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Anechoic chamber registration No.: 3463 (IC)

**TCB ID: DE 0001**



Accredited by the  
German Accreditation Council  
**DAR–Registration Number**

**DAT-P-176/94-D1**



Independent ETSI  
compliance test house



**Accredited Bluetooth™ Test Facility (BQTF)**

Test report No. **2-5029-01-02/05**  
Applicant: Marconi Communications GmbH  
Type: AXR-24

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## 1.2 Testing laboratory

CETECOM ICT Services GmbH	CETECOM ICT Services GmbH
Untertürkheimerstraße 6–10	P.O. – Box 65 01 55
66117 Saarbrücken	66140 Saarbrücken
Germany	Germany

Telefon	:	+ 49 (0) 681 598–8432
Telefax	:	+ 49 (0) 681 598–9075

State of accreditation:

The test laboratory is accredited according to      DIN EN ISO/IEC 17025.

DAR-registration number:      TTI-P-G 081/94-D0

Testing location, if different from CETECOM ICT Services GmbH:      not applicable

## 1.3 Details of applicant

Name	:	Marconi Communications GmbH
Street	:	Gerberstrasse 33
Town	:	71522 Backnang
Country	:	Germany
Phone	:	+49 7191 13 0
Fax	:	+49 7191 13 3793

### Contact person

Name	:	Wolfgang Rümmer
Phone	:	+49 7191 13 3648
Fax	:	+49 7191 13 3793
E-Mail	:	wolfgang.ruemmer@marconi.com

## 1.4 Application details

Date of receipt of application	:	2005-07-18
Date of receipt of test item	:	2005-07-25
Date of test	:	2005-07-25 – 2005-08-04
Representations of applicant	:	Mr. Dr. Wolfgang Rümmer Mr. Erwin Bayha Mr. Thomas Holl

## 1.5 Test item (EUT)

Description : Point to point, Digital Microwave Fixed Link  
Type designation : System AXR-24 consist of IDU-AXR (indoor unit)  
ODU-24 LBT-1 LM and ODU-24 UBT-1 LM  
Manufacturer : Marconi Communications GmbH  
Gerberstrasse 33  
71522 Backnang  
Germany

### Technical data

Frequency EUT (low band) : 24.350 000 GHz  
Frequency EUT (high band) : 25.150 000 GHz  
RF duplex spacing : 800.00 MHz  
Modulation : QPSK, 16QAM, 64QAM  
Radio output power : - 10.0 dBm to + 25.0 dBm  
Power supply U<sub>DC</sub> (nominal) : + 48.0 V  
Power supply U<sub>DC</sub> (minimum) : + 24.0 V  
Power supply U<sub>DC</sub> (maximum) : + 60.0 V

### 1.5.1 Operation conditions

Operation : Uninterrupted operation for TX and RX.

## 1.5.2 Equipment under test

### Outdoor unit

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Name:	Product Code:	S.N.
AXR-ODU LBT		05G1006342
AXR-ODU UBT		05G1006337

### Indoor unit

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Name:	Product Code:	S.N.
AXR-IDU		05 1219373

## 1.6 Test standards

### FEDERAL COMMUNICATIONS COMMISSION

47 CFR part 15	2005-04-05	Subpart C – Intentional Radiators
47 CFR Part 101	2003-01-31	Emission limitation
Cispr 22 + A1 +A2	2002	Information technology equipment – Radio disturbance Characteristics – Limits and methods of measurement

## 2 Technical test

### 2.1 Summary of test results

Complete RF tests for Spurious radiated and Spurious conducted TX parameters.

The 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.

Normal conditions :                      Temperature    + 23.0 °C  
   Humidity        60.0 %

### 2.3 Measurement and test set-up

Measurement uncertainties:

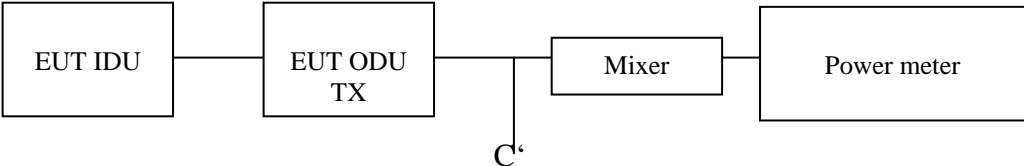
Power	± 0.4 dB
Frequency	± 0.01ppm
Spectrum masks	± 0.4 dB; ± 0.01ppm
Spurious emissions	± 0.4 dB; ± 0.01ppm



Test set-up

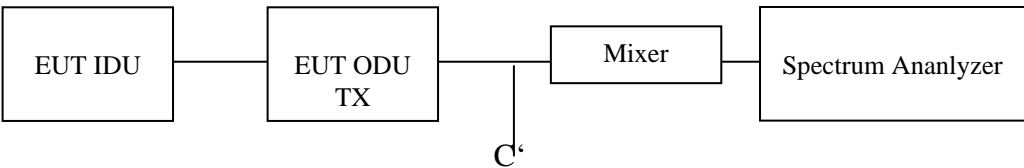
No. 1

Test set-up:



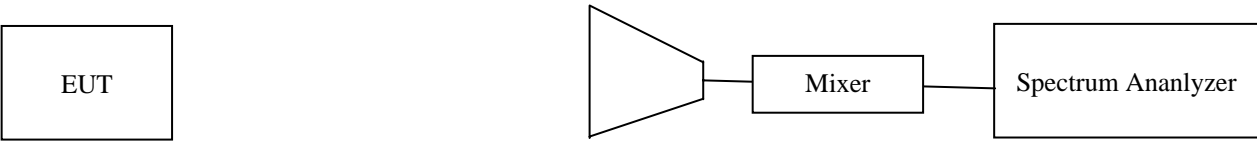
No. 2

Test set-up:



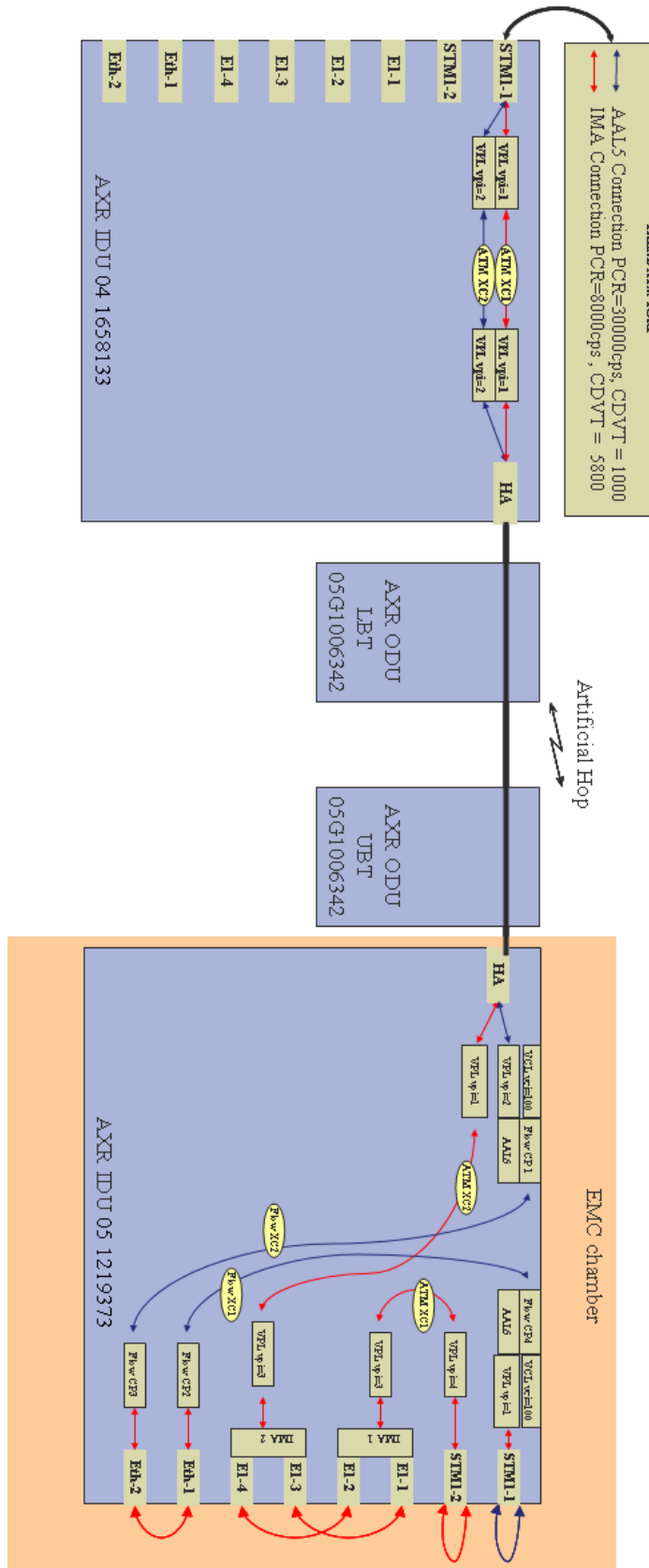
No. 3

Test set-up:



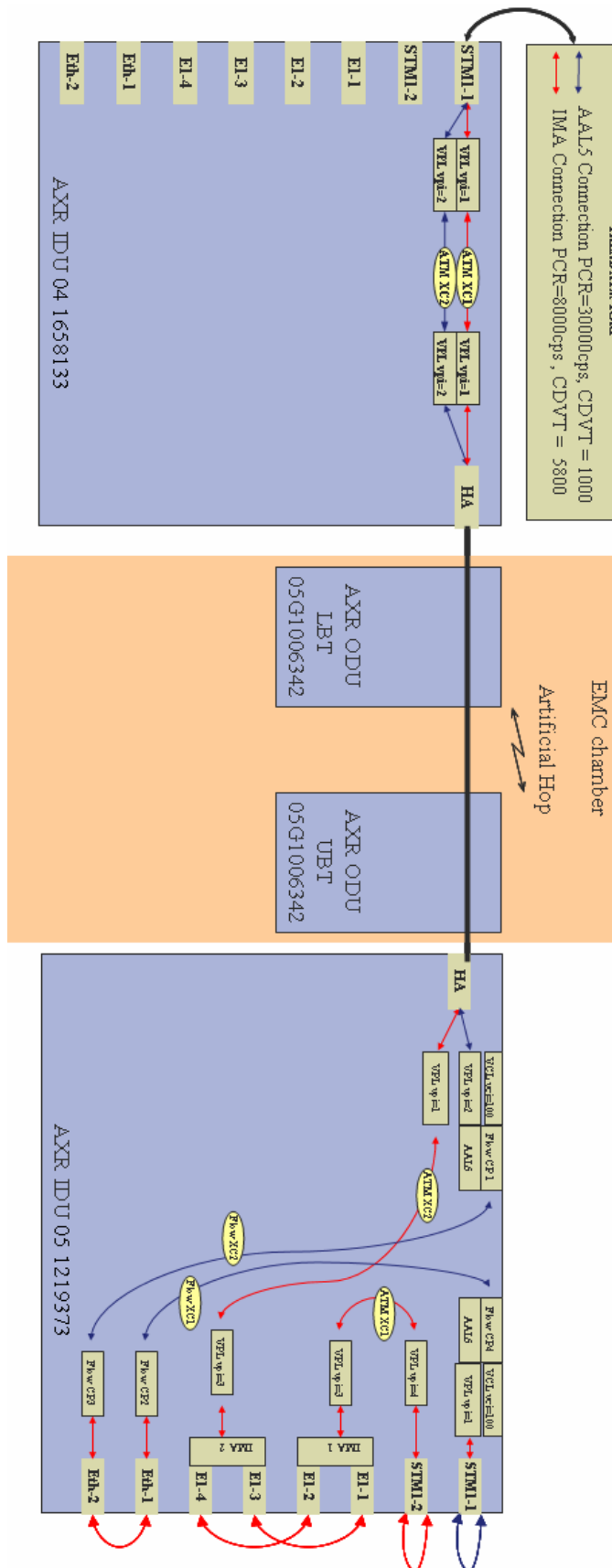
No. 4

Test set-up:



No. 5

Test set-up:



2.4 Test equipment utilized

Test equipment	Manufacturer	Type	Ref. No.
Spectrum Analyser	Hewlett Packard	8565E	C / N 300001665
Power meter	Hewlett Packard	E4419B	300002627
Power sensor	Hewlett Packard	R8481B	300001191
Power sensor	Hewlett Packard	8487D	300002628
Standard gain horn	Narda	639	300000762a
Standard gain horn	Narda	638	300000487
Standard gain horn	Narda	637	300000510
Standard gain horn	Thomson	33-50	300000812
Standard gain horn	Thomson	50-75	300000813
Standard gain horn	Flann	2724	300001988
Mixer	Hewlett Packard	11970Q	300000871o
Mixer	Hewlett Packard	11970V	300000781n
Mixer	Hewlett Packard	11970W	300000781i
Waveguide taper	Thomson	18-40	300000801a
Waveguide taper	Thomson	27-50	300000802a
Waveguide taper	Thomson	33-75	300000803a
Waveguide taper	Thomson	50-90	300000804
Waveguide taper	Thomson	60-110	300000815
Waveguide taper	Flann	20-22	30000985
Waveguide taper	Flann	22-23	30000986
Waveguide koax adaptors	Narda	609	300000762a
Waveguide koax adaptors	Flann	20093	300000487a
Waveguide koax adaptors	Mirad Microwave AG	153.27028	300002092
Power supply	Hewlett Packard	6038A	300001174
RF-cable	Hewlett Packard	5061-5359	300002033
HF-cable's	div. Manufators		
Spectrum analyser	HP	HP 85660B	S / N 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
Power supply	HP	HP 6038A	2848A07027
RF-cable	HP	5061-5359	P36303

ICT-Nr	Model/ Typ	Typ:	Serial No.	Spezifikation
0210	Flicker, Harmonics Analyzer PHE4500/B/D	Spitzenberger & Spies	B5976	EN 60555/IEC 555
0211	HF-Power Amplifier HP 83006	Hewlett Packard	3104 A 00499	0.01-26 MHz
0213	Horn Antenna 3115	EMCO	5289	1-18 GHz
0217	Adjustable transformer RT 5A	Grundig	01005	25-260 Volt
0237	Feeding bridge B	Bosse	no	-
0324	Spectrum-Analyzer 8566 OB No.1	Hewlett Packard	2637 A 03480	100 Hz- 22 GHz
0358	No.2		2747 A 05349	
0325	Quasi-Peak-Adapter 85650 A No.1	Hewlett Packard	2521 A 00806	
2446	No.2		2811 A 01145	
0327	AC/DC Power Supply	Zentro		
0346	Power Sensor 8482 A	Hewlett Packard	2652 A 18811	0.1-4.2 GHz
0347	Power Sensor 8481 A	Hewlett Packard	2702 A 71333	0.01-18 GHz
0353	Synthesized-Signal-Generator 8662 A	Hewlett Packard	2811 A 03269	10 kHz-1.2GHz
0355	HF-Generator 8671 B	Hewlett Packard	2823 A 00656	2-18 GHz
0357	Dual Power Meter 438	Hewlett Packard	2804 U 01015	
0369	Signal-Generator 8657 A	Hewlett Packard	2838 A 00638	10 kHz - 1040 MHz
0372	Multimeter	Hewlett Packard	2619 A 44829	
0385	Power-Meter 437 B	Hewlett Packard	2861 A 00774	
0386	Power Sensor 8482 B	Hewlett Packard	2703 A 03024	0.01-4.2 GHz
0524	Isotropic-Field-Probe 7122	EMCO	9305-1160	10 kHz - 1 GHz
0527	Ferrit Clamp MDS 21	Rohde & Schwarz	301404-038	20 - 1000 MHz
0528	Logger Antenna AT 1080	EMCO		80 - 1000 MHz
0529	RF-Amplifier 100 W 1000 M1	ar	13161	80 - 1000 MHz
0530	Logger Antenna HL 223	Rohde & Schwarz	832727/007	0.2-1.3 GHz
0532	Bicon Antenna HK 116	Rohde & Schwarz	833162/004	20-300 MHz
0534	CDN M2/M3 L801-	Lüth	9350105	
0538	Injection Probe F-120-4	FCC	23	10-100 MHz
0549	RF-Amplifier LD 220 - 200	ar	910 130 06	0.01 -220 MHz
0552	Ferrit Clamp MDS 21	Rohde & Schwarz	301404-039	20 - 1000 MHz
0552	Audio-Analyzer UPA	Rohde & Schwarz	883.864/014	10 Hz - 100 kHz
0561	PC Siemens Scenic 4T PCI	Siemens	S26361-K345V	
0567	DC-NNBM 8125	Rohde & Schwarz	8125401	
0568	EMI Receiver 8542 E	Hewlett Packard	3617A00170	9 kHz-2,9 GHz
0573	Bilog Antenne CBL 6112	Rohde & Schwarz	2110	0.03-2 GHz
0574	CDN 801-S9	FCC	56	
0575	Bicon Antenne 3109	EMCO	8906-2309	20-300 MHz
0577	Oscilloscope HM 303-4	HAMEG	Z 30948	
0578	Logger Antenne 3146	EMCO	8905-2435	0.2-1 GHz
0580	Power Supply 6032 A	Hewlett Packard	2920 A 04466	0-60 Volt
0582	V-ISN ESH 3-Z5	Rohde & Schwarz	893045/002	230V/AC
0584	V-ISN ESH 3-Z5	Rohde & Schwarz	893045/003	230V/AC
0585	V-ISN ESH 3-Z5	Rohde & Schwarz	893045/004	230V/AC
0589	Capacity Coupling Clamp	MWB		
0591	ESD 30 incl. 2x P 18	EM-Test	6089-18+26	-
0600	Camera - System	Scout		
0611	4-Wire T-ISN EZ 10	Rohde & Schwarz	828757/009	9 KHz -150MHz
0612	Power Sensor 8481 D	Hewlett Packard	2928 A 03607	0.01-18 GHz
0625	Turn-table , - Antenna-Tower Controler	EMCO	1061-3M 1218	

ICT-Nr	Model/ Typ	Typ:	Serial No.	Spezifikation
0626	CDN- EM-Injection Clamp 203i			
0627	CDN 801-M3-16	FCC	237	
0629	CDN 801-T2	FCC	78	
0631	CDN 801-AF 4	FCC		
0632	RF-Amplifier 25S1G4	ar	20452	0.8 - 1 Ghz
0906	Power Sensor URV 5-Z-4	R&S	840310/71	100KHz-2GHz
1505	Synthesizer 8904 A	Hewlett Packard	2822 A 01153	DC - 600 kHz
2439	Spectrum-Analyzer-Display 8566 2A	Hewlett Packard	2542 A 13175 No.1	
2444			2816 A 16665 No.2	
2441	RF-Preselector 85685 A	Hewlett Packard	2620 A 00354 No.1	20 Hz - 2 GHz
2448			2837 A 00778 No.2	
2453	4-Wire T-ISN EZ 10	Rohde & Schwarz	828757/009	9 KHz -150MHz
2454	4-Wire T-ISN EZ 10	Rohde & Schwarz	828757/009	9 KHz -150MHz
2563	PC Extensa 711TE	Acer		
2599	Hybrid-Generator 500M6	UCS	EM-Test 0399-07	-
2623	PC Satellite 4090XCDT	Toshiba	10442626G PCN037	
2643	PC Lifetec	Medion		
2657	Surges Coupling-decoupling CNV 504	EM-Test		
2658	Coupling-decoupling RFTVS	EM-Test		
2660	Coupling-decoupling CN	EM-Test		
2661	Coupling-decoupling MV	EM-Test		
2662	Coupling-decoupling TN	EM-Test		
2844	Power Meter URV 5	R&S	837723/025	
3052	DSL-Simulator Pres-link 2.1	Siemens		
3312	ESCI 1166.5950.03	Rohde und Schwarz	100083	9kHz – 3 GHz
F 001	2-Wire T1-ISN T1	BOSSE	EMV-Labor Nr. 1-10	10 - 30 MHz
F 011	2 -Wire T2-ISN T2	BOSSE	EMV-Labor Nr. 1-10	30 -150 MHz
F030	Power Sensor Z-4 URV5-	R&S	839080/005	9KHz-3GHz 10Volt
F031	Power Sensor Z-4 URV5-	R&S	838314/030	100KHz-3GHz 100Volt
F032	Power Sensor Z-4 URV5-	R&S	830755/057	9KHz-3GHz 10Volt
F033	Power Meter NRV	R&S	860327/024	
F034	PABX T-Concept XI 321	Telekom		
F035	T-ISN	UNI Dortmund		
F036	PC EMV+ analoge Modem	F+W, Creatix		
	Ultra Notch-Filter Rejected band Ch. 62	WRCD	9	901,9-903,1MHz
	Notch Filter TTR 750-3EE1	Telonic	90177-1	
2862	CMU 200	R&S	832221/0055	850,900,1800,1900
3078	CMD 55	R&S	839352/005	900,1800

The calibration datas were verified by CETECOM ICT Services.

