CETECOM ICT Services GmbH

Radio Satellite Communication
Untertürkheimer Straße 6-10 . D-66117 Saarbrücken Telefon: +49 (0)681 598-9100 Telefax: -9075

Accredited Testing Laboratory

DAR-Registration number:
TTI-P-G 166/98-00

Test report no.: 2_2427-B/01
FCC Part 15.247
1130102-BV
FCC ID : PBY1130102

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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

CETECOM ICT Services GmbH
Untertürkheimer Straße 6 - 10
66117 Saarbrücken
Germany
Telefone: + 49 681 598 - 9100
Telefax : + 49 681 598 - 9075
E-mail : Harro.Ames@ict.cetecom.de
Internet : www.cetecom.de
Accredited testing laboratory
DAR-registration number : TTI-P-G 166/98-00

1.3 Details of applicant

Name : Ericsson Mobile Communications AB
Street : Nya Vattentornet
City : S-22183 Lund
Country : Sweden
Telephone : +46-46-19 3000
Telefax : +46-46-19 3295
Contact : Mr. Bo Johansson
Telephone : +46-46-19 3000

1.4 Application details

Date of receipt of application : 16.02.01
Date of receipt of test item : 05.03.01
Date of test : 09.03.01

1.5 Test item

Type of equipment	:	**Bluetooth transceiver**
Type designation	:	**1130102-BV**
Manufacturer	:	applicant
Street	:	
City	:	
Country	:	
Serial number	:	004601-01-111510-3-02, Hardware: A
Additional informations:	**:**	
Frequency	:	2400 – 2483.5 MHz
Type of modulation	:	1M00FXD / 79M8FXD (FHSS)
Number of channels	:	79
Antenna	:	integral antenna
Power supply	:	3,6 V DC accu
Output power	:	2 mW EIRP
Type of equipment	:	Temperature range : 0°C - +45°C

1.6 Test standards: FCC Part 15 §15.247

2 Technical test

2.1 Summary of test results

The radiated measurements were performed verticaly, horizontal results are about 3.5 dB lower over the whole frequency range.
The antenna gain measurement was performed by the difference between conducted and radiated output measurement.
All measurement settings are according to FCC 15.35, 15.205, 15.209, 15.247 and the „Measurement guidelines for FHSS systems“.

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

Technical responsibility for area of testing :

05.03.01	**RSC 8411**	**Berg M.**	
Date	**Section**	**Name**	**Signature**

Technical responsibility for area of testing :

05.03.01	**RSC8414**	**Ames H.**	
Date	**Section**	**Name**	**Signature**

2.2 Testreport

TEST REPORT

Testreport no. : 2_2427-B/01

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)	13
§ 15.247 (a)(1)	Spectrum bandwidth of a FHSS System	20
§ 15.247 (b)(2)	Maximum peak output power	24
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Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 29%

Antenna Gain **SUBCLAUSE § 15.204**

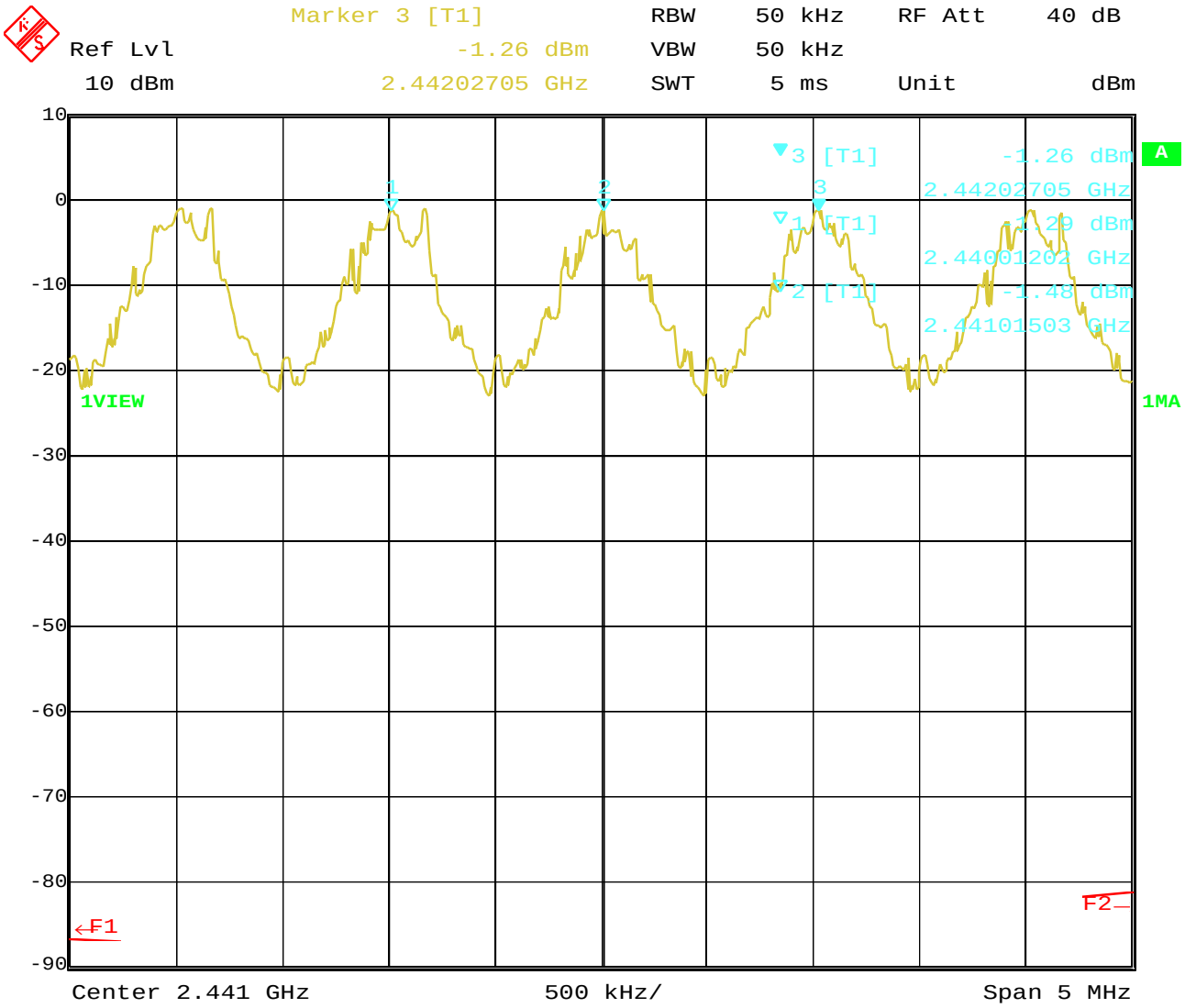
The gain is +2.5dBi

(measured effectiv radiated power over dipol– measured conducted power with a temporary RF-connector)

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 29%

Carrier frequency separation §15.247(a)



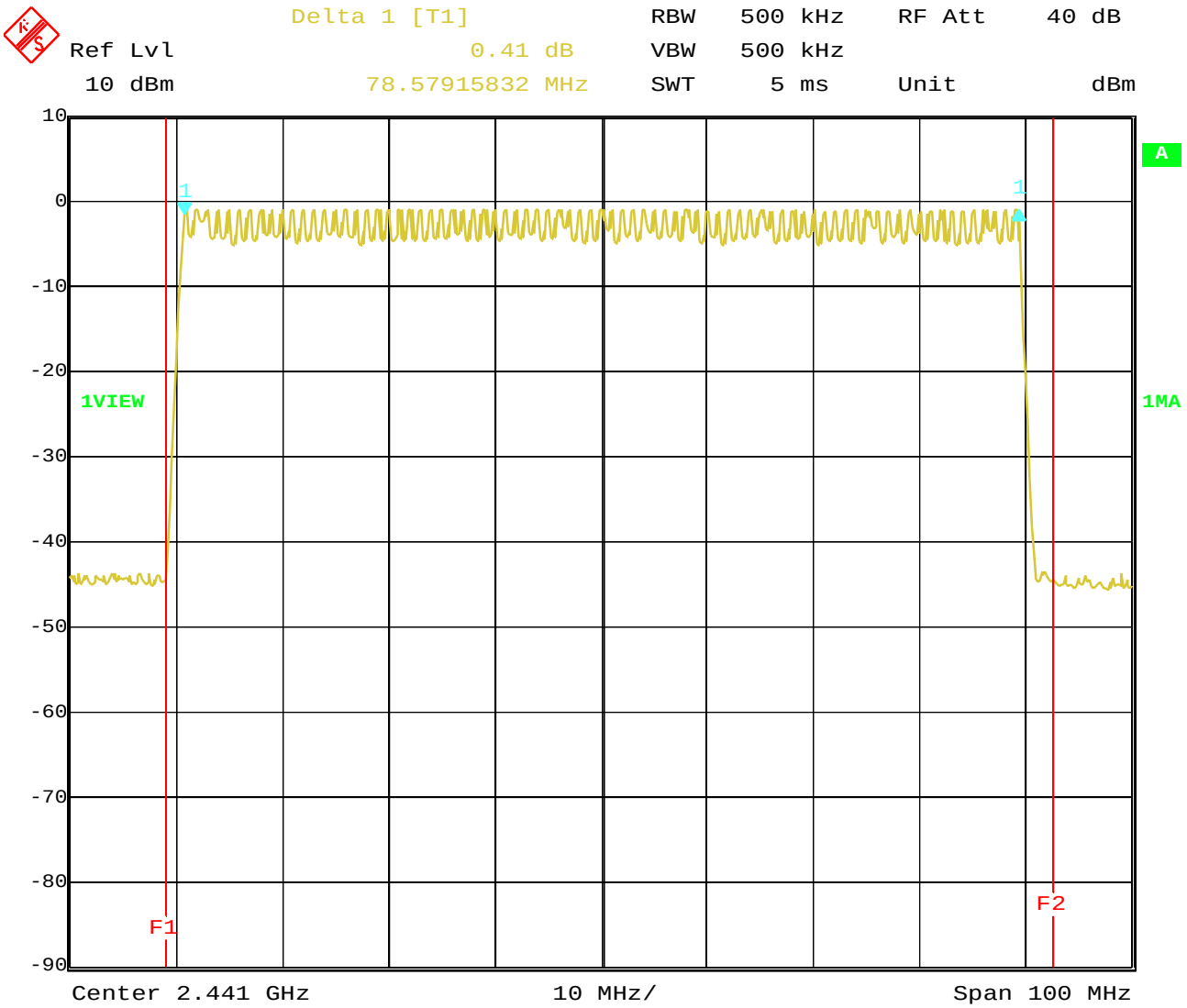
Date: 1.MAR.2001 13:47:14

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 29%

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

The number of hopping channels is 79.



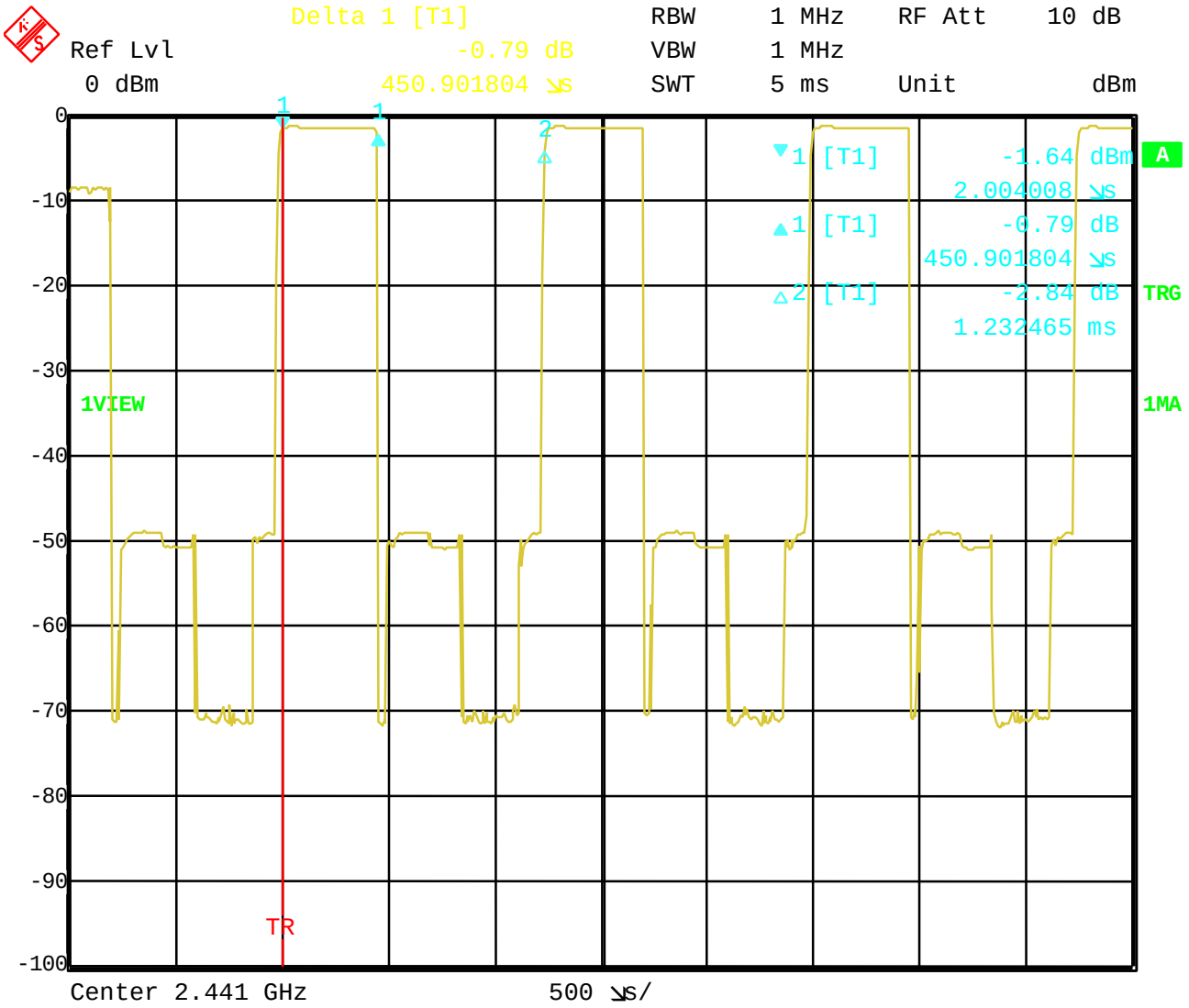
Date: 1.MAR.2001 13:42:04

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 29%

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 470 µs.
<u>So we have 303.9 * 450,9 µs = 137,03 ms per 30 seconds.</u>



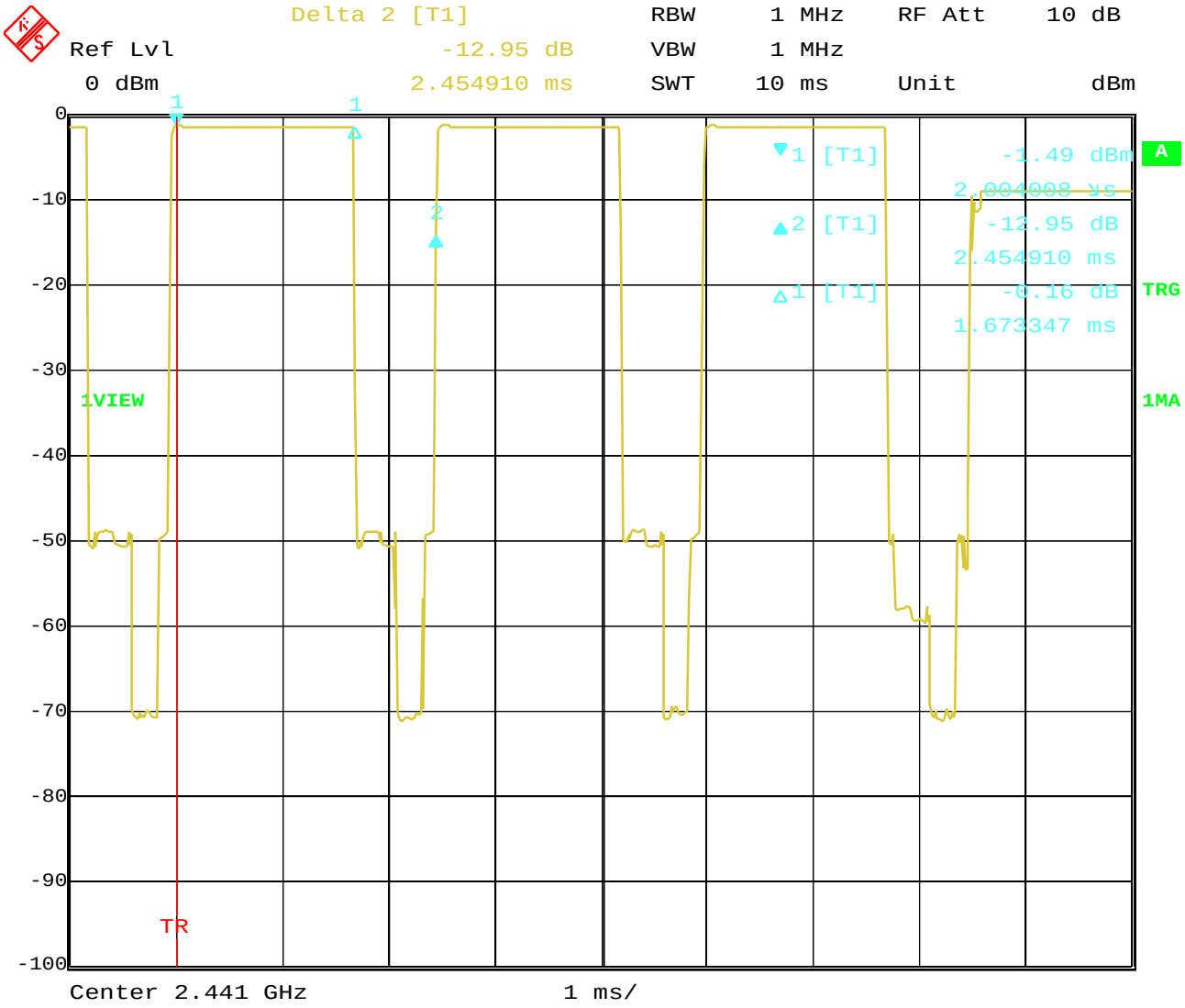
Date: 1.MAR.2001 14:19:25

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 29%

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 1.70 ms.
<u>So we have 153 * 1.67 ms = 255.511 ms per 30 seconds.</u>



