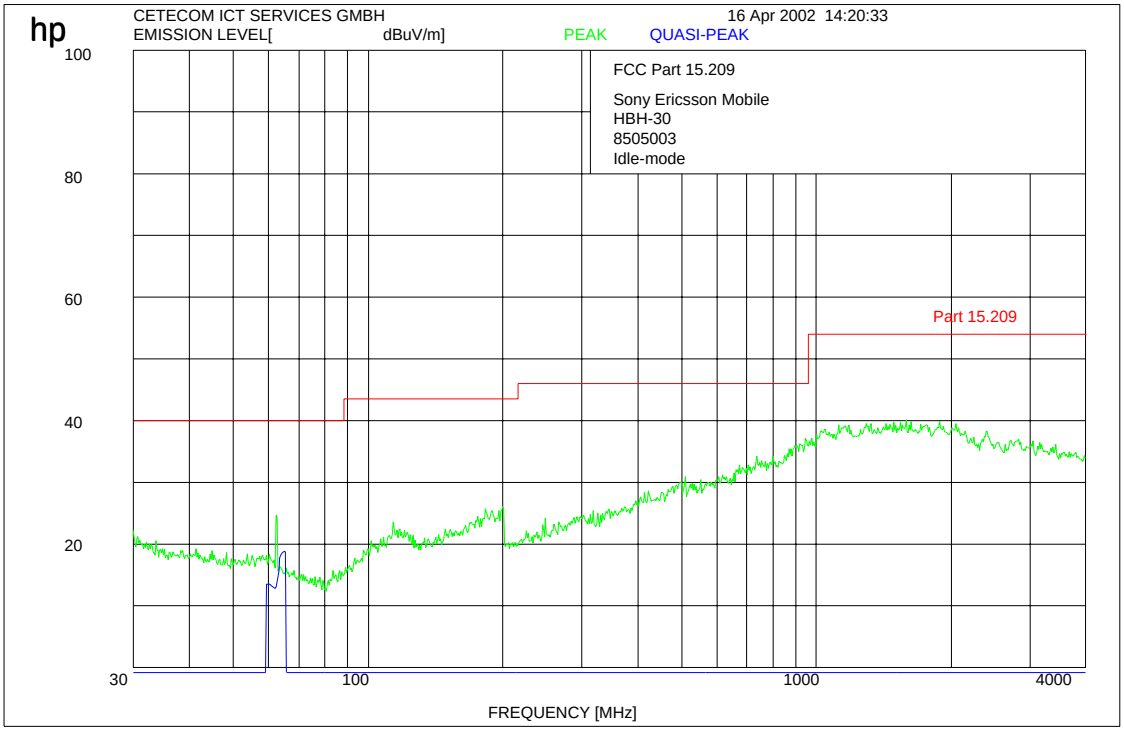
Limits **SUBCLAUSE § 15.109**

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

RECEIVER SPURIOUS RADIATION § 15.109



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

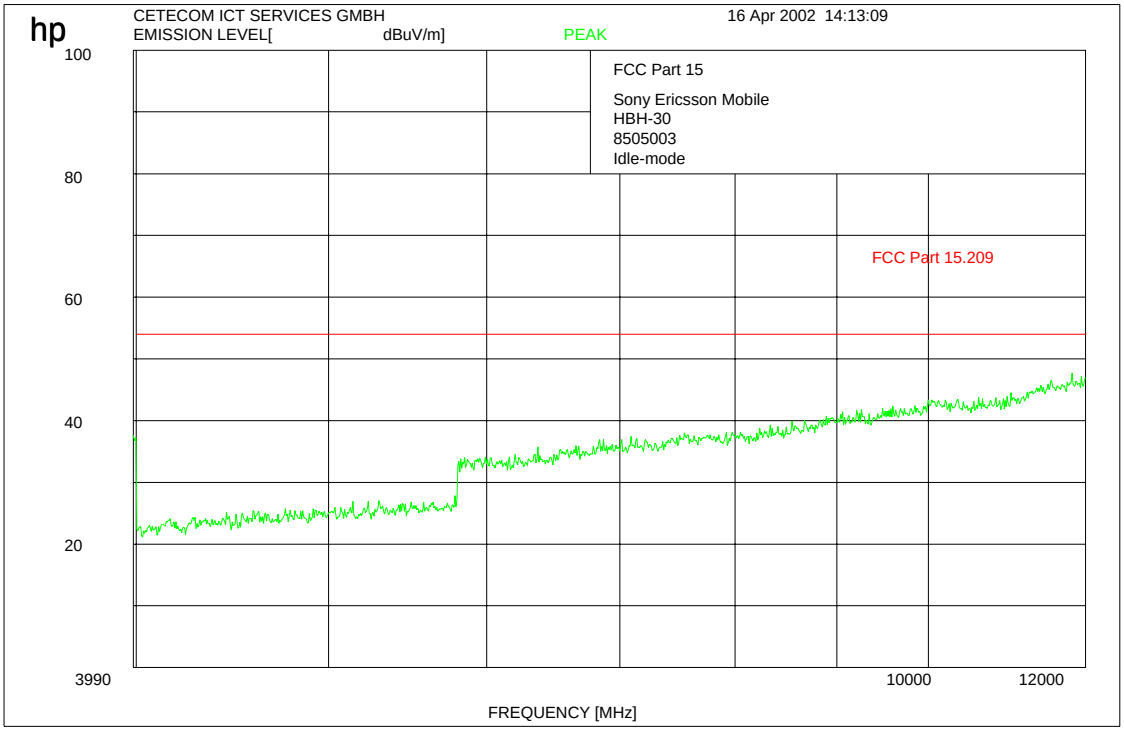
Limits **SUBCLAUSE § 15.109**

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

RECEIVER SPURIOUS RADIATION § 15.109



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

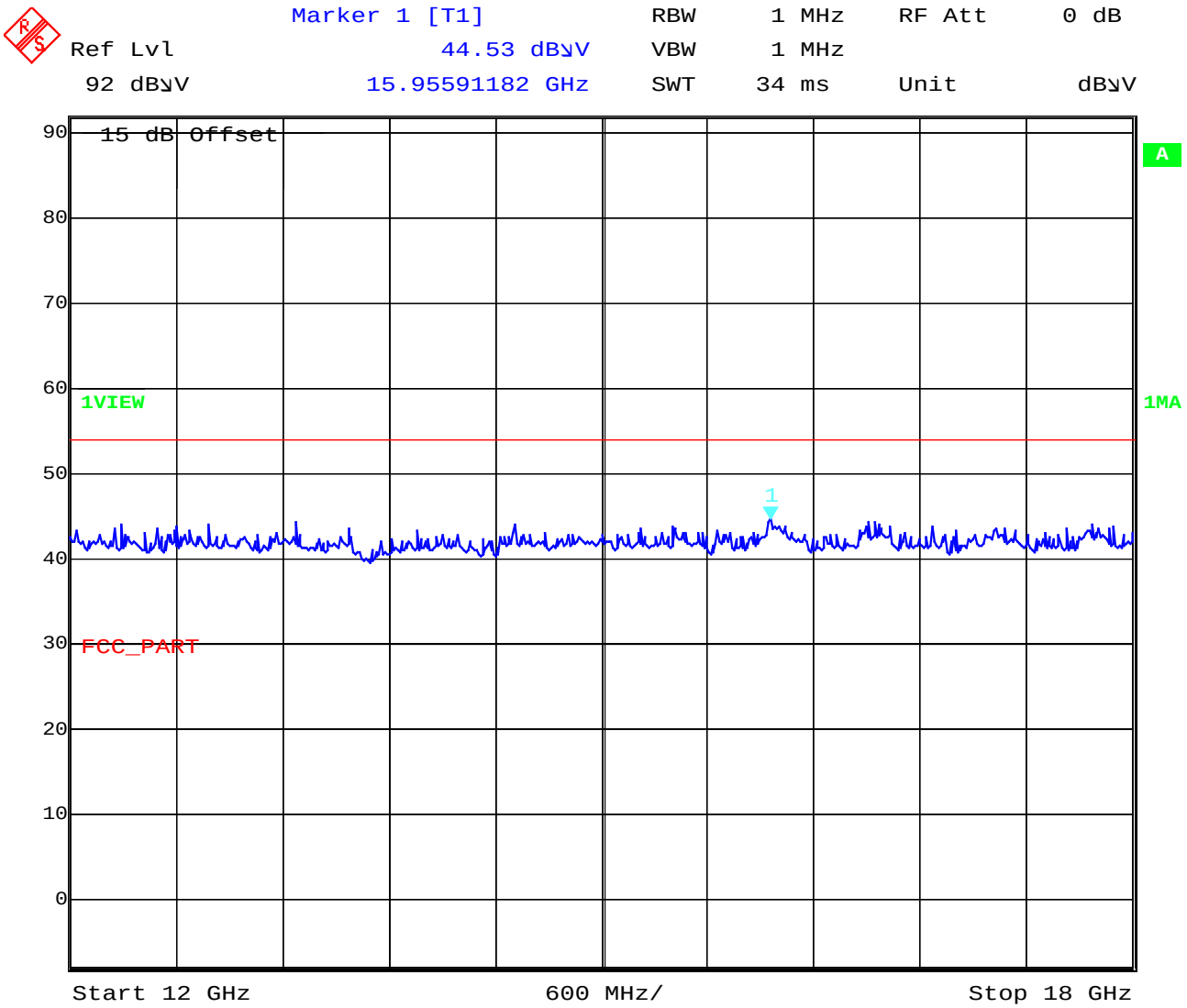
Limits SUBCLAUSE § 15.109

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%

RECEIVER SPURIOUS RADIATION § 15.109



Date: 16.APR.2002 11:17:01

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

