

TEST REPORT
of the accredited test laboratory

TÜV Nr.:M/FG-09/120

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TÜV®

Applicant: ADCON TELEMETRY GmbH
Inkustraße 24
A-3400 Klosterneuburg

Tested Product: UHF – GSM/GPRS Gateway transceiver

FCC-ID: SHXRA440-46

Manufacturer: ADCON TELEMETRY GmbH
Inkustraße 24
A-3400 Klosterneuburg

Output power / field strength: 500mW max. **power supply:** 6,2 VDC

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

Standard: FCC: 47 CFR 90 10-1-08 Edition;
RSS-119 Issue 9 (June 2007)



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IC 2932K-1

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10.08.2009

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checked by:

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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
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	Test object data	3
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TEST OBJECT DATA

General EUT Description

This telemetry gateway equipment will be used to collect data packets received on UHF and transmit it through a GSM/GPRS network and vice versa. This telemetry equipment will be situated in environment where normally no persons are situated and will work without user interaction. The GSM/GPRS function of this device is reported in a separate test report nbr. M/FG-09/119.

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, the output power is fixed to 500mW.

2.1033 (7) Maximum output power rating: 500 mW into whip antenna

2.1033 (8) DC Voltage and Current: 6,2 V nominal 10V maximum (internal battery)
12 V nominal (10,5 – 20V maximum on external DC input)
maximum current consumption: 1,66A

Power Output

§ 2.1046(a)
§ 5.4

Rated output power: 500mW

Conducted Measurement

Test conditions		Transmitter power (mW)		
		450 MHz	460 MHz	470 MHz
T_{nom} (22)°C	V_{nom} (6,2)V	484	492	484
Maximum deviation from output power under normal test conditions (dB)		-0,14	-0,07	-0,14
Measurement uncertainty		$\pm 0,75$ dB		

LIMIT

SUBCLAUSE 2.1046(a) (5.4)

Under normal test conditions	± 1 dB
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Test Equipment used: NT-207

Emissions Mask D

§ 90.210 (d)

§ 5.5

LIMIT

90.210 (d) and 5.5:

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.

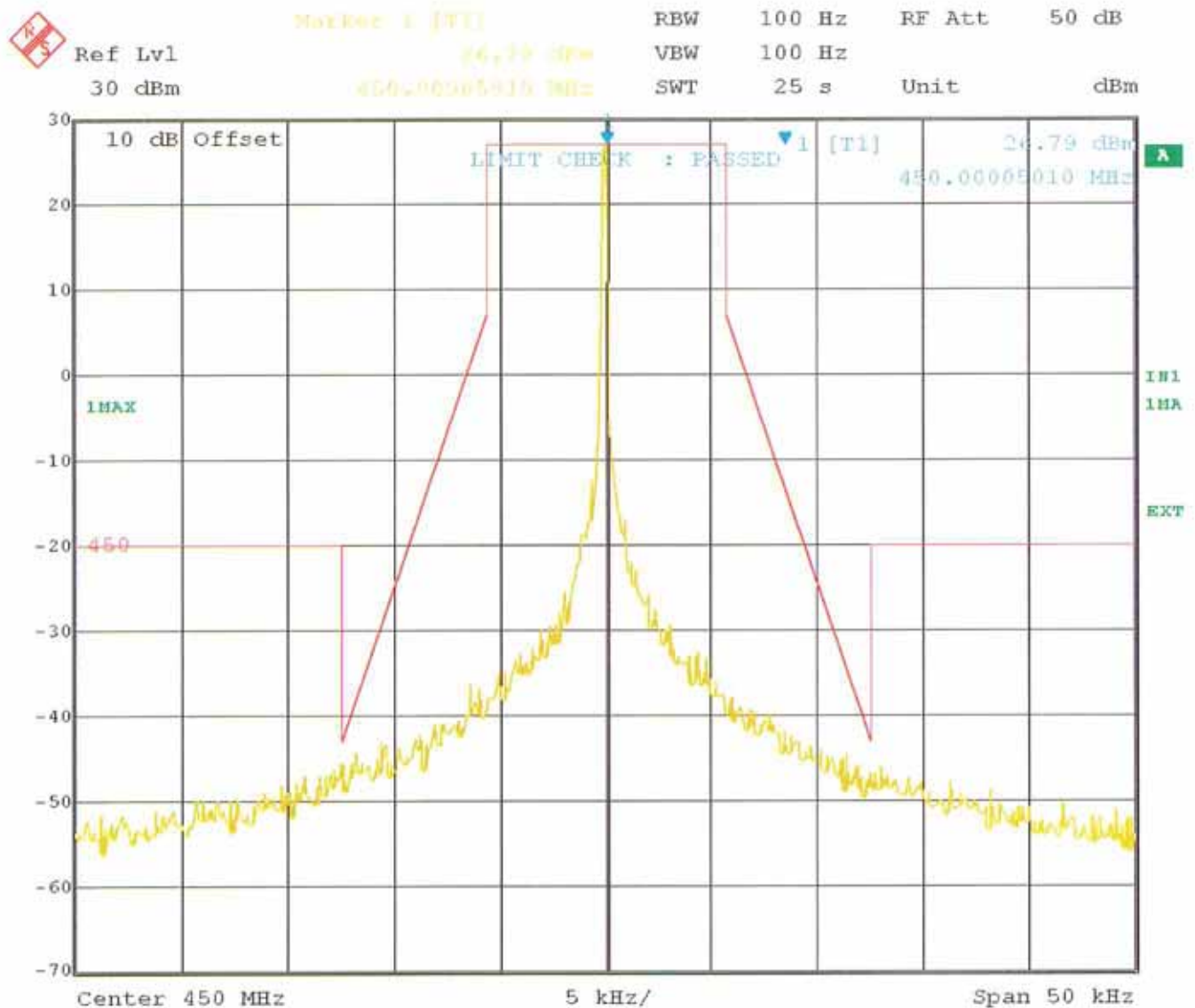
Emissions Mask D

§ 90.210 (d)
§ 5.5

Operating mode:

Frequency: 450 MHz

Modulation: unmodulated carrier



Date: 2.APR.2009 13:46:11

Test Equipment used: NT-207

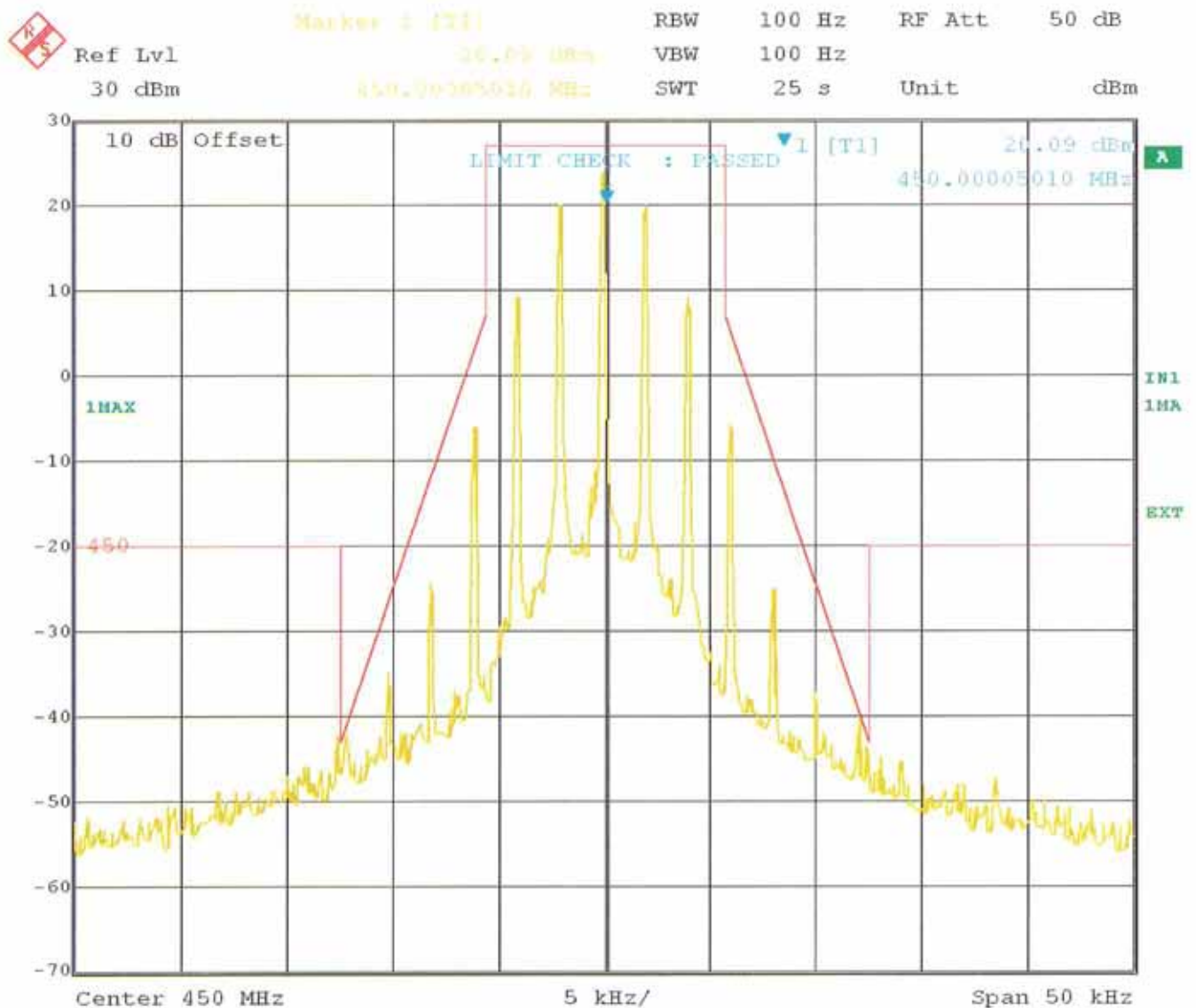
Emissions Mask D

§ 90.210 (d)
§ 5.5

Operating mode:

Frequency: 450 MHz

Modulation: modulated carrier symbol 0 (2 kHz)



Date: 2.APR.2009 13:48:21

Test Equipment used: NT-207

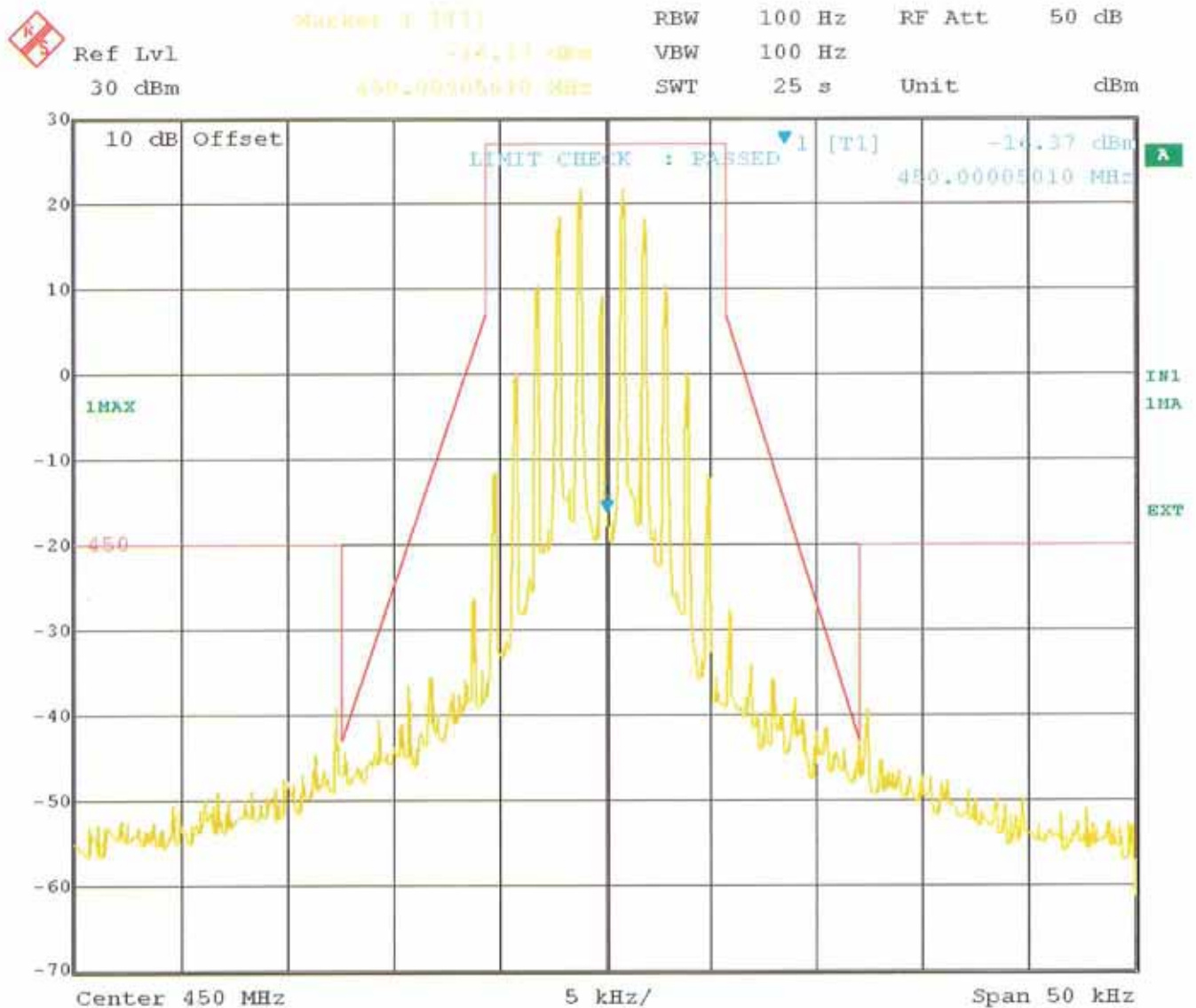
Emissions Mask D

§ 90.210 (d)
§ 5.5

Operating mode:

Frequency: 450 MHz

Modulation: modulated carrier symbol 1 (1 kHz)



Date: 2.APR.2009 13:53:41

Test Equipment used: NT-207

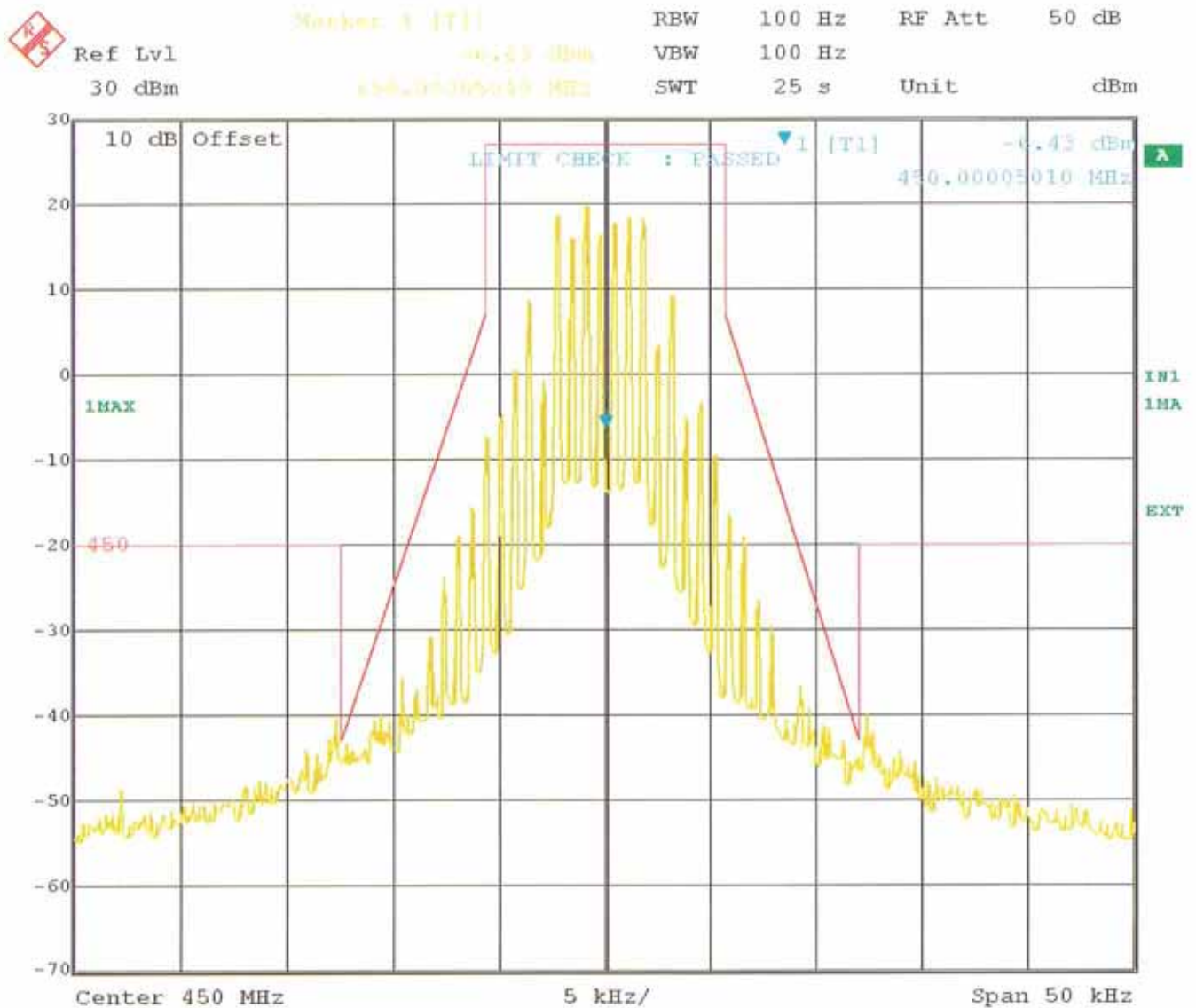
Emissions Mask D

§ 90.210 (d)
§ 5.5

Operating mode:

Frequency: 450 MHz

Modulation: modulated carrier symbol 0/1 at 4000 bps



Date: 2.APR.2009 13:57:29

Test Equipment used: NT-207

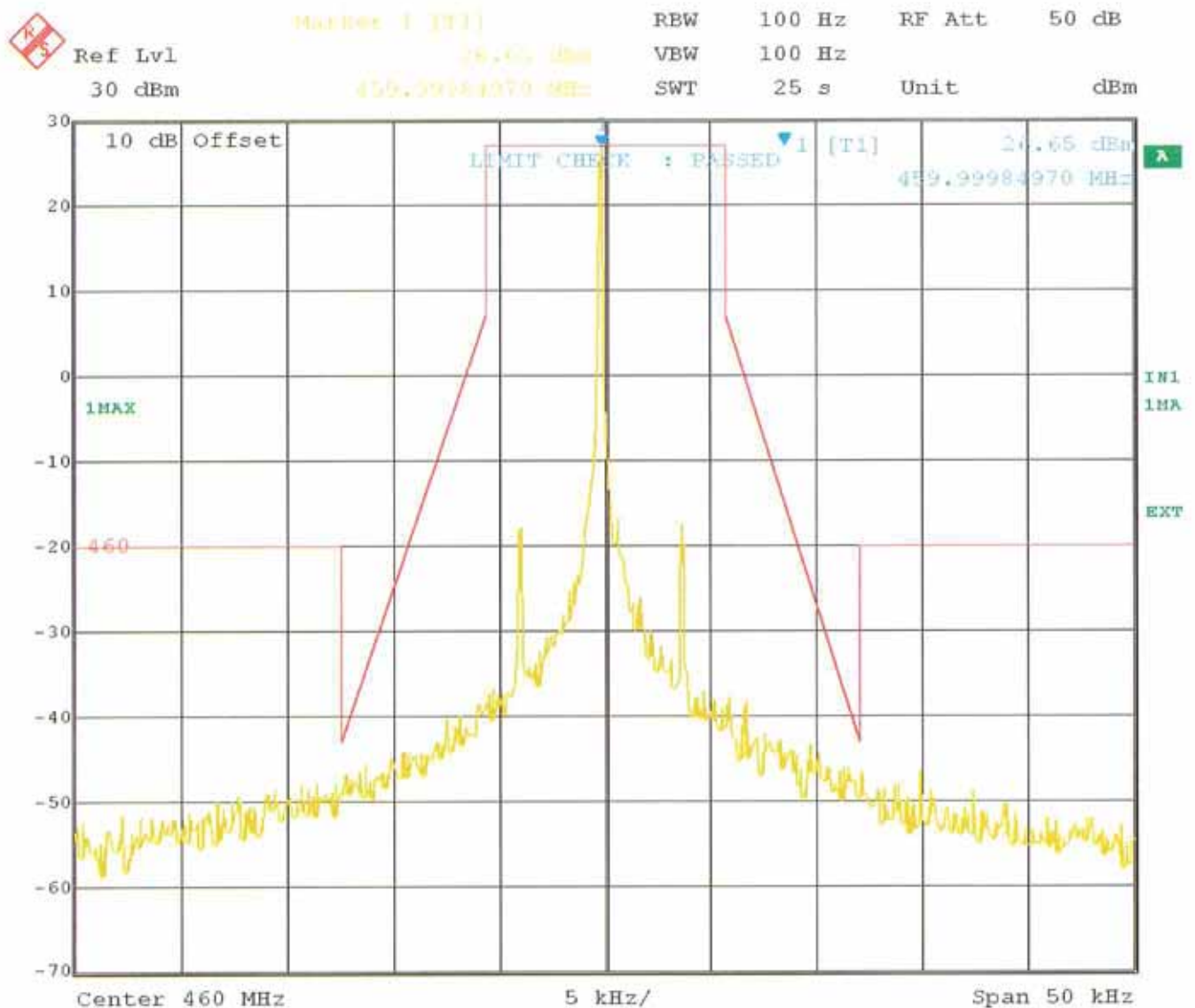
Emissions Mask D

§ 90.210 (d)
§ 5.5

Operating mode:

Frequency: 460 MHz

Modulation: unmodulated carrier



Date: 2.APR.2009 13:59:39

Test Equipment used: NT-207

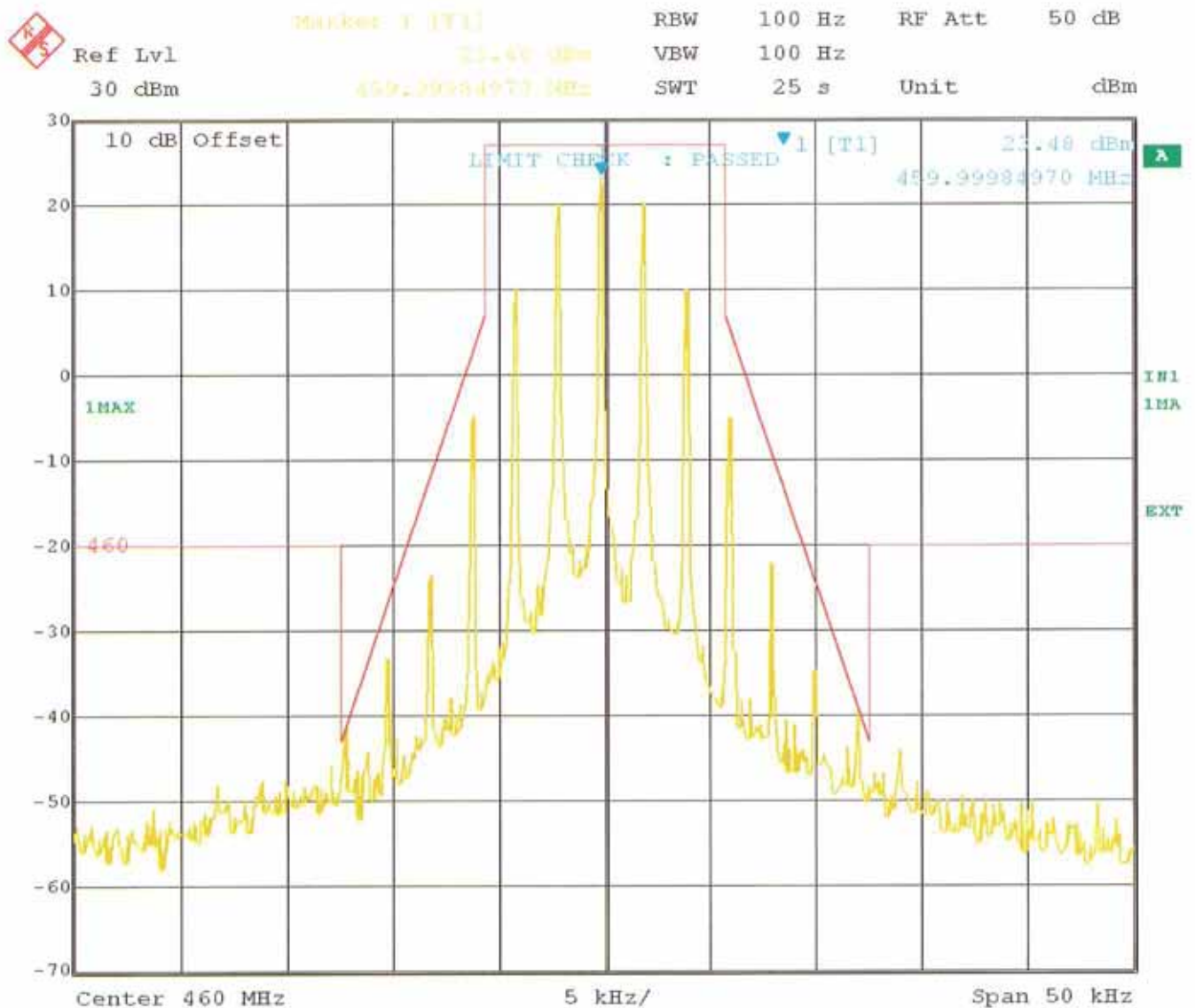
Emissions Mask D

§ 90.210 (d)
§ 5.5

Operating mode:

Frequency: 460 MHz

Modulation: modulated carrier symbol 0 (2 kHz)



Date: 2.APR.2009 14:03:55

Test Equipment used: NT-207

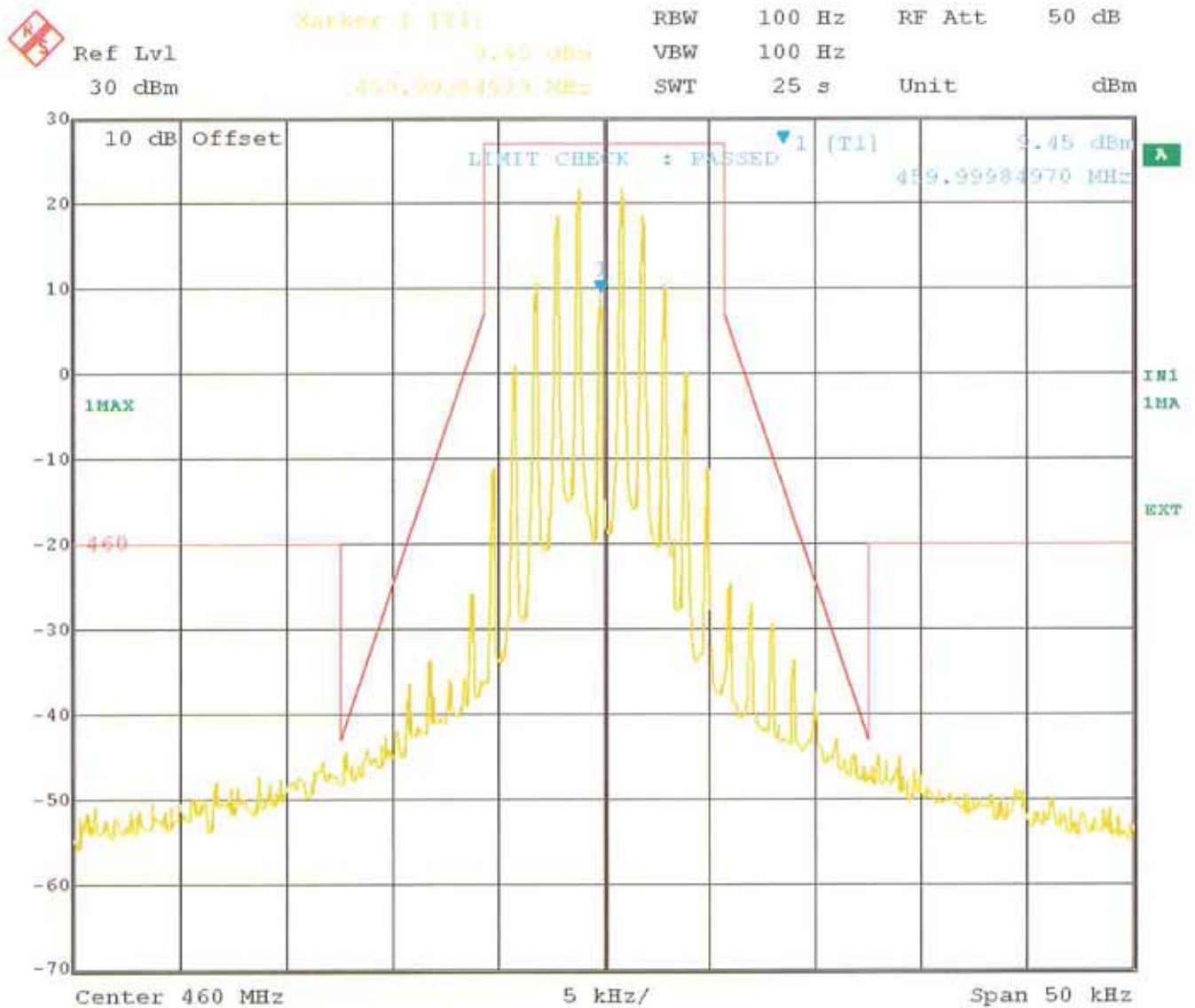
Emissions Mask D

§ 90.210 (d)
§ 5.5

Operating mode:

Frequency: 460 MHz

Modulation: modulated carrier symbol 1 (1 kHz)



Date: 2.APR.2009 14:09:30

Test Equipment used: NT-207

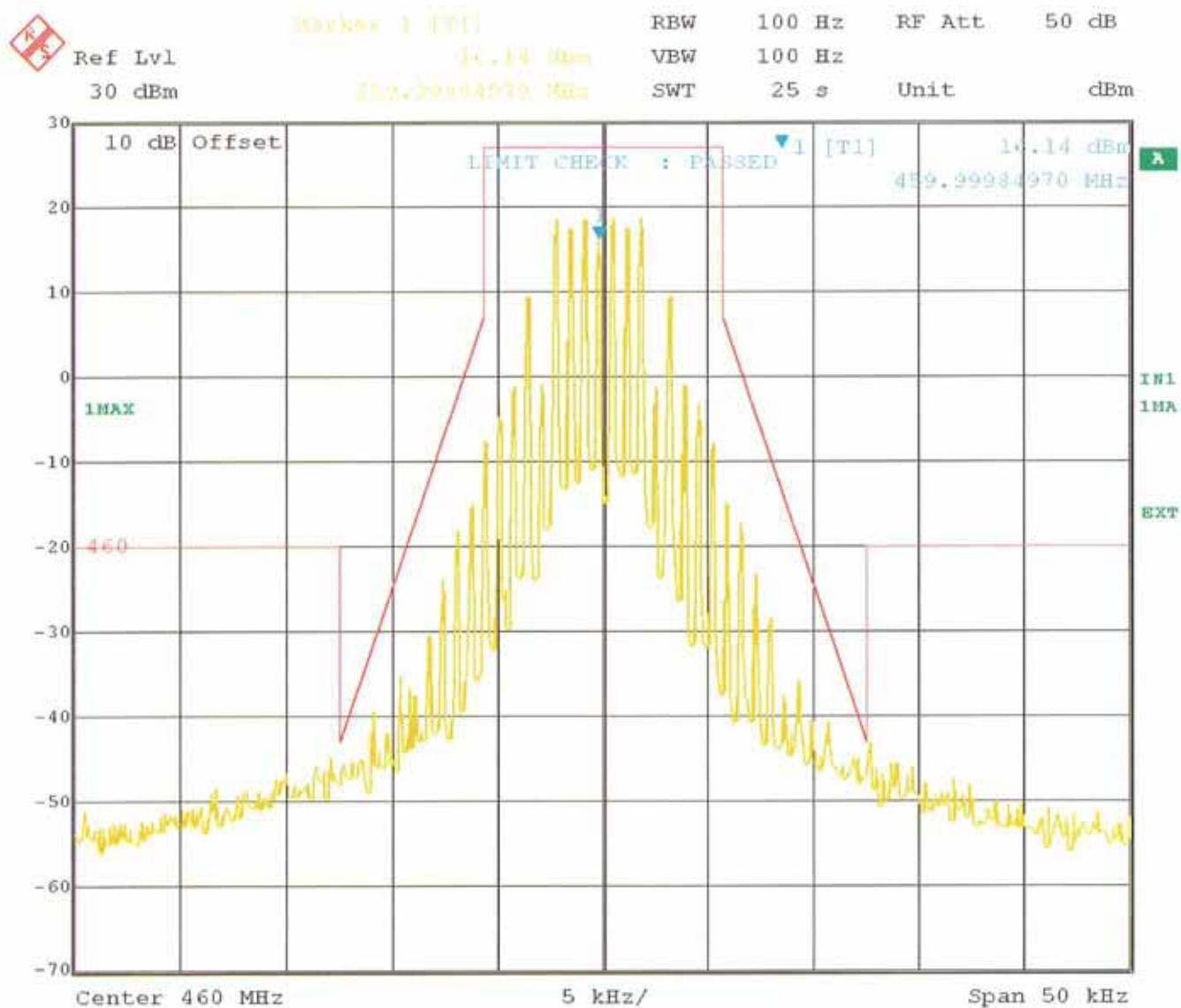
Emissions Mask D

§ 90.210 (d)
§ 5.5

Operating mode:

Frequency: 460 MHz

Modulation: modulated carrier symbol 0/1 at 4000 bps



Date: 2.APR.2009 14:12:06

Test Equipment used: NT-207

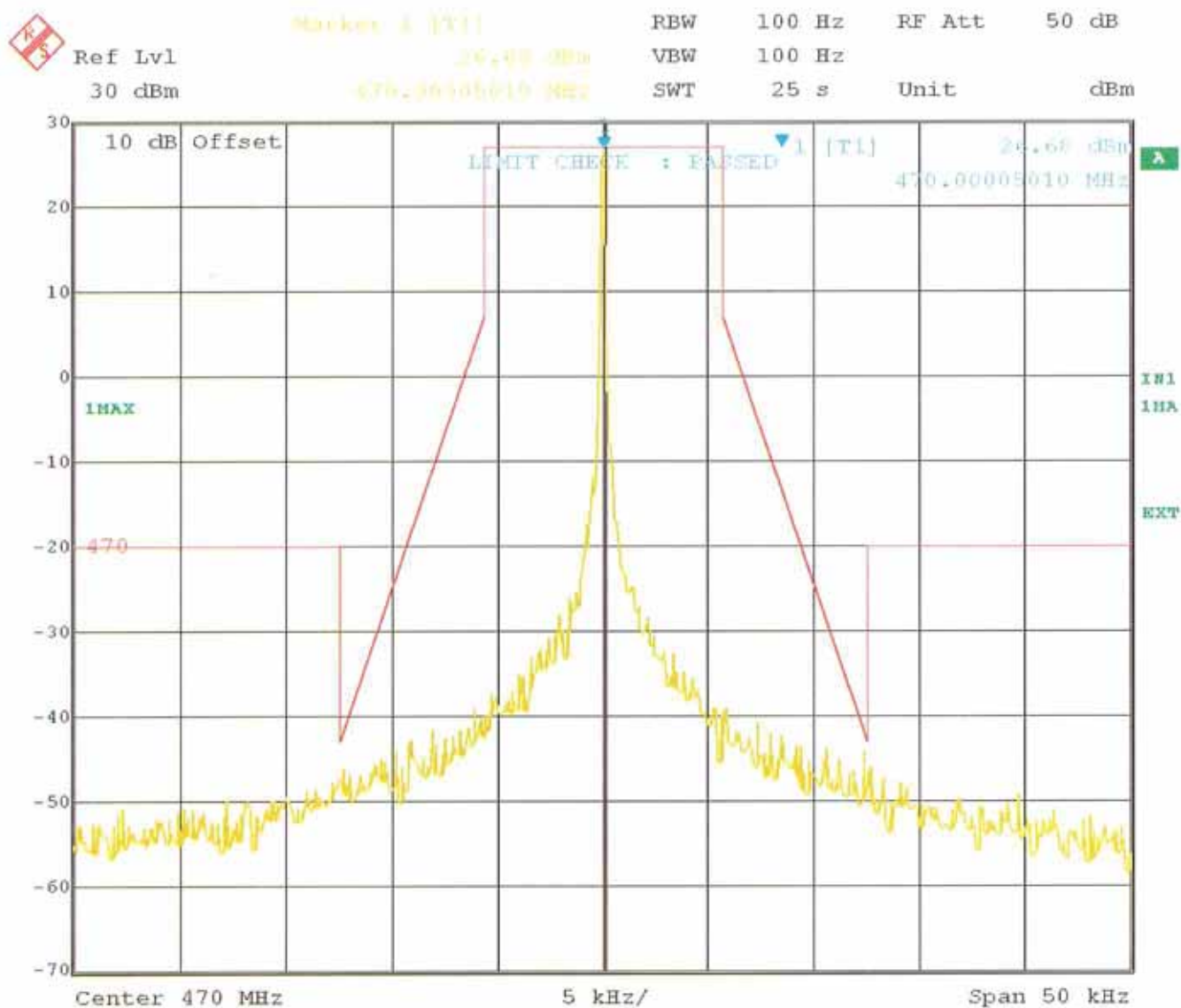
Emissions Mask D

§ 90.210 (d)
§ 5.5

Operating mode:

Frequency: 470 MHz

Modulation: unmodulated carrier



Date: 2.APR.2009 14:17:32

Test Equipment used: NT-207

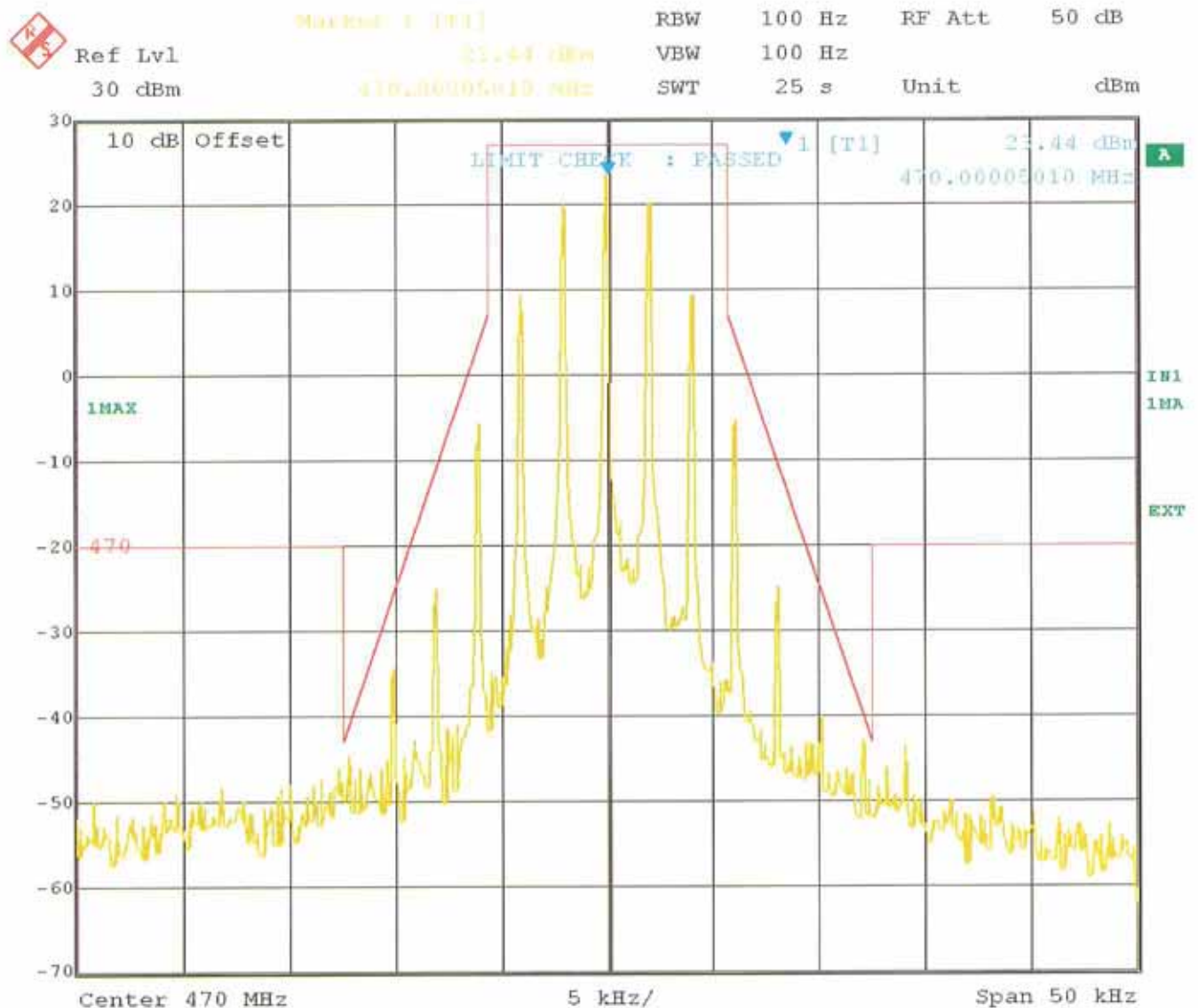
Emissions Mask D

§ 90.210 (d)
§ 5.5

Operating mode:

Frequency: 470 MHz

Modulation: modulated carrier symbol 0 (2 kHz)



Date: 2.APR.2009 14:20:38

Test Equipment used: NT-207

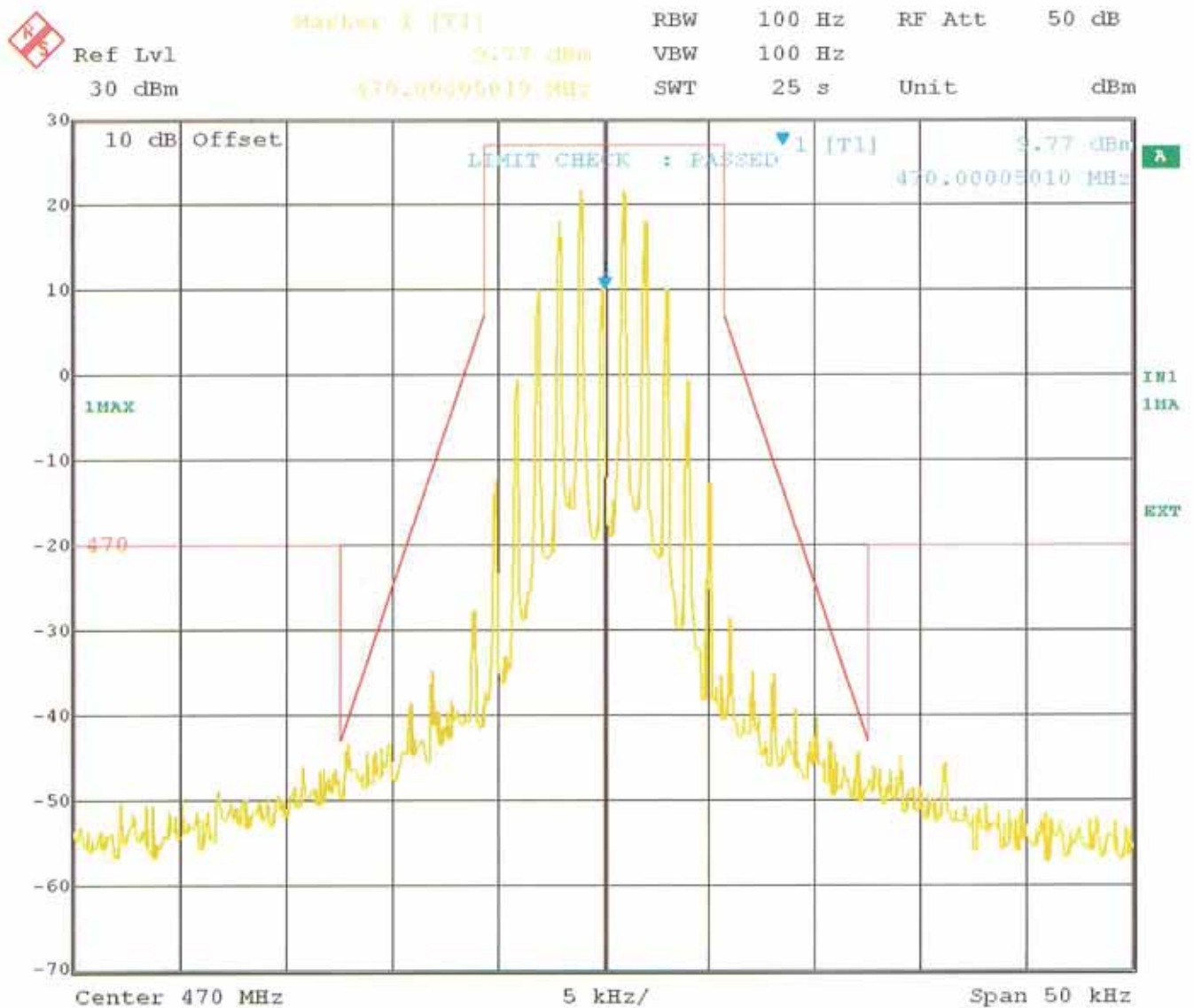
Emissions Mask D

§ 90.210 (d)
§ 5.5

Operating mode:

Frequency: 470 MHz

Modulation: modulated carrier symbol 1 (1 kHz)



Date: 2.APR.2009 14:22:10

Test Equipment used: NT-207

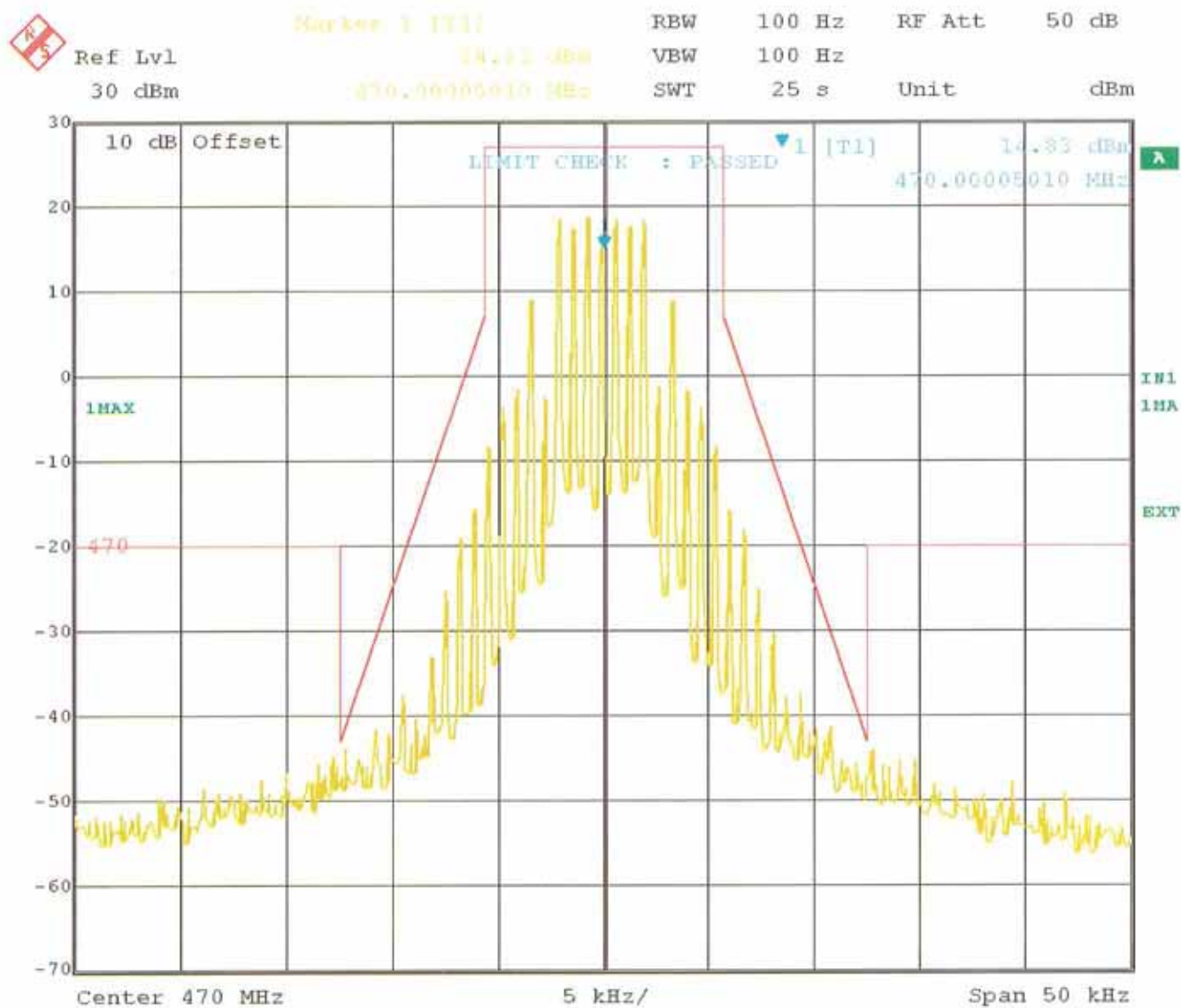
Emissions Mask D

§ 90.210 (d)
§ 5.5

Operating mode:

Frequency: 470 MHz

Modulation: modulated carrier symbol 0/1 at 4000 bps



Date: 2.APR.2009 14:23:56

Test Equipment used: NT-207

Spurious conducted emissions

§ 2.1051

§ 5.8

LIMIT

90.210 (d) and 5.8:

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.

Spurious conducted emissions

§ 2.1051
§ 5.8

Operating mode: Transmit at 500mW

Modulation: unmodulated carrier

SPURIOUS EMISSION LEVEL (dBm)								
CH 1 (450 MHz)			CH 2 (460 MHz)			CH 3 (470 MHz)		
f (MHz)	Bandwidth (kHz)	Level (dBm)	f (MHz)	Bandwidth (kHz)	Level (dBm)	f (MHz)	Bandwidth (kHz)	Level (dBm)
864	100	-49,7	920	100	-44,8	940	100	-44,8
2250	1000	-42,7	1840	1000	-45,5	1880	1000	-47,2
All others < 1 GHz		< -60	2300	1000	-35,7	2350	1000	-32,6
All others ≥ 1GHz		< -50	2760	1000	-48,3	2820	1000	-40,5
			3680	1000	-42,8	3760	1000	-48,8
			4140	1000	-47,8	4230	1000	-46,3
			All others < 1 GHz		< -60	All others < 1 GHz		< -60
			All others ≥ 1GHz		< -50	All others ≥ 1GHz		< -50
Measurement uncertainty			± 4 dB					

Bandwidth (kHz); this refers to the bandwidth of the measurement receiver

Test Equipment used: NT-207

Field strength of spurious emissions of the transmitter

§ 2.1053
§ 5.8.3

LIMIT

90.210 (d) and 5.8.3:

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	1880	-37,2
				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

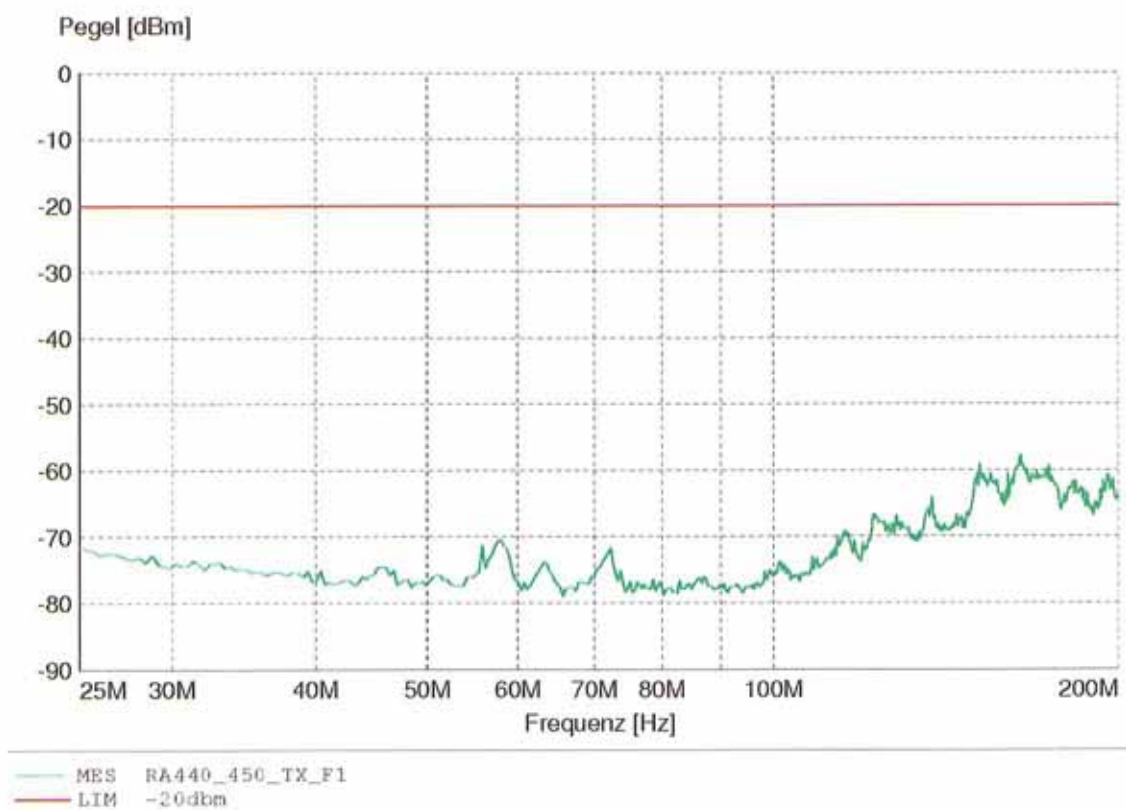
§ 2.1053

§ 5.8.3

Operating mode:

Frequency: 450 MHz

Modulation: unmodulated carrier



Seite 1 02.04.2009 09:20

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

Field strength of spurious emissions of the transmitter

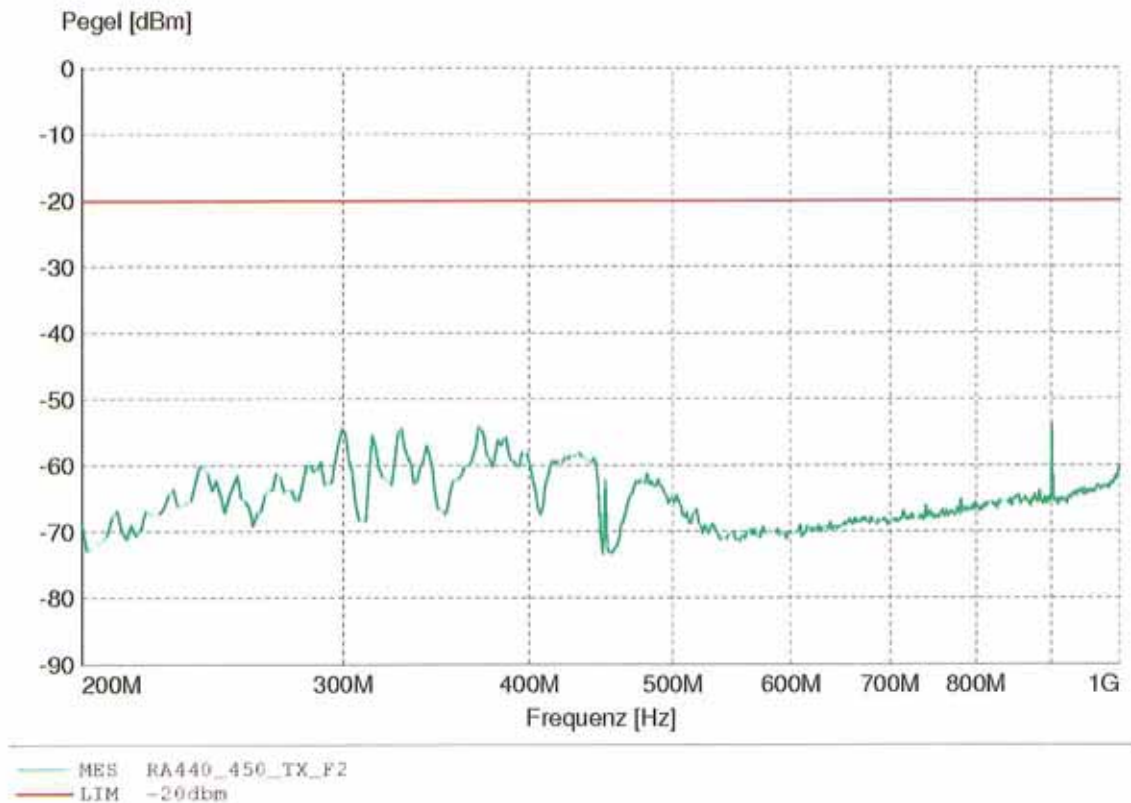
§ 2.1053

§ 5.8.3

Operating mode:

Frequency: 450 MHz

Modulation: unmodulated carrier



Seite 1 01.04.2009 16:33

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207; NT-453

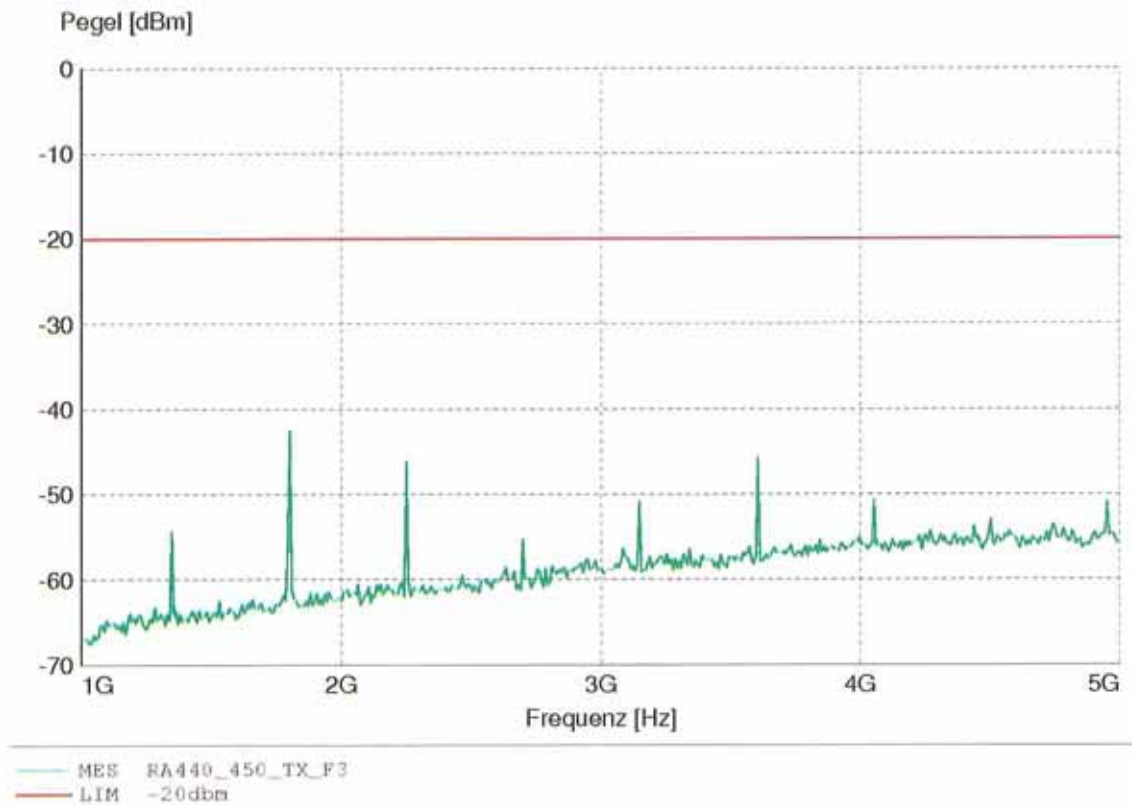
Field strength of spurious emissions of the transmitter

§ 2.1053
§ 5.8.3

Operating mode:

Frequency: 450 MHz

Modulation: unmodulated carrier



Seite 1 01.04.2009 11:38

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

Field strength of spurious emissions of the transmitter

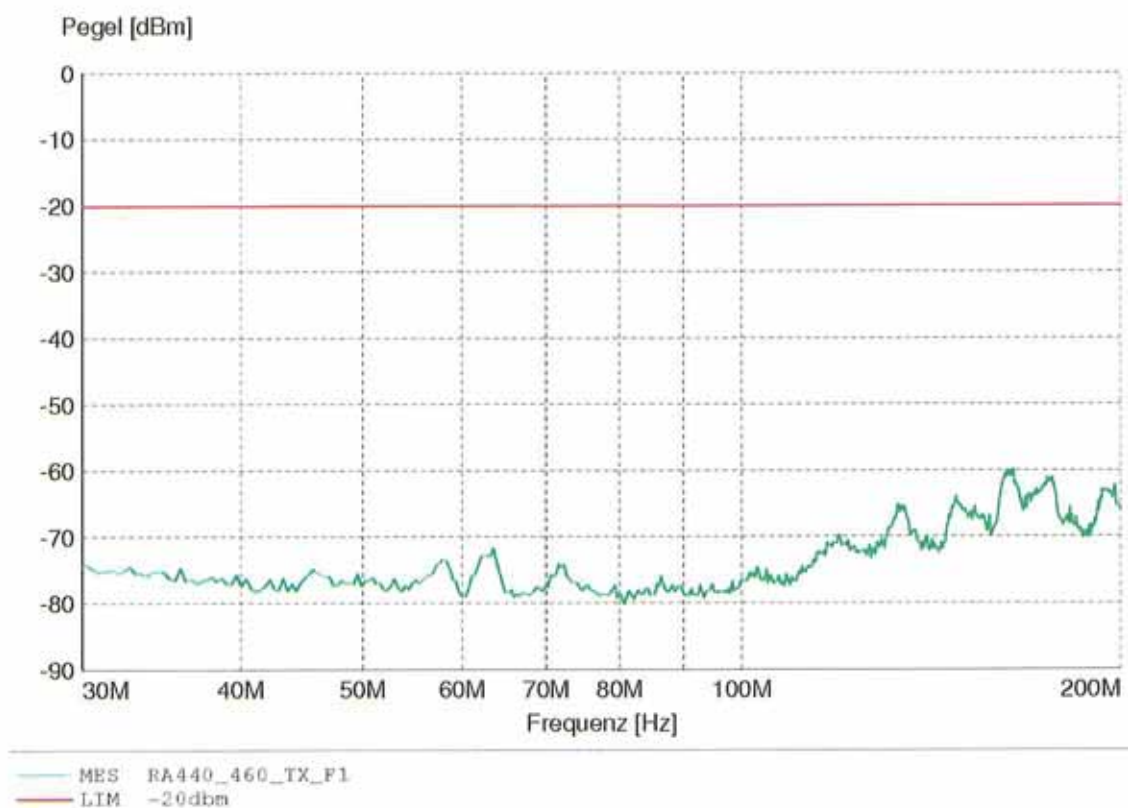
§ 2.1053

§ 5.8.3

Operating mode:

Frequency: 460 MHz

Modulation: unmodulated carrier



Seite 1 02.04.2009 09:09

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

Field strength of spurious emissions of the transmitter

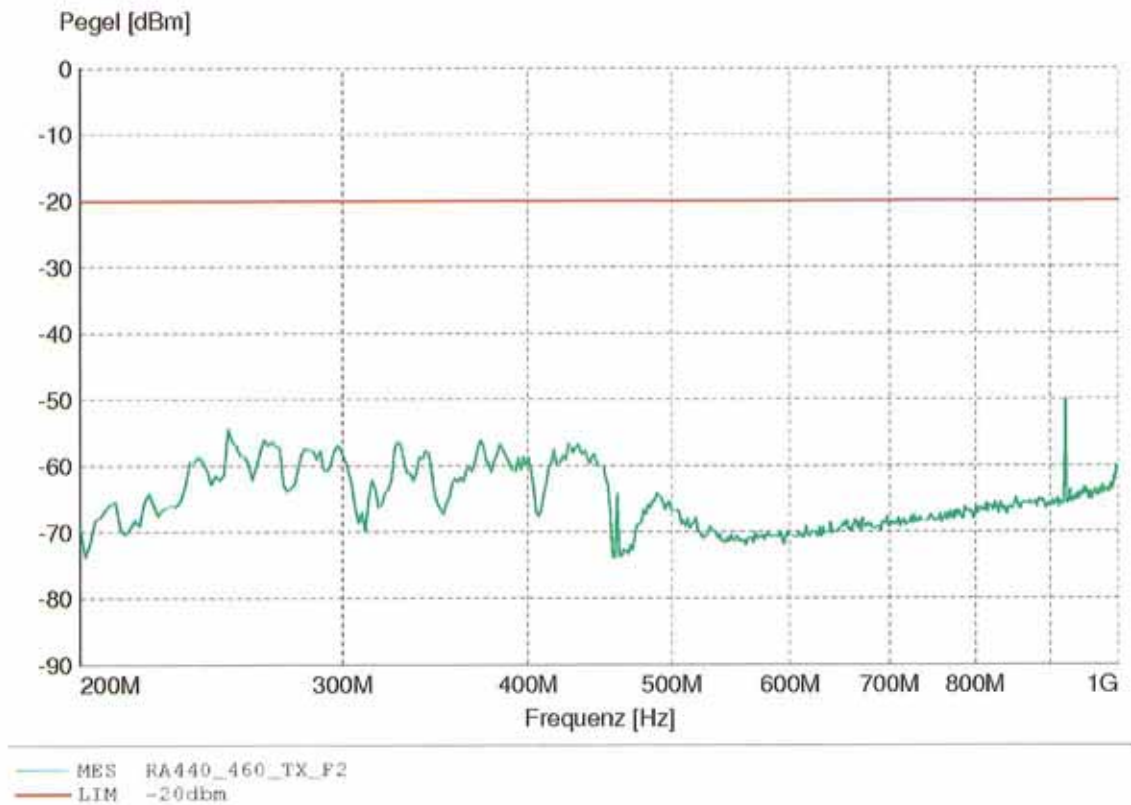
§ 2.1053

§ 5.8.3

Operating mode:

Frequency: 460 MHz

Modulation: unmodulated carrier



Seite 1 01.04.2009 16:13

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207; NT-453

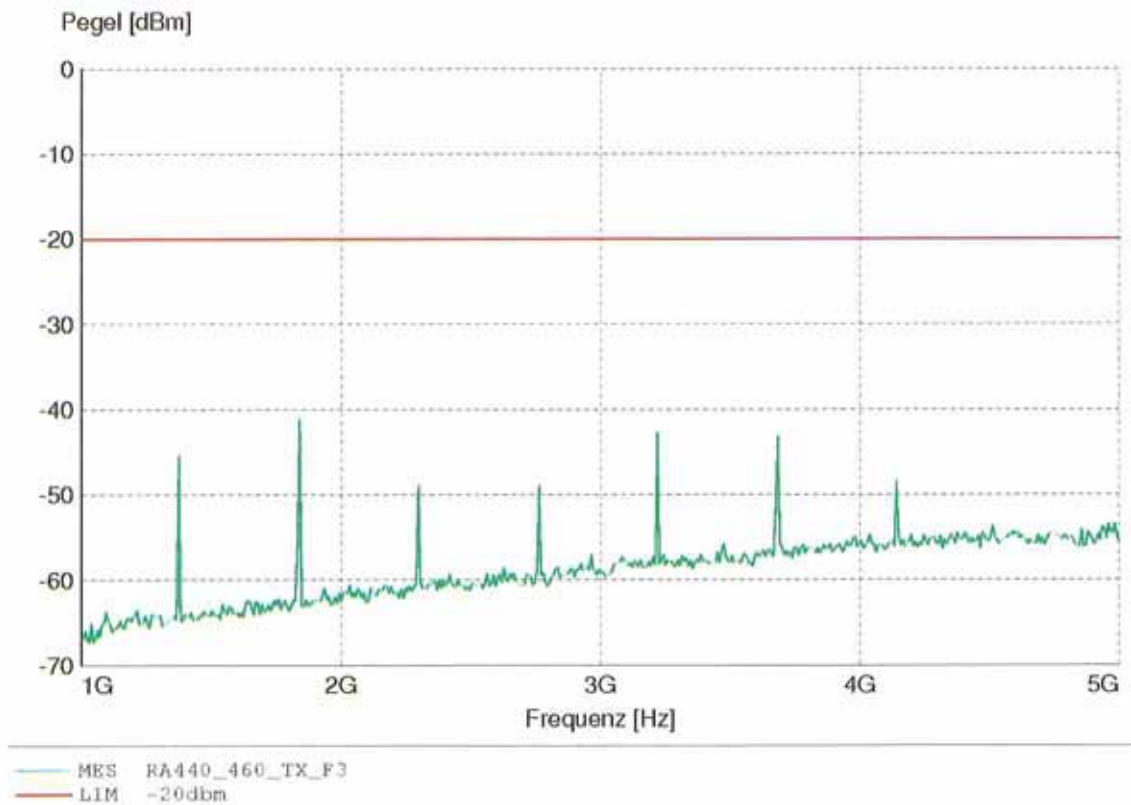
Field strength of spurious emissions of the transmitter

§ 2.1053
§ 5.8.3

Operating mode:

Frequency: 460 MHz

Modulation: unmodulated carrier



Seite 3 01.04.2009 13:36

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

Field strength of spurious emissions of the transmitter

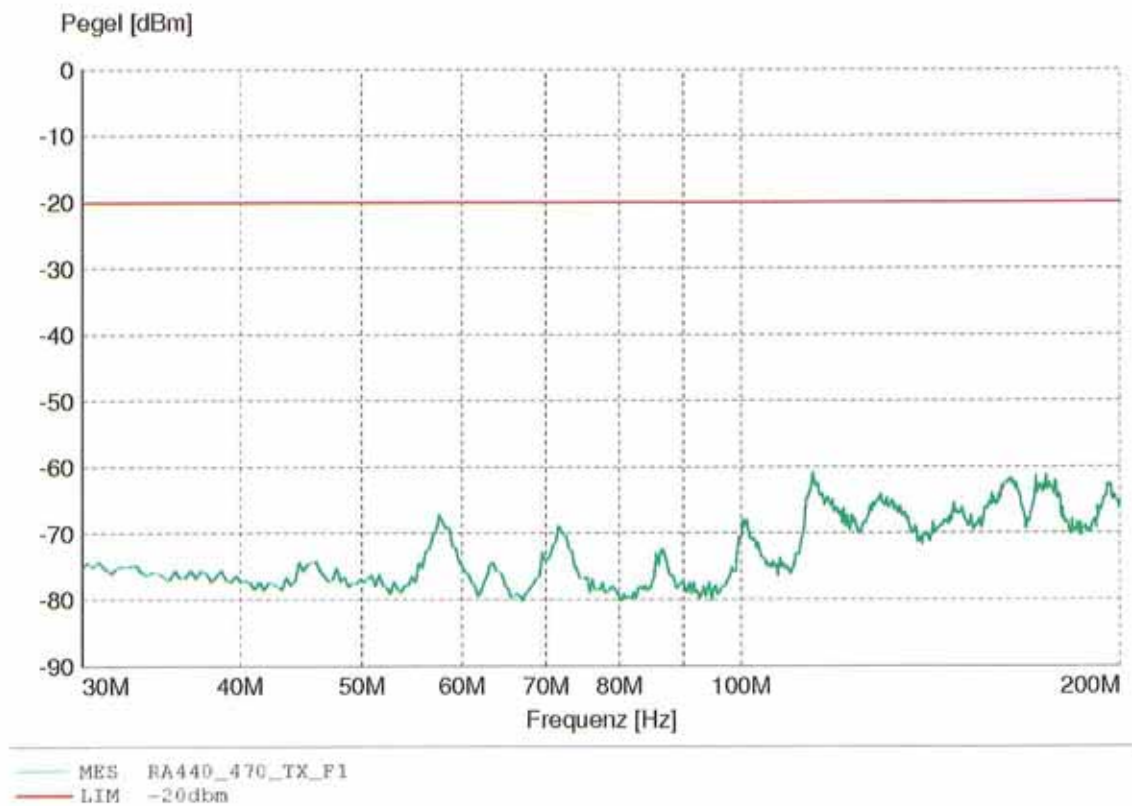
§ 2.1053

§ 5.8.3

Operating mode:

Frequency: 470 MHz

Modulation: unmodulated carrier



Seite 1 02.04.2009 09:25

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

Field strength of spurious emissions of the transmitter

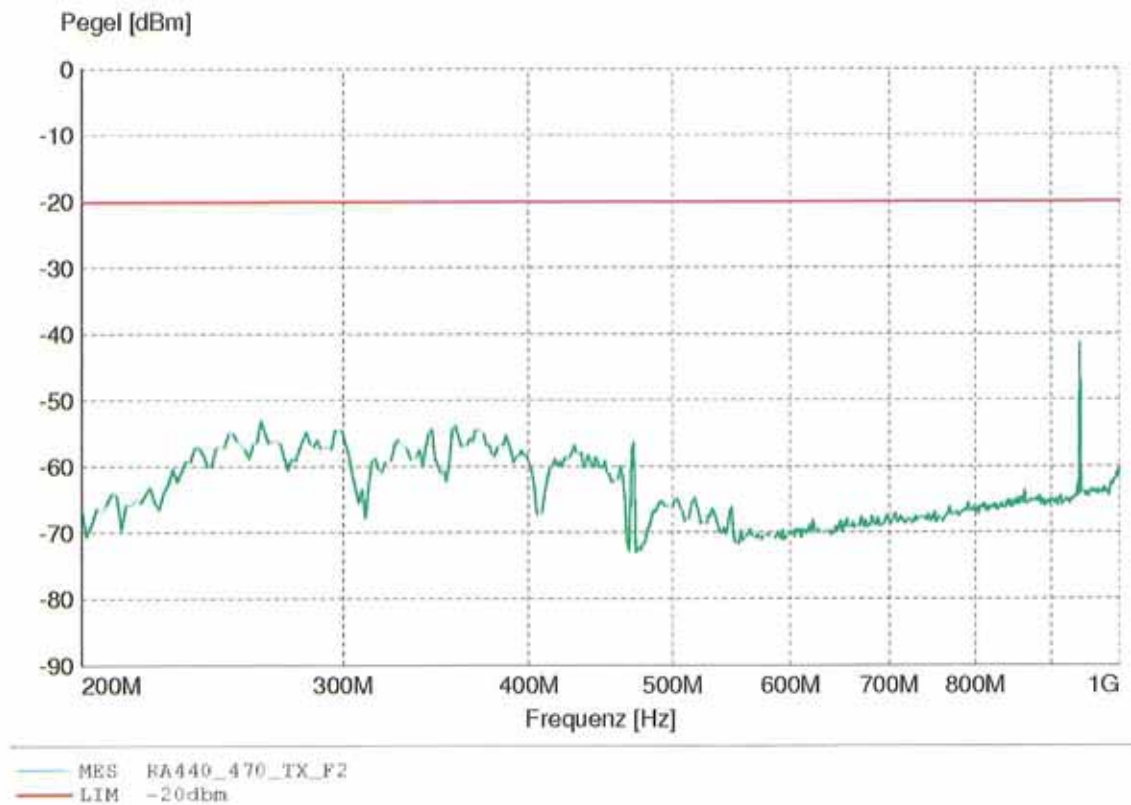
§ 2.1053

§ 5.8.3

Operating mode:

Frequency: 470 MHz

Modulation: unmodulated carrier



Seite 1: 01.04.2009 16:11

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207; NT-453

Field strength of spurious emissions of the transmitter

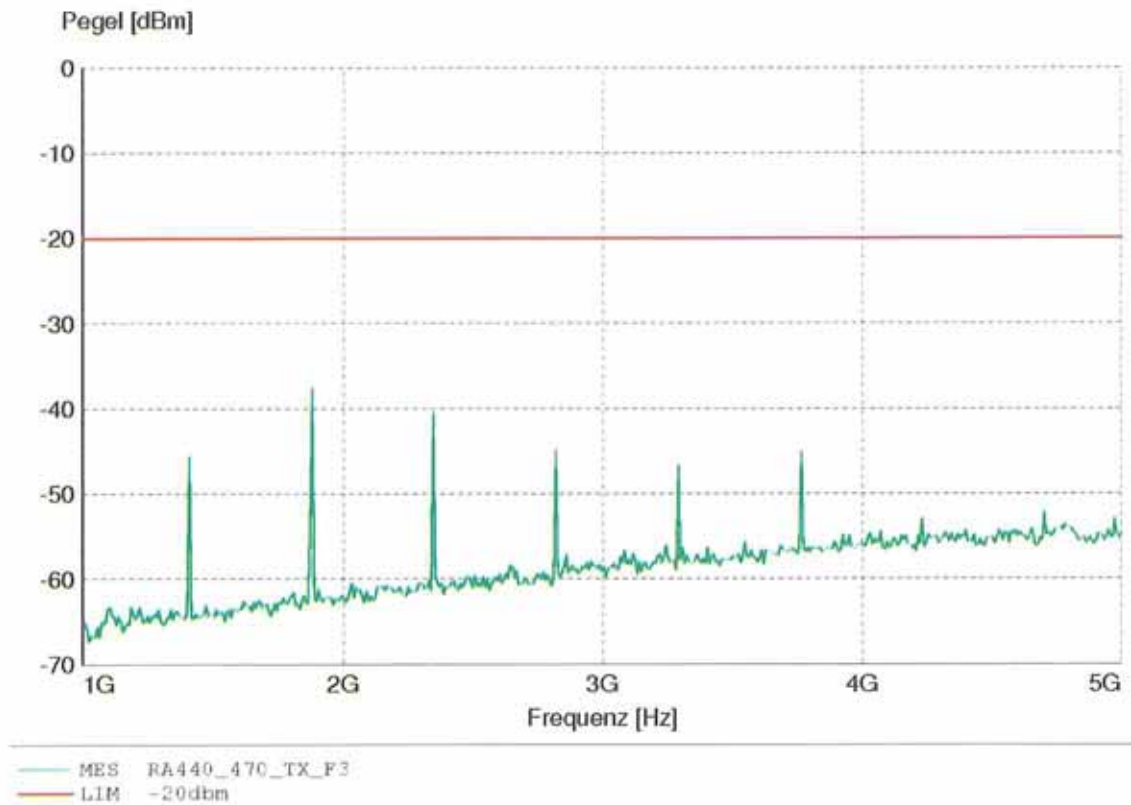
§ 2.1053

§ 5.8.3

Operating mode:

Frequency: 470 MHz

Modulation: unmodulated carrier



Seite 1 01.04.2009 13:59

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

Frequency stability

§ 90.213
§ 5.3

Frequency error vs. Supply voltage – internal battery power port

DC-Voltage	Frequency Error Hz			Frequency Error ppm		
	450 MHz	460 MHz	470 MHz	450 MHz	460 MHz	470 MHz
6,2 V	0	+50	+110	0,000	+0,109	+0,234
5,6 V	0	+50	+110	0,000	+0,109	+0,234
7,13 V	0	+50	+110	0,000	+0,109	+0,234
10 V	0	+50	+110	0,000	+0,109	+0,234

Frequency error vs. Supply voltage – external DC power port

DC-Voltage	Frequency Error Hz			Frequency Error ppm		
	450 MHz	460 MHz	470 MHz	450 MHz	460 MHz	470 MHz
12 V	0	+50	+110	0,000	+0,109	+0,234
10,5 V	0	+50	+110	0,000	+0,109	+0,234
14 V	0	+50	+110	0,000	+0,109	+0,234
20 V	0	+50	+110	0,000	+0,109	+0,234

Frequency error vs. Temperature

Temperature °C	Frequency Error Hz			Frequency Error ppm		
	450 MHz	460 MHz	470 MHz	450 MHz	460 MHz	470 MHz
-30	-70	+30	+700	-0,156	+0,065	+1,489
-20	0	+120	+300	0,000	+0,261	+0,638
-10	+30	+90	+190	+0,067	+0,196	+0,404
±0	-50	0	+70	-0,111	0,000	+0,149
+10	0	+40	+90	0,000	+0,087	+0,191
+20	0	+50	+110	0,000	+0,109	+0,234
+30	-70	-40	+30	-0,156	-0,087	+0,064
+40	-170	-130	-100	-0,378	-0,283	-0,213
+50	-390	-430	-70	-0,867	-0,935	-0,149

LIMIT 90.213(a) (5.3 Table 1)

In the 421-512 (450-470) MHz band, fixed and base stations with a 12,5 kHz channel bandwidth must have a frequency stability of 1,5 ppm. In the 421-512 (450-470) MHz band, mobile stations with a 12,5 kHz channel bandwidth must have a frequency stability of 2,5 ppm.

Transient frequency behaviour

§ 90.214

§ 5.9

LIMIT

90.214 and 5.9:

Transmitters designed to operate in the 150-174 MHz and 421-512 MHz frequency bands must maintain transient frequencies within the maximum frequency difference limits during the time intervals indicated:

Time intervals ^{1,2}	Maximum frequency Difference ³	All Equipment	
		150 to 174 MHz	421 to 512 MHz
Transient Frequency Behaviour for Equipment designed to Operate on 25 kHz Channels			
t ₁ ⁴	± 25,0 kHz	5,0 ms	10,0 ms
t ₂	± 12,5 kHz	20,0 ms	25,0 ms
t ₃ ⁴	± 25,0 kHz	5,0 ms	10,0 ms
Transient Frequency Behaviour for Equipment designed to Operate on 12,5 kHz Channels			
t ₁ ⁴	± 12,5 kHz	5,0 ms	10,0 ms
t ₂	± 6,25 kHz	20,0 ms	25,0 ms
t ₃ ⁴	± 12,5 kHz	5,0 ms	10,0 ms
Transient Frequency Behaviour for Equipment designed to Operate on 6,25 kHz Channels			
t ₁ ⁴	± 6,25 kHz	5,0 ms	10,0 ms
t ₂	± 3,125 kHz	20,0 ms	25,0 ms
t ₃ ⁴	± 6,25 kHz	5,0 ms	10,0 ms

¹ t_{on} is the instant when a 1 kHz test signal is completely suppressed, including any capture time due to phasing.

t_1 is the time period immediately following t_{on}

t_2 is the time period immediately following t_1

t_3 is the time period from the instant when the transmitter is turned off until t_{off}

² During the time from the end of t_2 to the beginning of t_3 , the frequency difference must not exceed the limits specified in § 90.213.

³ Difference between the actual frequency and the assigned transmitter frequency.

⁴ If the transmitter carrier output power rating is 6 watts or less, the frequency difference during this time period may exceed the maximum frequency difference for this time period.

Transient frequency behaviour

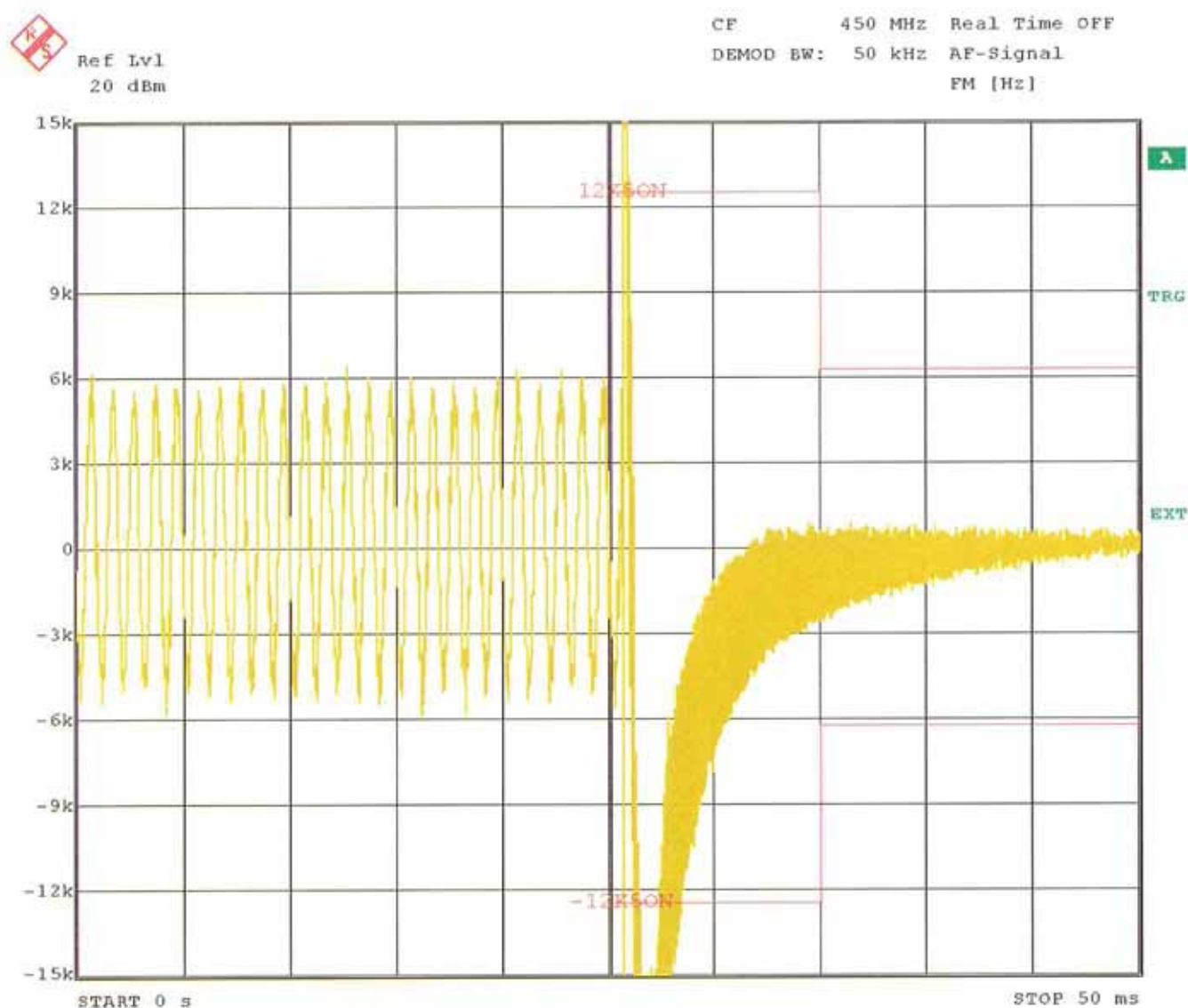
§ 90.214

§ 5.9

Operating mode: t_{on} is in the middle of the screen (25ms pre-trigger)

Frequency: 450 MHz

Transmitter switching on



Date: 4.MAY.2009 11:37:46

Test Equipment used: NT-207, NT-310

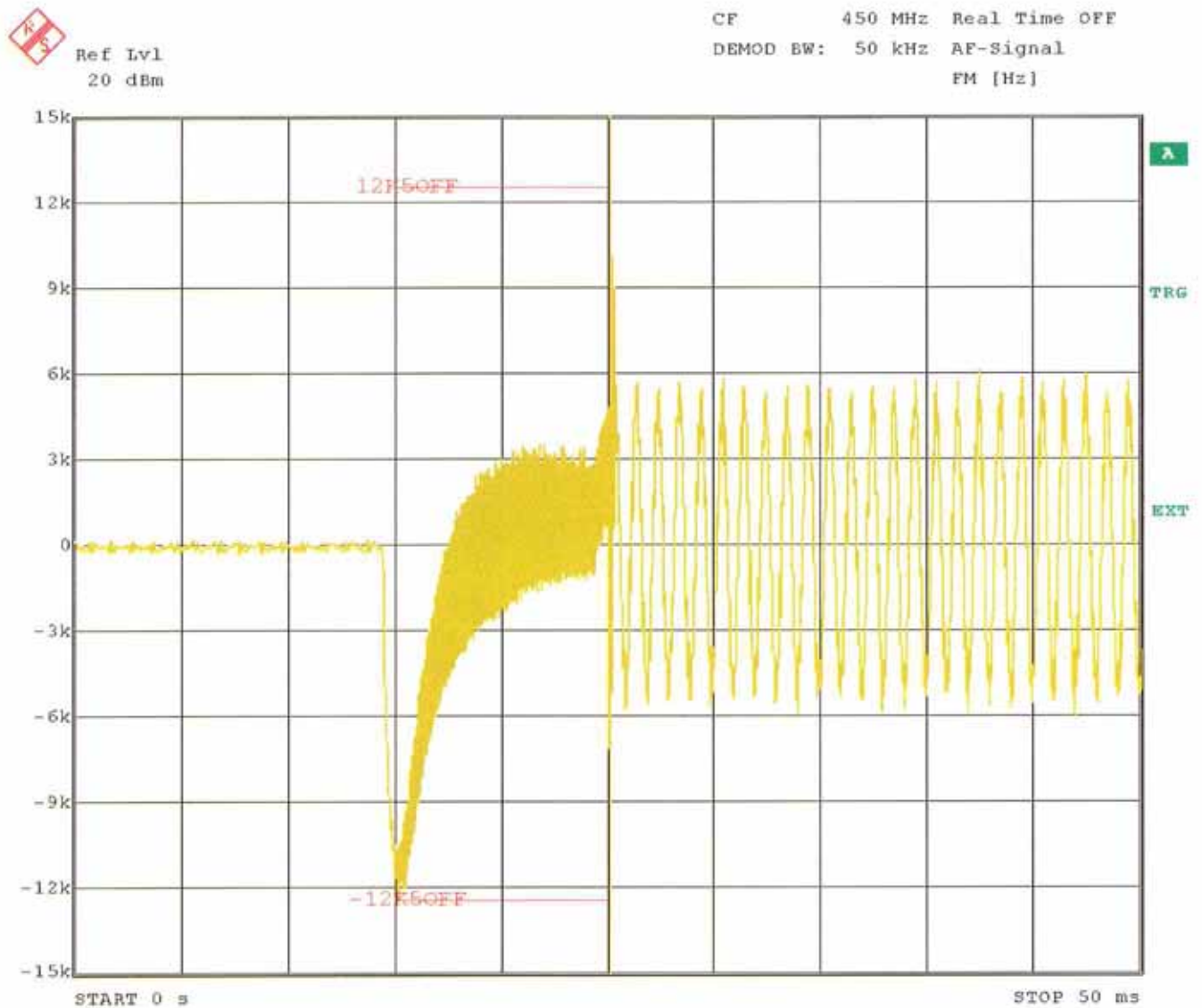
Transient frequency behaviour

§ 90.214
§ 5.9

Operating mode: t_{off} is in the middle of the screen (25ms pre-trigger)