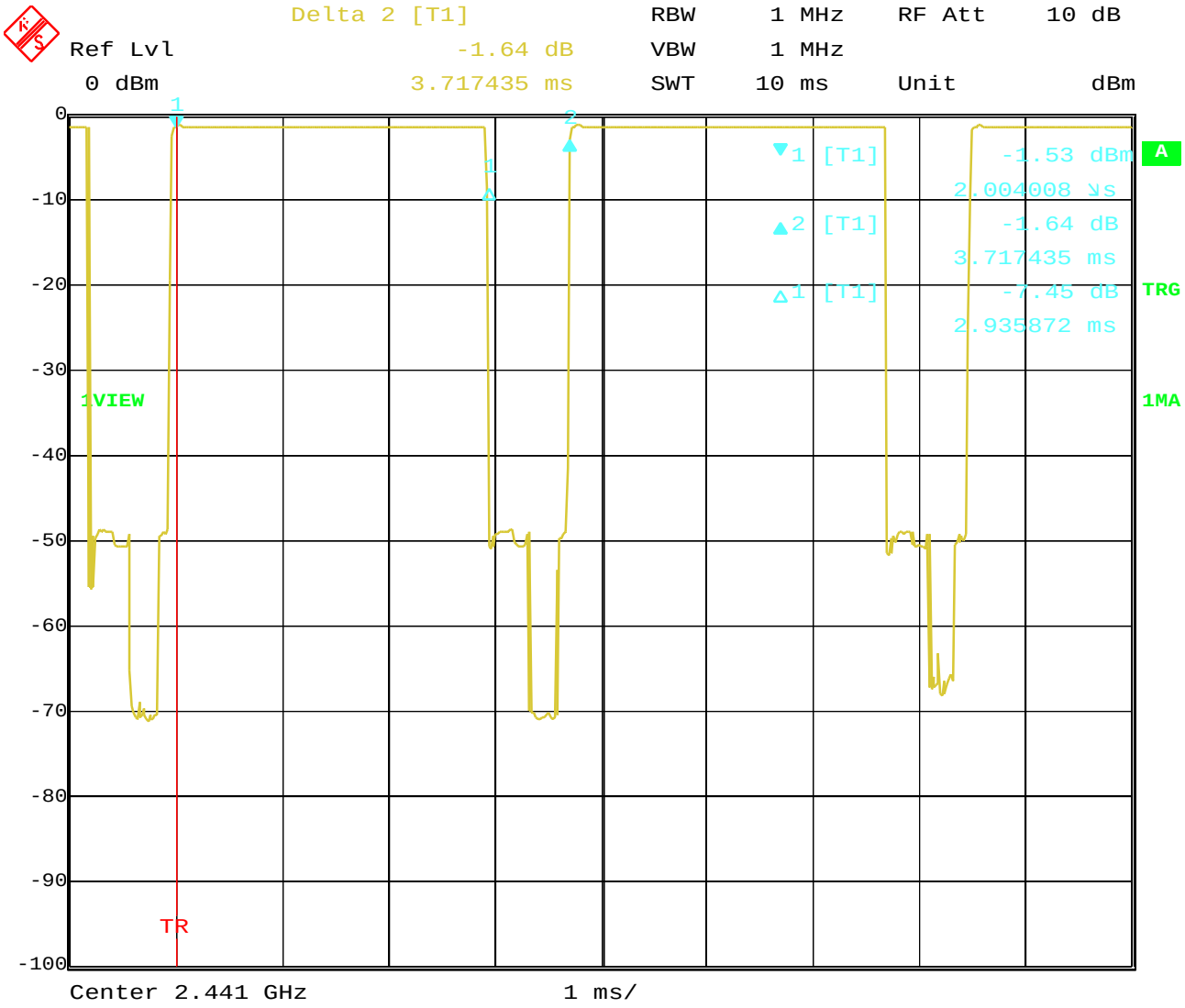
Date: 1.MAR.2001 14:20:28

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 29%

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 3.7 ms.
<u>So we have 100,8 * 2,94 ms = 375,94 ms per 30 seconds.</u>

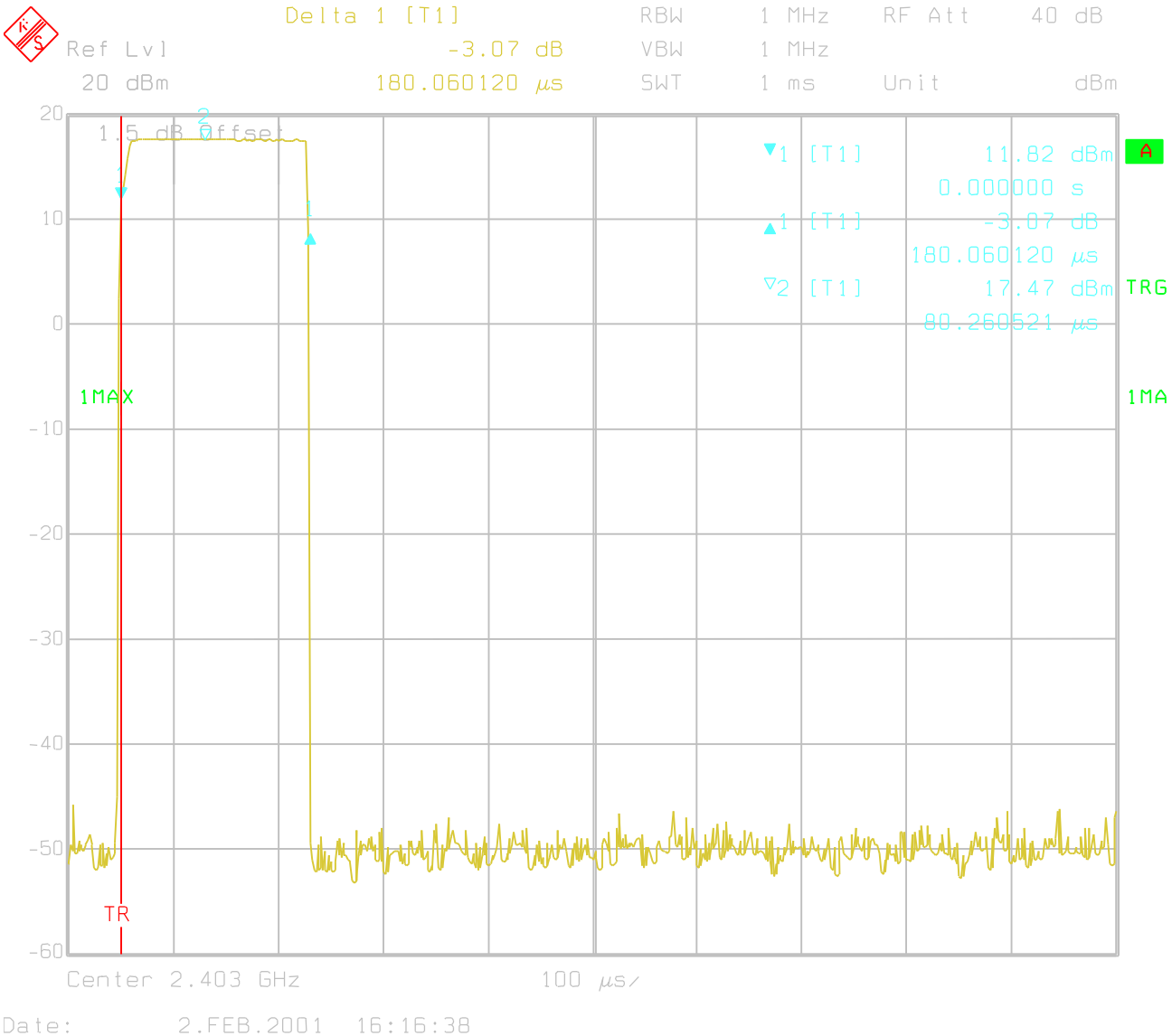


Date: 1.MAR.2001 14:21:23

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 29%
Time of occupancy (dwell time) for page mode §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*180µs, then 8.96 s other frequencies, then again 7*128*180µs
⇨ together in30 s maximal 2 sequences =>maximal 0,322 s per 30 second period.

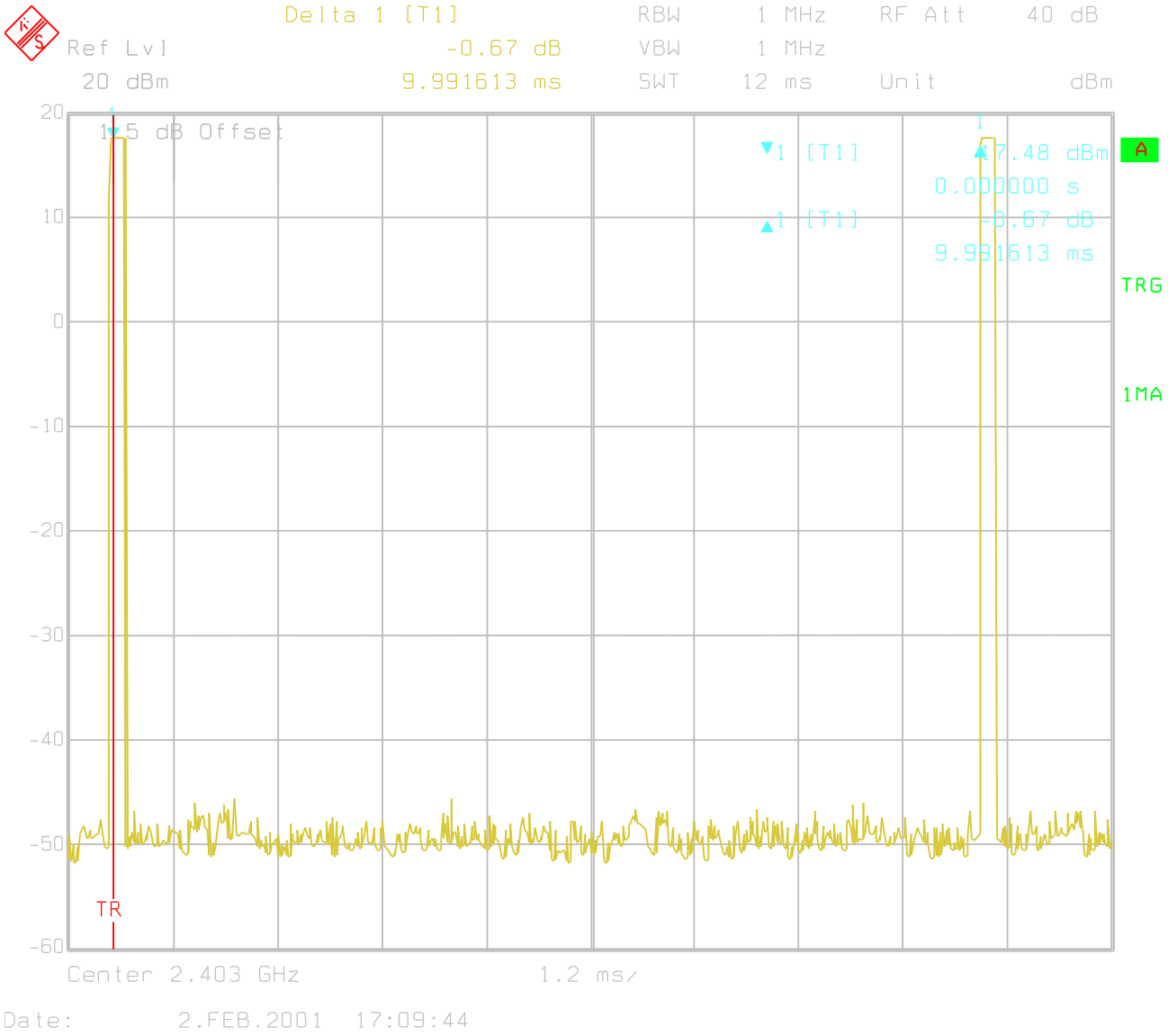
Page mode (TX-on time)



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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 29%

Page mode (complete sequence)



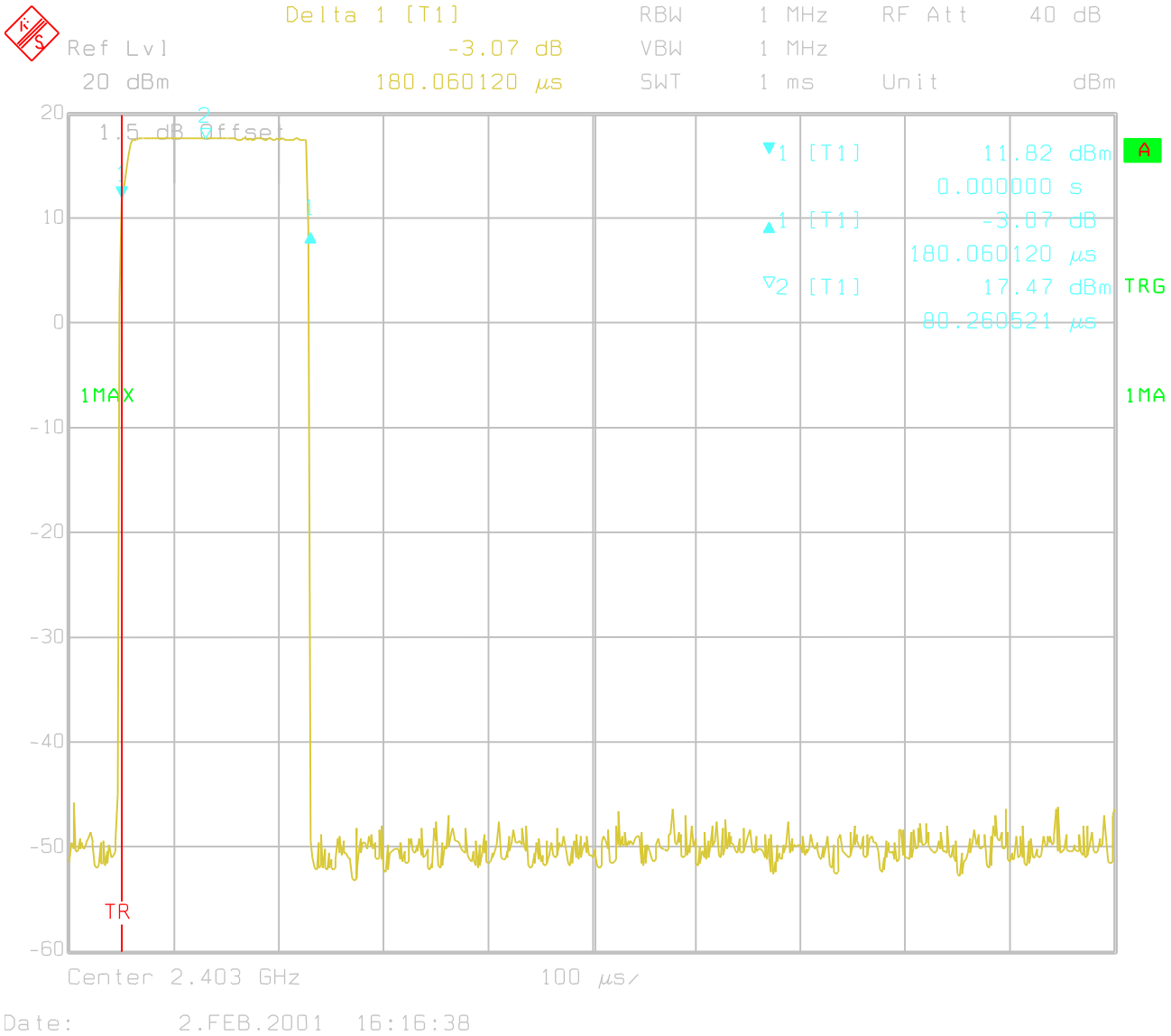
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 29%
Time of occupancy (dwell time) for inquiry mode **§15.247(a)**
At inquiry mode the system uses the same timing as in page mode

⇨ **so we have 7*128*180µs, then 8.96 s other frequencies, then again 7*128*180µs**

⇨ **together in30 s maximal 2 sequences =>maximal 0,322 s per 30 second period.**

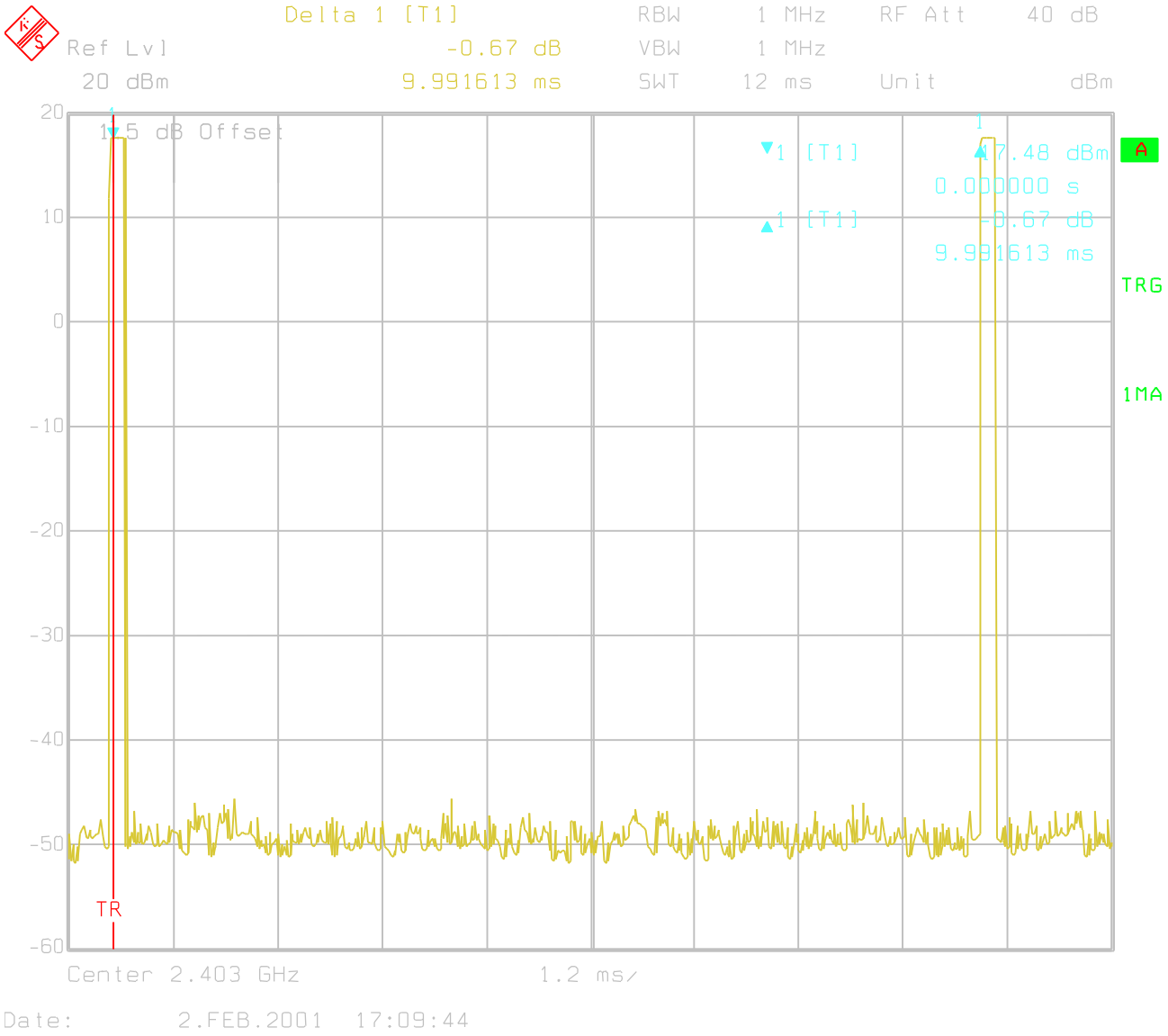
Inquiry mode (TX-on time)