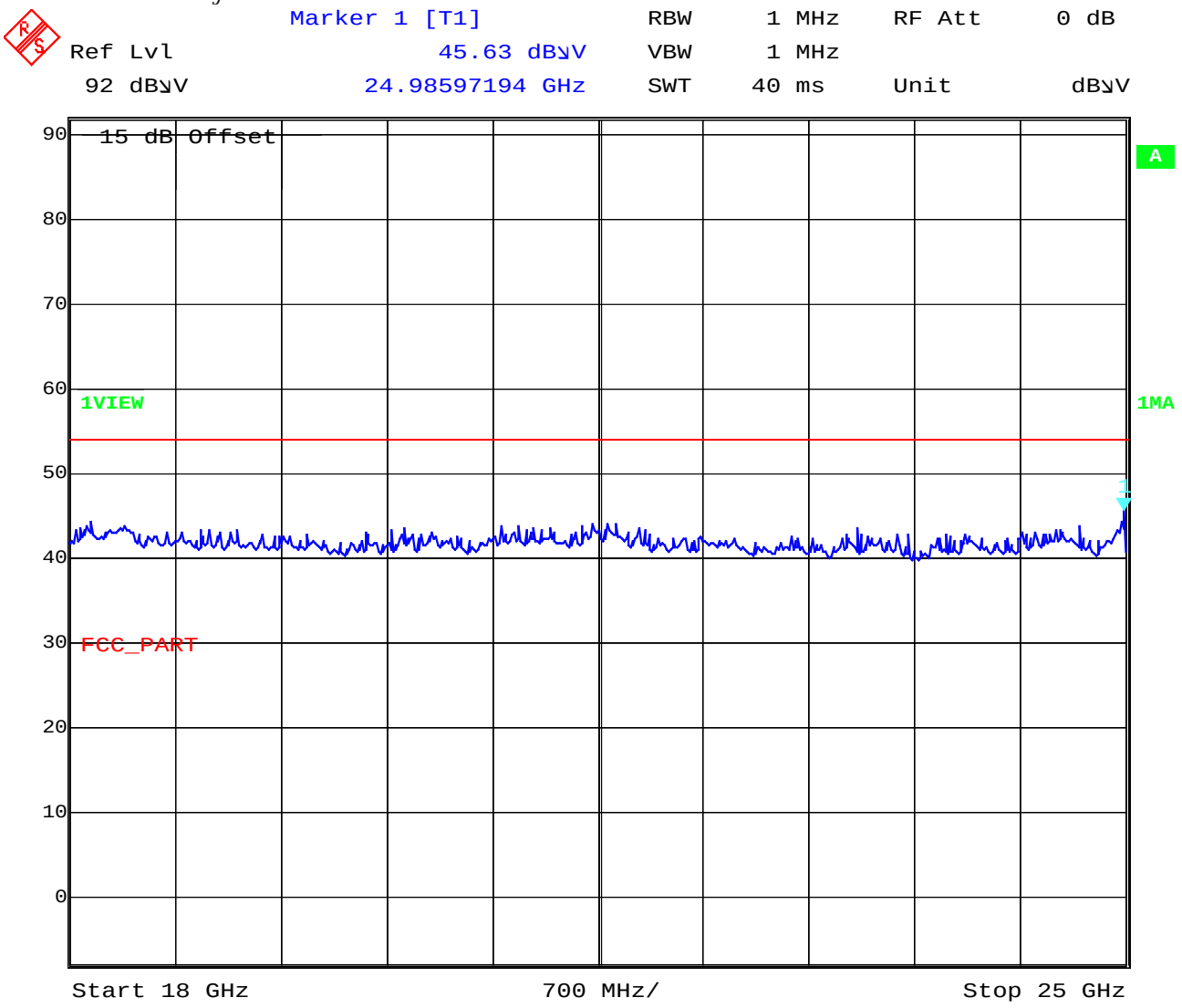
Limits **SUBCLAUSE § 15.109**

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

RECEIVER SPURIOUS RADIATION § 15.109

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

Equipment under test : 8505003
Ambient temperature : 23.9°C
Relative humidity : 33%



Date: 16.APR.2002 11:17:33

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

Limits **SUBCLAUSE § 15.109**

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

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

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

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	Funktionsgenerator	AFGU	Rohde & Schwarz	862 480/032
09	Regeltrenntrafo	MPL	Erfi	91350