2.5 Test results

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

2.6 Test results

Transmitter characteristics ..... 17

TX Spurious and RX Spurious emissions conducted (High band) QPSK, 16QAM, 64QAM ..... 17

TX Spurious and RX Spurious emissions conducted (Low band) QPSK, 16QAM, 64QAM..... 18

TX Spurious emissions radiated (Low and High band) QPSK..... 19

RX Spurious emissions radiated (Low and High band)..... 19

TX Spurious emissions radiated (Low and High band) 16QAM..... 20

RX Spurious emissions radiated (Low and High band)..... 20

TX Spurious emissions radiated (Low and High band) 64QAM..... 21

RX Spurious emissions radiated (Low and High band)..... 21

AC Conducted..... 22

Radiated Emission Measurement up to 1 GHz AXR IDU..... 23

Radiated Emission Measurement up to 1 GHz AXR ODU ..... 25



## Transmitter characteristics

TX Spurious and RX Spurious emissions conducted (High band) QPSK, 16QAM, 64QAM

Measurement conditions :

Frequency	$f_{nom}$	= 25.150 000 GHz
Modulation	M	= QPSK, 16QAM, 64QAM
Rx / Tx duplex spacing	DS	= 800.00 MHz
Temperature	t	= + 23.0 ° C
Nominal power supply	$U_{DC}$	= + 48.0 V
Measurement at	C'	

Test set-up : see page 9 / No. 2

Test measurement : QPSK

Frequency Range [ GHz ]	Limit [ dBm ]	Res. BW [ MHz ]	Spurious Frequency [ GHz ]	Emissions P [ dBm ]	see plot no.
40.000 – 50.000	- 13.0	1.0	n.f.	< limit	1
50.000 – 75.000	- 13.0	1.0	n.f.	< limit	2
75.000 – 100.000	- 13.0	1.0	n.f.	< limit	3

Test measurement : 16QAM

Frequency Range [ GHz ]	Limit [ dBm ]	Res. BW [ MHz ]	Spurious Frequency [ GHz ]	Emissions P [ dBm ]	see plot no.
40.000 – 50.000	- 13.0	1.0	n.f.	< limit	4
50.000 – 75.000	- 13.0	1.0	n.f.	< limit	5
75.000 – 100.000	- 13.0	1.0	n.f.	< limit	6

Test measurement : 64QAM

Frequency Range [ GHz ]	Limit [ dBm ]	Res. BW [ MHz ]	Spurious Frequency [ GHz ]	Emissions P [ dBm ]	see plot no.
40.000 – 50.000	- 13.0	1.0	n.f.	< limit	7
50.000 – 75.000	- 13.0	1.0	n.f.	< limit	8
75.000 – 100.000	- 13.0	1.0	n.f.	< limit	9

n.f. = nothing found

Test result:

Passed:

Failed:

TX Spurious and RX Spurious emissions conducted (Low band) QPSK, 16QAM, 64QAM

Measurement conditions :

Frequency  $f_{nom}$  = 24.350 000 GHz  
 Modulation M = QPSK, 16QAM, 64QAM  
 Rx / Tx duplex spacing DS = 800.00 MHz  
 Temperature t = + 23.0 ° C  
 Nominal power supply  $U_{DC}$  = + 48.0 V  
 Measurement at C'

Test set-up : see page 9 / No. 2

Test measurement : QPSK

Frequency Range [ GHz ]	Limit [ dBm ]	Res. BW [ MHz ]	Spurious Frequency [ GHz ]	Emissions P [ dBm ]	see plot no.
40.000 – 50.000	- 13.0	1.0	n.f.	< limit	10
50.000 – 75.000	- 13.0	1.0	n.f.	< limit	11
75.000 – 100.000	- 13.0	1.0	n.f.	< limit	12

Test measurement : 16QAM

Frequency Range [ GHz ]	Limit [ dBm ]	Res. BW [ MHz ]	Spurious Frequency [ GHz ]	Emissions P [ dBm ]	see plot no.
40.000 – 50.000	- 13.0	1.0	n.f.	< limit	13
50.000 – 75.000	- 13.0	1.0	n.f.	< limit	14
75.000 – 100.000	- 13.0	1.0	n.f.	< limit	15

Test measurement : 64QAM

Frequency Range [ GHz ]	Limit [ dBm ]	Res. BW [ MHz ]	Spurious Frequency [ GHz ]	Emissions P [ dBm ]	see plot no.
40.000 – 50.000	- 13.0	1.0	n.f.	< limit	16
50.000 – 75.000	- 13.0	1.0	n.f.	< limit	17
75.000 – 100.000	- 13.0	1.0	n.f.	< limit	18

n.f. = nothing found

Test result:                      Passed:                       Failed:

TX Spurious emissions radiated (Low and High band) QPSK  
 RX Spurious emissions radiated (Low and High band)

Measurement conditions :

Frequency	$f_{nom}$	= 24.350 000 GHz and 25.150 000 GH
Modulation	M	= QPSK
Rx / Tx duplex spacing	DS	= 800.00 MHz
Temperature	t	= + 23.0 ° C
Nominal power supply	$U_{DC}$	= + 48.0 V
Measurement at	C'	

Test set-up : see page 9 / No. 3

Test measurement : QPSK

Frequency Range [ GHz ]	Limit [ dBm ]	Res. BW [ MHz ]	Spurious Frequency [ GHz ]	Emissions P [ dBm ]	see plot no.
1.000 - 4000	- 13.0	1.0	n.f.	< limit	19
0.030 – 4.000	- 13.0	0.1 / 1.0	n.f.	< limit	20
4.000 – 12.000	- 13.0	1.0	n.f.	< limit	21
12.000 – 18.000	- 13.0	1.0	n.f.	< limit	22
18.000 – 26.000	- 13.0	1.0	n.f.	< limit	23
26.000 – 40.000	- 13.0	1.0	n.f.	< limit	24
40.000 – 50.000	- 13.0	1.0	n.f.	< limit	25
50.000 – 75.000	- 13.0	1.0	n.f.	< limit	26
75.000 – 100.000	- 13.0	1.0	n.f.	< limit	27

n.f. = nothing found

Test result:

Passed:

Failed:

TX Spurious emissions radiated (Low and High band) 16QAM  
 RX Spurious emissions radiated (Low and High band)

Measurement conditions :

Frequency	$f_{nom}$	= 24.350 000 GHz and 25.150 000 GH
Modulation	M	= 16QAM
Rx / Tx duplex spacing	DS	= 800.00 MHz
Temperature	t	= + 23.0 ° C
Nominal power supply	$U_{DC}$	= + 48.0 V
Measurement at	C'	

Test set-up : see page 9 / No. 3

Test measurement : 16QAM

Frequency Range [ GHz ]	Limit [ dBm ]	Res. BW [ MHz ]	Spurious Frequency [ GHz ]	Emissions P [ dBm ]	see plot no.
1.000 - 4000	- 13.0	1.0	n.f.	< limit	28
0.030 – 4.000	- 13.0	0.1 / 1.0	n.f.	< limit	29
4.000 – 12.000	- 13.0	1.0	n.f.	< limit	30
12.000 – 18.000	- 13.0	1.0	n.f.	< limit	31
18.000 – 26.000	- 13.0	1.0	n.f.	< limit	32
26.000 – 40.000	- 13.0	1.0	n.f.	< limit	33
40.000 – 50.000	- 13.0	1.0	n.f.	< limit	34
50.000 – 75.000	- 13.0	1.0	n.f.	< limit	35
75.000 – 100.000	- 13.0	1.0	n.f.	< limit	36

n.f. = nothing found

Test result:

Passed:

Failed:

TX Spurious emissions radiated (Low and High band) 64QAM  
 RX Spurious emissions radiated (Low and High band)

Measurement conditions :

Frequency	$f_{nom}$	= 24.350 000 GHz and 25.150 000 GH
Modulation	M	= 64QAM
Rx / Tx duplex spacing	DS	= 800.00 MHz
Temperature	t	= + 23.0 ° C
Nominal power supply	$U_{DC}$	= + 48.0 V
Measurement at	C'	

Test set-up : see page 9 / No. 3

Test measurement : 64QAM

Frequency Range [ GHz ]	Limit [ dBm ]	Res. BW [ MHz ]	Spurious Frequency [ GHz ]	Emissions P [ dBm ]	see plot no.
1.000 - 4000	- 13.0	1.0	n.f.	< limit	37
0.030 – 4.000	- 13.0	0.1 / 1.0	n.f.	< limit	38
4.000 – 12.000	- 13.0	1.0	n.f.	< limit	39
12.000 – 18.000	- 13.0	1.0	n.f.	< limit	40
18.000 – 26.000	- 13.0	1.0	n.f.	< limit	41
26.000 – 40.000	- 13.0	1.0	n.f.	< limit	42
40.000 – 50.000	- 13.0	1.0	n.f.	< limit	43
50.000 – 75.000	- 13.0	1.0	n.f.	< limit	44
75.000 – 100.000	- 13.0	1.0	n.f.	< limit	45

n.f. = nothing found

Test result:

Passed:

Failed:



Radiated Emission Measurement up to 1 GHz AXR IDU

Results of the electromagnetic radiated emissions (distance 10 m)

Instrumentation for test (see equipment list)

<b>F</b>	<b>3312</b>	<b>0573</b>								
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Radiated limits

Frequency- range	CISPR 22 Class B	CISPR 22 Class A
30 MHz - 230 MHz	30 dB(µV/m)	40 dB(µV/m)
230 MHz -1000 MHz	37 dB(µV/m)	47 dB(µV/m)

Radiated limits

Frequency- range	FCC part 15 Class B		FCC part 15 Class A	
30 MHz – 88 MHz	40.0 dB(µV/m)	3m	39.0 dB(µV/m)	10m
88 MHz – 216 MHz	43.5 dB(µV/m)	3m	44.0 dB(µV/m)	10m
216 MHz – 960 MHz	46.0 dB(µV/m)	3m	46.0 dB(µV/m)	10m
960 MHz – 1000 MHz	54.0 dB(µV/m)	3m	50.0 dB(µV/m)	10m
1 GHz – 2 GHz	54.0 dB(µV/m)	3m	50.0 dB(µV/m)	10m

EUT set-up	No. 4
Operation mode	Maximum transmit power of the modem was applied during the measurement (max. data rate).

Results

Frequency range	Class B		Class A		Effect
	complies	failed	complies	failed	
30 MHz - 1000 MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	no

Test result:

- normal performance within the specification limits

List of the results of radiated emission AXR IDU

**Test Information**

EUT Name: AXR IDU  
 Serial Number: 051219373  
 Test Description: FCC 10 m  
 Operating Conditions: data transfer 64QAM 116MBit/s  
 Operator Name: Kraus  
 Comment: Setup IDU

**Scan Setup: Electric Field Strength fin [EMI radiated]**

Hardware Setup: Electric Field Strength  
 Level Unit: dBµV/m

**Subrange**                      **Detectors**                      **IF Bandwidth**                      **Meas. Time**                      **Receiver**  
 30MHz - 1GHz                      QuasiPeak                      120kHz                      1s                      ESCI 3

**Final Measurement Detector 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity
250.007500	25.9	1000.000	120.000	98.0	V
666.683750	32.4	1000.000	120.000	202.0	V
700.027500	27.1	1000.000	120.000	122.0	H
733.311250	26.3	1000.000	120.000	96.0	V
875.292500	22.0	1000.000	120.000	141.0	V
933.313750	29.4	1000.000	120.000	324.0	H

Frequency (MHz)	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
250.007500	47.0	14.5	10.1	36.0	
666.683750	73.0	22.6	3.6	36.0	
700.027500	68.0	22.5	8.9	36.0	
733.311250	74.0	23.3	9.7	36.0	
875.292500	97.0	25.0	14.0	36.0	
933.313750	78.0	24.9	6.6	36.0	



Radiated Emission Measurement up to 1 GHz AXR ODU

Results of the electromagnetic radiated emissions (distance 3 m)

Instrumentation for test (see equipment list)

<b>F</b>	<b>3312</b>	<b>0573</b>								
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**Radiated limits**

Frequency- range	CISPR 22 Class B	CISPR 22 Class A
30 MHz - 230 MHz	30 dB(µV/m)	40 dB(µV/m)
230 MHz -1000 MHz	37 dB(µV/m)	47 dB(µV/m)

**Radiated limits**

Frequency- range	FCC part 15 Class B		FCC part 15 Class A	
30 MHz – 88 MHz	40.0 dB(µV/m)	3m	39.0 dB(µV/m)	10m
88 MHz – 216 MHz	43.5 dB(µV/m)	3m	44.0 dB(µV/m)	10m
216 MHz – 960 MHz	46.0 dB(µV/m)	3m	46.0 dB(µV/m)	10m
960 MHz – 1000 MHz	54.0 dB(µV/m)	3m	50.0 dB(µV/m)	10m
1 GHz – 2 GHz	54.0 dB(µV/m)	3m	50.0 dB(µV/m)	10m

EUT set-up	No. 5
Operation mode	Maximum transmit power of the modem was applied during the measurement (max. data rate).

**Results**

Frequency range	Class B		Class A		Effect
	complies	failed	complies	failed	
30 MHz - 1000 MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	no

Test result:

- normal performance within the specification limits

List of the results of radiated emission

**Test Information**

EUT Name: 2 x AXR ODU  
 Serial Number: 05G1006342 / 05G1006337  
 Test Description: FCC 3m  
 Operating Conditions: data transfer 64QAM 116MBit/s  
 Operator Name: Kraus  
 Comment: ---

**Scan Setup: Electric Field Strength fin [EMI radiated]**

Hardware Setup: Electric Field Strength  
 Level Unit: dBµV/m  
**Subrange**                      **Detectors**                      **IF Bandwidth**                      **Meas. Time**                      **Receiver**  
 30MHz - 1GHz                      QuasiPeak                      120kHz                      1s                      ESCI 3

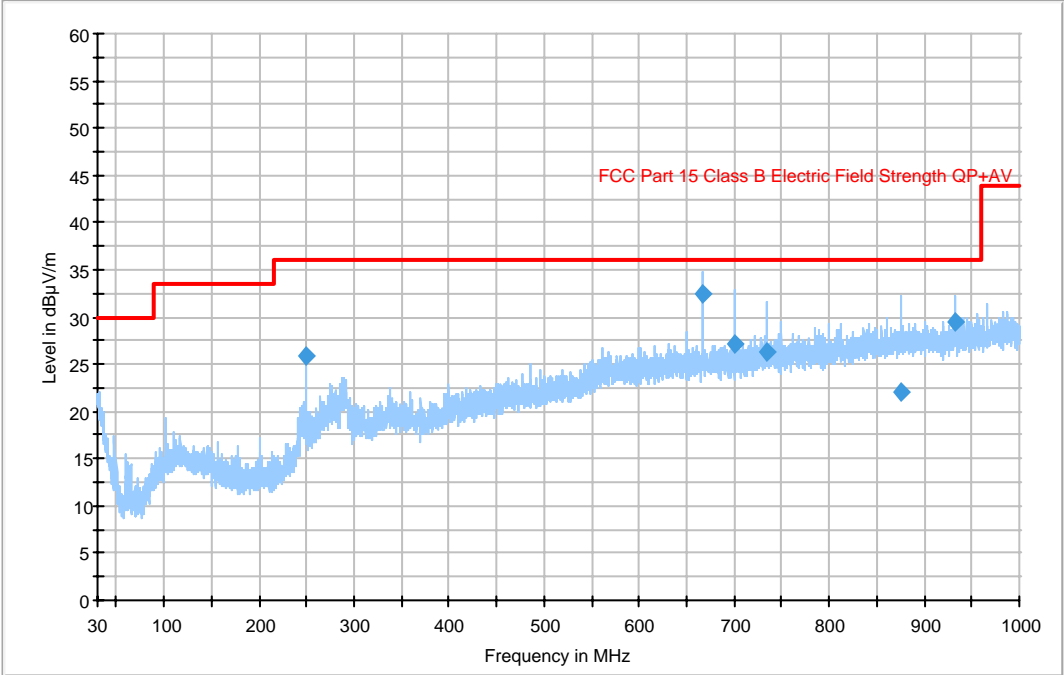
**Final Measurement Detector 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity
47.880000	5.3	1000.000	120.000	202.0	H
52.732500	24.2	1000.000	120.000	391.0	H
103.721250	24.8	1000.000	120.000	188.0	H

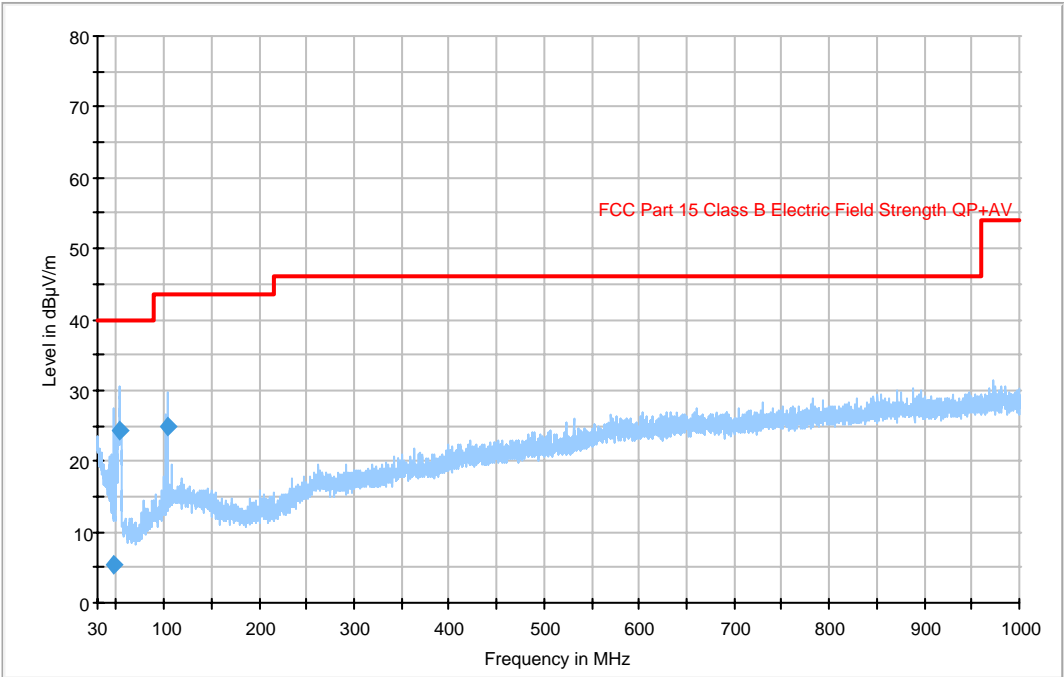
Frequency (MHz)	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
47.880000	111.0	9.9	34.7	40.0	
52.732500	124.0	8.3	15.8	40.0	
103.721250	138.0	12.6	18.7	43.5	