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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 29%

Inquiry mode (complete sequence)



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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 29%

Spectrum Bandwith 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}(3,6)V	809.6	845.7	895.8
Measurement uncertainty		±1kHz		

10 dB bandwidth

TEST CONDITIONS		10 dB BANDWIDTH (kHz)		
Frequency (MHz)		2402	2441	2480
T_{nom}(23) °C	V_{nom}(3.6)V	372.7	388.8	392.8
Measurement uncertainty		±1kHz		

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

LIMIT **SUBCLAUSE §15.247(a) (1)**

The maximum 20dB bandwith shall be at maximum 1000 KHz

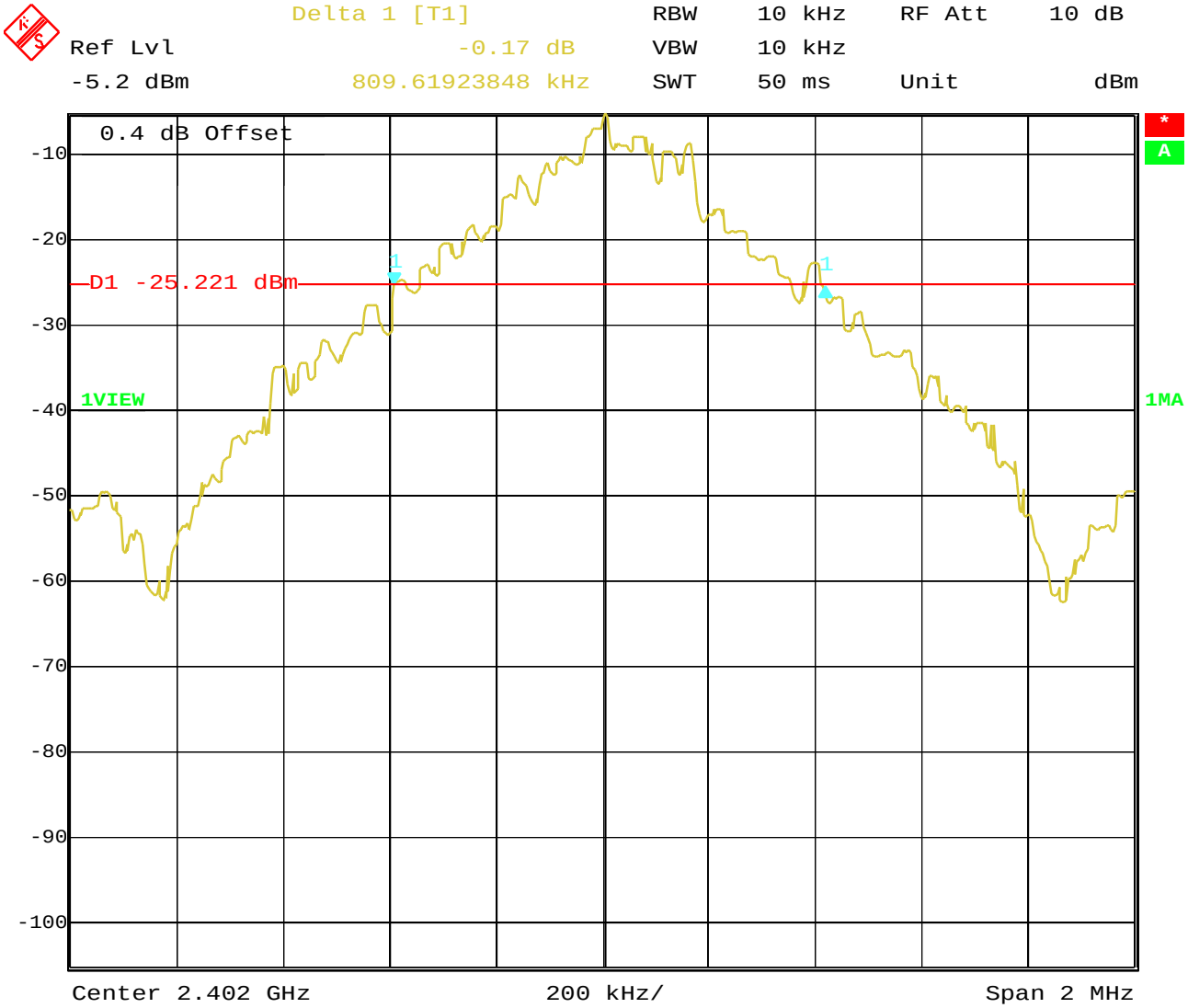
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 29%

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

20 dB bandwidth

Channel 1



Date: 1.MAR.2001 15:04:08

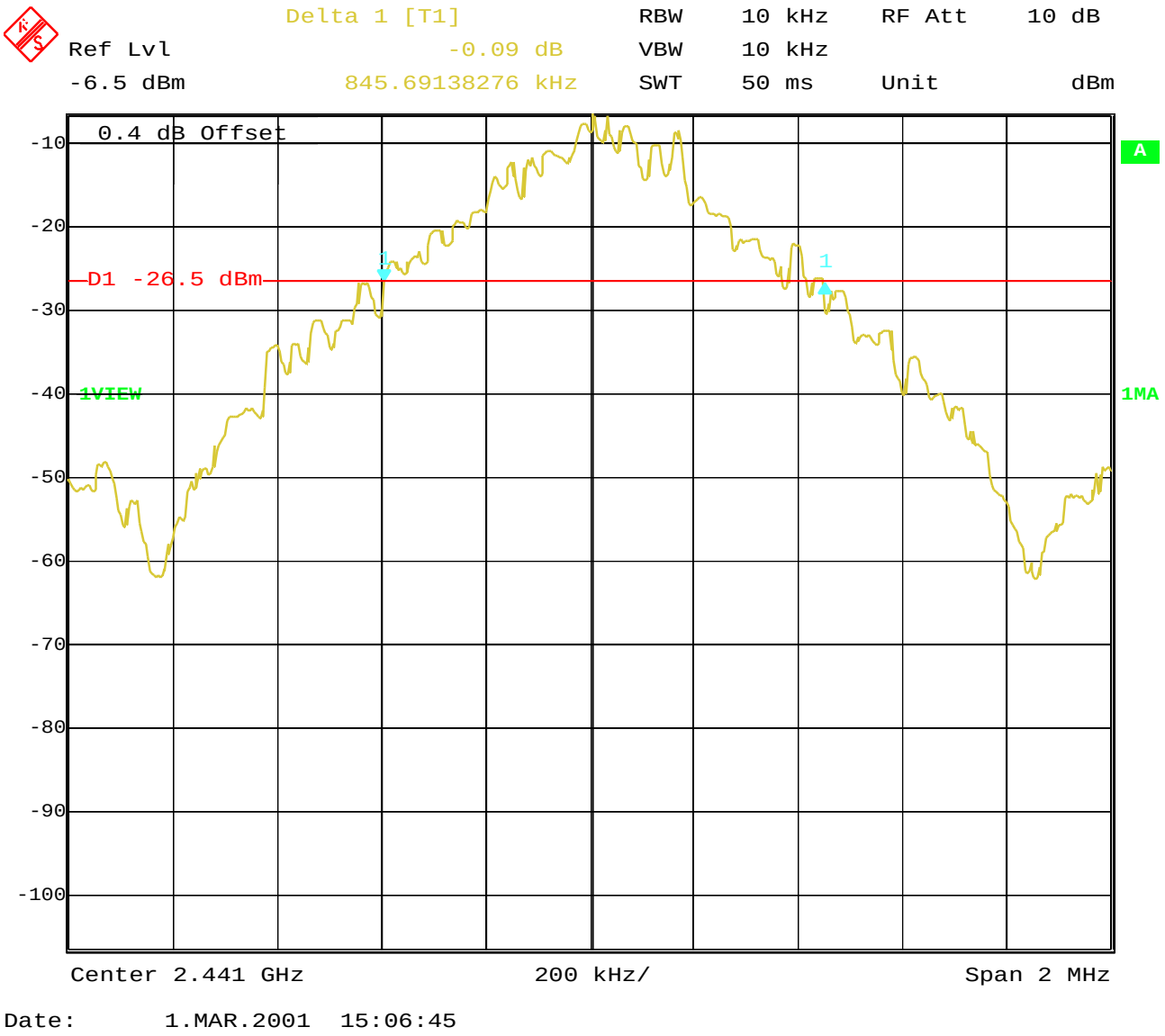
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 29%

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

20 dB bandwidth

Channel 2



Date: 1.MAR.2001 15:06:45

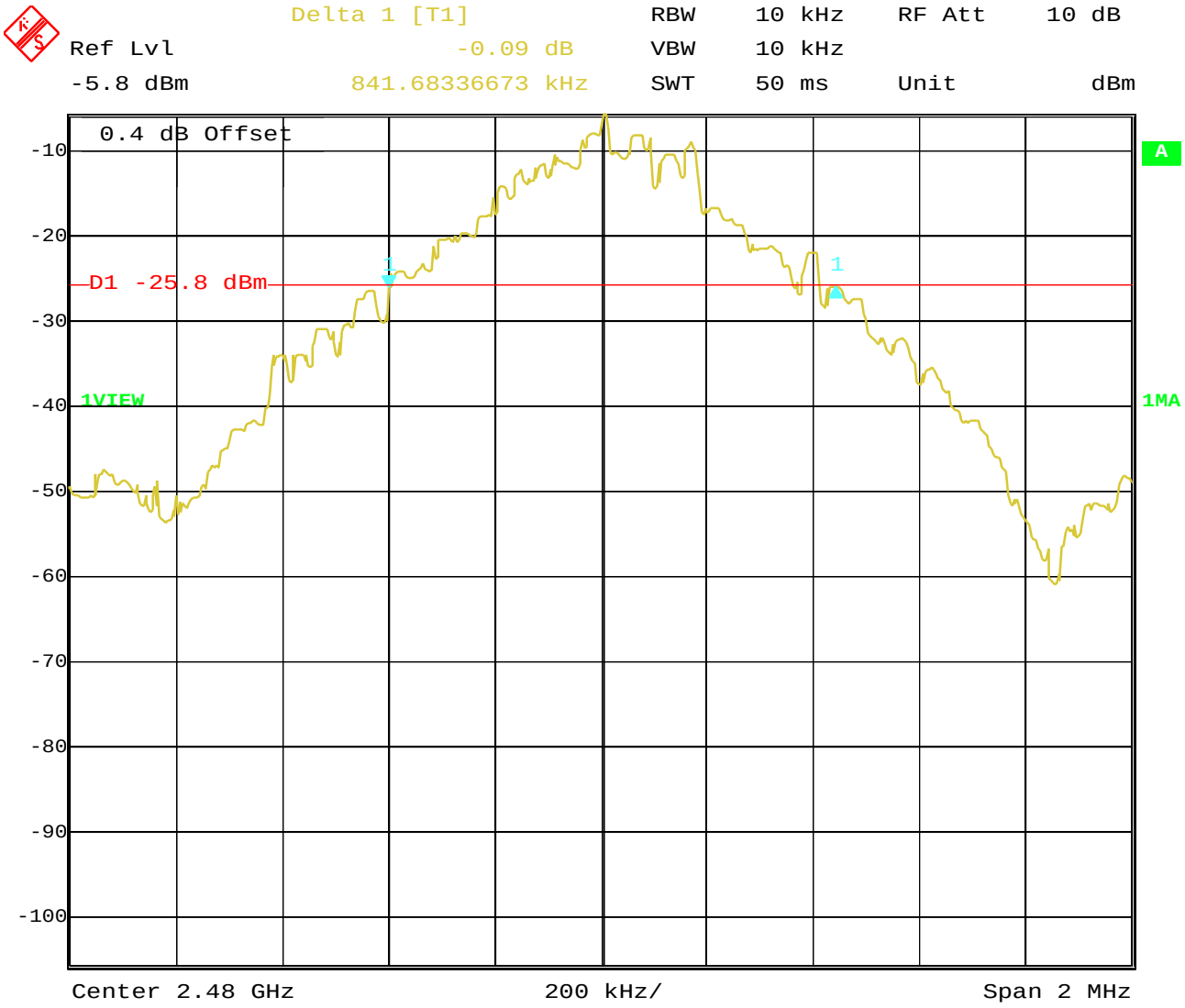
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 29%

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

20 dB bandwidth

Channel 3:



Date: 1.MAR.2001 15:09:17

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 29%

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

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (mW)			
Frequency (MHz)			2402	2442	2481
T_{nom}(23) °C	V_{nom}(3.6)V	PK	-1.08	-1.13	-1.23
		AV	-2.10	-2.15	-2.25
Maximum deviation from output power under extreme test conditions (dBc)		not applicable		not applicable	not applicable
Measurement uncertainty		±3dB			

RBW / VBW : 3 MHz

LIMIT **SUBCLAUSE § 15.247 (b) (1)**

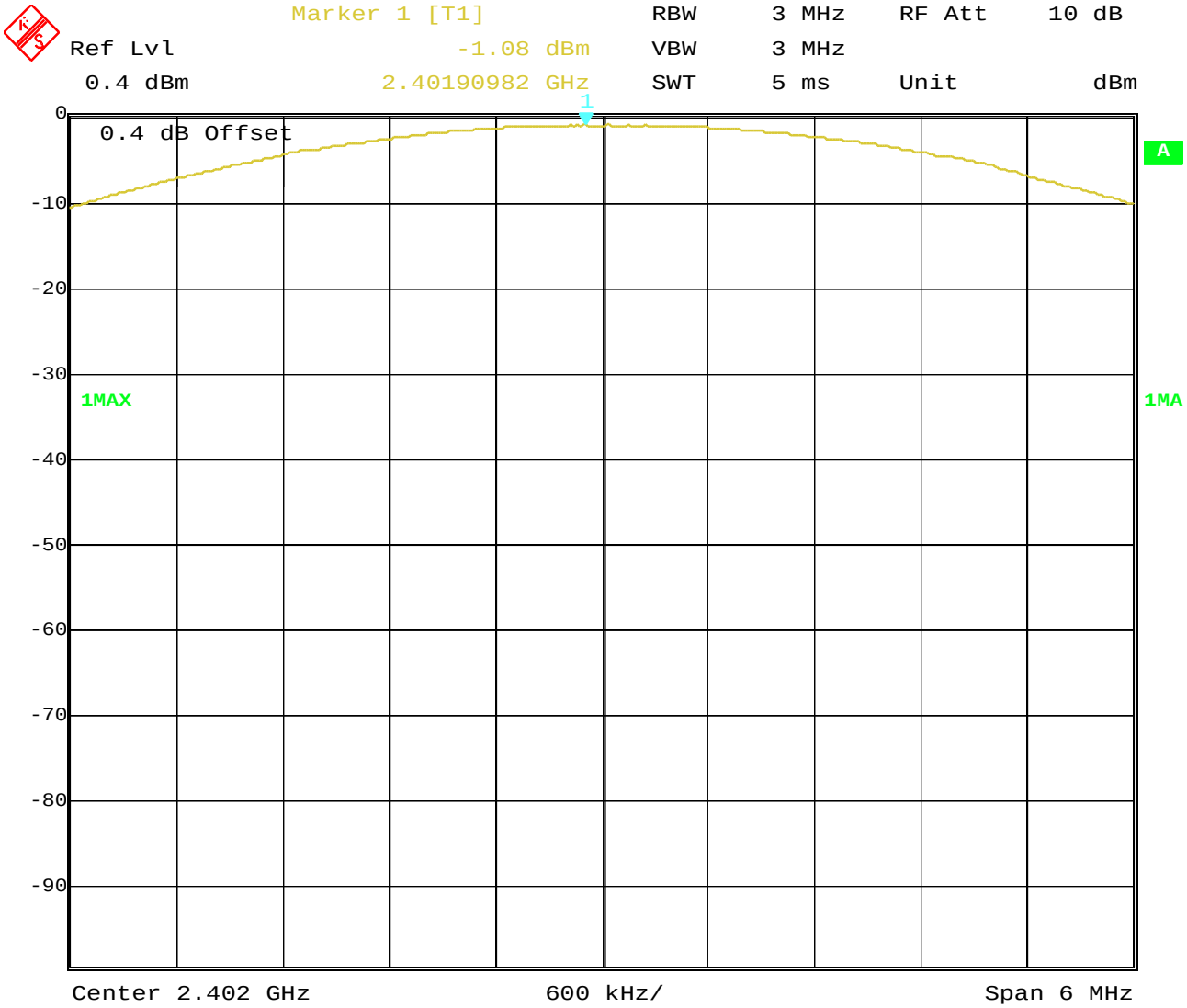
Frequency range	RF power output
2400-2483.5 MHz	1.0 Watt

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

Channel 1: -1.08 dBm at 2402 MHz
De facto EIRP with +2.5 dbI max. antenna gain is +1.42 dBm



