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Federal Communications Commission and Industry Canada
Anechoic chamber registration No.: 90462 (FCC)
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 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.

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Test Laboratory Manager :

2005-08-10 _____ Manfred Paschwitz _____
Date Name Signature



2005-08-10 _____ Ullrich Kraus _____
Date Name Signature



Technical responsibility for area of testing :

2005-08-10 _____ Dirk Hausknecht _____
Date Name Signature



1.2 Testing laboratory

CETECOM ICT Services GmbH
Untertürkheimerstraße 6–10
66117 Saarbrücken
Germany

CETECOM ICT Services GmbH
P.O. – Box 65 01 55
66140 Saarbrücken
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 _{DC}	(nominal)	: + 48.0 V
Power supply U _{DC}	(minimum)	: + 24.0 V
Power supply U _{DC}	(maximum)	: + 60.0 V

1.5.1 Operation conditions

Operation : Uninterrupted operation for TX and RX.

1.5.2 Equipment under test

Outdoor unit

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

Indoor unit

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 ± 0.01 ppm

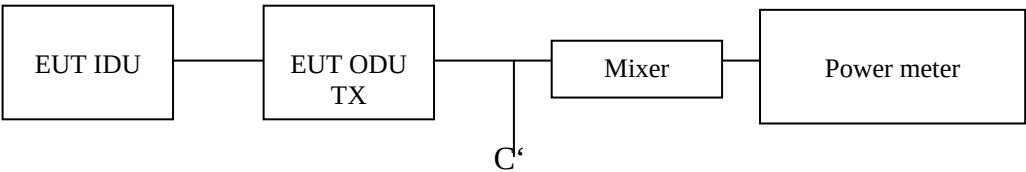
Spectrum masks ± 0.4 dB; ± 0.01 ppm

Spurious emissions ± 0.4 dB; ± 0.01 ppm

Test set-up

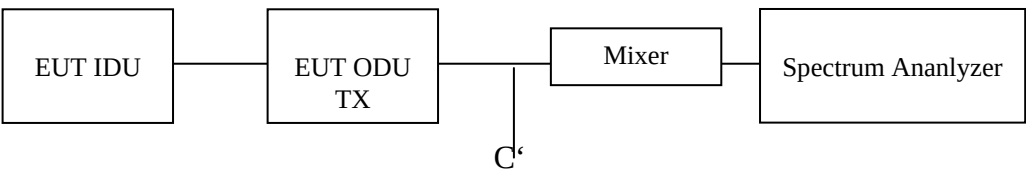
No. 1

Test set-up:



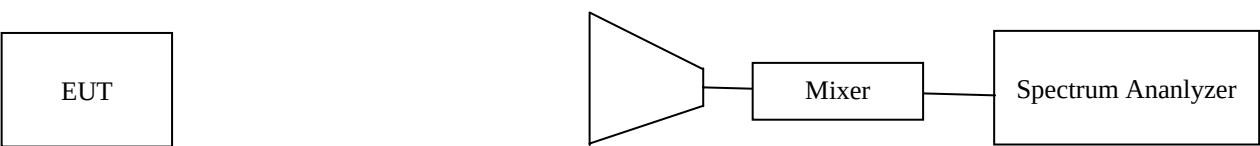
No. 2

Test set-up:

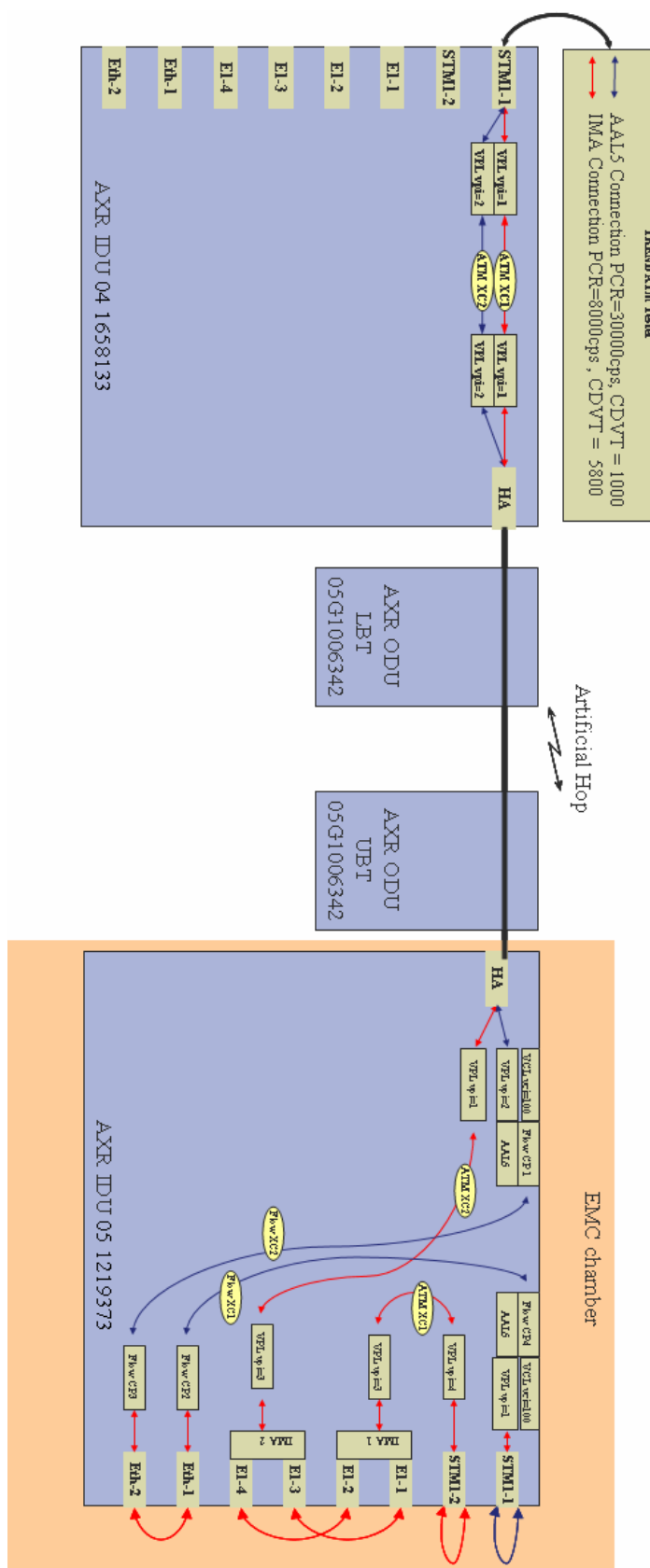


No. 3

Test set-up:

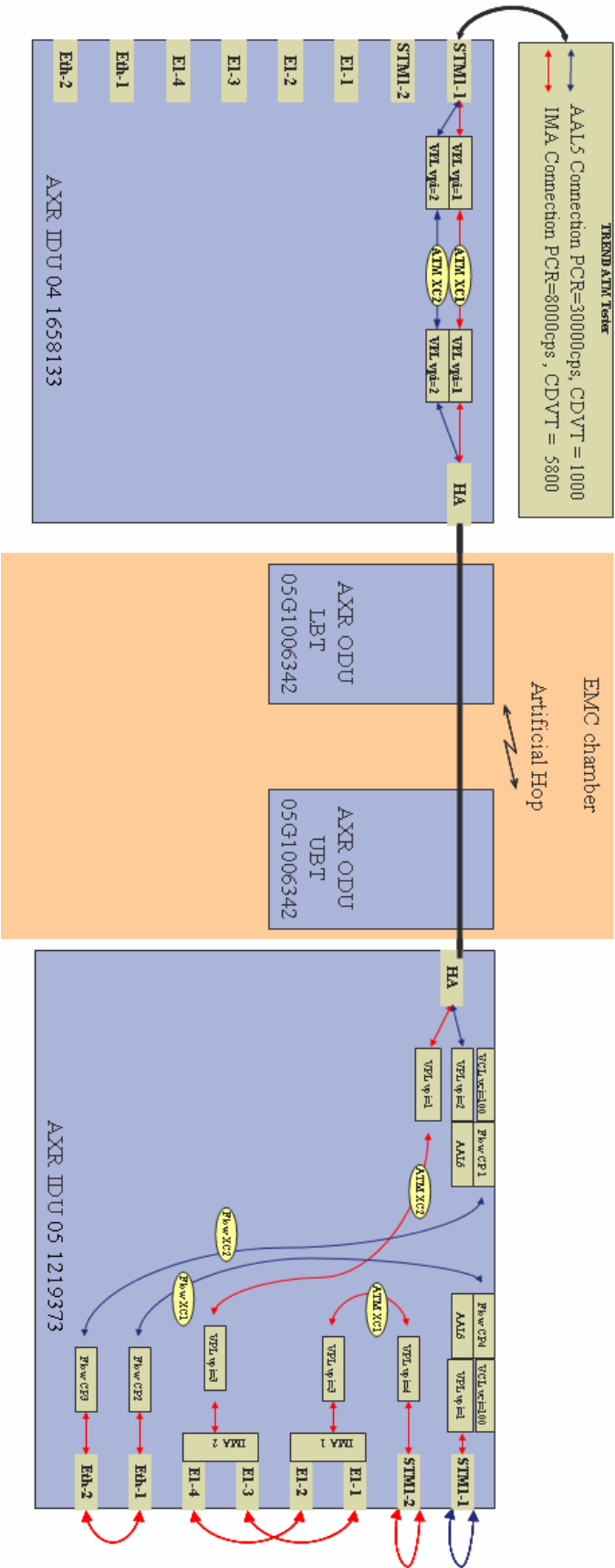


Test set-up:



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	Hewlett Packard	2747 A 05349	
0325	Quasi-Peak-Adapter 85650 A No.1	Hewlett Packard	2521 A 00806	
2446	No.2	Hewlett Packard	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 L801-M2/M3	Lüth	9350105	
0538	Injection Probe F-120-4	FCC	23	10-100 MHz
0549	RF-Amplifier 220 - 200 LD	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 2444	Spectrum-Analyzer-Display 8566 2A	Hewlett Packard	2542 A 13175 No.1 2816 A 16665 No.2	
2441 2448	RF-Preselector 85685 A	Hewlett Packard	2620 A 00354 No.1 2837 A 00778 No.2	20 Hz - 2 GHz
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 2.1 Pres-link	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	Limit	Res. BW	Spurious	Emissions	see
Range			Frequency	P	plot
[GHz]	[dBm]	[MHz]	[GHz]	[dBm]	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	Limit	Res. BW	Spurious	Emissions	see
Range			Frequency	P	plot
[GHz]	[dBm]	[MHz]	[GHz]	[dBm]	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	Limit	Res. BW	Spurious	Emissions	see
Range			Frequency	P	plot
[GHz]	[dBm]	[MHz]	[GHz]	[dBm]	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	Limit	Res. BW	Spurious	Emissions	see
Range			Frequency	P	plot
[GHz]	[dBm]	[MHz]	[GHz]	[dBm]	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	Limit	Res. BW	Spurious	Emissions	see
Range			Frequency	P	plot
[GHz]	[dBm]	[MHz]	[GHz]	[dBm]	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	Limit	Res. BW	Spurious	Emissions	see
Range			Frequency	P	plot
[GHz]	[dBm]	[MHz]	[GHz]	[dBm]	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	Limit	Res. BW	Spurious	Emissions	see
Range			Frequency	P	plot
[GHz]	[dBm]	[MHz]	[GHz]	[dBm]	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	Limit	Res. BW	Spurious	Emissions	see
Range			Frequency	P	plot
[GHz]	[dBm]	[MHz]	[GHz]	[dBm]	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	Limit	Res. BW	Spurious	Emissions	see
Range			Frequency	P	plot
[GHz]	[dBm]	[MHz]	[GHz]	[dBm]	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: ☐

AC Conducted

Measurement conditions :

Frequency	f_{nom}	= 24.350 000 GHz
Modulation	M	= 64QAM
Rx / Tx duplex spacing	DS	= 800.00 MHz
Temperature	t	= + 23.0 ° C
Nominal power supply	U_{AC}	= 110.0 V
Measurement at	see Photo	

Limits:

SECTION 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

Test measurement:

	TRANSMITTER SPURIOUS EMISSION			
	AC CONDUCTED			
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	46

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)

F	3312	0573									
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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	☒	☐	☒	☐	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)

F	3312	0573								
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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	☒	☐	☒	☐	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: dB μ V/m

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

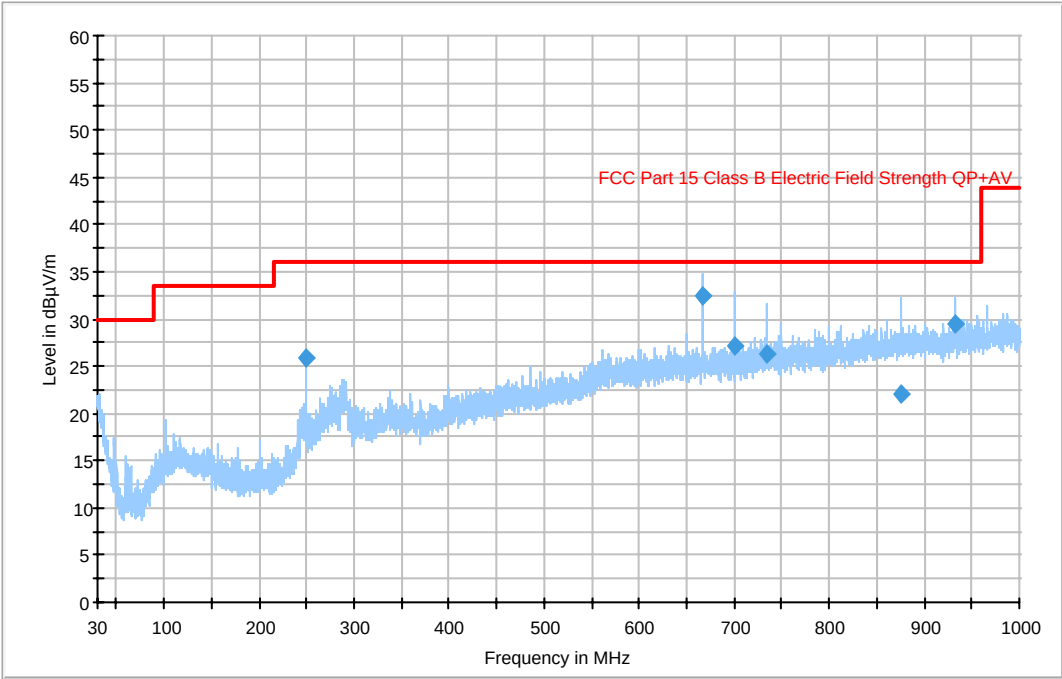
Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB μ V/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

