

Recognized by the
Federal Communications Commission and Industry Canada
Anechoic chamber registration No.: 90462 (FCC)
Anechoic chamber registration No.: 3463 (IC)
TCB ID: DE0001



Accredited by the
German Accreditation Council
DAR–Registration Number
TTI–P–G 081/94-D0



Independent ETSI
compliance test house



Test report No. 2-3629-03-02/04
Applicant: KROHNE Messtechnik GmbH & Co. KG
Type: OPTIWAVE 7300 C
Test standard : FCC Part 15
IC RSS 210

Member of RWTÜV Group



Table of contents

Page

1.	General information.....	3
1.1	Notes.....	3
1.2	Testing laboratory.....	4
1.3	Details of applicant.....	4
1.4	Application details.....	4
1.5	Equipment under test (EUT).....	5
1.6	Technical data.....	5
1.7	Test standards.....	6
2.	Technical tests.....	7
2.1	Summary of test results.....	7
2.2	Test environment.....	7
2.3	Measurement and test set-up.....	7
2.4	Test equipment utilized and test set-up.....	8 - 9
2.5	Test results.....	10 - 13
3.	Plots, graphs and data sheets.....	14 - 28
4.	Photographs.....	29 - 36

1 General information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 1.5. 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.

Tester :

Date	Name	Signature
2005.03.22	Detlev Gillmann	

Technical responsibility for area of testing:

Date	Name	Signature
2005.03.22	Manfred Paschwitz	



Test Report Cover Sheet/Performance Test Data

TEST REPORT NUMBER: 2-3629-01-03/04

EQUIPMENT MODEL NUMBER: OPTIWAVE 7300C

CERTIFICATION NO:

MANUFACTURER : KROHNE Messtechnik GmbH & Co. KG

TESTED TO RADIO STANDARDS SPECIFICATION NO. : RSS 210 Issue 5

OPEN AREA TEST SITE INDUSTRY CANADA NUMBER: 3463

FREQUENCY RANGE (or fixed frequency): 24.000 GHz – 24.250 GHz

FIELD STRENGTH (at what distance): 223.8 mV/m @3m

TYPE OF MODULATION: sweep

EMISSION DESIGNATOR (TRC-43): 20K0FN0N (hopping puls)

ANTENNA INFORMATION: Horn

TRANSMITTER SPURIOUS (worst case): 103.8 dB μ V/m @ 3m

ATTESTATION:**DECLARATION OF COMPLIANCE:**

I declare that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned Industry Canada standard(s); and that the equipment identified in this application has been subjected to all the applicable test conditions specified in the Industry Canada standards and all of the requirements of the standard have been met.

Laboratory Manager :

2005-03-22

RSC 8434

M. Paschwitz

Date

Section

Name

Signature

1.2 Testing laboratory

CETECOM ICT Services GmbH
Untertürkheimerstraße 6–10
D-66117 Saarbrücken
Germany

CETECOM ICT Services GmbH
P.O. Box 10 04 45
D-66004 Saarbrücken
Germany

Telephone : + 49 (0) 681 598–0
Fax : + 49 (0) 681 598–9075
e-mail : info@ict.cetecom.de
Internet : <http://www.cetecom.de>

Accredited testing laboratory

Accredited by : Regulierungsbehörde für Telekommunikation und Post (RegTP)
Listed by : Federal Communications Commission (FCC)
Industry Canada (IC)

Authority	Identification/Registration No.
RegTP	TTI-P-G 081/94-D0
FCC	90462
IC	3463

Testing location, if different from CETECOM ICT Services GmbH: (Not applicable)

1.3 Details of applicant

Name : KROHNE Messtechnik GmbH & Co. KG
Street : Ludwig-Krohne-Strasse 5
Town : D-47058 Duisburg
Country : Germany
Phone : +49 203 301 0
Fax : +49 203 301 368

Contact person

Name : Mr. Uwe Wegemann
Phone : +49 203 301 459
Fax : +49 203 301 368
E-Mail : uwegemann@krohne.de

1.4 Application details

Date of test : 28.02.2005
Person(s) who have been : Mr. Charalambos Ouzounis
present during the test : Mr. Gerding

1.5 Test item (EUT)

Description	:	Field disturbance sensor
Type designation	:	OPTIWAVE 7300 C
Manufacturer	:	
Name	:	KROHNE Messtechnik GmbH & Co. KG
Street	:	Ludwig-Krohne-Strasse 5
Town	:	D-47058 Duisburg
Country	:	Germany

1.6 Technical data

Operational frequency	:	24.000 GHz ... 24.250 GHz
EIRP PEP	:	223.8 mV/m (EUT outside the tank)
Type of modulation	:	Frequency Modulated Continuous Wave (FMCW)
Pulse width	:	1.7 ms
Microwave modules	:	TX / RX – Module with VCO
Antenna	:	Horn Antenna operating outside the tanks
Normal power supply (U nom)	:	24.0 V DC
Extreme power supply (U min)	:	14.0 V DC
(U max)	:	30.0 V DC

1.6.1 Operation conditions

Operation:	:	As soon as the equipment is powered up, TX and RX start operating
Purpose of operation	:	Level measurement outside tanks

1.6.2 Equipment under test

OPTIWAVE 7300 C

1.7 Test standards

Code of Federal Regulations (CFR 47)
Federal Communications Commission (FCC)

FCC Part 15

Section 15.249
Operation within the band 24.000 - 24.250 GHz

SECTION 15.205
Restricted bands of operation.

SECTION 15.209
Radiation emission limits, general requirements

Industry Canada RSS 210 (Issue 5)
Low Power Licence-Exempt Radio communication Devices

Main Changes

TX

Section	6.2.2 (n)	Field Disturbance Sensor
	6.3	Restricted Bands and Unwanted Emission Frequencies
	6.4	Frequency Stability not applicable
	6.5	Pulse Operations not applicable
	6.6	Transmitter AC Wireline Conducted Emissions

RX

Section	7.2	Receiver Spurious Emissions (conducted) not applicable
	7.3	Receiver Spurious Emissions (radiated)
	7.4	Receiver AC Wireline Conducted Emissions

2 Technical test

2.1 Summary of test results

- ☐ No deviations from the technical specification (s) were ascertained in the course of the performed tests.
- ☒ The deviations as specified in 2.5 were ascertained in the course of the performed tests.

This test report :

- ☒ describes the first test
- ☐ describes an additional test
- ☐ is a verification of documents
- ☐ is only valid with the test report no.

2.2 Test environment

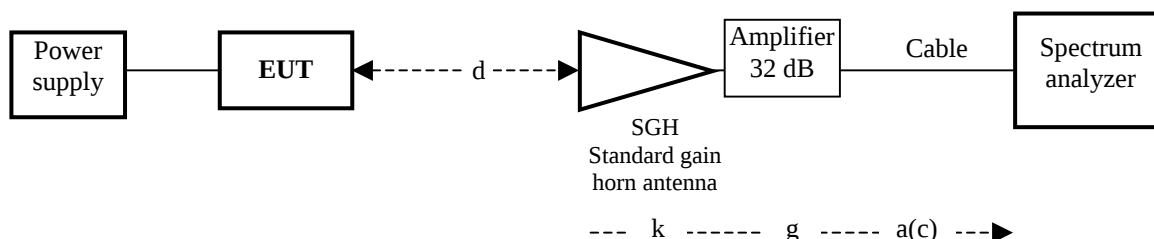
The environmental conditions are documented especially for each test.

2.3 Measurement and test set-up

The measurement and test set-up is defined in the technical specification .

2.4 Test equipment utilized and test set-up

2.4.1 Field strength measurement of fundamental and spurious radiation in the frequency range 0.9 GHz to 33 GHz



Frequency f [GHz]	Distance d [m]	Antenna factor k [dB(1/m)]	Amp.gain g [dB]	Cable loss a(c) [dB]
0.9 to 2.0	3.0	23.45	32.0	0.5 ... 0.7
2.0 to 4.0	3.0	23.68	32.0	0.7 ... 0.9
4.0 to 6.0	3.0	27.31	32.0	0.9 ... 1.3
6.0 to 8.0	3.0	30.06	32.0	1.3 ... 1.8
8.0 to 12.0	3.0	33.70	32.0	1.8 ... 2.5
12.0 to 18.0	3.0	33.97	32.0	2.5 ... 3.5
18.0 to 26.0	3.0	40.22	28.0	3.5 ... 4.7
26.0 to 33.0	3.0	44.00	28.0	4.7 ... 5.0

Calculation :

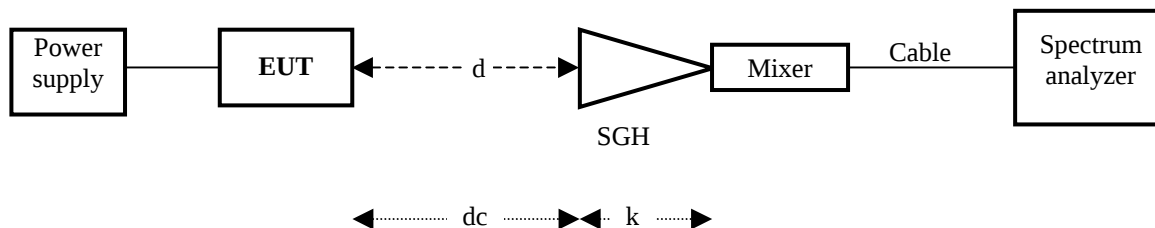
$$\begin{aligned} \text{Field strength} &= \text{analyser reading} + \text{cable loss} - \text{amplifier gain} + \text{antenna factor} \\ e [\text{dB(mV/m)}] &= u [\text{dB(mV)}] + a [\text{dB}] - g [\text{dB}] + k [\text{dB(1/m)}] \end{aligned}$$

Test equipment	Manufacturer	Type	CETECOM reference
Spectrum Analyser	HP	HP 8565E	300001665
SGH 1.0 to 2.0 GHz	flann	0624-10	300000225
SGH 2.0 to 4.0 GHz	narda	644	300000769
SGH 4.0 to 6.0 GHz	narda	643	300002447
SGH 6.0 to 8.0 GHz	narda	642	300000767
SGH 8.0 to 12.5 GHz	narda	640	300000784
SGH 12.0 to 18.0 GHz	narda	639	300000787
SGH 18.0 to 26.5 GHz	narda	V637	300000487
Amplifier 0.1 ... 26 GHz	HP	HP 83017A	300002267
Climatic chamber	Vötsch	VUK 04/500	300000297
DC Power supply	HP	HP 6038A	300001174
RF-cable	HP	5061-5359	300002033

Measurement uncertainties

Test parameter	Measurement uncertainty
DC Power supply	±0.5 V
Temperature	±0.2 °C
Frequency	±0.01 ppm
eirp	±1.5 dB

2.4.3 Field strength and spurious radiation in the frequency range 33 GHz to 110 GHz



Frequency range [GHz]	Distance d [m]	Distance correction dc (3 m/Xm) [dB]	Antenna factor k [dB 1/m]
33.0 50.0	0.25	-21.58	39.10
50.0 75.0	0.25	-21.58	40.67
75.0 ... 110.0	0.125	-27.60	45.07