3 Plots

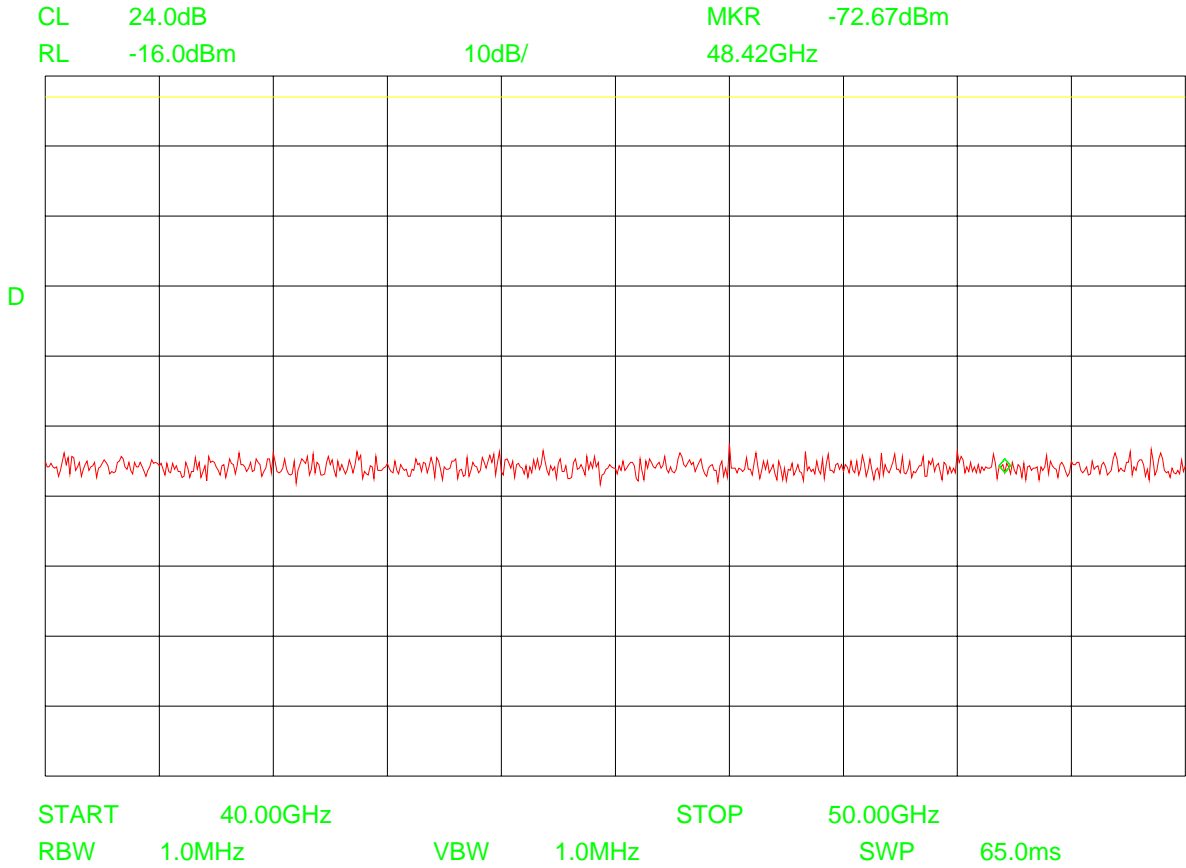
Plot 1



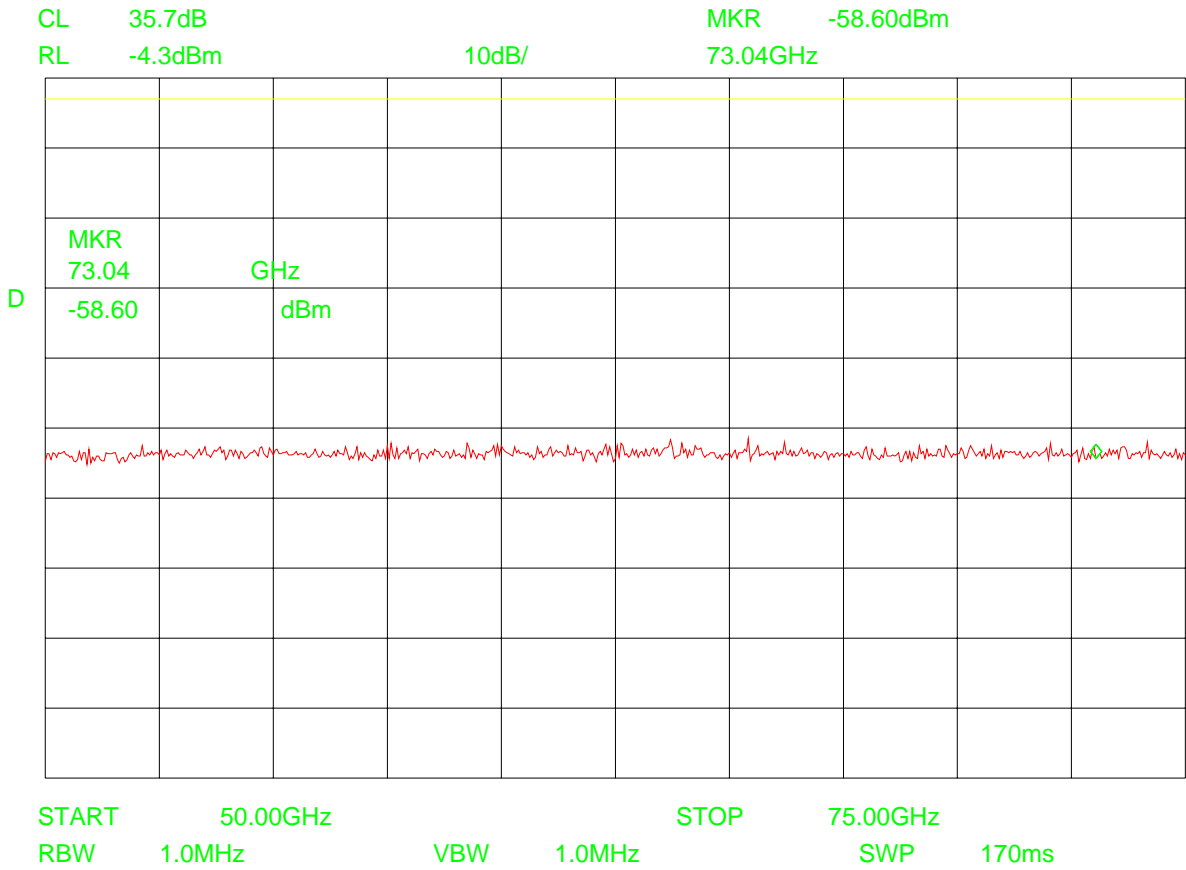
Plot 2



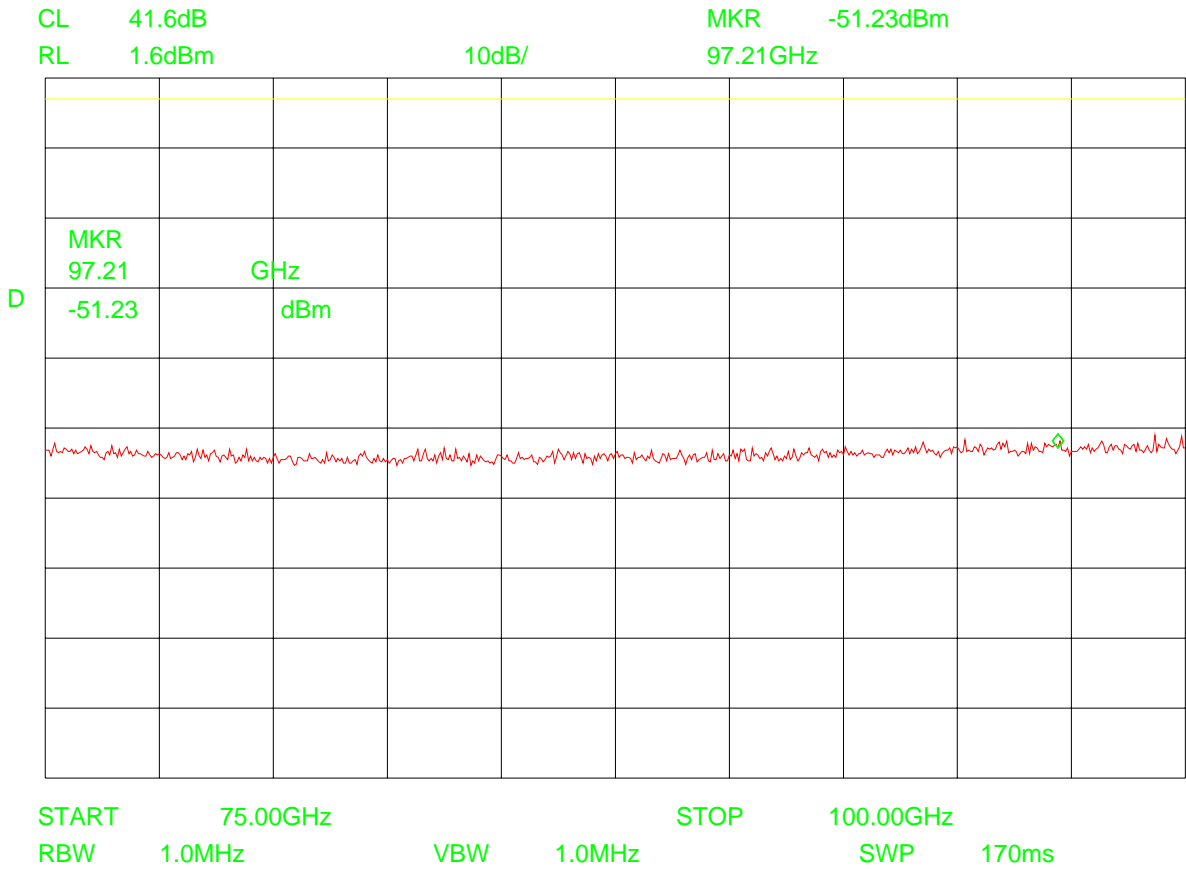
Plot 3



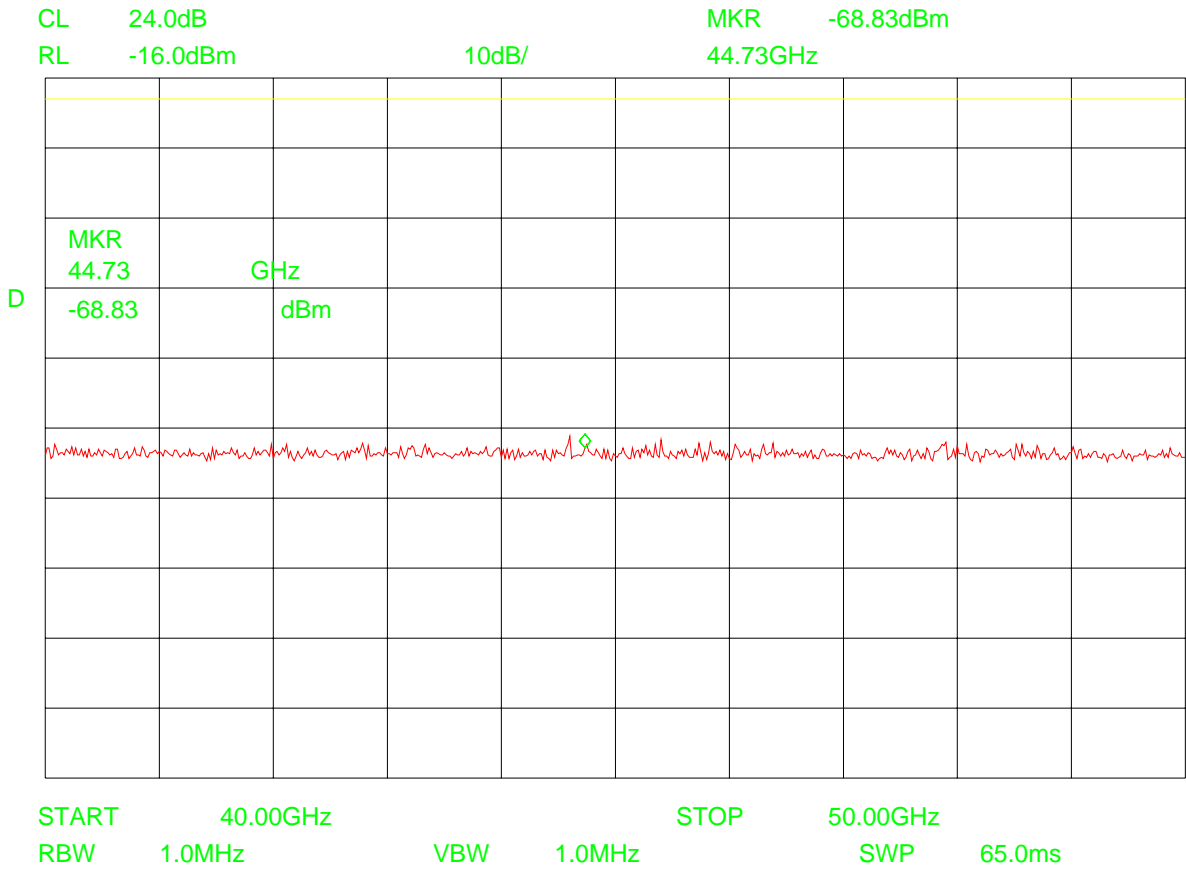
Plot 4



Plot 5



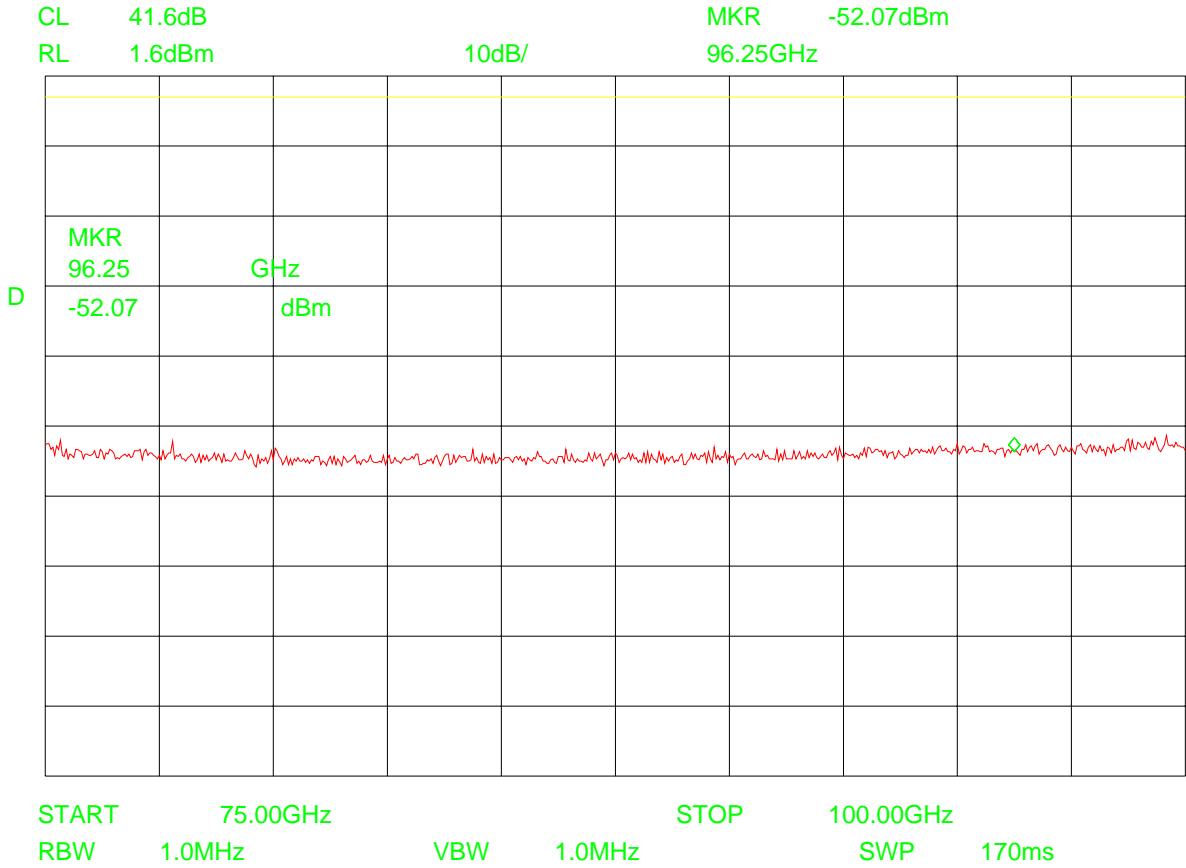
Plot 6



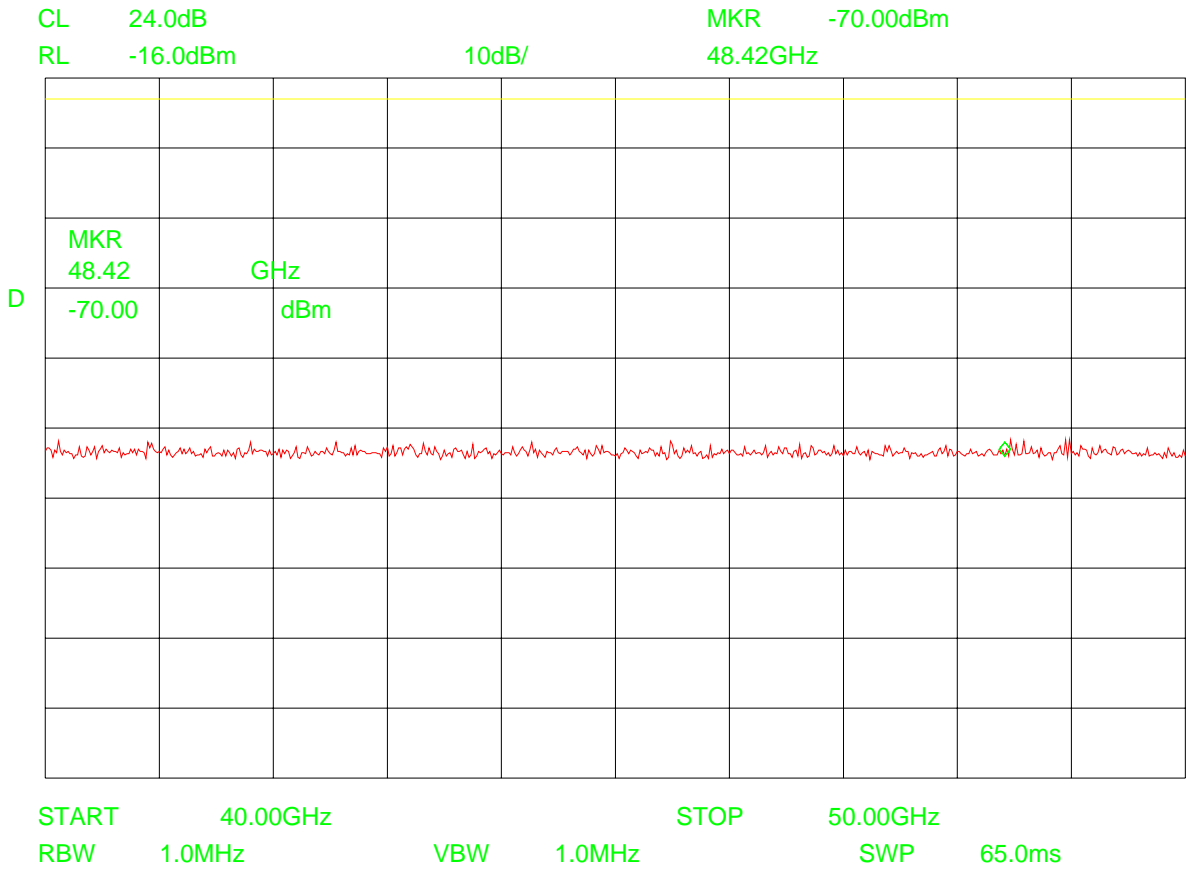




Plot 8

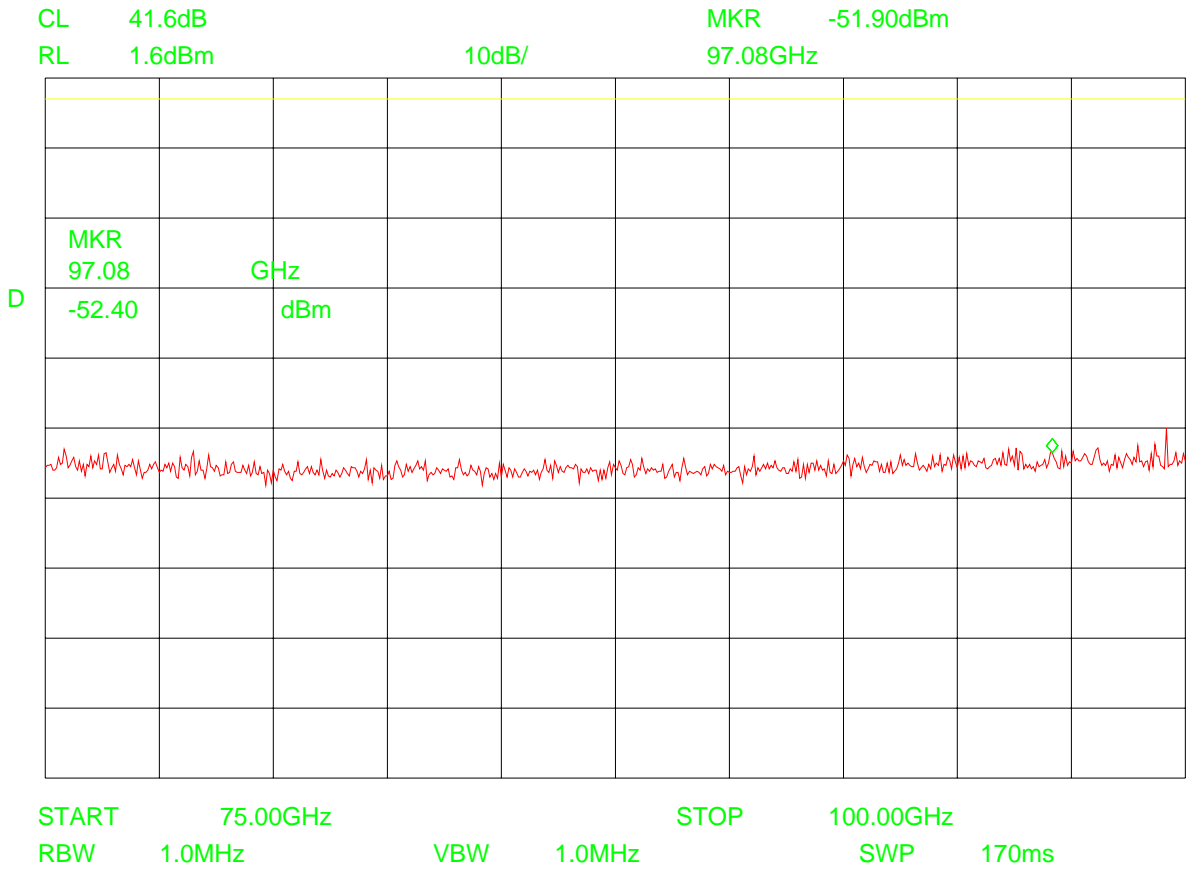


Plot 9

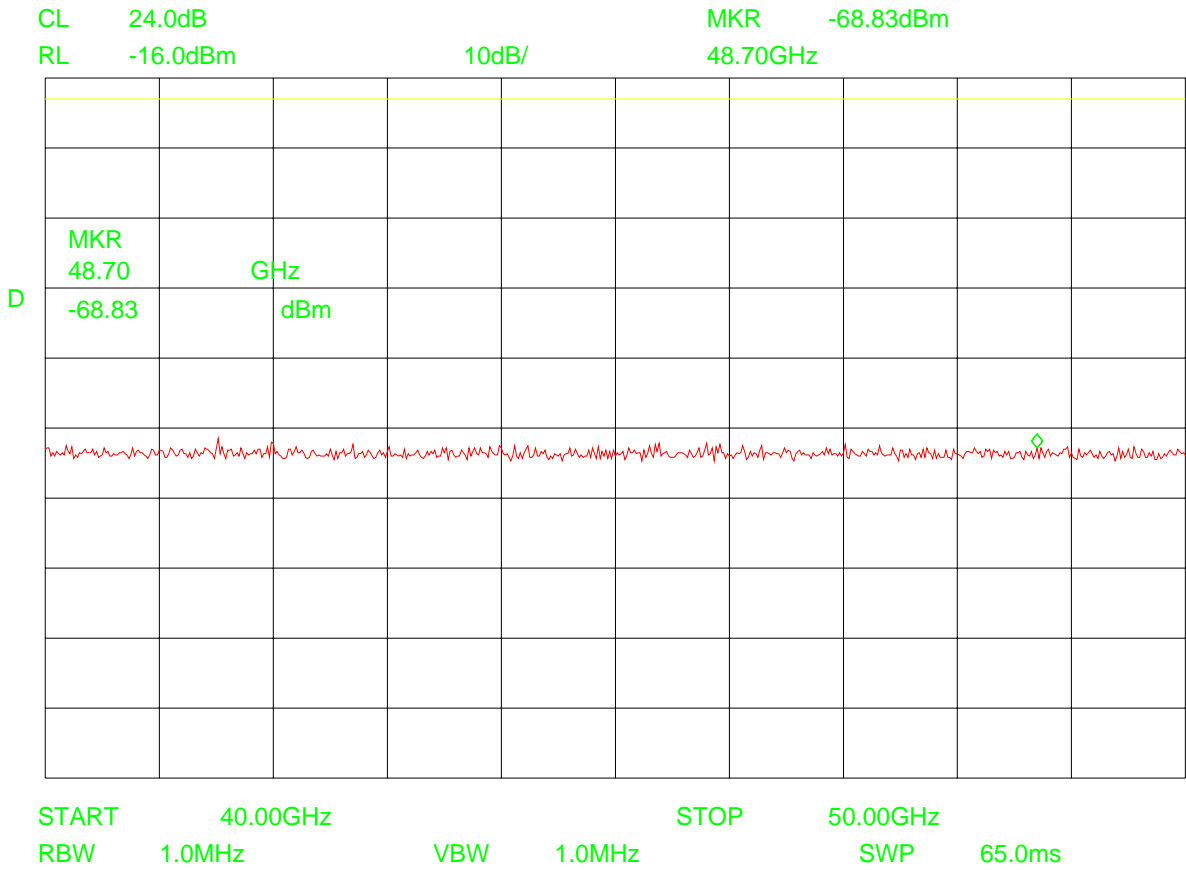