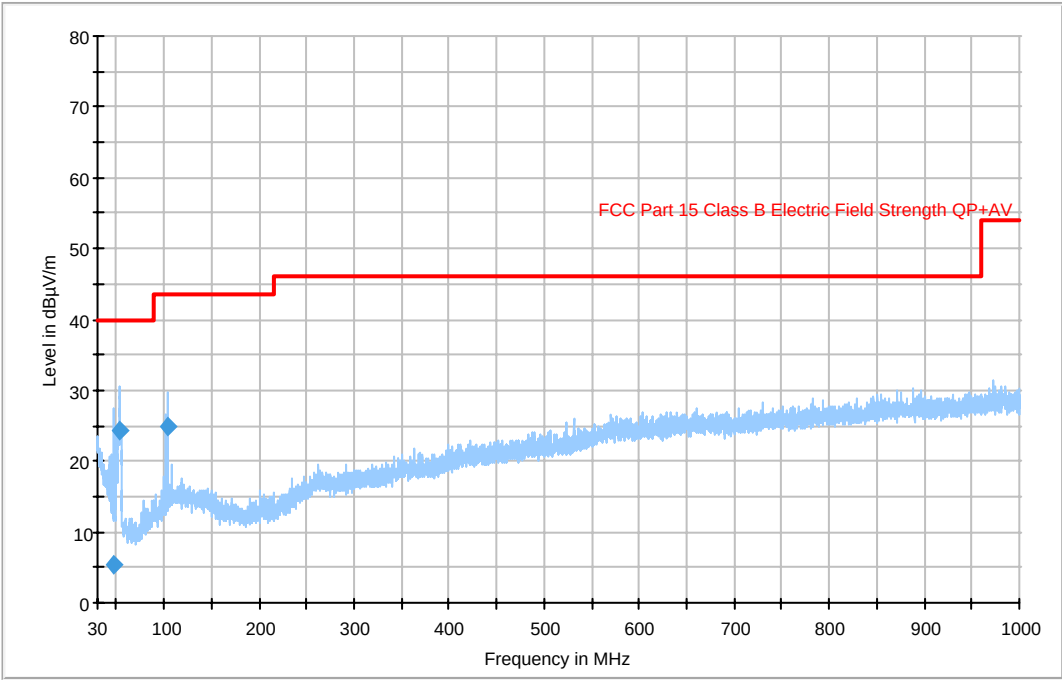
Frequency (MHz)	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
47.880000	111.0	9.9	34.7	40.0	
52.732500	124.0	8.3	15.8	40.0	
103.721250	138.0	12.6	18.7	43.5	