Calculation : Field strength = Analyser reading + Cable loss + Antenna factor + Distance correction

$$e = u + a + k + dc$$

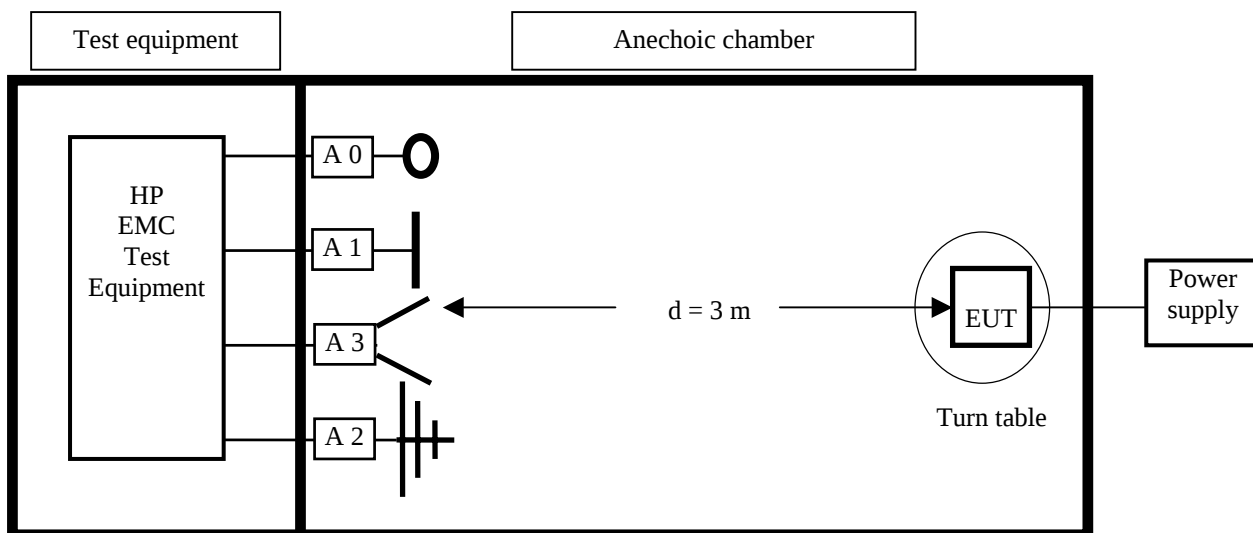
Test equipment	Manufacturer	Type	CETECOM reference
Spectrum Analyser	HP	HP 8565E	300001665
Power supply	HP	6032A	300002115
SGH 33 ... 50 GHz	Thomson	COR 33_50	300000812
Mixer 33 ... 50 GHz	HP	11970Q	300000781j
SGH 50 ... 75 GHz	Thomson	COR 50_75	300000789k
Mixer 50 ... 75 GHz	HP	11970V	300000871o
SGH 75 ... 110 GHz	Thomson	COR 75_110	300000789m
Mixer 75 ... 110 GHz	HP	11970W	300000871v

Measurement uncertainty

Test parameter	Measurement uncertainty
Power supply	±0.1 VDC
Temperature	±0.2 °C
Frequency	±0.01 ppm
Field strength <50 GHz	±1.0 dB
Field strength >50 GHz	±3.0 dB

2.4.2 Field strength and spurious radiation in the frequency range 9 kHz to 12 GHz

Set-up for radiated measurements



Test equipment	Manufacturer	Type	Serial No.
Spectrum analyser	HP	HP 85660B	2478A05306
Analyser display	HP	HP 85662A	2816A16541
Quasi peak adapter	HP	HP 85650A	2811A01131
RF-preselector	HP	HP 85685A	2833A00768
Loop Antenna A 0	R&S	HFH 2-Z2	881 058/42
Biconical antenna A 1	Emco	3104	3758
Log.-per.-antenna A 2	Emco	3146	2304
Double ridge horn ant. A 3	Emco	3115	3007
Relay switch	R&S	RSU	375 339/002
High pass filter	FSY Microwave	HM 985955	001
Amplifier	Tron-Tech	P42-GA29	B2302
DC Power supply	HP	HP 6038A	300001174
RF-cable	HP	5061-5359	P36303

Measurement uncertainties

Performance	Measurement uncertainty
Input power (DC)	± 0.5 V
Temperature	± 0.2 °C
Frequency	± 0.01 ppm
RF-power	± 1.5 dB

2.5 Test results

2.5.1 Test results overview

This test was performed :

☐ in addition to the test report no.

Verification of EUT :

☐ EUT is in accordance with the technical description

☐ EUT is not in accordance with the technical description

☒ The equipment is not compliant to FCC requirement

2.5.2 Remarks on methods of measurements

A variable DC power supply drives the level gauge. The operation of the system is controlled by a service PC that is connected to the system by means of a twisted pair signal wire.

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 110 GHz in a semi-anechoic chamber. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are conform with specifications ANSI C63.2-1999 clause 15 and ANSI C63.4-2003 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test set-ups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received.

The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths (RBW) over various frequency ranges are set according to requirement ANSI C63.4-2003 clause 4.2.

1. Measurements of ERP/EIRP at fundamental and spurious frequencies

Spurious frequencies are produced by transmitter and receiver when the EUT is active. According to FCC requirements 15.209, spurious emissions have to be investigated as maximum field strength values in the frequency range from 9 kHz to 960 MHz. Where possible, the measurement distance shall be 3 m.

In the low frequency range (9 kHz to 30 MHz), the receiving antenna is an active loop antenna which is positioned at 3 m distance in a shielded, anechoic chamber (see page 8). In case of required measuring distances > 3 m, a distance correction factor is used to calculate the received field strength.

Spurious EIRP measurements in the frequency range 960 MHz to 22 GHz are carried out in a shielded semi-anechoic test chamber. The measurement distance is 3.0 m.

In the frequency range 4 GHz to 110 GHz, spurious EIRP measurements are performed in a shielded fully anechoic chamber with rectangular SGH's. The measurement distances are indicated underneath each plot, and a calculation for field strength is added, where all relevant factors like cable losses, antenna factors, etc are taken into account.

2.5.3 Test results in details

Equipment under test (EUT) : see page 5

Ambient temperature : 23 °C

Relative humidity : 55 %

TRANSMITTER PARAMETERS

SECTION 15.49 (A)

FUNDAMENTAL FREQUENCY

SECTION 15.249 (A)

Microwave module : OPTIWAVE 7300 C operating in FMCW

Test condition t = 23.0 ° C	EUT operating in FMCW		
TX on and RX on	Frequency f [GHz]	E [mV/m] / @3m	See plot no.:
U DC = 24.0 V	24.029	223.8	1a
	24.133	223.8	1b
	24.236	223.8	1c
	sweep	223.8	1d

REFERENCE OF TEST EQUIPMENT USED : see test set-up on page 8 / 9

LIMITS:

SECTION 15.249

Section	Frequency range [GHz]	Measurement distance [m]	Field strength e [dBmV/m] @ 3 m	Field strength E [mV/m]
15.249	24.000 to 24.250	3.0	47.96	250

Verdict : Field strength limits are kept

Equipment under test (EUT) : see page 5

Ambient temperature : 23 °C

Relative humidity : 55 %

TRANSMITTER PARAMETERS

SECTION 15.205 / 15.209 / 15.249

SPURIOUS FREQUENCIES

SECTION 15.205 / 15.209 / 15.249

Microwave module :

OPTIWAVE 7300 C operating in FMCW

Test condition t = 23.0 ° C	EUT operating in FMCW			
Frequency range	Spurious frequencies [GHz]	S A e [dBμV/m]	E [μV/m]	See plot no.:
0.009 – 30.0 MHz (h + v) horizontal and vertical plane	1.67 MHz	43.2	144.5	2 / 3
	54.0 kHz	58.0	794.3	
30.0 - 4000.0 MHz	noise	35.0	56.2	4 / 5
4.0 - 12.0 GHz	noise	33.0	44.6	6
4.0 - 6.0 GHz	noise	44.0	158.5	7
6.0 - 8.0 GHz	noise	47.5	237.1	8
8.0 - 12.0 GHz	noise	50.6	338.8	9
12.0 - 18.0 GHz	noise	52.6	426.5	10
18.0 - 24.0 GHz	noise	39.2	91.2	11
24.25 - 29.0 GHz	noise	50.2	323.5	12
29.0 - 40.0 GHz	noise	24.5	16.7	13
33.0 - 50.0 GHz	noise	52.8	436.5	14
48.0 - 48.6 GHz	1. Harmonics	64.6	1698.2	15
50.0 - 75.0 GHz	noise	35.0	56.3	16
75.0 - 110.0 GHz	noise	47.6	239.8	17

REFERENCE OF TEST EQUIPMENT USED :

see test set-up on pages 8 / 9

LIMITS:

SECTION 15.205 / 15.209 / 15.249

Frequency range (MHz)	Measurement distance [m]	Field strength e [dBμV/m] @ 3 m	Field strength E [μV/m]
0.009 – 0.490	300	88.5 ... 53.8	2400/F(kHz)
0.490 – 1.705	30	53.8 ... 43.0	24000/F(kHz)
1.705 – 30.0	30	49.5	30
30.0 – 88.0	3	40.0	100
88.0 – 216.0	3	43.5	150
216.0 – 960.0	3	46.0	200
> 960.0	3	54.0	500
Harmonics	3	67.9	2,500

Verdict : Field strength limits are kept

EUT : OPTIWAVE 7300C
 Ambient temperature : 23 °C
 Relative humidity : 55 %

Microwave module : with Antenna module

DC Conducted Limits

TRANSMITTER SPURIOUS EMISSION				
Frequency range Frequency [GHz]	Spurious frequencies [GHz]	S A u [dBmV]	E [µV/m]	See plot no.:
0.150 – 30.000 MHz	Noise	< limit	< limit	18
0.150 – 30.000 MHz	Noise	< limit	< limit	19

REFERENCE

FCC:	CFR Part 15.207, 15.107
------	-------------------------

LIMITS:

SECTION 15.107 / 15.207

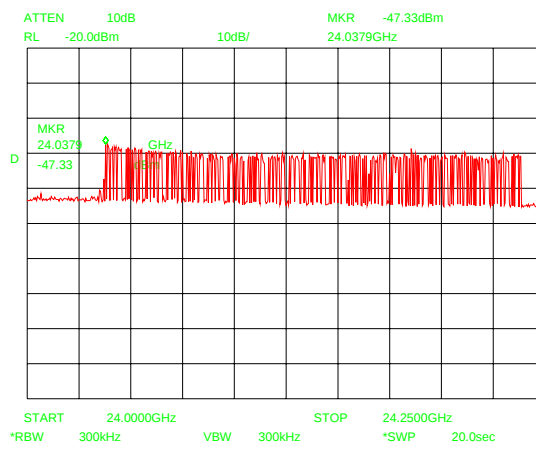
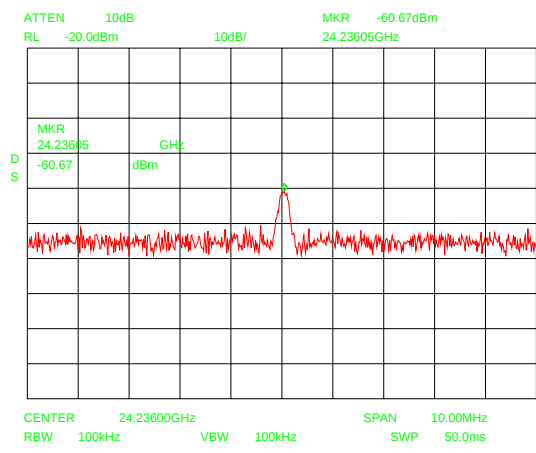
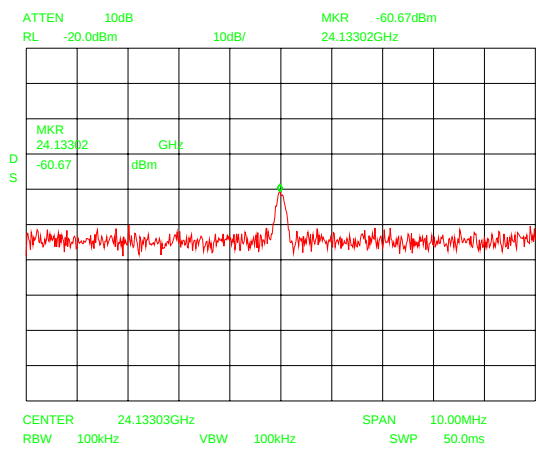
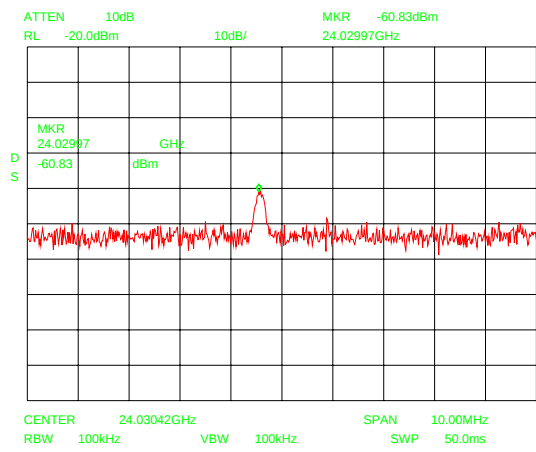
Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency