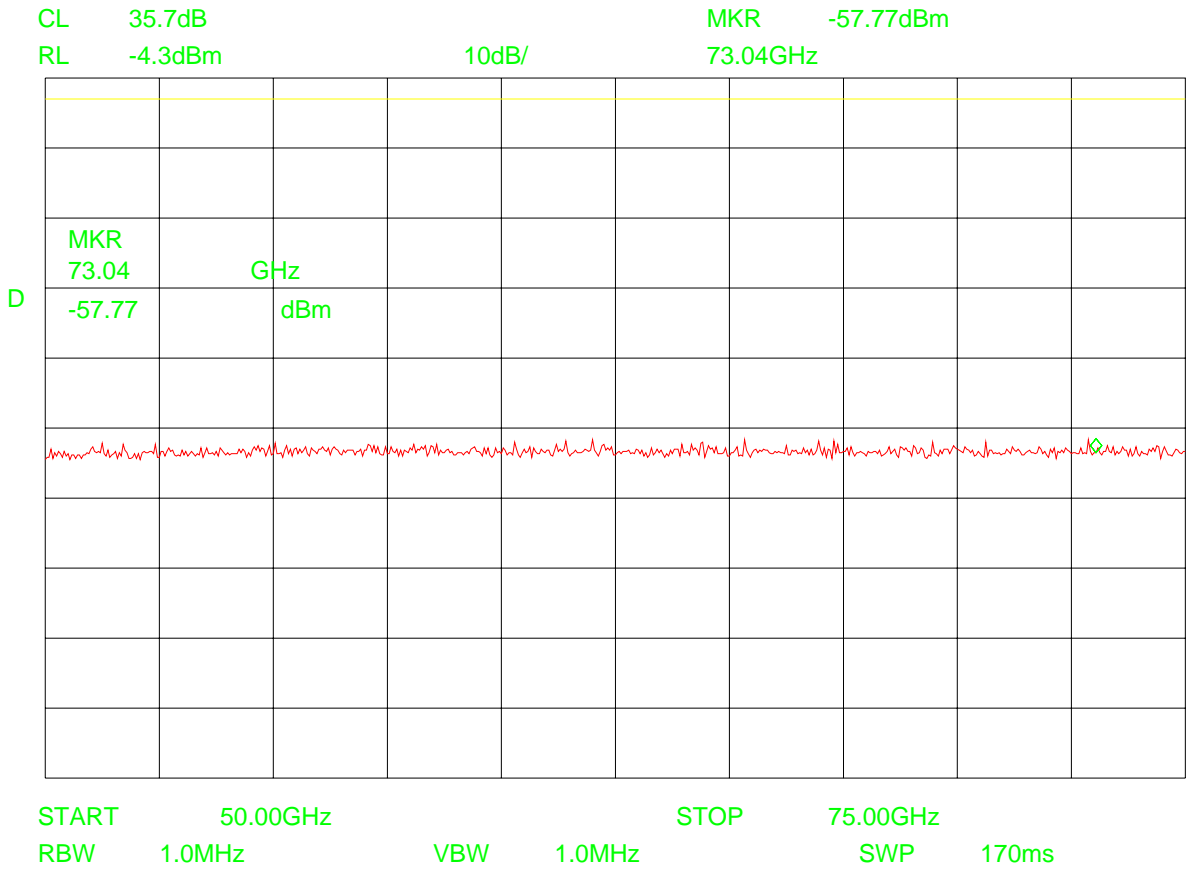
Plot 11



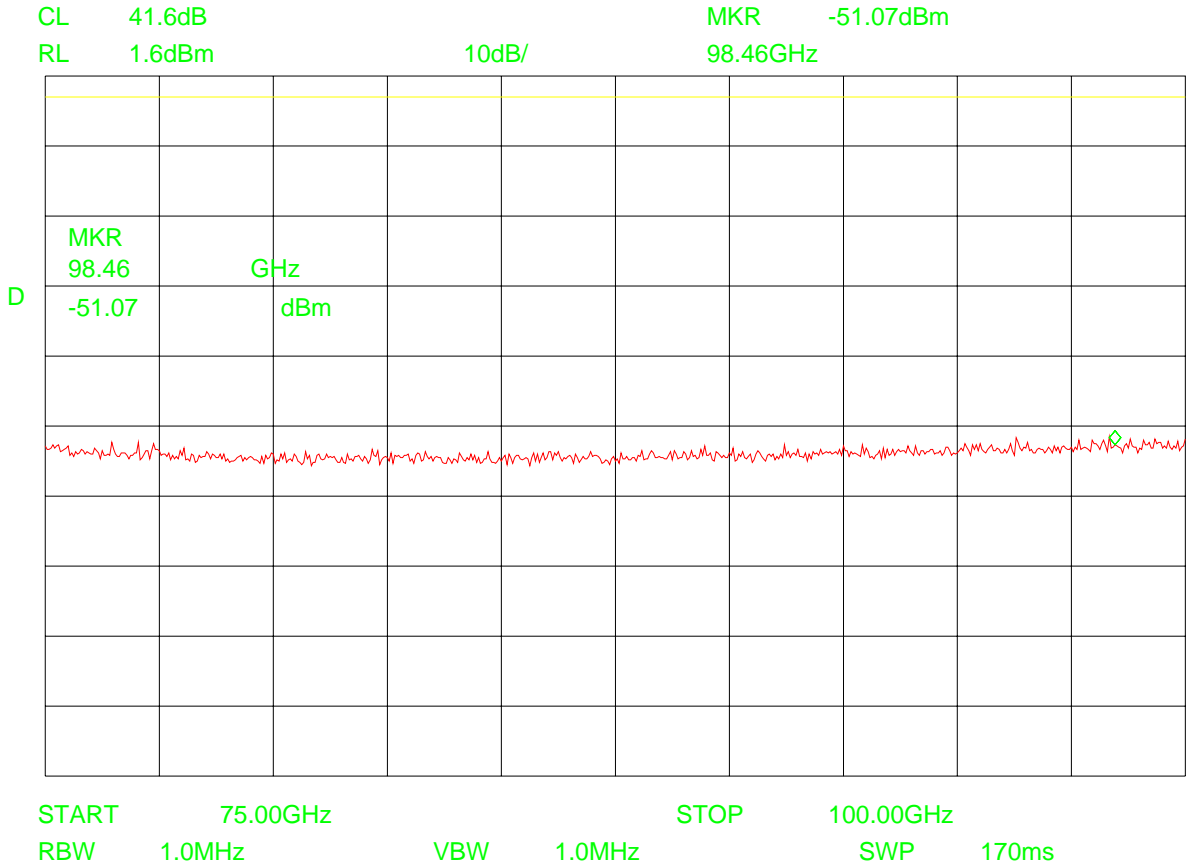
Plot 12



Plot 13



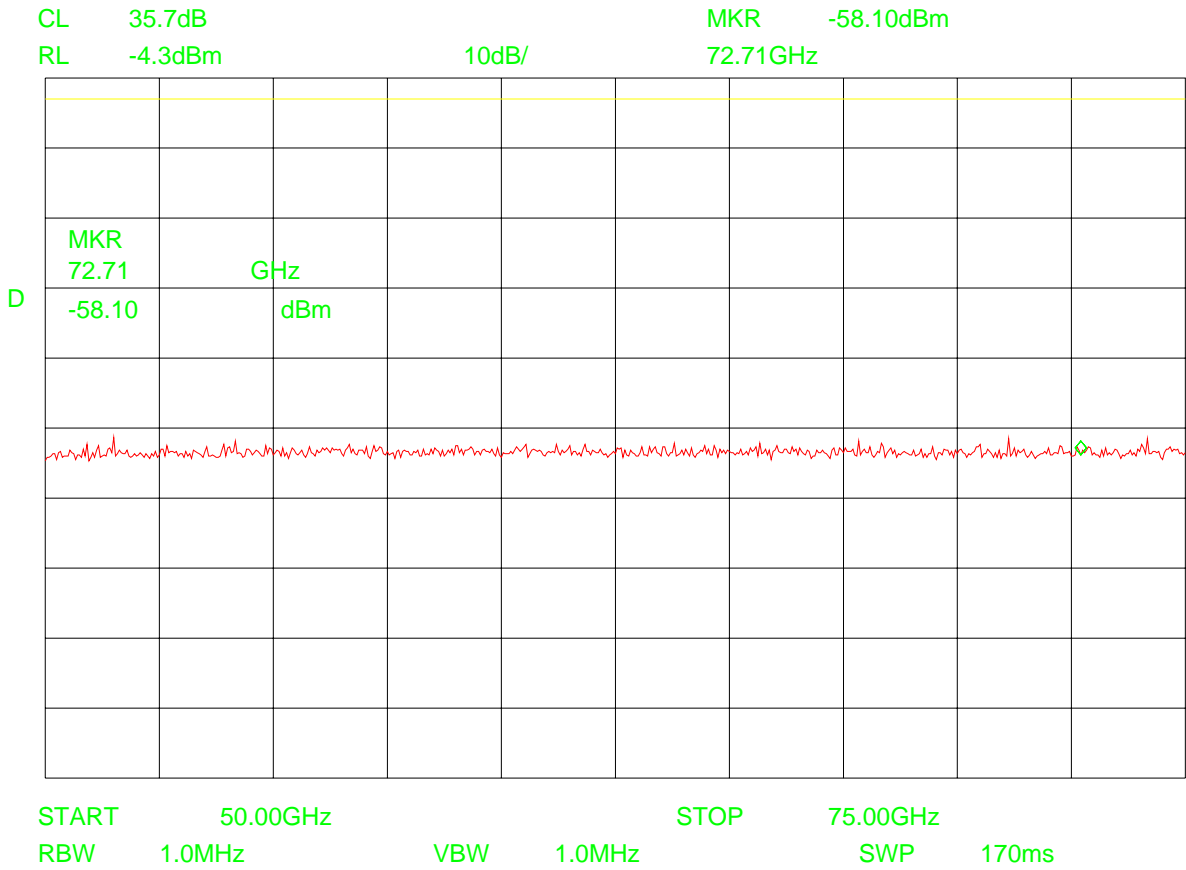
Plot 14



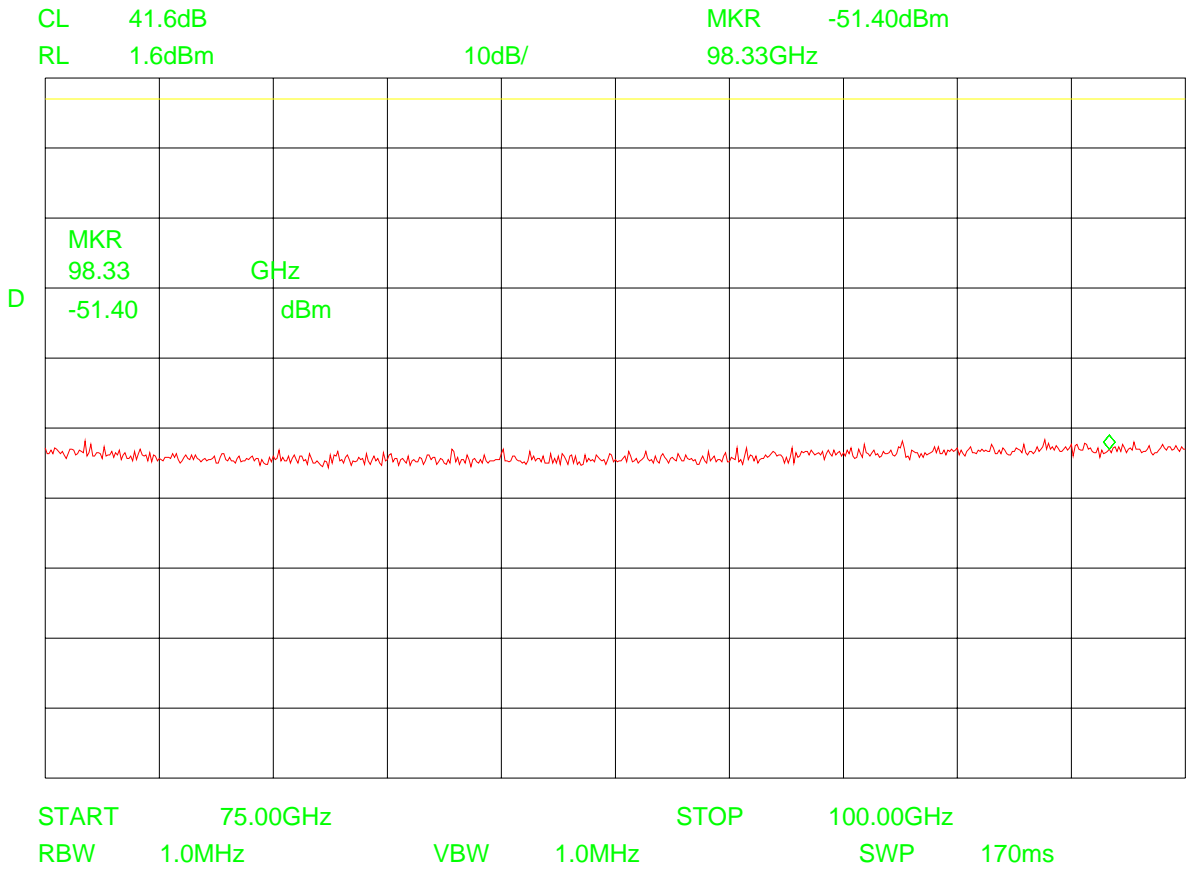




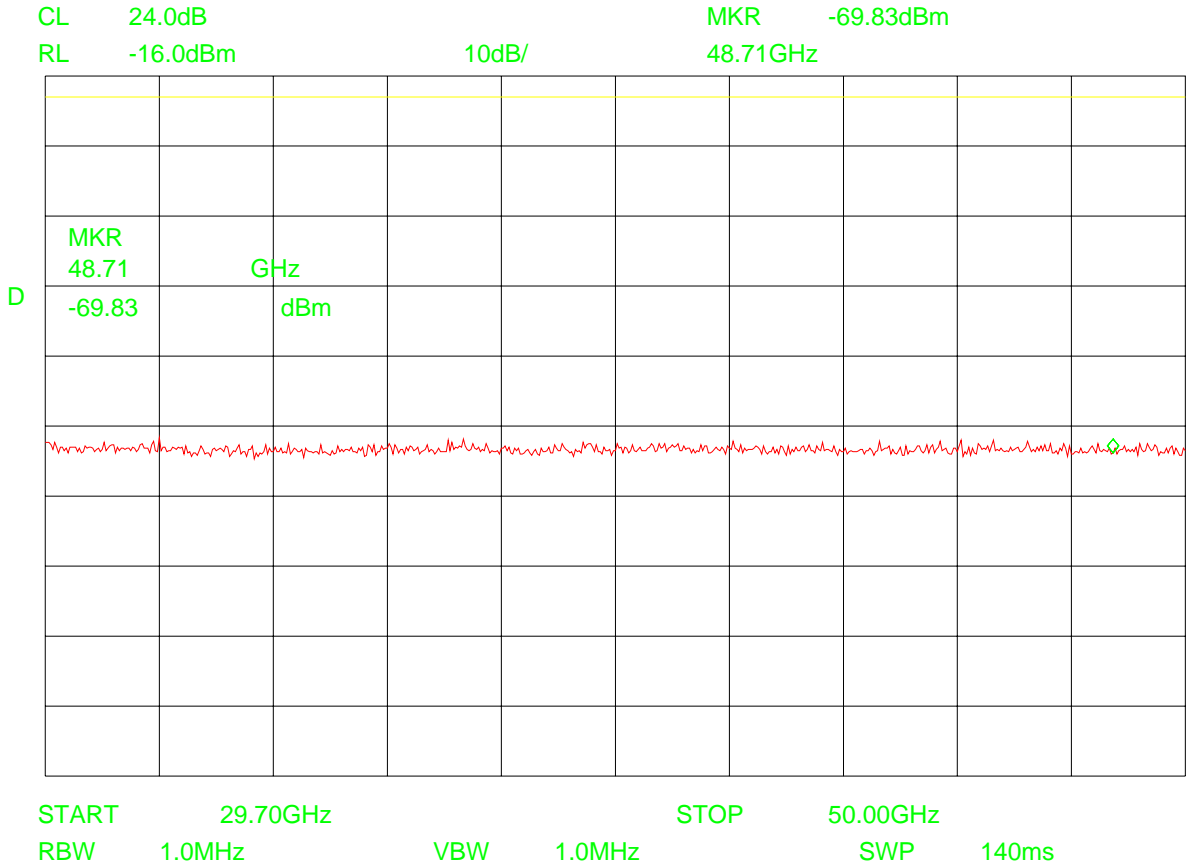
Plot 16



Plot 17

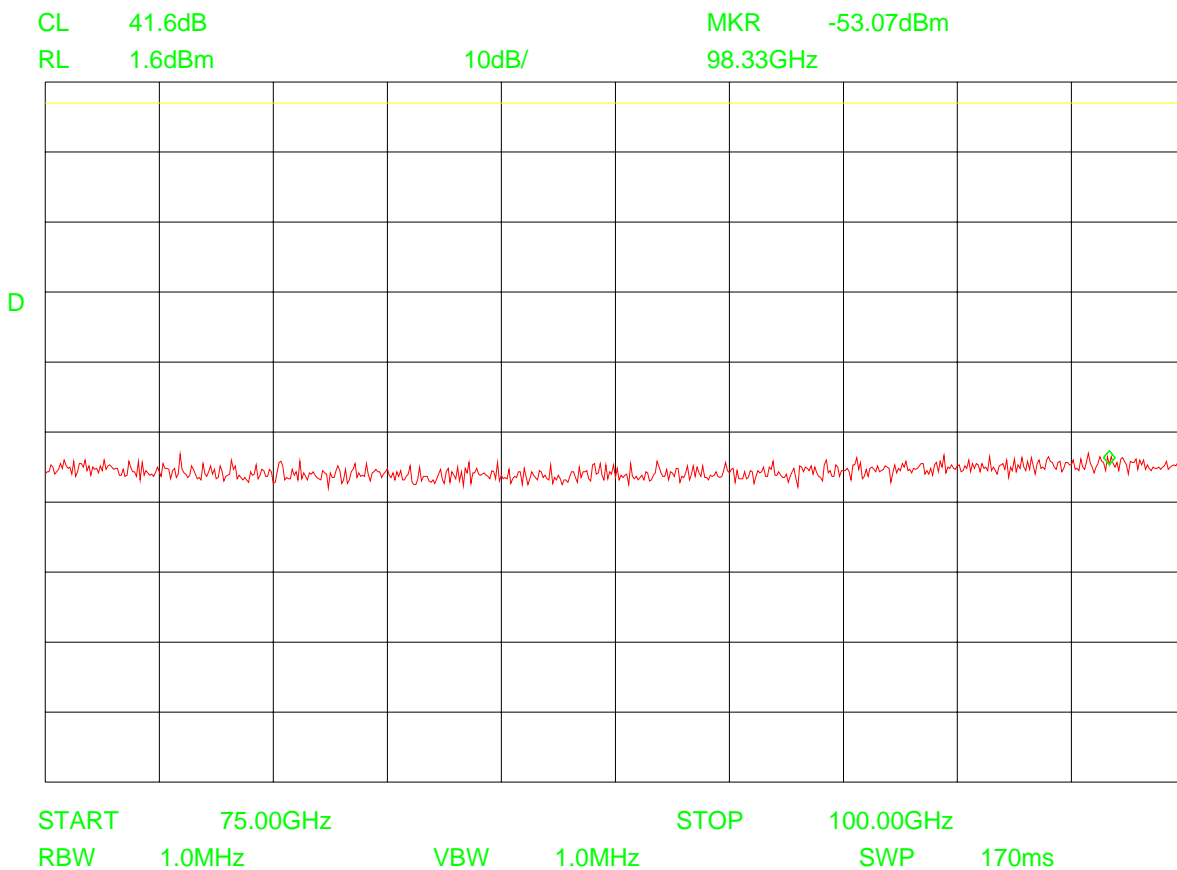


Plot 18

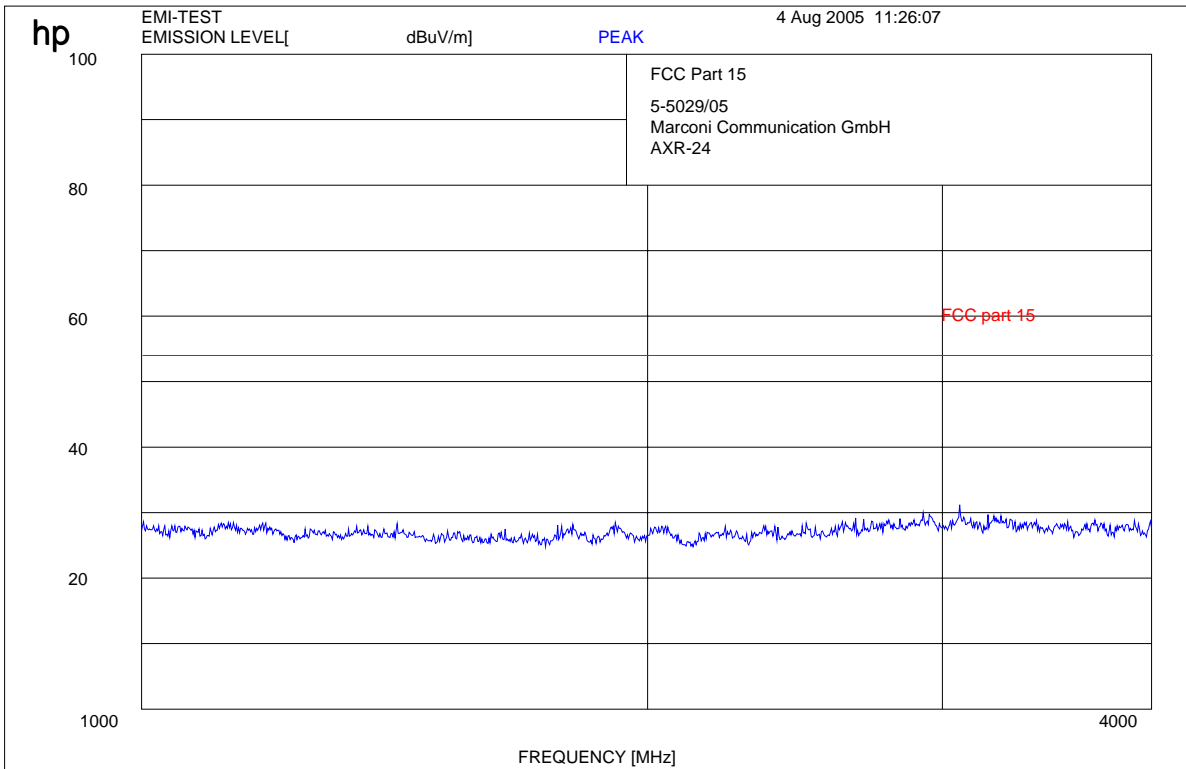




**Plot 20**

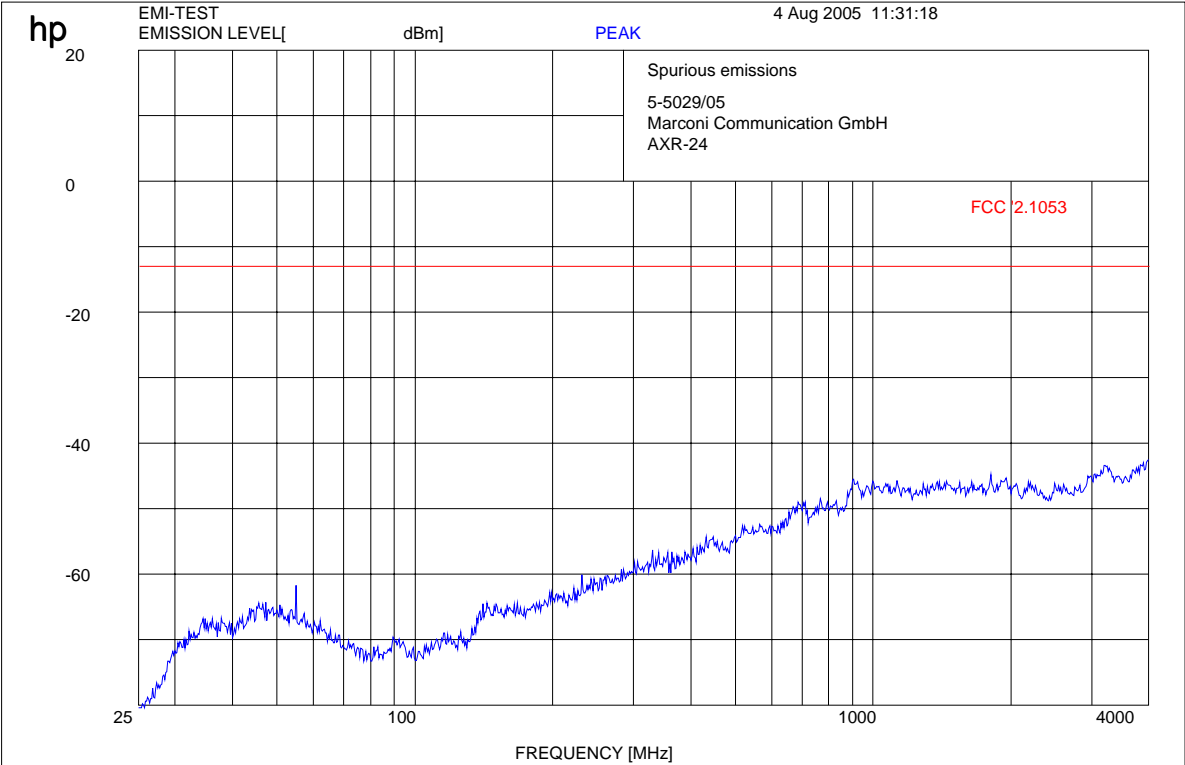


Plot 21



F ≥ 1 GHz : RBW / VBW 1.0 MHz