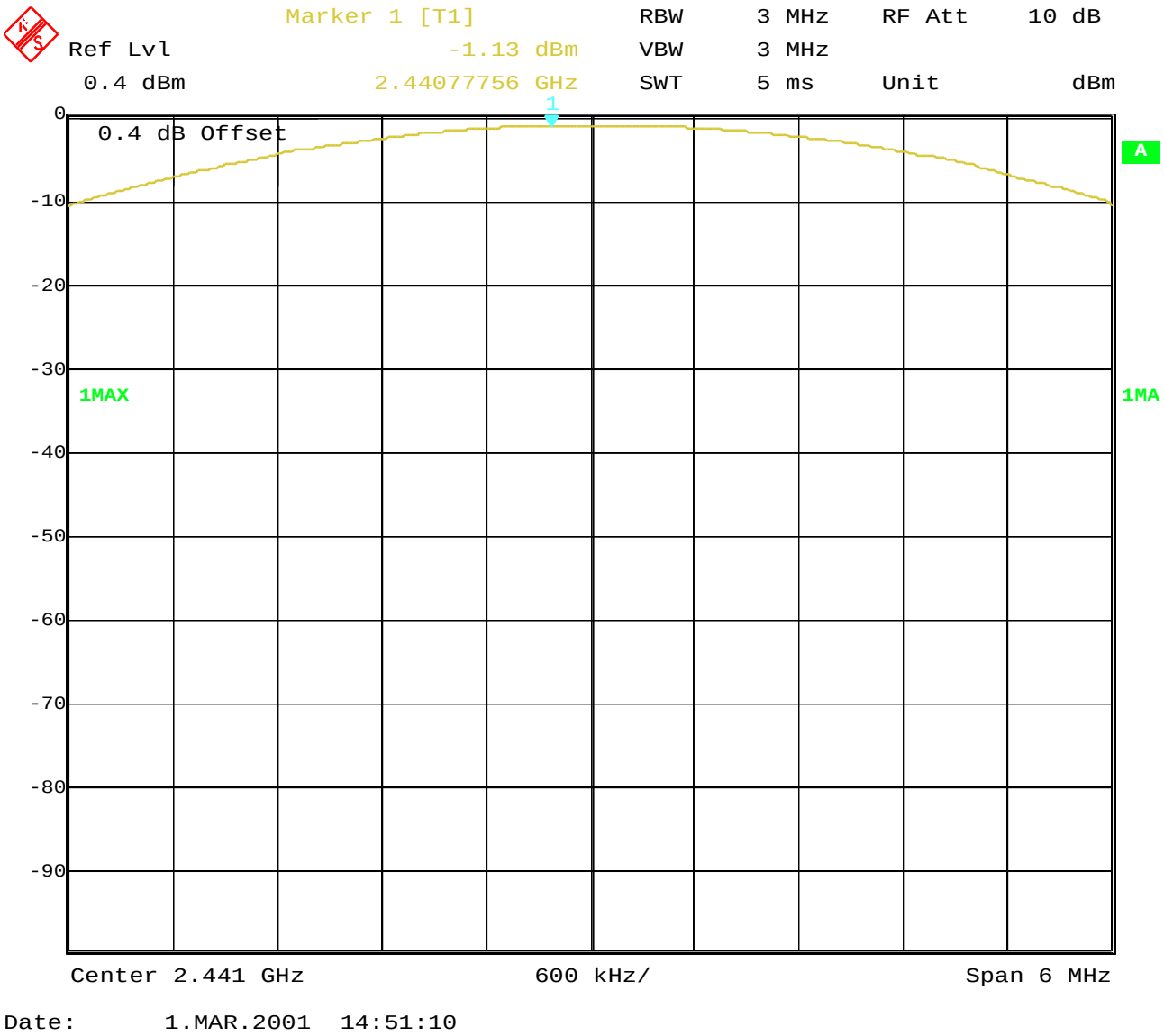
Date: 1.MAR.2001 14:49:51

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

Channel 2: -1.12 dBm at 2441 MHz
De facto EIRP with +2.5 dbI max. antenna gain is +1.38 dBm



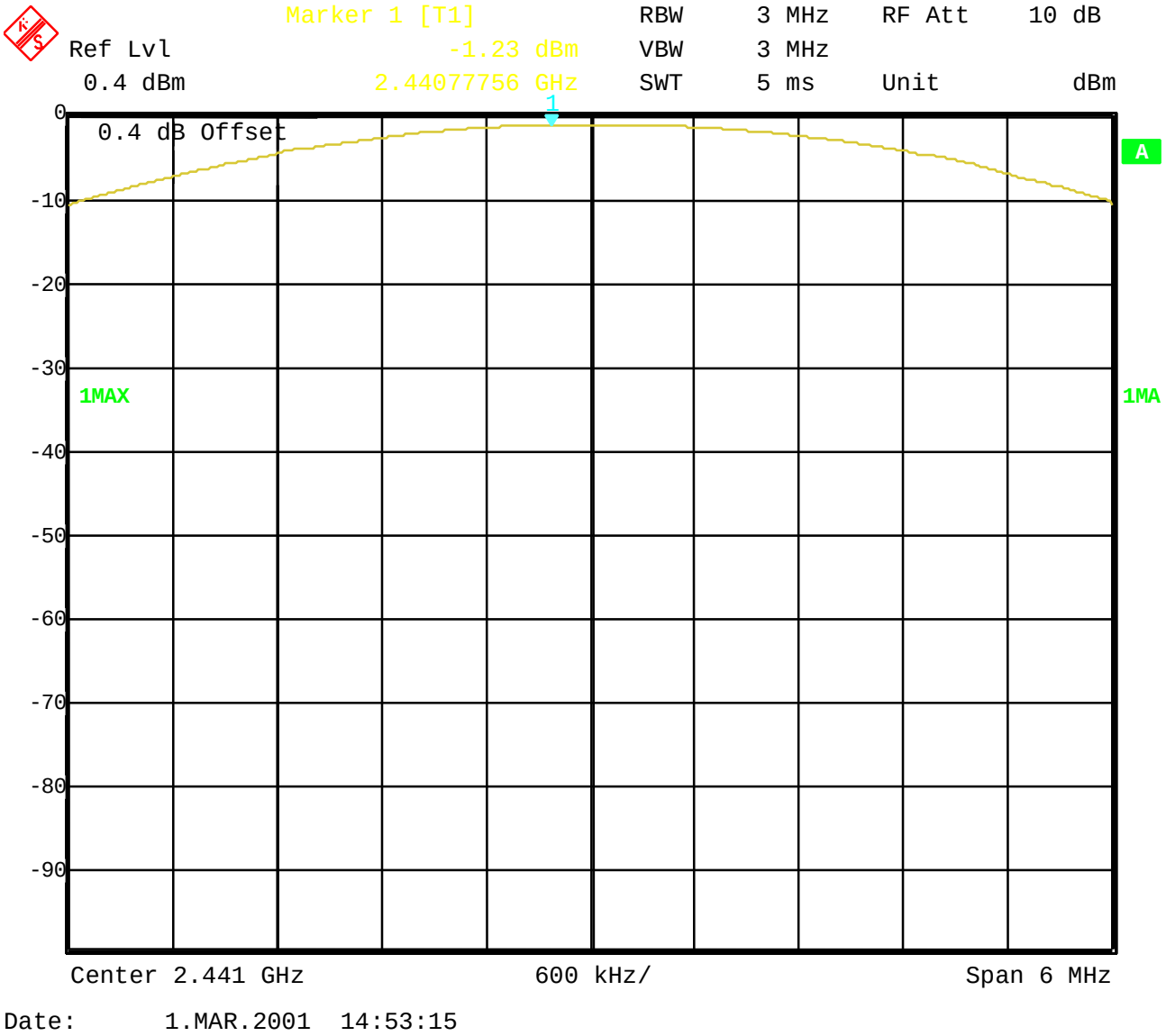
Date: 1.MAR.2001 14:51:10

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

Channel 3: -1.23 dBm at 2481 MHz
De facto EIRP with +2.5 dbI max. antenna gain is +1.27dBm



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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (mW)		
Frequency (MHz)		2402	2441	2481
T_{nom}(20) °C	V_{nom}(3.6)V	1.39	1.37	1.34
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)**

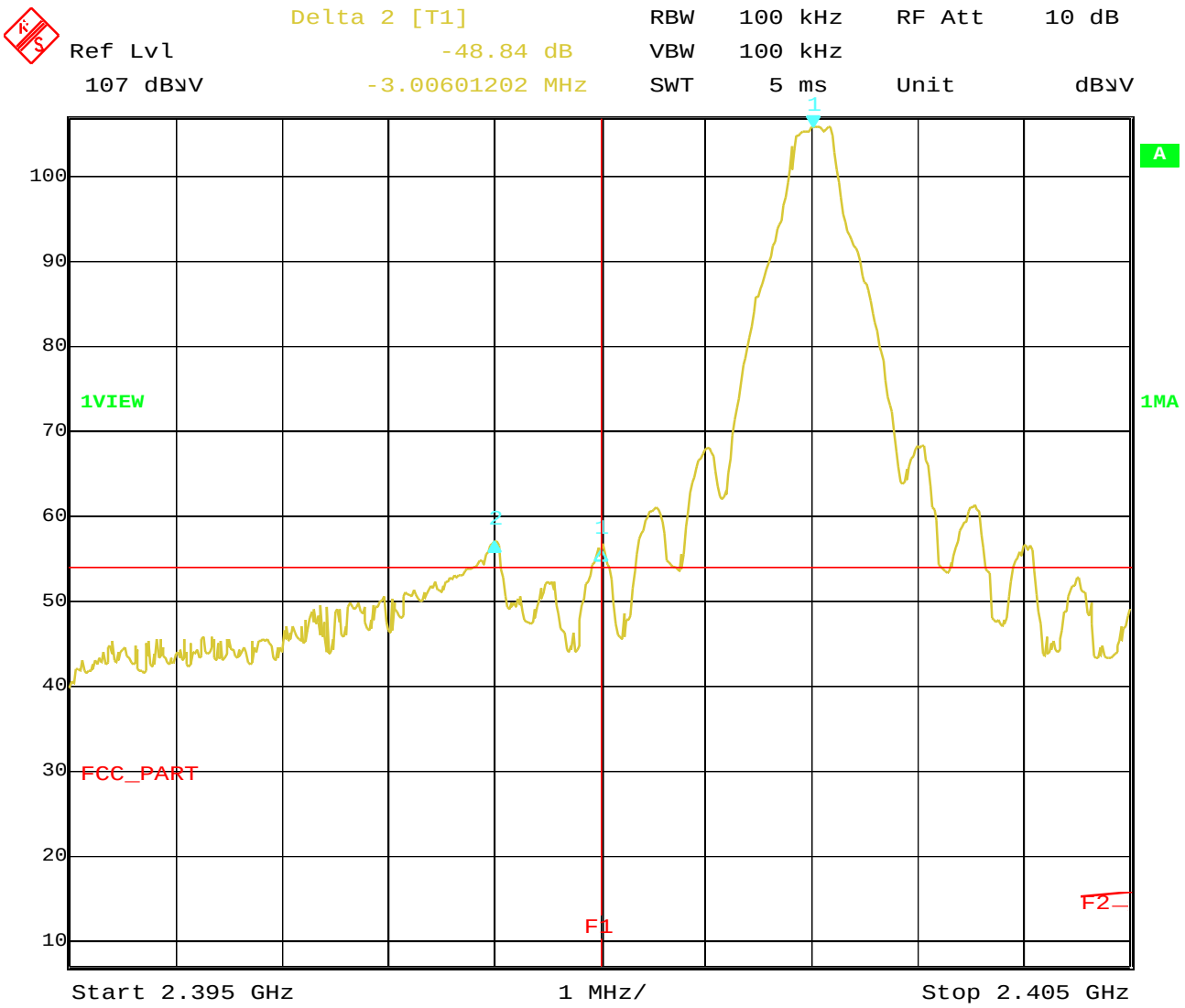
Frequency range	RF power output
2400-2483.5 MHz	1.0 Watt

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

Low frequency section (hopping off)



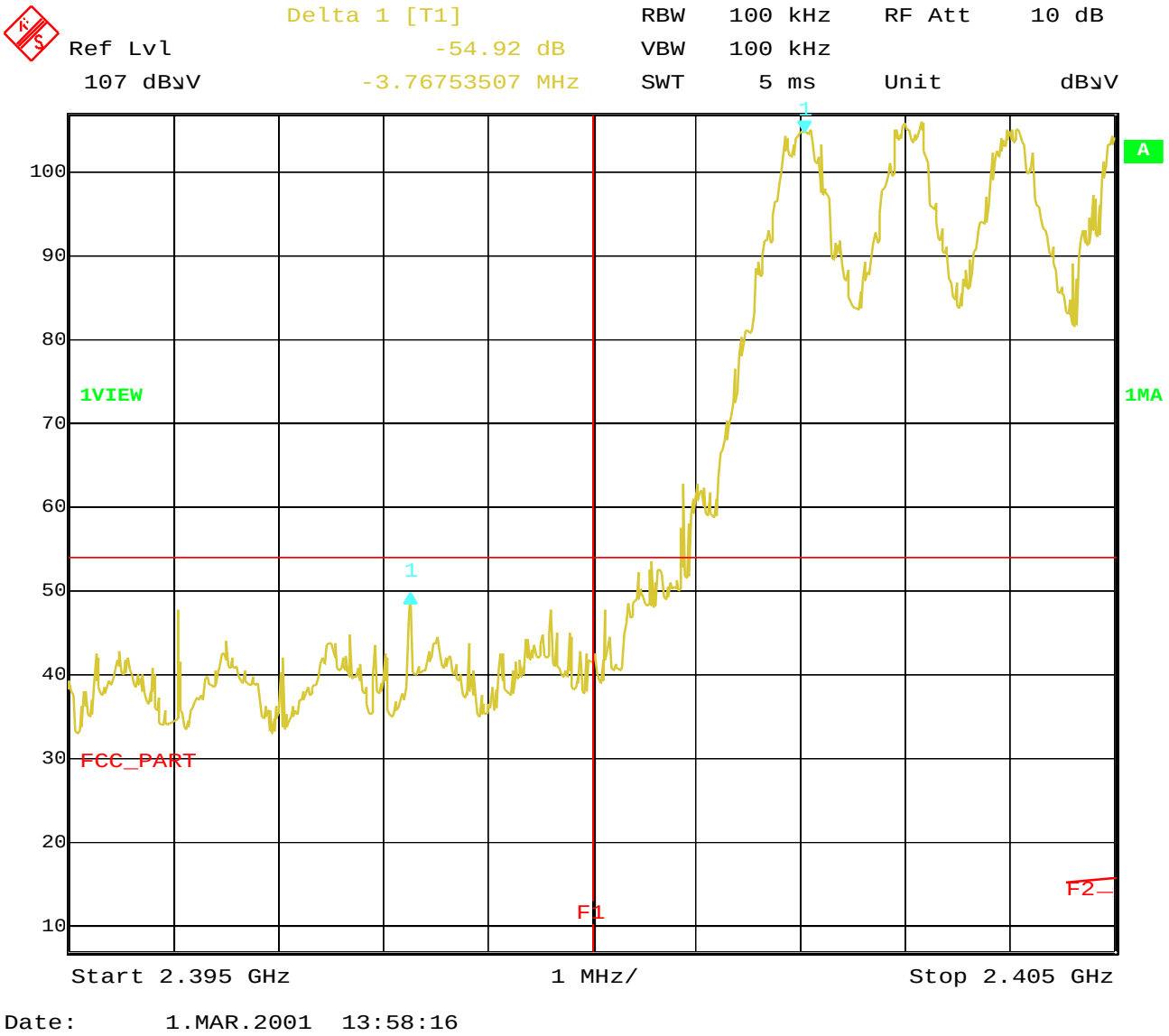
Date: 1.MAR.2001 14:09:31

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31 %

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

Low frequency section (hopping on)



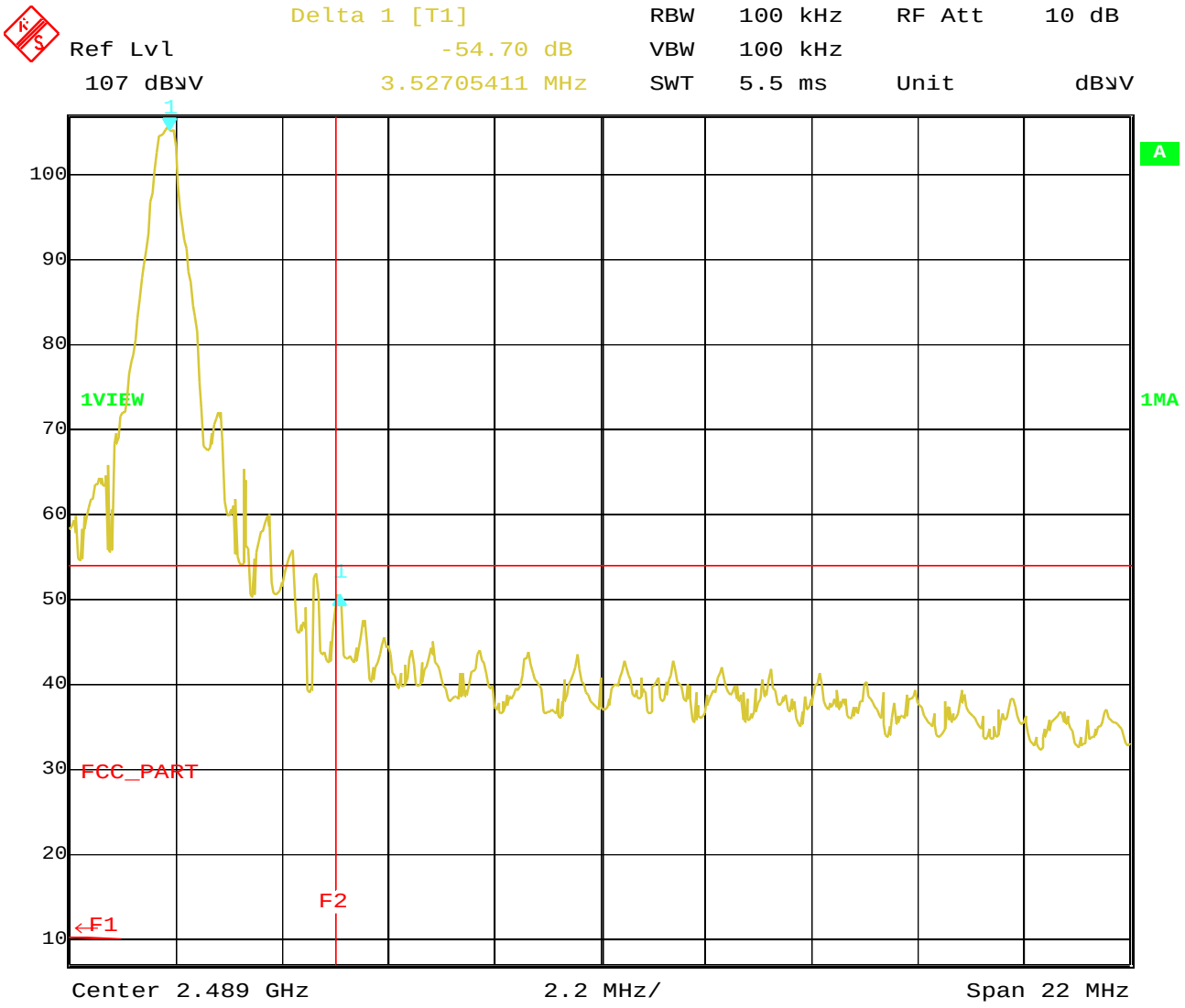
Date: 1.MAR.2001 13:58:16

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

high frequency section (hopping off)