Frequency: 450 MHz

Transmitter switching off



Date: 4.MAY.2009 11:39:23

Test Equipment used: NT-207, NT-310

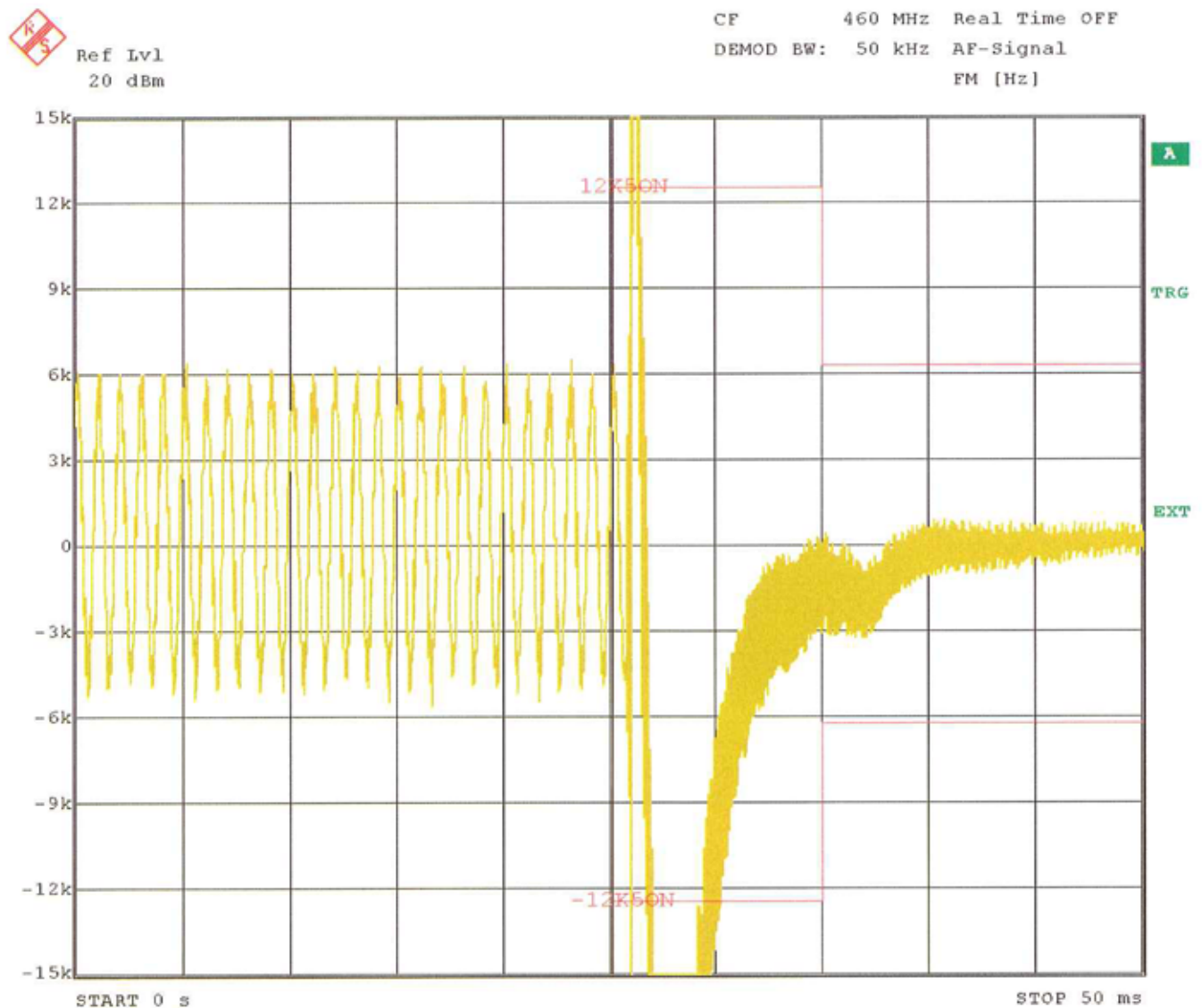
Transient frequency behaviour

§ 90.214
§ 5.9

Operating mode: t_{on} is in the middle of the screen (25ms pre-trigger)

Frequency: 460 MHz

Transmitter switching on



Date: 4.MAY.2009 11:40:31

Test Equipment used: NT-207, NT-310

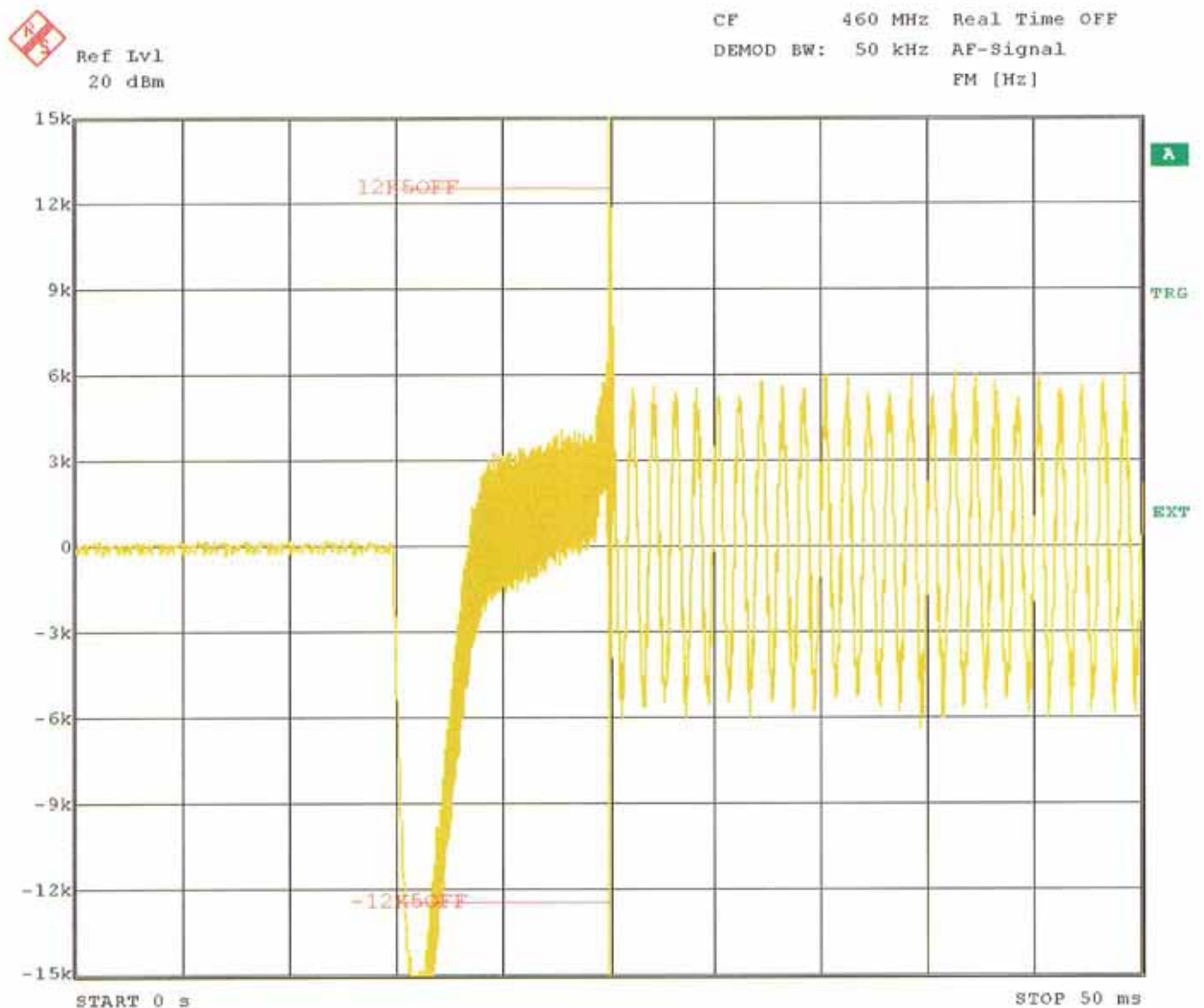
Transient frequency behaviour

§ 90.214
§ 5.9

Operating mode: t_{off} is in the middle of the screen (25ms pre-trigger)

Frequency: 460 MHz

Transmitter switching off



Date: 4.MAY.2009 11:39:53

Test Equipment used: NT-207, NT-310

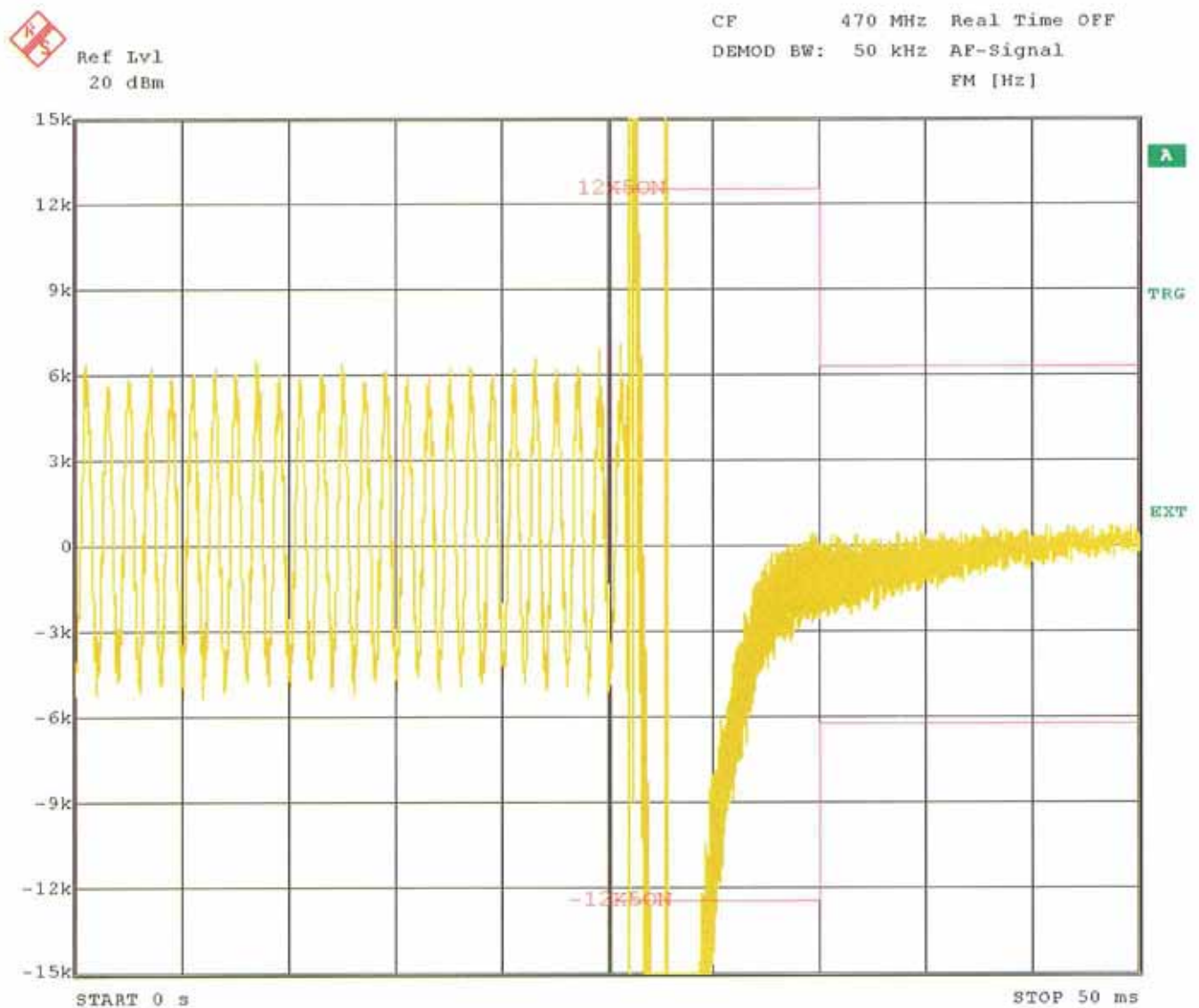
Transient frequency behaviour

§ 90.214
§ 5.9

Operating mode: t_{on} is in the middle of the screen (25ms pre-trigger)

Frequency: 470 MHz

Transmitter switching on



Date: 4.MAY.2009 11:43:48

Test Equipment used: NT-207, NT-310

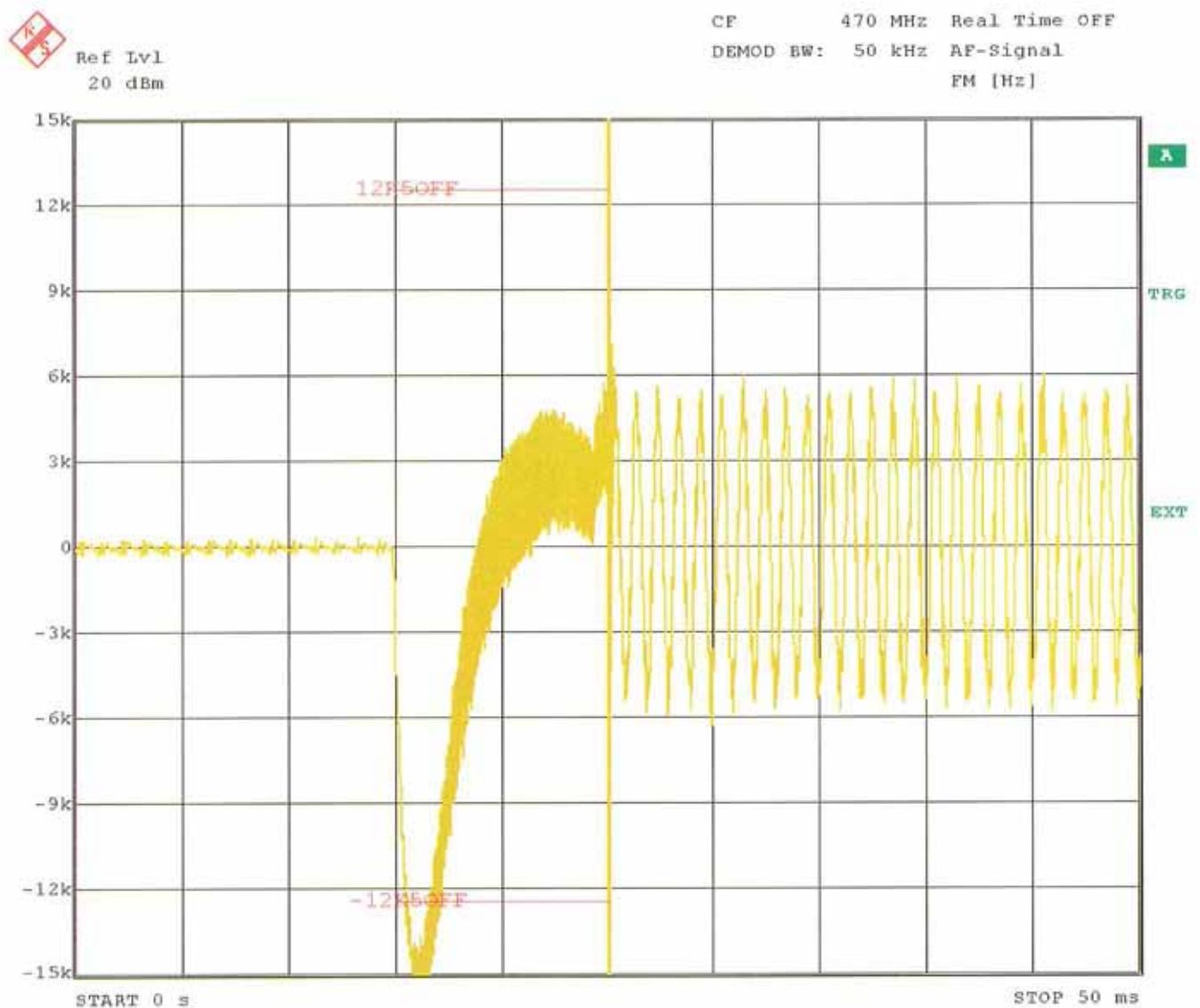
Transient frequency behaviour

§ 90.214
§ 5.9

Operating mode: t_{off} is in the middle of the screen (25ms pre-trigger)

Frequency: 470 MHz

Transmitter switching off



Date: 4.MAY.2009 11:44:40

Test Equipment used: NT-207, NT-310

Receiver spurious emissions

§ 5.11

LIMIT

Clause 6 Table 1 of RSS-Gen:

The field strength of any spurious frequency generated by the receiver in each polarization (vertical and horizontal), measured at a distance of 3 metres, shall not exceed the limits of Table 6. The resolution bandwidth of the spectrum analyser shall be 100 kHz for measuring spurious emissions below 1,0 GHz and 1,0 MHz for above 1,0 GHz.