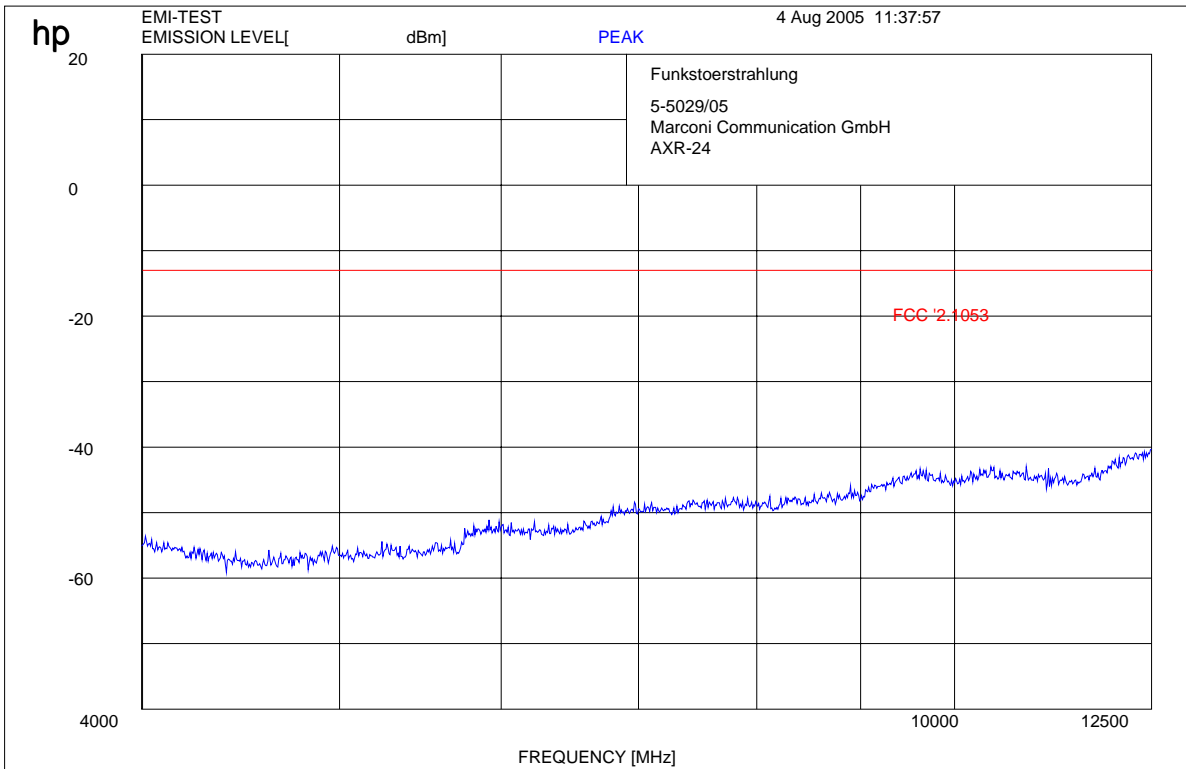
Plot 22



F < 1 GHz : RBW / VBW: 100 kHz  
F ≥ 1 GHz : RBW / VBW 1.0 MHz

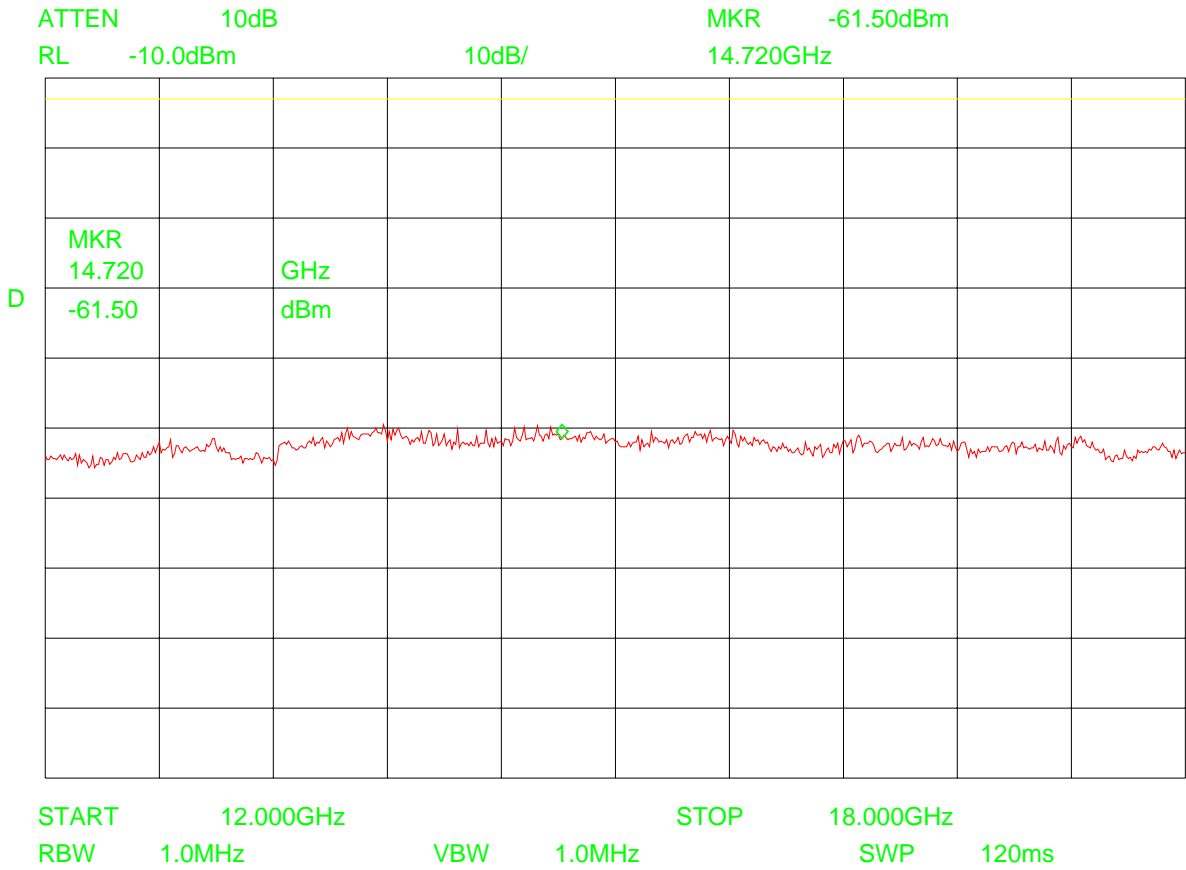


Plot 23

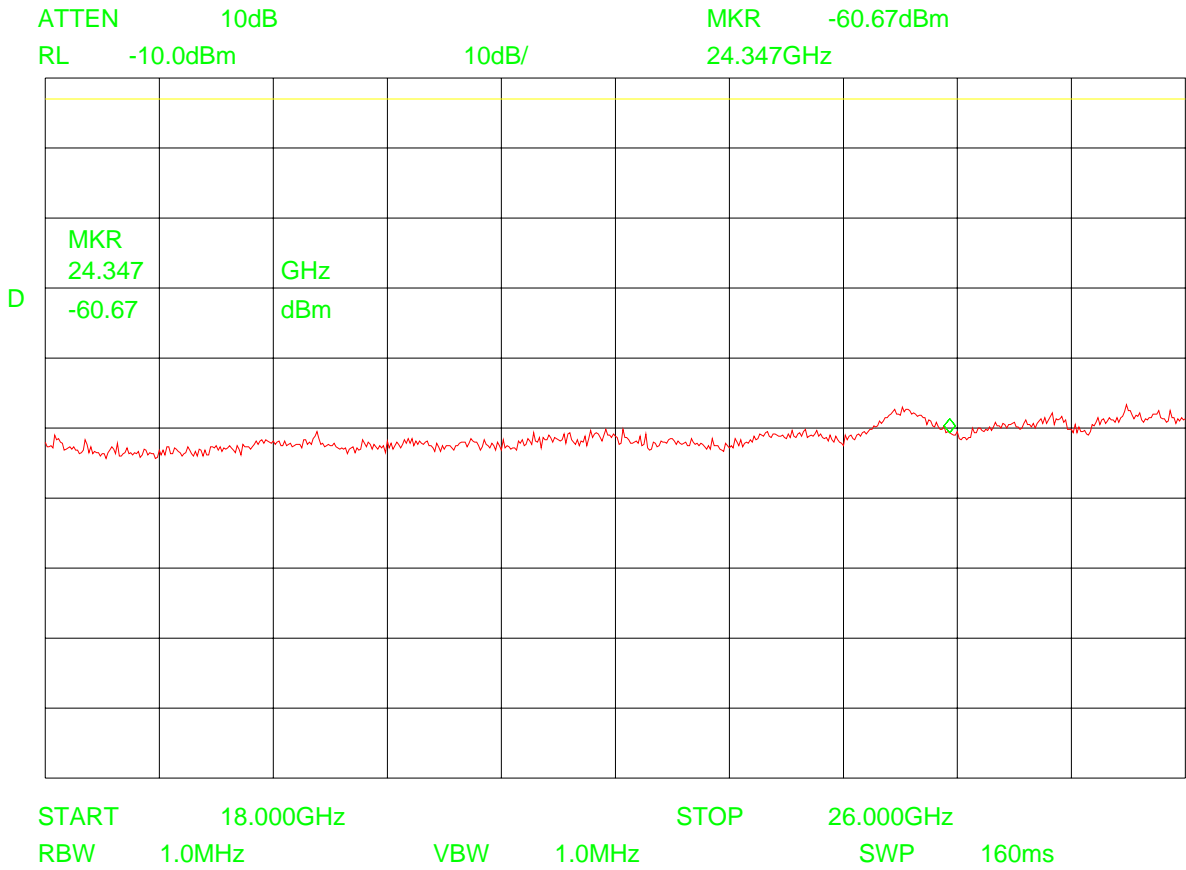


F ≥ 1 GHz : RBW / VBW 1.0 MHz

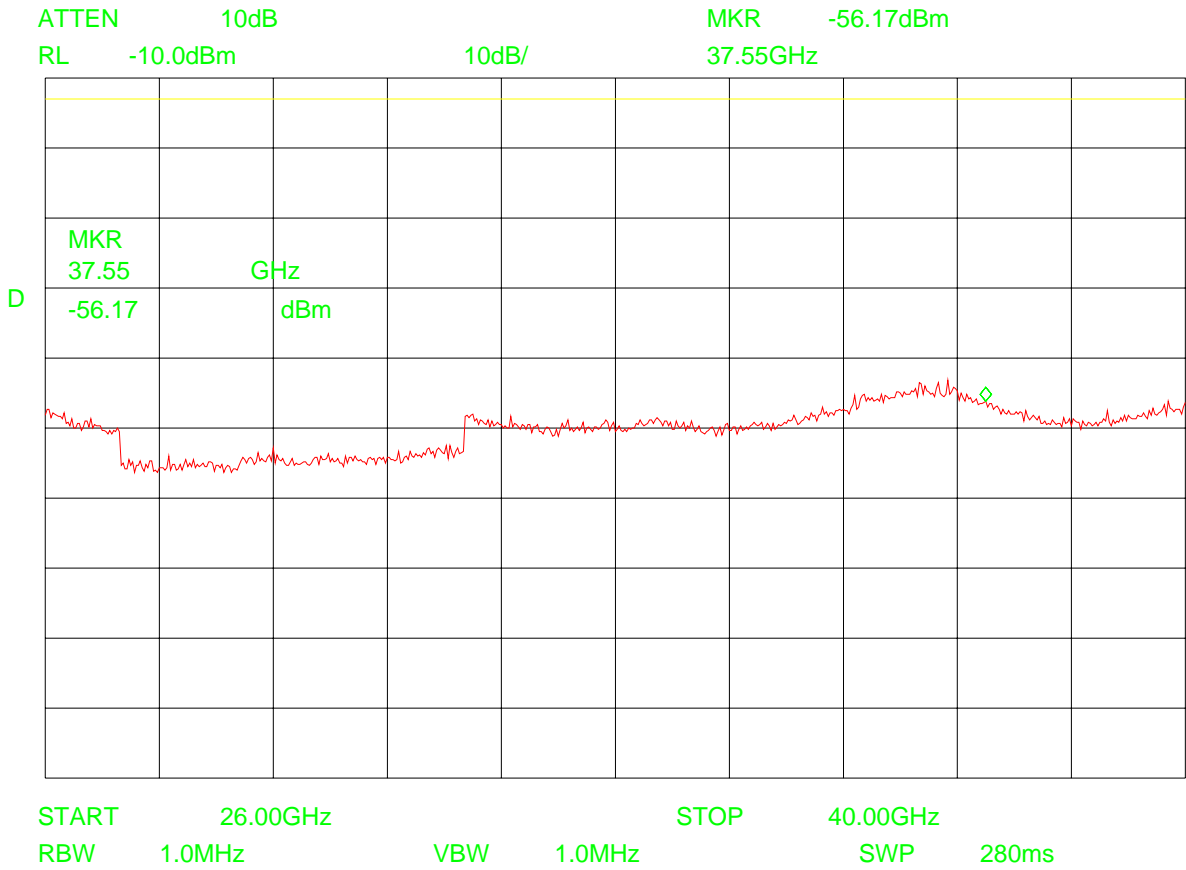
Plot 24



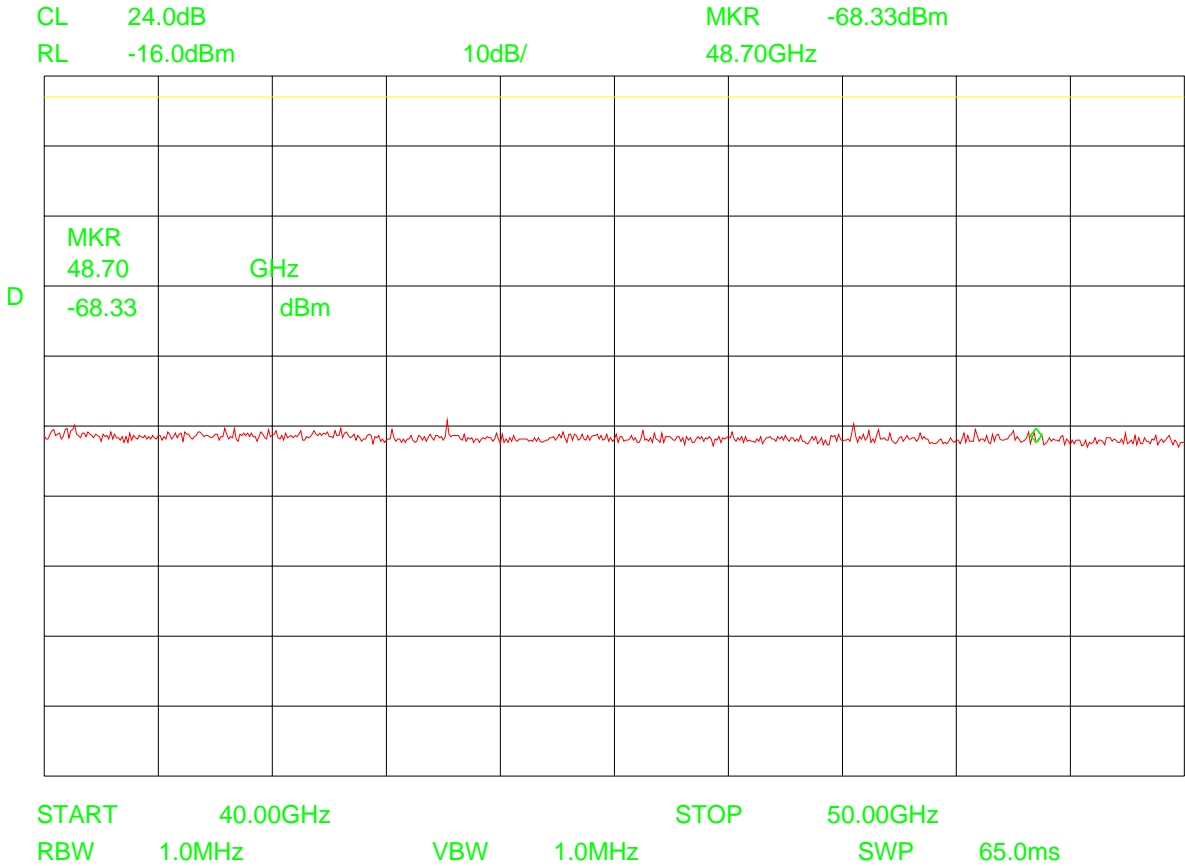
Plot 25



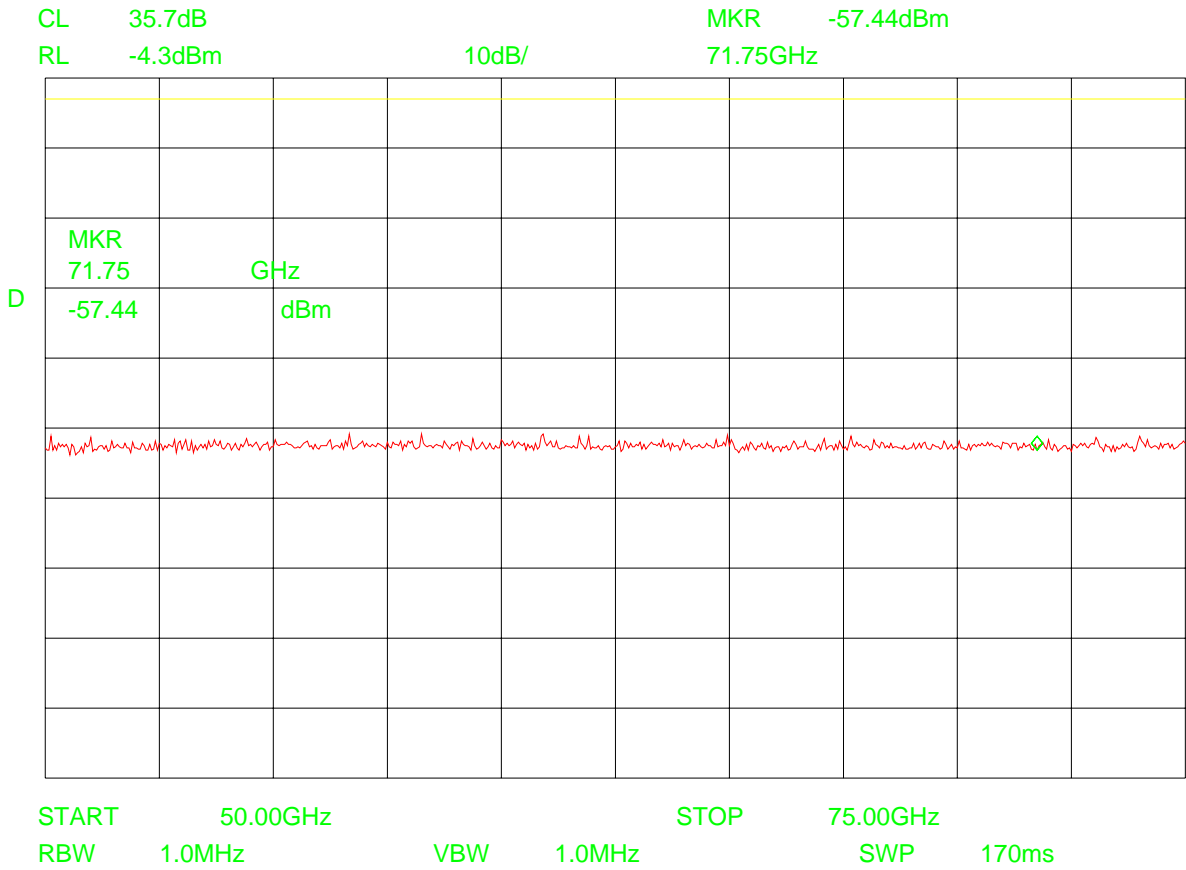
Plot 26



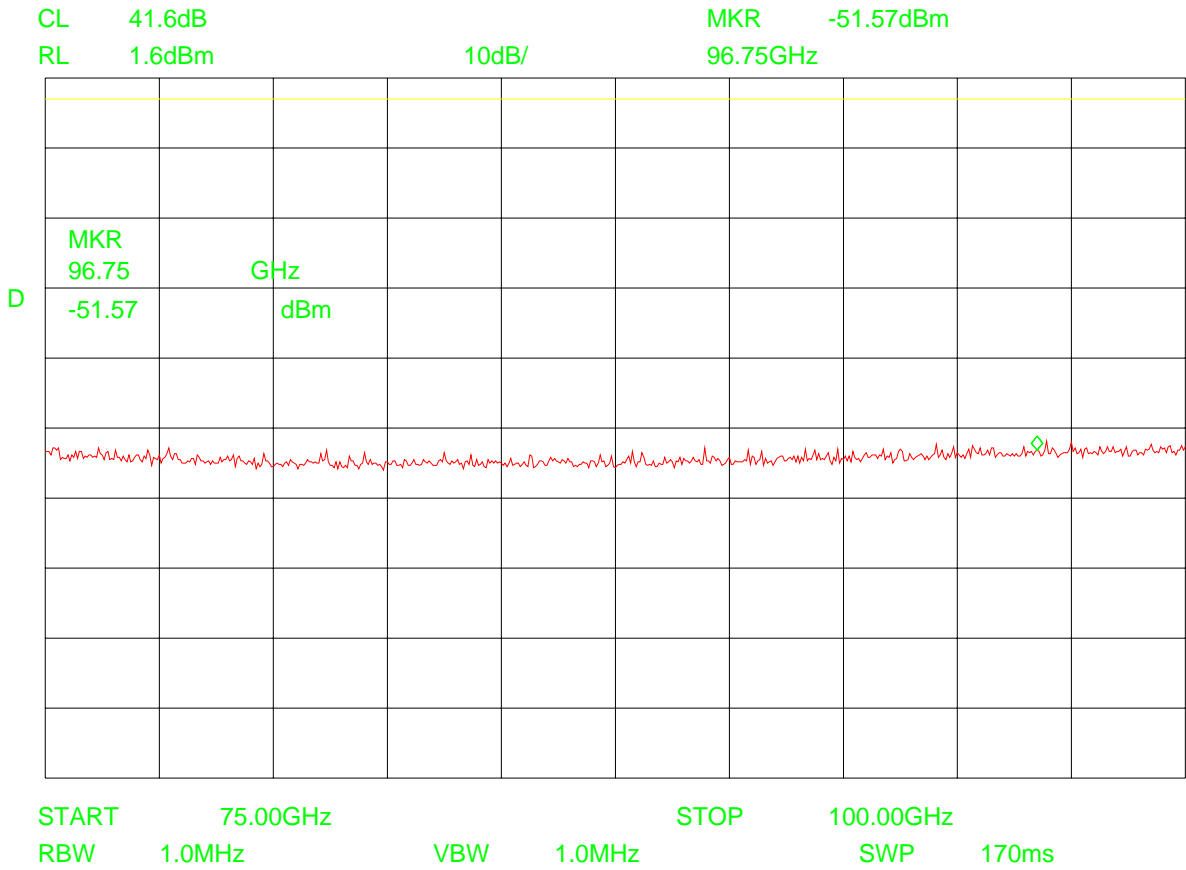