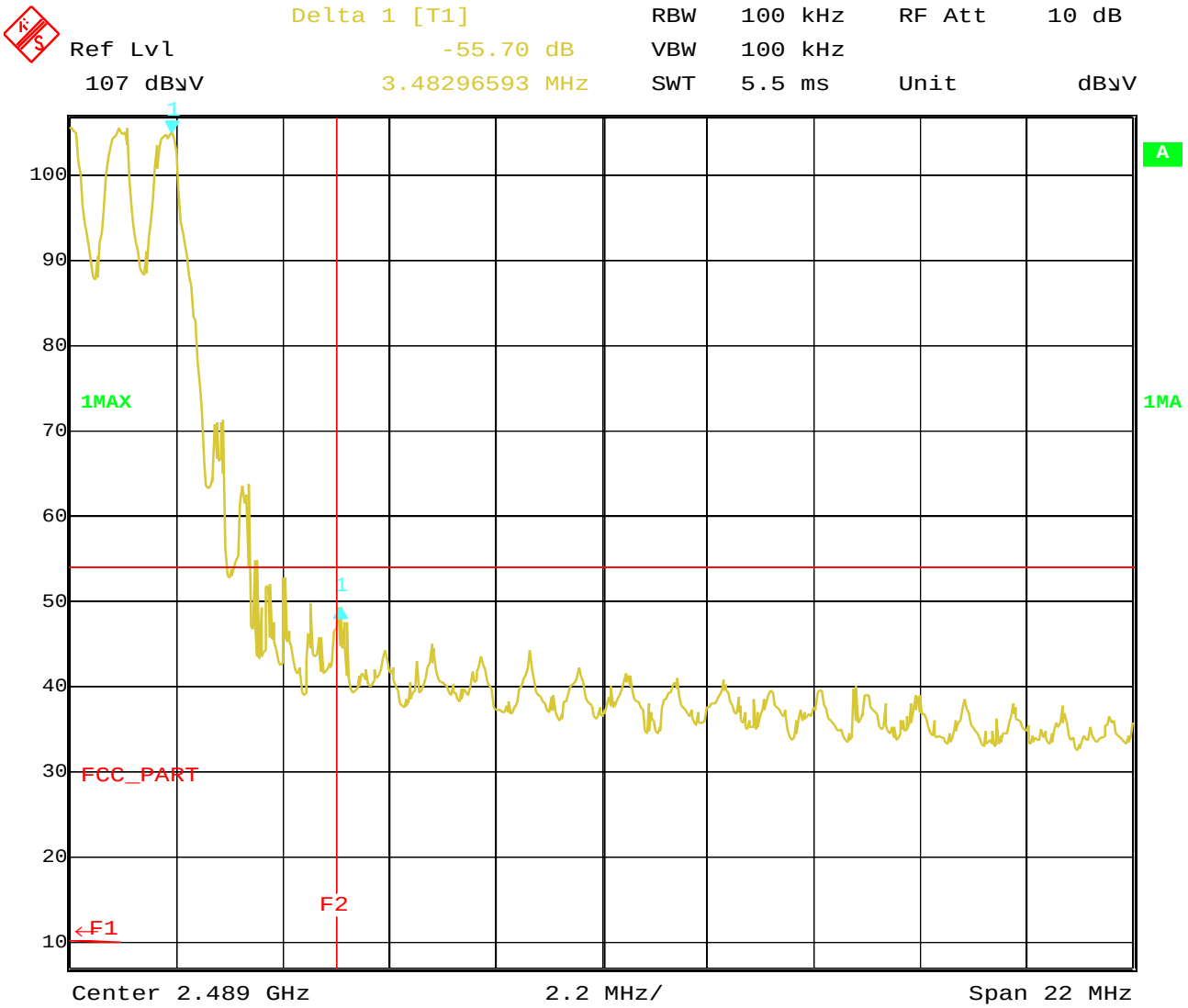
Date: 1.MAR.2001 14:07:42

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

high frequency section (hopping on)

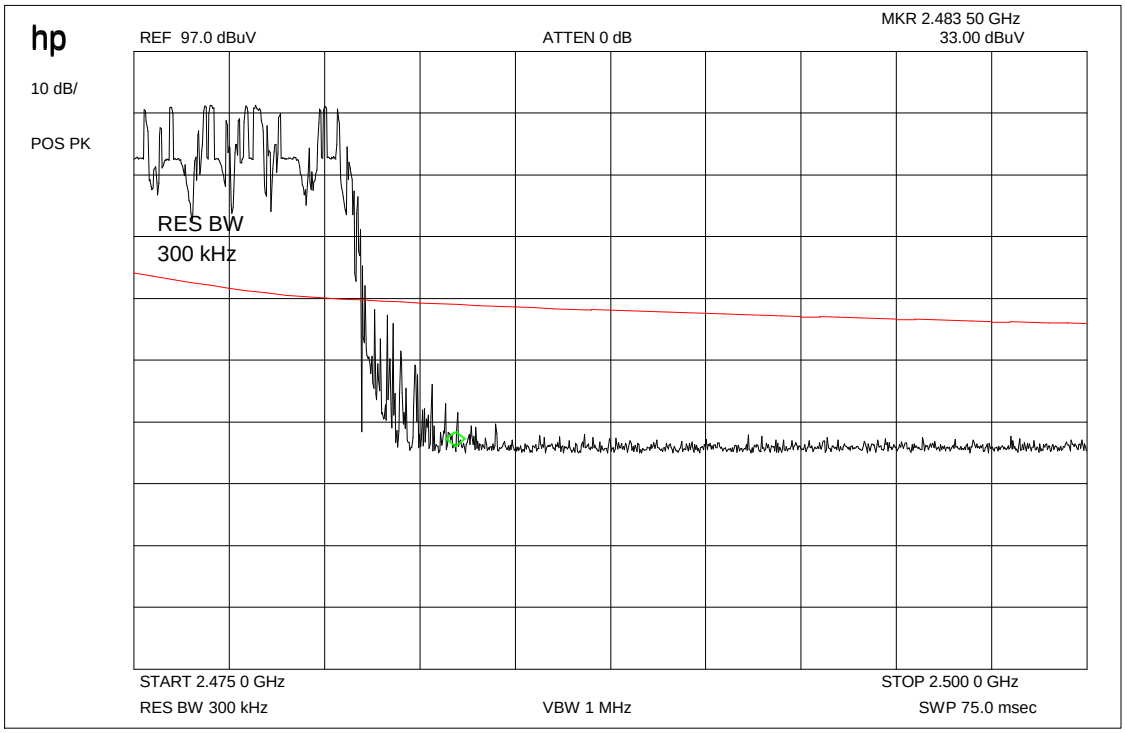


Date: 1.MAR.2001 14:04:43

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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)
64

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%
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		1.42	30 dBm	-	Operating frequency
all peaks <<limit			-20 dBc	see plot	complies
2441		1.38	30 dBm	-	Operating frequency
all peaks <<limit			-20 dBc	see plot	complies
2480		1.27	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.

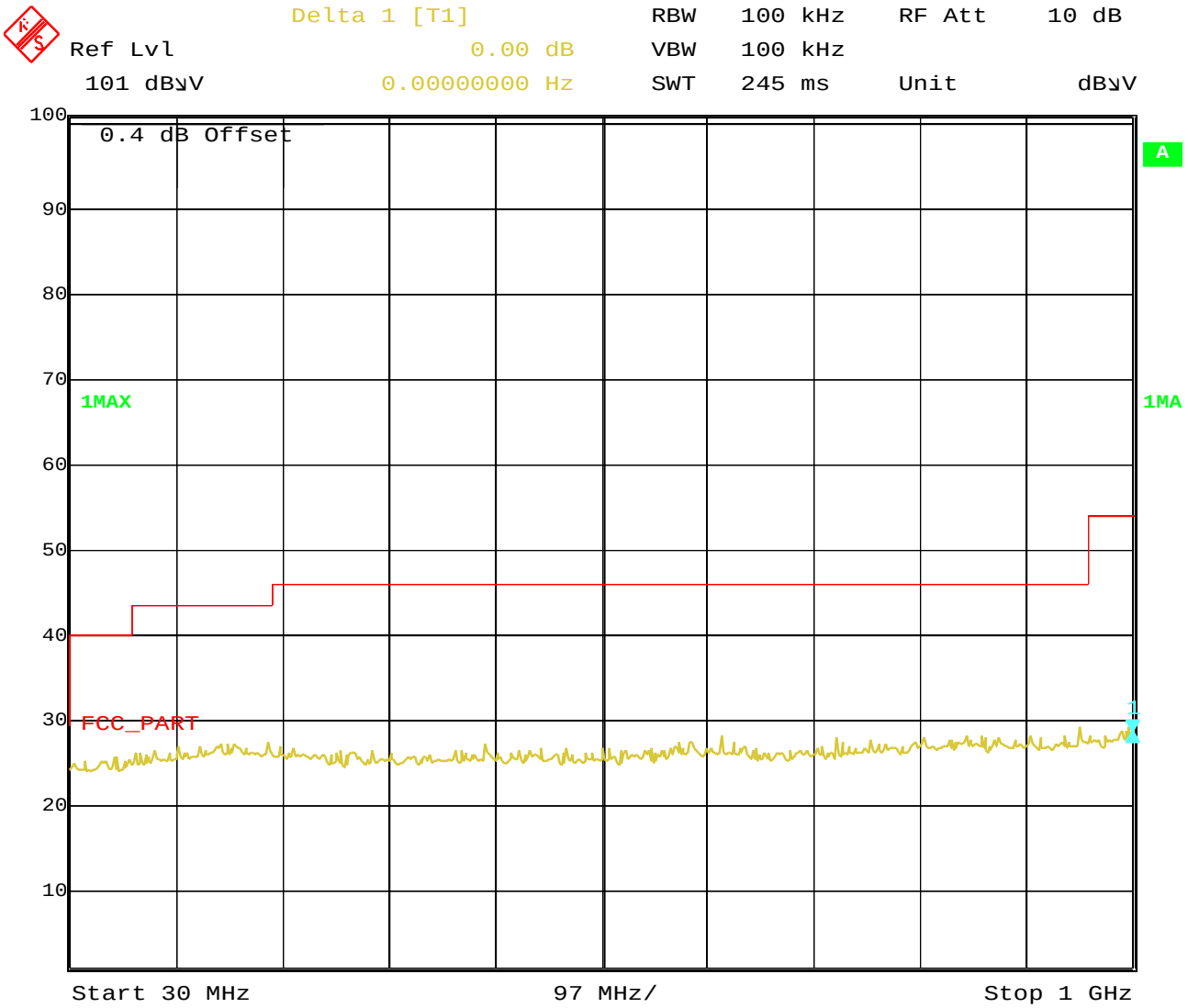
LIMITS SUBCLAUSE § 15.247 (c)

