

**TEST REPORT**  
of the accredited test laboratory

TÜV Nr.:M/FG-05/112

Geschäftsbereich  
Medizintechnik,  
Nachrichtentechnik  
und EMV

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Überwachungs-,  
Zertifizierungs- und  
Kalibrierstelle

Notified Body 0408

**Applicant:** FRONIUS International GmbH  
Günther Fronius-Strasse 1  
A-4600 Wels-Thalheim

**Tested Product:** Frequency hopping radio module

**Type (FCC-ID):** QKWFRF905

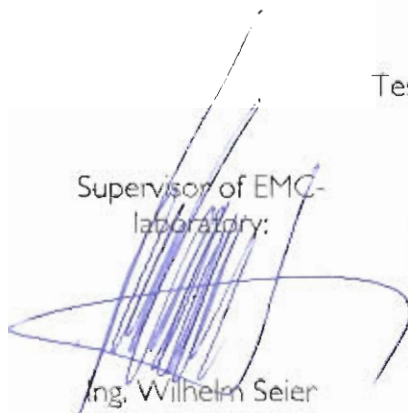
**Manufacturer:** FRONIUS International GmbH  
Günther Fronius-Strasse 1  
A-4600 Wels-Thalheim

**Output power / field strength:** 6 dBm nom. power supply: 3,14 VDC  
10 dBm max.

**Frequency range:** 902.4 – 927.6 MHz **Channel separation:** 400 kHz

**Standard:** FCC: 47 CFR 15.247


TÜV Österreich  
Test laboratory for EMC

Supervisor of EMC-  
laboratory:  
  
Ing. Wilhelm Seier



checked by:

  
Ing. Andreas Malek

Copy Nbr.: 

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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 15.247 is given below.

SUBCLAUSE	PARAMETER TO BE MEASURED	PAGE
	<b>Intentional Radiators</b>	
	Test object data	3
15.247 a	Channel carrier frequency separation	4
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## TEST OBJECT DATA

### General EUT Description

This device is a frequency hopping radio transceiver module operating in the 902-928 MHz frequency band according to FCC 15.247 intended to be used only by the manufacturer to be installed into devices built by the same manufacturer. This means that the device could also be part of a bigger PCB like that it was tested on.

The device divides the frequency band into 64 channels each spaced by 400 kHz beginning at 902,4 MHz and ending at 927,6 MHz. The channel must be represented by a pseudo-random hopping sequence through the 64 channels. All frequencies shall be equally used. The average time of occupancy shall not exceed 0,4 s within any 20 second period. At least 50 channels must be used.

The device can be used with three different antennas. Two of them will be connected through a SMA connector that shall not be accessible by the user. The third antenna would be placed directly on the PCB instead of the SMA connector.

The three antennas are:

PSKN3-890S	Half wavelength vertical whip antenna
ANT-DB1-RMT-SMA-2mRG174	Quarter wavelength vertical whip antenna connected via 2m coax
ANT-916-JJB-ST	Helix Antenna directly attached to the PCB by soldering

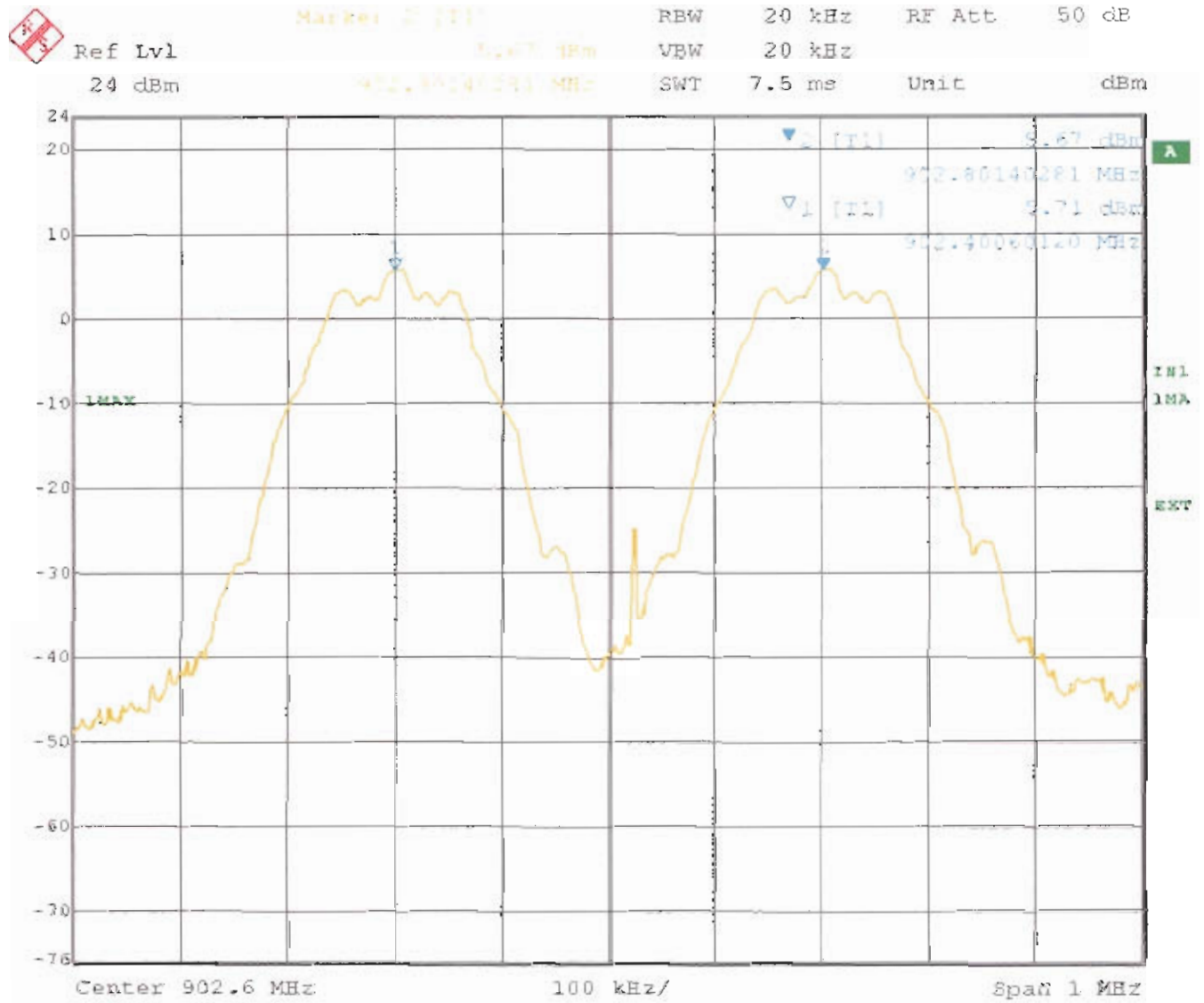
All measurements (except the radiated emissions test according to 15.209) were made at the antenna connector. The 15.209 radiated measurements were made on all three antennas.

To keep the spurious radiation limits using the antenna PSKN3-890S the duty cycle of the transmission must be 50% at maximum, or the output power must be reduced from 10dBm to 6 dBm. Both kinds of restrictions were measured during radiated emission tests. All conducted tests were made at highest power and continuous transmission.



CHANNEL CARRIER FREQUENCY

§ 15.247/a



Date: 30.JUN.2005 09:51:09

The channel separation is 400 kHz.



NUMBER OF HOPPING CHANNELS

§ 15.247/a

The number of hopping channels is 64 between 902,4 and 927,6 MHz. The tested module was only able to operate at the lowest, the highest and the middle channel, so there is no graph available for this paragraph.

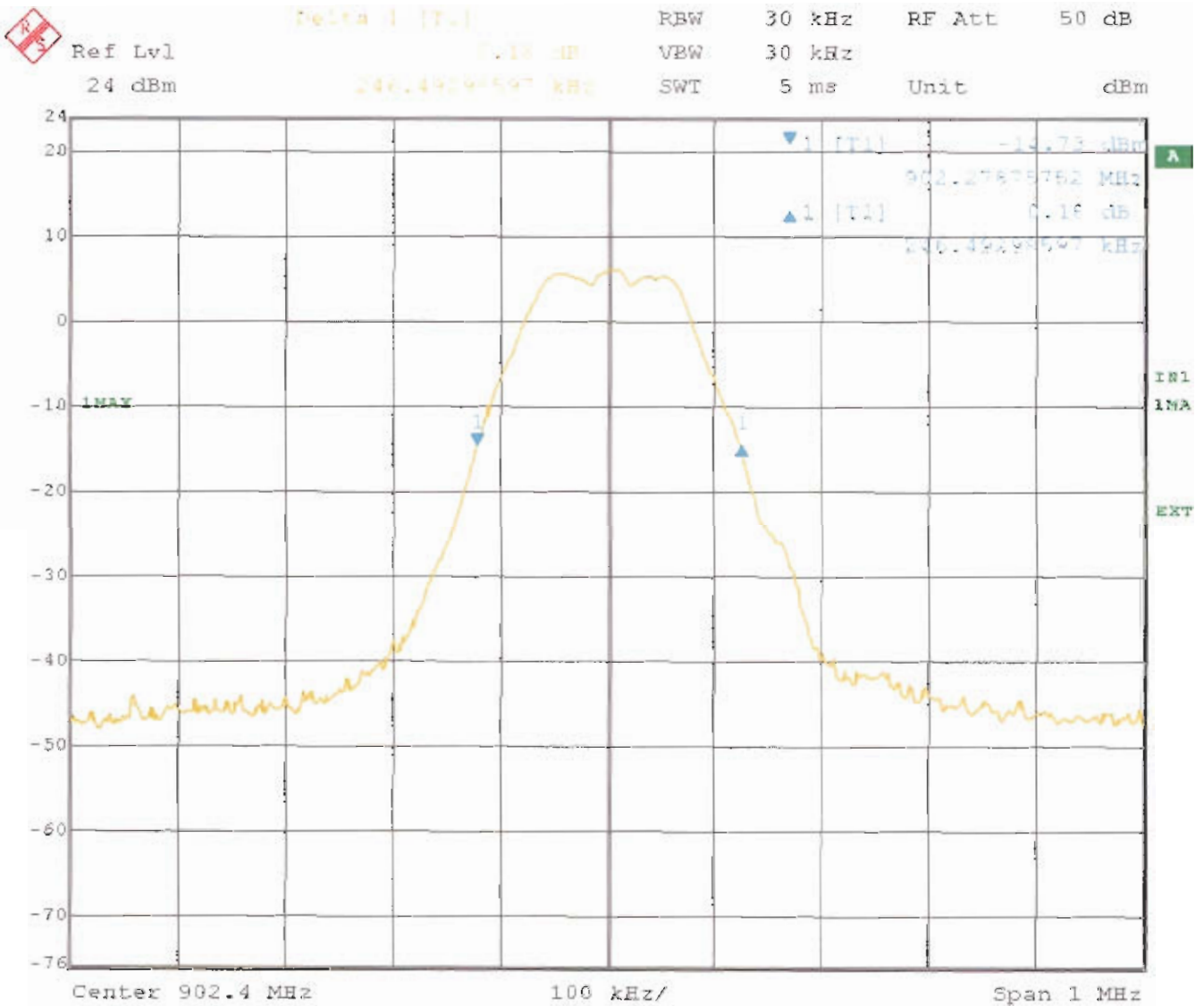


20 dB BANDWIDTH

§ 15.247/a

Measurements were made on the lowest, the highest and the middle hopping channel frequency with hopping disabled.

The transmitter was modulated by a pseudorandom bit sequence at the nominal RF-data rate.