Table 6: Spurious Emission Limits for Receivers

Spurious frequency (MHz)	Field strength ($\mu\text{V/m}$) at 3 metres
30-88	100
88-216	150
216-960	200
above 960	500

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

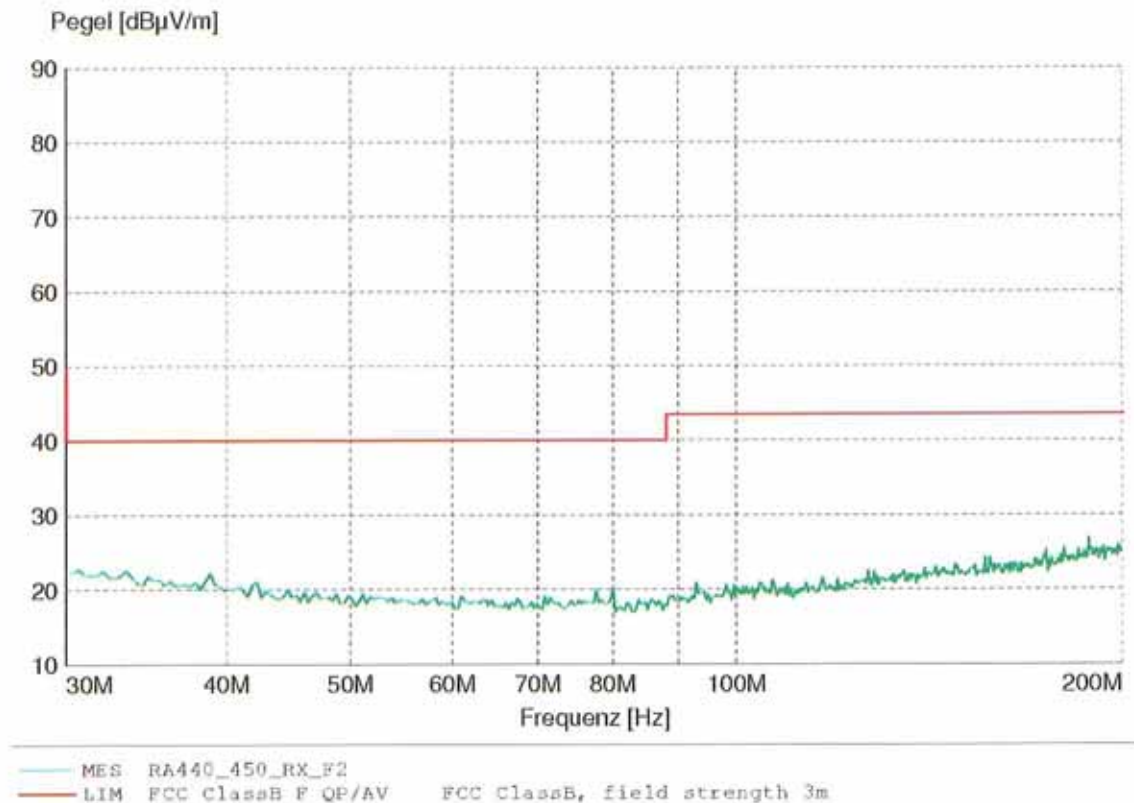
Receiver spurious emissions

§ 5.11

Operating mode:

Frequency: 450 MHz

Receiving



Seite 1 02.04.2009 09:15

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

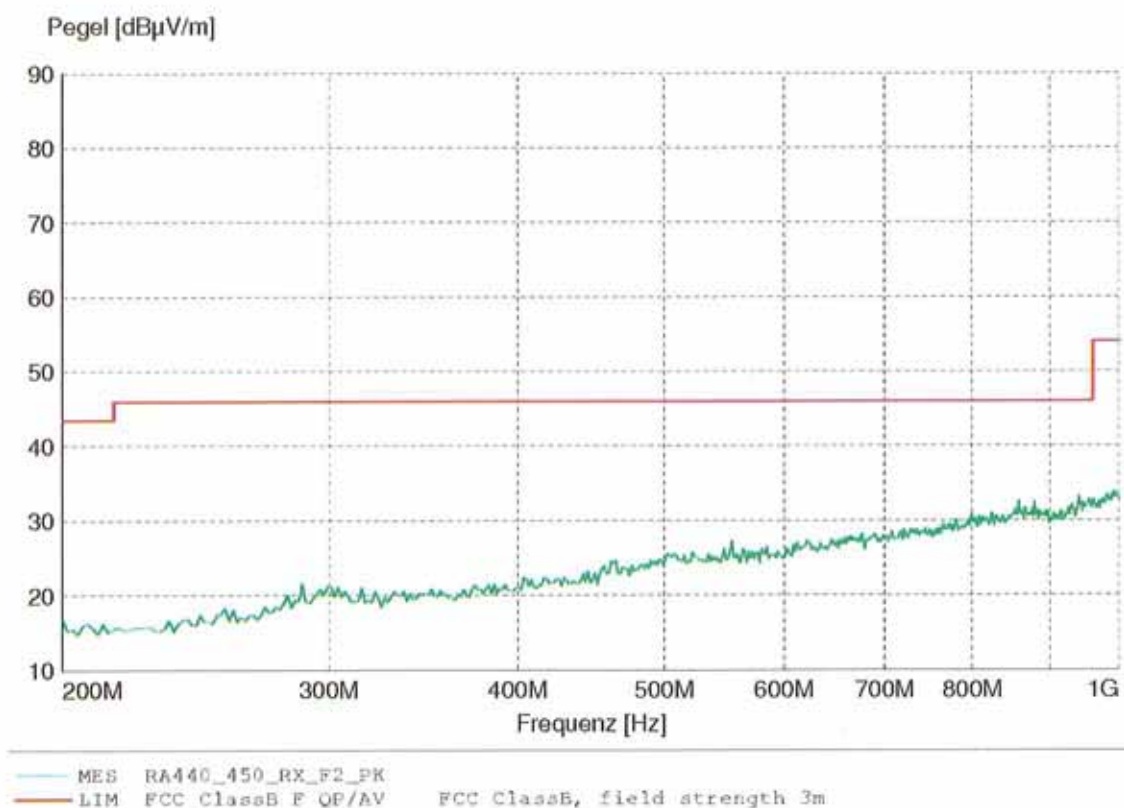
Receiver spurious emissions

§ 5.11

Operating mode:

Frequency: 450 MHz

Receiving



Seite 1 01.04.2009 16:22

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

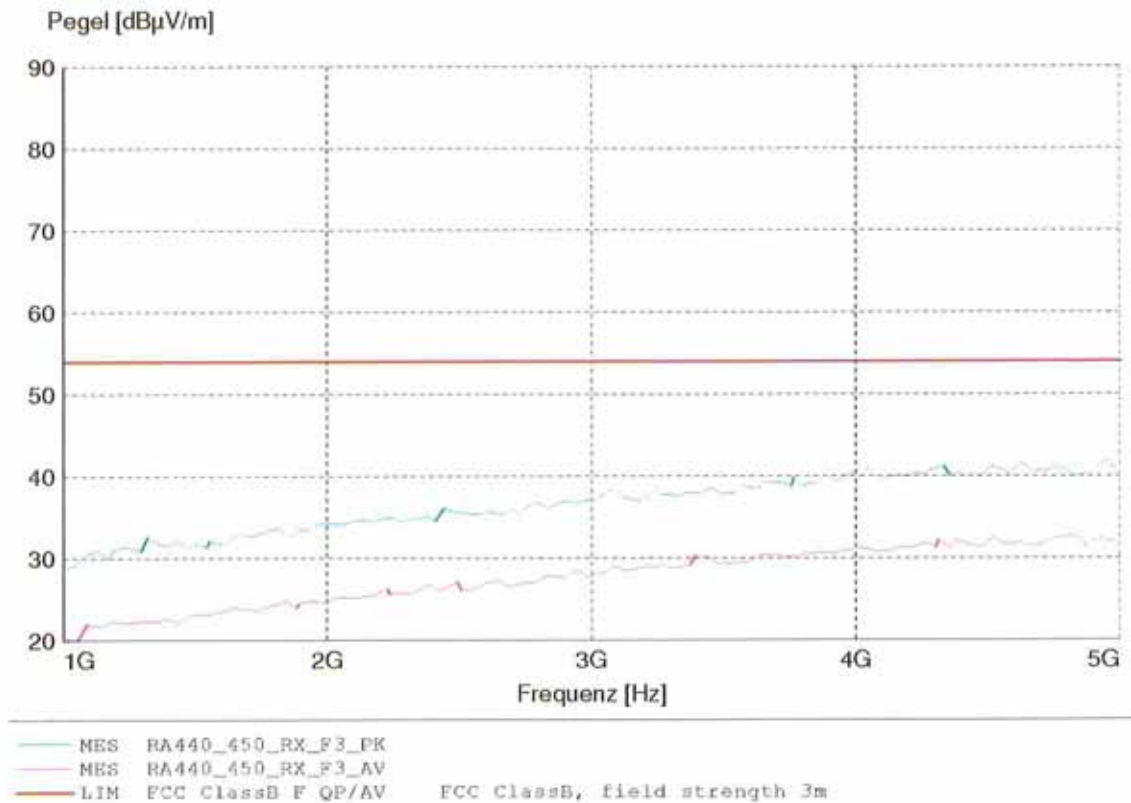
Receiver spurious emissions

§ 5.11

Operating mode:

Frequency: 450 MHz

Receiving



Seite 1 01.04.2009 13:44

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

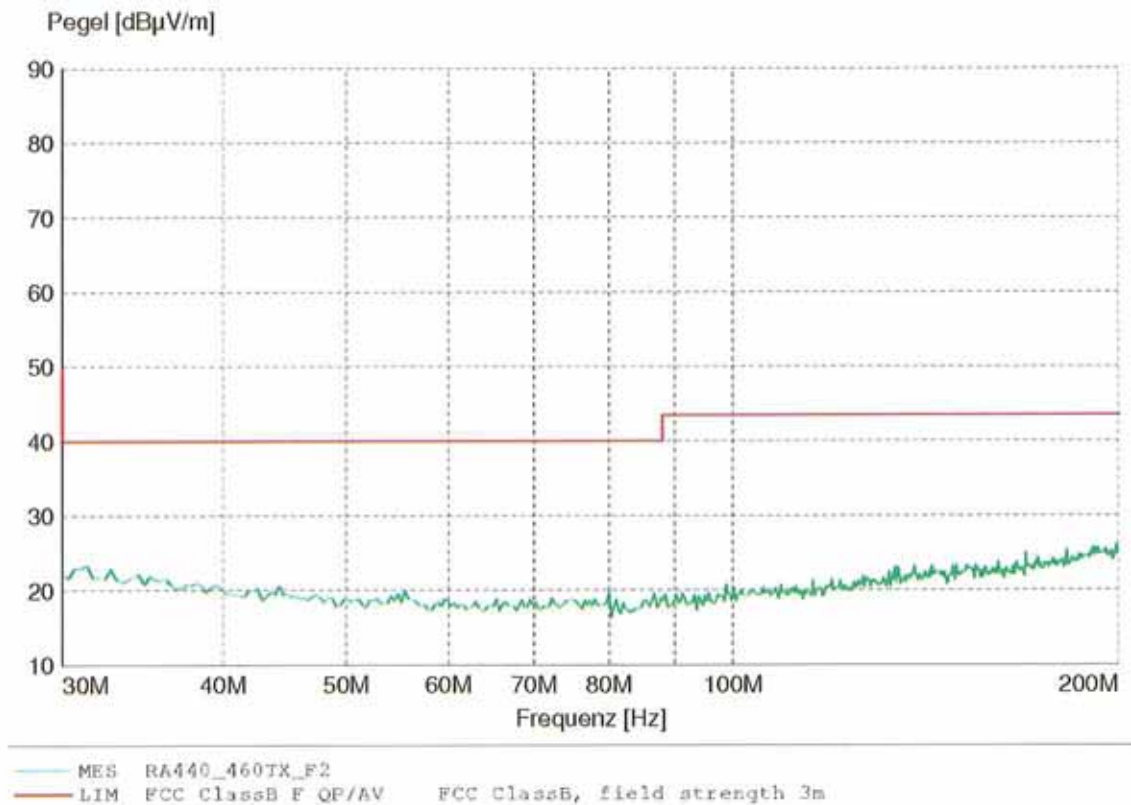
Receiver spurious emissions

§ 5.11

Operating mode:

Frequency: 460 MHz

Receiving



Seite 1 02.04.2009 09:12

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

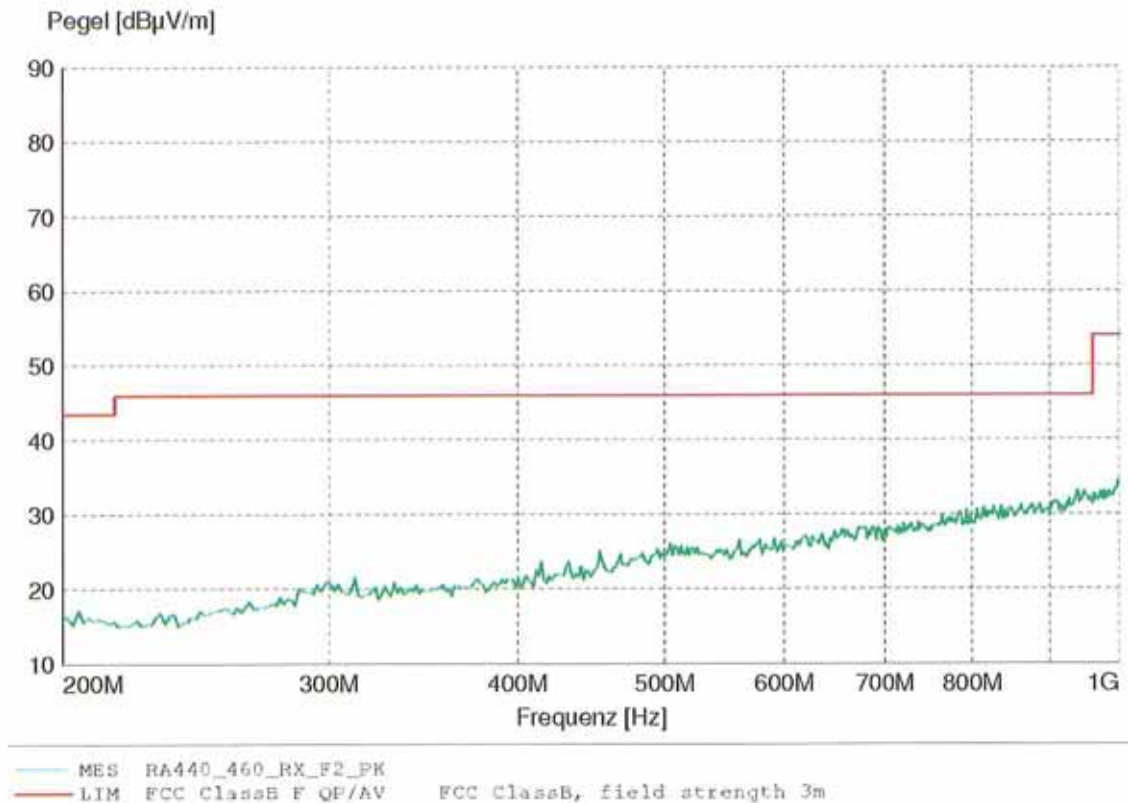
Receiver spurious emissions

§ 5.11

Operating mode:

Frequency: 460 MHz

Receiving



Seite 1 01.04.2009 16:15

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

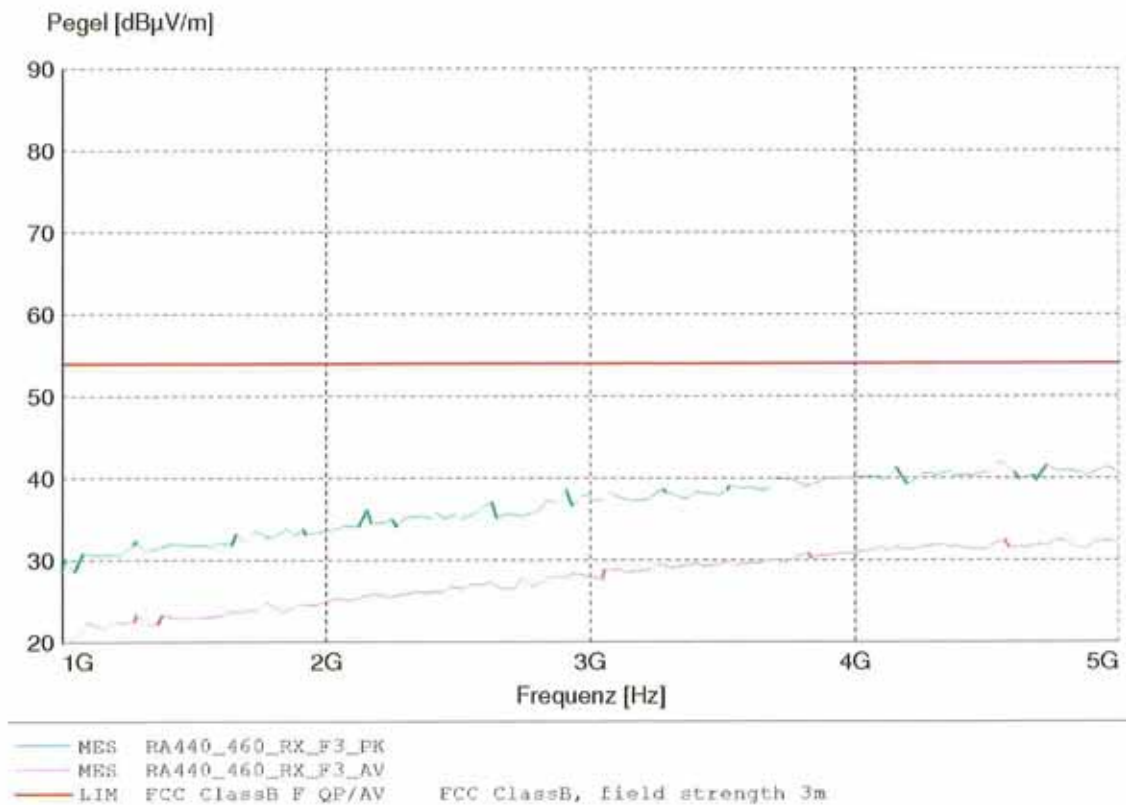
R Receiver spurious emissions

§ 5.11

Operating mode:

Frequency: 460 MHz

Receiving



Seite 1 01.04.2009 13:50

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

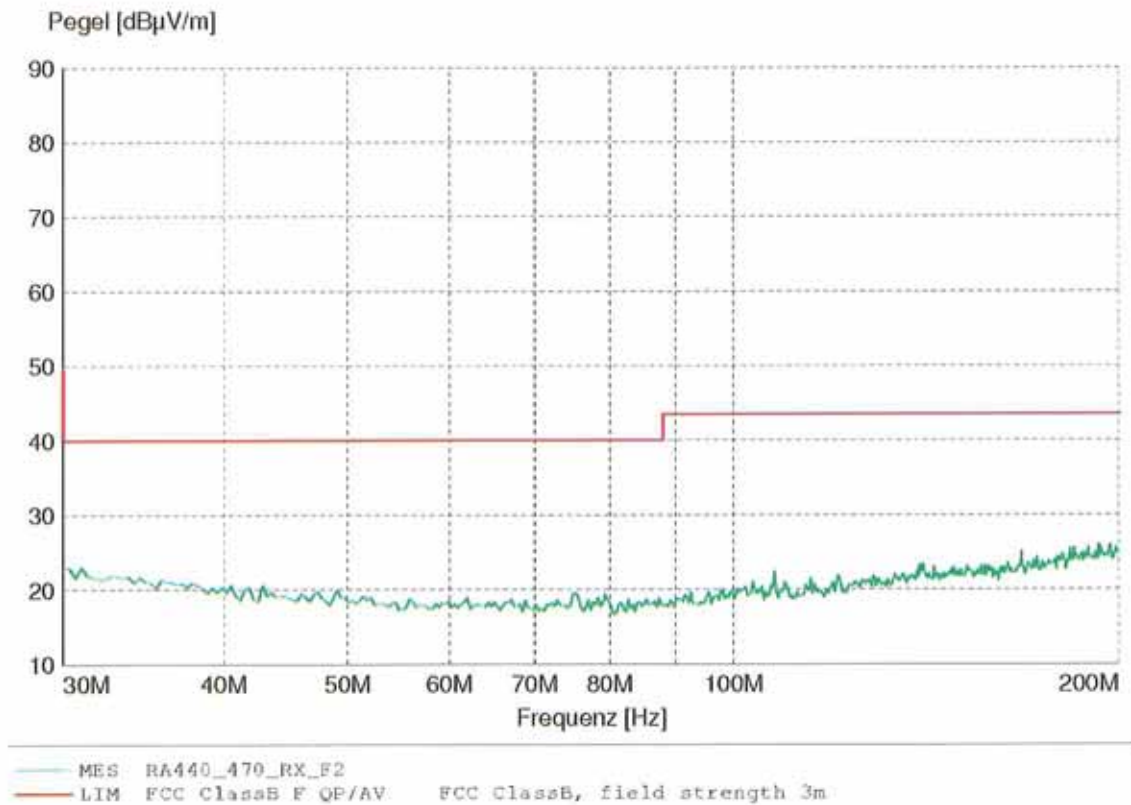
Receiver spurious emissions

§ 5.11

Operating mode:

Frequency: 470 MHz

Receiving



Seite 3 02.04.2009 09:28

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

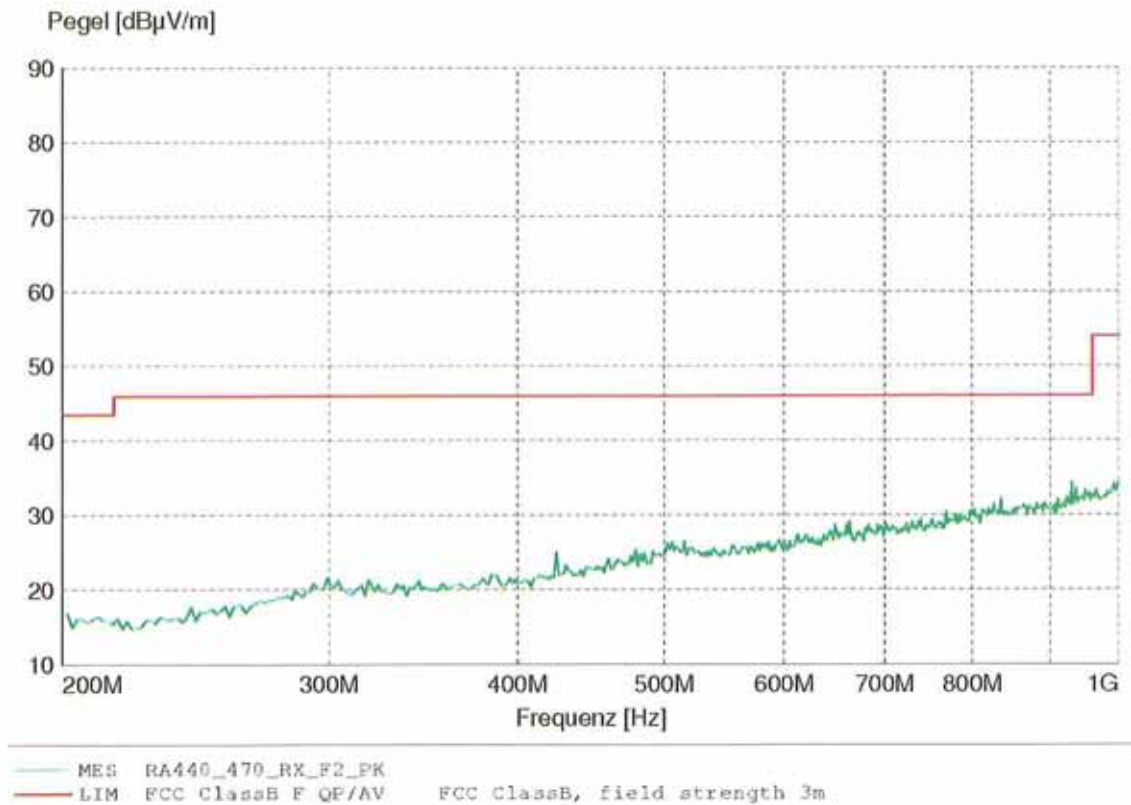
Receiver spurious emissions

§ 5.11

Operating mode:

Frequency: 470 MHz

Receiving



Seite 1 01.04.2009 16:03

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

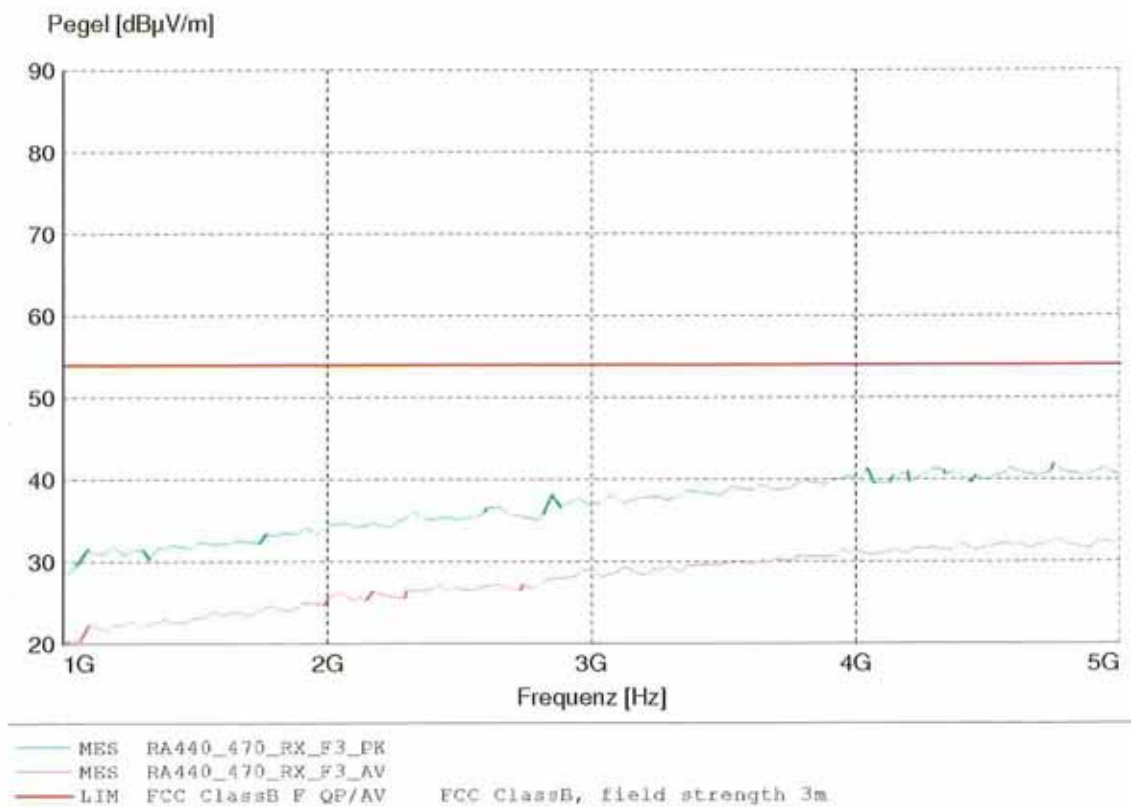
Receiver spurious emissions

§ 5.11

Operating mode:

Frequency: 470 MHz

Receiving



Seite 1 01.04.2009 14:02

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

Appendix 1

Test equipment used

☐	Anechoic Chamber with 3m measurement distance	NT-100	☐	Spectrum analyzer – FSP7 9 kHz – 7 GHz	NT-200
☐	Stripline according to ISO 11452-5	NT-108	☐	ESVP - Test receiver 20 - 1000 MHz	NT-201
☐	MA 240 - Antenna mast 1 - 4 m height	NT-110	☐	ESPC - Test receiver 9 kHz - 2,5 GHz	NT-203
☐	DS 412 - Turntable 0 - 400 ° Azimuth	NT-111	☐	ESI26 – Test receiver 20 Hz – 26,5 GHz	NT-207
☐	HD 100 Controller Mast+Turntable	NT-112	☐	Digital Radio Tester CMU200	NT-208
☐	HUF-Z2 - Bicon. Antenna 20 - 300 MHz	NT-120	☐	Noise-gen., ITU-R 559-2 20 Hz – 20 kHz	NT-209
☐	HUF-Z3 - Log. Per. Antenna 200 - 1000 MHz	NT-121	☐	CMTA - Radiocommunication analyzer ; 0,1 - 1000 MHz	NT-210
☐	HFH-Z2 - Loop Antenna 9 kHz - 30 MHz	NT-122	☐	3271 - Spectrum analyzer 100 Hz - 26,5 GHz	NT-211
☐	HFH-Z6 - Rod Antenna 9 kHz - 30 MHz	NT-123	☐	Radiocommunication analyzer Marconi 2945A	NT-212
☐	3121C - Dipole Antenna 28 - 1000 MHz	NT-124	☐	2855S - Communication analyzer	NT-213
☐	3115 - Horn Antenna 1 - 18 GHz (immunity)	NT-125	☐	Mixer M28HW 26,5 GHz - 40 GHz	NT-214
☐	3116 - Horn Antenna 18 - 40 GHz	NT-126	☐	Diode Detector 0,01 GHz - 26,5 GHz	NT-215
☐	SAS-200/543 - Bicon. Antenna 20 MHz - 300 MHz	NT-127	☐	RubiSource T&M Timing reference	NT-216
☐	AT-1080 - Log. Per. Antenna 80 - 1000 MHz	NT-128	☐	Radiocommunication analyzer SWR 1180 MD	NT-217
☐	HK-116 - bicon. Antenna 20 MHz - 300 MHz	NT-129	☐	Mixer M19HWD 40 GHz – 60 GHz	NT-218
☐	HK-116 - bicon. Antenna 20 MHz - 300 MHz	NT-130	☐	Mixer M12HWD 60 GHz – 90 GHz	NT-219
☐	3146 - Log. Per. Antenna 200 – 1000 MHz	NT-131	☐	TDS - 540 DSO Digital scope	NT-220
☐	Loop Antenna H-Field	NT-132	☐	TPS 2014 Digital scope	NT-222
☐	Horn Antenna 500 MHz - 2900 MHz	NT-133	☐	Artificial Ear according to IEC 60318	NT-224
☐	Horn Antenna 500 MHz - 6000 MHz	NT-133/1	☐	1 kHz Sound calibrator	NT-225
☐	Log. per. Antenna 800 MHz - 2500 MHz	NT-134	☐	B10 - Harmonics and flicker analyzer	NT-232
☐	Log. per. Antenna 800 MHz - 2500 MHz	NT-135	☐	SRM-3000 Spectrum analyzer	NT-233
☐	BiConiLog Antenna 26 MHz – 2000 MHz	NT-137	☐	E-field probe SRM 75 MHz – 3 GHz	NT-234
☐	Conical Dipole Antenna PCD8250	NT-138	☐	Hall-Teslameter ETM-1	NT-241
☐	HF 906 - Horn Antenna 1 - 18 GHz (emission)	NT-139	☐	EFA-3 H-field- / E-field probe	NT-243
☐	HZ-1 Antenna tripod	NT-150	☐	E-field measuring instrument EMR-200; 100 kHz – 3 GHz	NT-244
☐	BN 1500 Antenna tripod	NT-151	☐	E-field probe 100 kHz – 3 GHz	NT-245
☐	Ant. tripod for EN61000-4-3 Model TP1000A	NT-156	☐	Magnetic field Sensor 300 kHz – 30 MHz	NT-246
☐	Power quality analyzer Fluke 1760 (complete set)	NT-160 - NT-172	☐	E-field probe 3 MHz – 18 GHz	NT-247

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Appendix 1 (continued)

Test equipment used

☐ ELT-400 1 Hz – 400 kHz	NT-249	☐ T82-50 RF-Amplifier 2 GHz – 8 GHz	NT-331
☐ MDS 21 - Absorbing clamp 30 - 1000 MHz	NT-250	☐ 500W1000M7 - RF-Amplifier 80 - 1000 MHz / 500 W	NT-332
☐ FCC-203I EM Injection clamp	NT-251	☐ AS0102-65R - RF-Amplifier 1 GHz - 2 GHz	NT-333
☐ FCC-203I-DCN Ferrite decoupling network	NT-252	☐ APA01 – RF-Amplifier 0,5 GHz – 2,5 GHz	NT-334
☐ PR50 Current Probe	NT-253	☐ Preamplifier 1 GHz - 4 GHz	NT-335
☐ PR630 Current Probe	NT-254	☐ Preamplifier for GPS MKU 152 A	NT-336
☐ Fluke 87 V True RMS Multimeter	NT-260	☐ Preamplifier 100 MHz – 23 GHz	NT-337
☐ Model 2000 Digital Multimeter	NT-261	☐ DC Block 10 MHz – 18 GHz Model 8048	NT-338
☐ Fluke 87 V Digital Multimeter	NT-262/1	☐ 2-97201 Electronic load	NT-341
☐ ESH2-Z5-U1 Artificial mains network 4x25A	NT-300	☐ TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-344
☐ ESH3-Z5-U1 Artificial mains network 2x10A	NT-301	☐ TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-345
☐ ESH3-Z6-U1 Artificial mains network 1x100A	NT-302	☐ VDS 200 Mobil-impuls-generator	NT-350
☐ ESH3-Z4 T-Artificial network	NT-303	☐ LD 200 Mobil-impuls-generator	NT-351
☐ PHE 4500/B Power amplifier	NT-304	☐ MPG 200 Mobil-Impuls-Generators	NT-352
☐ EZ10 T-Artificial Network	NT-305	☐ EFT 200 Mobil-impuls-generator	NT-353
☐ ENY22 Artificial Network	NT-308	☐ AN 200 S1 Artificial Network	NT-354
☐ ENY41 Artificial Network	NT-309	☐ FP-EFT 32M 3 ph. Coupling filter (Burst)	NT-400/1
☐ SMG - Signal generator 0,1 - 1000 MHz	NT-310	☐ PHE 4500 - Mains impedance network	NT-401
☐ PM 5518 TXVPS Video generator	NT-311	☐ IP 6.2 Coupling filter for data lines (Surge)	NT-403
☐ RefRad Reference generator	NT-312	☐ TK 9421 High Power Volt. Probe 150 kHz - 30 MHz	NT-409
☐ SMP 02 Signal generator 10 MHz - 20 GHz	NT-313	☐ ESH2-Z3 - Probe 9 kHz - 30 MHz	NT-410
☐ 40 MHz Arbitrary Generator TGA1241	NT-315	☐ IP 4 - Capacitive clamp (Burst)	NT-411
☐ Artificial mains network NSLK 8127-PLC	NT-316	☐ Highpass-Filter 100 MHz – 3 GHz	NT-412
☐ PEFT - Burst generator up to 4 kV	NT-320	☐ Highpass-Filter 600 MHz – 4 GHz	NT-413
☐ ESD 30 System up to 25 kV	NT-321	☐ Highpass-Filter 1250 MHz – 4 GHz	NT-414
☐ PSURGE 4.1 Surge generator	NT-324	☐ Highpass-Filter 1800 MHz – 16 GHz	NT-415
☐ TRANSIENT 1000 Immunity test system	NT-325	☐ Highpass-Filter 3500 MHz – 18 GHz	NT-416
☐ VCS 500-M6 Surge-Generator	NT-326	☐ RF-Attenuator 10 dB DC – 18 GHz / 50 W	NT-417
☐ BTA-250 - RF-Amplifier 9 kHz - 220 MHz / 250 W	NT-330	☐ RF-Attenuator 6 dB DC – 18 GHz / 50 W	NT-418

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Appendix 1 (continued) Test equipment used

☐ RF-Attenuator 3 dB DC – 18 GHz / 50 W	NT-419	☐ 95242-1 – Current probe 10 MHz – 400 MHz	NT-468
☐ RF-Attenuator 20 dB DC – 1000 MHz / 25 W	NT-421	☐ 94106-1L-1 – Current probe 20 Hz – 450 MHz	NT-471
☐ RF-Attenuator 30 dB DC – 1000 MHz / 1 W	NT-423	☐ GA 1240 Power amplifier according to EN 61000-4-16	NT-480
☐ RF-Attenuator 30 dB	NT-424	☐ Coupling networks according to EN 61000-4-16	NT-481 - NT-483
☐ RF-Attenuator 6 dB DC – 1000 MHz / 1 W	NT-425	☐ PC P4 3 GHz Test computer	NT-500
☐ RF-Attenuator 6 dB DC – 1000 MHz / 1 W	NT-426	☐ PC P4 1700 MHz Notebook	NT-505
☐ RF-Attenuator 6 dB	NT-428	☐ PC Intel Centrino 1600 MHz Notebook	NT-506
☐ RF-Attenuator 0 dB - 81 dB	NT-429	☐ Monitoring camera with Monitor	NT-511
☐ WRU 27 - Band blocking 27 MHz	NT-430	☐ ES-K1 Version 1.71 SP2 Test software	NT-520
☐ WHJ450C9 AA - High pass 450 MHz	NT-431	☐ SRM-TS Version 1.3 software for SRM-3000	NT-522
☐ WHJ250C9 AA - High pass 250 MHz	NT-432	☐ SPS-PHE Test software V2.4c voltage fluctuations/harmonics	NT-525
☐ RF-Load 150 W	NT-433	☐ SPS-EM Test software V2.4c EN61000-4-11	NT-527
☐ Impedance transducer 1:4 ; 1:9 ; 1:16	NT-435	☐ Noise power test apparatus according to EN 55014	NT-530
☐ RF-Attenuator DC – 18 GHz 6 dB	NT-436	☐ Vertical coupling plane (ESD)	NT-531
☐ RF-Attenuator DC – 18 GHz 6 dB	NT-437	☐ Test cable #4 for EN 61000-4-6	NT-553
☐ RF-Attenuator DC – 18 GHz 10 dB	NT-438	☐ Test cable #3 for conducted emission	NT-554
☐ RF-Attenuator DC – 18 GHz 20 dB	NT-439	☐ Test cable #5 ESD-cable (2x470k)	NT-555
☐ I+P 7780 Directional coupler 100 - 2000 MHz	NT-440	☐ Test cable #6 ESD-cable (2x470k)	NT-556
☐ ESH3-Z2 - Pulse limiter 9 kHz - 30 MHz	NT-441	☐ Test cable #8 Sucoflex 104EA	NT-559
☐ Power Divider 6 dB/1 W/50 Ohm	NT-443	☐ Test cable #9 (for outdoor measurements)	NT-580
☐ Directional coupler 0,1 MHz – 70 MHz	NT-444	☐ Test cable #10 (for outdoor measurements)	NT-581
☐ Directional coupler 0,1 MHz – 70 MHz	NT-445	☐ Test cable #13 Sucoflex 104PE	NT-584
☐ Tube imitations according to EN 55015	NT-450	☐ Test cable #21 for SRM-3000	NT-592
☐ FCC-801-M2-50A Coupling decoupling network	NT-459	☐ Shield chamber	NT-600
☐ FCC-801-M5-25 Coupling decoupling network	NT-460	☐ Climatic chamber	M-1200
☐ FCC-801-AF10 Coupling decoupling network	NT-461	☐ Control and simulation equipment for EUT	---
☐ FCC-801-S25 Coupling decoupling network	NT-462		
☐ FCC-801-T4 Coupling decoupling network	NT-463		
☐ FCC-801-C1 Coupling decoupling network	NT-464		
☐ F-16A - Current probe 1kHz - 70MHz	NT-465		

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