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)
17 - 24

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

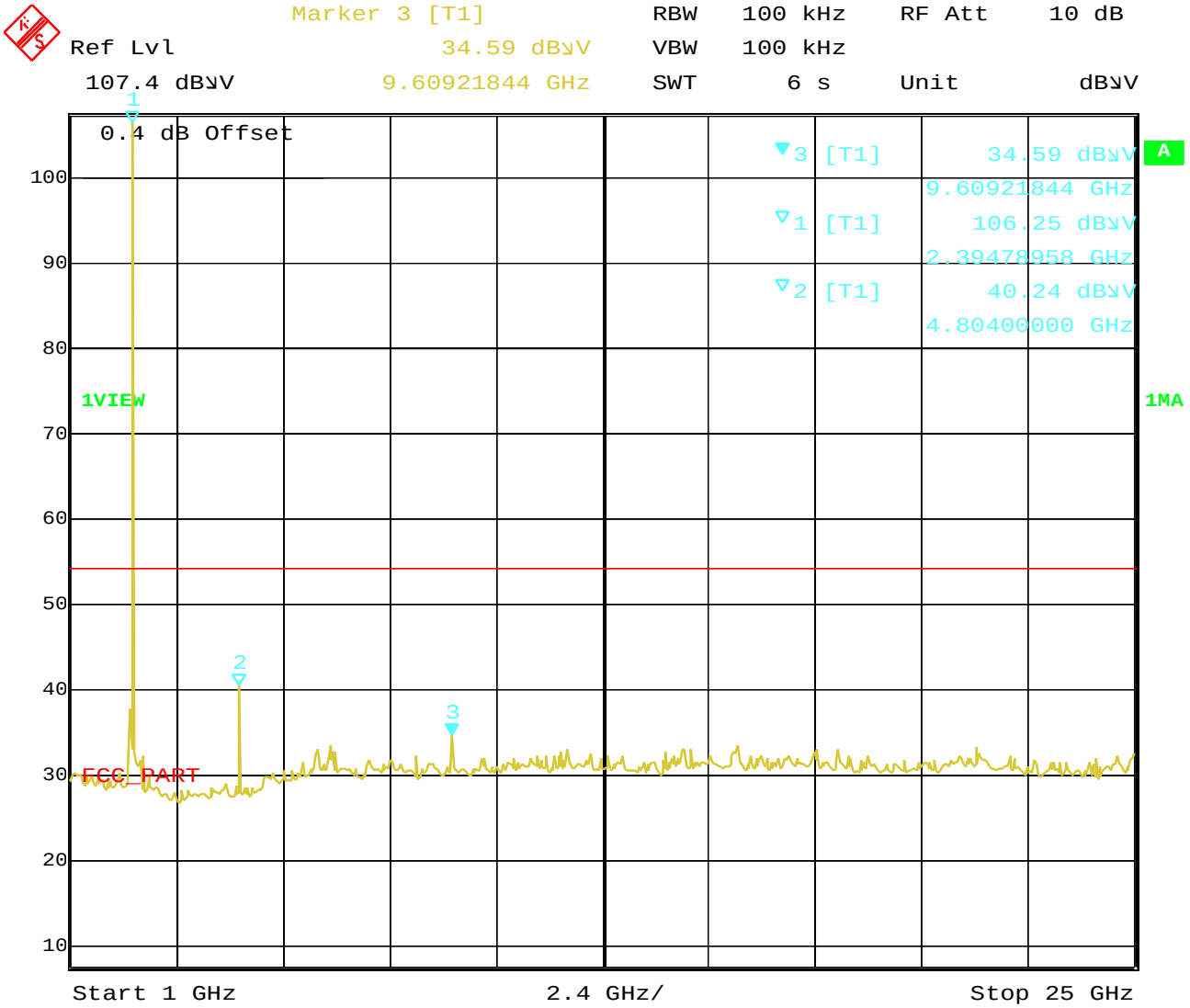


Date: 2.MAR.2001 07:05:17

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

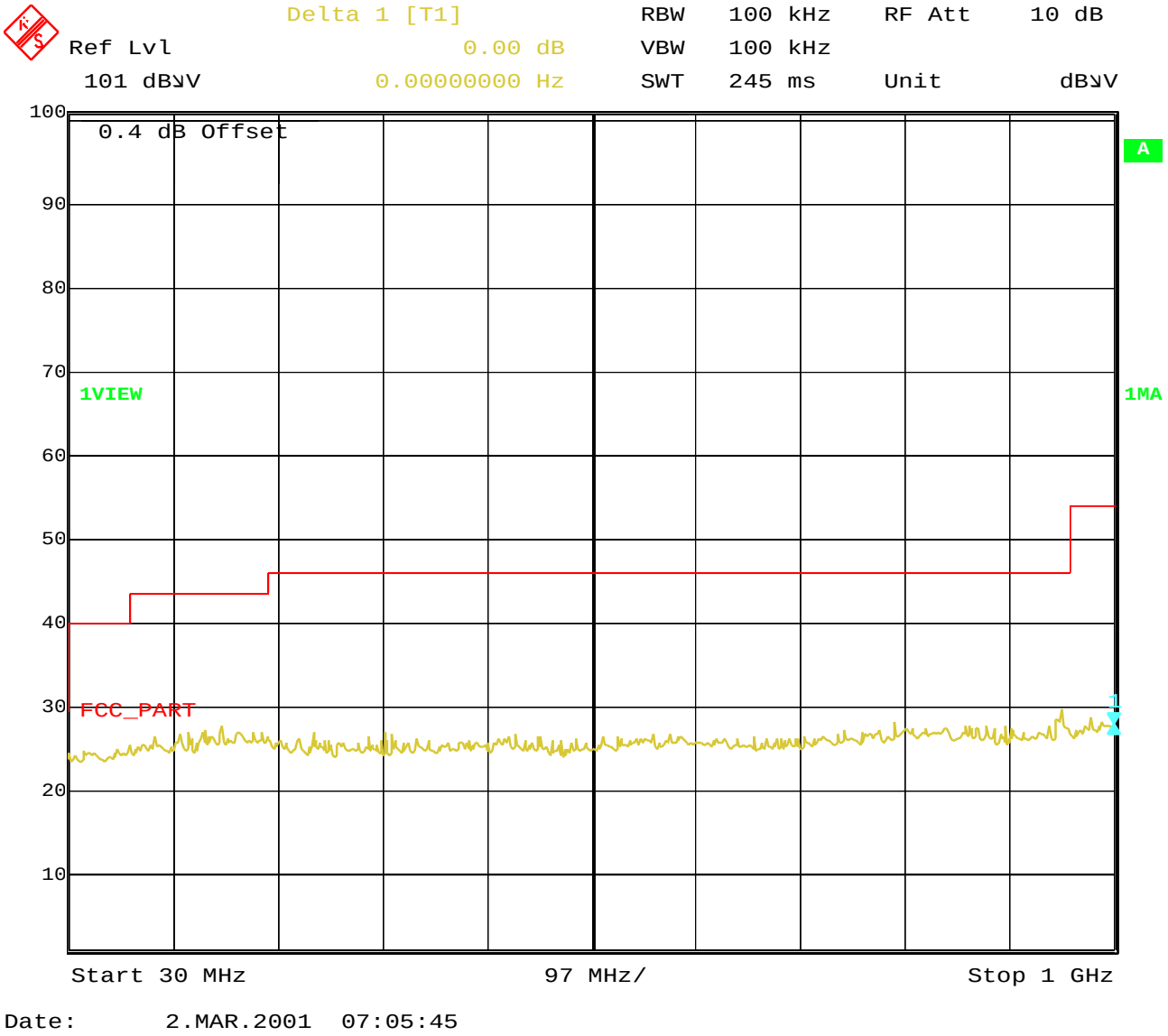


Date: 2.MAR.2001 07:28:30

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

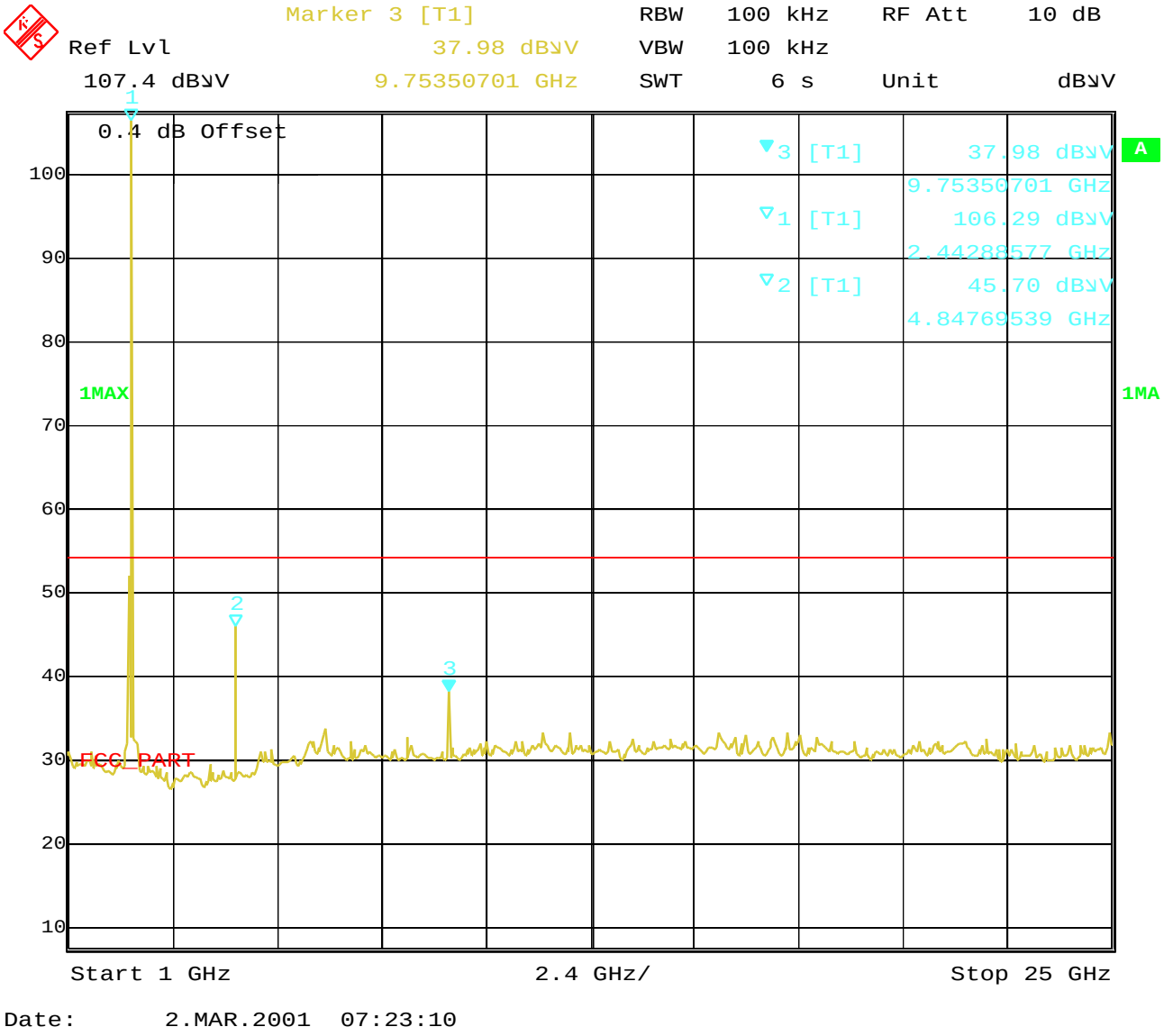


Date: 2.MAR.2001 07:05:45

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

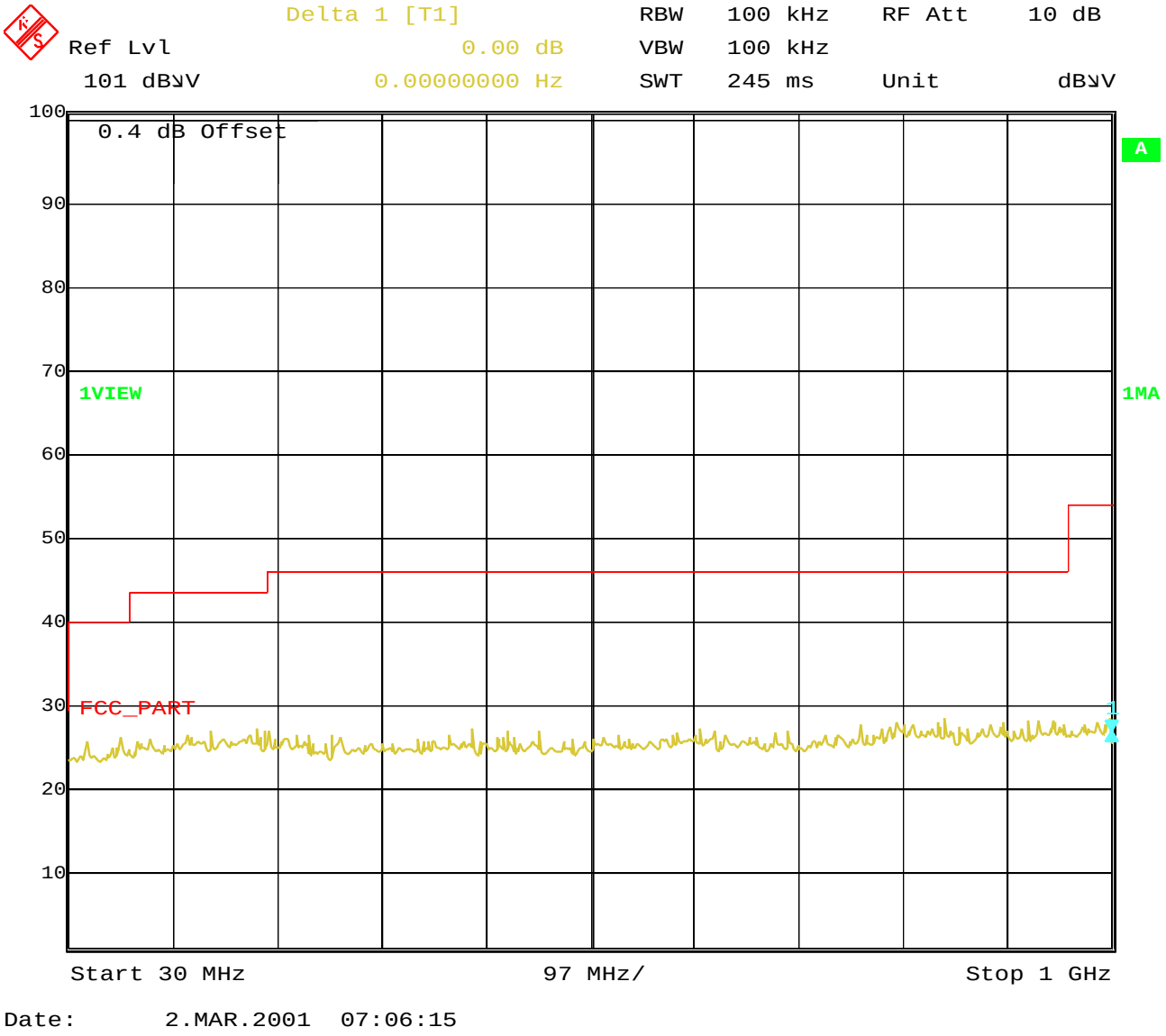


Date: 2.MAR.2001 07:23:10

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

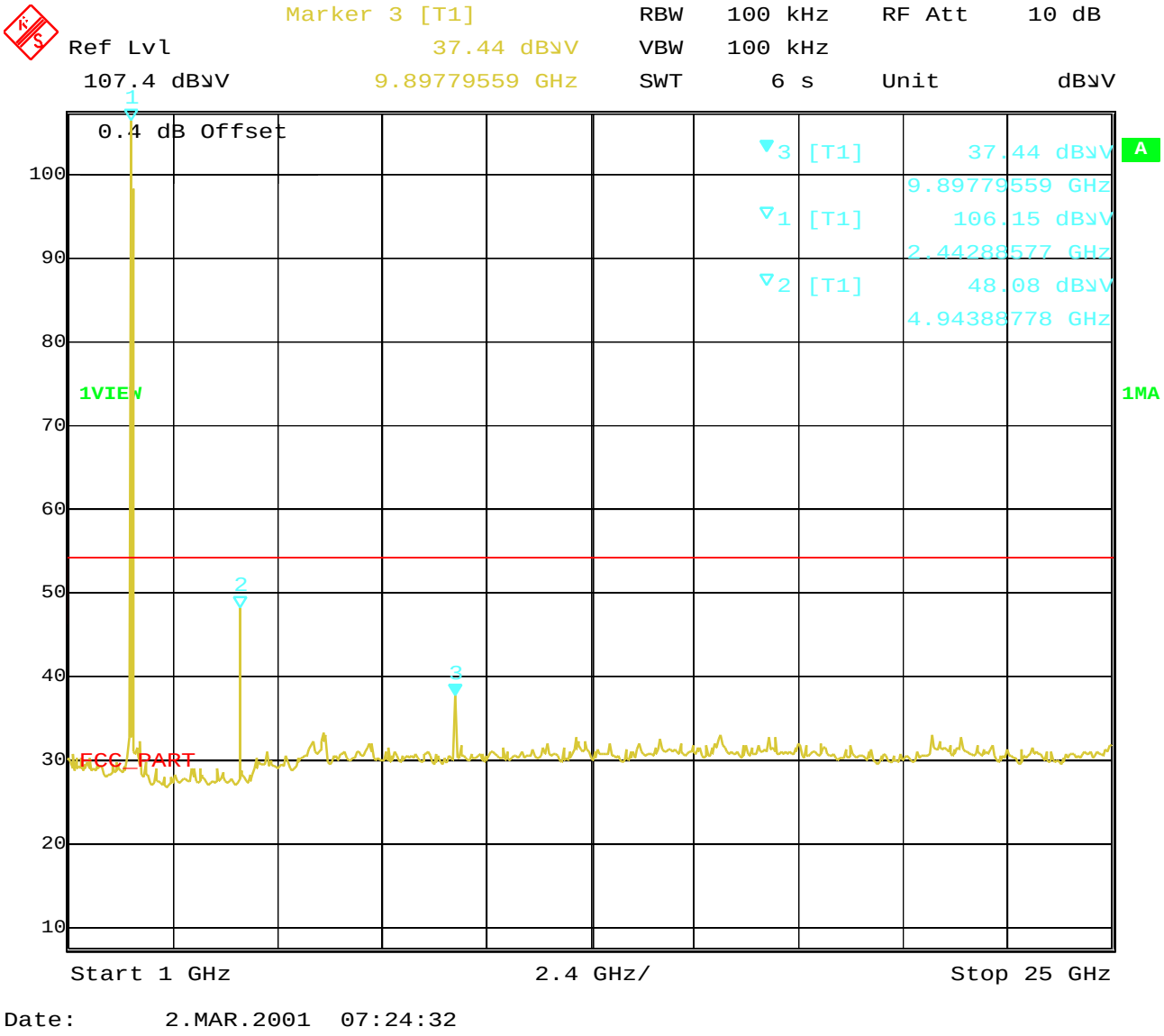


Date: 2.MAR.2001 07:06:15

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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



Date: 2.MAR.2001 07:24:32

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

EMISSION LIMITATIONS					
f (MHz)	polari-zation	amplitude of emission (dBµV/m) QUASIPEAK	amplitude of emission (dBµV/m) average	limit max. allowed emmision power (dBµV/m)	results
CH 1					
187.58	vertical	40.3		43.5	complies
200.86	vertical	37.6		43.5	complies
216.14	vertical	36.5		46.0	complies
CH 2					
186.66	vertical	42.0		43.5	complies
216.14	vertical	37.4		46.0	complies
223.67	vertical	33.1		46.0	complies
CH 3					
187.58	vertical	41.6		43.5	complies
199.88	vertical	34.7		43.5	complies
216.14	vertical	33.4		46.0	complies
Measurement uncertainty		± 3dB			

Horizontal measurements were about 2 dB lower

LIMITS **SUBCLAUSE § 15.247 (c)**

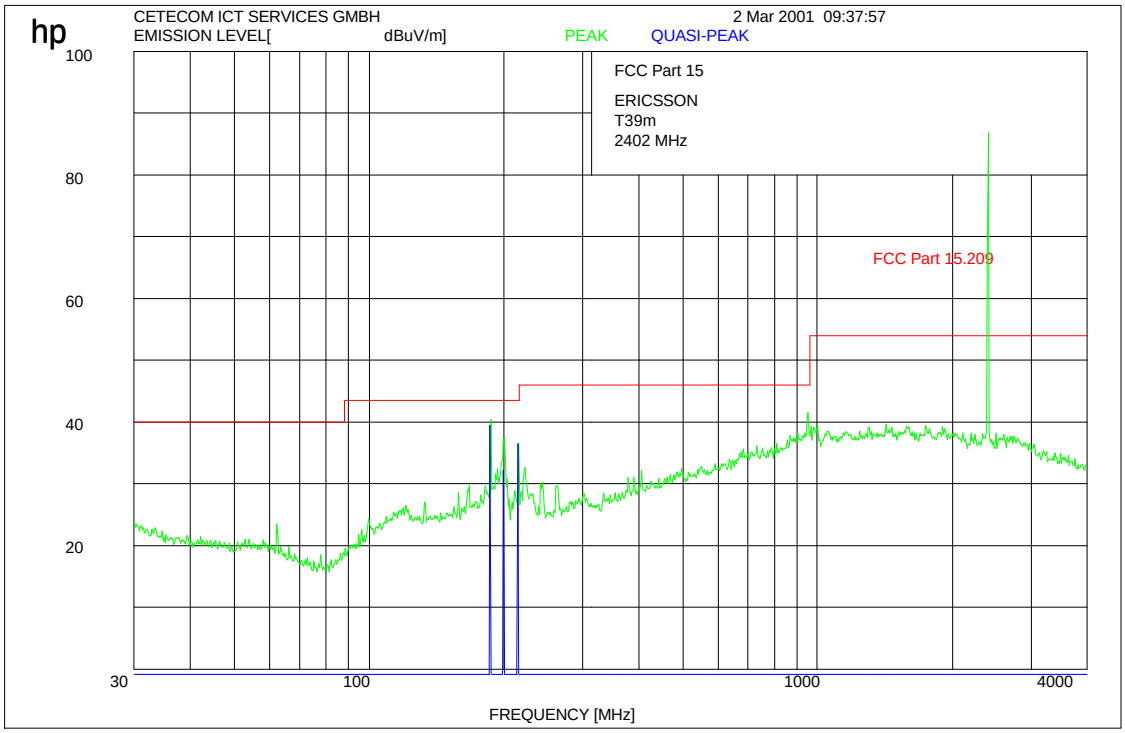
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

2402 MHz



f < 1 GHz : RBW/VBW: 100 kHz **f ³ 1GHz : RBW/VBW: 1 MHz**

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

LIMITS **SUBCLAUSE § 15.247 (c)**

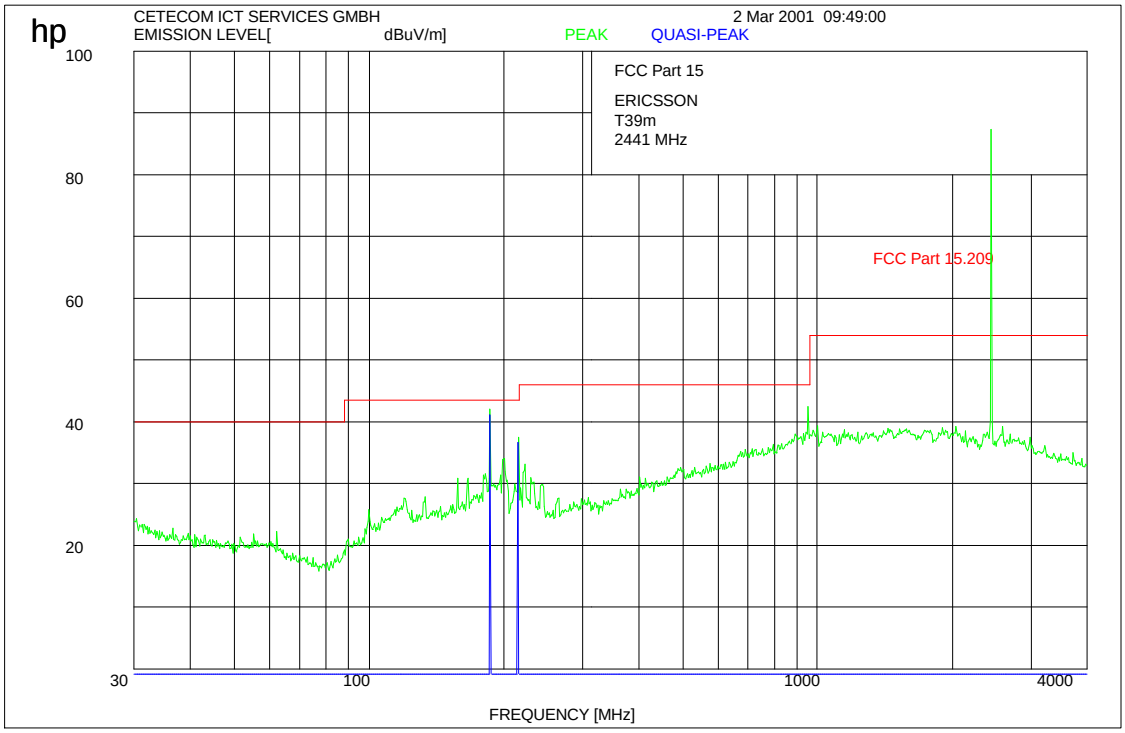
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