Date: 30.JUN.2005 10:01:24

Frequency: 902.4 MHz

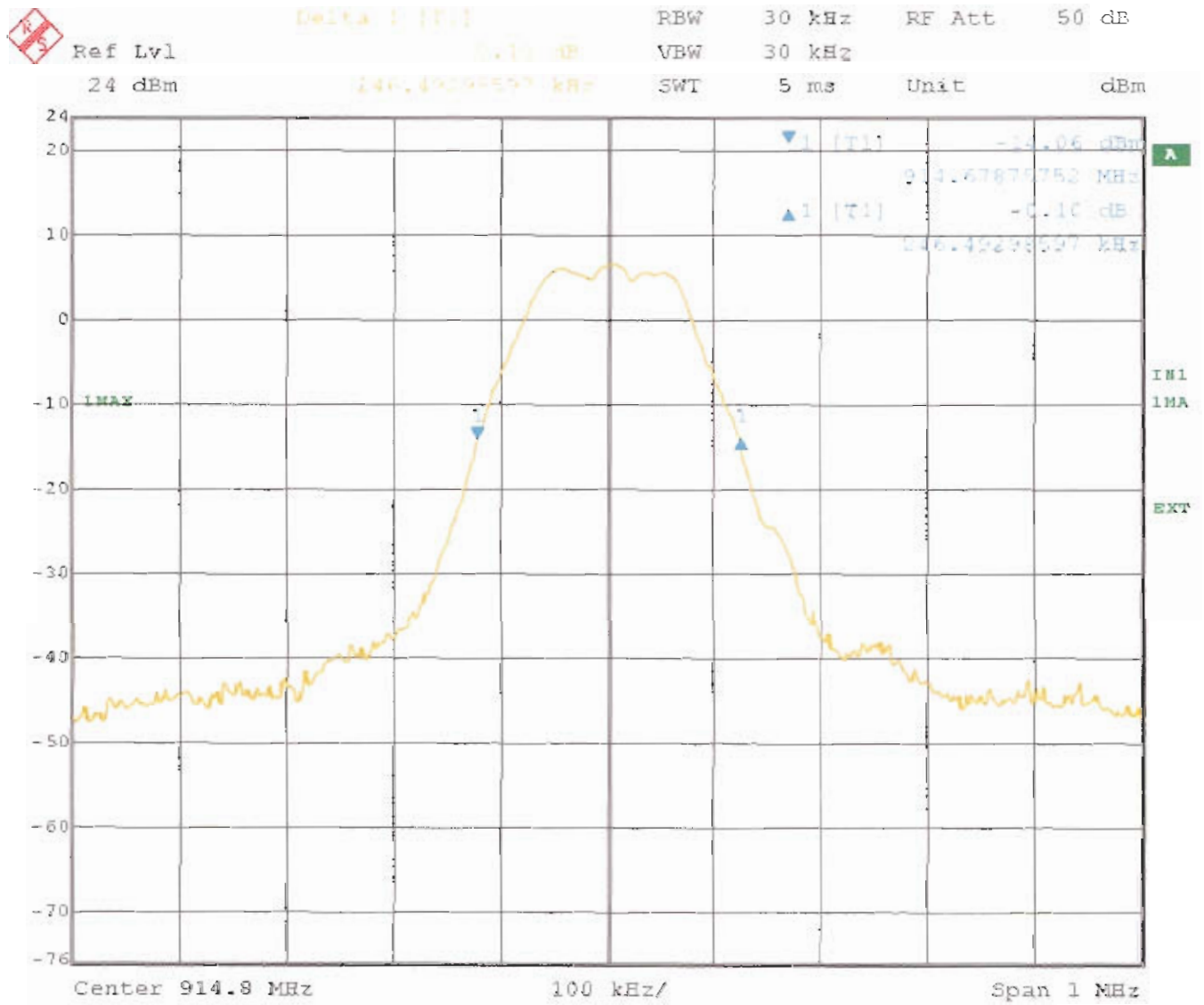
Bandwidth: 246.49 kHz





20 dB BANDWIDTH

§ 15.247/a



Date: 30 JUN 2005 09:59:44

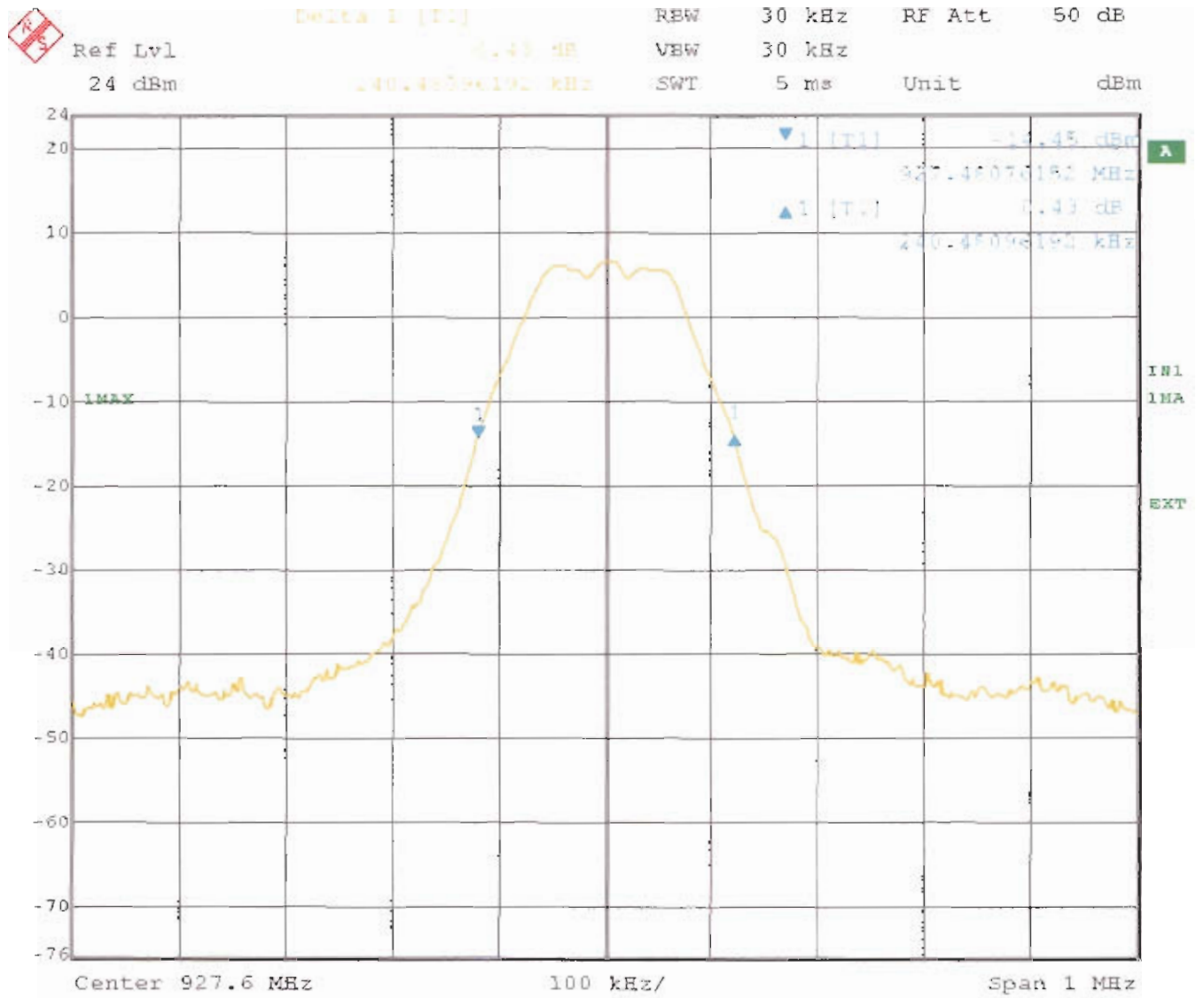
Frequency: 914.8 MHz

Bandwidth: 246.49 kHz



20 dB BANDWIDTH

§ 15.247/a



Date: 30.JUN.2005 09:58:35

Frequency: 927,6 MHz

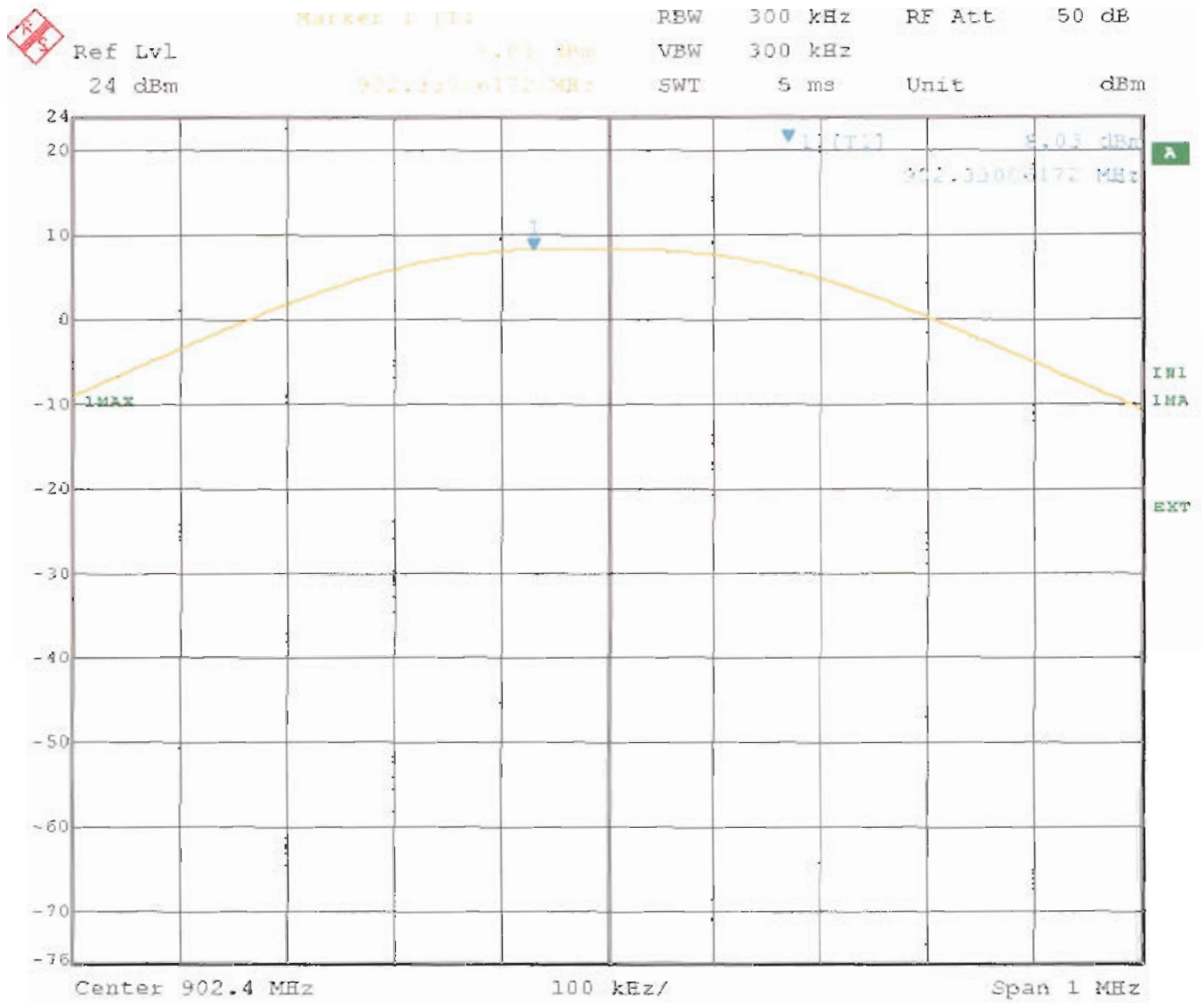
Bandwidth: 240,48 kHz





MAXIMUM PEAK OUTPUT POWER

§ 15.247/b



Date: 30.JUN.2005 09:55:35

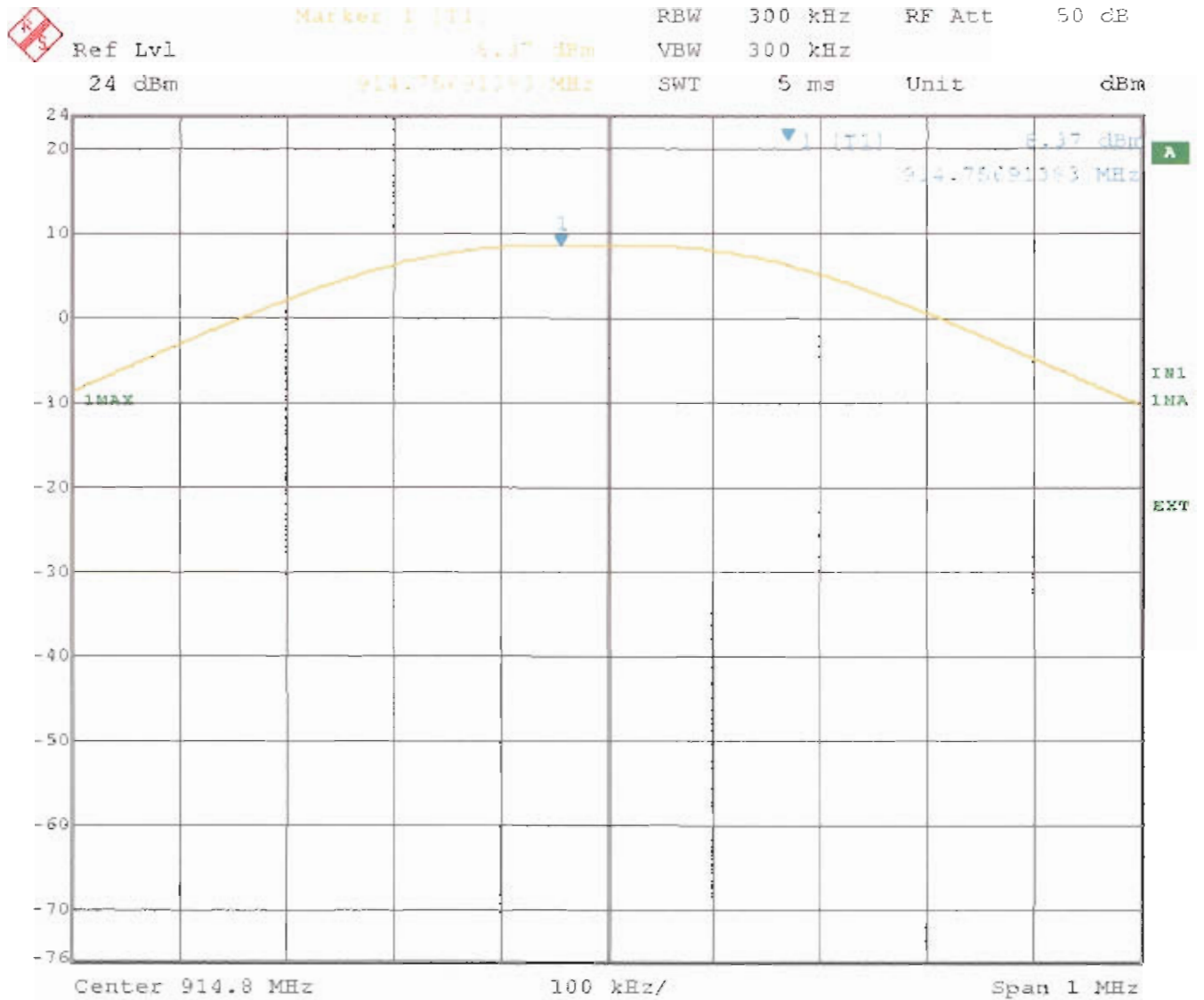
Frequency: 902,4 MHz

Peak output power 8,03 dBm



MAXIMUM PEAK OUTPUT POWER

§ 15.247/b



Date: 30.JUN.2005 09:54:38

Frequency: 914,8 MHz

Peak output power 8,37 dBm

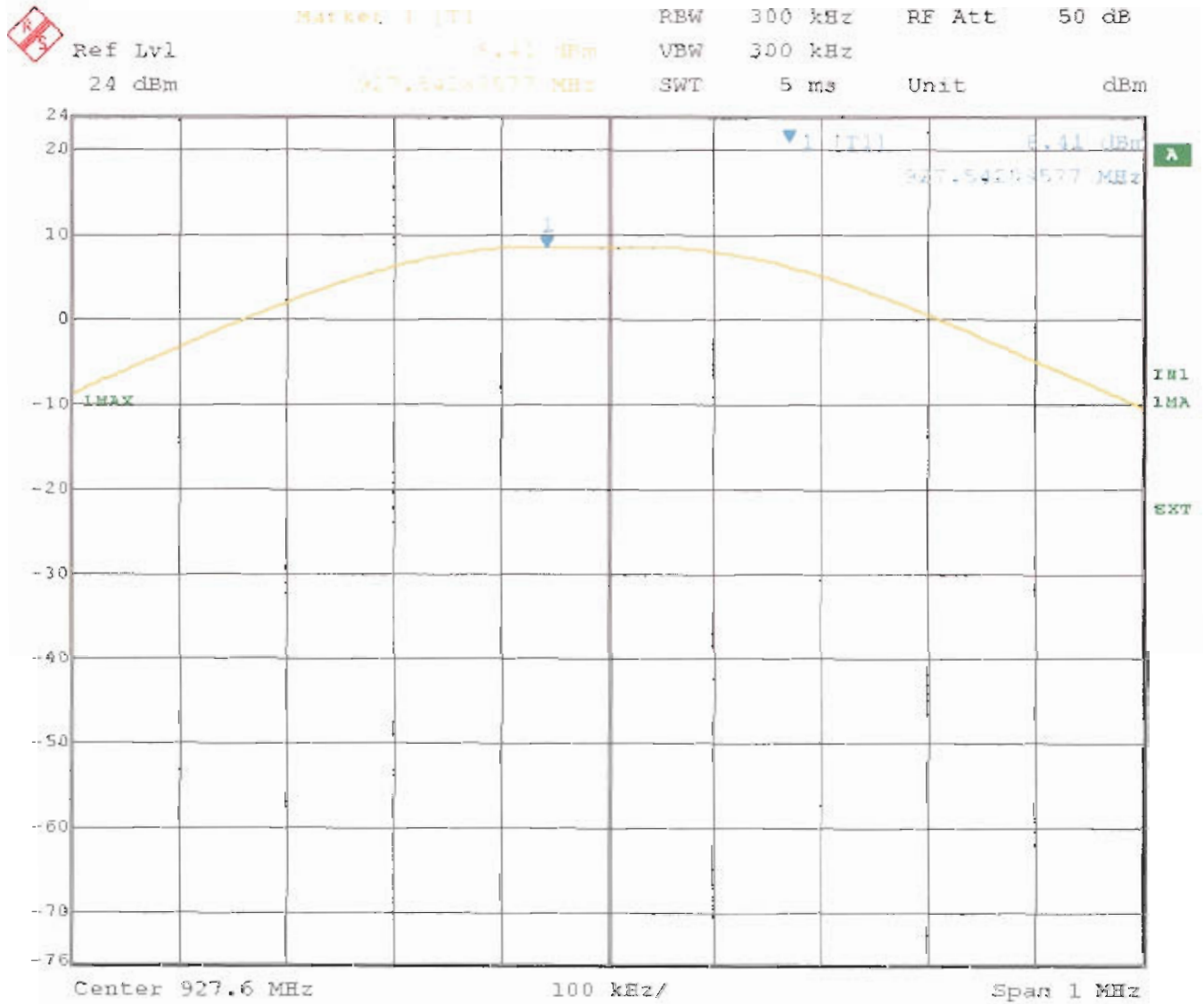


Ambient temperature: 24°C

Relative humidity: 43%

MAXIMUM PEAK OUTPUT POWER

§ 15.247/b



Date: 30.JUN.2005 09:56:16

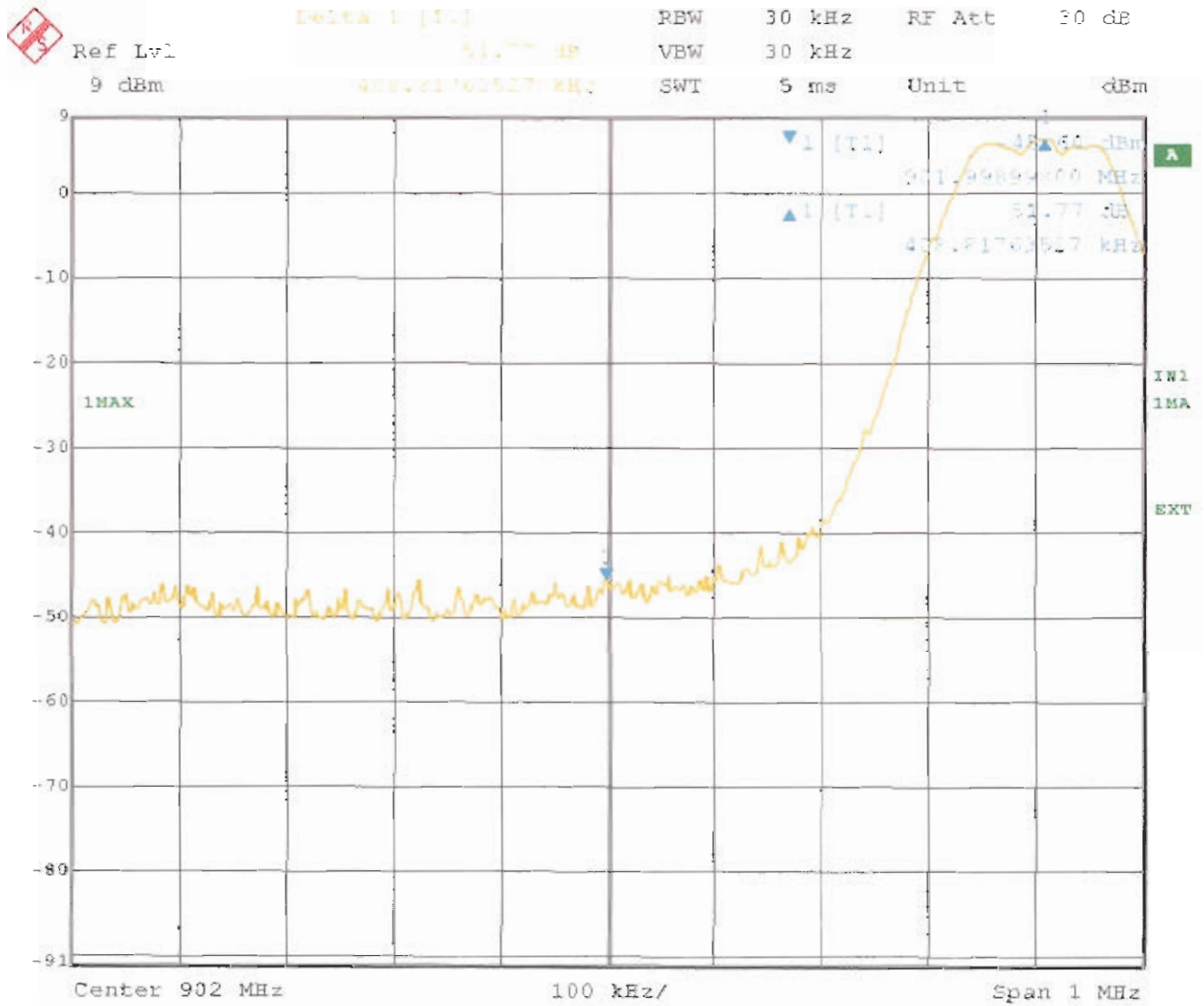
Frequency: 927.6 MHz

Peak output power 8.41 dBm



BAND EDGE REQUIREMENTS

§ 15.247/c



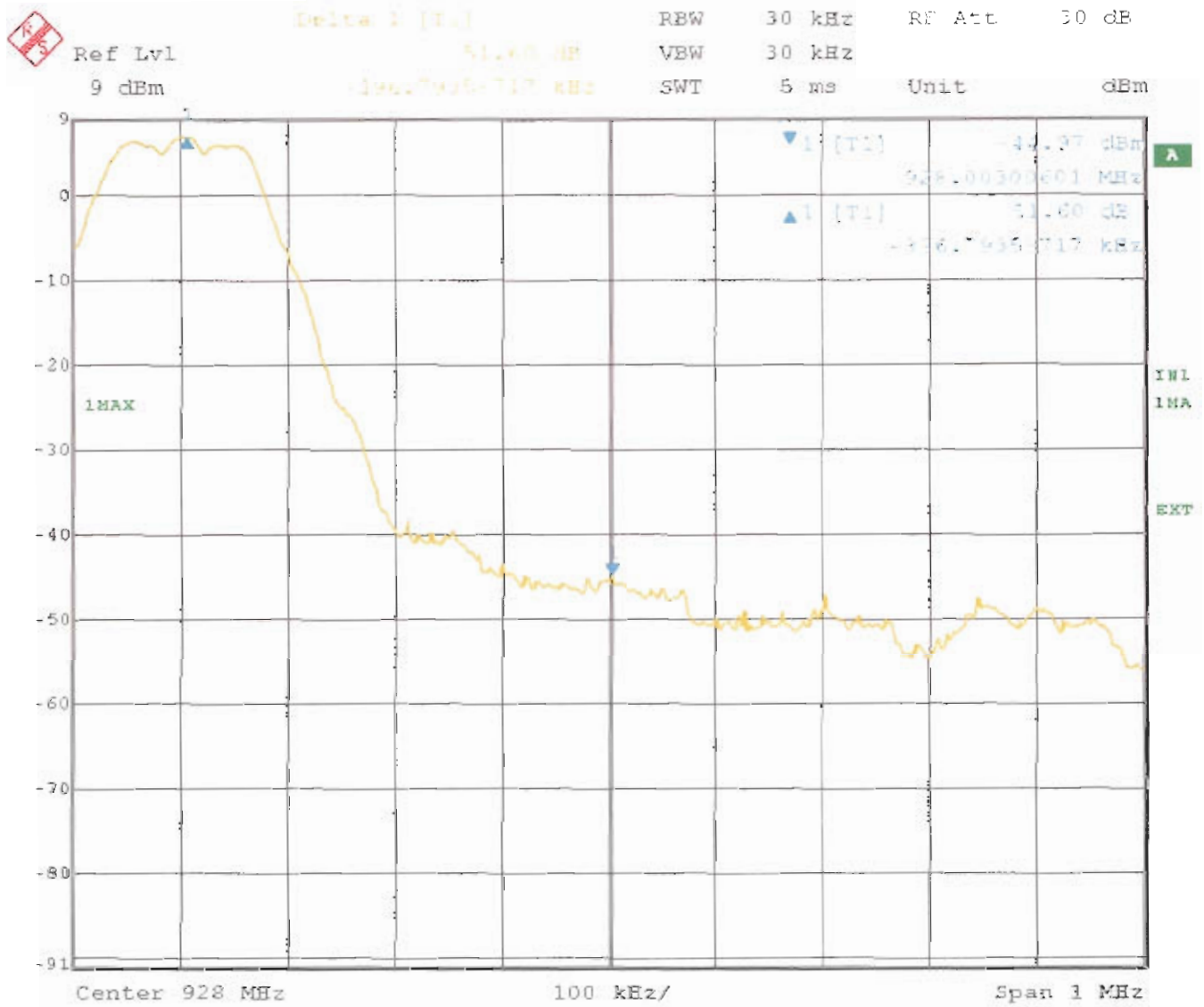
Date: 30.JUN.2005 10:04:34

Peak power at the lower band edge or at the highest emission outside the band on the lowest channel: -51,77 dBc



BAND EDGE REQUIREMENTS

§ 15.247/c



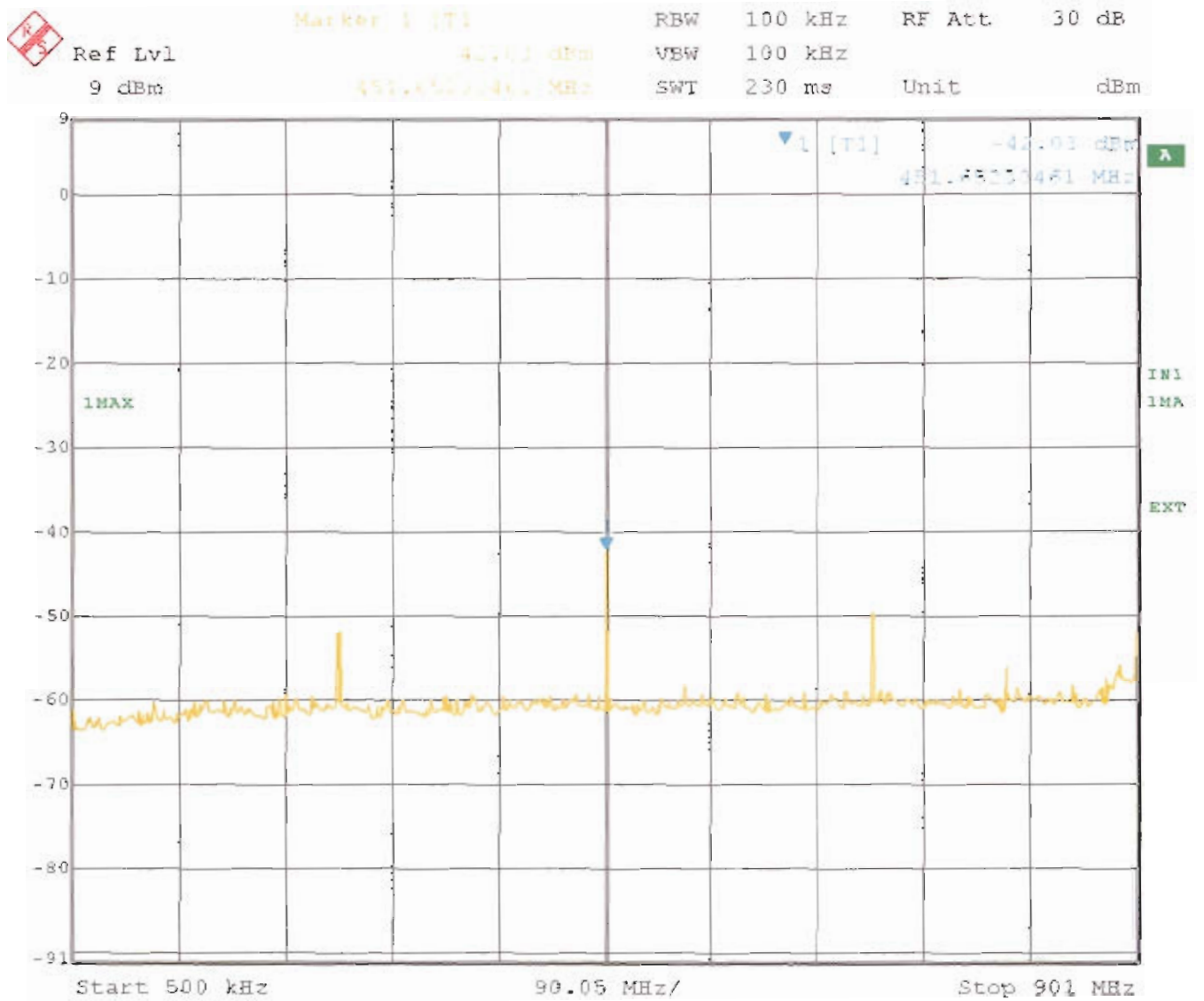
Date: 30.JUN.2005 10:06:03

Peak power at the higher band edge or at the highest emission outside the band on the highest channel: -51,60 dBc



SPURIOUS EMISSIONS

§ 15.247/c



Date: 30.JUN.2005 10:14:56

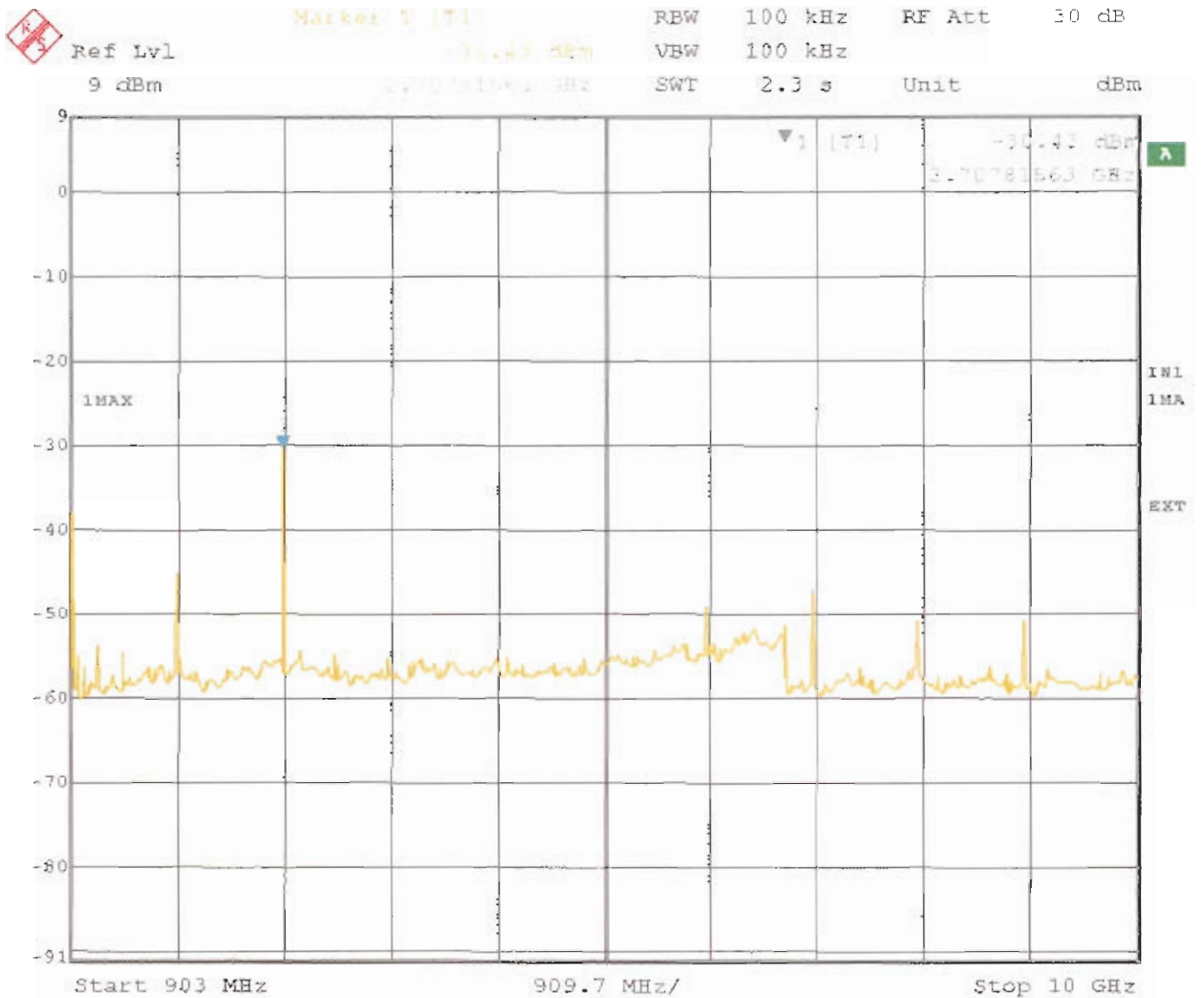
Emissions in the frequency range 500 kHz to 901 MHz operated on the lowest channel.





