

TEST REPORT
of the accredited test laboratory

TÜV Nr.:M/FG-05/102

Geschäftsbereich
Medizintechnik,
Nachrichtentechnik
und EMV

Prüfstelle für
Nachrichtentechnik
und EMV

Prüfzentrum Wien
A - 1230 Wien
Deutschstraße 10

Tel: +43-1-61091-0
Fax: DW 6505
Mail: office@tuev.or.at

Applicant: Adcon Telemetry GmbH
Inkustr. 24
A-3400 Klosterneuburg

Tested Product: Telemetry transceiver

FCC-ID: SHXA731-46

Manufacturer: Adcon Telemetry GmbH
A-3400 Klosterneuburg; Inkustr. 24

Output power / 0,5 W max. **power supply:** 6,2 VDC
field strength:

Frequency range: 450 - 470 MHz **Channel separation:** 12,5 kHz

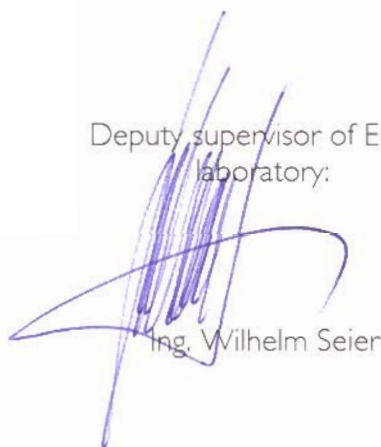
Standard: FCC: 47 CFR 90; RSS-119

Akkreditierte Prüf-,
Überwachungs-,
Zertifizierungs- und
Kalibrierstelle

Notified Body 0408

TUV Austria
Test laboratory for EMC

Deputy supervisor of EMC-
laboratory:



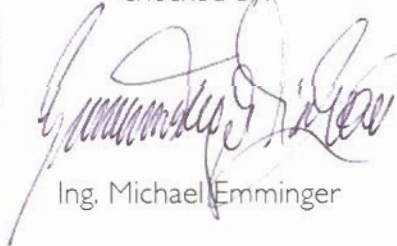
Ing. Wilhelm Seier



4. 4. 2005

Copy Nbr.: 01

checked by:



Ing. Michael Emminger

A publication of this test report is only permitted literally.
Copying or reproduction of partial sections needs a written permission of TÜV Austria.
The results of this test report only refer to the provided equipment.

LIST OF MEASUREMENTS

The complete list of measurements called for in 47 CFR 90 and (RSS-119) is given below.

SUBCLAUSE	PARAMETER TO BE MEASURED	PAGE
	Intentional Radiators	
	Test object data	3
2.1046(a) (6.2)	RF Power Output	4
90.210(d) (6.4)(d)	Emission Mask D	5-17
2.1051 (6.3)	Spurious conducted emissions	18-21
2.1053	Field strength of spurious emissions of the transmitter	22-31
90.213 (7)	Frequency stability	32-33
90.214 (6.5)	Transient frequency behaviour	34-40
(8)	Receiver spurious emissions	41-50

TEST OBJECT DATA

General EUT Description

This telemetry equipment will be used to collect data and write it into memory and send it out on the 70cm band. This telemetry equipment will be situated in environment where normally no persons are situated and will work without user interaction.

2.1033 (c) Technical description

2.1033 (4) Type of emission: 8K50F1D – channel spacing 12,5 kHz

2.1033 (5) Frequency range: 450 – 470 MHz

2.1033 (6) Power range and Controls: There are NO user power controls, although the power level is programmable by the manufacturer and his representative down to a level of 5% to 10% of the maximum rated power.

2.1033 (7) Maximum output power rating: 0,5 W into 50 Ohm

2.1033 (8) DC Voltage and Current: 6,2 V nominal 10V maximum
maximum current consumption: 0,44A

Power Output

§ 2.1046(a)
§ 6.2

Conducted Measurement

Test conditions		Transmitter power (mW)		
		450 MHz	460 MHz	470 MHz
T_{nom} (23)°C	V_{nom} (6,2)V	0,468	0,481	0,493
Maximum deviation from output power under normal test conditions (dB)		-0,29	-0,17	-0,06
Measurement uncertainty		$\pm 0,75$ dB		

LIMIT

SUBCLAUSE 2.1046(a) (6.2)

Under normal test conditions	± 1 dB
------------------------------	------------

Test Equipment used: NT-207

Emissions Mask D

§ 90.210 (d)

§ 6.4 (d)

LIMIT

90.210 (d) and 6.4 (d):

For transmitters designed to operate with a 12,5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(1) On any frequency from the center of the authorized bandwidth f_0 to 5,625 kHz removed from f_0 :

Zero dB.

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5,625 kHz but no more than 12,5 kHz: At least $7,27(f_d - 2,88 \text{ kHz})$ dB.

(3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12,5 kHz: At least $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.

Emissions Mask D

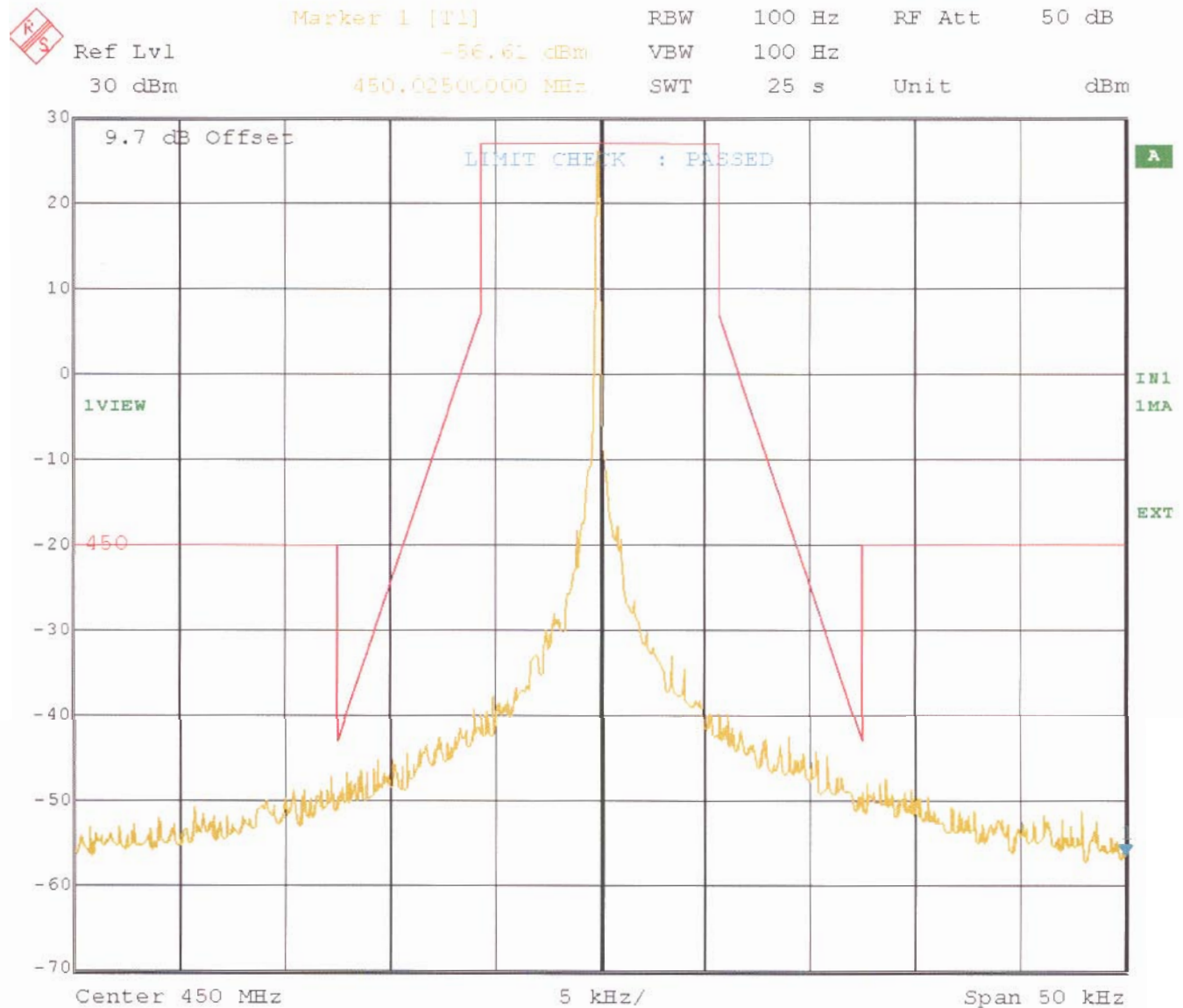
§ 90.210 (d)

§ 6.4 (d)

Operating mode:

Frequency: 450 MHz

Modulation: unmodulated carrier



Date: 17.FEB.2005 11:04:12

Test Equipment used: NT-207

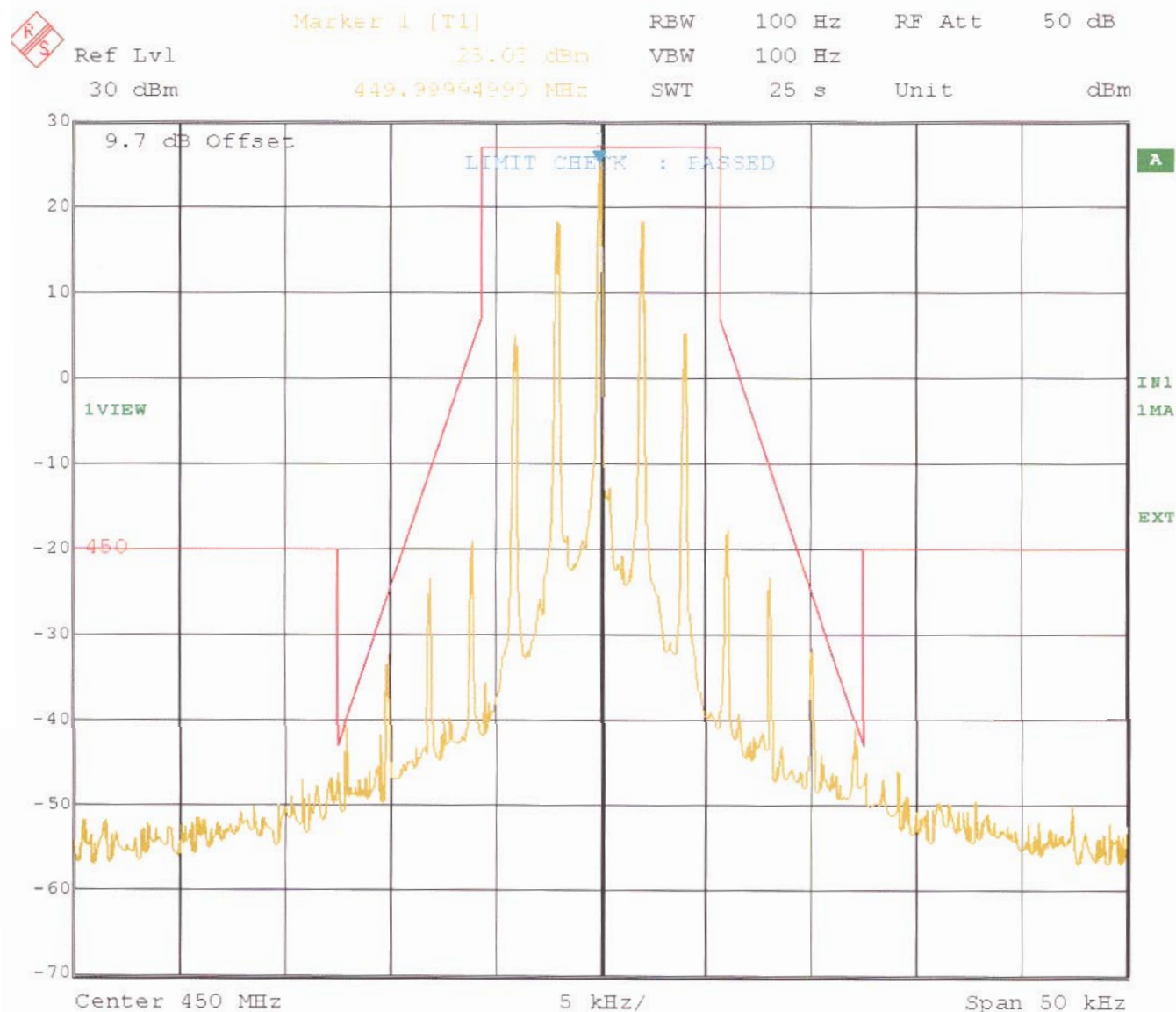
Emissions Mask D

§ 90.210 (d)
§ 6.4 (d)