2441 MHz



f < 1 GHz : RBW/VBW: 100 kHz **f ³ 1GHz : RBW/VBW: 1 MHz**

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

LIMITS **SUBCLAUSE § 15.247 (c)**

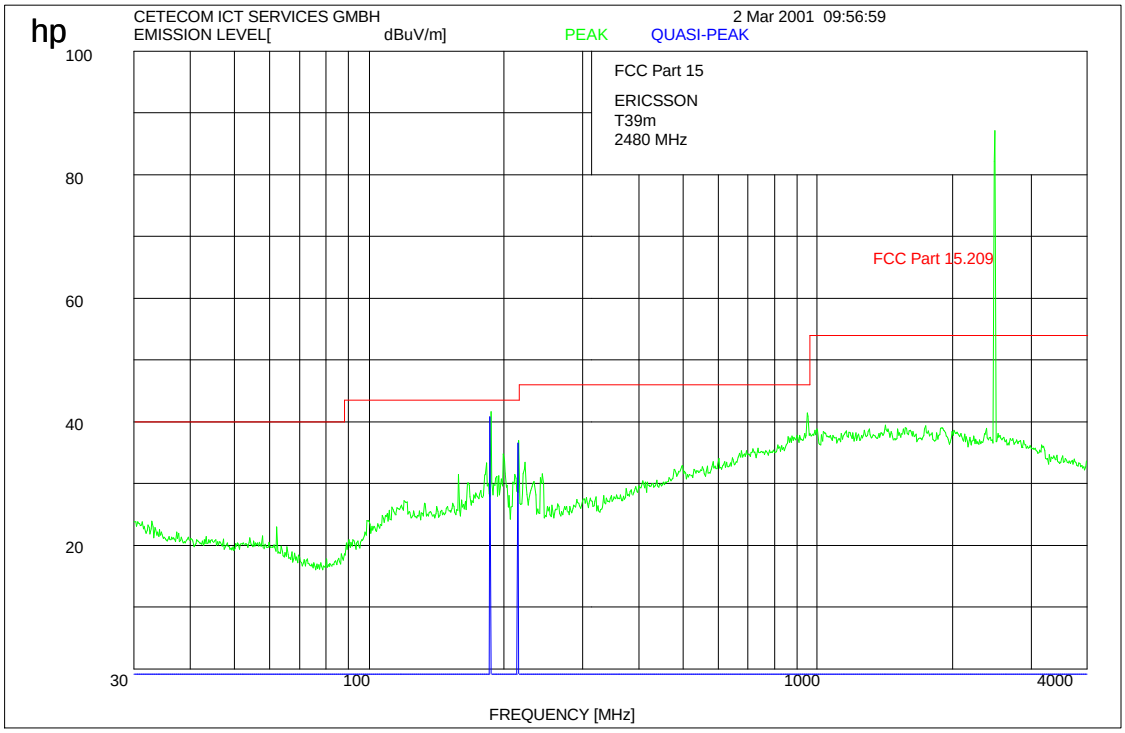
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

2480 MHz



f < 1 GHz : RBW/VBW: 100 kHz **f ³ 1GHz : RBW/VBW: 1 MHz**

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

LIMITS **SUBCLAUSE § 15.247 (c)**

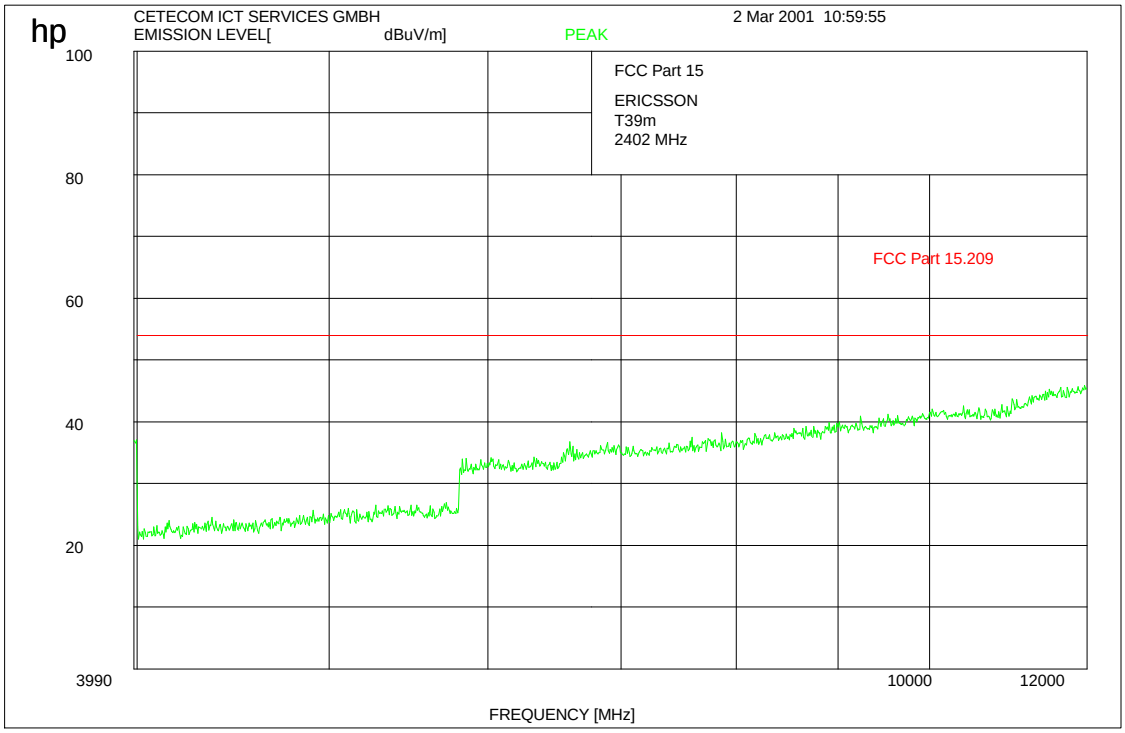
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

Channel 1



f < 1 GHz : RBW/VBW: 100 kHz **f ³ 1GHz : RBW/VBW: 1 MHz**

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

LIMITS **SUBCLAUSE § 15.247 (c)**

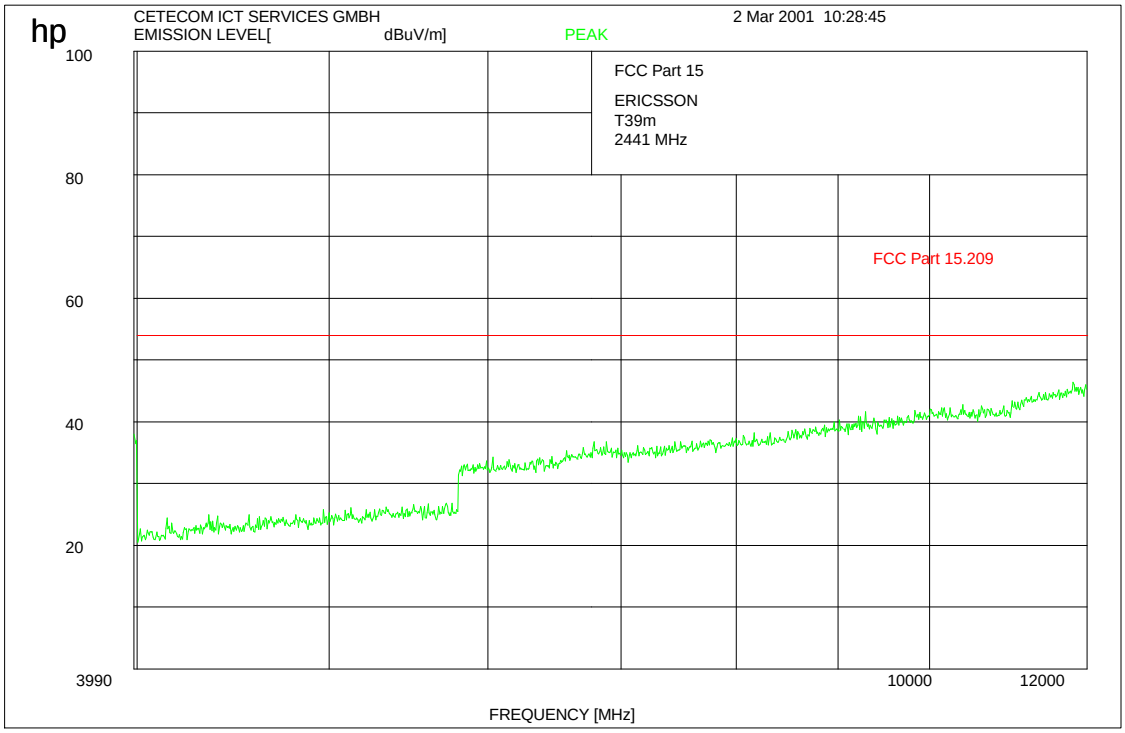
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

Channel 2



f < 1 GHz : RBW/VBW: 100 kHz **f ³ 1GHz : RBW/VBW: 1 MHz**

LIMITS **SUBCLAUSE § 15.247 (c)**

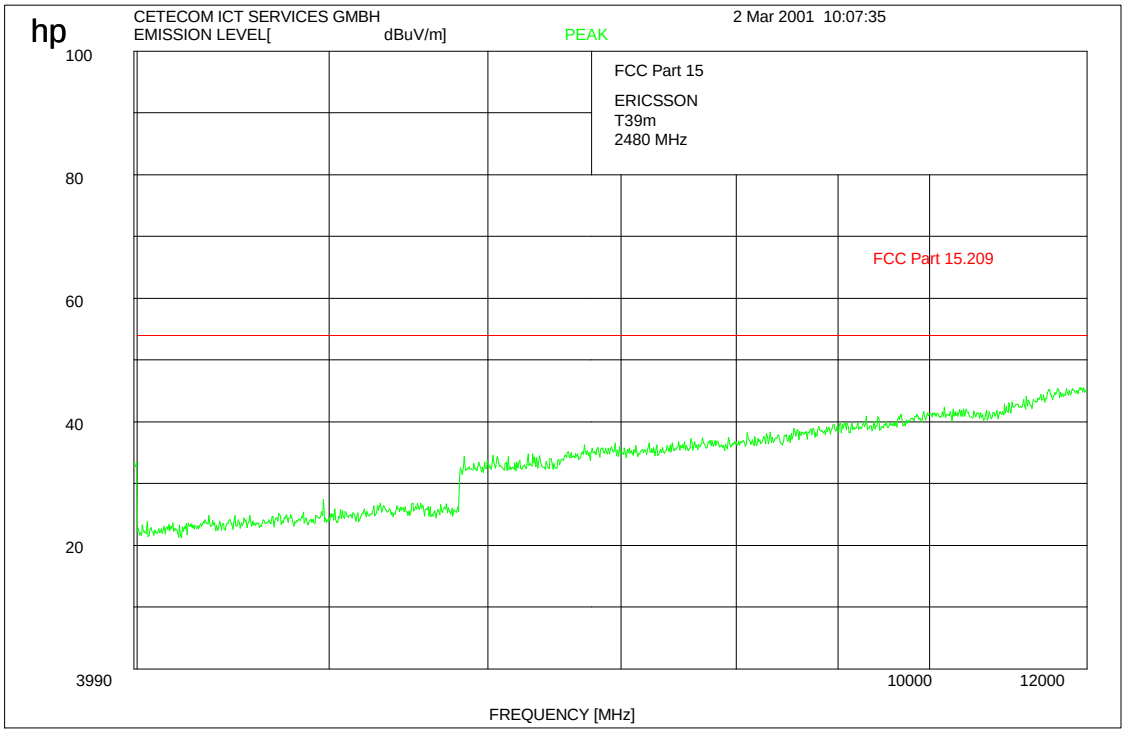
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

Channel 3



f < 1 GHz : RBW/VBW: 100 kHz **f ³ 1GHz : RBW/VBW: 1 MHz**

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

LIMITS **SUBCLAUSE § 15.247 (c)**

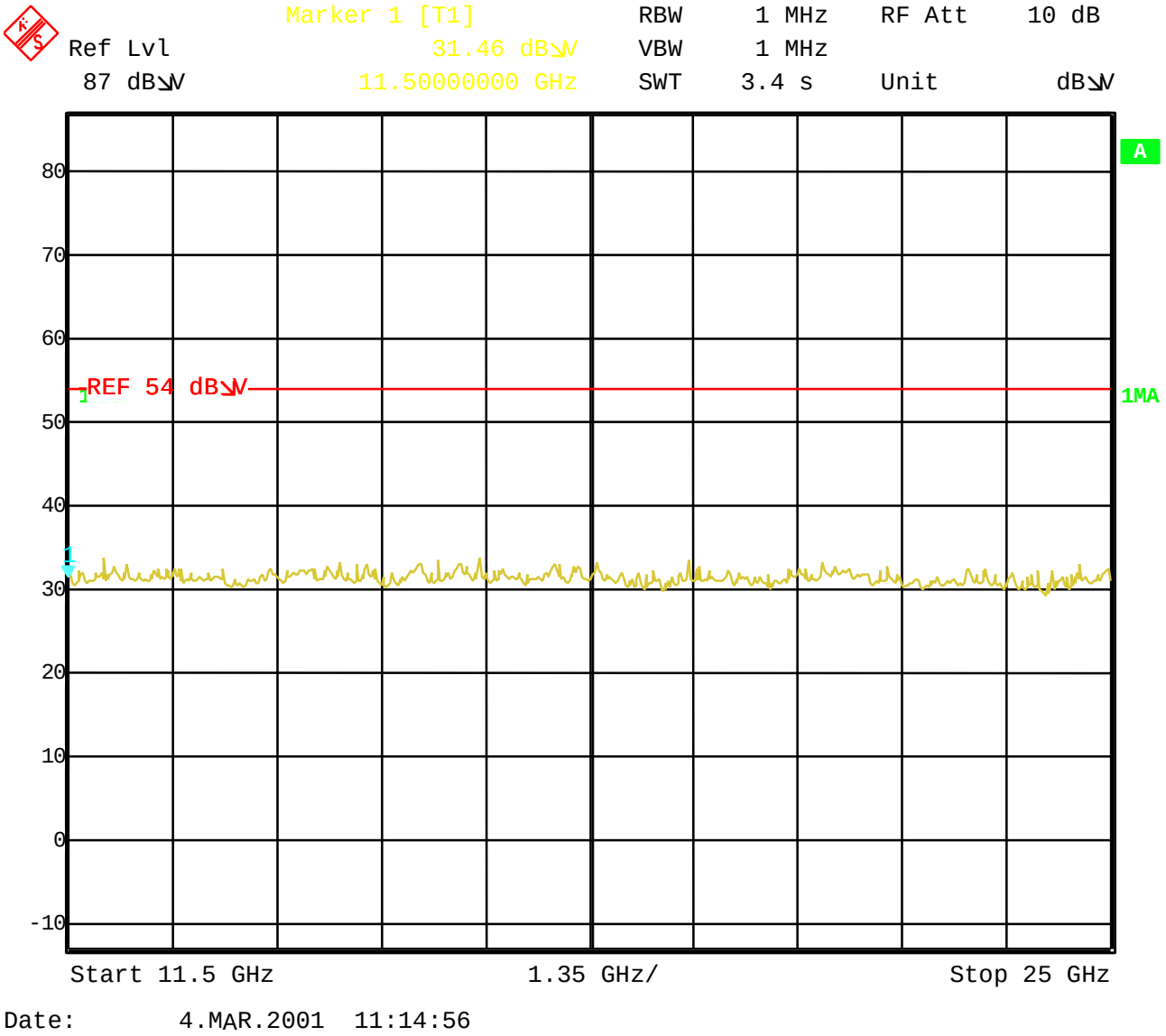
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

Channel 1-3 (this is valid for all 3 channels)
Peak



Date: 4.MAR.2001 11:14:56

LIMITS **SUBCLAUSE § 15.247 (c)**

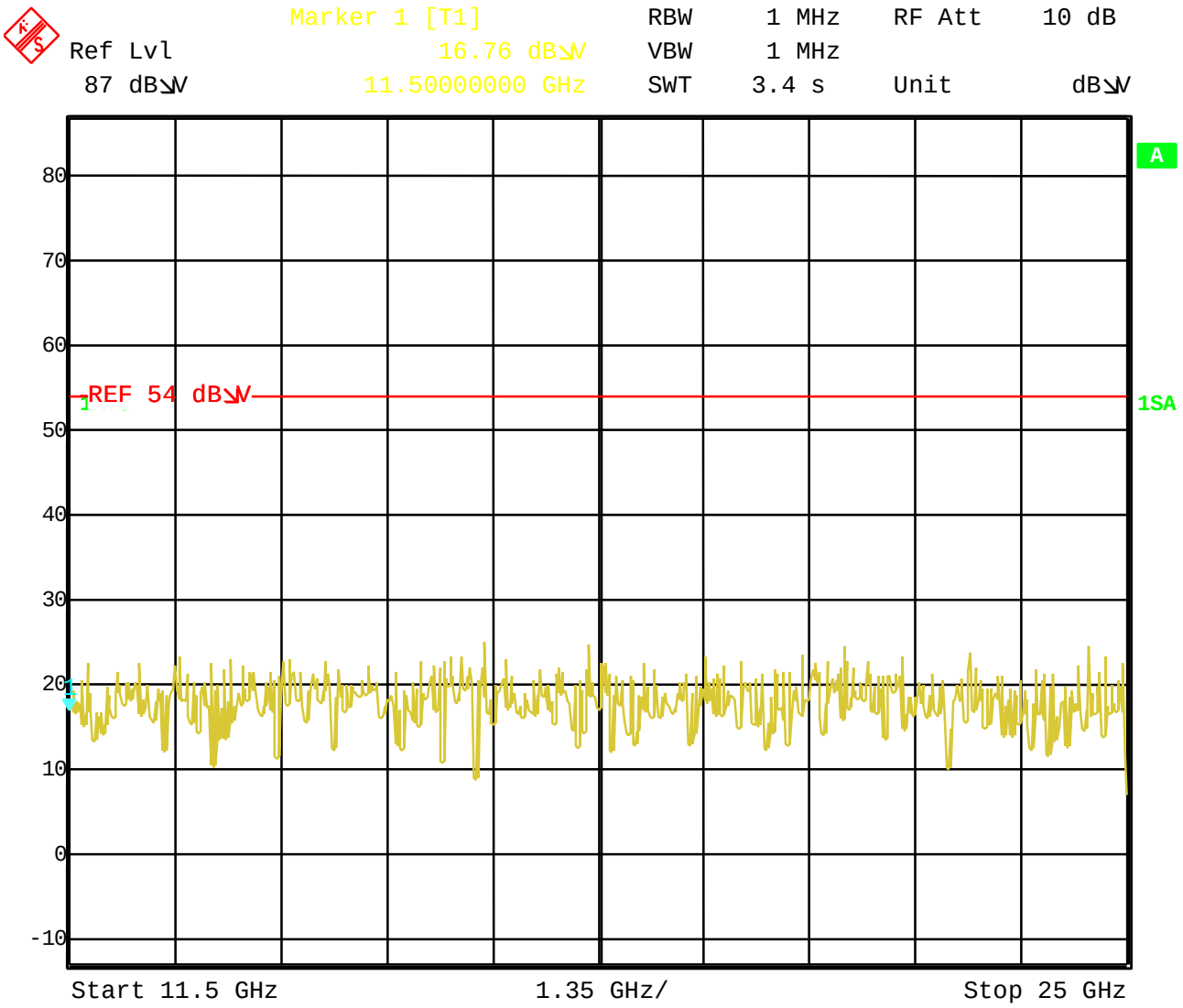
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
65