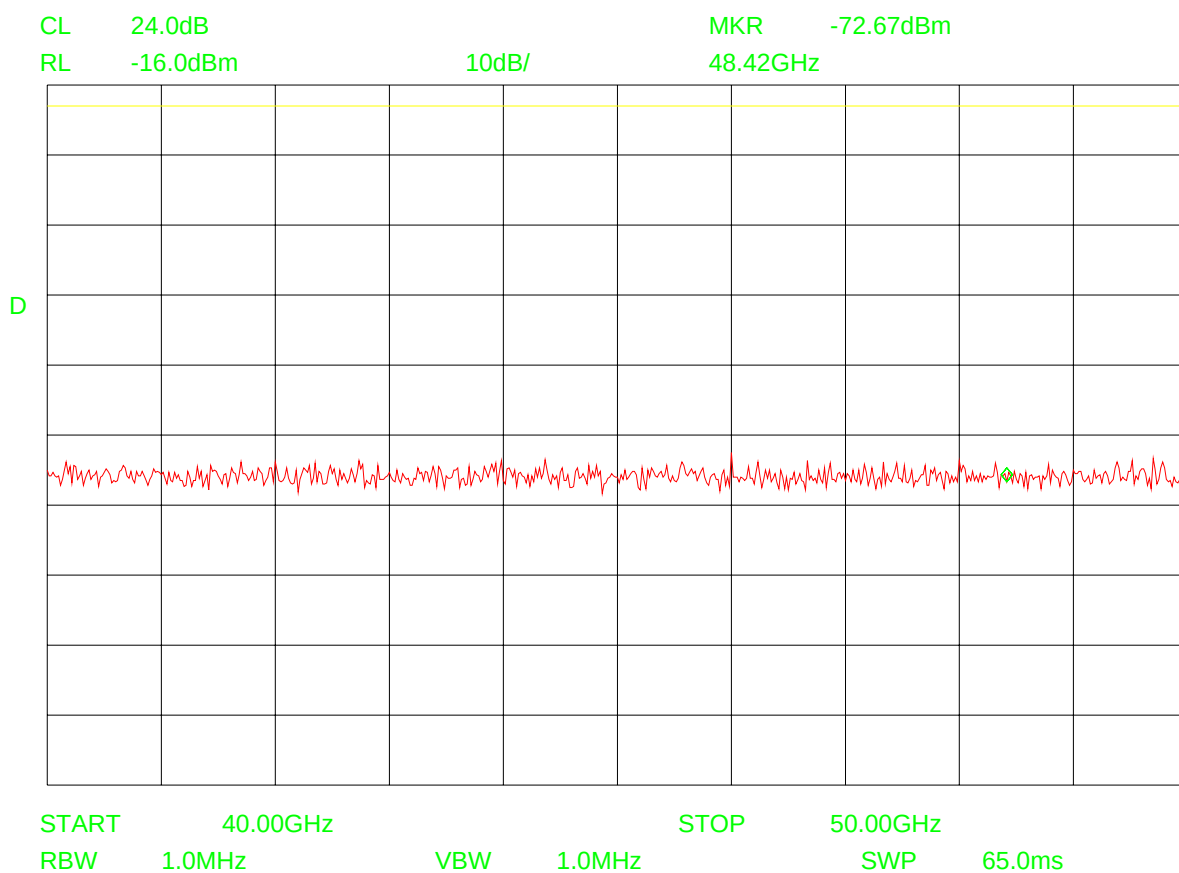
3 Plots

Plot 1

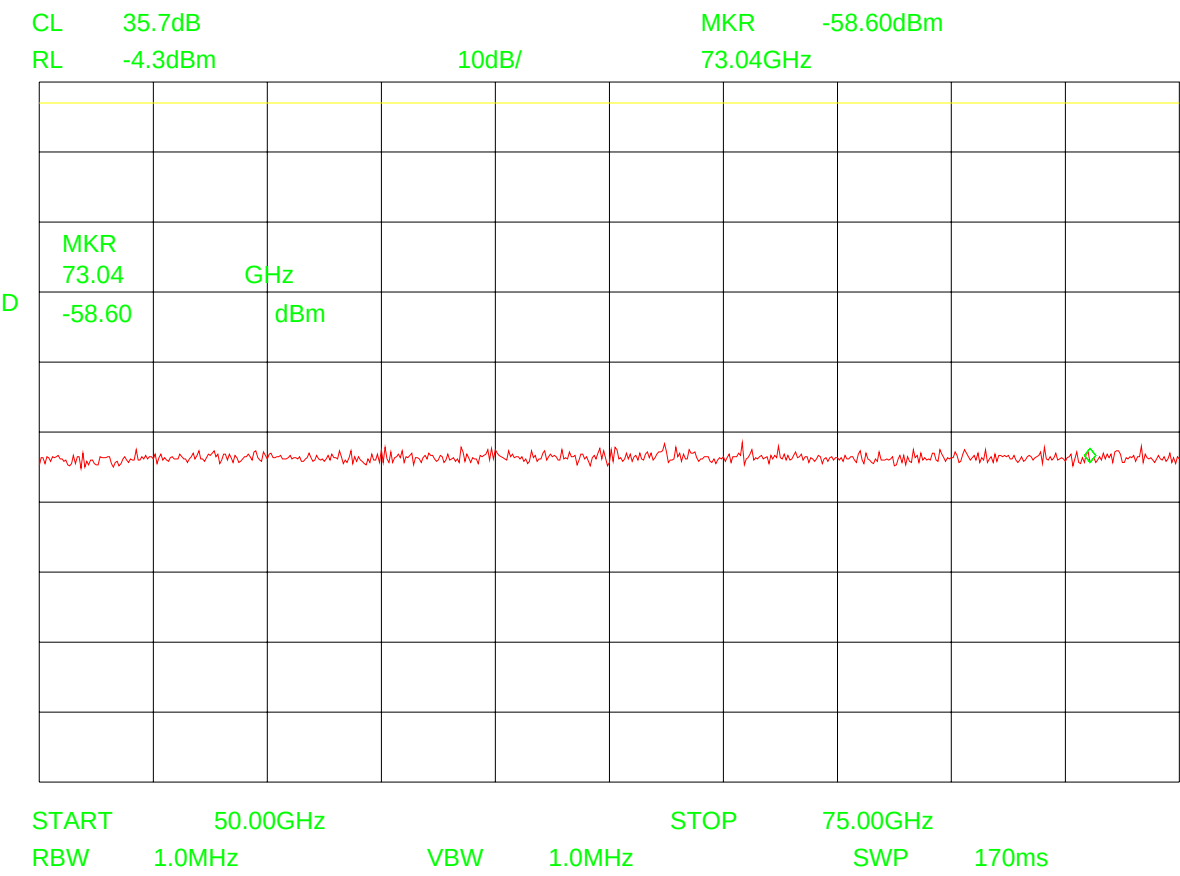