Verdict :	Spurious limits are kept
-----------	--------------------------

3 Plots, graphs and data sheets

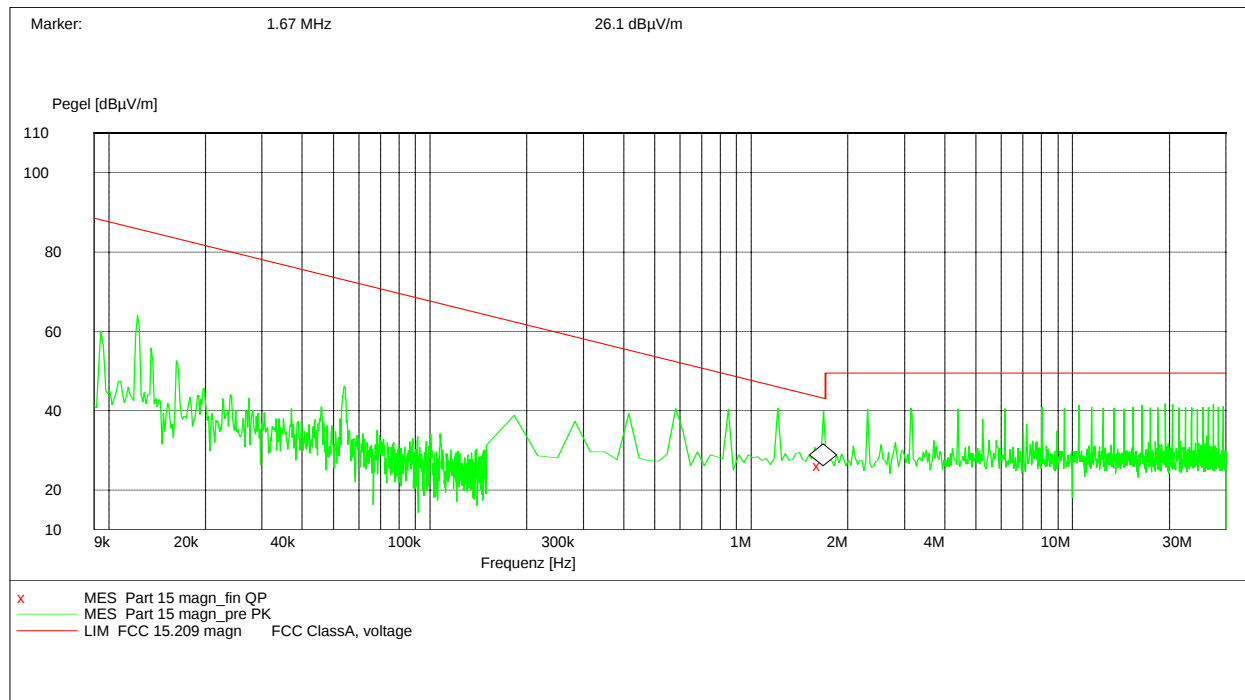
Plot 1a, 1b, 1c, 1d



Measurement distance d = 3.0 m

Field strength = analyser reading + cable loss -+ antenna factor
e [dB(mV/m)] = u [dB(mV)] + a [dB] -+ k [dB(1/m)]
e = -0.5 + 3.5 -+ 44.0
e = 47.0 dB(mV/m)
e = 107.0 dB(µV/m)
E = 223.8 mV/m @3m (Noise)

Plot 2



Settings:

Peak

9 kHz – 150 kHz

150 kHz – 30 MHz

QP

9 kHz – 150 kHz

150 kHz – 30 MHz

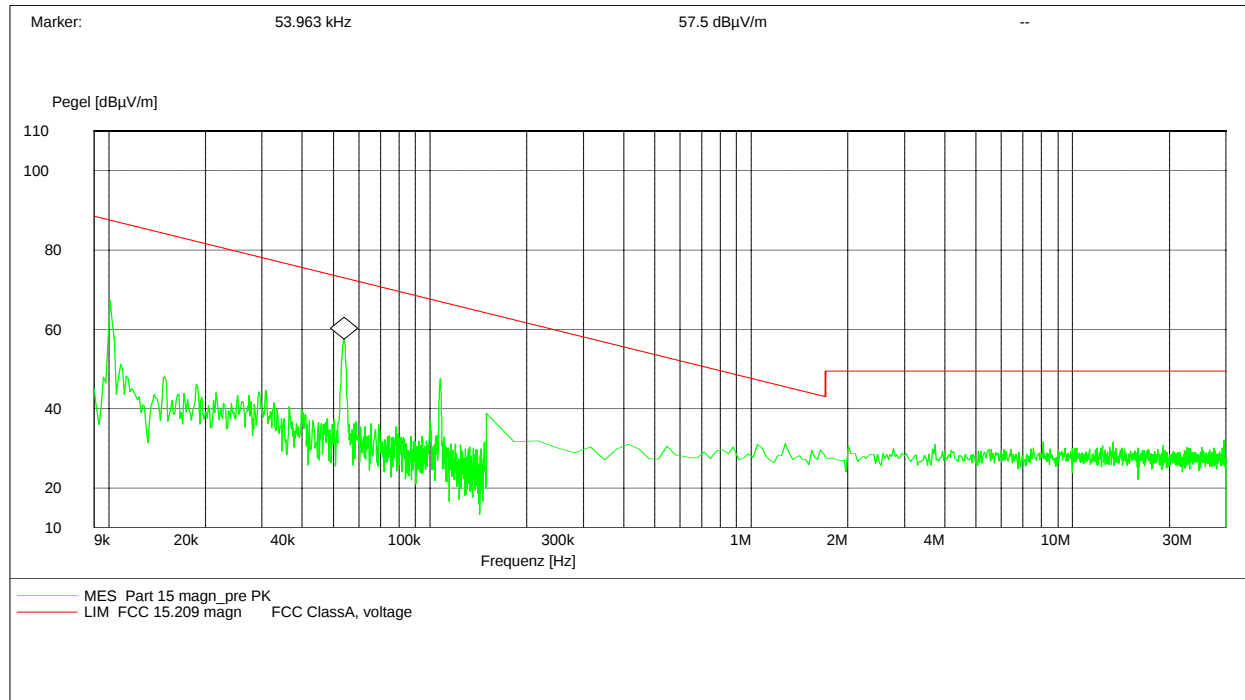
RBW / VBW 100 Hz

RBW / VBW 9.0 kHz

RBW / VBW 200 Hz

RBW / VBW 9.0 kHz

Plot 3



Settings:

Peak

9 kHz – 150 kHz

RBW / VBW 100 Hz

150 kHz – 30 MHz

RBW / VBW 9.0 kHz

QP

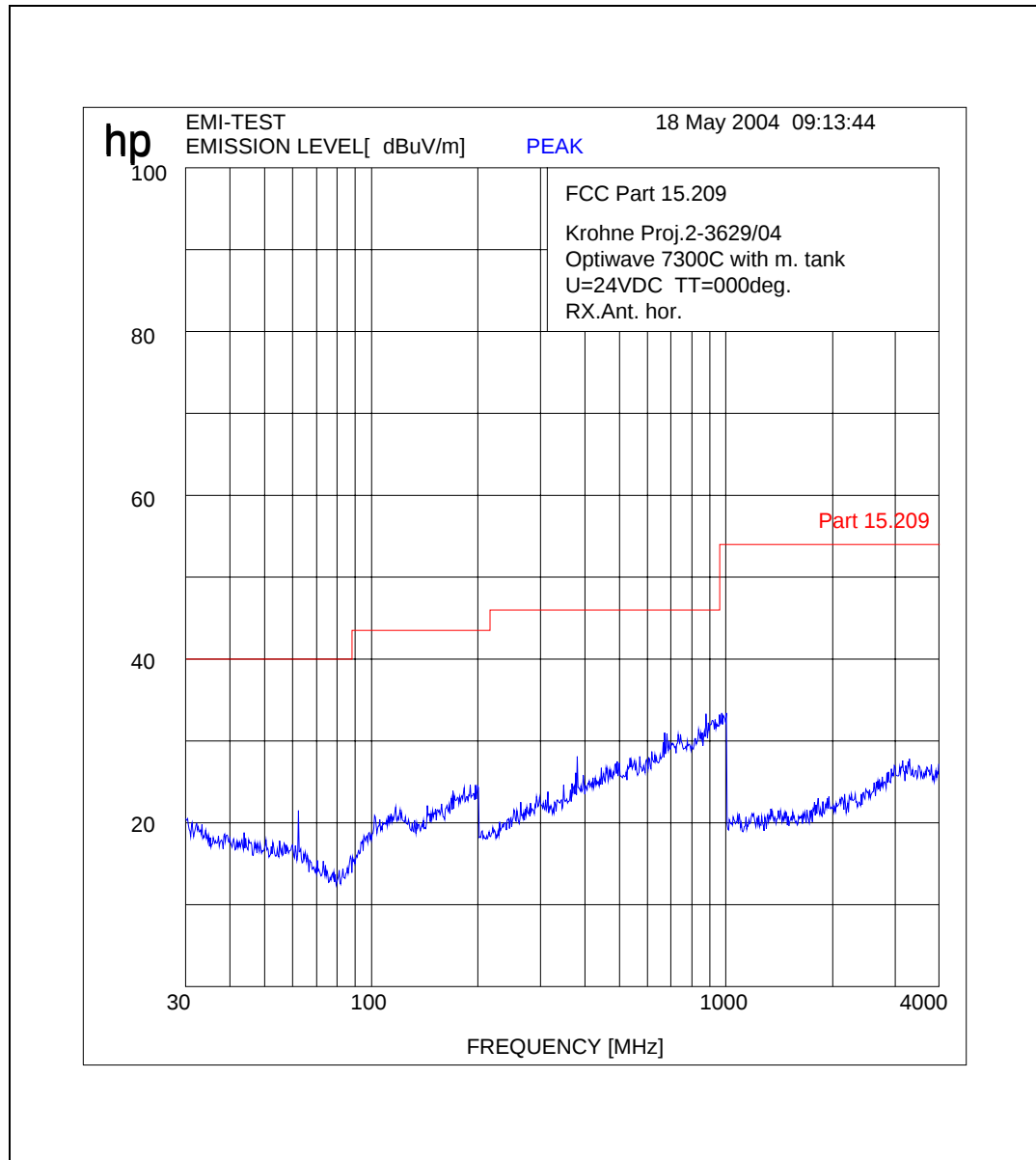
9 kHz – 150 kHz

RBW / VBW 200 Hz

150 kHz – 30 MHz

RBW / VBW 9.0 kHz

Plot 4



Settings:

Peak

30 MHz – 1.0 GHz

1.0 GHz – 4.0 GHz

QP

30 MHz – 1.0 GHz

1.0 GHz – 4.0 GHz

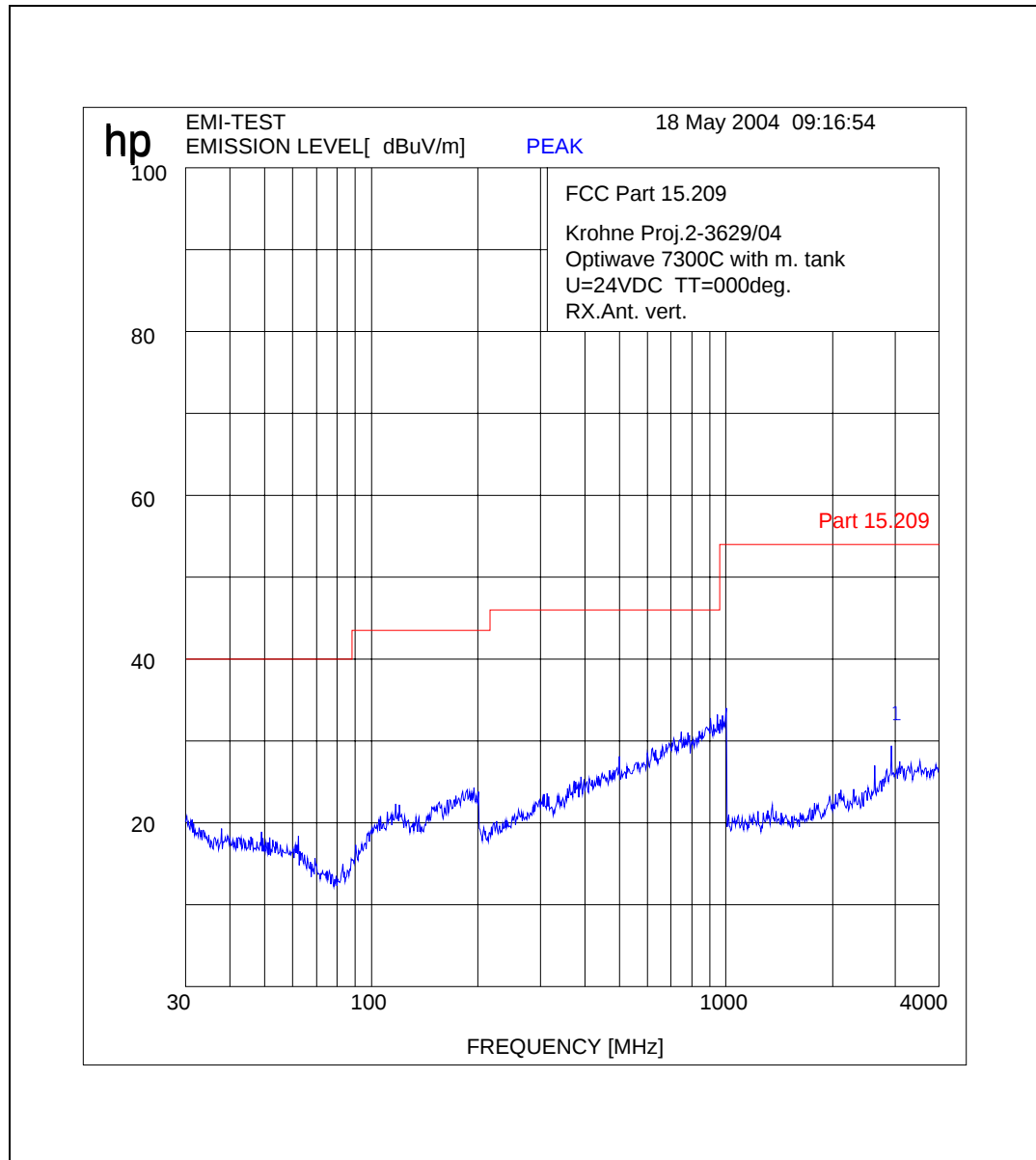
RBW / VBW 100 kHz

RBW / VBW 1.0 MHz

RBW / VBW 120 kHz

RBW / VBW 1.0 MHz

Plot 5



Settings:

Peak

30 MHz – 1.0 GHz

1.0 GHz – 4.0 GHz

QP

30 MHz – 1.0 GHz

1.0 GHz – 4.0 GHz

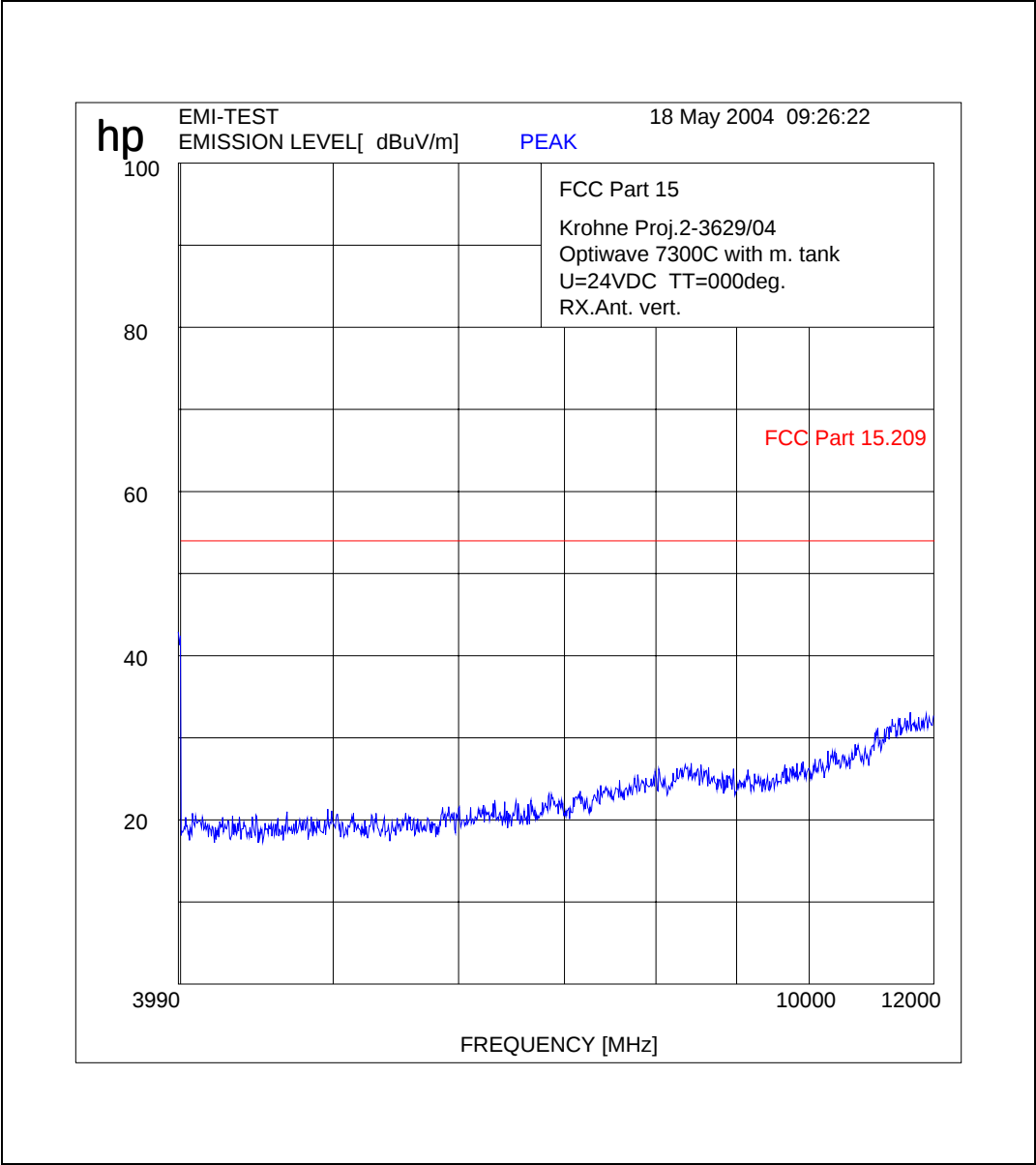
RBW / VBW 100 kHz

RBW / VBW 1.0 MHz

RBW / VBW 120 kHz

RBW / VBW 1.0 MHz

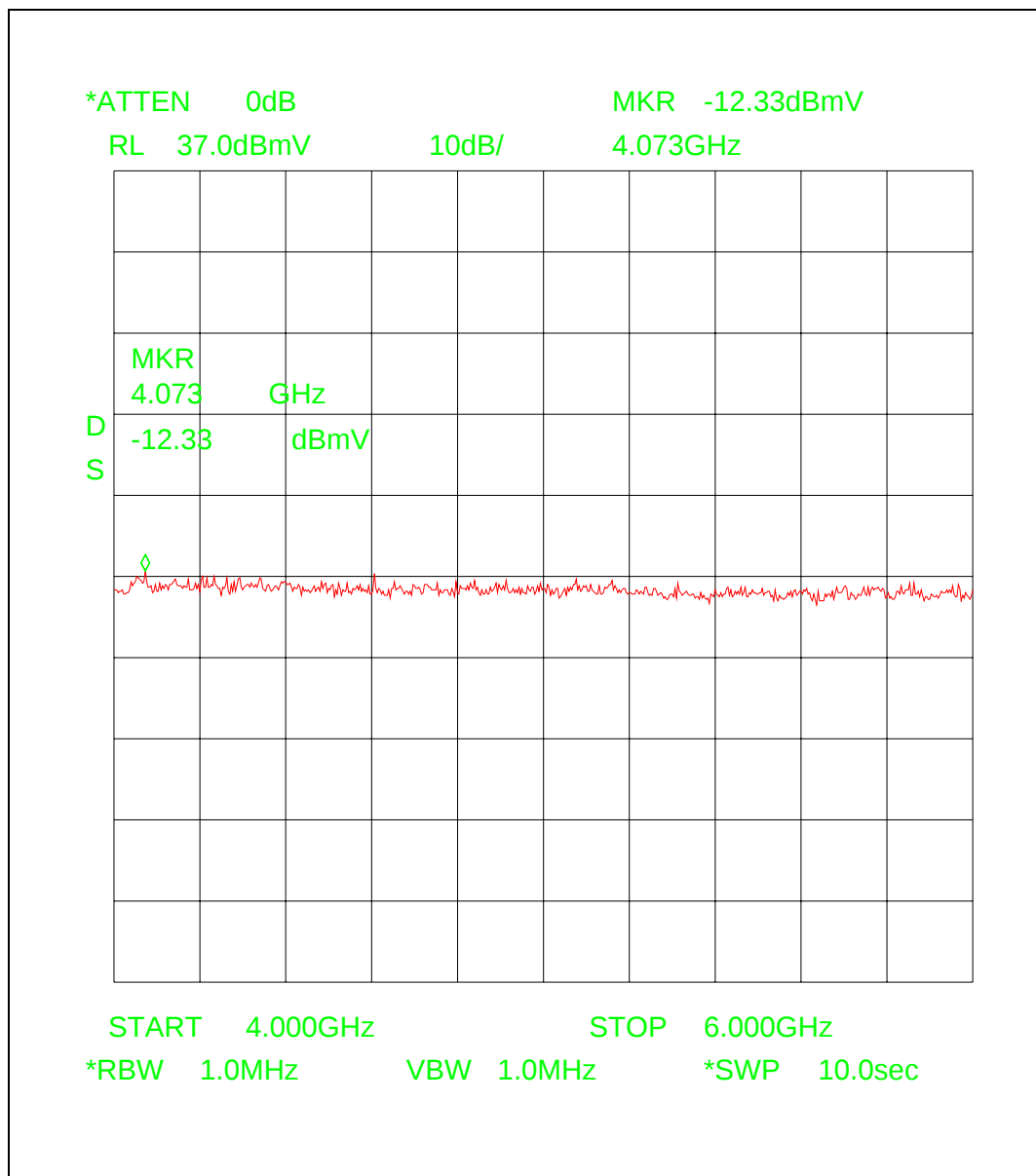
Plot 6



Settings:

Peak	
30 MHz – 1.0 GHz	RBW / VBW 100 kHz
1.0 GHz – 4.0 GHz	RBW / VBW 1.0 MHz
QP	
30 MHz – 1.0 GHz	RBW / VBW 120 kHz
1.0 GHz – 4.0 GHz	RBW / VBW 1.0 MHz
> 4.0 GHz	RBW / VBW 1.0 MHz