SPURIOUS EMISSIONS

§ 15.247/c



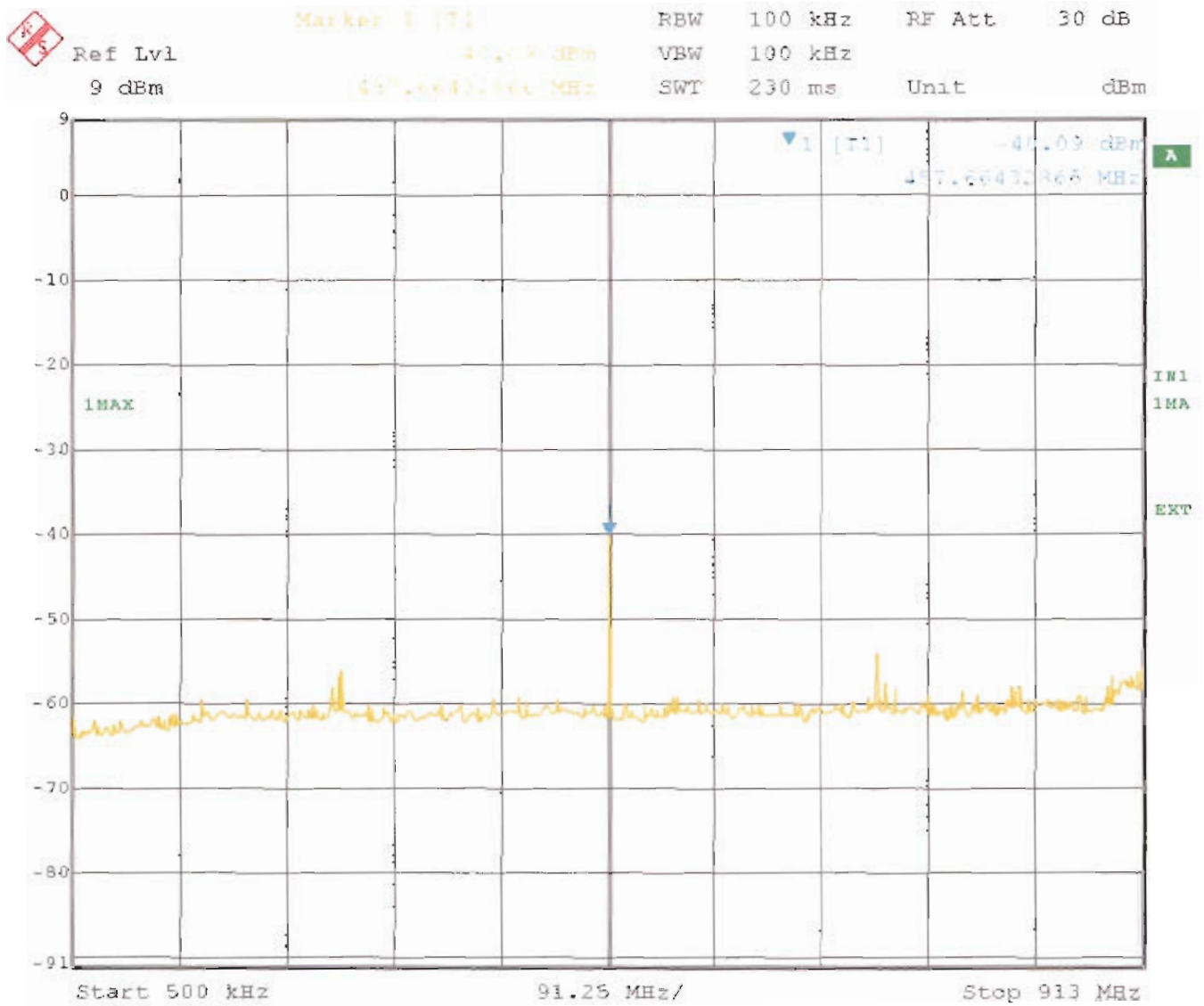
Date: 30.JUN.2005 10:15:47

Emissions in the frequency range 903 MHz to 10 GHz operated on the lowest channel.



SPURIOUS EMISSIONS

§ 15.247/c



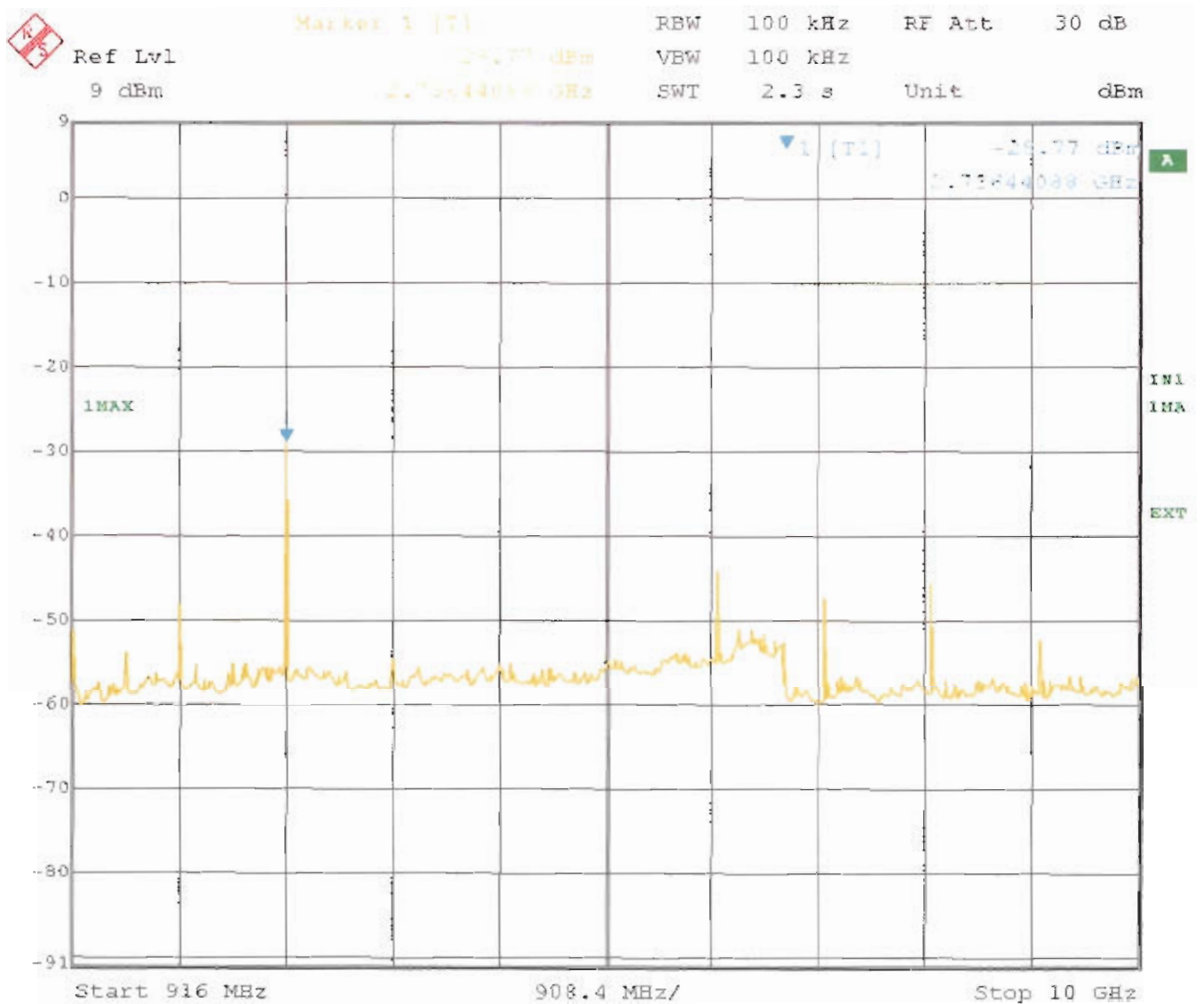
Date: 30.JUN.2005 10:04:00

Emissions in the frequency range 500 kHz to 913 MHz operated on the middle channel.



SPURIOUS EMISSIONS

§ 15.247/c



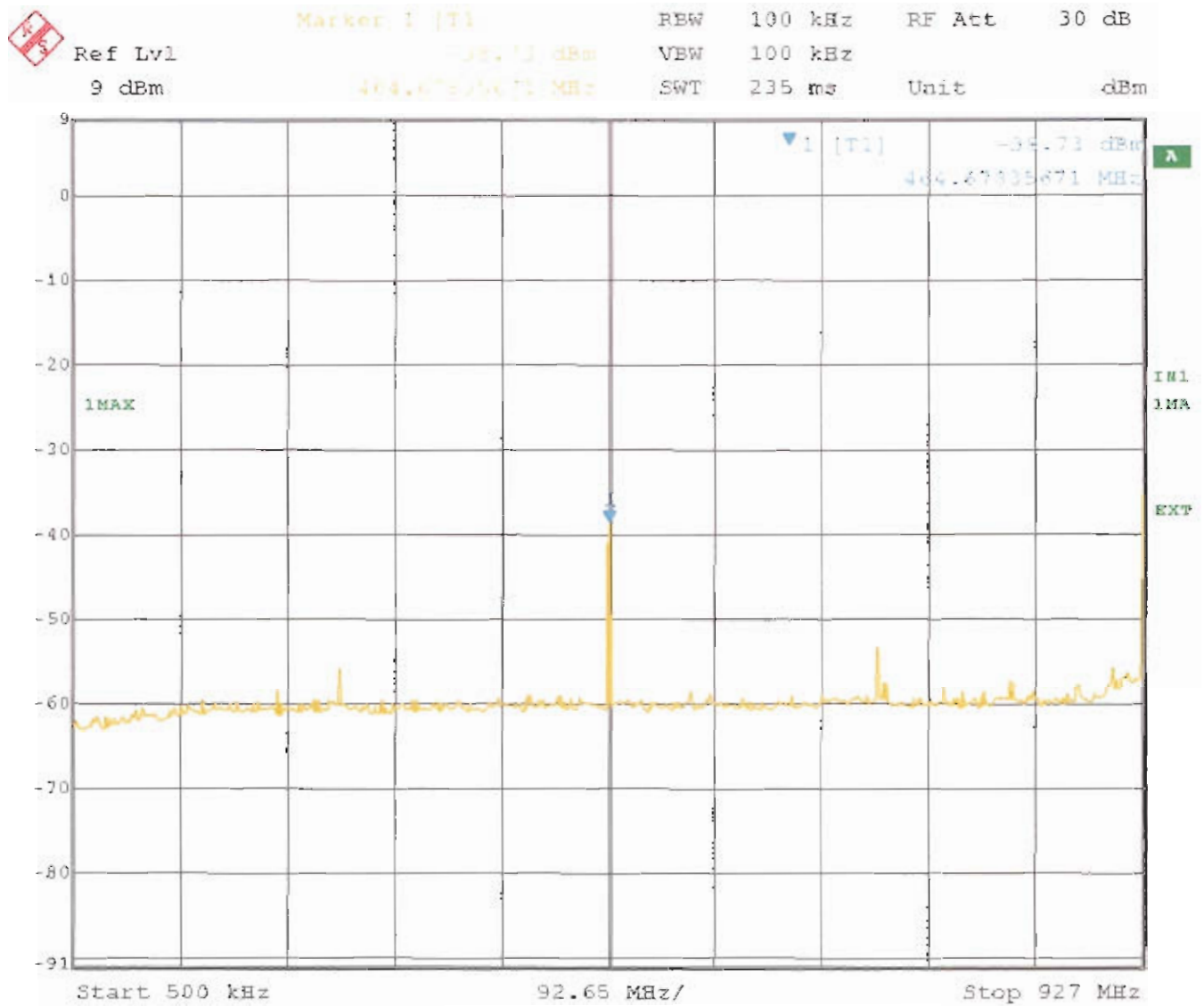
Date: 30.JUN.2005 10:12:41

Emissions in the frequency range 916 MHz to 10 GHz operated on middle channel.



SPURIOUS EMISSIONS

§ 15.247/c



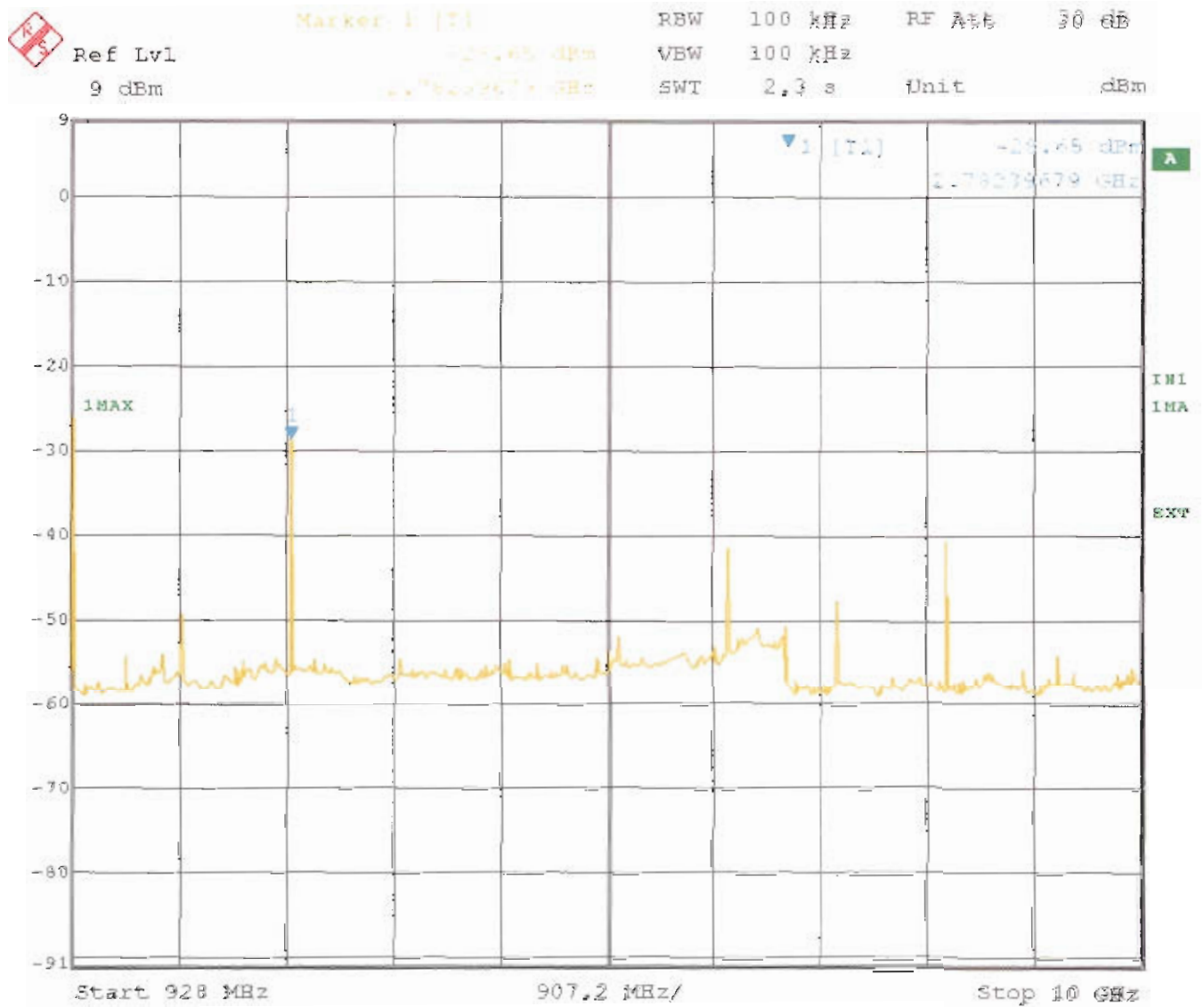
Date: 30.JUN.2005 10:09:03

Emissions in the frequency range 500 kHz to 927 MHz operated on the highest channel.



SPURIOUS EMISSIONS

§ 15.247/c



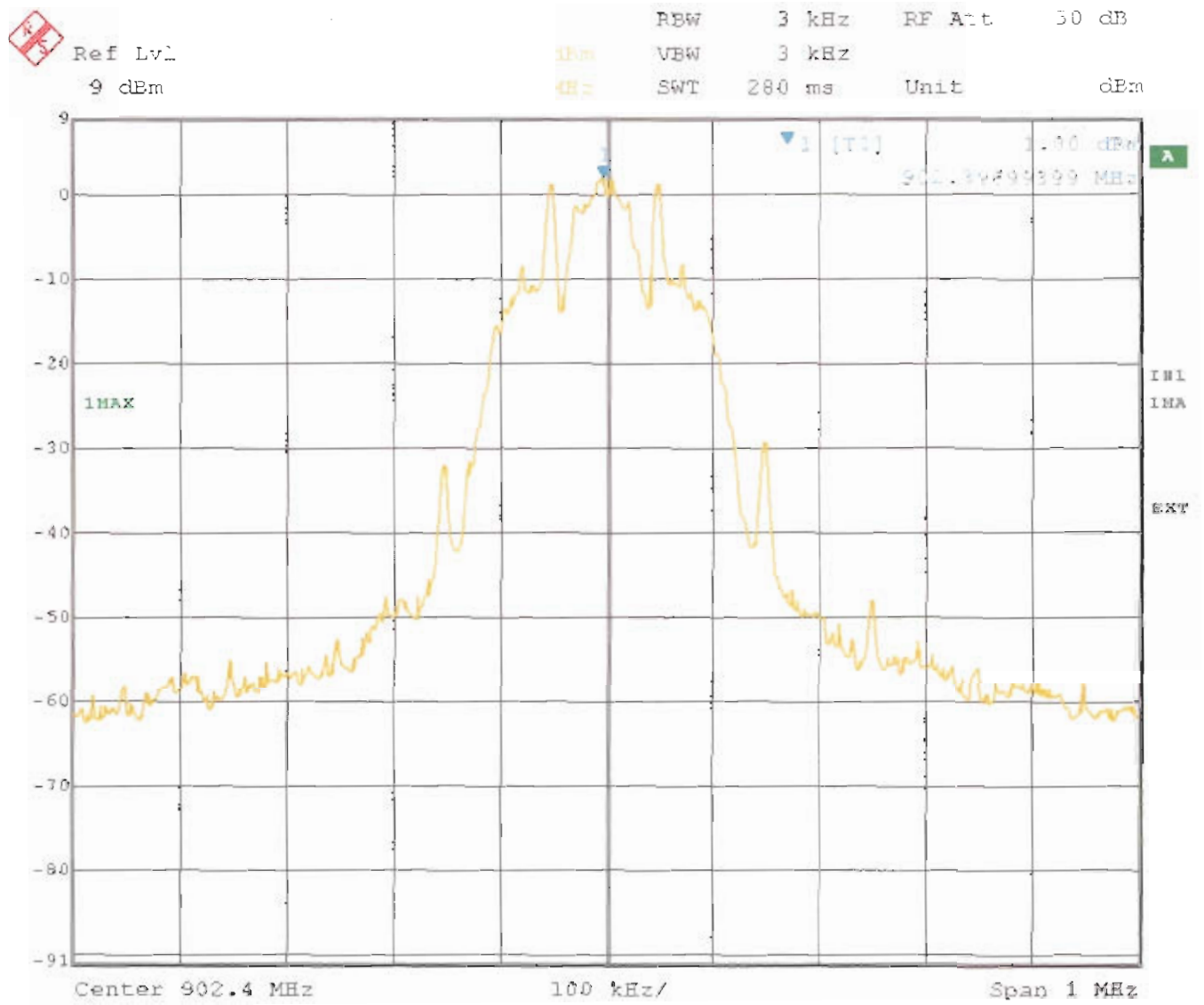
Date: 30 JUN 2005 10:11:17

Emissions in the frequency range 928 MHz to 10 GHz operated on the highest channel.