10	Netznachbildung	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	Modulationsmeter	9008	Racal-Dana	2647
16	Frequenzzähler	5340 A	Hewlett-Packard	1532A03899
17	Absorber Schirmkabine	---	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	Absorber Schirmkabine		Frankonia	
33	Steuerrechner	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

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.
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	Spektrum Monitor	EZM	Rohde & Schwarz	883 720/006
42	Meßempfänger	ESH 3	Rohde & Schwarz	890 174/002
43	Meßempfänger	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	Polarisationsnetzwerk	HL 024 Z1	Rohde & Schwarz	341 570/002
49	Double Ridge G Horn Antenne 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	Steuerrechner	PSM 7	Rohde & Schwarz	883 086/026
53	DC V-Netzwerk	ESH3-Z6	Rohde & Schwarz	861 406/005
54	DC V-Netzwerk	ESH3-Z6	Rohde & Schwarz	893 689/012
55	AC 2 Phasen V-Netzwerk	ESH3-Z5	Rohde & Schwarz	861 189/014
56	AC 2 Phasen V-Netzwerk	ESH3-Z5	Rohde & Schwarz	894 981/019
57	AC-3 Phasen V-Netzwerk	ESH2-Z5	Rohde & Schwarz	882 394/007
58	Stromversorgung	6032A	Rohde & Schwarz	2933A05441
59	HF-Test Empfänger	ESVP.52	Rohde & Schwarz	881 487/021
60	Spectrum Monitor	EZM	Rohde & Schwarz	883 086/026
61	HF-Test Empfänger	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
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