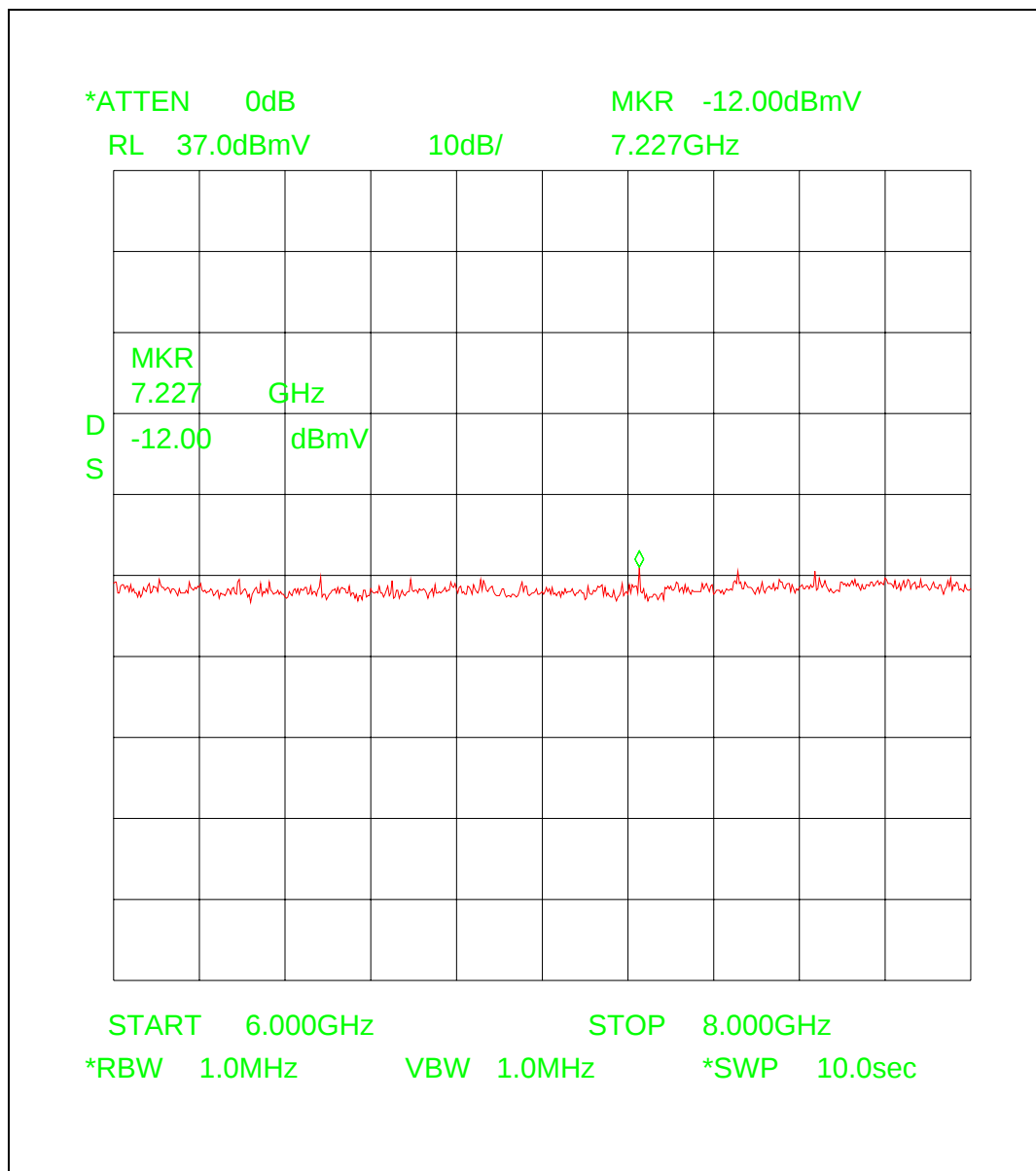
Plot 7



Measurement distance d = 3.0 m

Field strength	=	analyser reading	+	cable loss	-	amplifier gain	+	antenna factor
e [dB(mV/m)]	=	u [dB(mV)]	+	a [dB]	-	g [dB]	+	k [dB(1/m)]
e	=	-12.3	+	1.0	-	32.0	+	27.3
e	=	-16.0 dB(mV/m)						
e	=	44.0 dB(μV/m)						
E	=	158.49 μV/m @3m (Noise)						

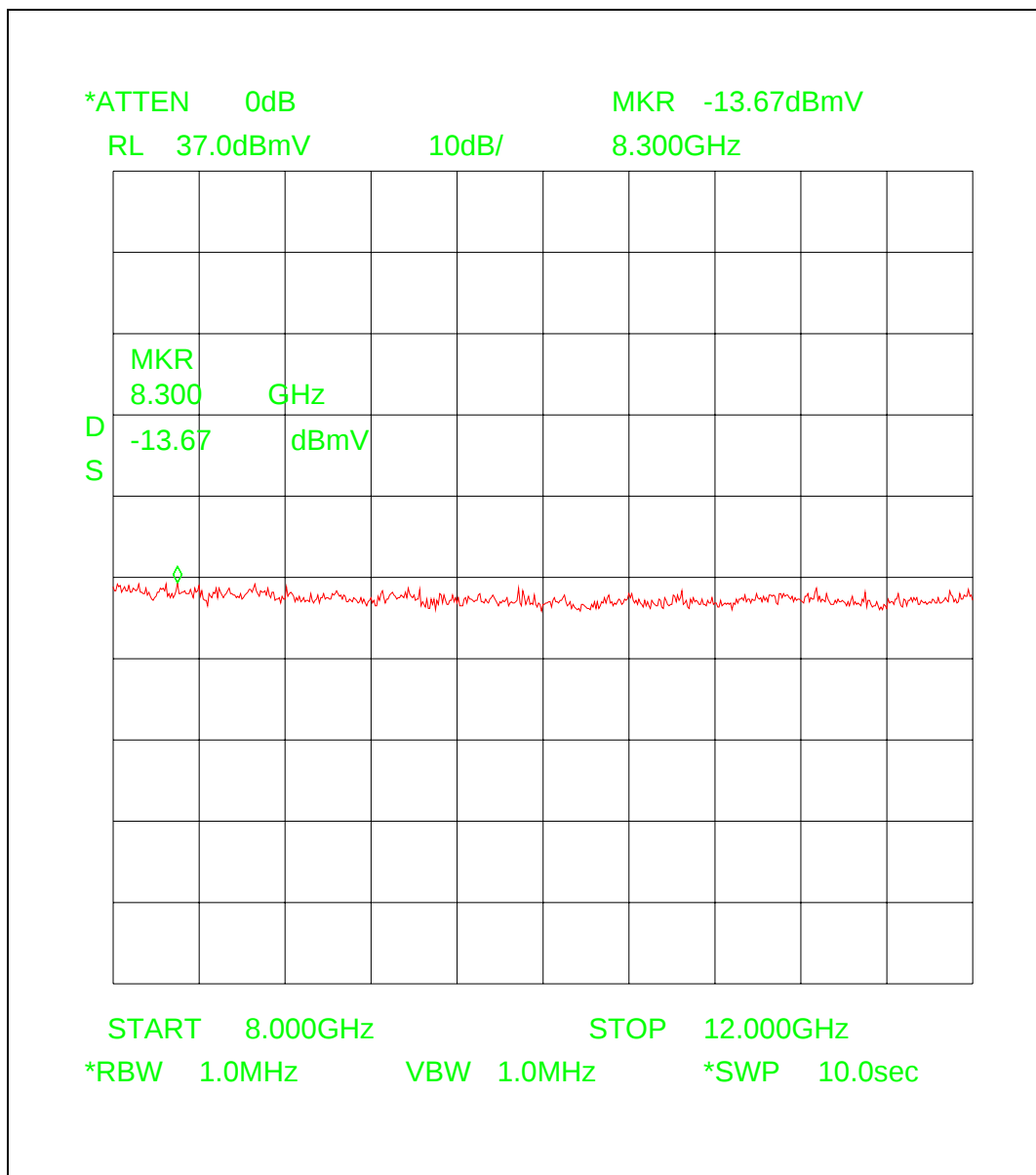
Plot 8



Measurement distance d = 3.0 m

Field strength	=	analyser reading	+	cable loss	-	amplifier gain	+	antenna factor
e [dB(mV/m)]	=	u [dB(mV)]	+	a [dB]	-	g [dB]	+	k [dB(1/m)]
e	=	-12.0	+	1.5	-	32.0	+	30.0
e	=	-12.5 dB(mV/m)						
e	=	47.5 dB(μV/m)						
E	=	237.1 μV/m @3m (Noise)						

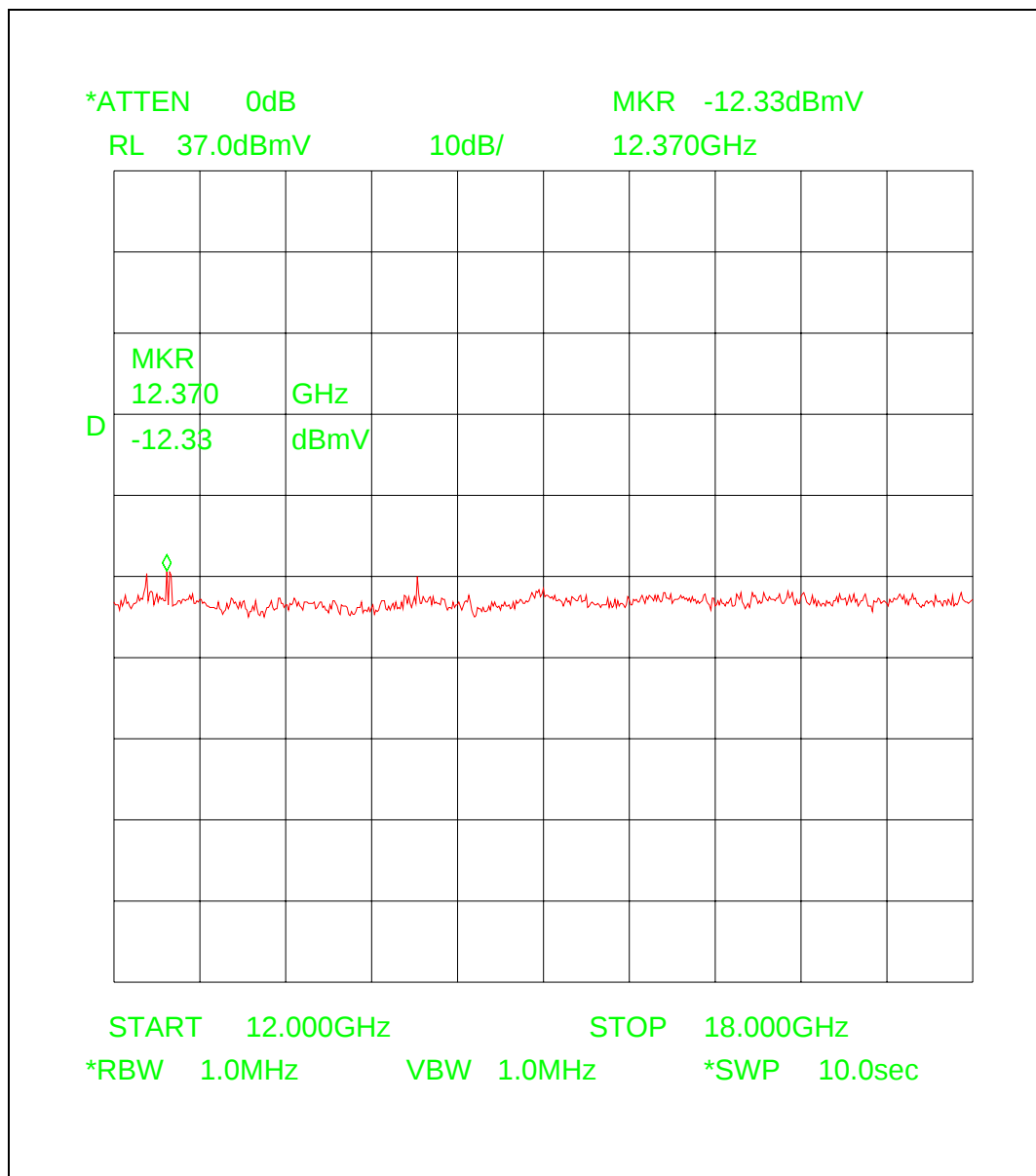
Plot 9



Measurement distance d = 3.0 m

Field strength	=	analyser reading	+	cable loss	-	amplifier gain	+	antenna factor
e [dB(mV/m)]	=	u [dB(mV)]	+	a [dB]	-	g [dB]	+	k [dB(1/m)]
e	=	-13.6	+	2.5	-	32.0	+	33.7
e	=	-9.4 dB(mV/m)						
e	=	50.6 dB(μV/m)						
E	=	338.8 μV/m @3m (Noise)						