POWER SPECTRAL DENSITY

§ 15.247/f (d)



Date: 30.JUN.2005 10:18:05

Frequency: 902.4 MHz

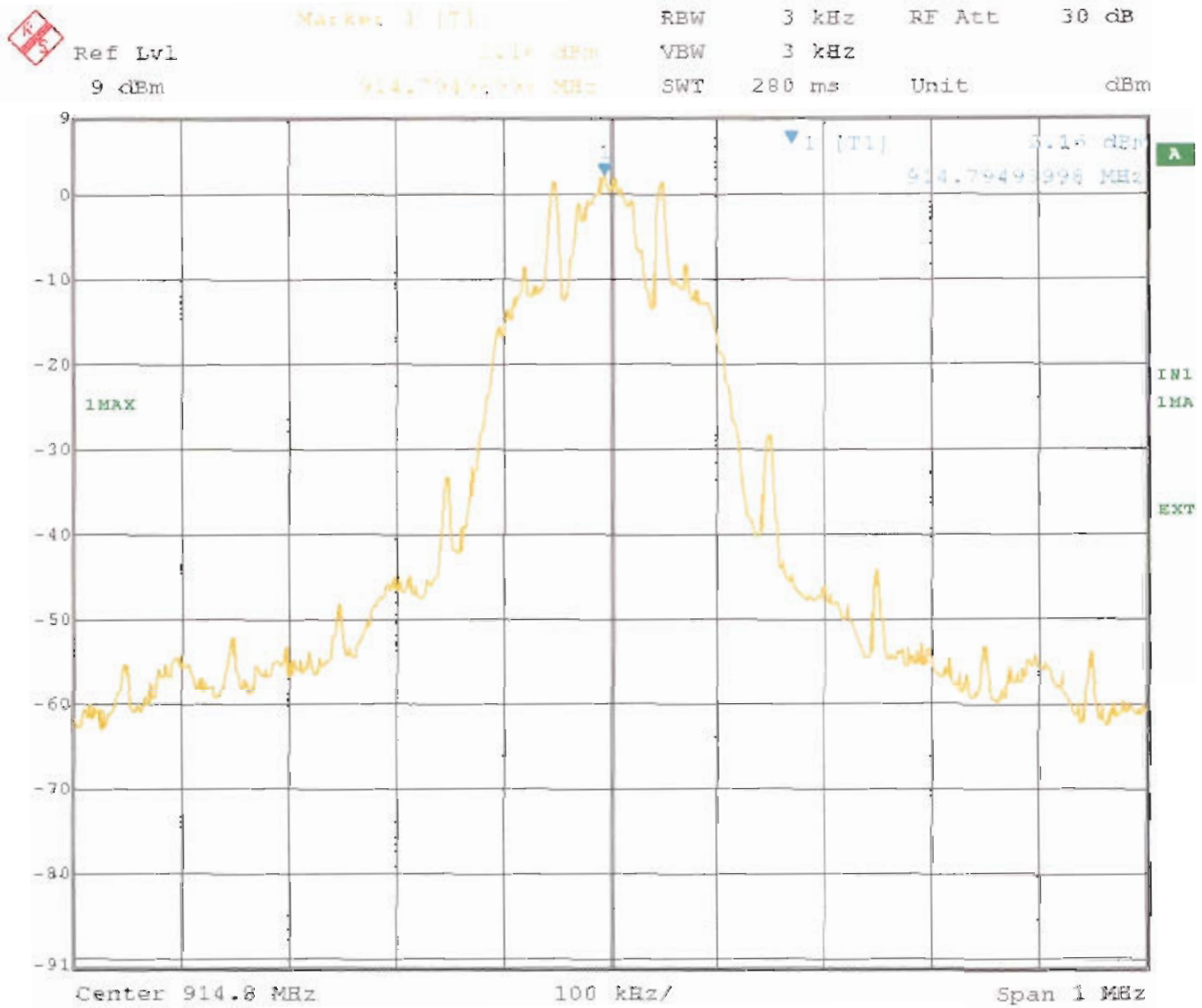
Power density: 1,80 dBm





POWER SPECTRAL DENSITY

$\S 15.247/f (d)$



Date: 30.JUN.2005 10:20:09

Frequency: 914.8 MHz

Power density: 2.16 dBm

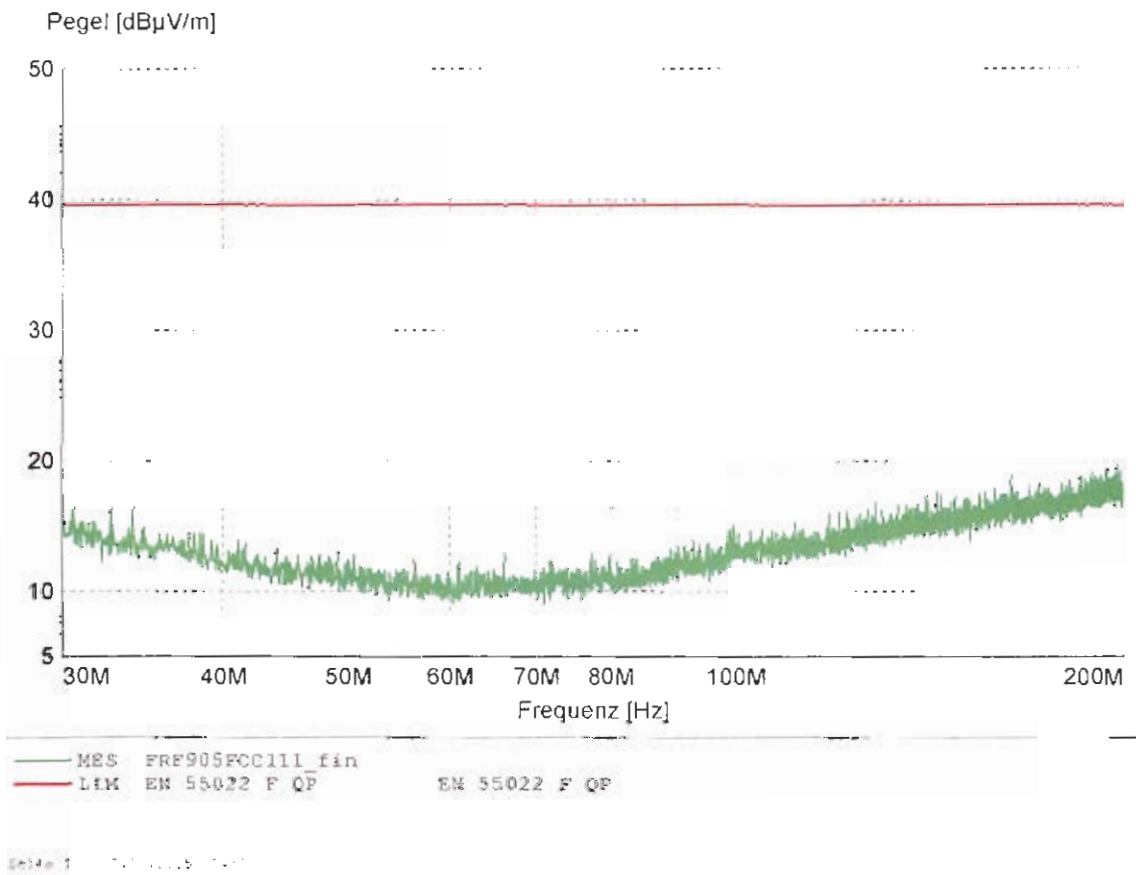


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: PSKN3-890S  
Channel: lowest  
Duty cycle: 100%  
Power setting: 10dBm  
Frequency range: 30 MHz to 200 MHz

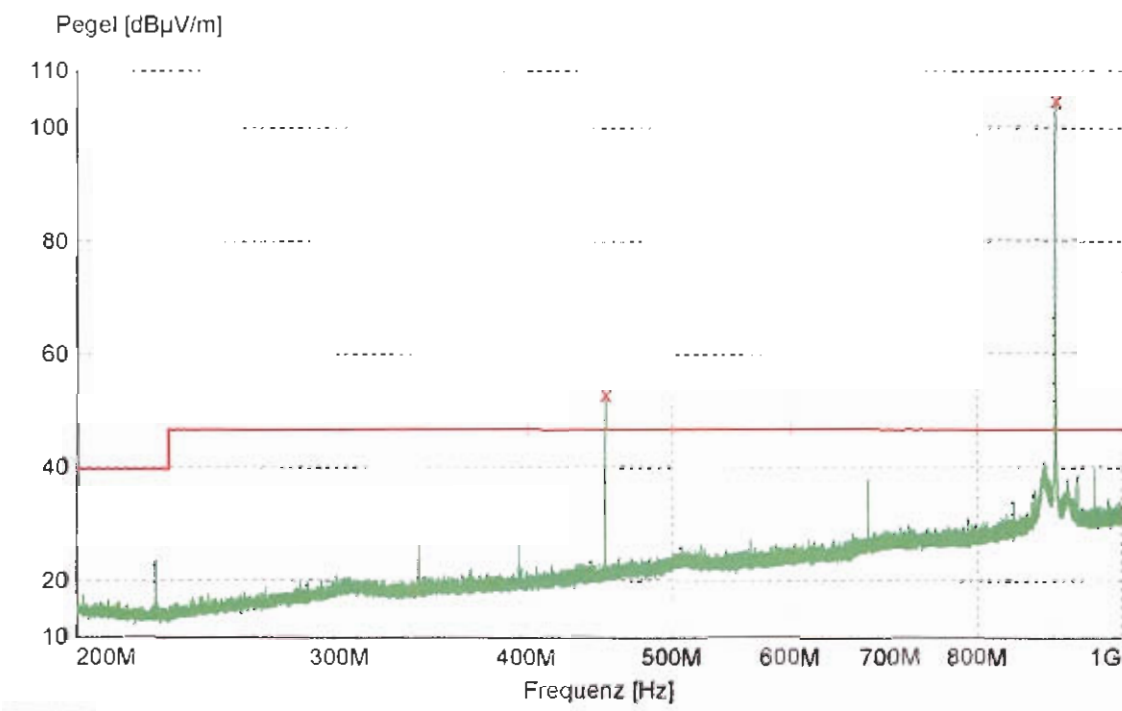


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: PSKN3-890S  
 Channel: lowest  
 Duty cycle: 100%  
 Power setting: 10dBm  
 Frequency range: 200 MHz to 1000 MHz



\* x MES FRF905FCC112\_fin  
 — MES FRF905FCC112\_pre  
 — LIM EN 55022 F QP EN 55022 F QP

Seite 1

Frequency (MHz)	QP-Level (dBµV/m) @3m	QP-Limit (dBµV/m) @3m	Remarks
451.200	52,8	46,0	This frequency does not fall into a restricted band so it need only to be 20dB attenuated below the carrier (15.247c)
902.400	104,7	46,0	Carrier frequency



RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: PSKN3-890S  
 Channel: lowest  
 Duty cycle: 100%  
 Power setting: 6dBm  
 Frequency range: 1 GHz to 9.5 GHz

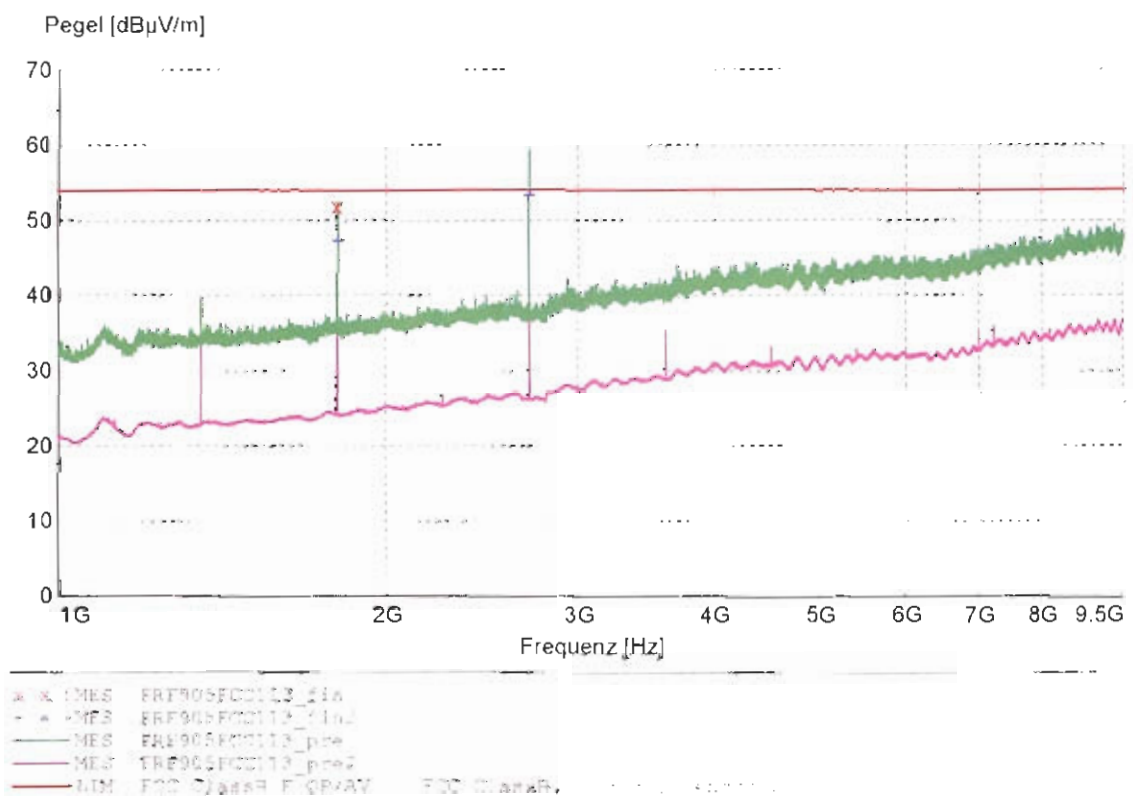


Figure 1: Radiated Emissions

Frequency (MHz)	AV-Level (dBµV/m) @3m	AV-Limit (dBµV/m) @3m	Remarks
1804,800	47,2	54,0	
2707,200	53,3	54,0	



RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: PSKN3-890S  
 Channel: lowest  
 Duty cycle: 50%  
 Power setting: 10dBm  
 Frequency range: 1 GHz to 9,5 GHz

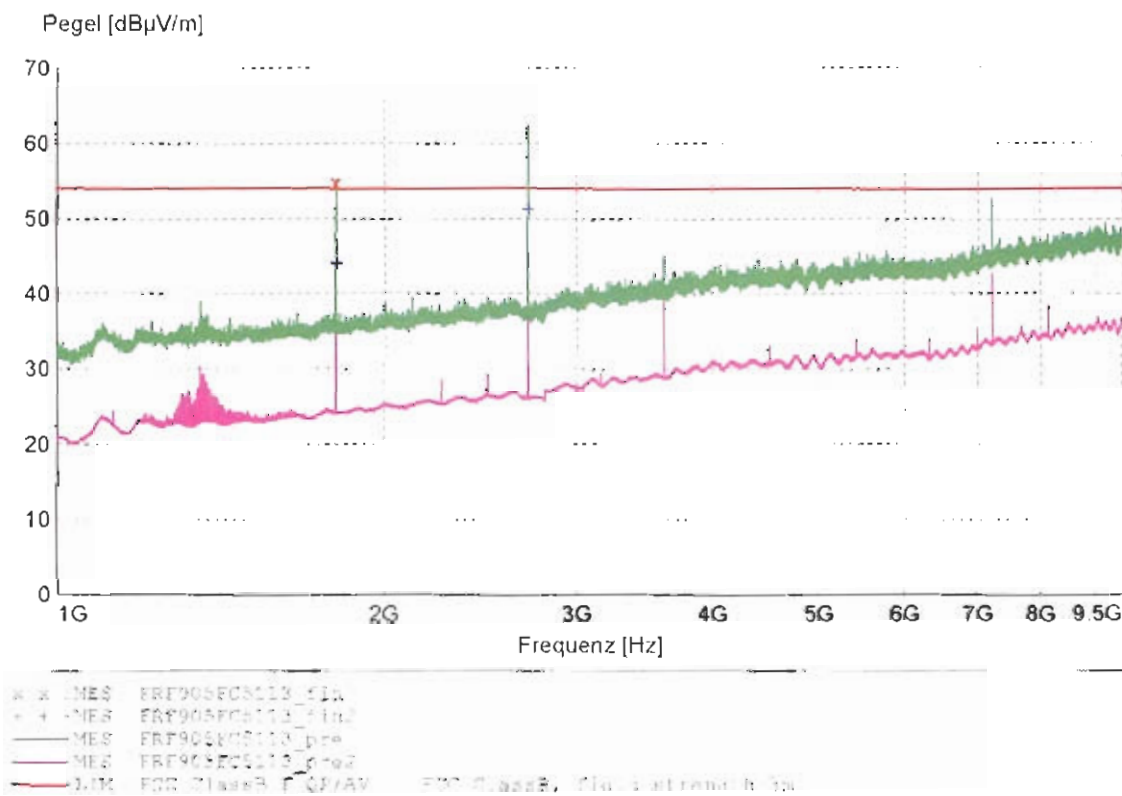


Table 1: Radiated Emissions

Frequency (MHz)	AV-Level (dBµV/m) @3m	AV-Limit (dBµV/m) @3m	Remarks
1804,800	44,0	54,0	
2707,200	51,2	54,0	



RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: PSKN3-890S  
Channel: middle  
Duty cycle: 100%  
Power setting: 10dBm  
Frequency range: 30 MHz to 200 MHz

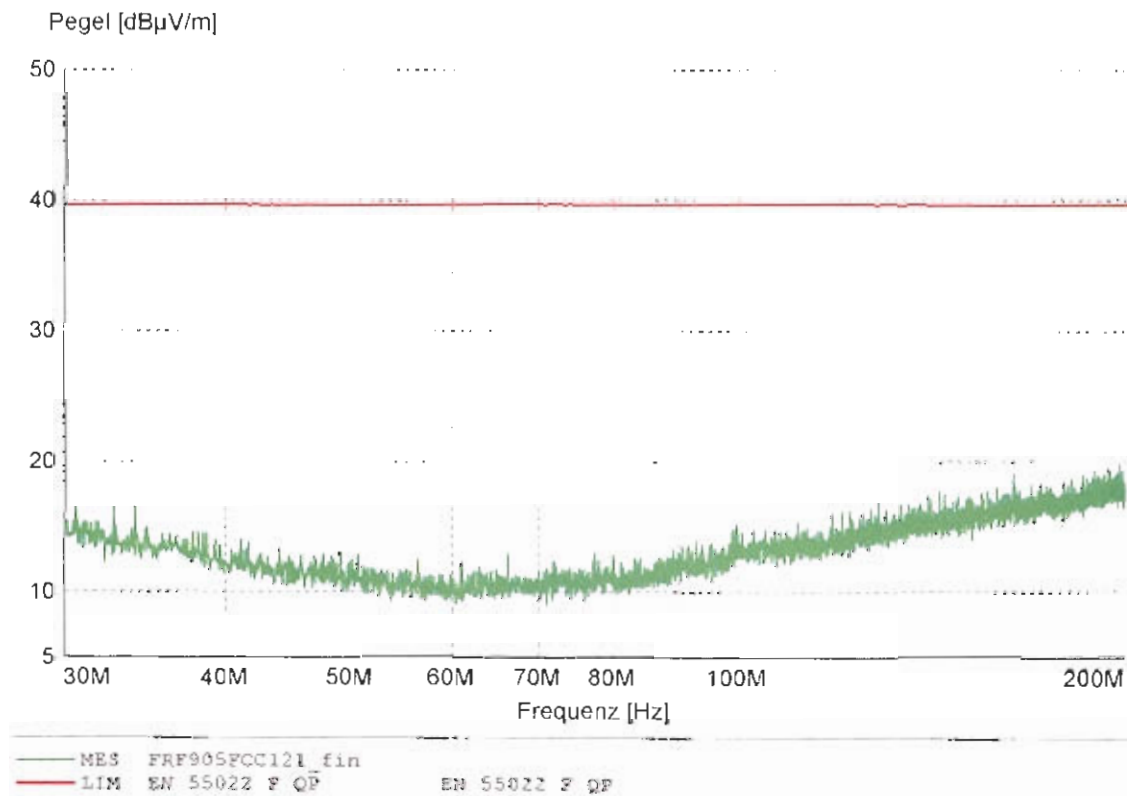


Figure 1: Radiated Emissions



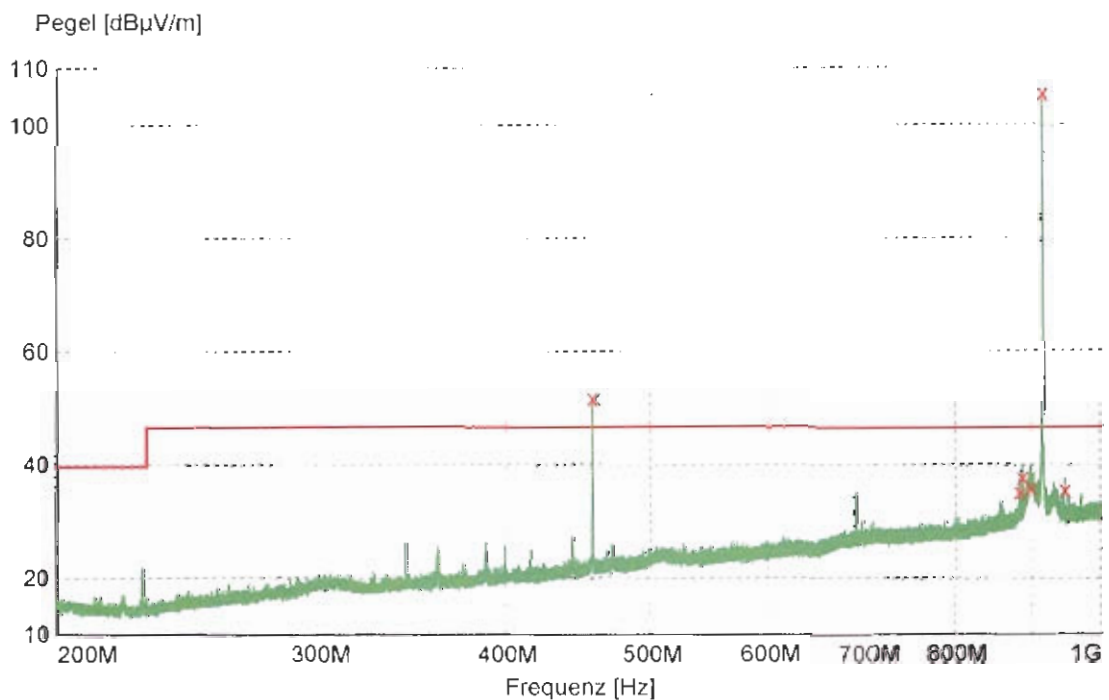


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: PSKN3-890S  
 Channel: middle  
 Duty cycle: 100%  
 Power setting: 10dBm  
 Frequency range: 200 MHz to 1000 MHz



x MES FRF905PCC122\_fin  
 — MES FRF905PCC122\_pre  
 — LIM EN 55022 F QP  
 EN 55022 F QP

Frequency (MHz)	QP-Level (dBµV/m) @3m	QP-Limit (dBµV/m) @3m	Remarks
457,400	51,7	46,0	This frequency does not fall into a restricted band so it need only to be 20dB attenuated below the carrier (15.247c)
914,800	105,7	46,0	Carrier frequency