Operating mode:

Frequency: 450 MHz

Modulation: modulated carrier symbol 0 (2 kHz)



Date: 17.FEB.2005 11:12:34

Test Equipment used: NT-207

Ambient temperature: 23°C

Relative humidity: 51%

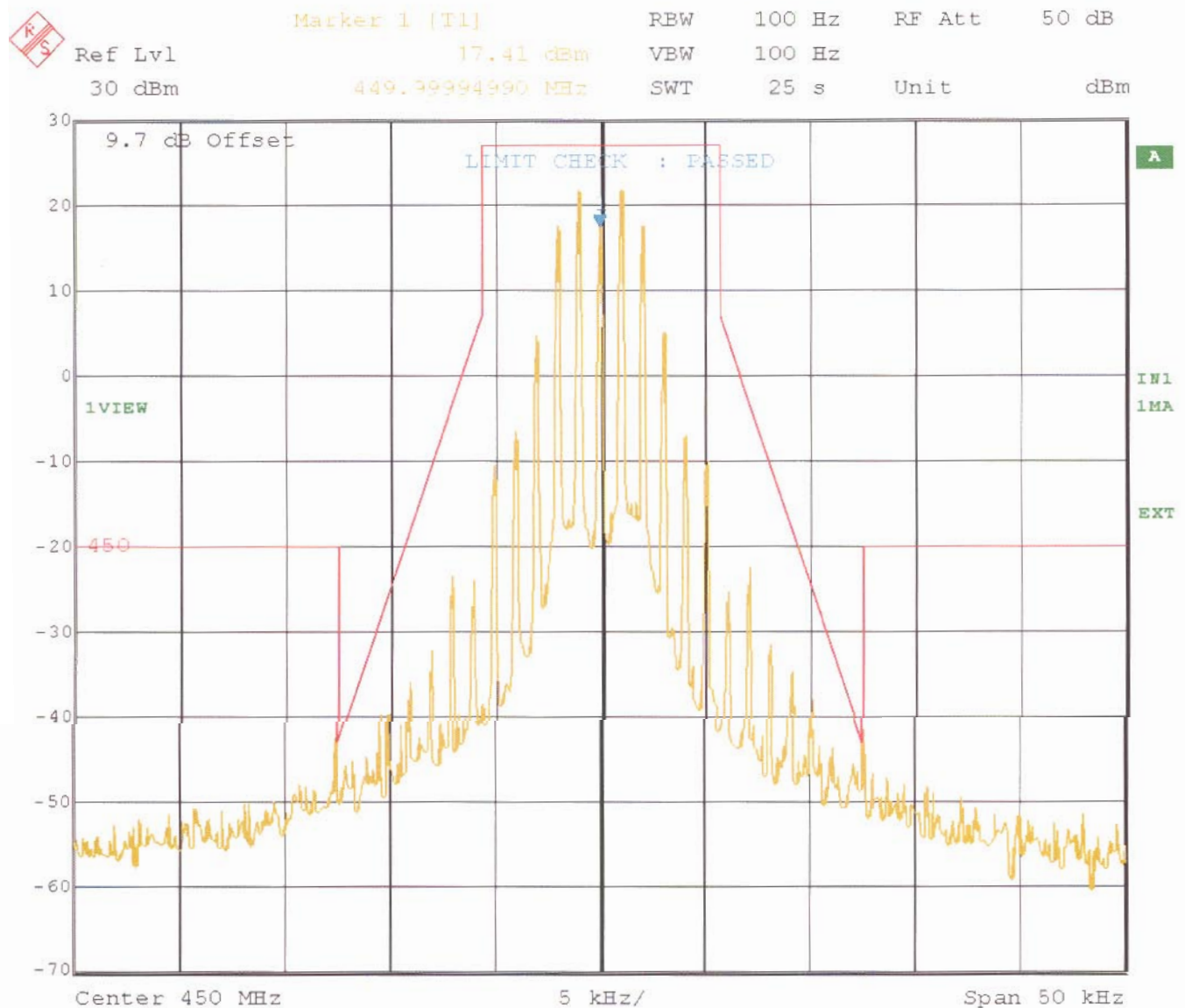
Emissions Mask D

§ 90.210 (d)
§ 6.4 (d)

Operating mode:

Frequency: 450 MHz

Modulation: modulated carrier symbol 1 (1 kHz)



Date: 17.FEB.2005 11:15:55

Test Equipment used: NT-207

Ambient temperature: 23°C

Relative humidity: 51%

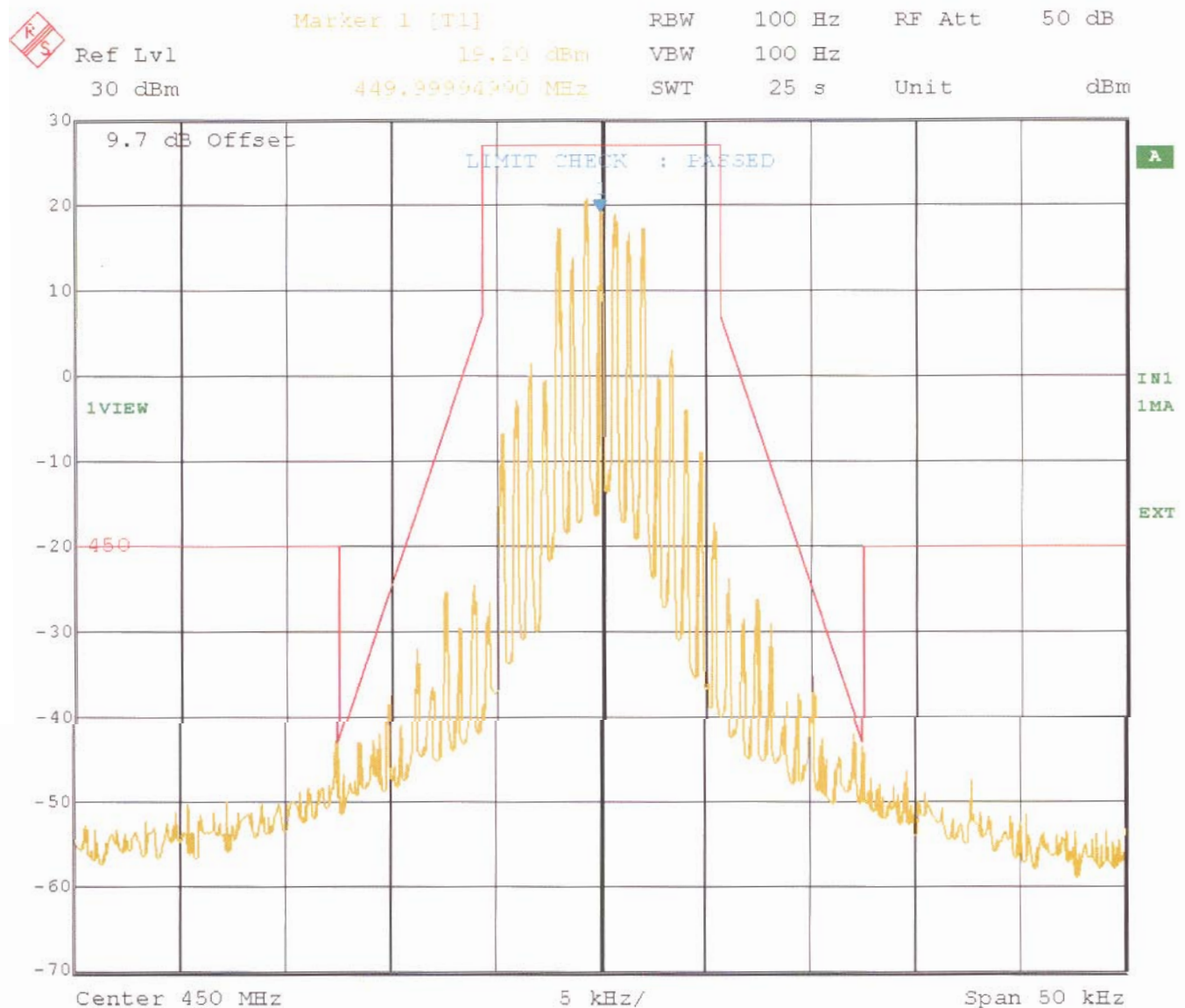
Emissions Mask D

§ 90.210 (d)
§ 6.4 (d)

Operating mode:

Frequency: 450 MHz

Modulation: modulated carrier symbol 0/1 at 4000 bps



Date: 17.FEB.2005 11:18:27

Test Equipment used: NT-207

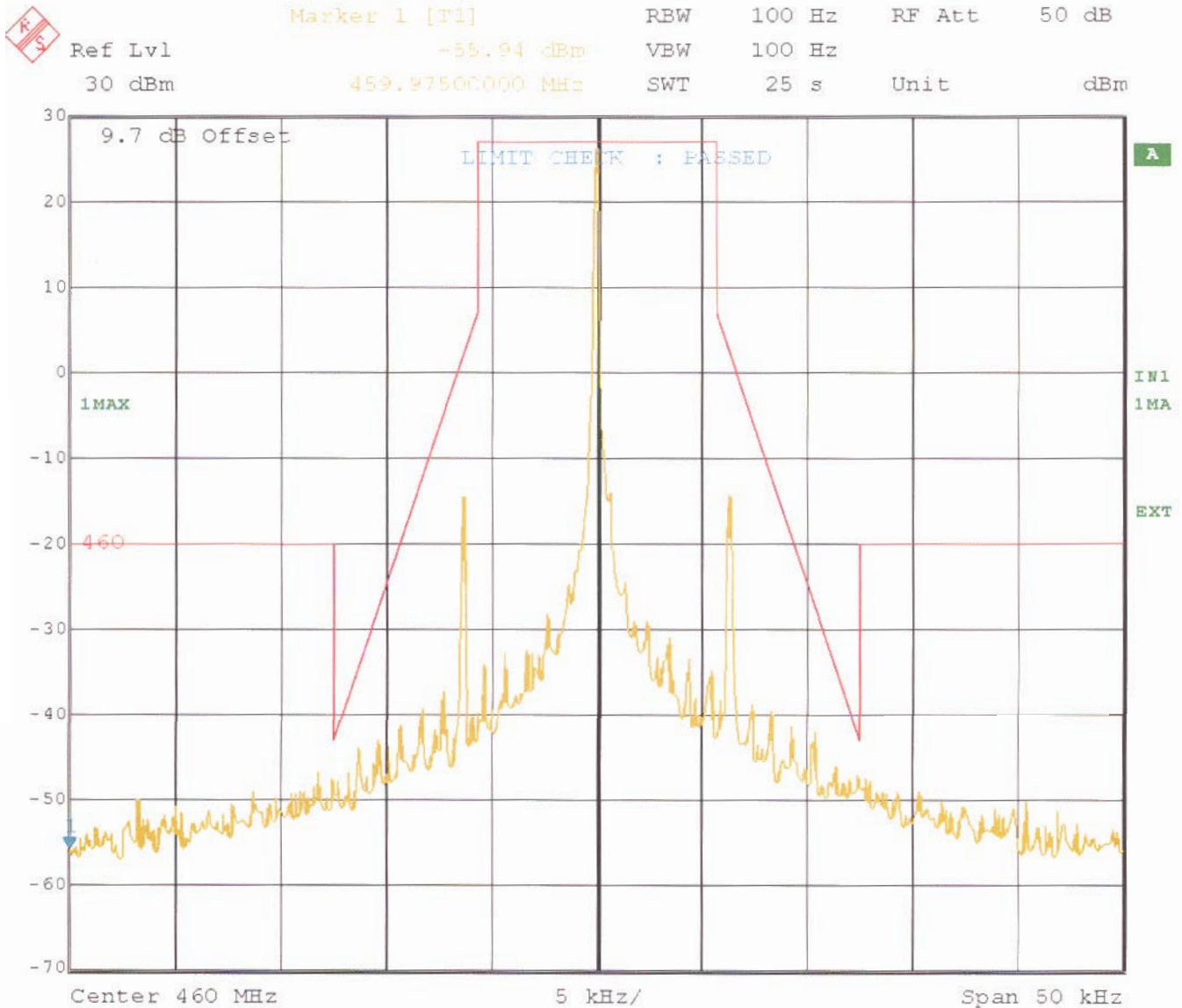
Emissions Mask D

§ 90.210 (d)
§ 6.4 (d)

Operating mode:

Frequency: 460 MHz

Modulation: unmodulated carrier



Date: 17.FEB.2005 11:26:02

Test Equipment used: NT-207

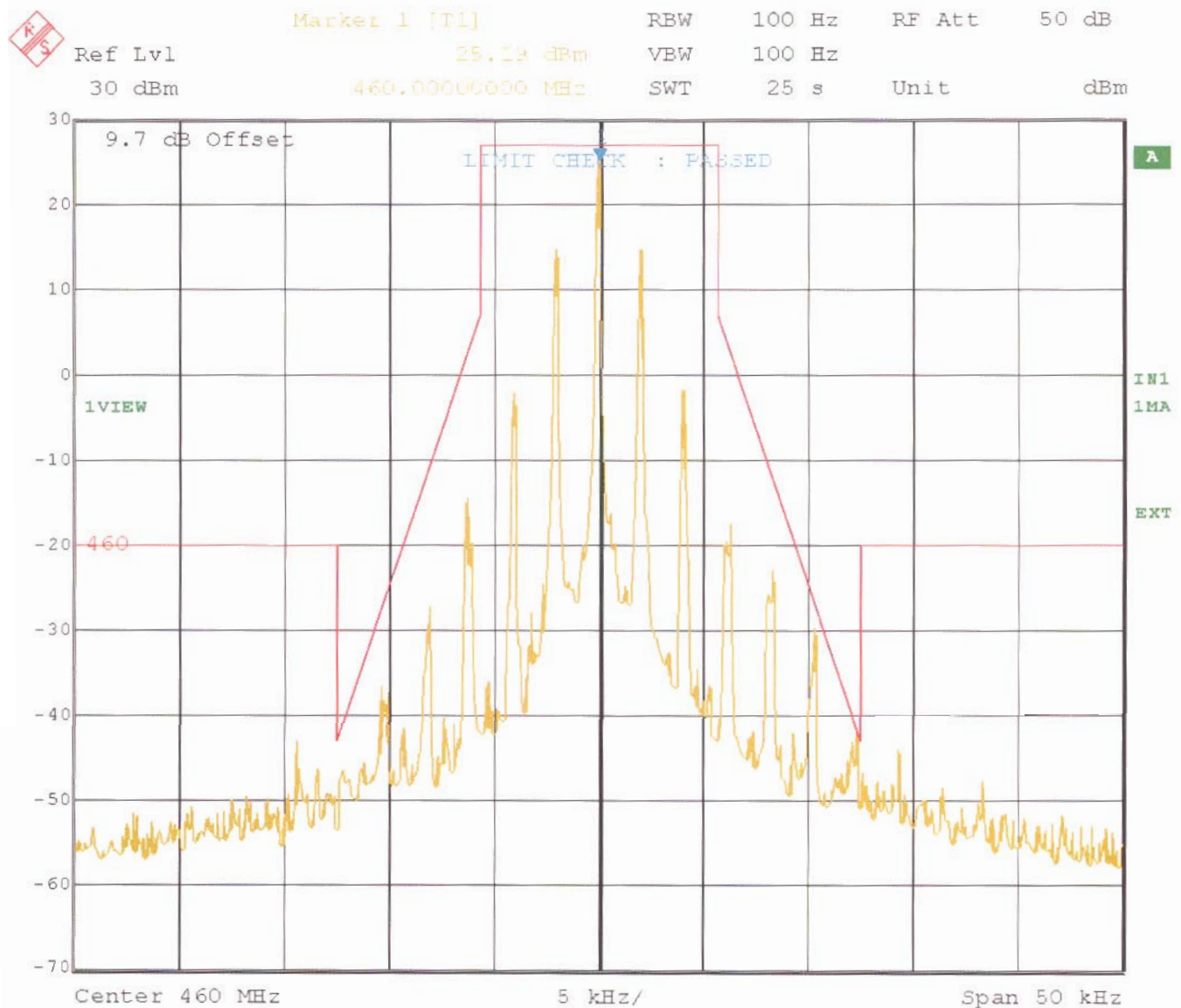
Emissions Mask D

§ 90.210 (d)
§ 6.4 (d)

Operating mode:

Frequency: 460 MHz

Modulation: modulated carrier symbol 0 (2 kHz)



Date: 17.FEB.2005 11:33:16

Test Equipment used: NT-207

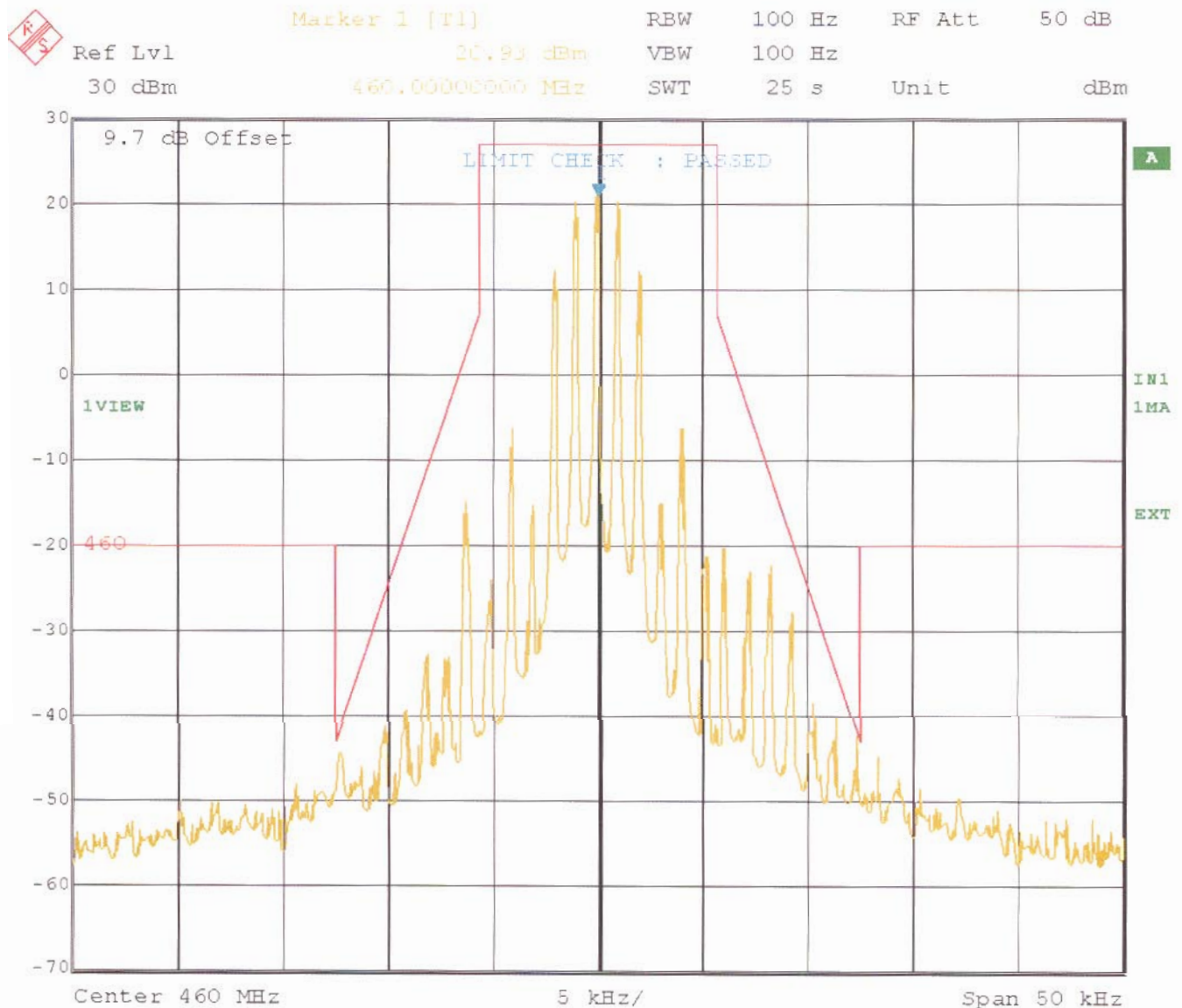
Emissions Mask D

§ 90.210 (d)
§ 6.4 (d)

Operating mode:

Frequency: 460 MHz

Modulation: modulated carrier symbol 1 (1 kHz)