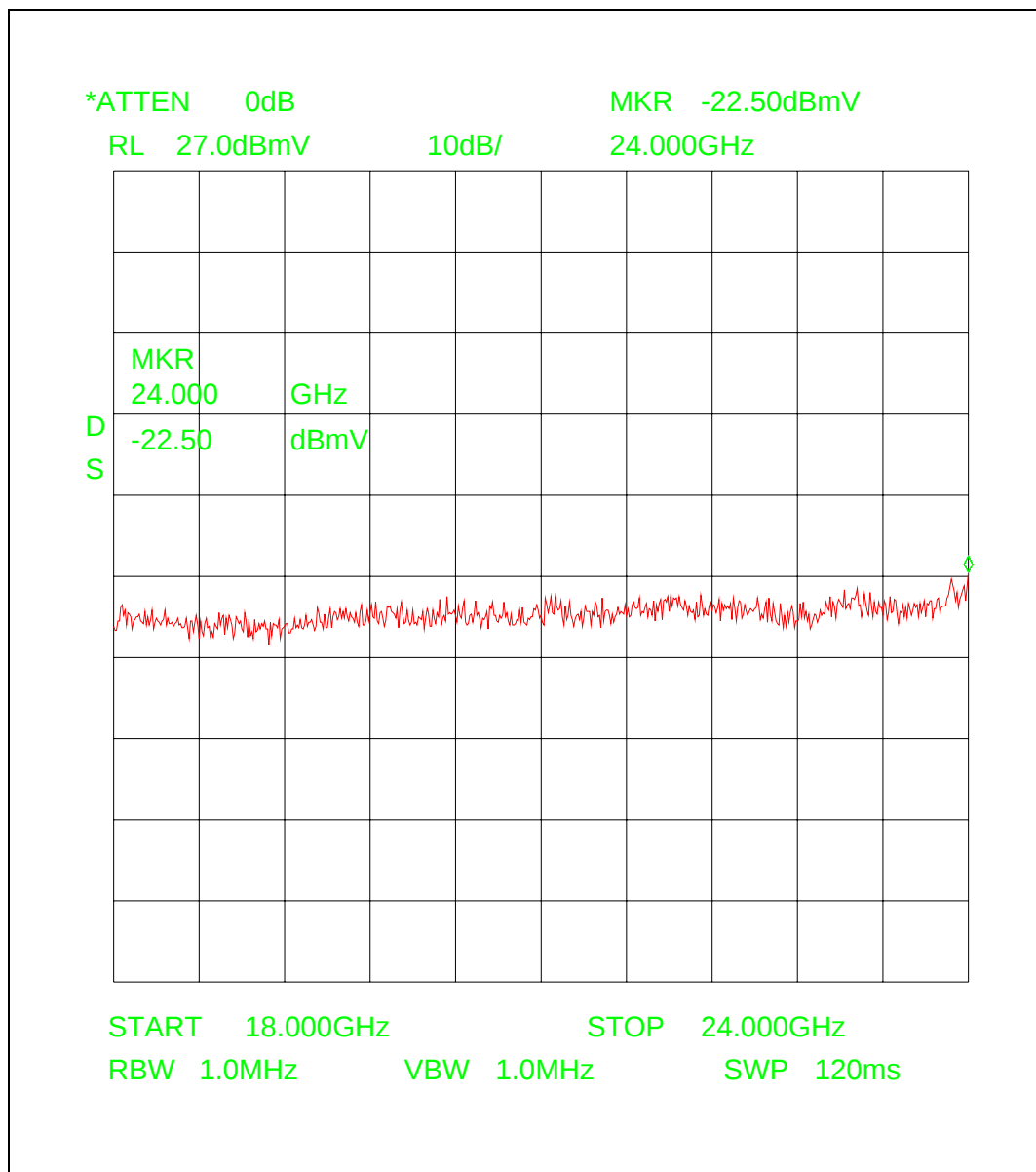
Plot 10



Measurement distance d = 3.0 m

Field strength = analyser reading + cable loss - amplifier gain + antenna factor
 e [dB(mV/m)] = u [dB(mV)] + a [dB] - g [dB] + k [dB(1/m)]
 e = -12.3 + 3.0 - 32.0 + 33.9
 e = -7.4 dB(mV/m)
 e = 52.6 dB(μV/m)
 E = 426.5 μV/m @3m (Noise)

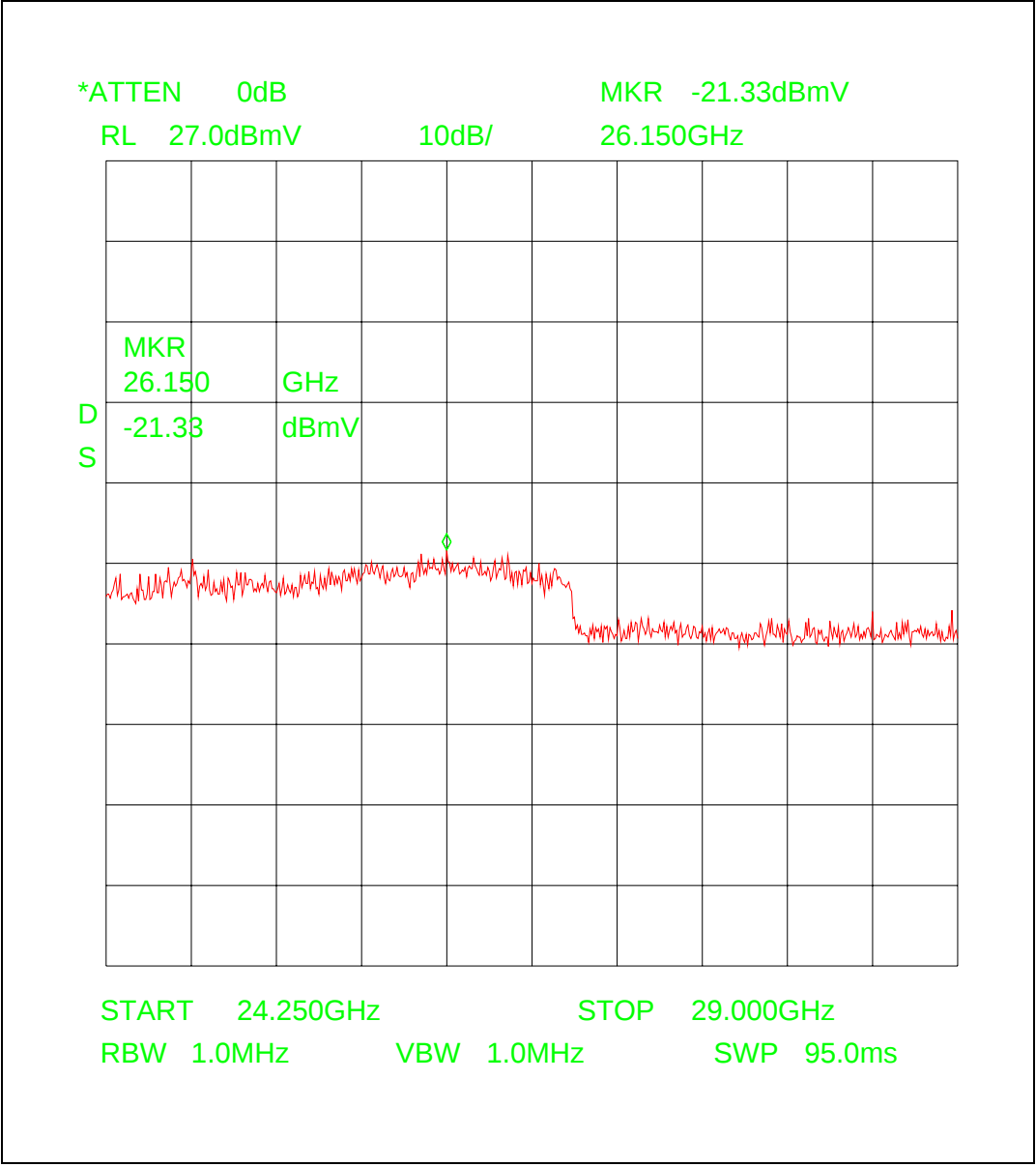
Plot 11



Measurement distance d = 3.0 m

Field strength = analyser reading + cable loss - amplifier gain + antenna factor
 e [dB(mV/m)] = u [dB(mV)] + a [dB] - g [dB] + k [dB(1/m)]
 e = -22.5 + 3.5 - 32.0 + 40.2
 e = -20.8 dB(mV/m)
 e = 39.2 dB(μV/m)
 E = 91.2 μV/m @3m (Noise)

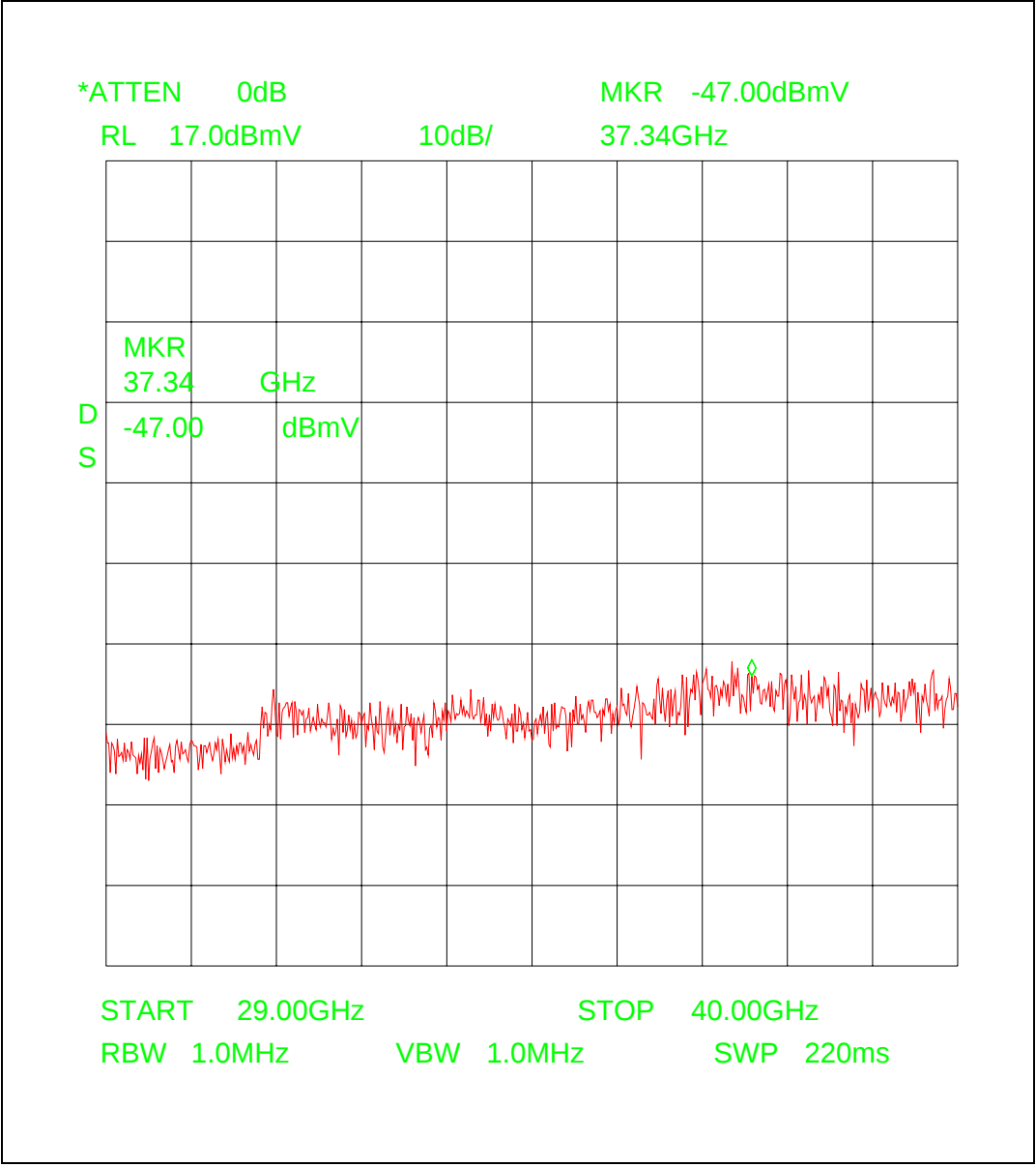
Plot 12



Measurement distance d = 1.0 m

Field strength = analyser reading + cable loss - amplifier gain + antenna factor - distance corr.
e [dB(mV/m)] = u [dB(mV)] + a [dB] - g [dB] + k [dB(1/m)] - d [dB]
e = -21.3 + 5.0 - 28.0 + 44.0 - 9.5
e = -9.8 dB(mV/m)
e = 50.2 dB(µV/m)
E = 323.5 µV/m @3m (Noise)