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

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

Channel 1-3 (this is valid for all 3 channels)
Average



Date: 3.MAR.2001 11:15:48

LIMITS **SUBCLAUSE § 15.247 (c)**

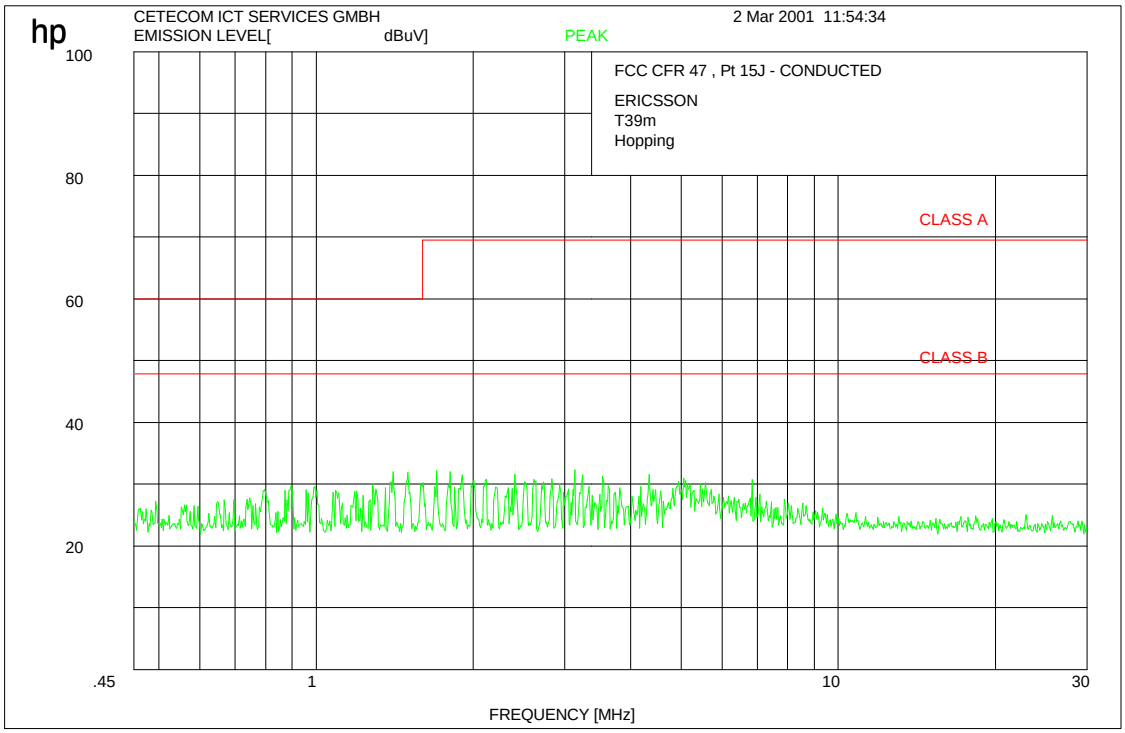
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
65

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

Conducted emissions **§ 15.107/207**

Measured with a SONY VAIO laptop powered by an AC/DC power adapter



Technical specification : 15.207 (Revised as of October 1, 1991)
Limit

0.45 to 30 MHz	250 µV / 47.96 dBµV

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
52 - 57

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

RECEIVER SPURIOUS RADIATION **§ 15.209**

Idle Mode

Radiated

SPURIOUS EMISSIONS LEVEL (µV/m)								
Idle Mode								
f (MHz)	Detector	Level (µV/m)	f (MHz)	Detector	Level (µV/m)	f (MHz)	Detector	Level (µV/m)
30.59	QP	30.6						
41.42	QP	31.2						
44.79	QP	30.2						
47.96	QP	36.0						
54.73	QP	28.8						
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz **f ³ 1GHz : RBW/VBW: 1 MHz**

Measurement distance see table

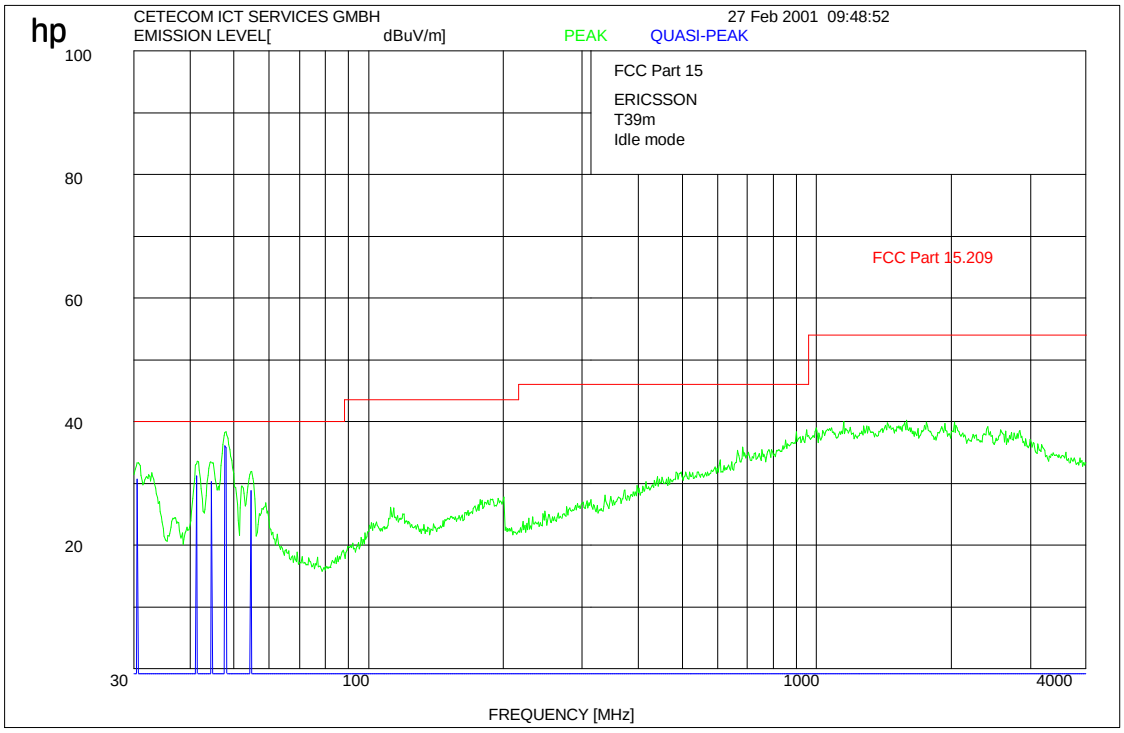
Limits **SUBCLAUSE § 15.209**

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%

RECEIVER SPURIOUS RADIATION § 15.209



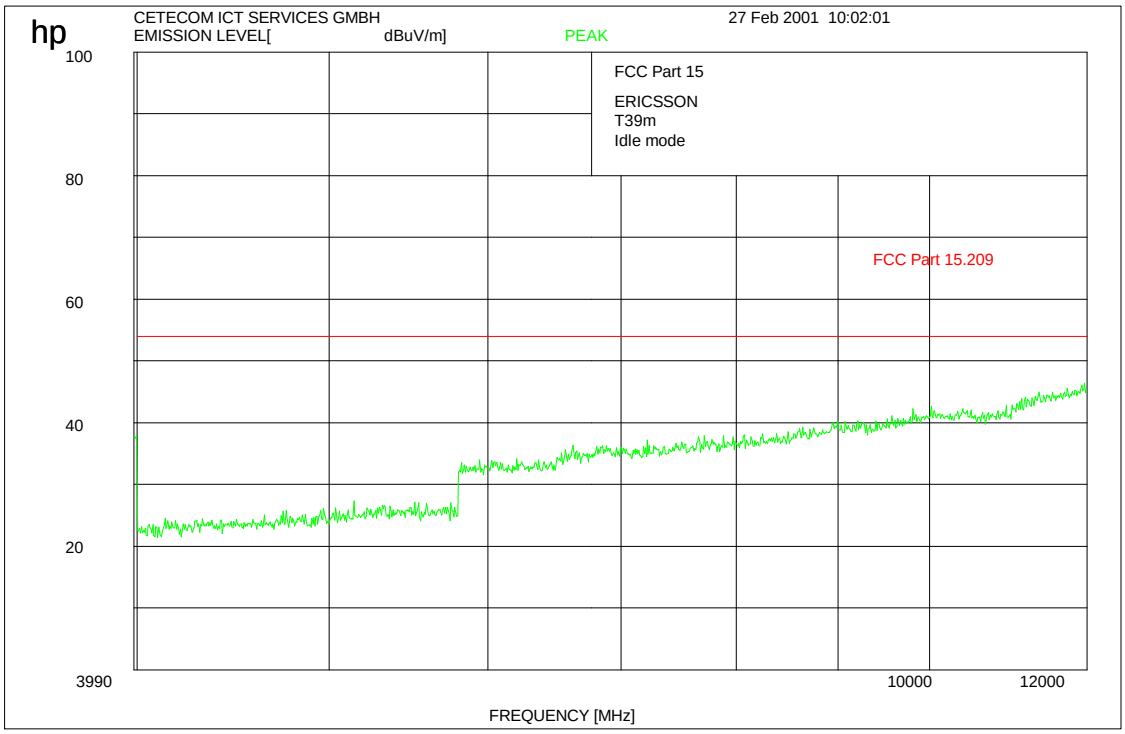
f < 1 GHz : RBW/VBW: 100 kHz **f ³ 1GHz : RBW/VBW: 1 MHz**

Limits **SUBCLAUSE § 15.209**

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%
RECEIVER SPURIOUS RADIATION **§ 15.209**



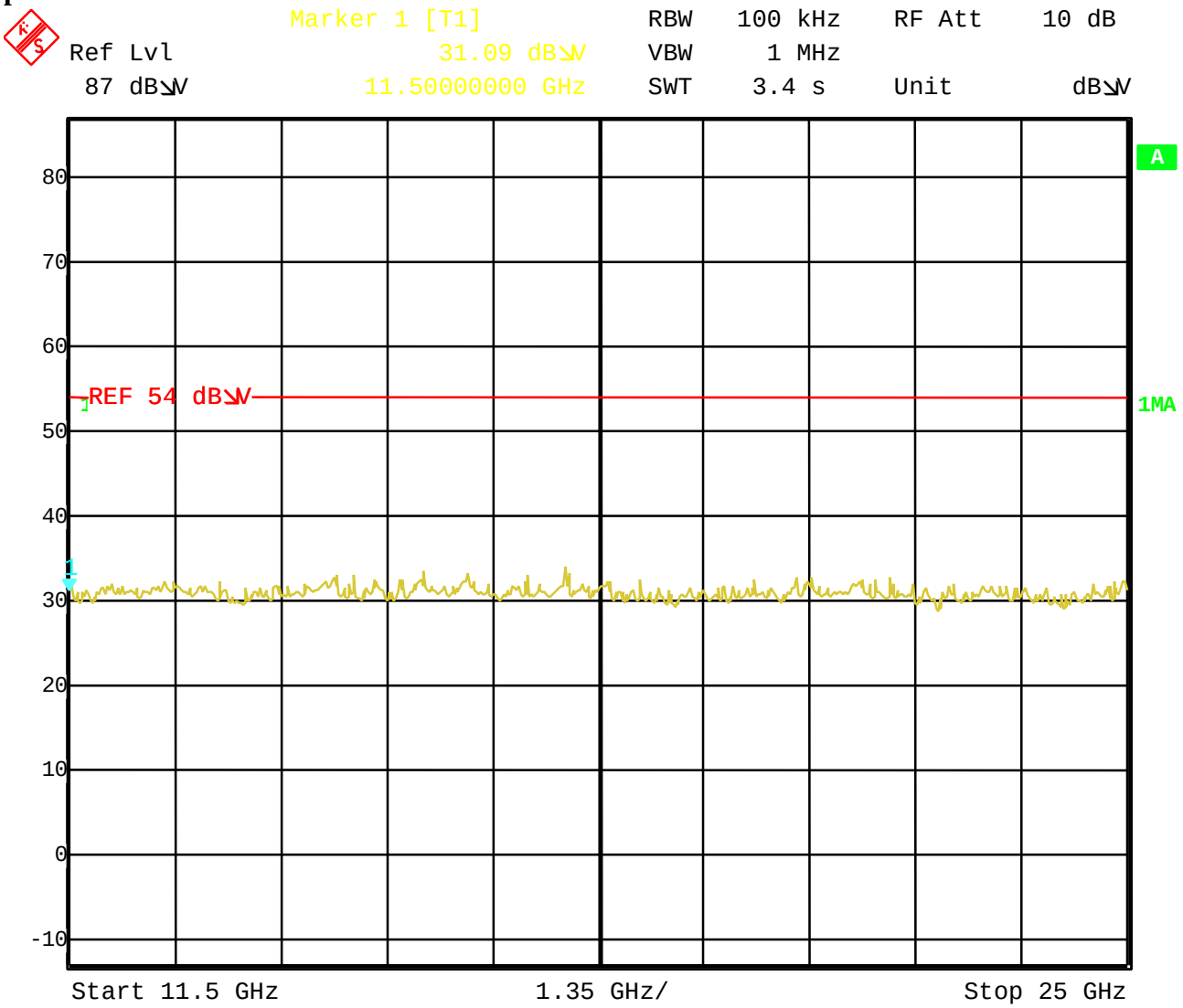
f < 1 GHz : RBW/VBW: 100 kHz **f ³ 1GHz : RBW/VBW: 1 MHz**

Limits **SUBCLAUSE § 15.209**

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%
RECEIVER SPURIOUS RADIATION **§ 15.209**
peak



Date: 27.FEB.2001 11:28:18

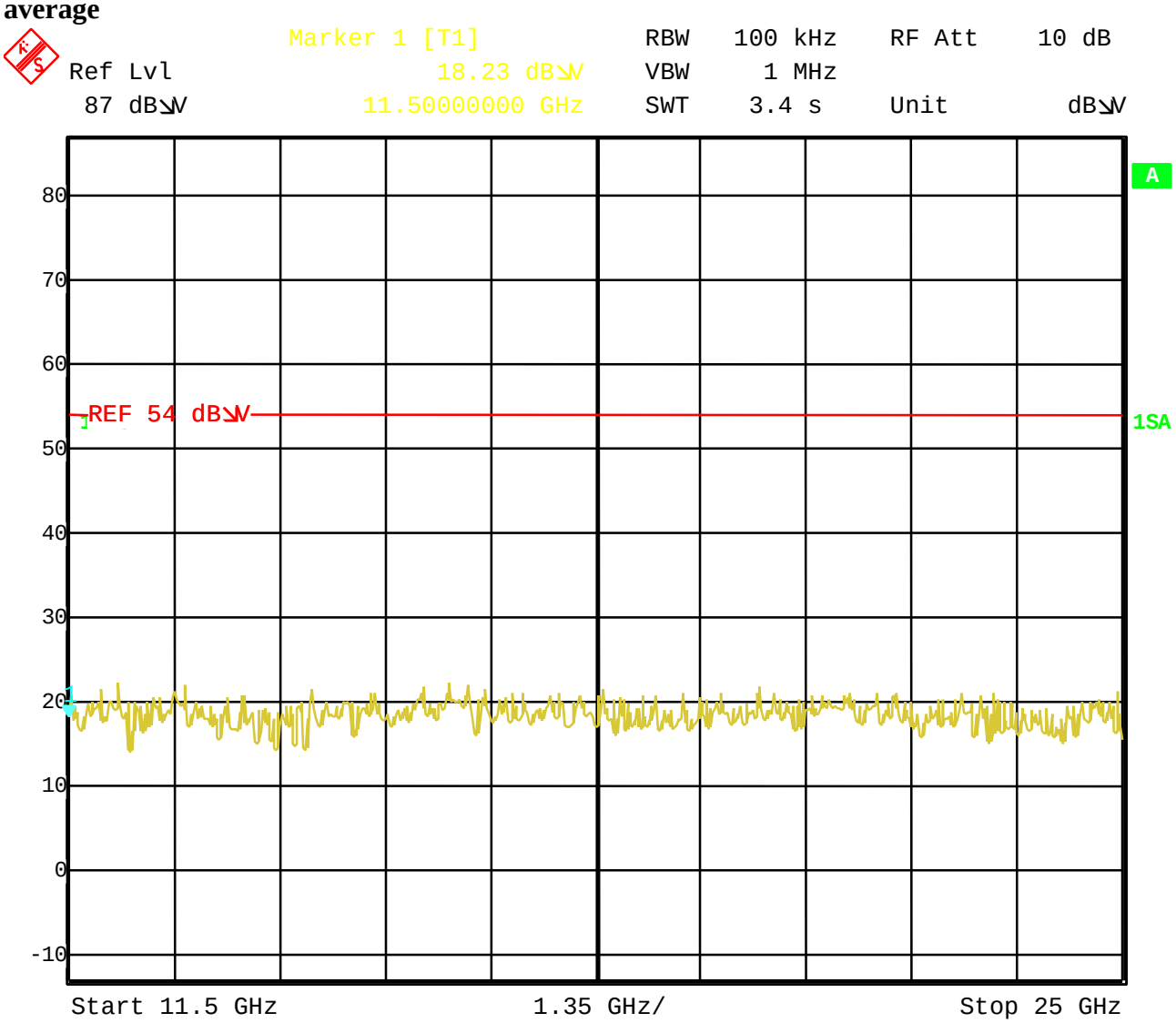
f < 1 GHz : RBW/VBW: 100 kHz **f ³ 1GHz : RBW/VBW: 1 MHz**

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

Equipment under test : 1130102-BV
Ambient temperature : 23 °C
Relative humidity : 31%
RECEIVER SPURIOUS RADIATION **§ 15.209**
average



Date: 27.FEB.2001 11:17:18

f < 1 GHz : RBW/VBW: 100 kHz **f ³ 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

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	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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