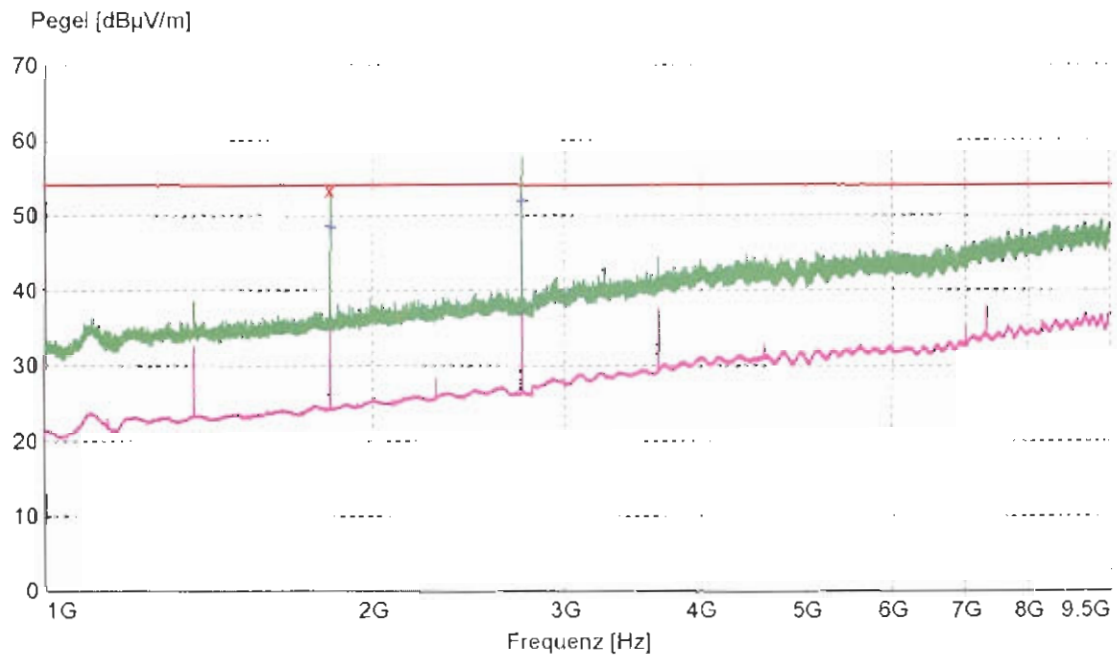


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: PSKN3-890S  
 Channel: middle  
 Duty cycle: 100%  
 Power setting: 6dBm  
 Frequency range: 1 GHz to 9.5 GHz



\* x MES FRF905FCC103\_fin  
 \* + MES FRF905FCC103\_fin2  
 — MFS FRF905FCC103\_pse  
 — MES FRF905FCC103\_pse2  
 — LIM FCC Class B E QP/AV 20.0 dBµV, field strength

Table 1: Radiated Emissions

Frequency (MHz)	AV-Level (dBµV/m) @3m	AV-Limit (dBµV/m) @3m	Remarks
1829,600	48,4	54,0	
2744,400	51,9	54,0	

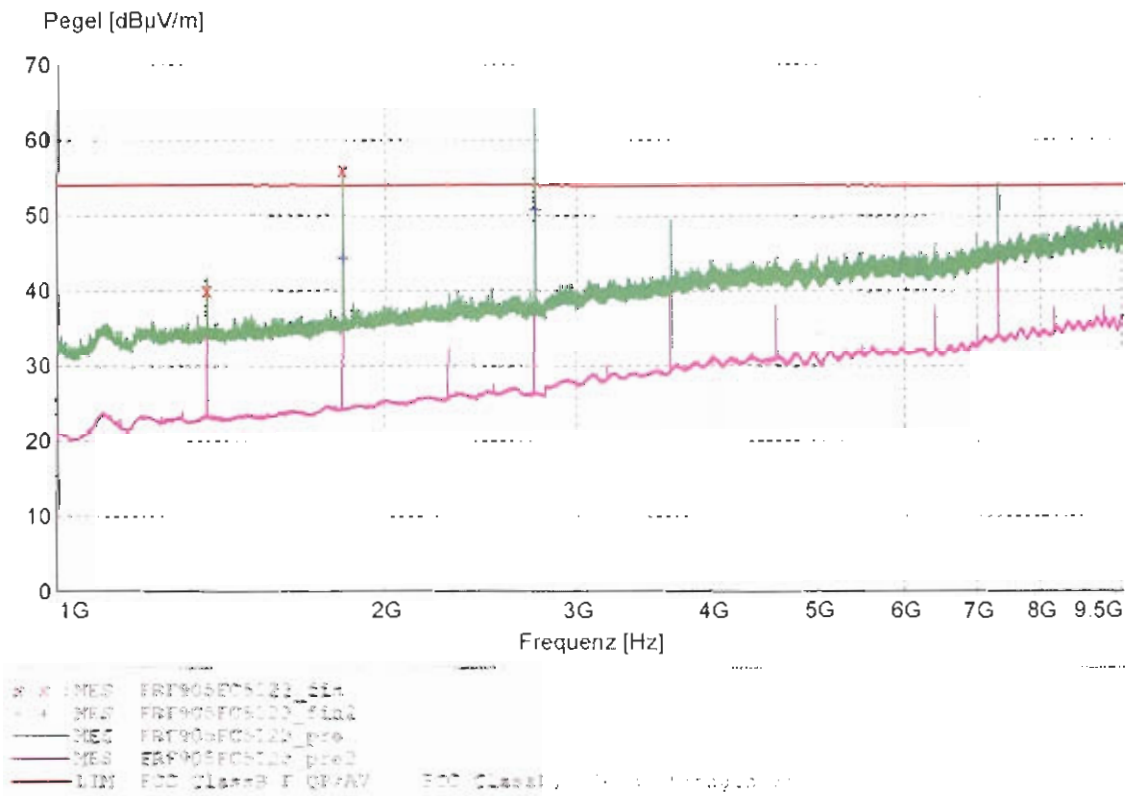


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: PSKN3-890S  
 Channel: middle  
 Duty cycle: 50%  
 Power setting: 10dBm  
 Frequency range: 1 GHz to 9.5 GHz



Frequency (MHz)	AV-Level (dBµV/m) @3m	AV-Limit (dBµV/m) @3m	Remarks
1829.600	44,3	54,0	
2744.400	50,7	54,0	

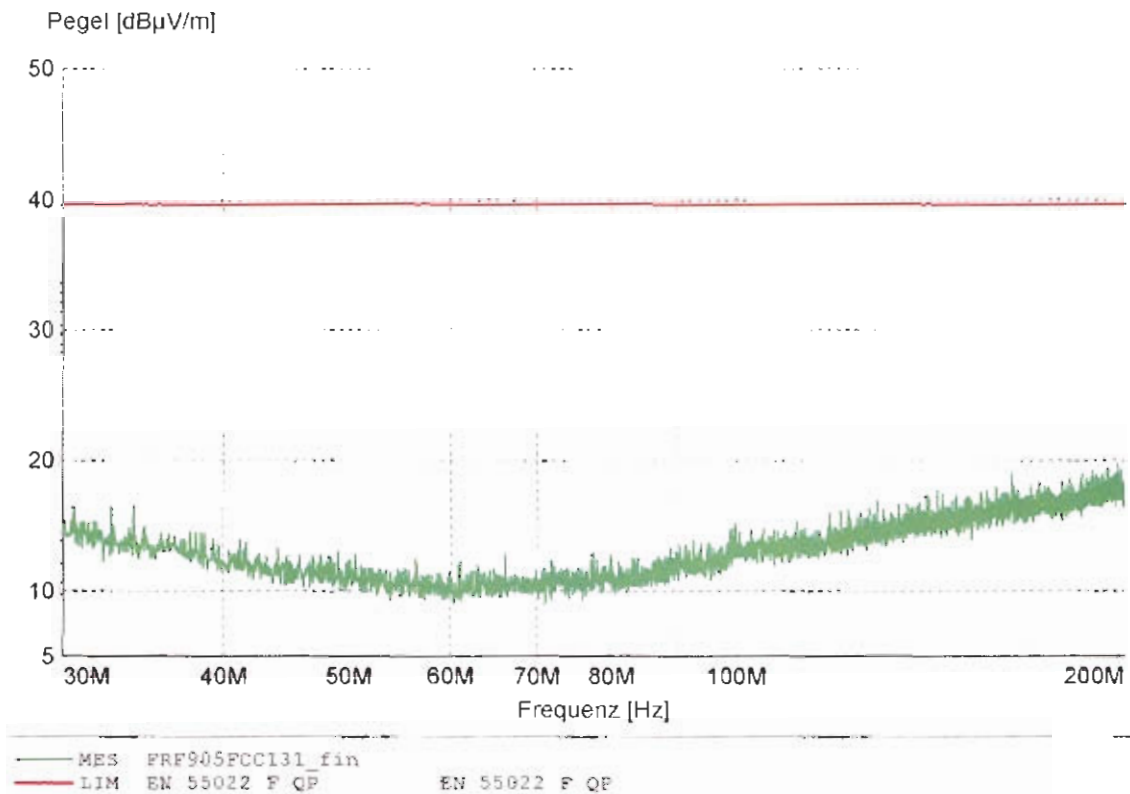


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: PSKN3-890S  
Channel: highest  
Duty cycle: 100%  
Power setting: 10dBm  
Frequency range: 30 MHz to 200 MHz



EN 55022 F QP EN 55022 F QP

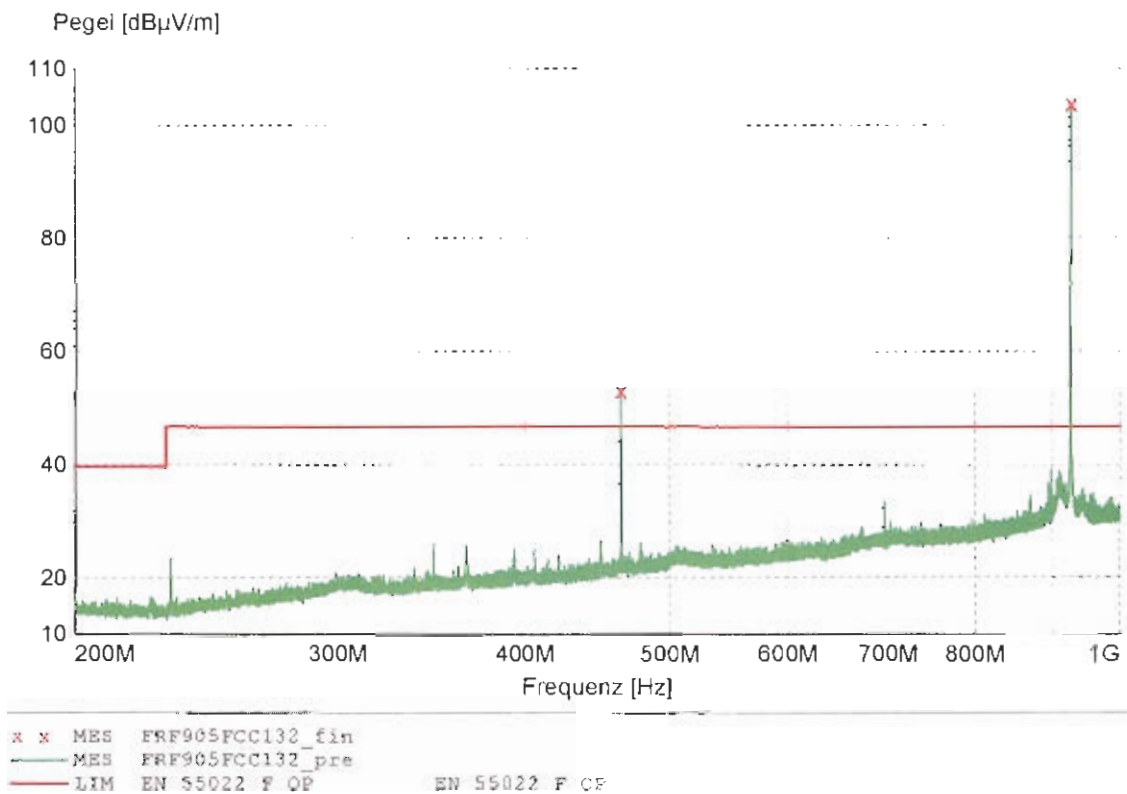


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: PSKN3-890S  
 Channel: highest  
 Duty cycle: 100%  
 Power setting: 10dBm  
 Frequency range: 30 MHz to 200 MHz



Frequency (MHz)	QP-Level (dBµV/m) @3m	QP-Limit (dBµV/m) @3m	Remarks
463,800	53,0	46,0	This frequency does not fall into a restricted band so it need only to be 20dB attenuated below the carrier (15.247c)
927,600	103,6	46,0	Carrier frequency

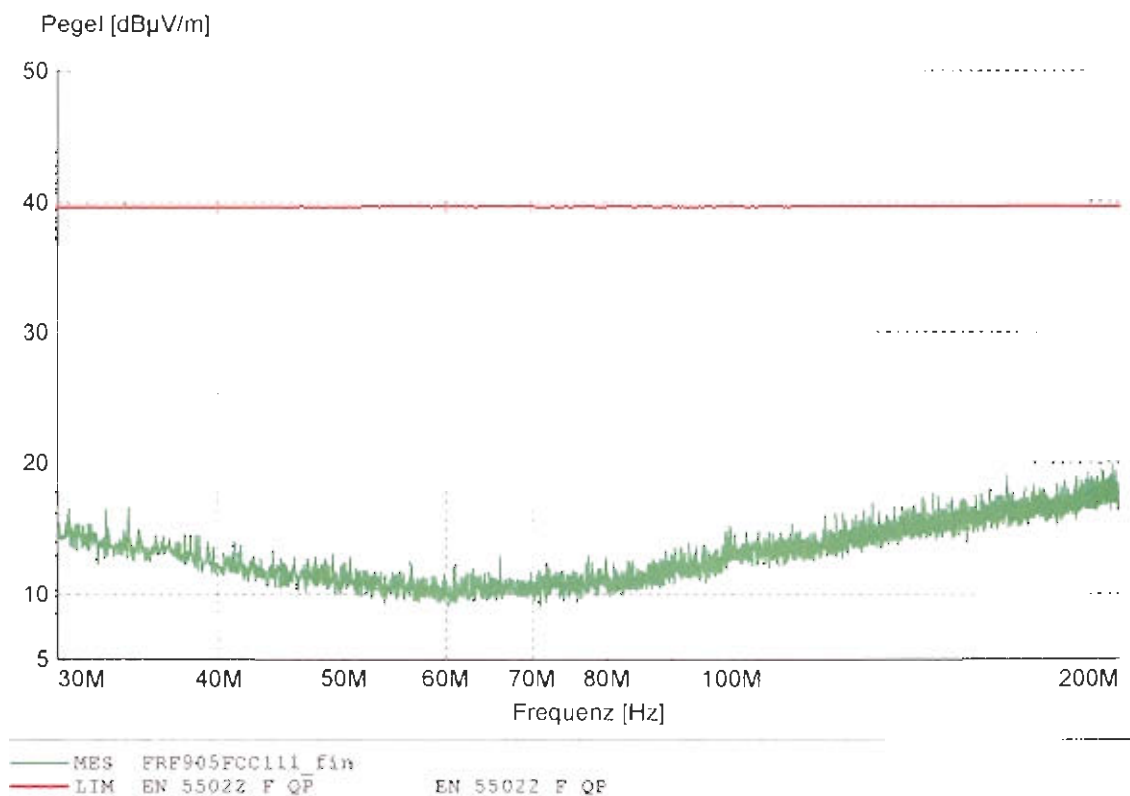


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: PSKN3-890S  
 Channel: highest  
 Duty cycle: 100%  
 Power setting: 6dBm  
 Frequency range: 1 GHz to 9,5 GHz



Frequency (MHz)	AV-Level (dBµV/m) @3m	AV-Limit (dBµV/m) @3m	Remarks
1855,200	50,7	54,0	
2782,800	51,0	54,0	
7420,800	40,5	54,0	
8348,400	30,8	54,0	



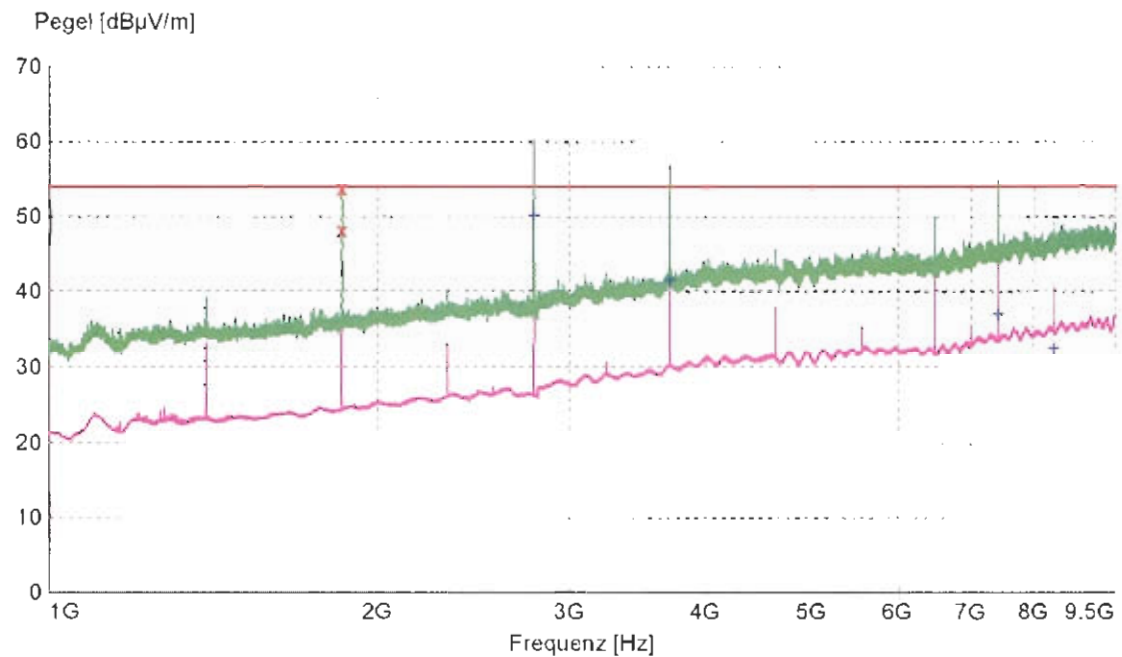


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: PSKN3-8905  
 Channel: highest  
 Duty cycle: 50%  
 Power setting: 10dBm  
 Frequency range: 1 GHz to 9,5 GHz



\* x ME3 FRF905F00123\_545  
 \* ME3 FRF905F00123\_finc  
 ME3 FRF905F00123\_pre  
 ME3 FRF905F00123\_pre2  
 LIM FCC ClassB E CP/A) ClassB, field strength 3m

Seite 3 12.07.2005 14:00

Frequency (MHz)	AV-Level (dBµV/m) @3m	AV-Limit (dBµV/m) @3m	Remarks
2782,800	50,2	54,0	
3710,400	41,5	54,0	
7420,800	36,9	54,0	
8348,400	32,4	54,0	





RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-DB1-RMT-SMA-2mRG174  
 Channel: lowest  
 Duty cycle: 100%  
 Power setting: 10dBm  
 Frequency range: 200 MHz to 1000 MHz

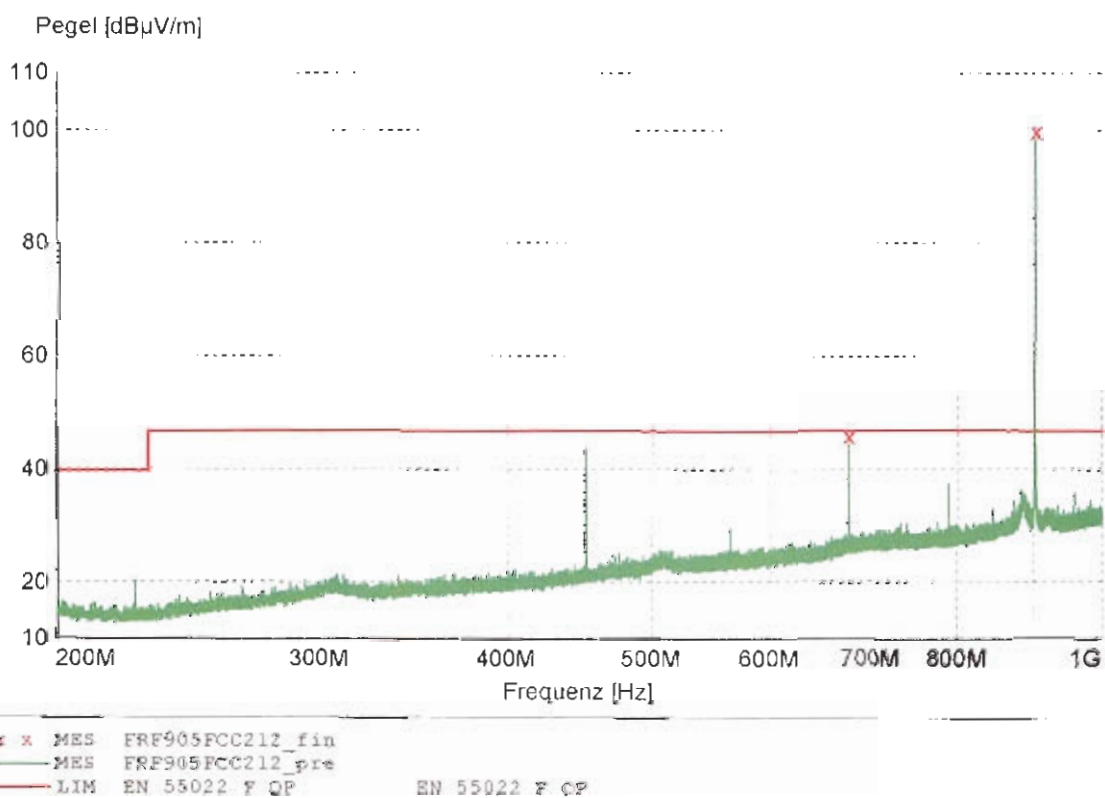


Table 2: Radiated Emissions

Frequency (MHz)	QP-Level (dBµV/m) @3m	QP-Limit (dBµV/m) @3m	Remarks
676.800	45,7	46,0	
902.400	99,3	46,0	Carrier frequency