Plot 2

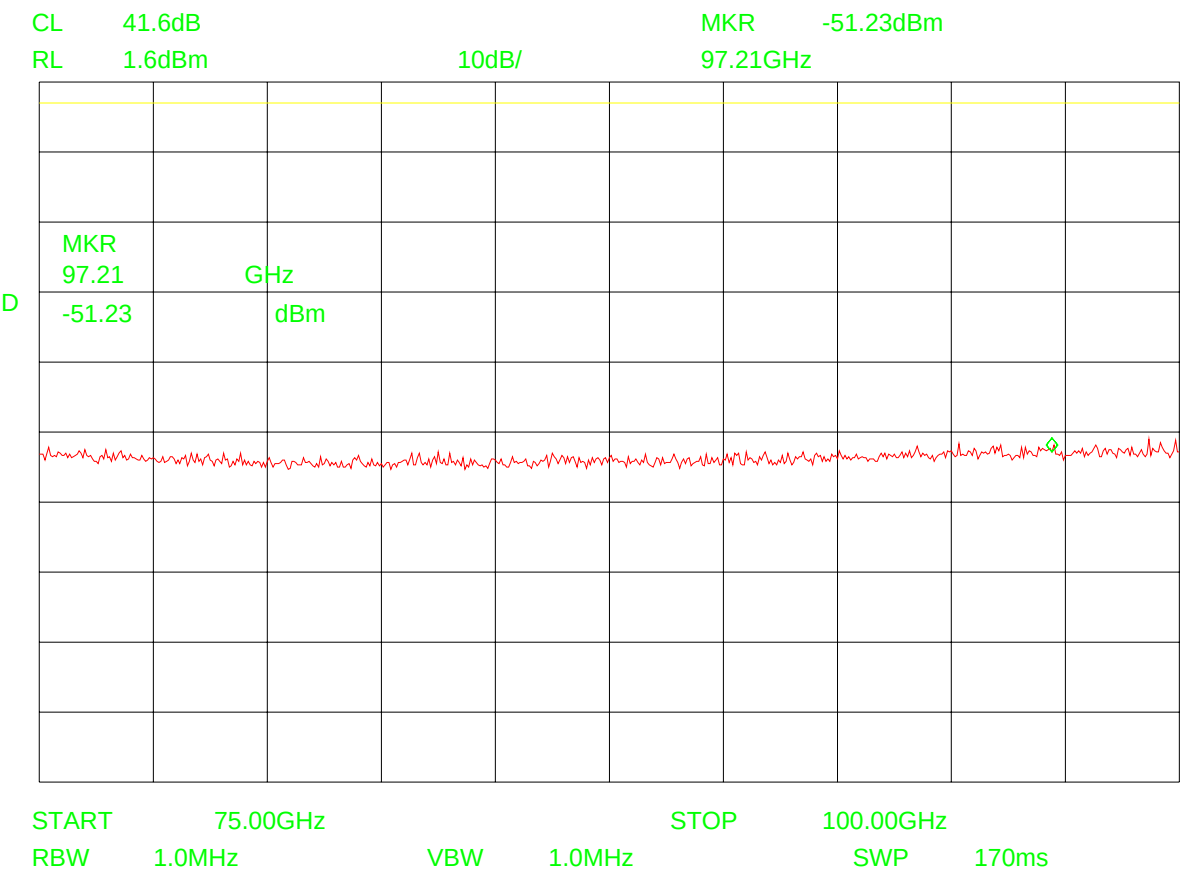