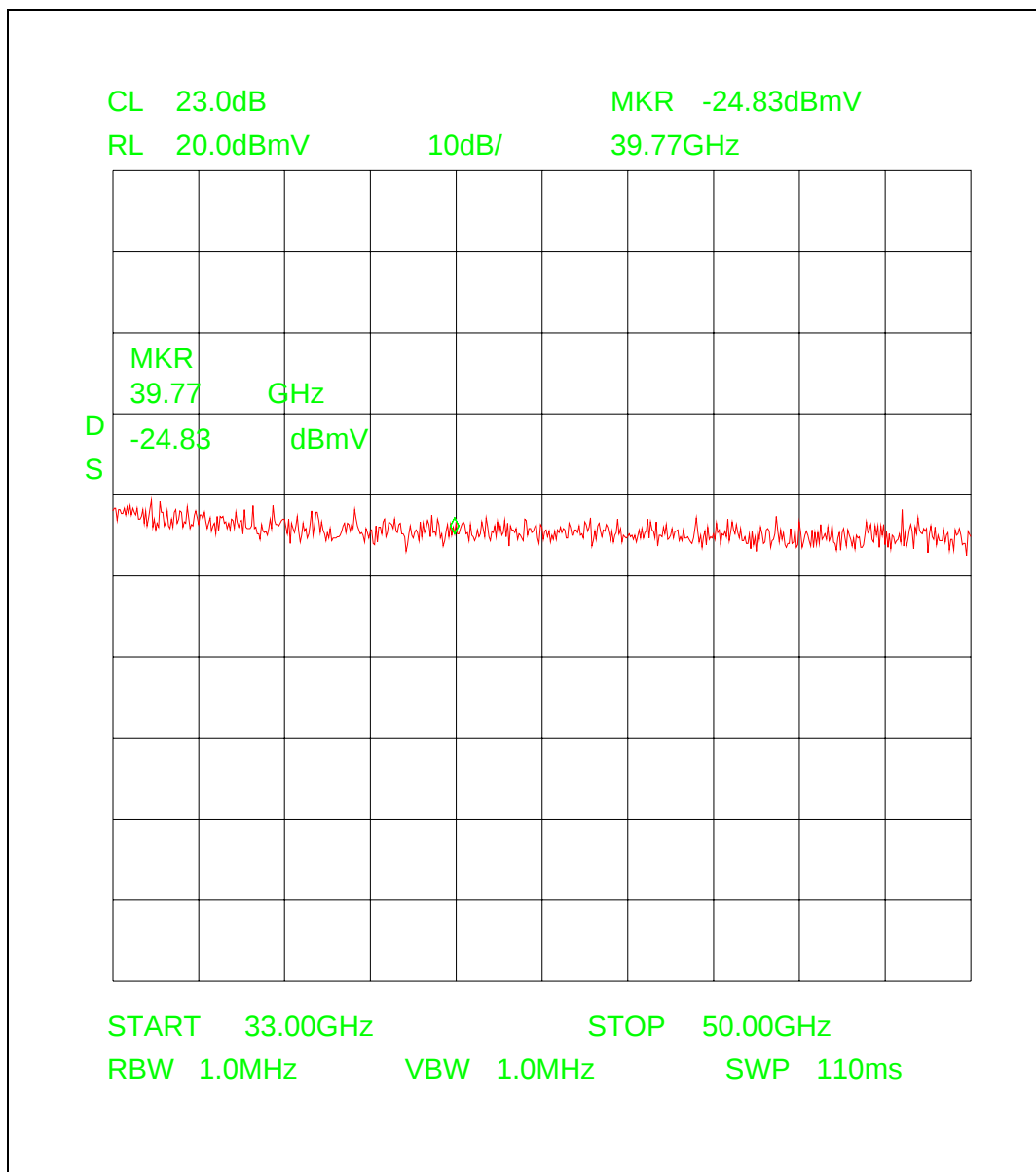
Plot 13



Measurement distance d = 1.0 m

Field strength = analyser reading + cable loss - amplifier gain + antenna factor - distance corr.
e [dB(mV/m)] = u [dB(mV)] + a [dB] - g [dB] + k [dB(1/m)] - d [dB]
e = -47.0 + 5.0 - 28.0 + 44.0 - 9.5
e = -35.5 dB(mV/m)
e = 24.5 dB(µV/m)
E = 16.7 µV/m @3m (Noise)

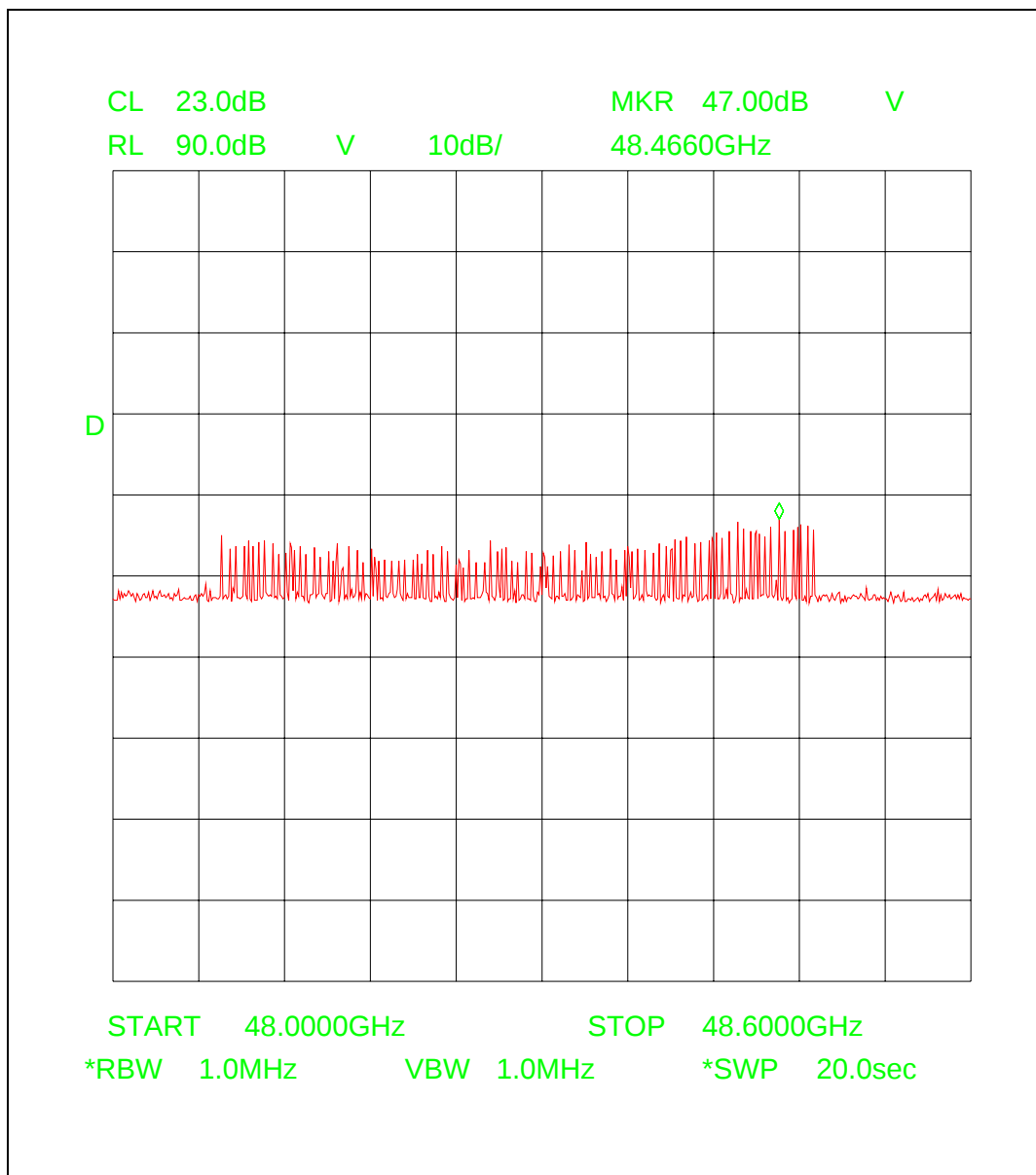
Plot 14



Measurement distance d = 0.25 m

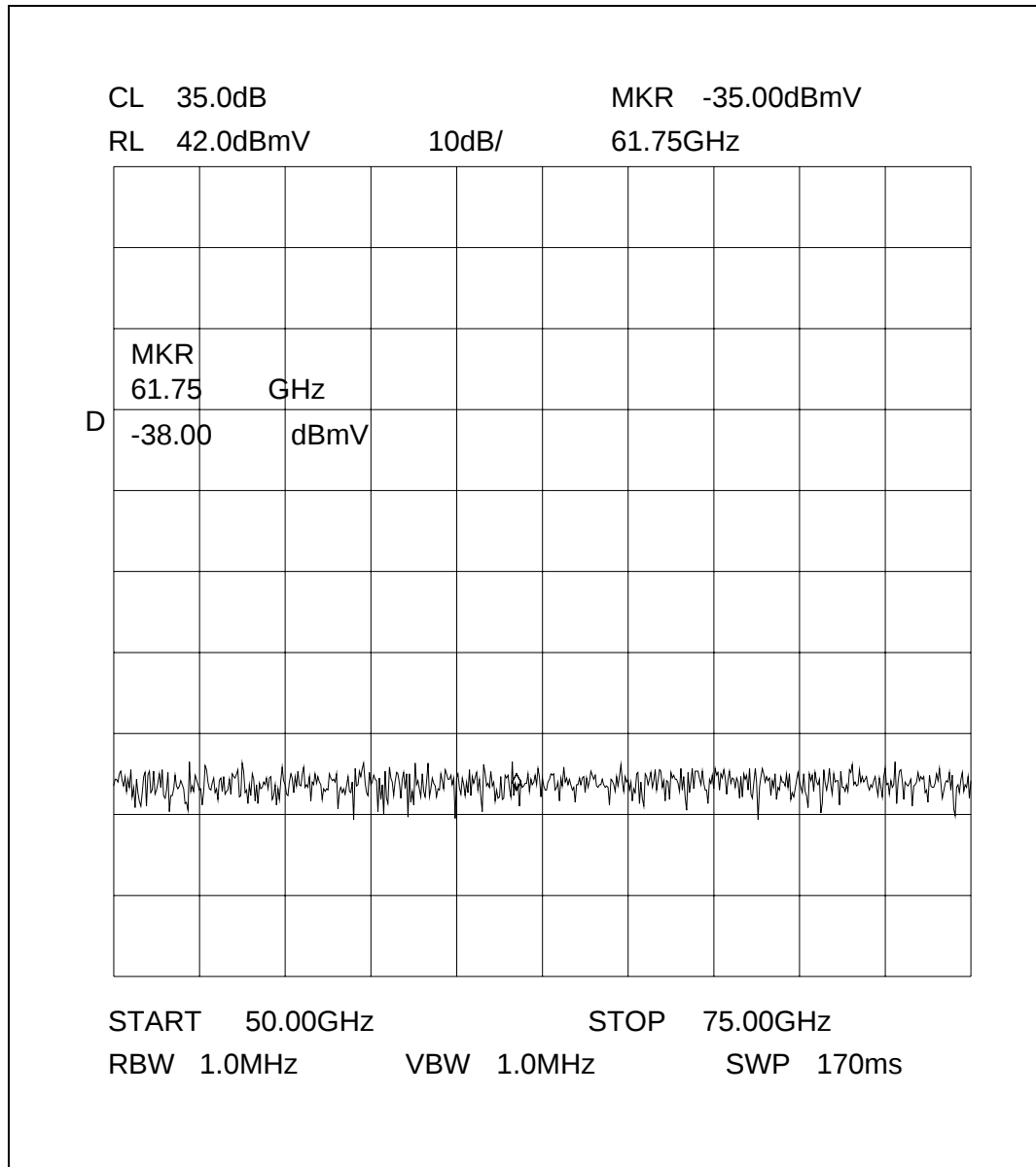
Field strength = analyser reading + antenna factor - distance corr.
 $e \text{ [dB(mV/m)]} = u \text{ [dB(mV)]} + k \text{ [dB(1/m)]} - d \text{ [dB]}$
 $e = -24.8 + 39.1 - 21.5$
 $e = -7.2 \text{ dB(mV/m)}$
 $e = 52.8 \text{ dB(μV/m)}$
 $E = 436.5 \text{ μV/m @3m (Noise)}$