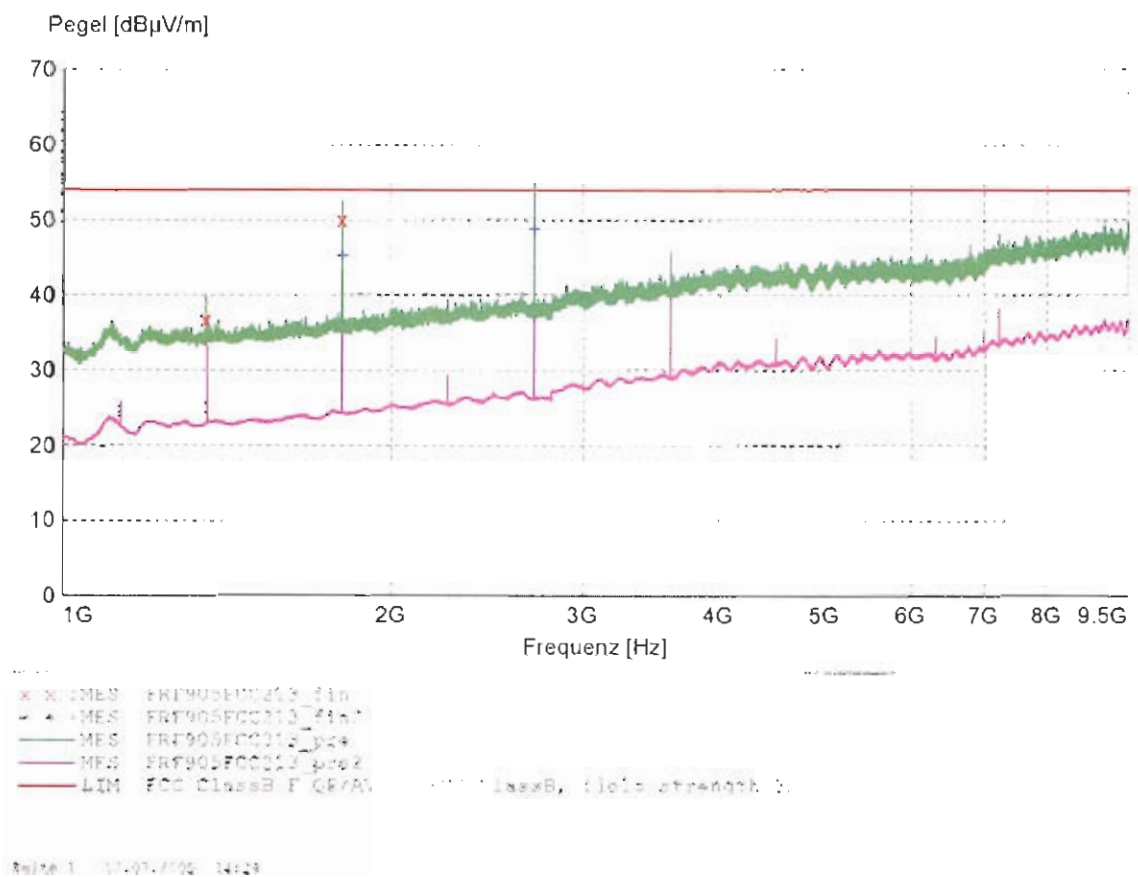


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-DB1-RMT-SMA-2mRG174  
 Channel: lowest  
 Duty cycle: 100%  
 Power setting: 10dBm  
 Frequency range: 1 GHz to 9,5 GHz



Frequency (MHz)	AV-Level (dBµV/m) @3m	AV-Limit (dBµV/m) @3m	Remarks
1804,800	45.2	54.0	
2707,200	48.7	54.0	

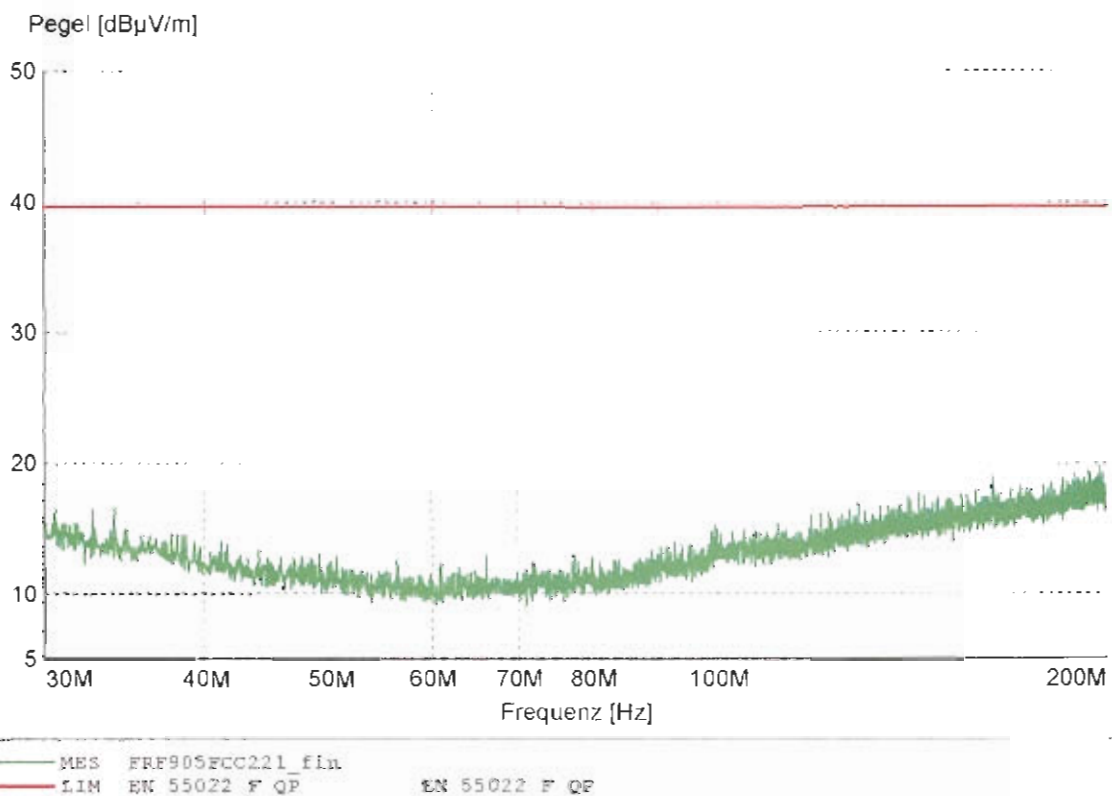


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-DB1-RMT-SMA-2mRG174  
Channel: middle  
Duty cycle: 100%  
Power setting: 10dBm  
Frequency range: 30 MHz to 200 MHz



09116 2 12-07-200

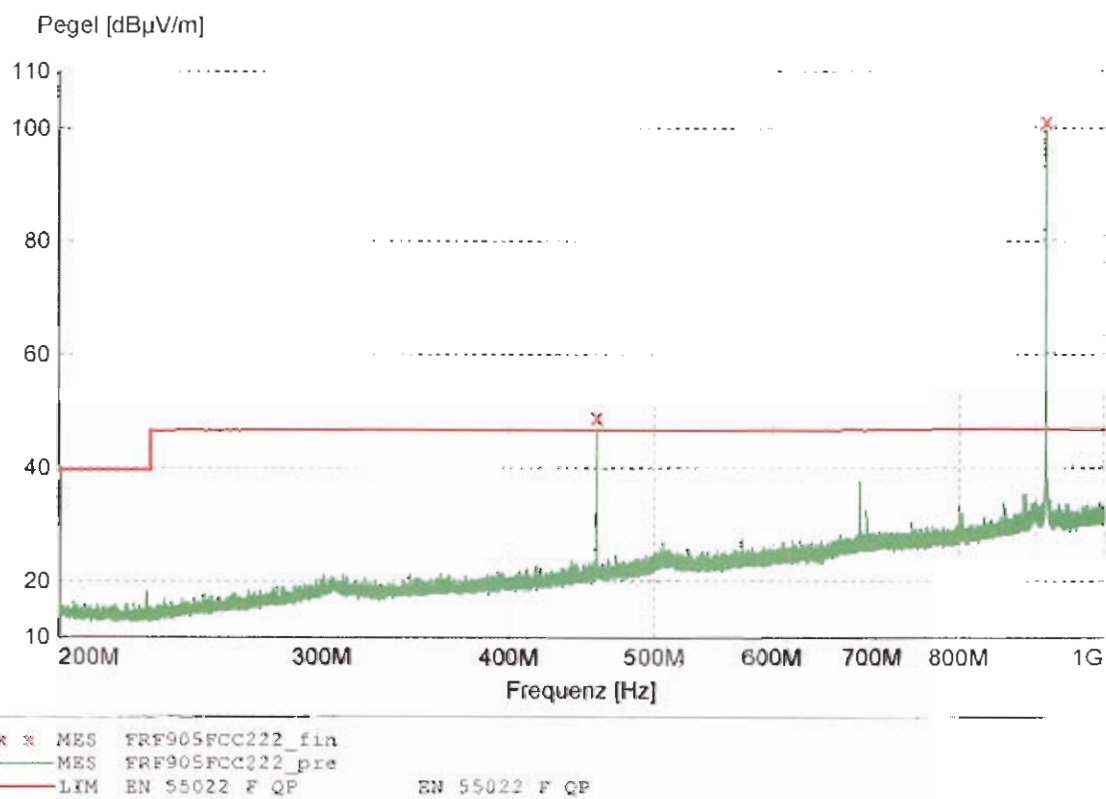


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-DB1-RMT-SMA-2mRG174  
 Channel: middle  
 Duty cycle: 100%  
 Power setting: 10dBm  
 Frequency range: 200 MHz to 1000 MHz



Seite 3 von 5

Frequency (MHz)	QP-Level (dBµV/m) @3m	QP-Limit (dBµV/m) @3m	Remarks
457.400	48.9	46.0	This frequency does not fall into a restricted band so it need only to be 20dB attenuated below the carrier (15.247c)
914.800	100.9	46.0	Carrier frequency



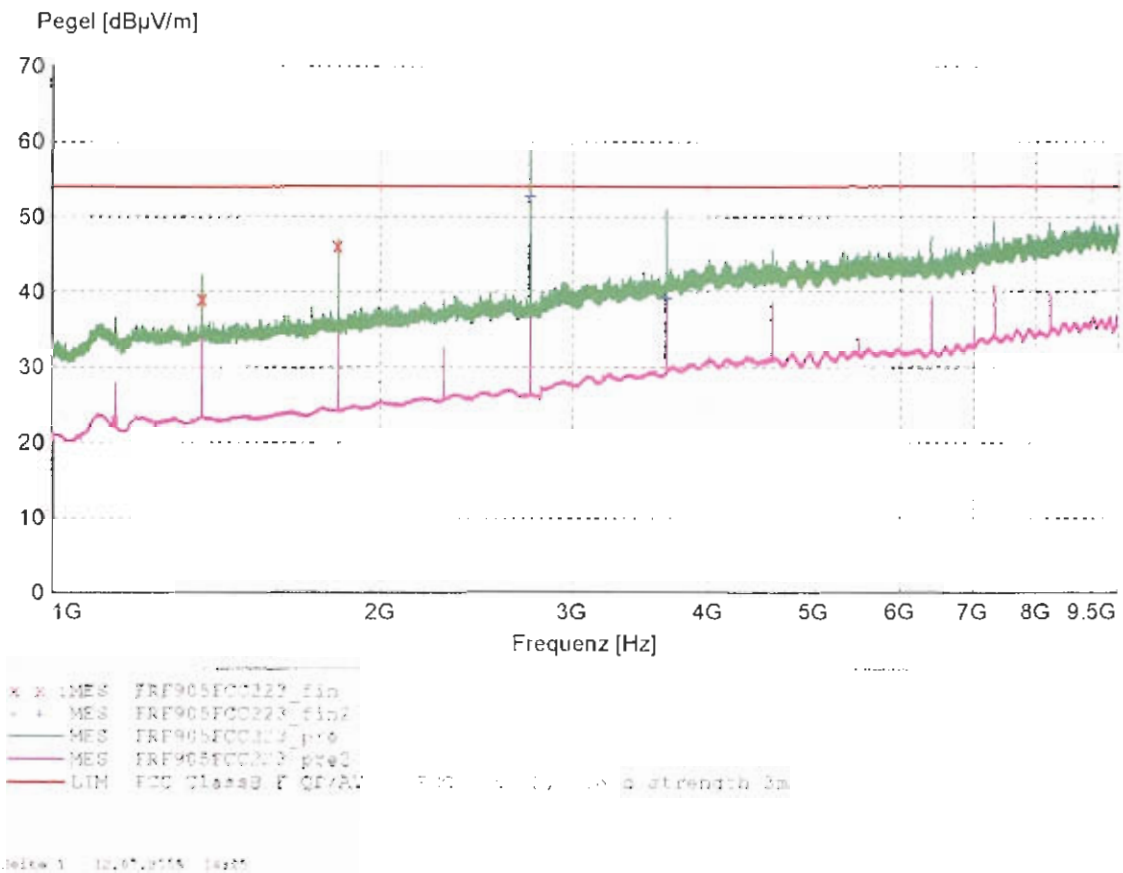


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-DB1-RMT-SMA-2mRG174  
 Channel: middle  
 Duty cycle: 100%  
 Power setting: 10dBm  
 Frequency range: 1 GHz to 9,5 GHz



Frequency (MHz)	AV-Level (dBµV/m) @3m	AV-Limit (dBµV/m) @3m	Remarks
2744.400	52.6	54.0	
3659.200	39.1	54.0	

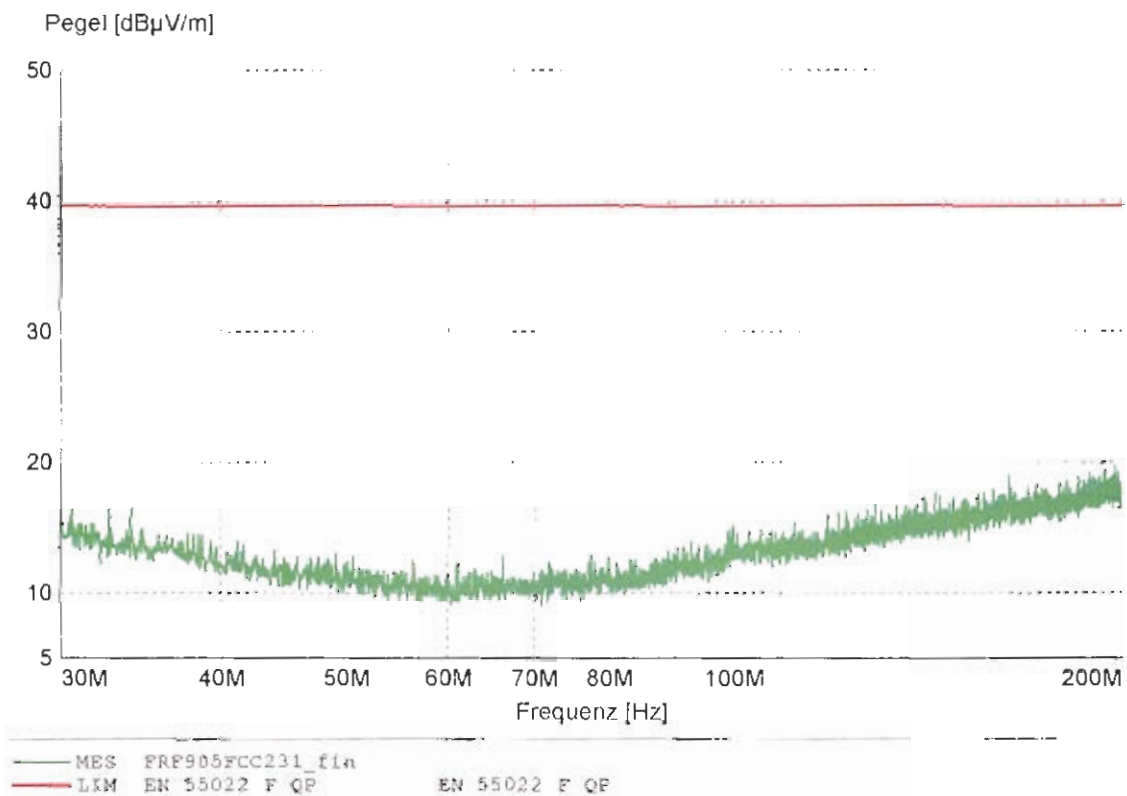


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-DB1-RMT-SMA-2mRG174  
Channel: highest  
Duty cycle: 100%  
Power setting: 10dBm  
Frequency range: 30 MHz to 200 MHz

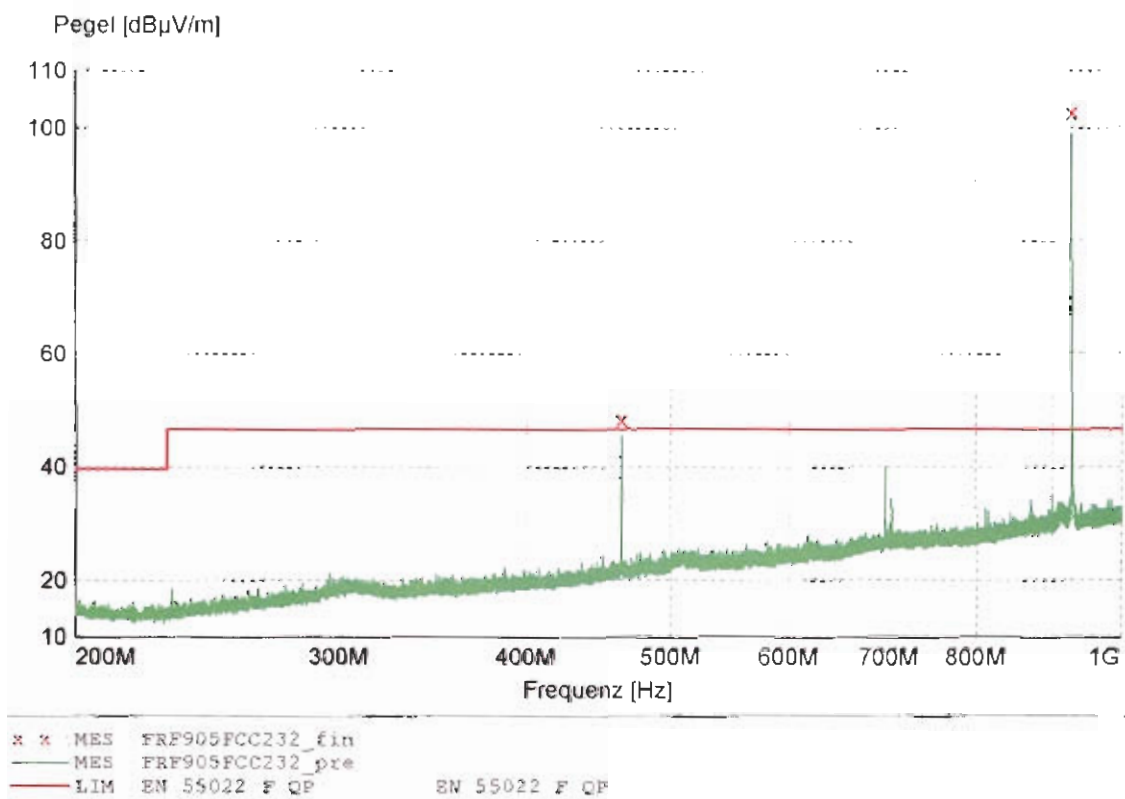


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-DB1-RMT-SMA-2mRG174  
 Channel: highest  
 Duty cycle: 100%  
 Power setting: 10dBm  
 Frequency range: 200 MHz to 1000 MHz



Seite 3 22.01.2005

Frequency (MHz)	QP-Level (dBµV/m) @3m	QP-Limit (dBµV/m) @3m	Remarks
463,800	48.4	46.0	This frequency does not fall into a restricted band so it need only to be 20dB attenuated below the carrier (15.247c)
927,600	102.7	46.0	Carrier frequency



RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-DB1-RMT-SMA-2mRG174  
 Channel: highest  
 Duty cycle: 100%  
 Power setting: 10dBm  
 Frequency range: 1 GHz to 9.5 GHz