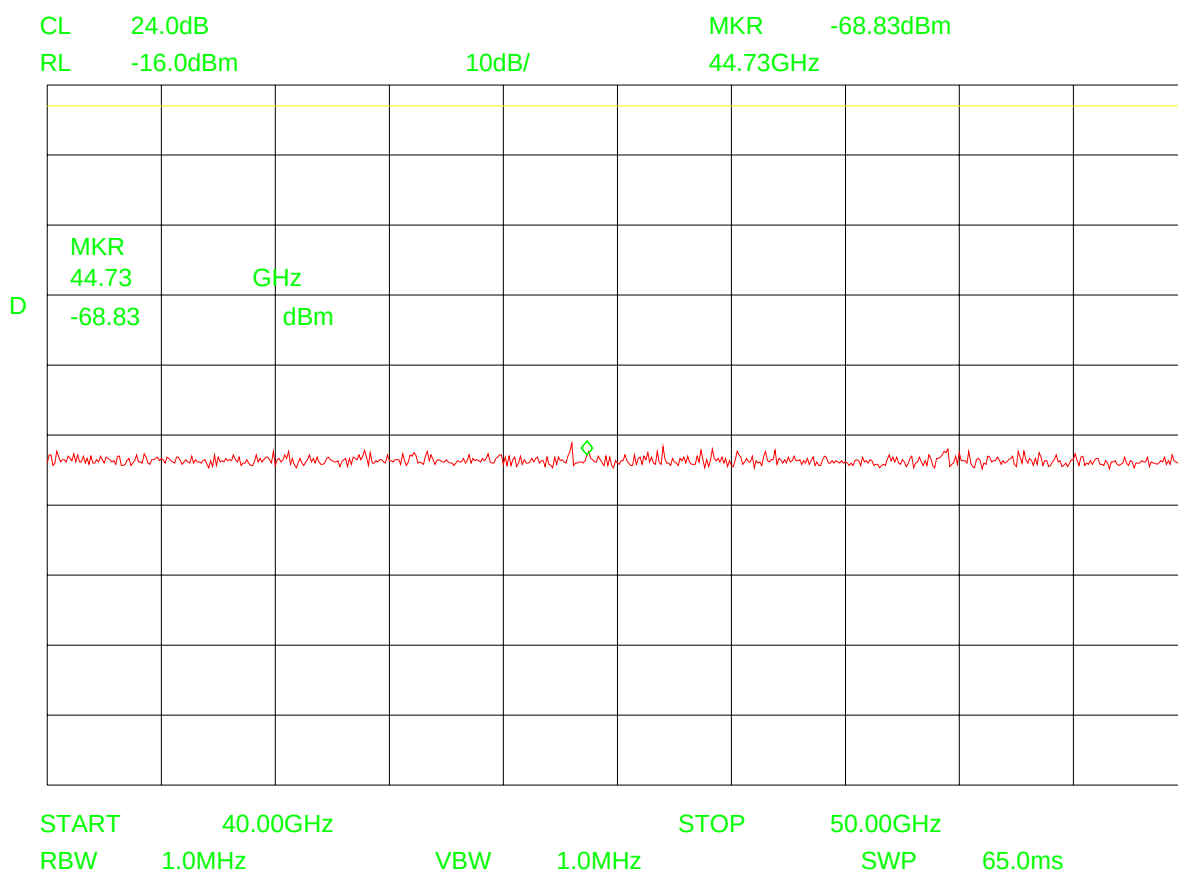


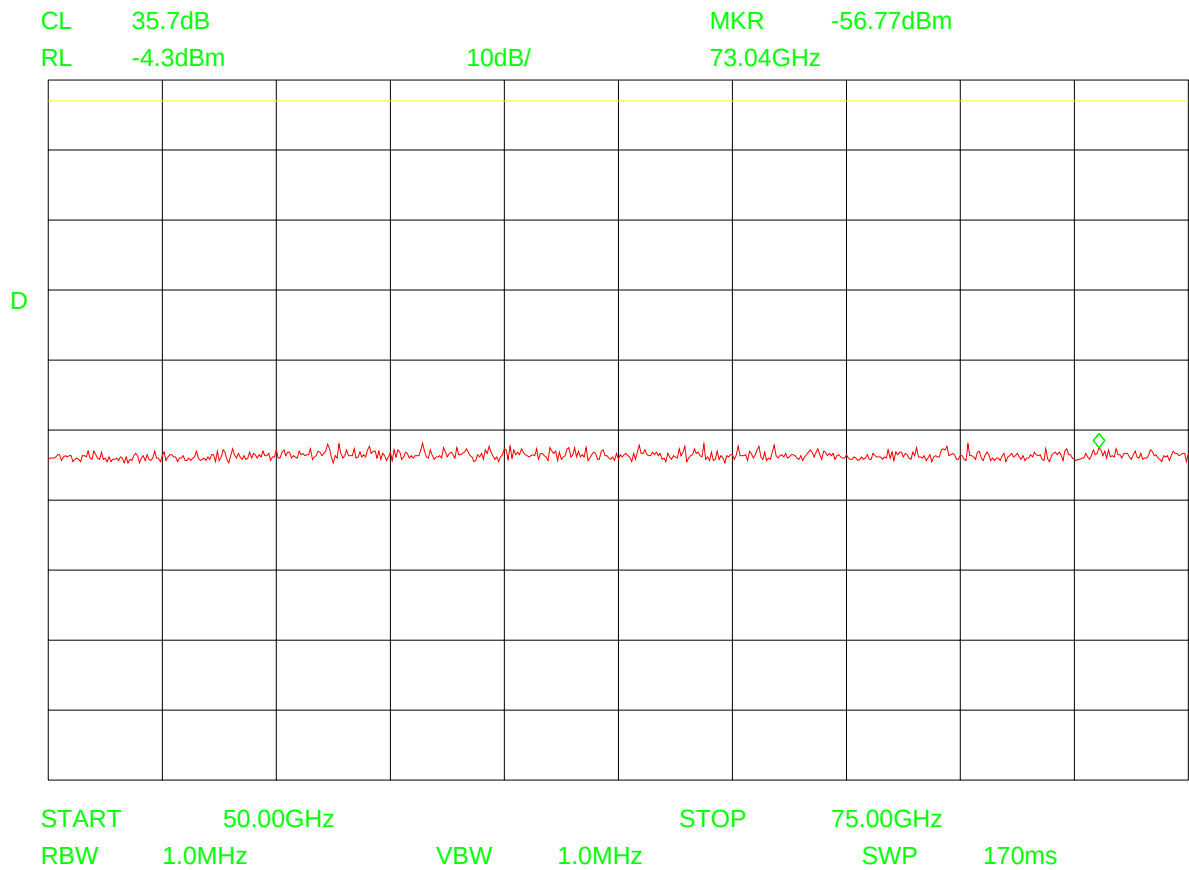
Plot 4