Date: 17.FEB.2005 11:49:03

Test Equipment used: NT-207

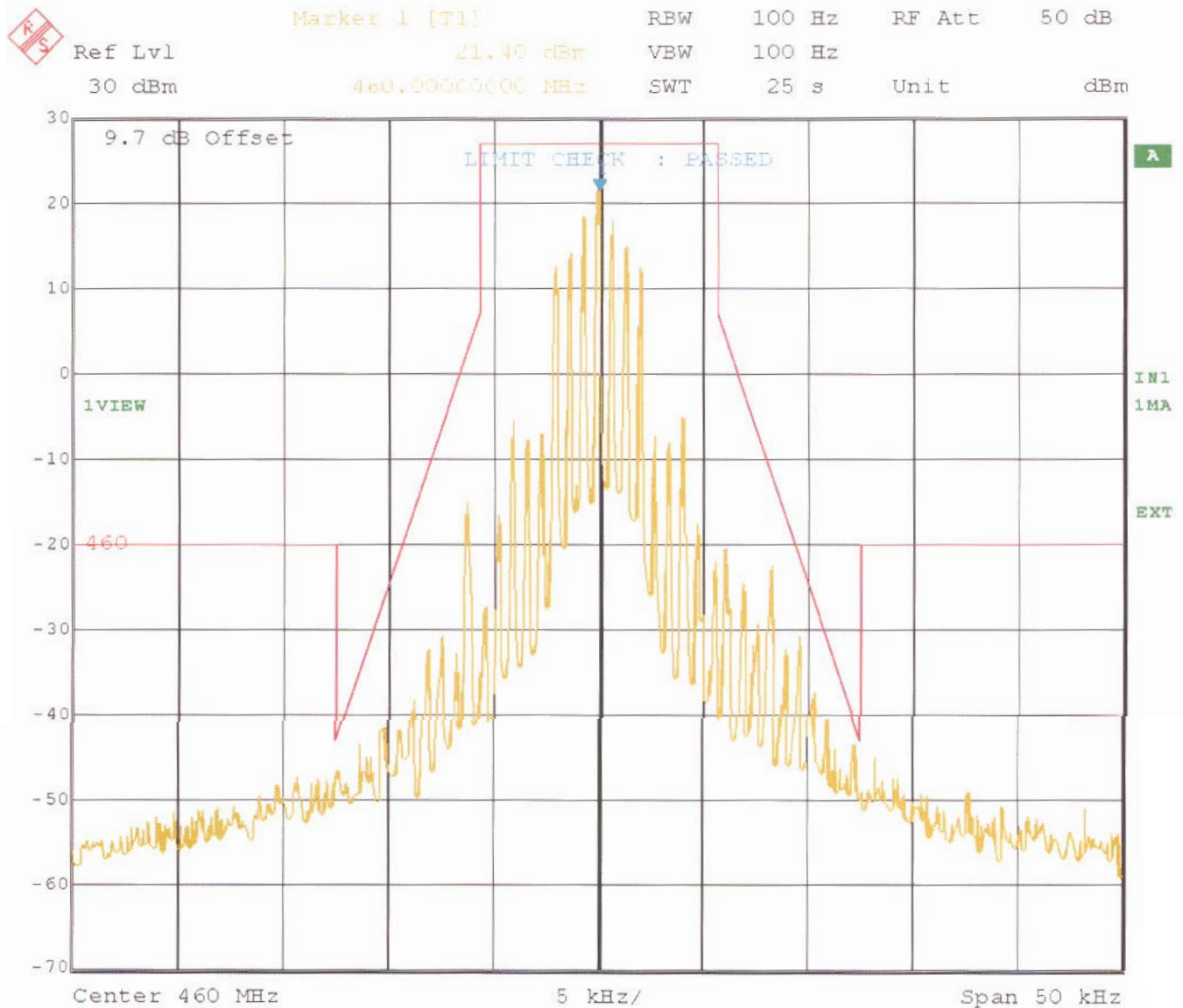
Emissions Mask D

§ 90.210 (d)
§ 6.4 (d)

Operating mode:

Frequency: 460 MHz

Modulation: modulated carrier symbol 0/1 at 4000 bps



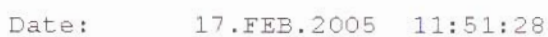
Date: 17.FEB.2005 11:50:10

Test Equipment used: NT-207

Relative humidity: 51%

§ 90.210 (d)
§ 6.4 (d)

Modulation: unmodulated carrier



File: 05-102.doc/4.4 2005

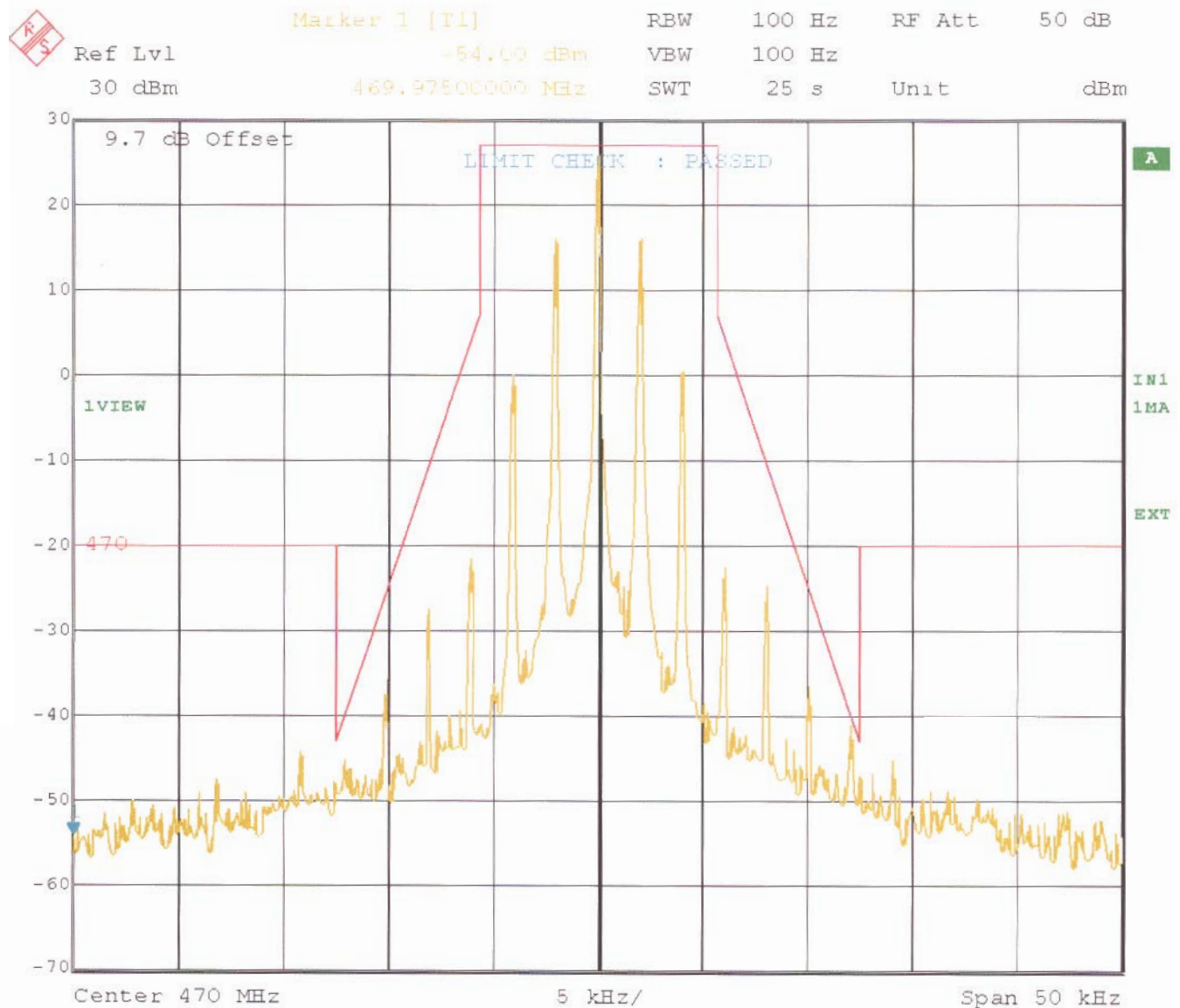
Emissions Mask D

§ 90.210 (d)
§ 6.4 (d)

Operating mode:

Frequency: 470 MHz

Modulation: modulated carrier symbol 0 (2 kHz)



Date: 17.FEB.2005 11:52:34

Test Equipment used: NT-207

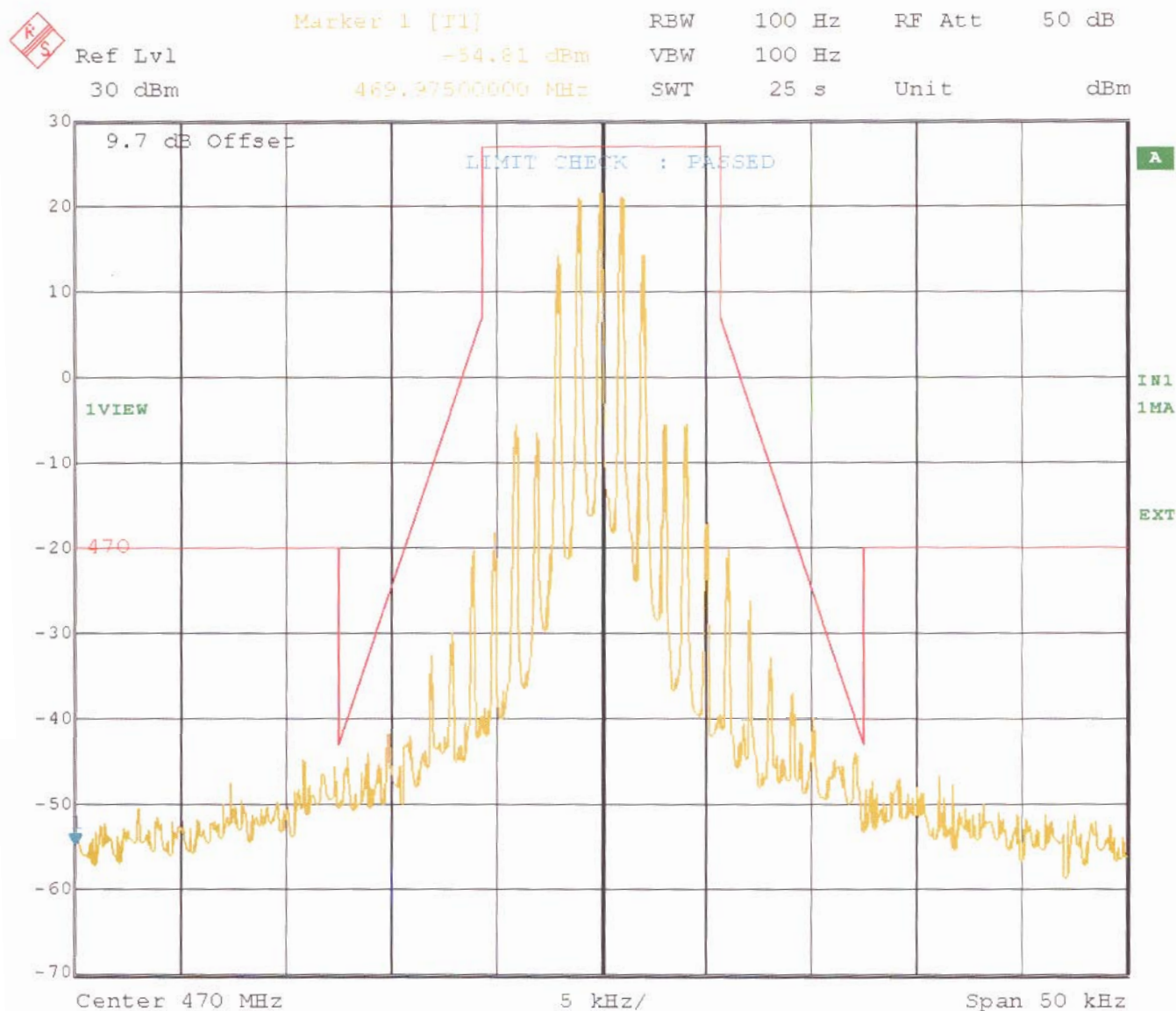
Emissions Mask D

§ 90.210 (d)
§ 6.4 (d)

Operating mode:

Frequency: 470 MHz

Modulation: modulated carrier symbol 1 (1 kHz)



Date: 17.FEB.2005 11:53:40

Test Equipment used: NT-207

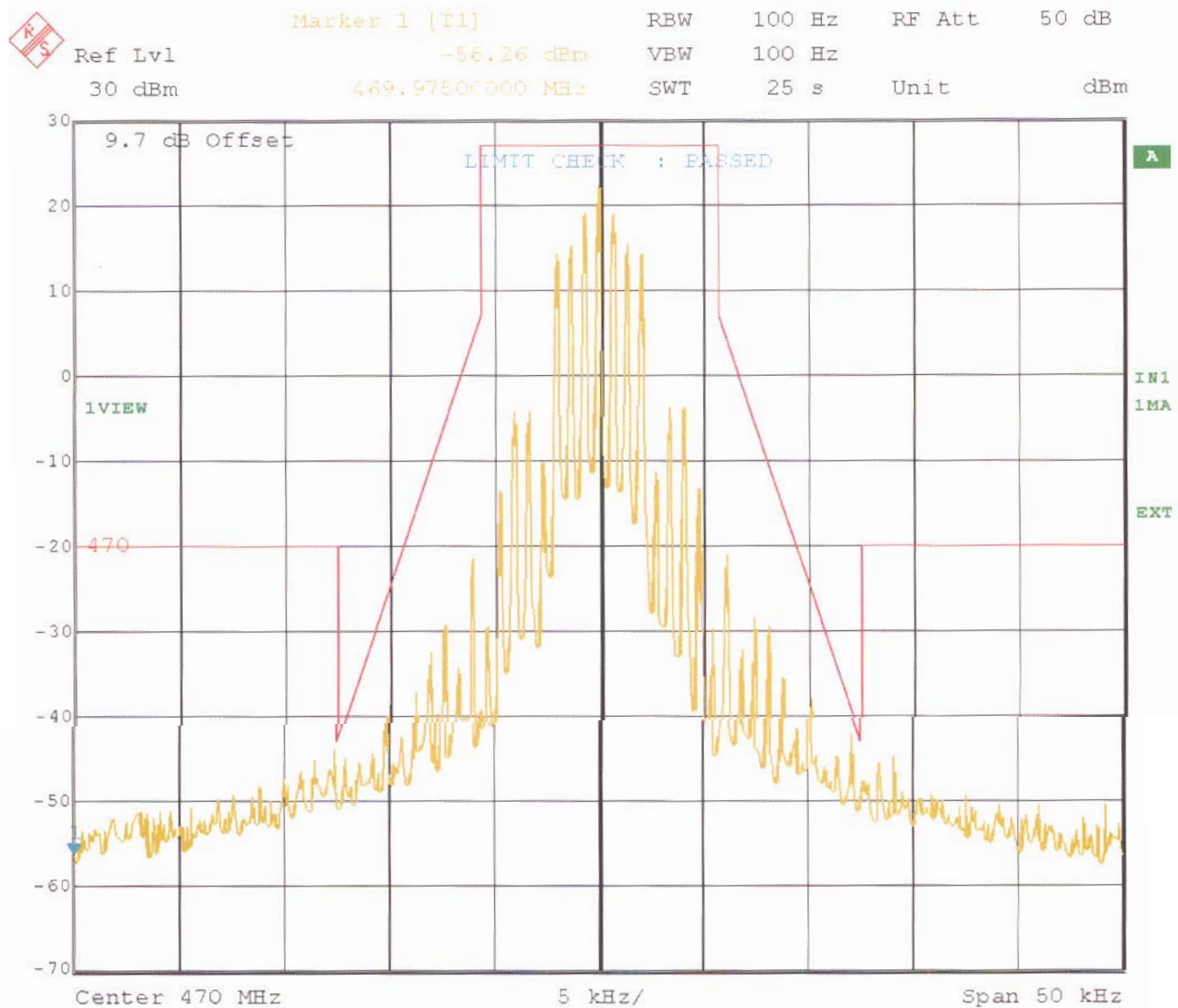
Emissions Mask D

§ 90.210 (d)
§ 6.4 (d)

Operating mode:

Frequency: 470 MHz

Modulation: modulated carrier symbol 0/1 at 4000 bps



Date: 17.FEB.2005 11:55:08

Test Equipment used: NT-207

Spurious conducted emissions

§ 2.1051

§ 6.3

LIMIT

90.210 (d) and 6.4 (d):

For transmitters designed to operate with a 12,5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12,5 kHz: At least $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.

With the given transmitter output Power of 500 mW this results in an absolute Limit of -20 dBm.

Results:

There were no other relevant emissions found except the harmonics in the spectrum from 9 kHz to the 10th harmonic.

Ambient temperature: 23°C

Relative humidity: 51%

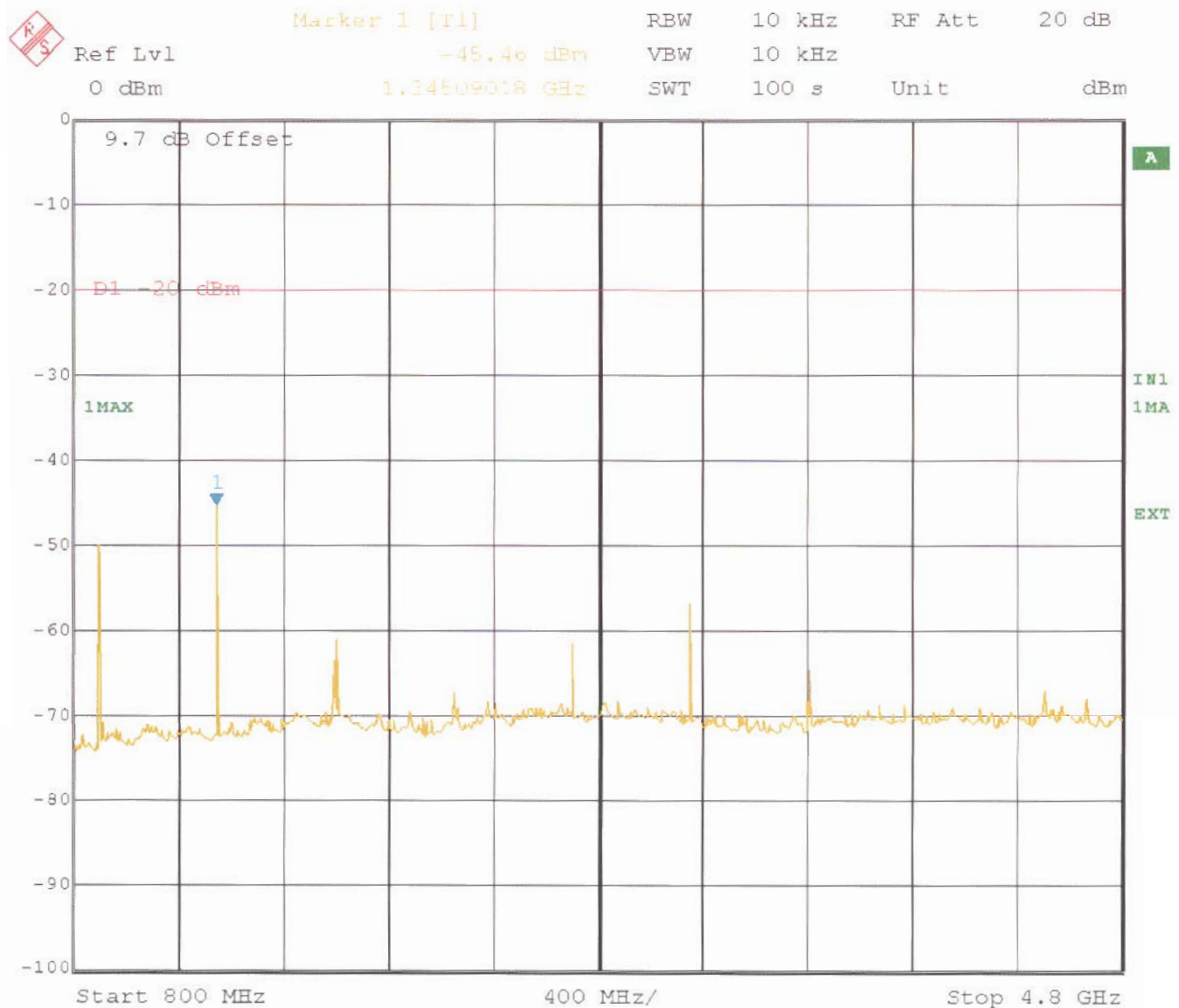
Spurious conducted emissions

§ 2.1051
§ 6.3

Operating mode:

Frequency: 450 MHz

Modulation: unmodulated carrier



Date: 17.FEB.2005 12:25:54

Test Equipment used: NT-207

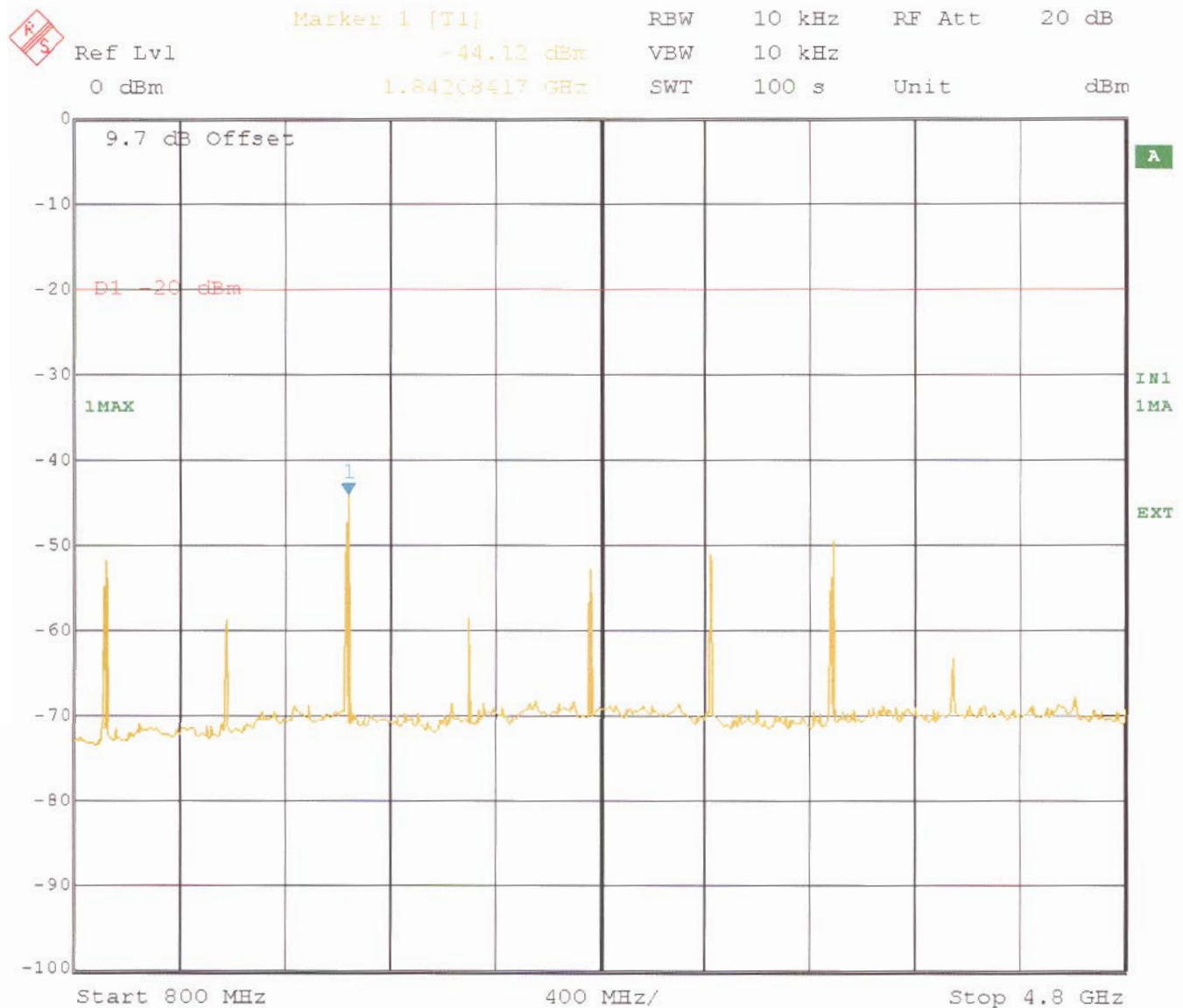
Spurious conducted emissions

§ 2.1051
§ 6.3

Operating mode:

Frequency: 460 MHz

Modulation: unmodulated carrier



Date: 17.FEB.2005 12:20:54

Test Equipment used: NT-207

Spurious conducted emissions

§ 2.1051
§ 6.3

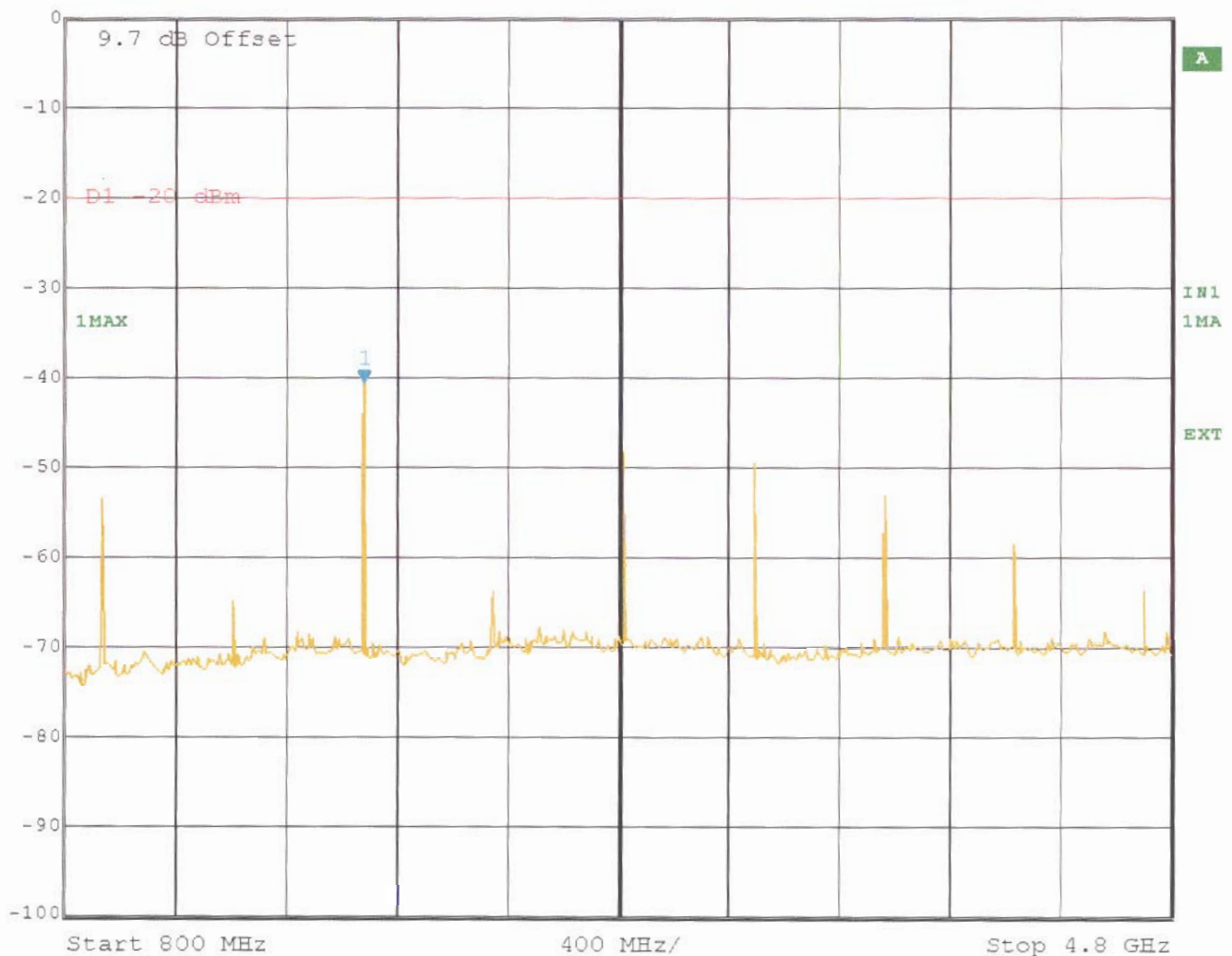
Operating mode:

Frequency: 470 MHz

Modulation: unmodulated carrier



Marker 1 [T1] RBW 10 kHz RF Att 20 dB
Ref Lvl 40.60 dBm VBW 10 kHz
0 dBm 1.83216435 GHz SWT 100 s Unit dBm



Date: 17.FEB.2005 12:10:55

Test Equipment used: NT-207

Field strength of spurious emissions of the transmitter

§ 2.1053

LIMIT

90.210 (d) and 6.4 (d):

For transmitters designed to operate with a 12,5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12,5 kHz: At least $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.

With the given transmitter output Power of 500 mW this results in an absolute Limit of -20 dBm.

Results:

There were no other relevant emissions found except the harmonics in the spectrum from 30 MHz to the 10th harmonic.

CHANNEL					
450 MHz		460 MHz		470 MHz	
Frequency (MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)
All	< -40	All	< -40	1410	-36,86
				1880	-33,66
				2350	-35,55
				All others	< -40

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207

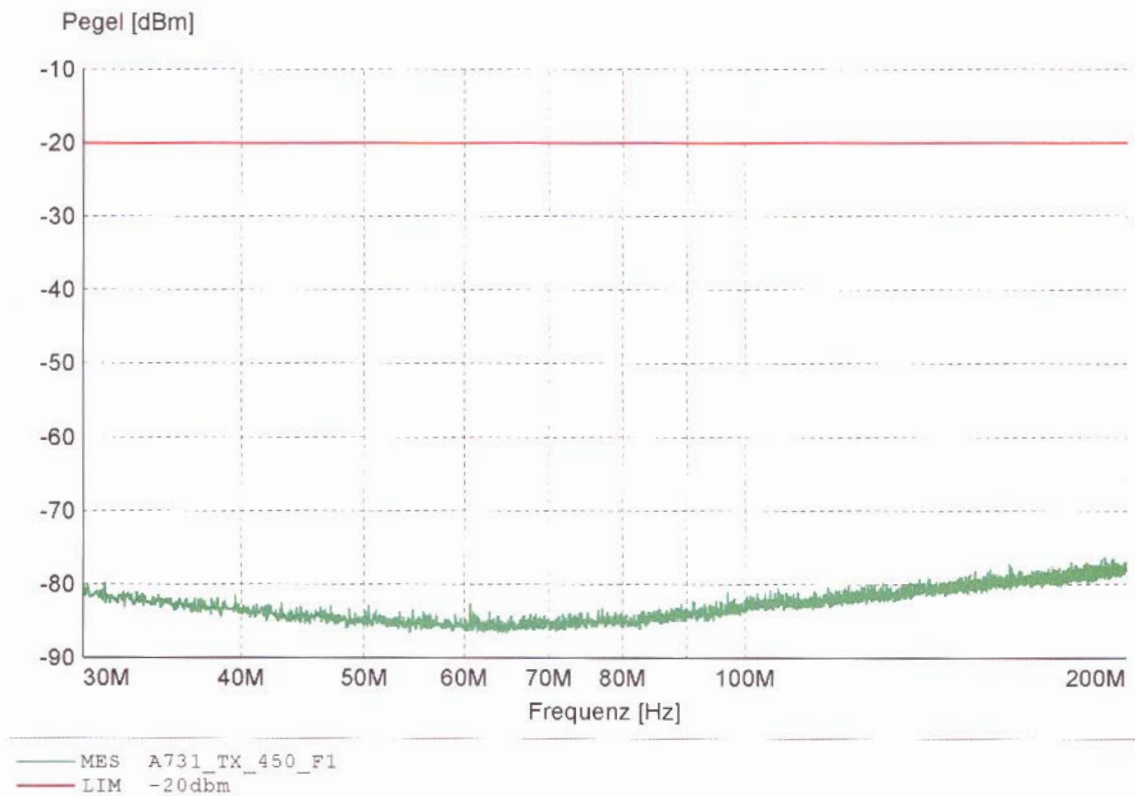
Field strength of spurious emissions of the transmitter

§ 2.1053

Operating mode:

Frequency: 450 MHz

Modulation: unmodulated carrier



Seite 1 21.02.2005 15:15

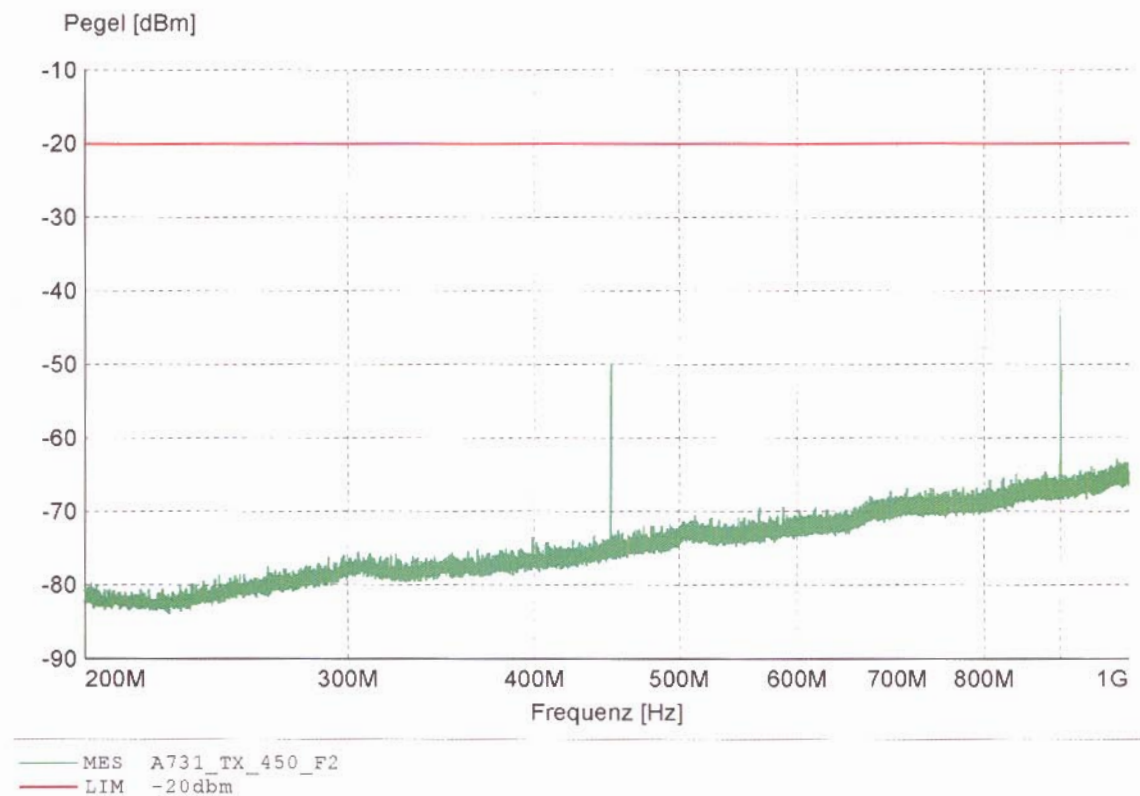
Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207