Plot 15



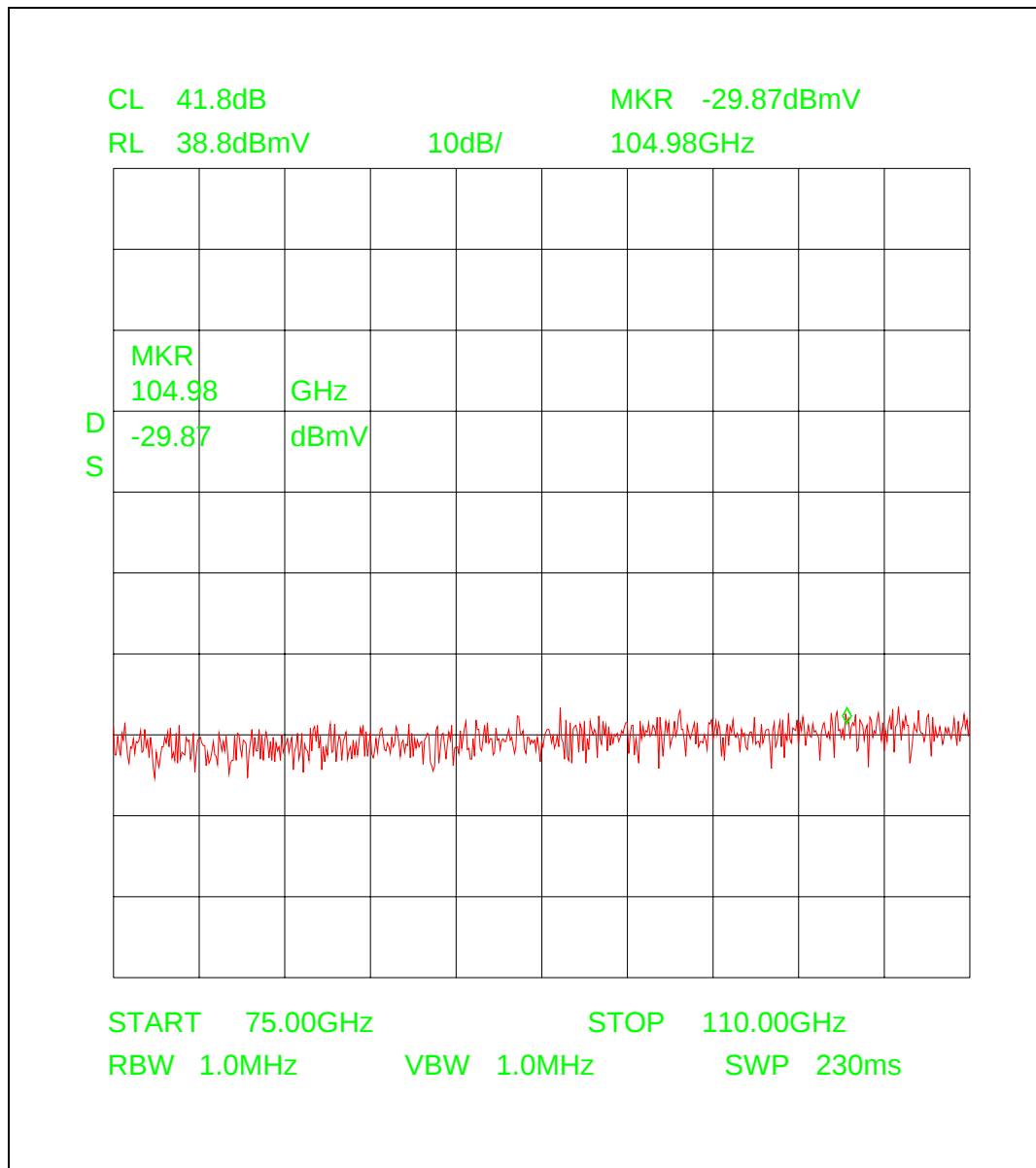
Measurement distance d = 0.25 m

Field strength = analyser reading + antenna factor - distance corr.
 e [dB(mV/m)] = u [dB(μV)] + k [dB(1/m)] - d [dB]
 e = 47.0 + 39.1 - 21.5
 e = 64.6 dB(μV/m)
 E = 1698.2 μV/m @3m (Noise)



Field strength	=	analyser reading	+	antenna factor	-	distance corr.
e [dB(mV/m)]	=	u [dB(mV)]	+	k [dB(1/m)]	-	d [dB]
e	=	-38.0	+	40.6	-	27.6
e	=	-25.0 dB(mV/m)				
e	=	35.0 dB(μV/m)				
E	=	56.3 μV/m @3m (Noise)				

Plot 17



Measurement distance d = 0.125 m

Field strength = analyser reading + antenna factor - distance corr.
 e [dB(mV/m)] = u [dB(mV)] + k [dB(1/m)] - d [dB]
 e = -29.8 + 45.0 - 27.6
 e = -12.4 dB(mV/m)
 e = 47.6 dB(μV/m)
 E = 239.8 μV/m @3m (Noise)

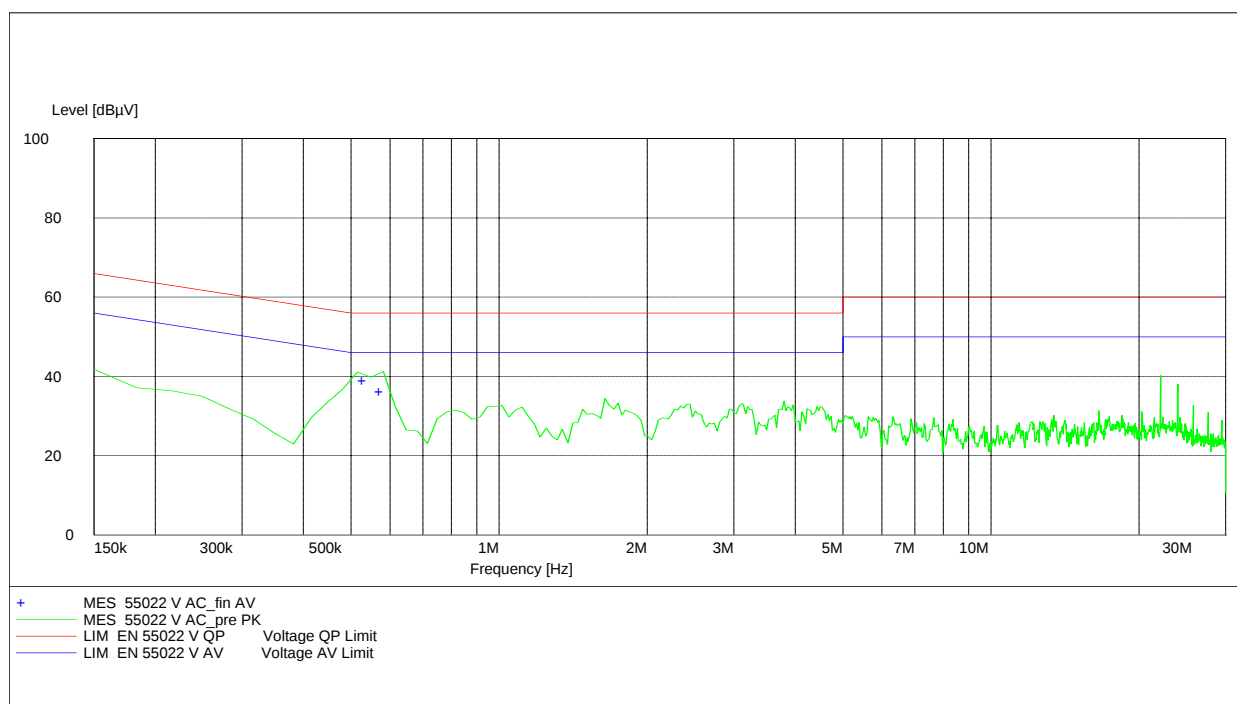
Plot 18

CISPR 22

EUT 24 GHz Tank Radar OPTIWAVE 7300 C
 Manufacturer: Krohne
 Operating Condition: TX on
 Test Site: CETECOM ICT Services Room 006
 Operator: PWM
 Test Specification: EN 55022 V
 Comment: 24.0 V DC
 Start of Test: 14.10.2004

SCAN TABLE: " CISPR 22"

Short Description: Voltage Mains 1.60 Unit dBμV Detector: Mode:



MEASUREMENT RESULT: " CISPR 22 AC_fin AV"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.540000	39.00	10.6	46	7.0	N	GND
0.585000	36.10	10.5	46	9.9	N	GND

Settings: N₁,
 L – System,
 Grounded and
 Flooding

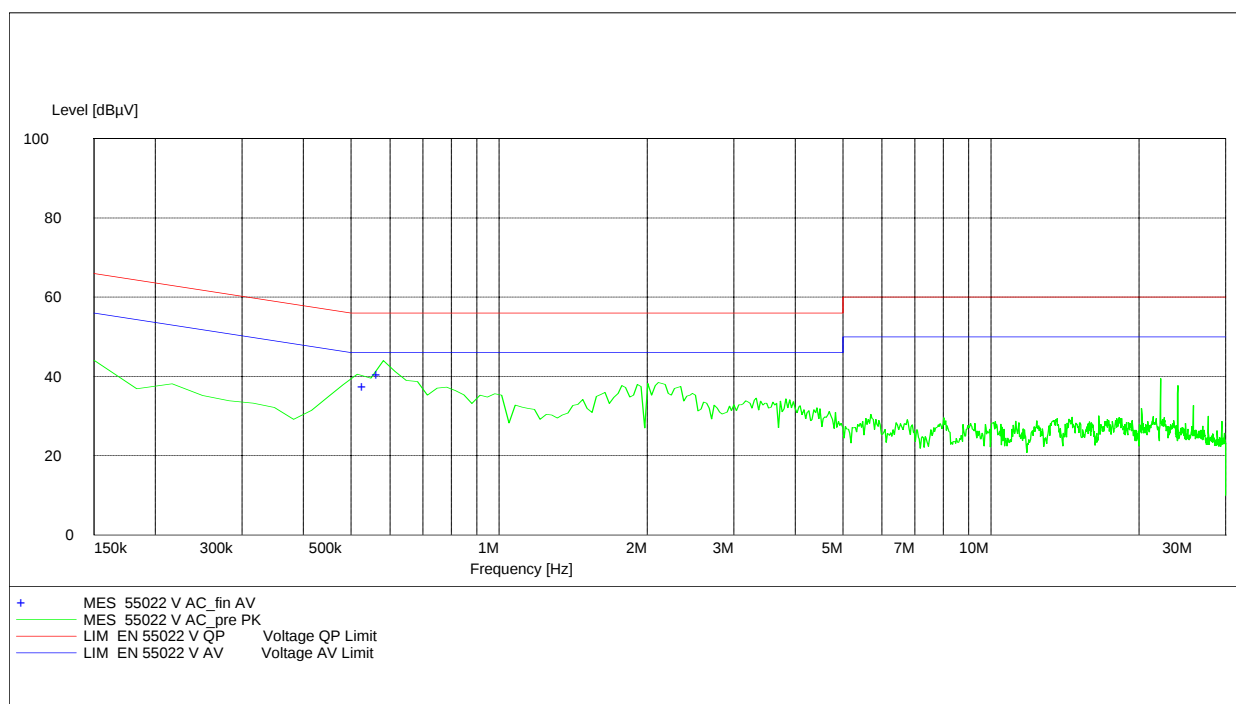
Plot 17

CISPR 22

EUT 24 GHz Tank Radar OPTIWAVE 7300 C
 Manufacturer: Krohne
 Operating Condition: TX on
 Test Site: CETECOM ICT Services Room 006
 Operator: PWM
 Test Specification: EN 55022 V
 Comment: 24.0 V DC
 Start of Test: 14.10.2004

SCAN TABLE: " CISPR 22"

Short Description: Voltage Mains 1.60 Unit dBμV Detector: Mode:



MEASUREMENT RESULT: " CISPR 22 AC_fin AV"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.540000	37.40	10.6	46	8.6	L1	GND
0.577500	40.50	10.5	46	5.5	L1	GND

Settings: N₁,
 L – System,
 Grounded and
 Flooding

4 Photographs