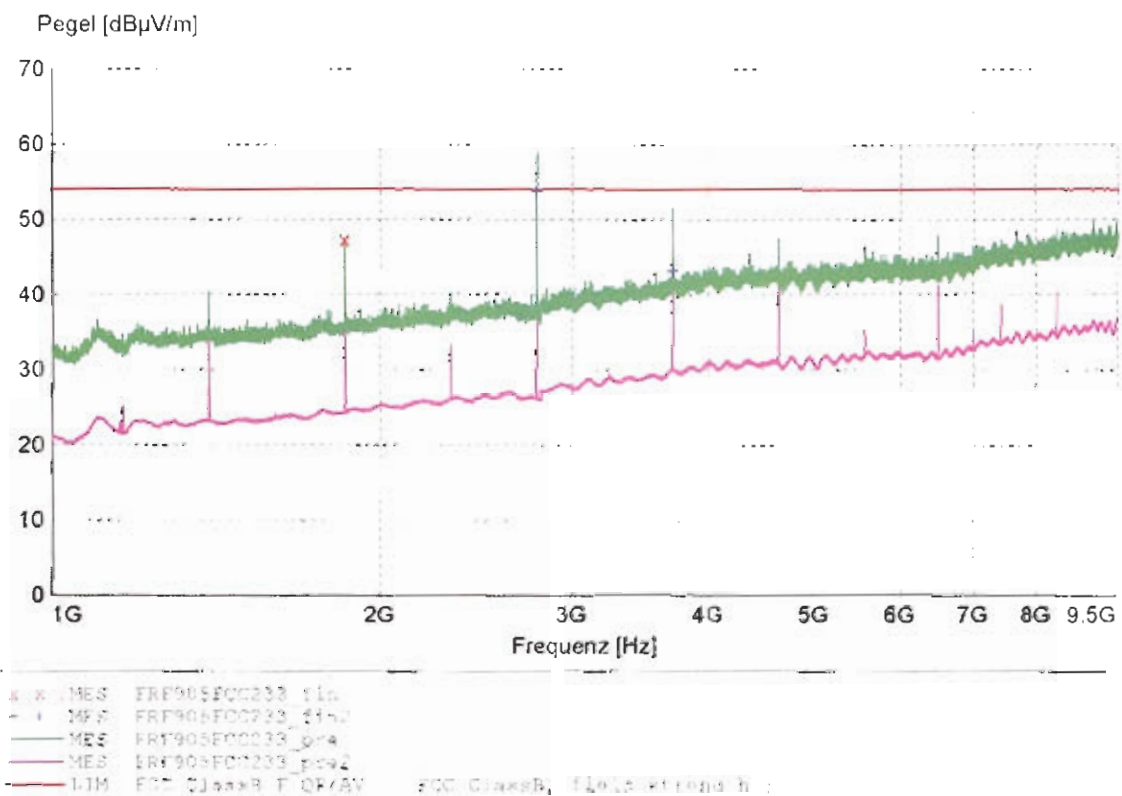


Table 1: Radiated Emissions

Frequency (MHz)	AV-Level (dBµV/m) @3m	AV-Limit (dBµV/m) @3m	Remarks
2782,800	53,7	54,0	
3710,400	43,0	54,0	

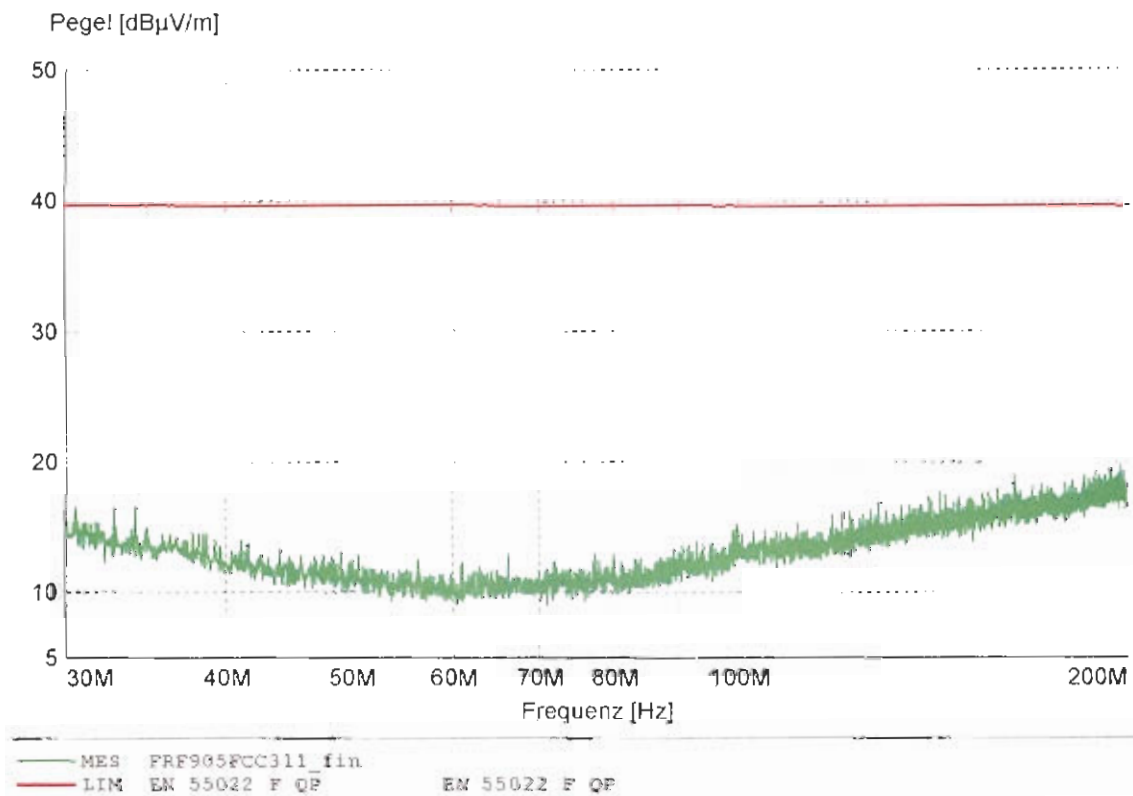


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-916-JJB-ST  
Channel: lowest  
Duty cycle: 100%  
Power setting: 10dBm  
Frequency range: 30 MHz to 200 MHz



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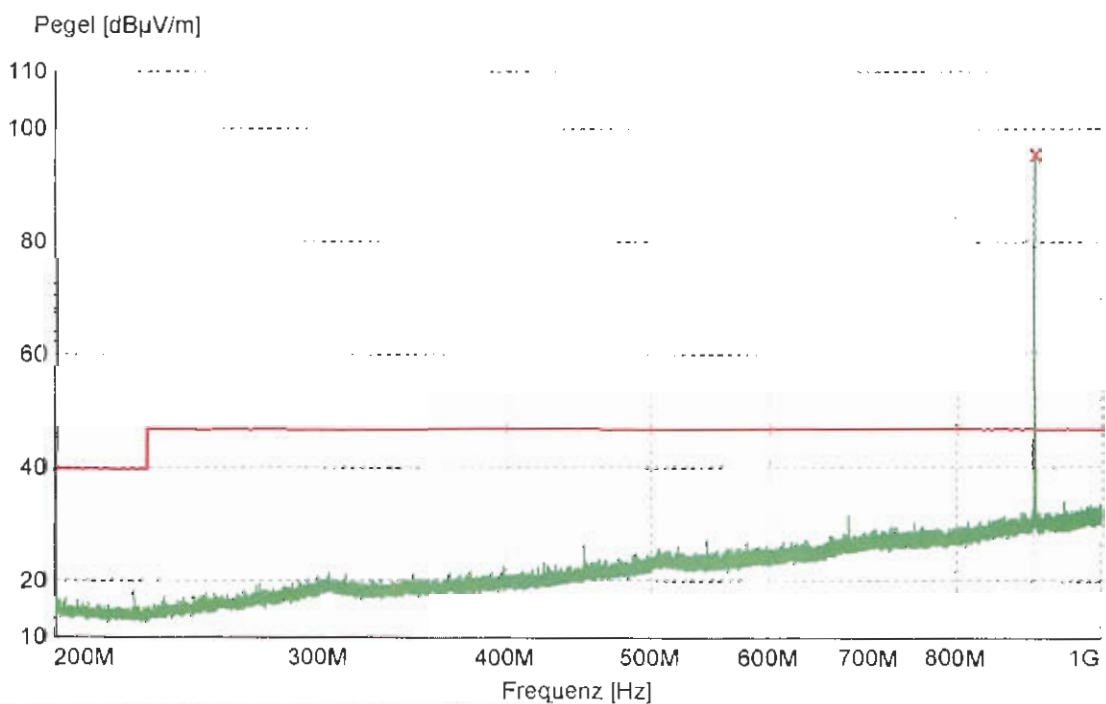


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-916-JJB-ST  
 Channel: lowest  
 Duty cycle: 100%  
 Power setting: 10dBm  
 Frequency range: 200 MHz to 1000 MHz



x x MES FRF905FCC312\_fin  
 — MES FRF905FCC312\_pre  
 — LIM EN 55022 P QP EN 55022 P QP

Seite 1 von 1

Frequency (MHz)	QP-Level (dBµV/m) @3m	QP-Limit (dBµV/m) @3m	Remarks
902.400	95.2	46.0	Carrier frequency



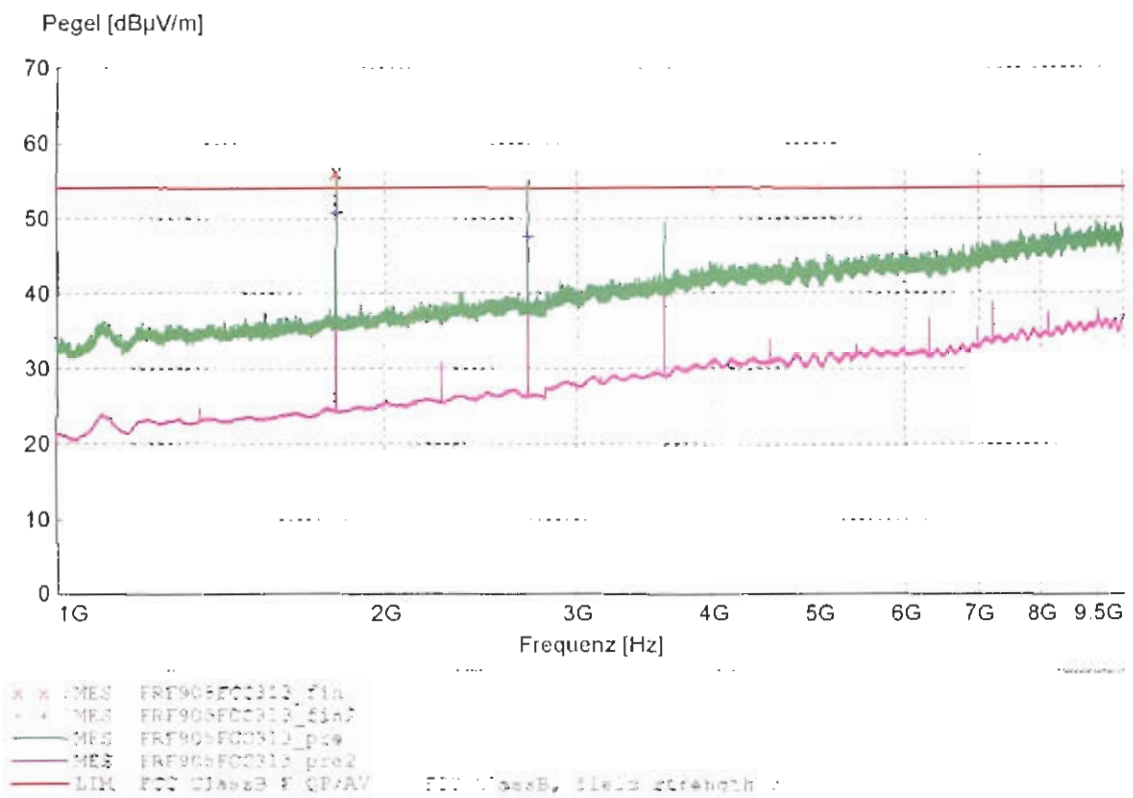


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-916-JJB-ST  
 Channel: lowest  
 Duty cycle: 100%  
 Power setting: 10dBm  
 Frequency range: 1 GHz to 9,5 GHz



Frequency (MHz)	AV-Level (dBµV/m) @3m	AV-Limit (dBµV/m) @3m	Remarks
1804,800	50,8	54,0	
2707,200	47,4	54,0	

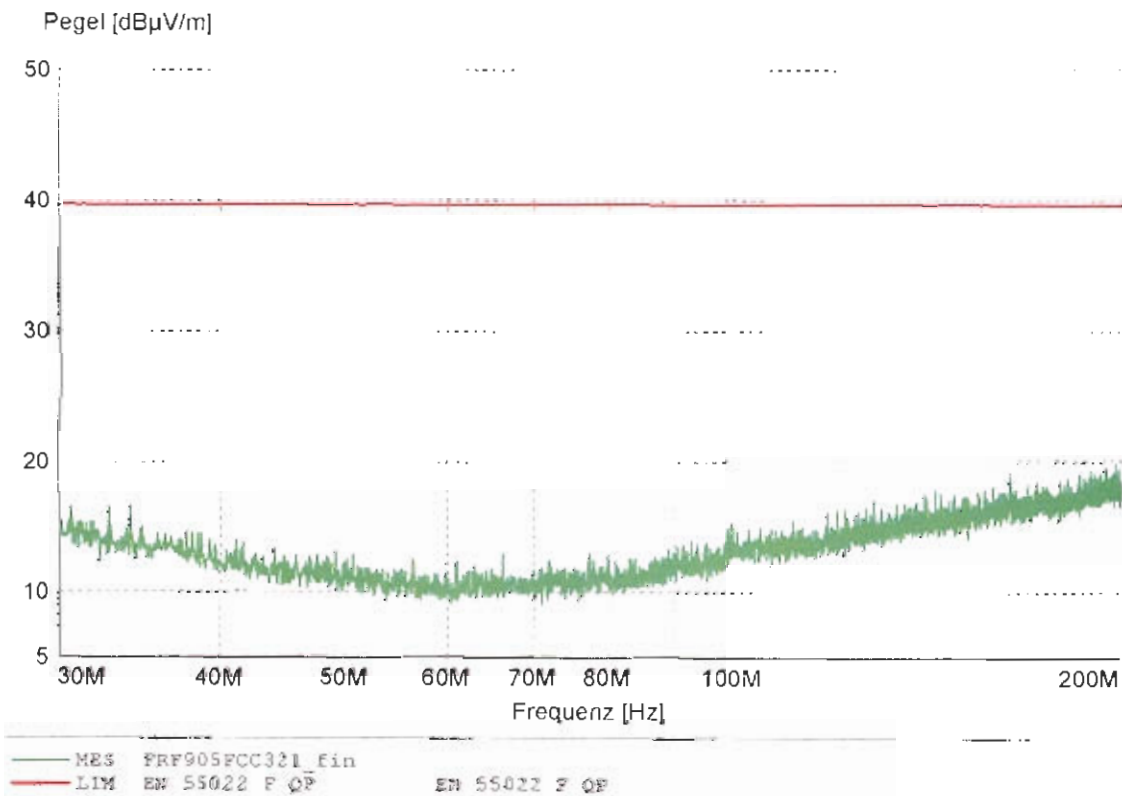


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-916-JB-ST  
Channel: middle  
Duty cycle: 100%  
Power setting: 10dBm  
Frequency range: 30 MHz to 200 MHz

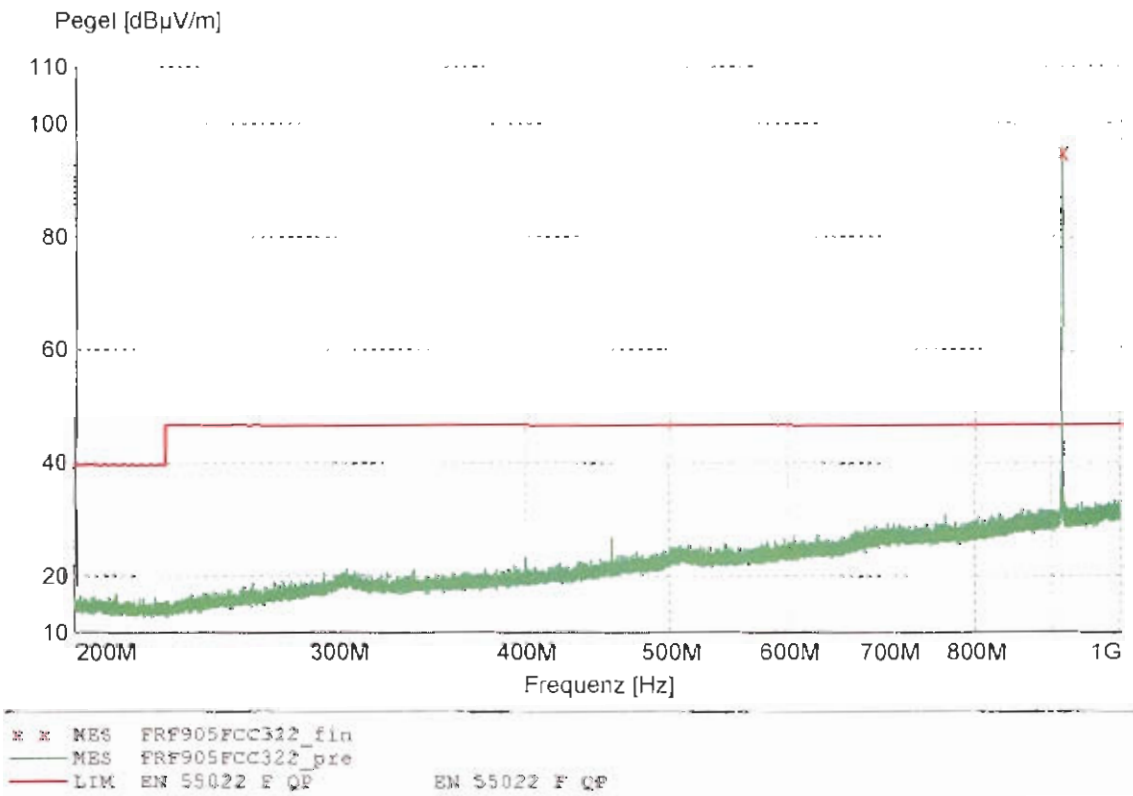


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-916-JJB-ST  
 Channel: middle  
 Duty cycle: 100%  
 Power setting: 10dBm  
 Frequency range: 200 MHz to 1000 MHz



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Frequency (MHz)	QP-Level (dBµV/m) @3m	QP-Limit (dBµV/m) @3m	Remarks
914,800	95,0	46,0	Carrier frequency

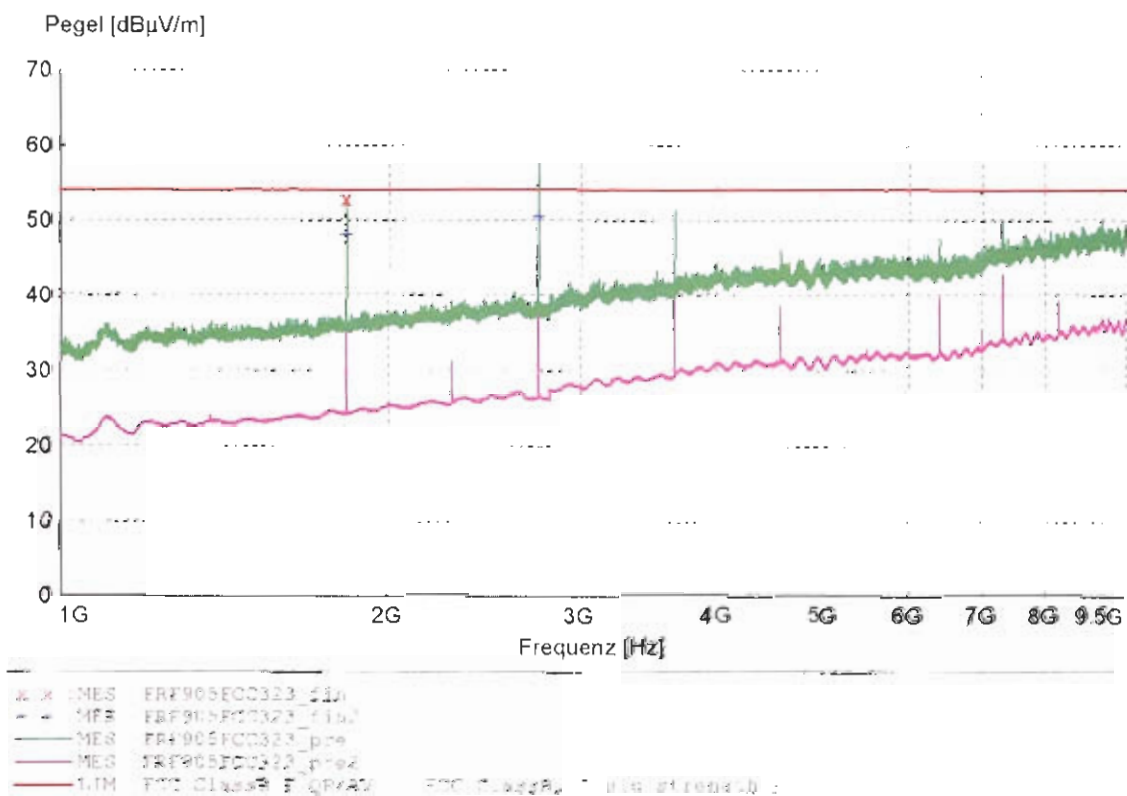


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-916-JJB-ST  
 Channel: middle  
 Duty cycle: 100%  
 Power setting: 10dBm  
 Frequency range: 1 GHz to 9.5 GHz



Seite 1 von 1

Frequency (MHz)	AV-Level (dBµV/m) @3m	AV-Limit (dBµV/m) @3m	Remarks
1829.600	48,1	54,0	
2744.400	50,4	54,0	

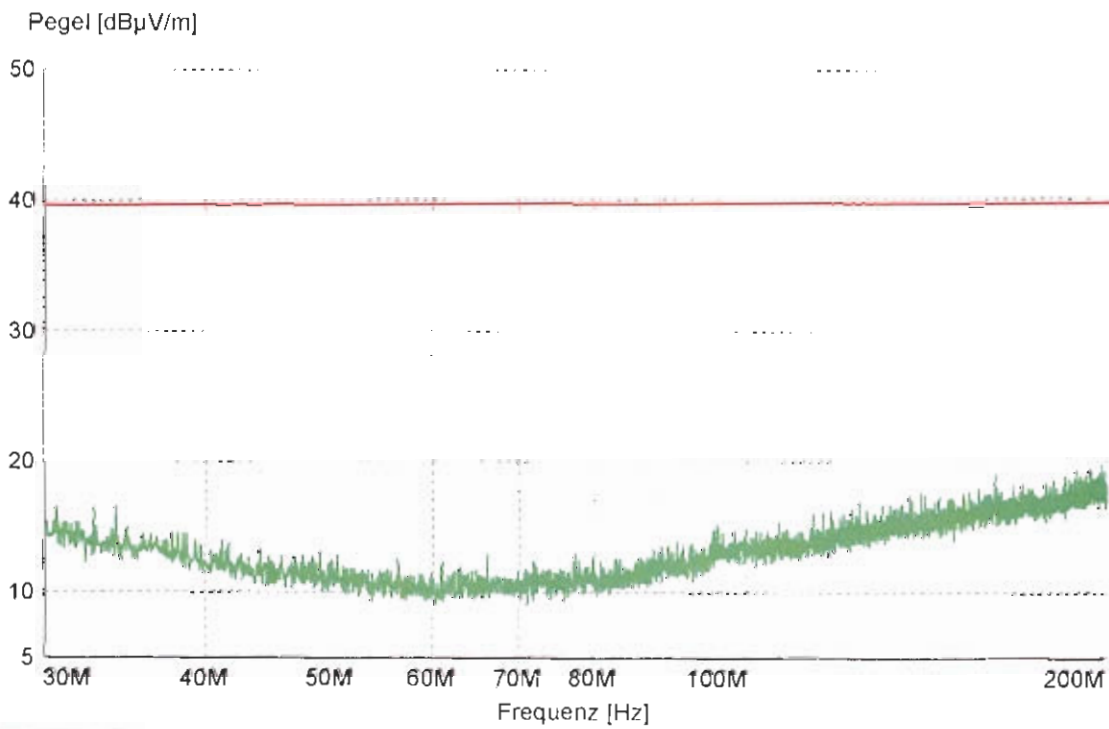


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-916-JJB-ST  
Channel: highest  
Duty cycle: 100%  
Power setting: 10dBm  
Frequency range: 30 MHz to 200 MHz