Field strength of spurious emissions of the transmitter § 2.1053

Operating mode:

Frequency: 450 MHz

Modulation: unmodulated carrier



Seite 1 21.02.2005 15:20

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207

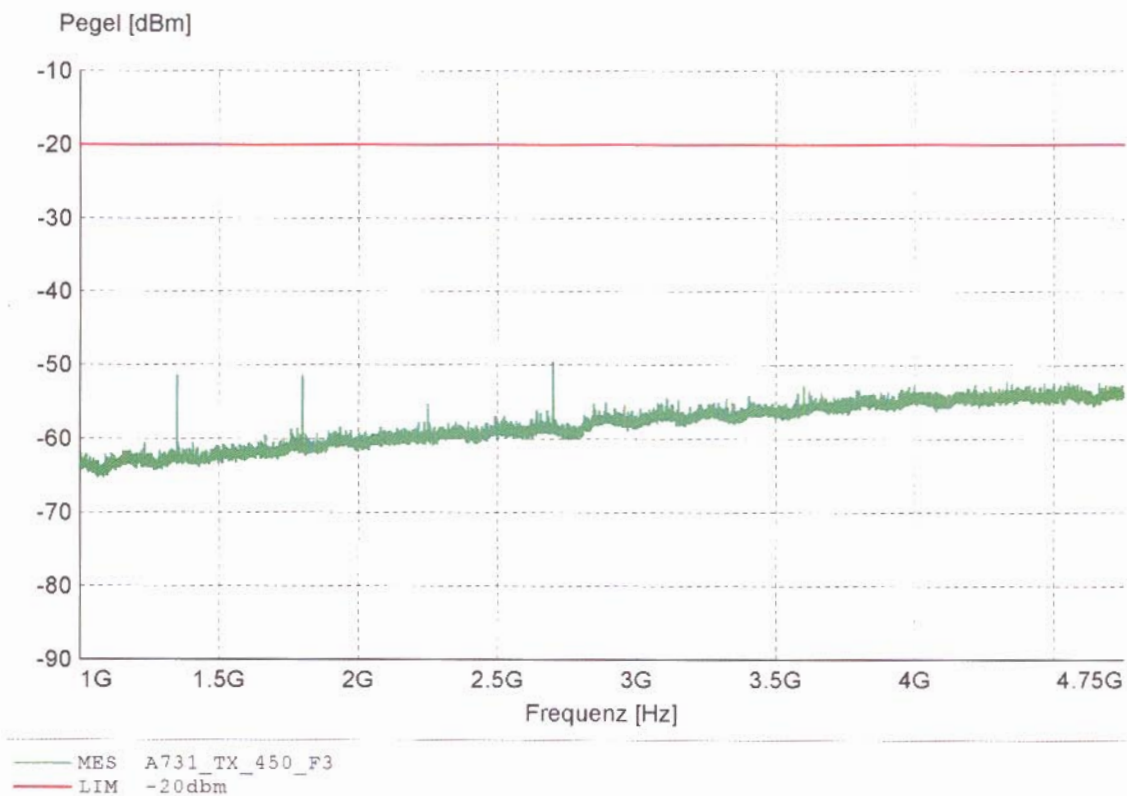
Field strength of spurious emissions of the transmitter

§ 2.1053

Operating mode:

Frequency: 450 MHz

Modulation: unmodulated carrier



Seite 1 21.02.2005 15:28

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207

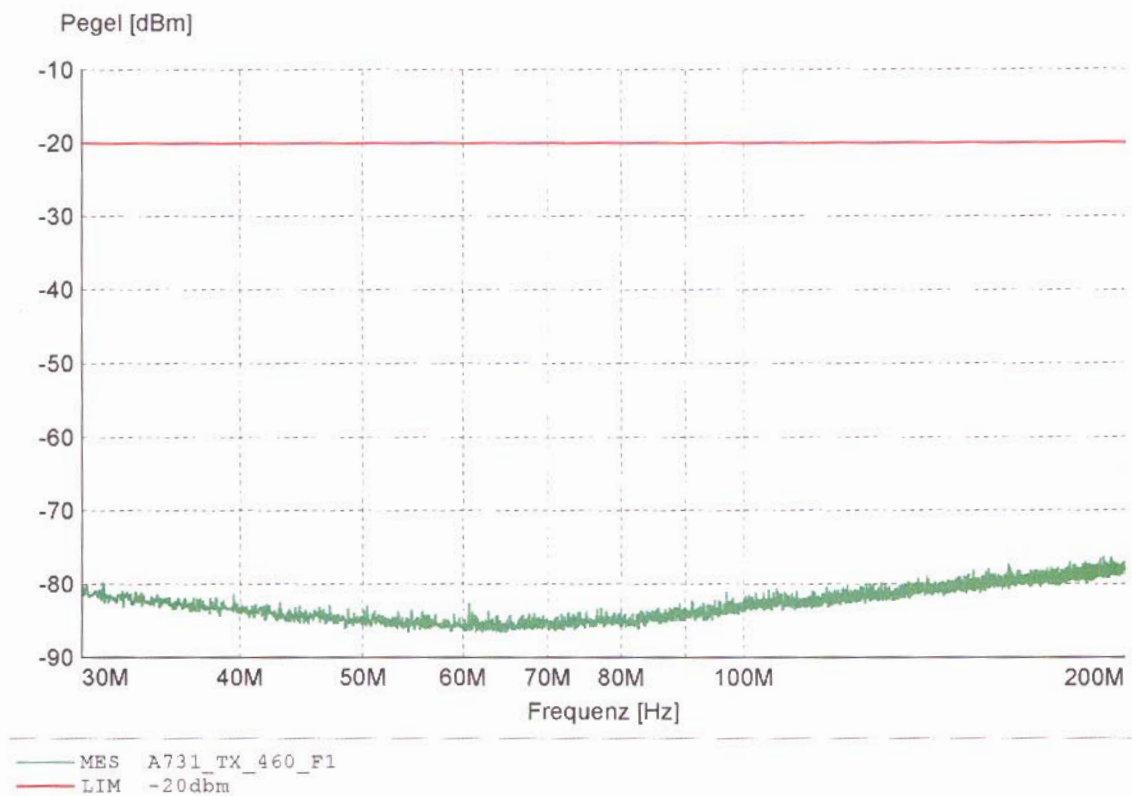
Field strength of spurious emissions of the transmitter

§ 2.1053

Operating mode:

Frequency: 460 MHz

Modulation: unmodulated carrier



Seite 1 21.02.2005 15:16

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207

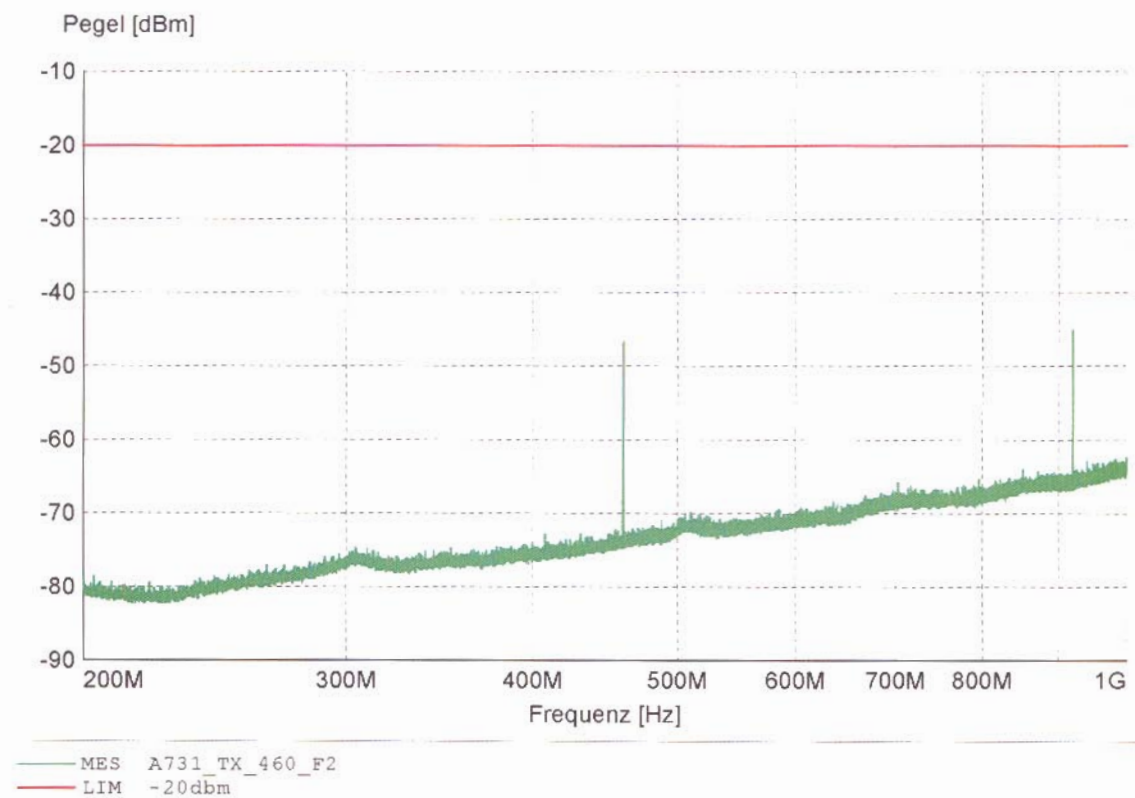
Field strength of spurious emissions of the transmitter

§ 2.1053

Operating mode:

Frequency: 460 MHz

Modulation: unmodulated carrier



Seite 1 21.02.2005 15:21

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207

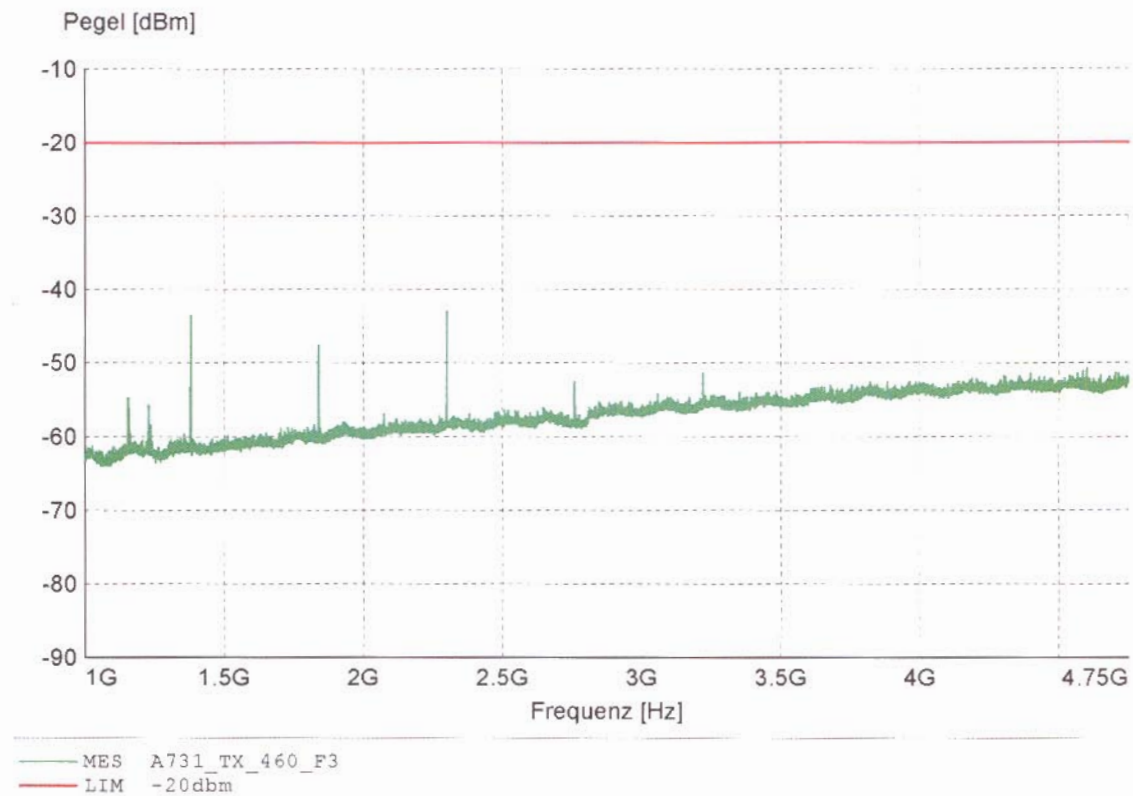
Field strength of spurious emissions of the transmitter

§ 2.1053

Operating mode:

Frequency: 460 MHz

Modulation: unmodulated carrier



Seite 1 27.03.2005 15:28

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207

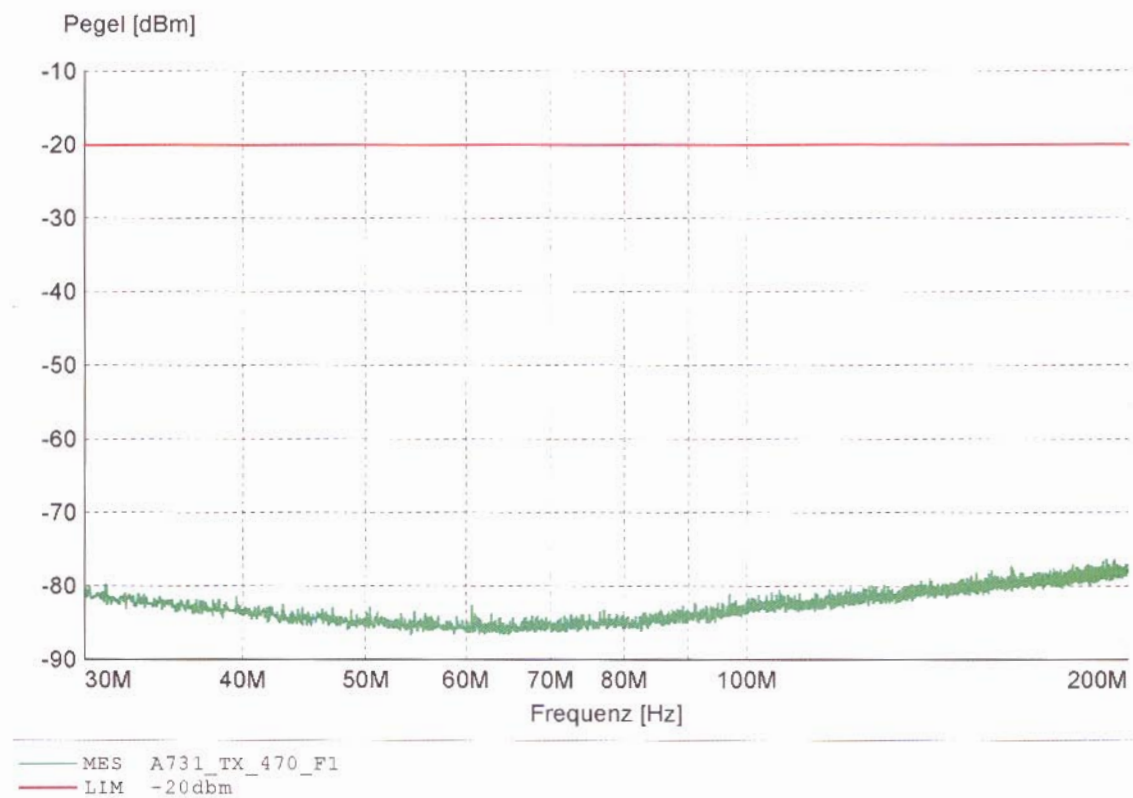
Field strength of spurious emissions of the transmitter

§ 2.1053

Operating mode:

Frequency: 470 MHz

Modulation: unmodulated carrier



Seite 1 21.02.2005 15:16

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207

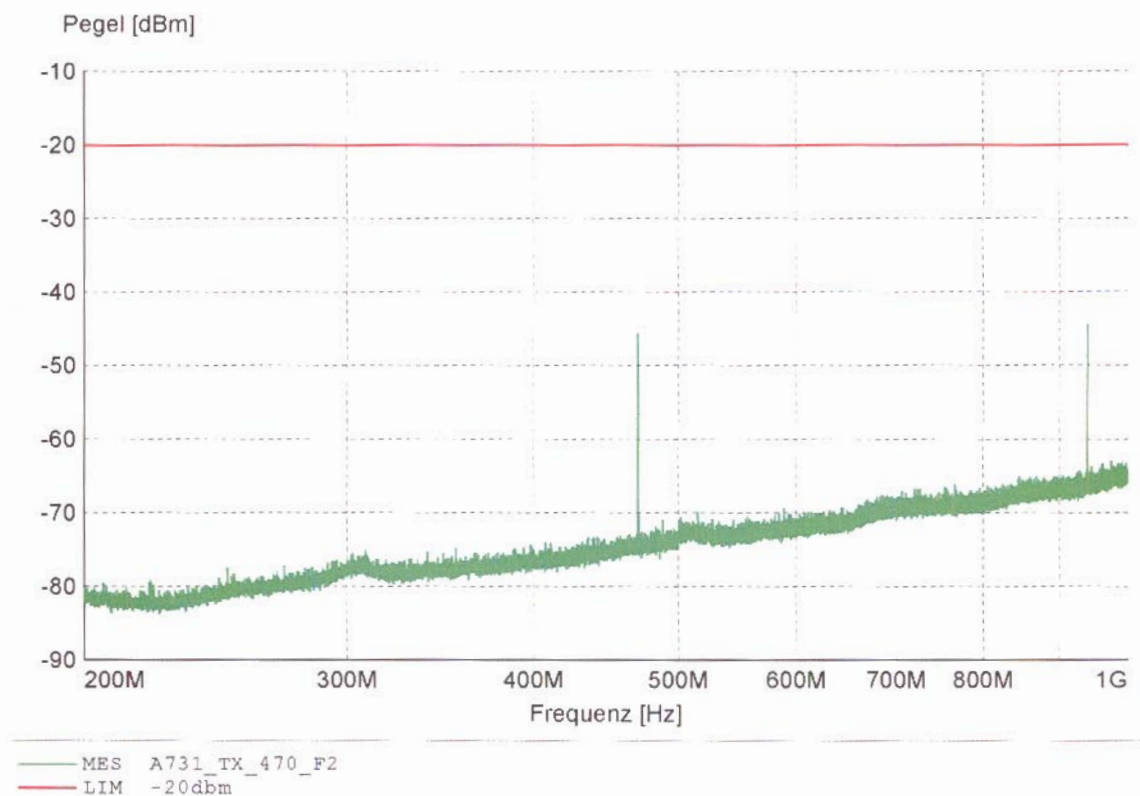
Field strength of spurious emissions of the transmitter

§ 2.1053

Operating mode:

Frequency: 470 MHz

Modulation: unmodulated carrier



Seite 1 21.02.2005 15:21

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207

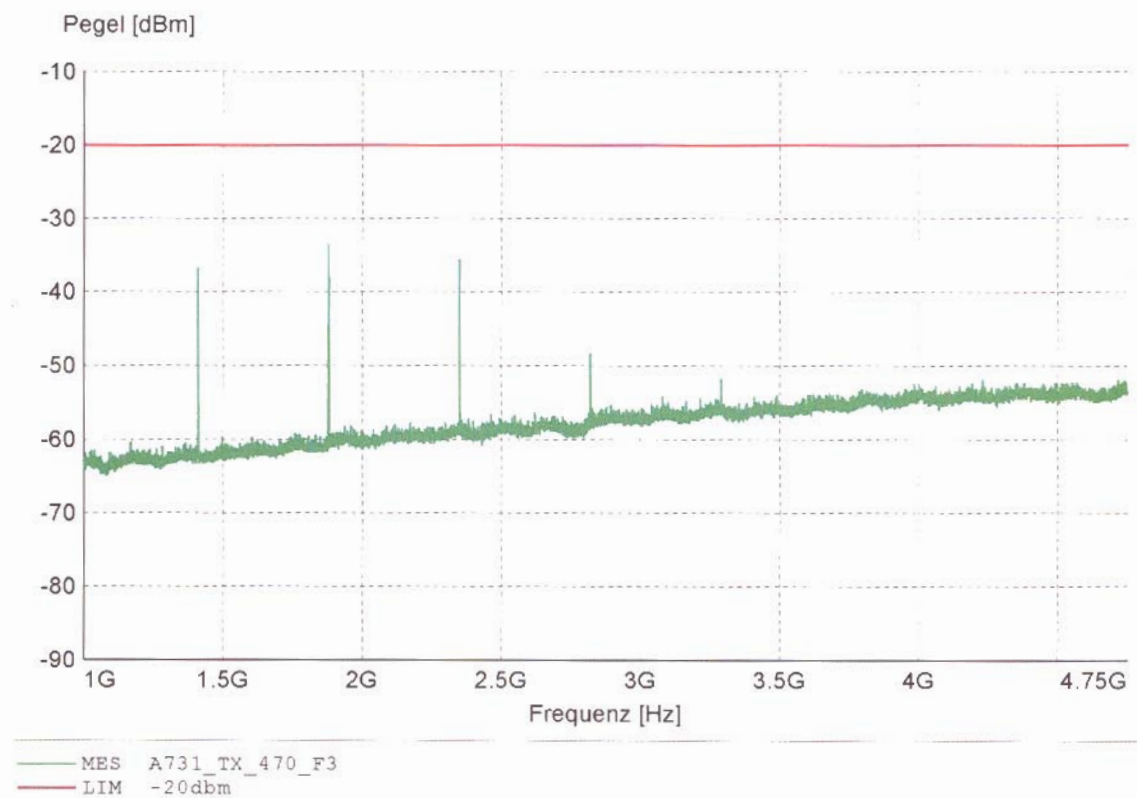
Field strength of spurious emissions of the transmitter

§ 2.1053

Operating mode:

Frequency: 470 MHz

Modulation: unmodulated carrier



Seite 1 21.02.2005 15:29

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207