**Plot 27**



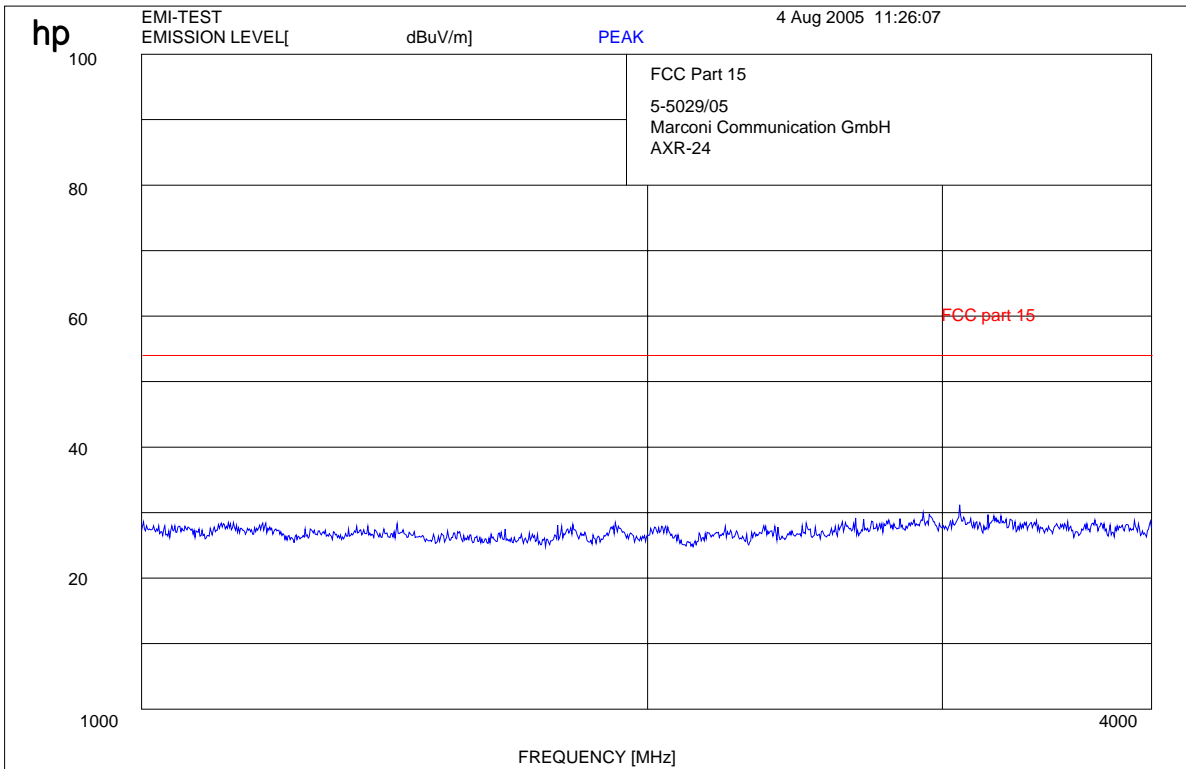
Plot 28



Plot 29



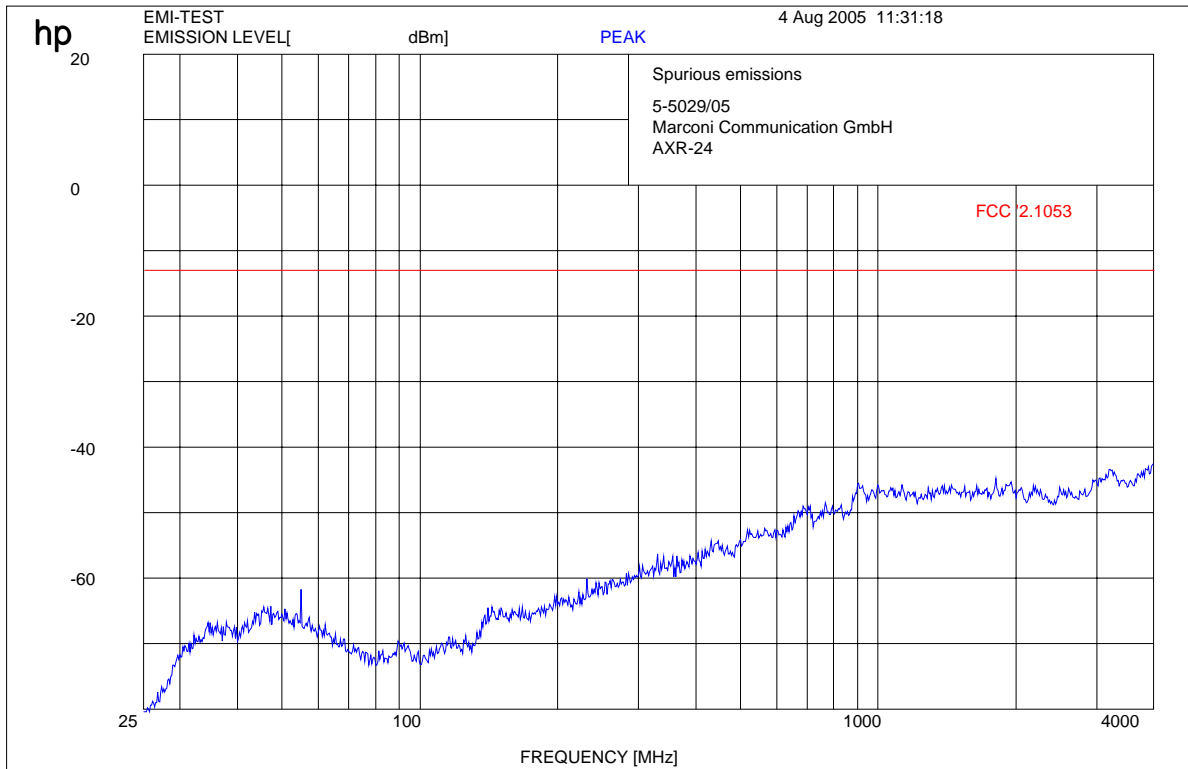
Plot 30



F ≥ 1 GHz : RBW / VBW 1.0 MHz



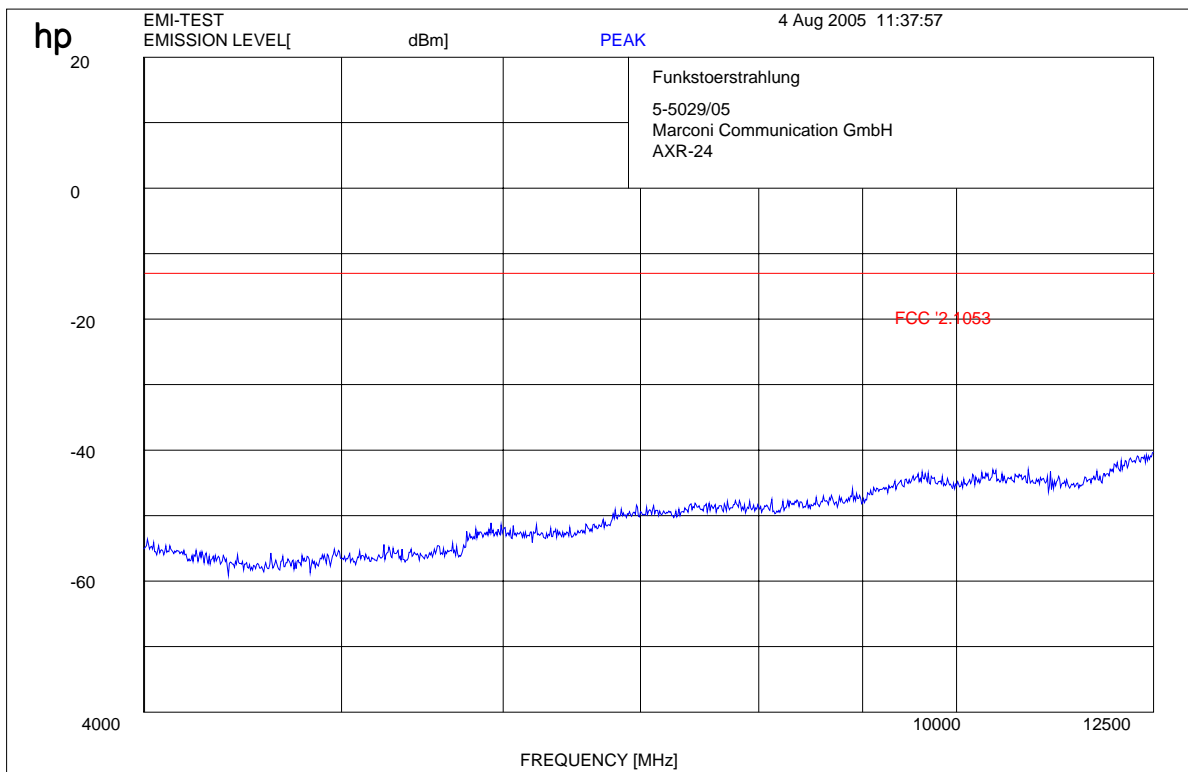
Plot 31



F < 1 GHz : RBW / VBW: 100 kHz

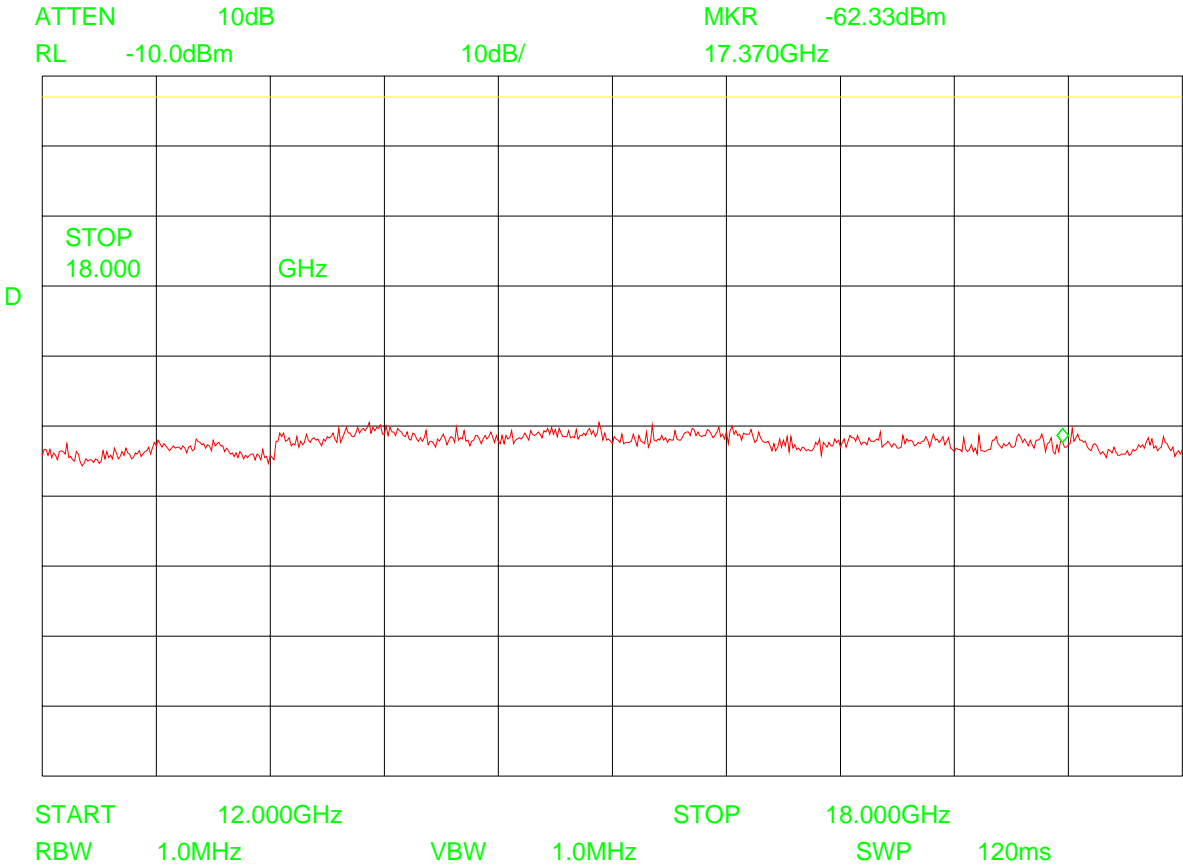
F ≥ 1 GHz : RBW / VBW 1.0 MHz

Plot 32

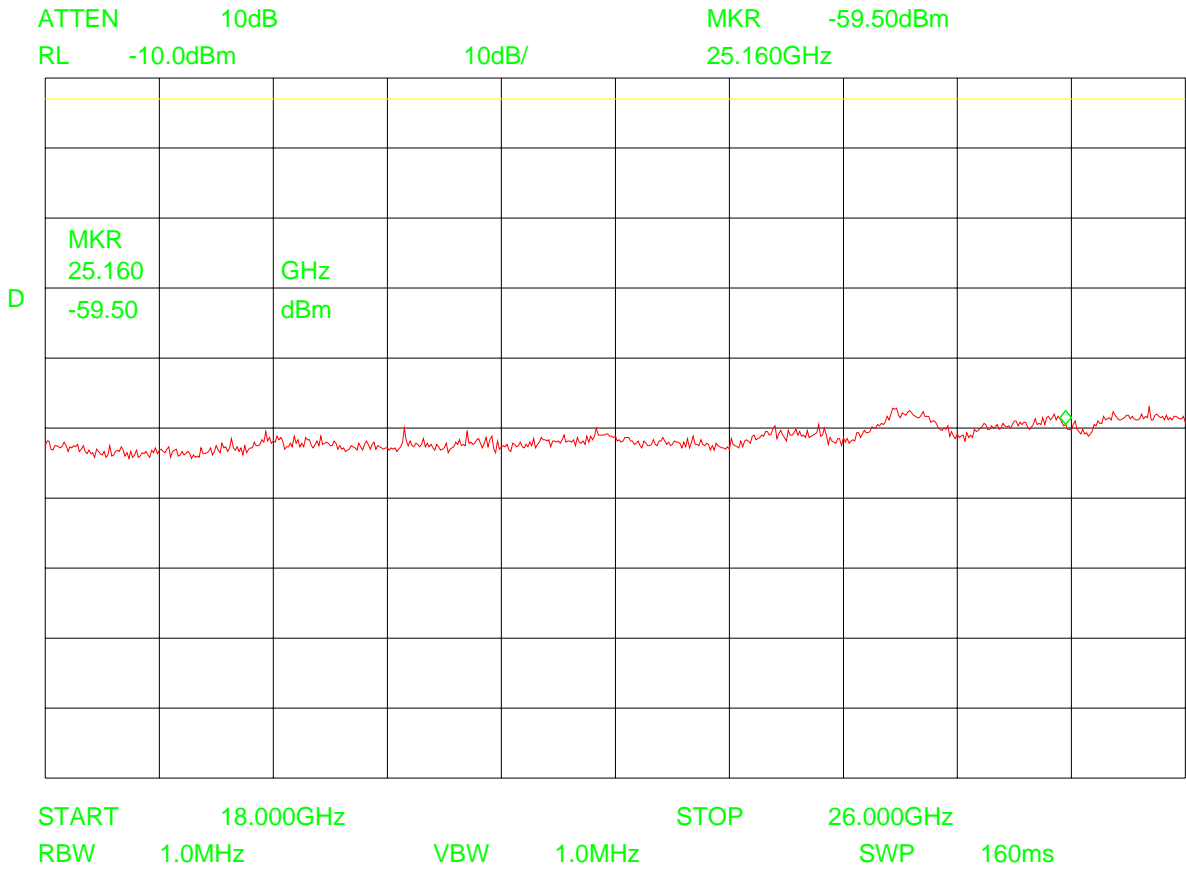


F ≥ 1 GHz : RBW / VBW 1.0 MHz

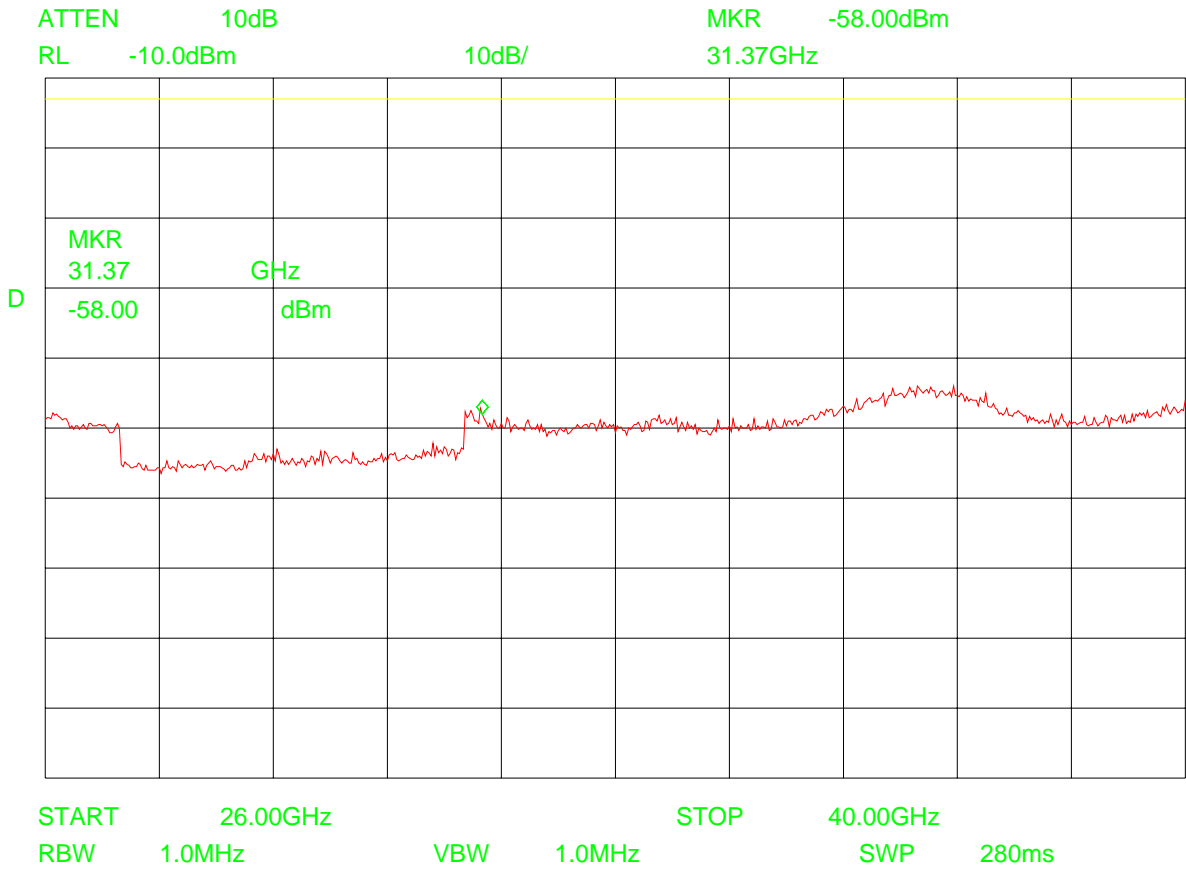