— MES FRF905PCC331\_fin  
— LIM EN 55022 F QP EN 55022 F QP

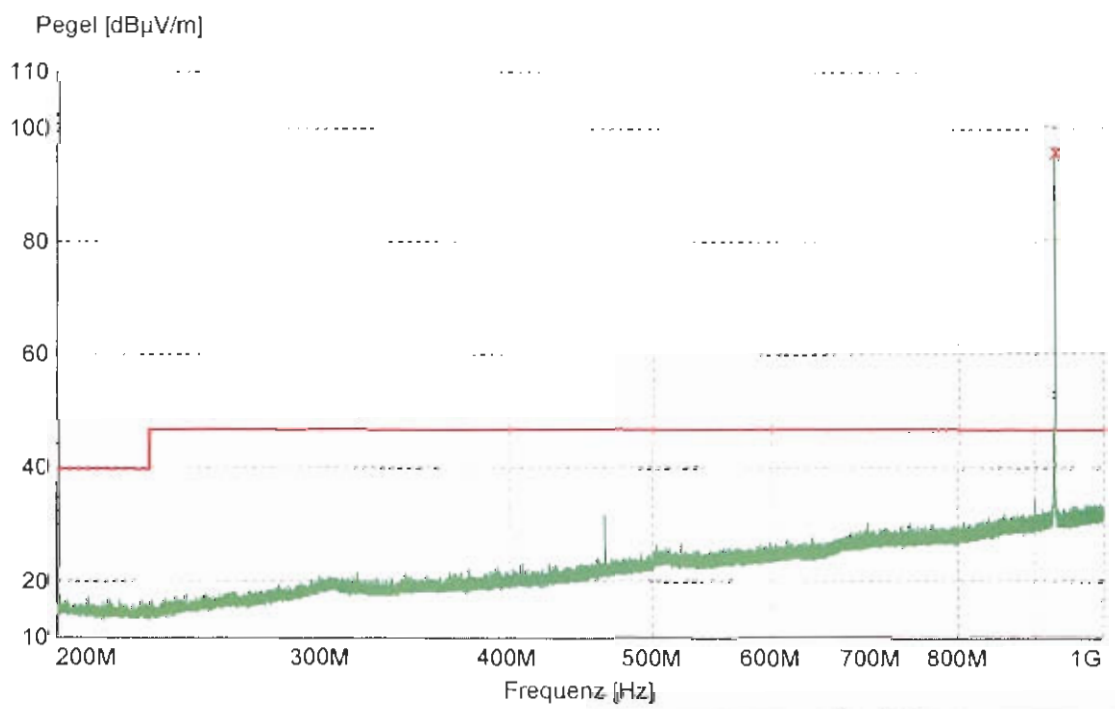


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-916-JJB-ST  
 Channel: highest  
 Duty cycle: 100%  
 Power setting: 10dBm  
 Frequency range: 200 MHz to 1000 MHz



\* \* MES FRF905FCC332\_fin  
 — MES FRF905FCC332\_pre  
 — LIM EN 55022 F QP EN 55022 F QP

Seite 1

Frequency (MHz)	QP-Level (dBµV/m) @3m	QP-Limit (dBµV/m) @3m	Remarks
927,600	95,7	46,0	Carrier frequency



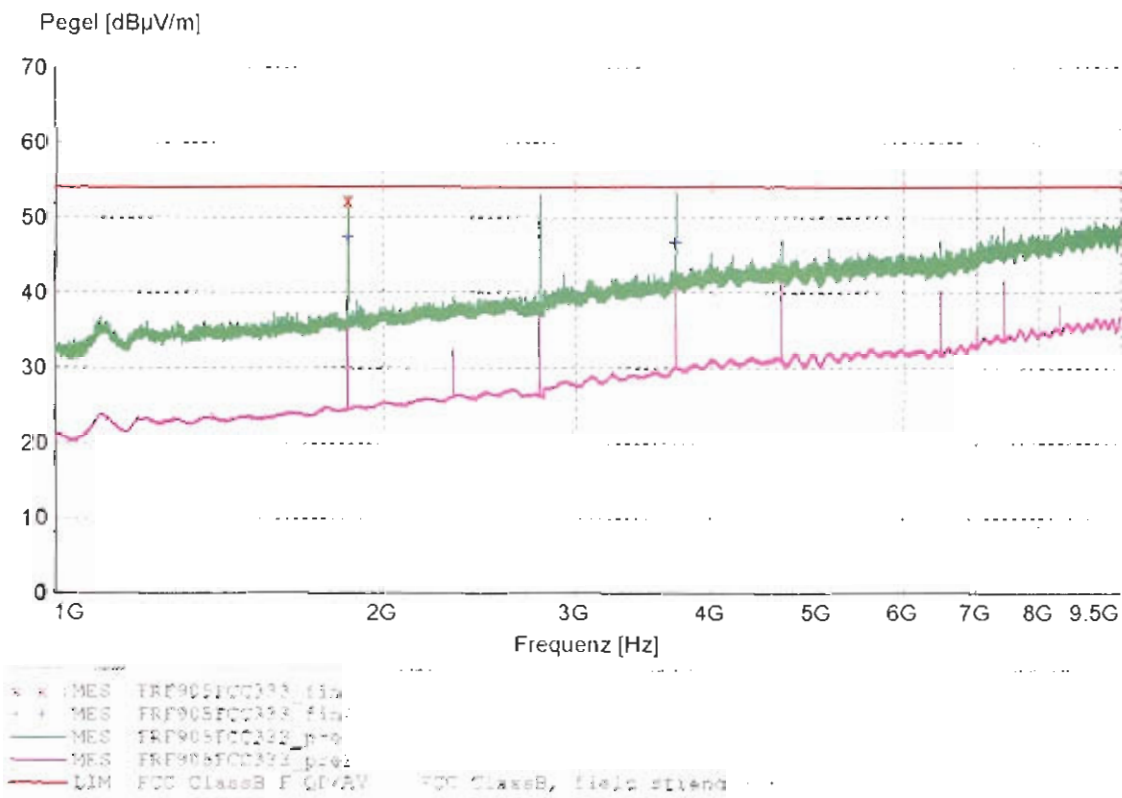


RADIATED EMISSIONS (Intentional Radiator)

§ 15.209/a

Measurement setup:

Antenna: ANT-916-JJB-ST  
 Channel: highest  
 Duty cycle: 100%  
 Power setting: 10dBm  
 Frequency range: 30 MHz to 200 MHz



Frequency (MHz)	AV-Level (dBµV/m) @3m	AV-Limit (dBµV/m) @3m	Remarks
1855,200	47,2	54,0	
3710,400	46,6	54,0	



# Appendix 1

## Test equipment used

<input checked="" type="checkbox"/>	Anechoic Chamber with 3m measurement distance	NT-100	<input type="checkbox"/>	ESVP - Test receiver 20 - 1000 MHz	NT-201
<input checked="" type="checkbox"/>	MA 240 - Antenna mast 1 - 4 m height	NT-110	<input type="checkbox"/>	ESPC - Test receiver 9 kHz - 2,5 GHz	NT-203
<input checked="" type="checkbox"/>	DS 412 - Turntable 0 - 400 ° Azimuth	NT-111	<input checked="" type="checkbox"/>	ESI26 - Test receiver 20 Hz - 26,5 GHz	NT-207
<input checked="" type="checkbox"/>	HD 100 Controller Mast+Turntable	NT-112	<input type="checkbox"/>	Digital Radio Tester CTSS5	NT-208
<input type="checkbox"/>	HUF-Z2 - Bicon. Antenna 20 - 300 MHz	NT-120	<input type="checkbox"/>	Noise-gen., ITU-R 559-2 20 Hz - 20 kHz	NT-209
<input type="checkbox"/>	HUF-Z3 - Log. Per. Antenna 200 - 1000 MHz	NT-121	<input type="checkbox"/>	CMTA - Radiocommunication analyzer ; 0,1 - 1000 MHz	NT-210
<input type="checkbox"/>	HFH-Z2 - Loop Antenna. 9 kHz - 30 MHz	NT-122	<input type="checkbox"/>	3271 - Spectrum analyzer 100 Hz - 26,5 GHz	NT-211
<input type="checkbox"/>	HFH-Z6 - Rod Antenna 9 kHz - 30 MHz	NT-123	<input type="checkbox"/>	Radiocommunication analyzer Marconi 2945A	NT-212
<input type="checkbox"/>	3121C - Dipole Antenna 28 - 1000 MHz	NT-124	<input type="checkbox"/>	2855S - Communication analyzer	NT-213
<input checked="" type="checkbox"/>	3115 - Horn Antenna 1 - 18 GHz	NT-125	<input type="checkbox"/>	Mixer M28HW 26,5 GHz - 40 GHz	NT-214
<input type="checkbox"/>	3116 - Horn Antenna 18 - 40 GHz	NT-126	<input type="checkbox"/>	Diode Detector 0,01 GHz - 26,5 GHz	NT-215
<input type="checkbox"/>	SAS-200/543 - Bicon. Ant. 20 MHz - 300 MHz	NT-127	<input type="checkbox"/>	RubiSource T&M Timing reference	NT-216
<input type="checkbox"/>	AT-1080 - Log. Per. Ant. 80 - 1000 MHz	NT-128	<input type="checkbox"/>	Radiocommunication analyzer SWR 3180 MD	NT-217
<input checked="" type="checkbox"/>	HK-116 - bicon. Ant. 20 MHz - 300 MHz	NT-129	<input type="checkbox"/>	Mixer M19HWD 40 GHz - 60 GHz	NT-218
<input type="checkbox"/>	HK-116 - bicon. Ant. 20 MHz - 300 MHz	NT-130	<input type="checkbox"/>	Mixer M12HWD 60 GHz - 90 GHz	NT-219
<input checked="" type="checkbox"/>	3146 - Log. Per. Ant. 200 - 1000MHz	NT-131	<input type="checkbox"/>	TDS - 540 DSO Digital scope	NT-220
<input type="checkbox"/>	Loop Antenna H-Field	NT-132	<input type="checkbox"/>	PM97 Scopemeter	NT-221
<input type="checkbox"/>	Horn Antenna 500 MHz - 2900 MHz	NT-133	<input type="checkbox"/>	TPS 20f4 Digital scope	NT-222
<input type="checkbox"/>	Log. per. Antenna 800 MHz - 2500 MHz	NT-134	<input type="checkbox"/>	B10 - Harmonics and flicker analyzer	NT-232
<input type="checkbox"/>	Log. per. Antenna 800 MHz - 2500 MHz	NT-135	<input type="checkbox"/>	SRM-3000 Spectrum analyzer	NT-233
<input type="checkbox"/>	BiConiLog Antenna 26 MHz - 2000 MHz	NT-137	<input type="checkbox"/>	E-field probe SRM1 75 MHz - 3 GHz	NT-234
<input type="checkbox"/>	Conical Dipol Antenna PCD8250	NT-138	<input type="checkbox"/>	Hall-Teslameter ETM-1	NT-241
<input type="checkbox"/>	HZ-1 Antenna tripod	NT-150	<input type="checkbox"/>	EFA-3 H-field- / E-field probe	NT-243
<input type="checkbox"/>	BN 1500 Antenna tripod	NT-151	<input type="checkbox"/>	E-field measuring instrument EMR-200; 100 kHz - 3 GHz	NT-244
<input type="checkbox"/>	Ant. tripod for EN61000-4-3 Model TP1000A	NT-156	<input type="checkbox"/>	E-field probe 100 kHz - 3 GHz	NT-245
<input type="checkbox"/>	Spectrum analyzer - FSP7 9 kHz - 7 GHz	NT-200	<input type="checkbox"/>	Magnetic field sensor 300 kHz - 30 MHz	NT-246


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# Appendix 1 (continued)

## Test equipment used

<input type="checkbox"/>	E-field probe 10 MHz – 18 GHz	NT-247	<input type="checkbox"/>	TRANSIENT 1000 Immunity test system	NT-325
<input type="checkbox"/>	H-field probe 10 MHz – 1 GHz	NT-248	<input type="checkbox"/>	VCS 500-M6 Surge-Generator	NT-326
<input type="checkbox"/>	ELT-400 1 Hz – 400 kHz	NT-249	<input type="checkbox"/>	BTA-250 - RF-Amplifier 9 kHz - 220 MHz / 250 W	NT-330
<input type="checkbox"/>	MDS 21 - Absorbing clamp 30 - 1000 MHz	NT-250	<input type="checkbox"/>	T82-50 RF-Amplifier 2 GHz – 8 GHz	NT-331
<input type="checkbox"/>	FCC-2031 EM Injection clamp	NT-251	<input type="checkbox"/>	500W1000M7 - RF-Amplifier 80 - 1000 MHz / 500 W	NT-332
<input type="checkbox"/>	FCC-2031-DCN Ferrite decoupling network	NT-252	<input type="checkbox"/>	AS0102-65R - RF-Amplifier 1 GHz - 2 GHz	NT-333
<input type="checkbox"/>	PR50 Current Probe	NT-253	<input type="checkbox"/>	APA01 – RF-Amplifier 0.5 GHz – 2.5 GHz	NT-334
<input type="checkbox"/>	PR630 Current Probe	NT-254	<input type="checkbox"/>	Preamplifier 1 GHz - 4 GHz	NT-335
<input type="checkbox"/>	Fluke 87 V True RMS Multimeter	NT-260	<input type="checkbox"/>	Preamplifier for GPS MKU 152 A	NT-336
<input type="checkbox"/>	Model 2000 Digital Multimeter	NT-261	<input type="checkbox"/>	Preamplifier 100 MHz – 23 GHz	NT-337
<input type="checkbox"/>	Fluke 79 Digital Multimeter	NT-262	<input type="checkbox"/>	DC Block 10 MHz – 18 GHz Model 8048	NT-338
<input type="checkbox"/>	Fluke 79 Digital Multimeter	NT-263	<input type="checkbox"/>	2-97201 Electronic load	NT-341
<input type="checkbox"/>	ESH2-Z5 Artificial mains network 4x25A	NT-300	<input type="checkbox"/>	TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-344
<input type="checkbox"/>	ESH3-Z5 Artificial mains network 2x10A	NT-301	<input type="checkbox"/>	TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-345
<input type="checkbox"/>	ESH3-Z6 Artificial mains network 1x100A	NT-302	<input type="checkbox"/>	VDS 200 Mobil-impuls-generator	NT-350
<input type="checkbox"/>	ESH3-Z4 T-Artificial network	NT-303	<input type="checkbox"/>	LD 200 Mobil-impuls-generator	NT-351
<input type="checkbox"/>	PHE 4500/B Power amplifier	NT-304	<input type="checkbox"/>	MPG 200 Mobil-Impuls-Generators	NT-352
<input type="checkbox"/>	EZ10 T-Artificial network	NT-305	<input type="checkbox"/>	EFT 200 Mobil-impuls-generator	NT-353
<input type="checkbox"/>	SMG - Signal generator 0,1 - 1000 MHz	NT-310	<input type="checkbox"/>	FP 16/3-1 3 ph. Coupling filter (Burst)	NT-400
<input type="checkbox"/>	PM 5518 TXVPS Video generator	NT-311	<input type="checkbox"/>	PHE 4500 - Mains impedance network	NT-401
<input type="checkbox"/>	RefRad Reference generator	NT-312	<input type="checkbox"/>	4P 6.2 Coupling filter for data lines (Surge)	NT-403
<input type="checkbox"/>	SMP 02 Signal generator 10 MHz - 20 GHz	NT-313	<input type="checkbox"/>	ESH2-Z3 - Probe 9 kHz - 30 MHz	NT-410
<input type="checkbox"/>	40 MHz Arbitrary Generator T1241	NT-315	<input type="checkbox"/>	IP 4 - Capacitive clamp (Burst)	NT-411
<input type="checkbox"/>	PEFT - Burst generator up to 4 kV	NT-320	<input type="checkbox"/>	Highpass-Filter 100 MHz – 4 GHz	NT-412
<input type="checkbox"/>	ESD 30 System up to 25 kV	NT-321	<input type="checkbox"/>	Highpass-Filter 600 MHz – 4 GHz	NT-413
<input type="checkbox"/>	PSURGE 4.1 Surge generator	NT-324	<input checked="" type="checkbox"/>	Highpass-Filter 1250 MHz – 4 GHz	NT-414


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# Appendix 1 (continued)

## Test equipment used

<input type="checkbox"/>	Highpass-Filter 1800 MHz – 18 GHz	NT-415	<input type="checkbox"/>	FCC-801-AF10 Coupling decoupling network	NT-461
<input type="checkbox"/>	Highpass-Filter 3500 MHz – 18 GHz	NT-416	<input type="checkbox"/>	FCC-801-S25 Coupling decoupling network	NT-462
<input type="checkbox"/>	RF-Attenuator 20 dB 0,1 - 1000 MHz / 25 W	NT-421	<input type="checkbox"/>	FCC-801-T4 Coupling decoupling network	NT-463
<input type="checkbox"/>	RF-Attenuator 10 dB 0,1 - 1000 MHz / 20 W	NT-422	<input type="checkbox"/>	FCC-801-C1 Coupling decoupling network	NT-464
<input type="checkbox"/>	RF-Attenuator 30 dB 0,1 - 1000 MHz / 1 W	NT-423	<input type="checkbox"/>	F-16A - Current probe 1kHz - 70MHz	NT-465
<input type="checkbox"/>	RF-Attenuator 30 dB	NT-424	<input checked="" type="checkbox"/>	PC P4 3 GHz Test computer	NT-500
<input type="checkbox"/>	RF-Attenuator 6 dB 0,1 - 1000 MHz / 1 W	NT-425	<input type="checkbox"/>	PC P4 1700 MHz Notebook	NT-505
<input type="checkbox"/>	RF-Attenuator 6 dB 0,1 - 1000 MHz / 1 W	NT-426	<input type="checkbox"/>	PC Intel Centrino 1600 MHz Notebook	NT-506
<input type="checkbox"/>	RF-Attenuator 6 dB	NT-428	<input type="checkbox"/>	Monitoring camera with Monitor	NT-511
<input type="checkbox"/>	RF-Attenuator 0 dB - 81 dB	NT-429	<input checked="" type="checkbox"/>	ES-K1 Version 1.71 Test software	NT-520
<input type="checkbox"/>	WRU 27 - Band blocking 27 MHz	NT-430	<input type="checkbox"/>	SRM-TS Version 1.2.8 software for SRM-3000	NT-522
<input type="checkbox"/>	WHJ450C9 AA - High pass 450 MHz	NT-431	<input type="checkbox"/>	SPS-PHE Test software V2.32 voltage fluctuations/harmonics	NT-525
<input type="checkbox"/>	WHJ250C9 AA - High pass 250 MHz	NT-432	<input type="checkbox"/>	SPS-EM Test software V2.32 for PHE 4500/B	NT-527
<input type="checkbox"/>	RF-Load 150 W	NT-433	<input type="checkbox"/>	Noise power test apparatus according to EN 55014	NT-530
<input type="checkbox"/>	Impedance transducer 1:4 ; 1:9 ; 1:16	NT-435	<input type="checkbox"/>	Vertical coupling plane (ESD)	NT-531
<input type="checkbox"/>	RF-Attenuator DC – 18 GHz 6 dB	NT-436	<input type="checkbox"/>	Test cable #4 for EN 61000-4-6	NT-553
<input type="checkbox"/>	RF-Attenuator DC – 18 GHz 6 dB	NT-437	<input type="checkbox"/>	Test cable #3 for conducted emission	NT-554
<input type="checkbox"/>	RF-Attenuator DC – 18 GHz 10 dB	NT-438	<input type="checkbox"/>	Test cable #5 ESD-cable (2x470k)	NT-555
<input type="checkbox"/>	RF-Attenuator DC – 18 GHz 20 dB	NT-439	<input type="checkbox"/>	Test cable #6 ESD-cable (2x470k)	NT-556
<input type="checkbox"/>	I+P 7780 Directional coupler 100 - 2000 MHz	NT-440	<input type="checkbox"/>	Test cable #8 Sucoflex 104EA	NT-559
<input type="checkbox"/>	ESH3-Z2 - Pulse limiter 9 kHz - 30 MHz	NT-441	<input type="checkbox"/>	Test cable #9 (for outdoor measurements)	NT-580
<input type="checkbox"/>	Power Divider 6 dB/1 W/50 Ohm	NT-443	<input type="checkbox"/>	Test cable #10 (for outdoor measurements)	NT-581
<input type="checkbox"/>	Directional coupler 0,1 MHz – 70 MHz	NT-444	<input type="checkbox"/>	Test cable #13 Sucoflex 104PE	NT-584
<input type="checkbox"/>	Directional coupler 0,1 MHz – 70 MHz	NT-445	<input type="checkbox"/>	Test cable #21 for SRM-3000	NT-592
<input type="checkbox"/>	Tube imitations according to EN 55015	NT-450	<input type="checkbox"/>	Shield chamber	NT-600
<input type="checkbox"/>	FCC-801-M2-50A Coupling decoupling network	NT-459	<input type="checkbox"/>	Climatic chamber -55°C to +180°C	M-512
<input type="checkbox"/>	FCC-801-M5-25 Coupling decoupling network	NT-460	<input type="checkbox"/>	Control and simulation equipment for EUT	---

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