Plot 33



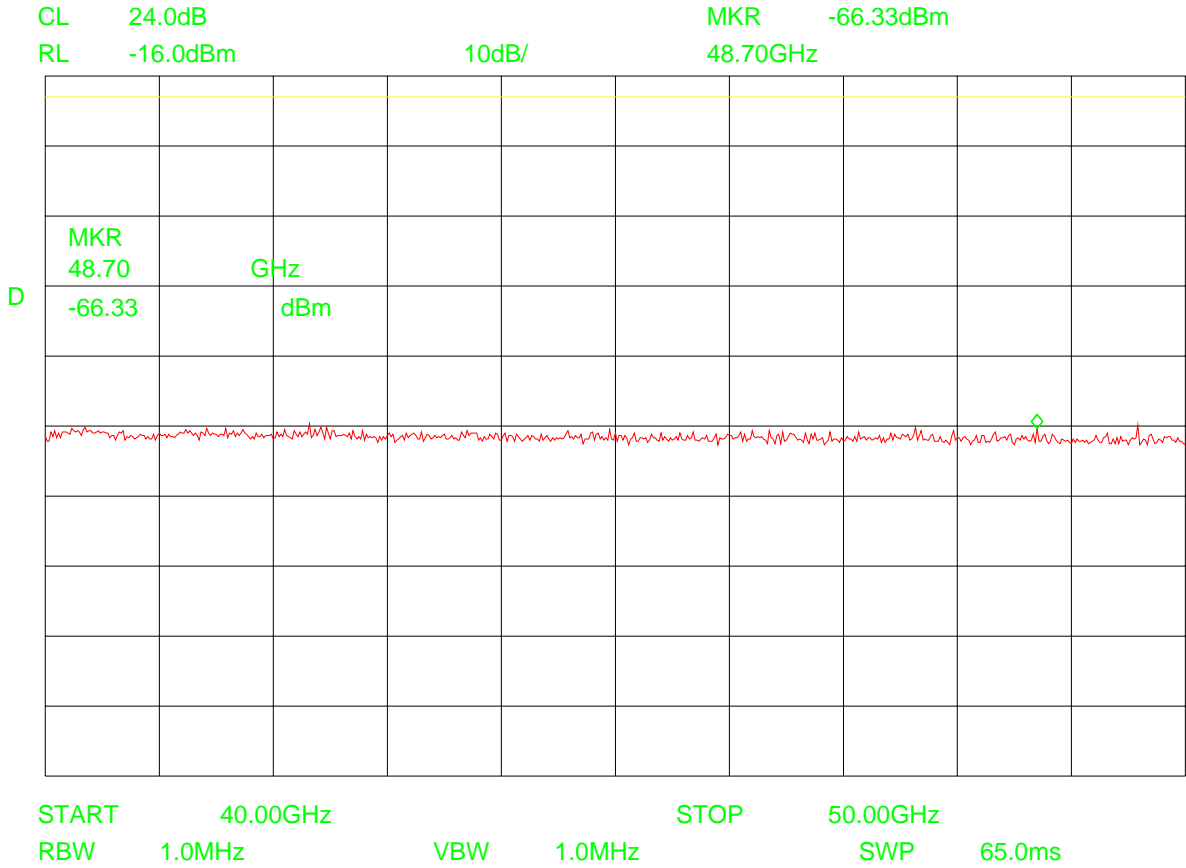
Plot 34



**Plot 35**

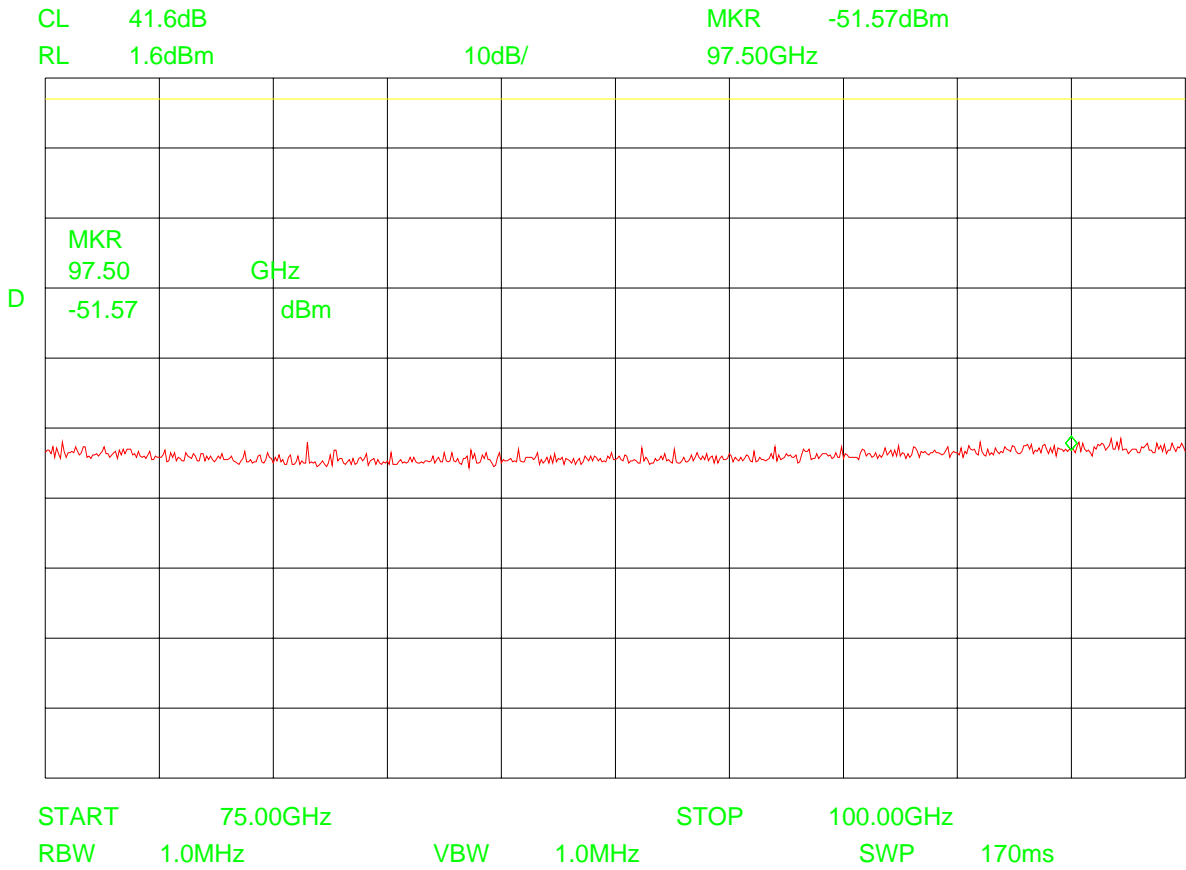


Plot 36



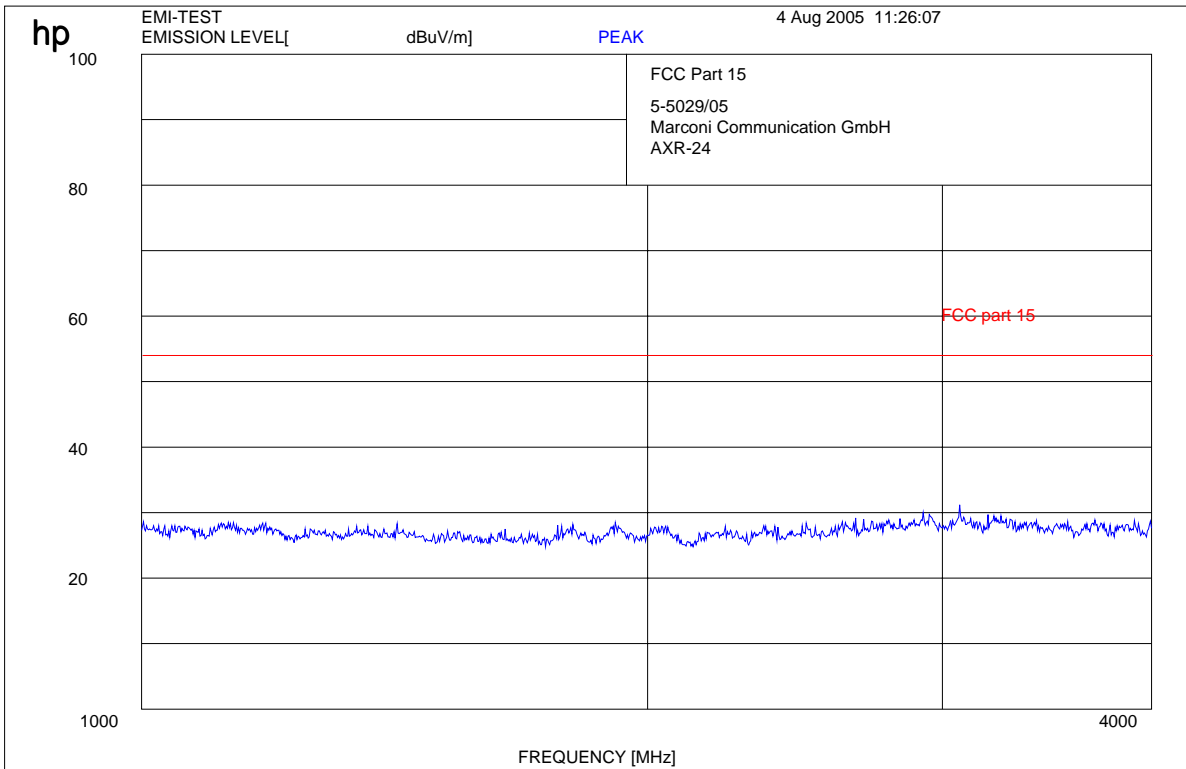


Plot 38



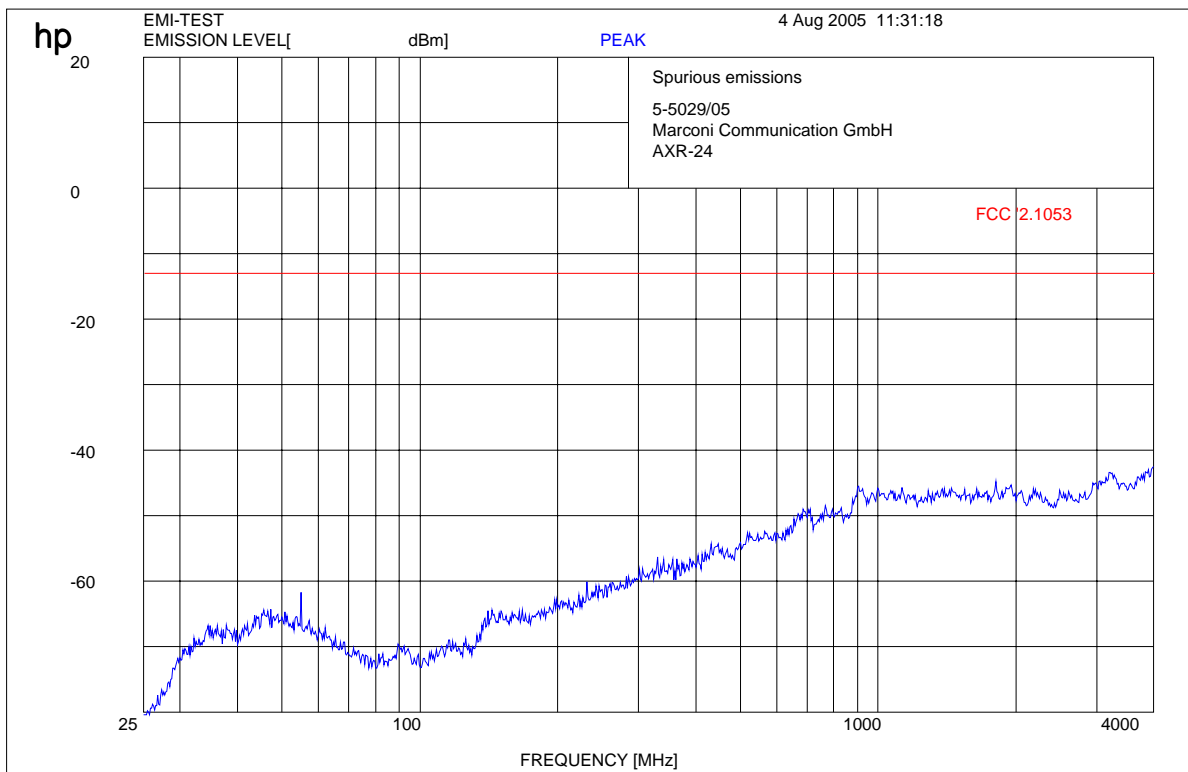


Plot 39



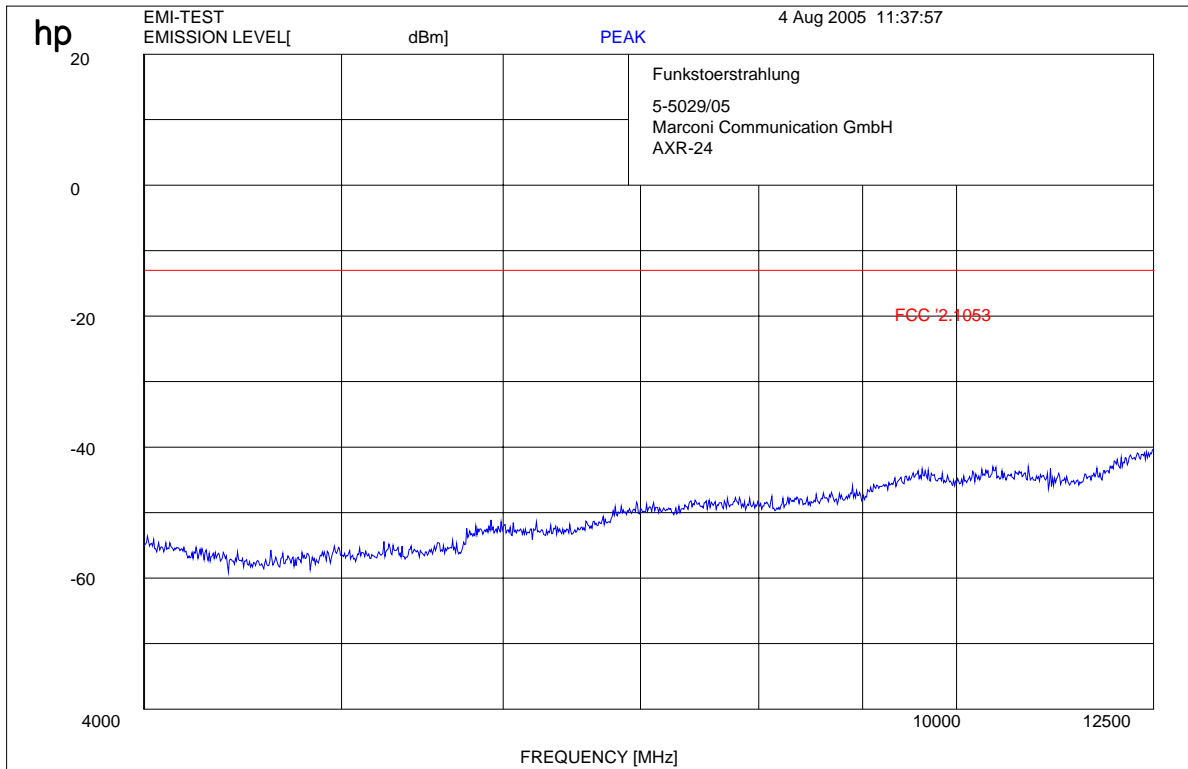
F ≥ 1 GHz : RBW / VBW 1.0 MHz

Plot 40



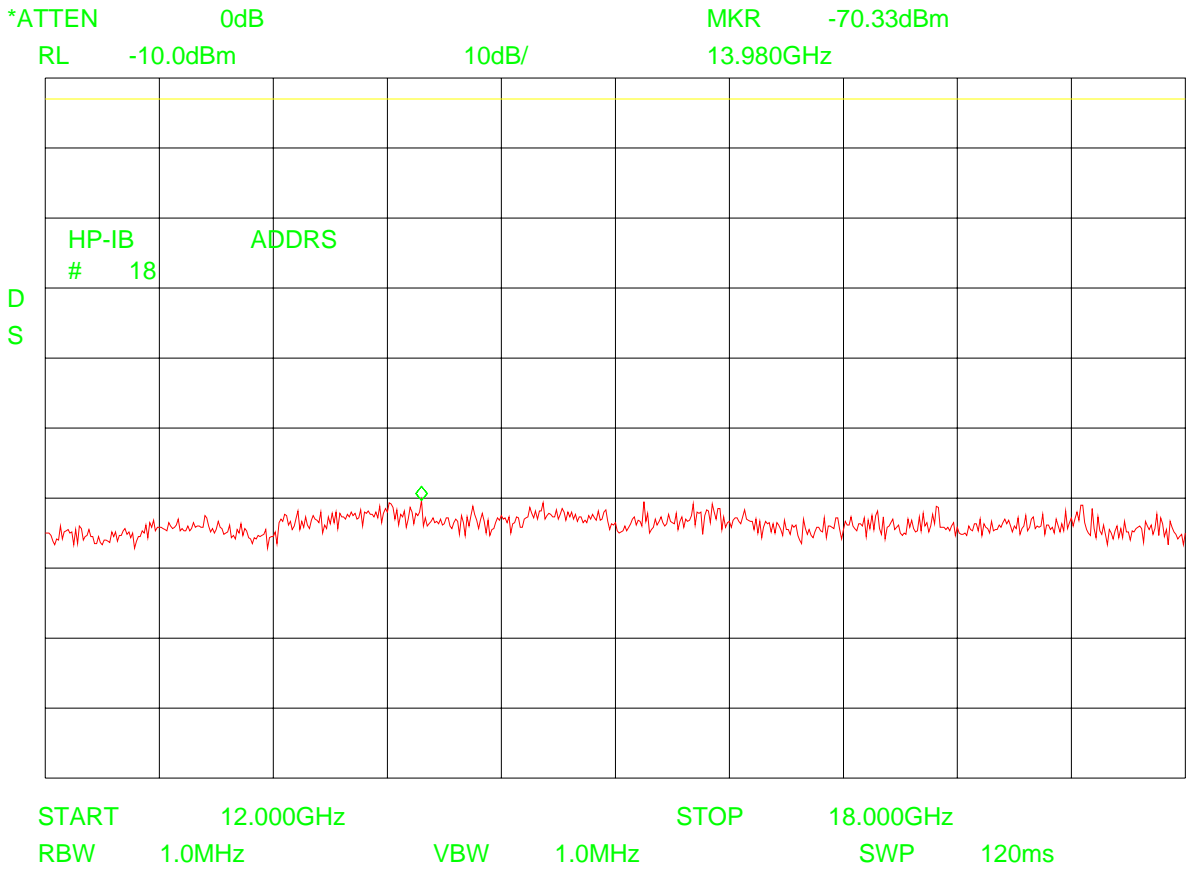
F < 1 GHz : RBW / VBW: 100 kHz  
F ≥ 1 GHz : RBW / VBW 1.0 MHz

Plot 41

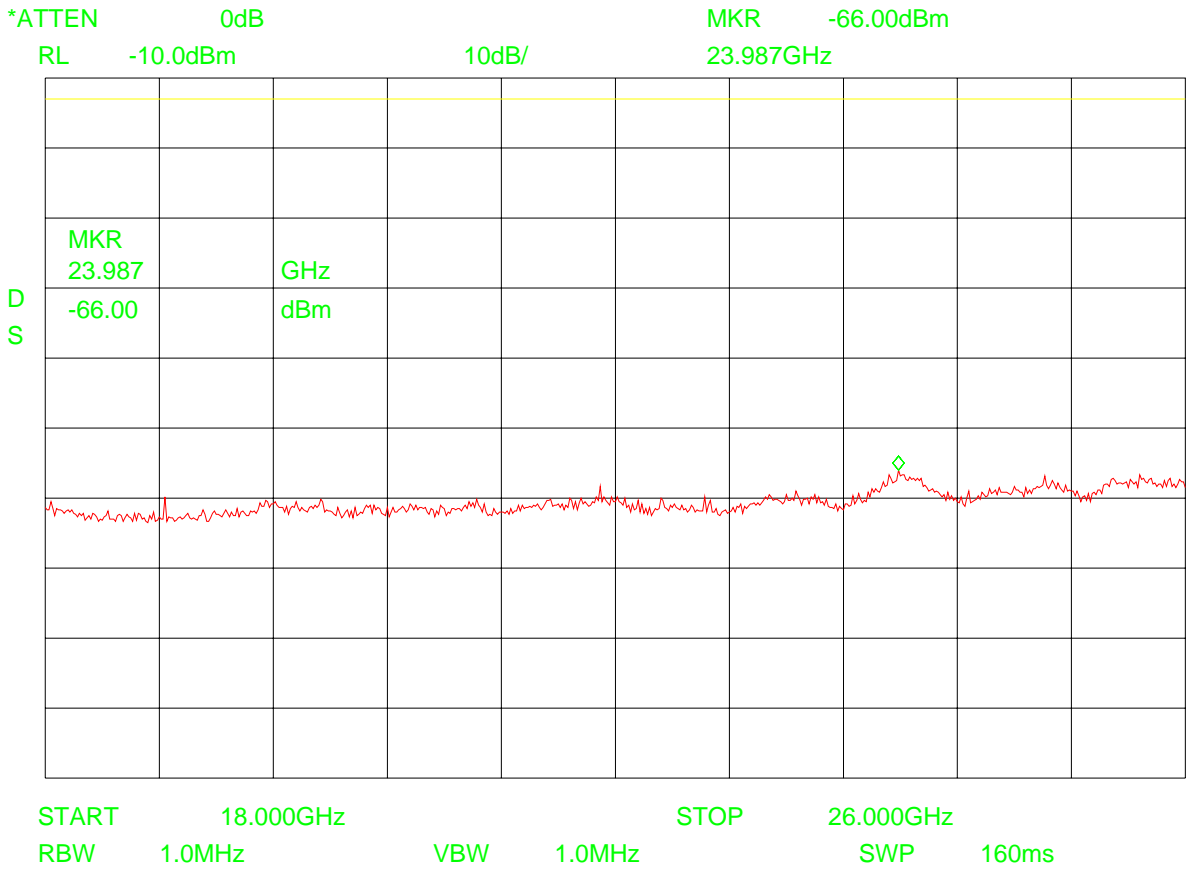


F ≥ 1 GHz : RBW / VBW 1.0 MHz

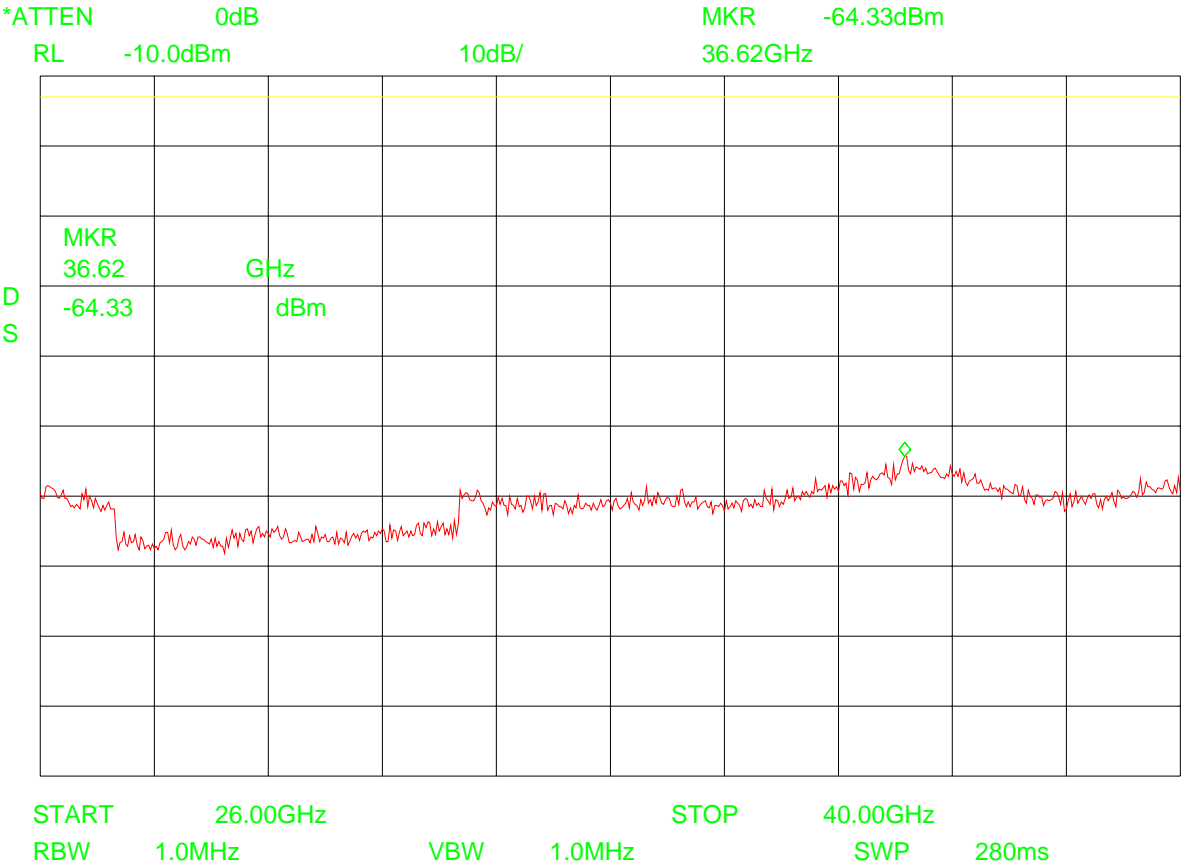
Plot 42



Plot 43

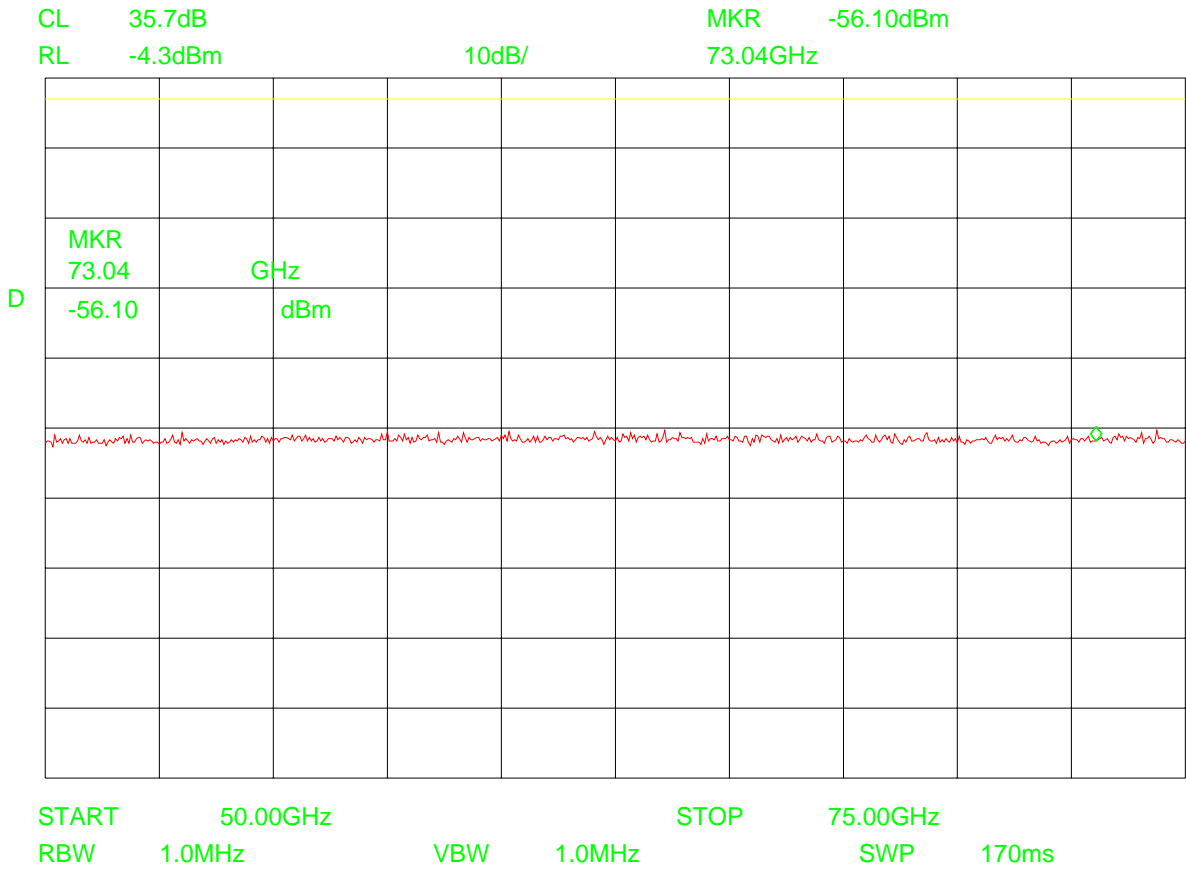


Plot 44





Plot 46







**Plot 48**

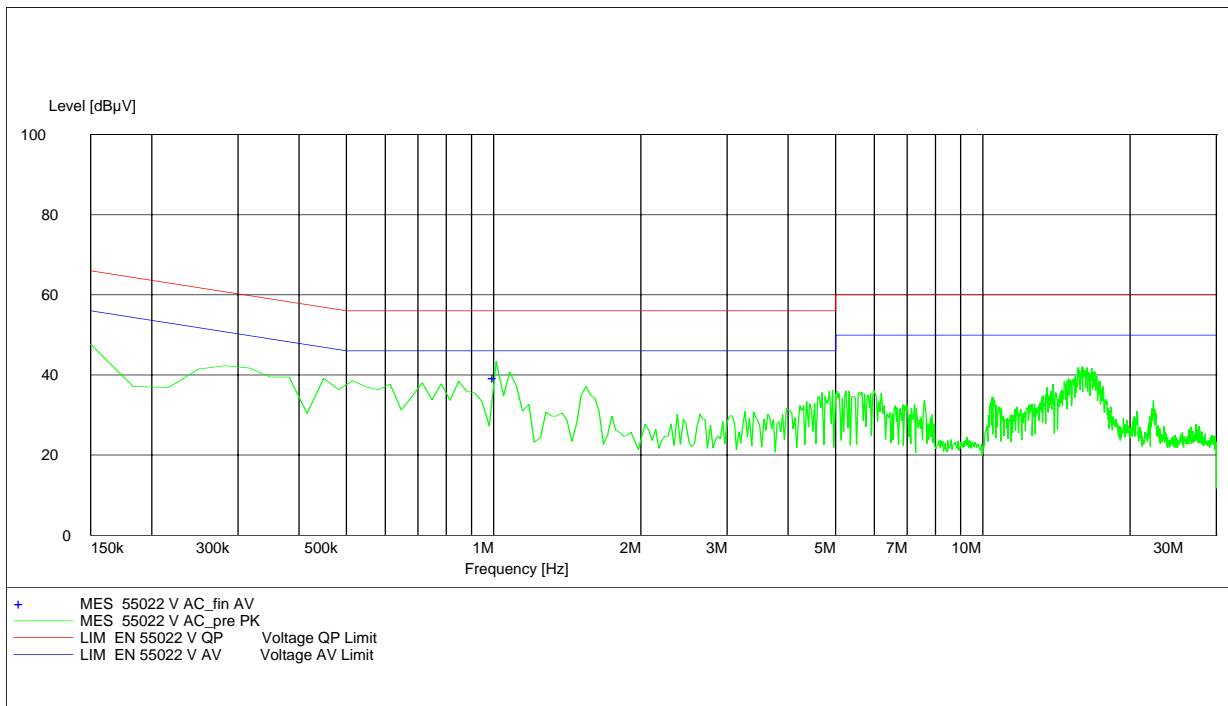
**EN 55022 V AC Class B**

EUT: AXR-24  
 Manufacturer: Marconi  
 Test Site: CETECOM ICT Services Room 006  
 Operator: Weiden

**SCAN TABLE: "EN 55022 V"**

Short Description: Voltage Mains 1.60

Start Frequency	Stop Frequency	Step Width	Detector Time	Meas. Bandw.	IF	Transducer
150.0 kHz	30.0 MHz	7.5 kHz	MaxPeak	100.0 ms	10 kHz	ESH3-Z5 L1 1458



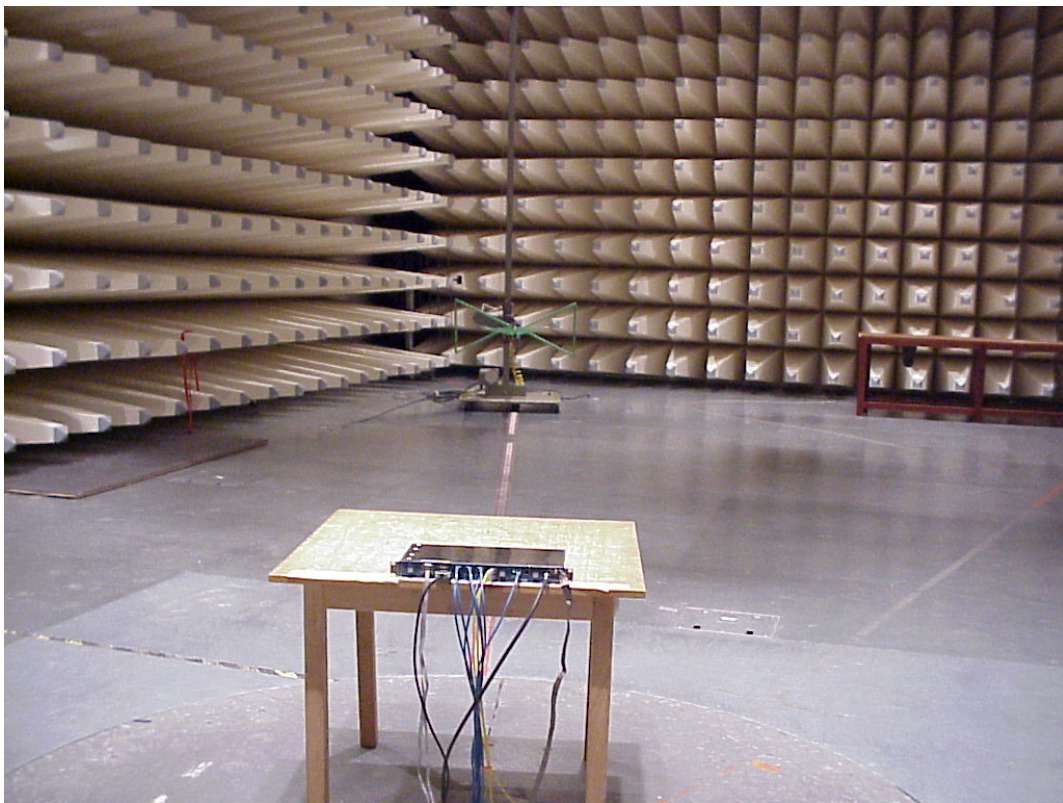
**MEASUREMENT RESULT: "55022 V AC\_fin AV"**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
1.020000	39.20	10.5	46	6.8	L1 / FLO	

4 Photos

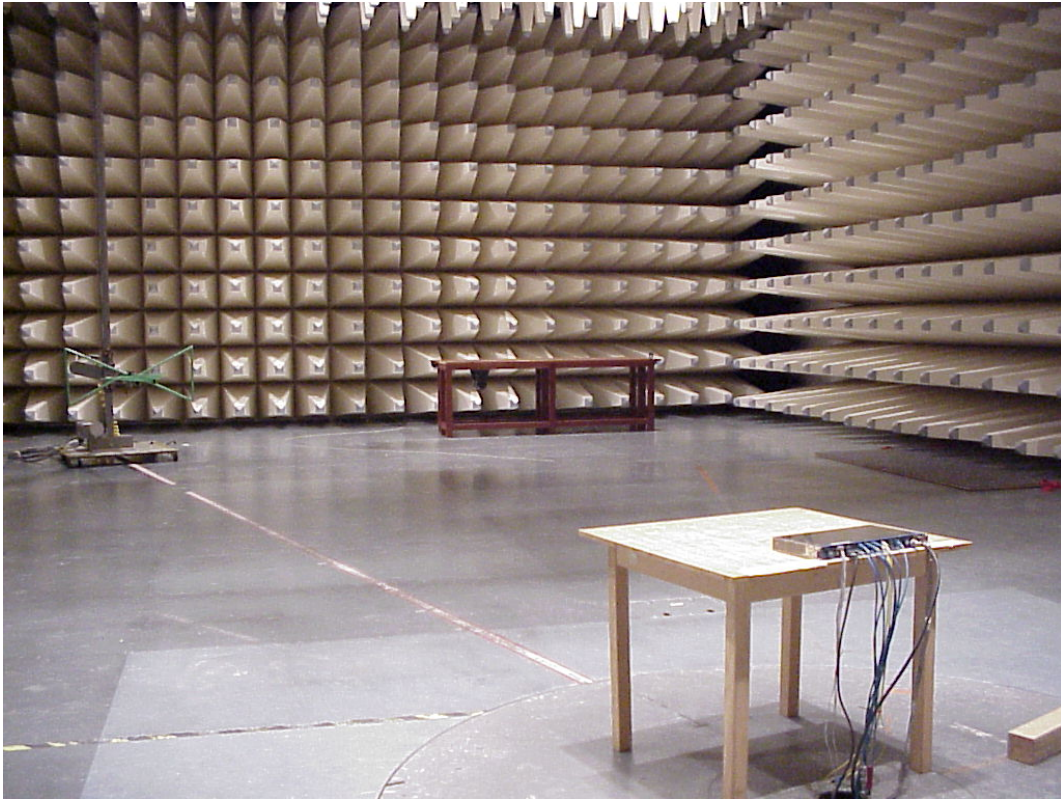
**Photo 1**

Set-up radiated emission, 10 m measurement distance



**Photo 2**

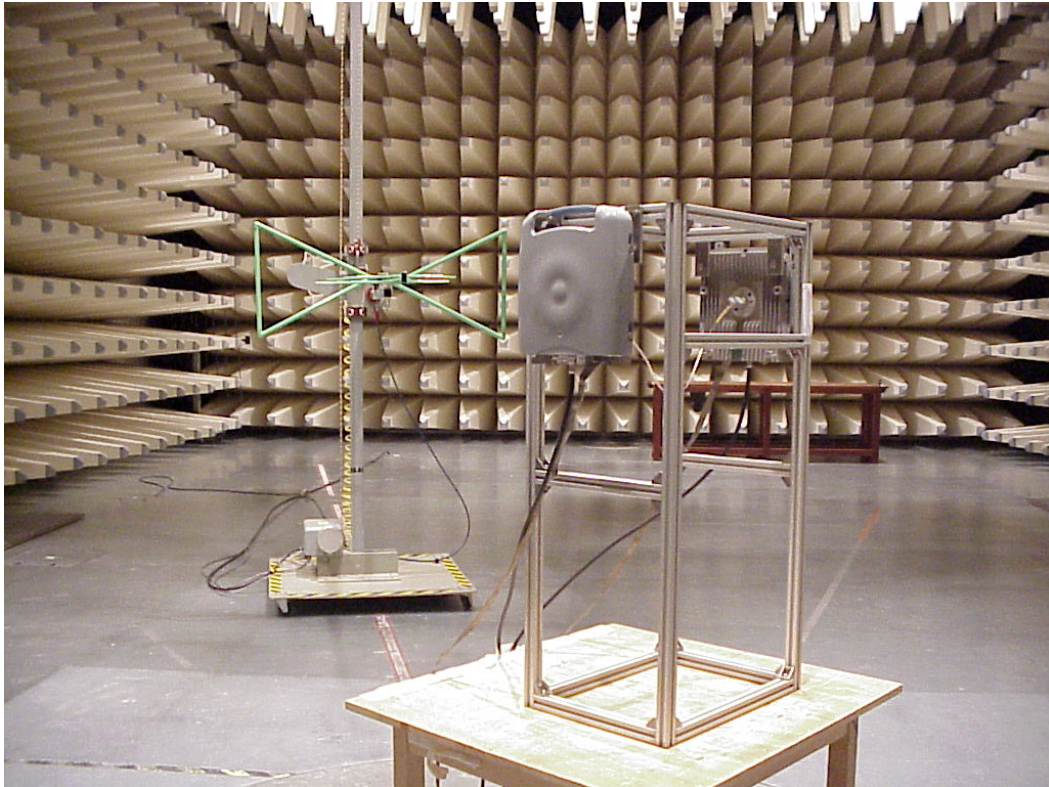
Set-up radiated emission, 10 m measurement distance





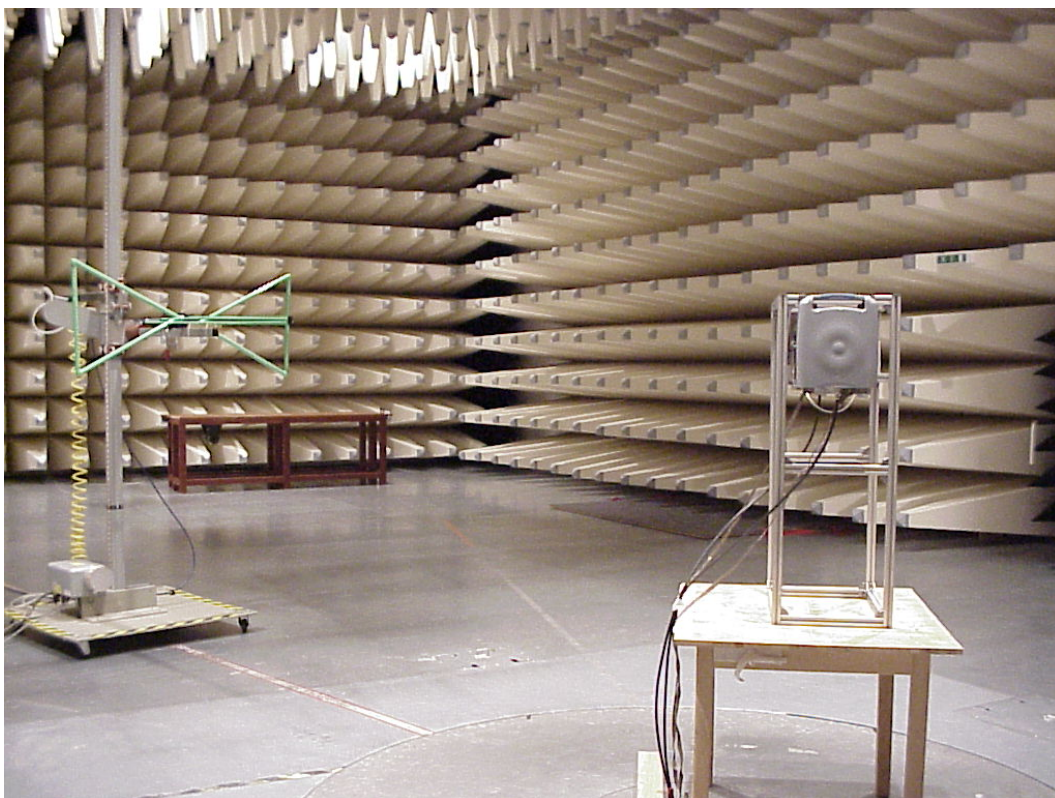
**Photo 3**

Set-up radiated emission, 3 m measurement distance



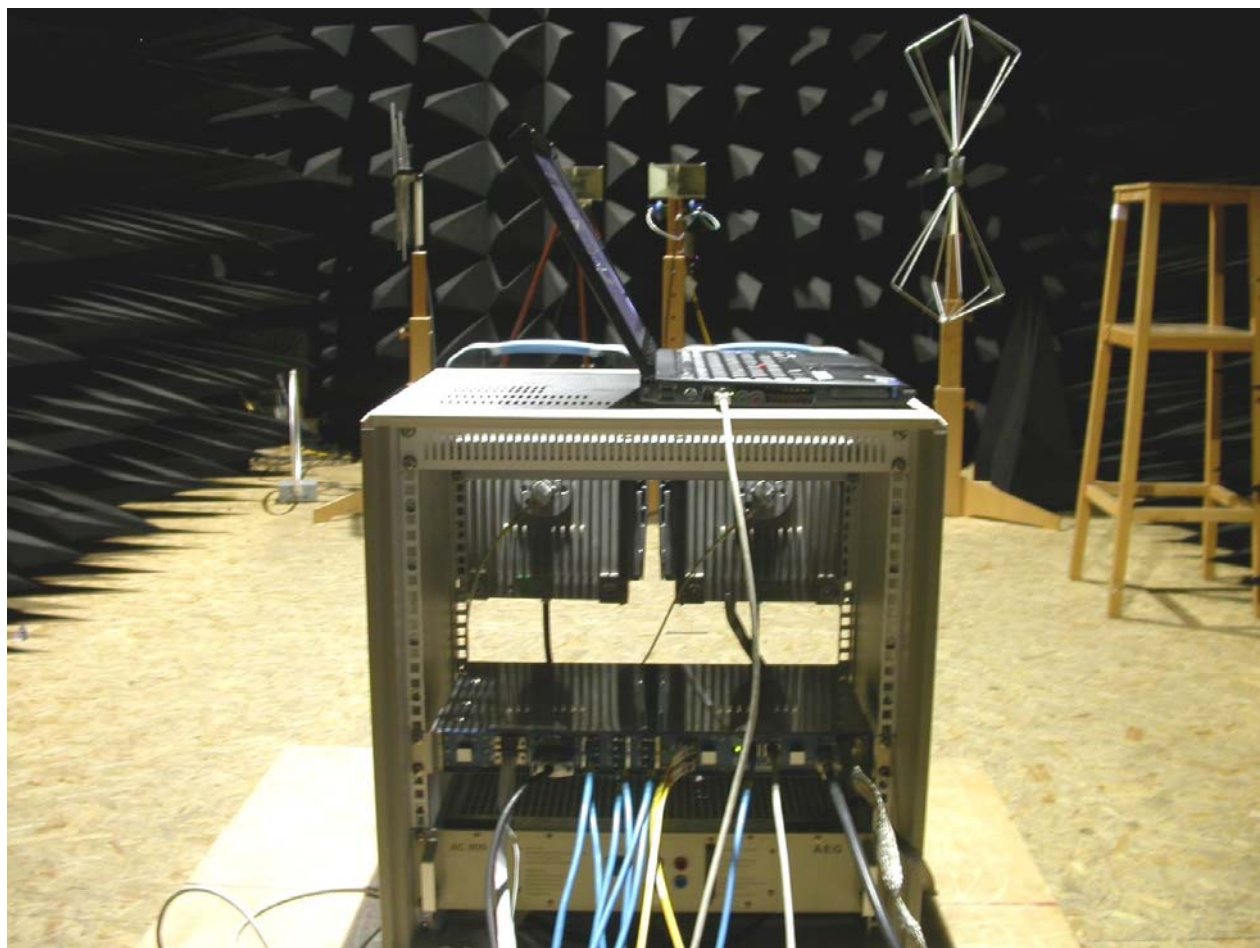
**Photo 4**

Set-up radiated emission, 3 m measurement distance



**Photo 5**

AXR-24 Spurious radiated measurement 0.30 GHz – 12 GHz





**Photo 6**

AXR-24 Spurious radiated measurement 0.30 GHz – 12 GHz





Photo 7

AXR-24 Spurious radiated measurement 12.0 GHz – 100.0 GHz  
Standard gain horns and Mixer 33.0 GHz – 110.0 GHz



Photo 8

AXR-24 Spurious conducted measurement 40.0 GHz – 100.0 GHz



Photo 9

AXR-24 Spurious conducted measurement 75.0 GHz – 100.0 GHz

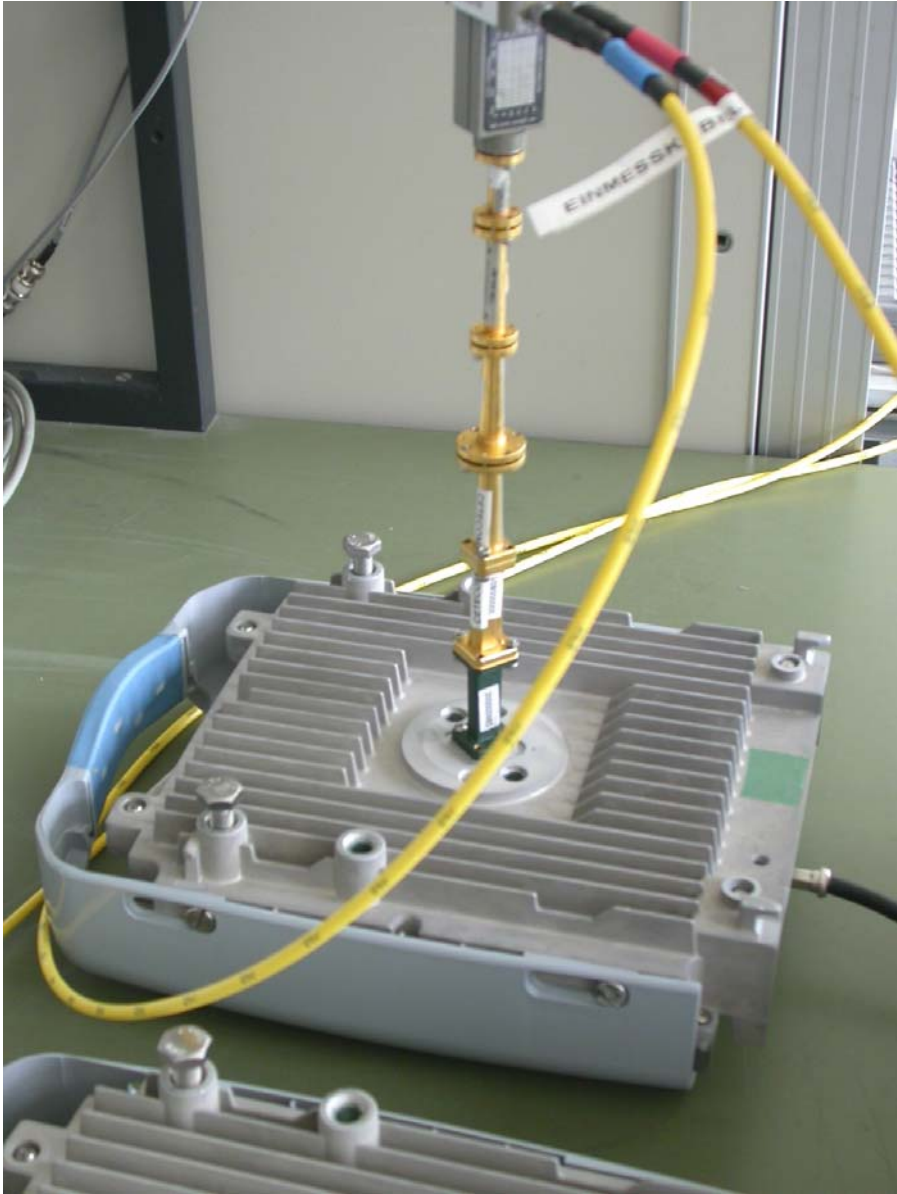


Photo 10

Mixer 33.0 GHz – 50.0 GHz





Photo 11

Mixer 50.0 GHz – 75.0 GHz



**Photo 12**

Mixer 75.0 GHz – 110.0 GHz



Photo 13

Mixer and Taper 40.0 GHz – 110.0 GHz  
Conducted measurement



Photo 14

AC Conducted line