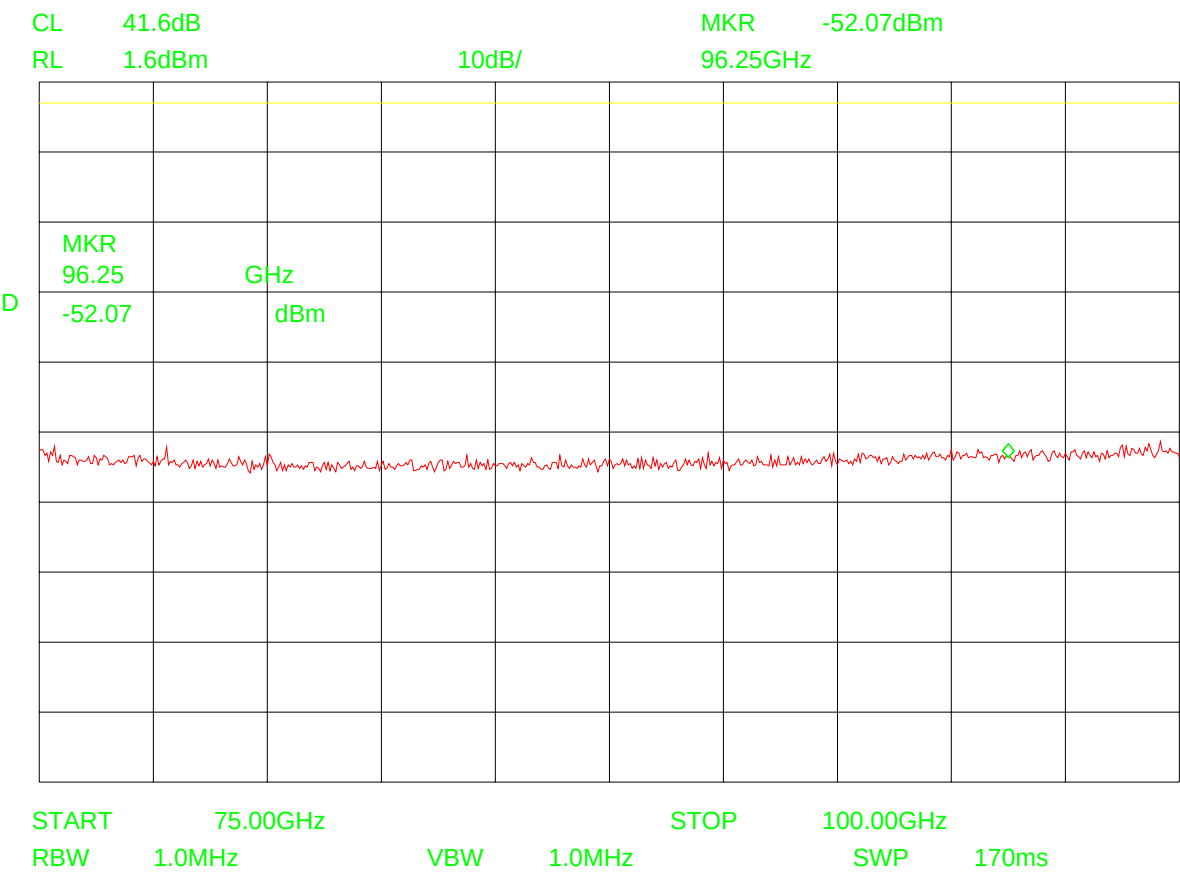
Plot 5

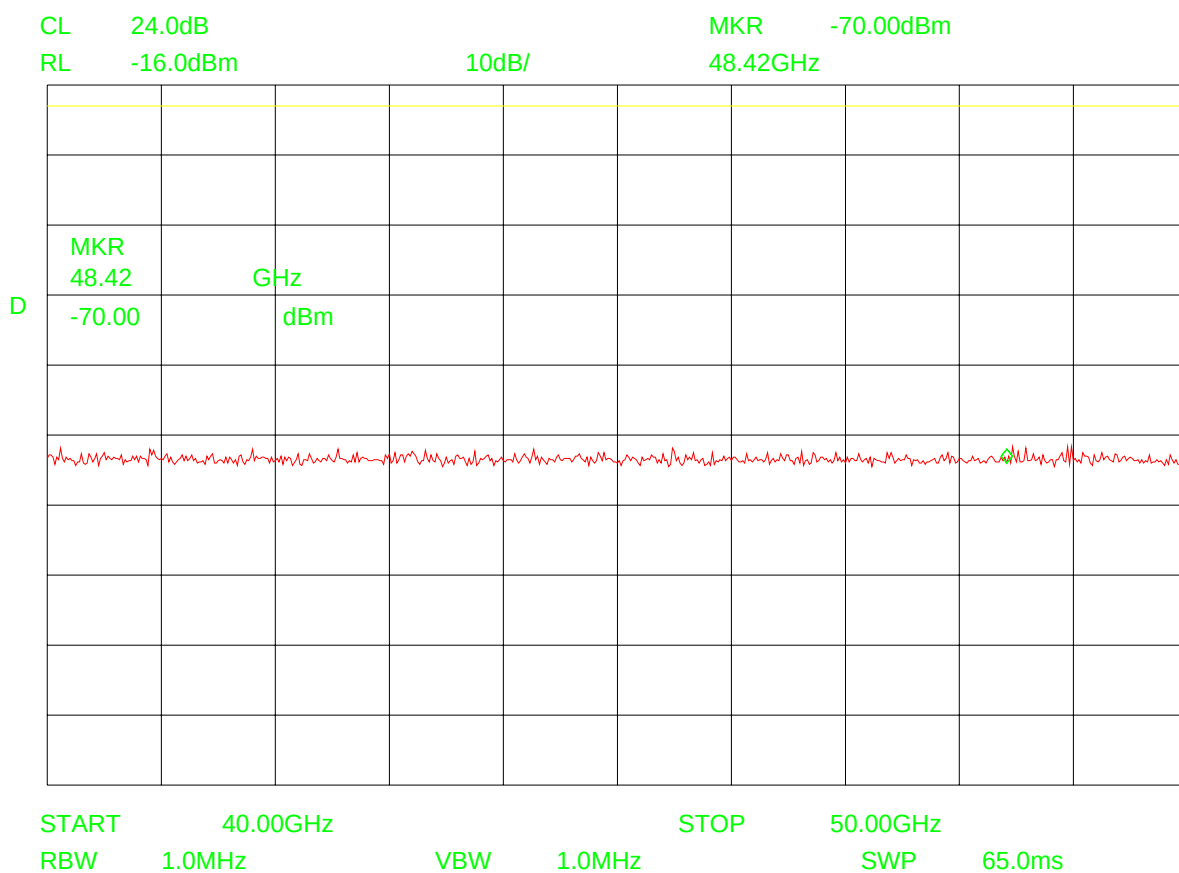




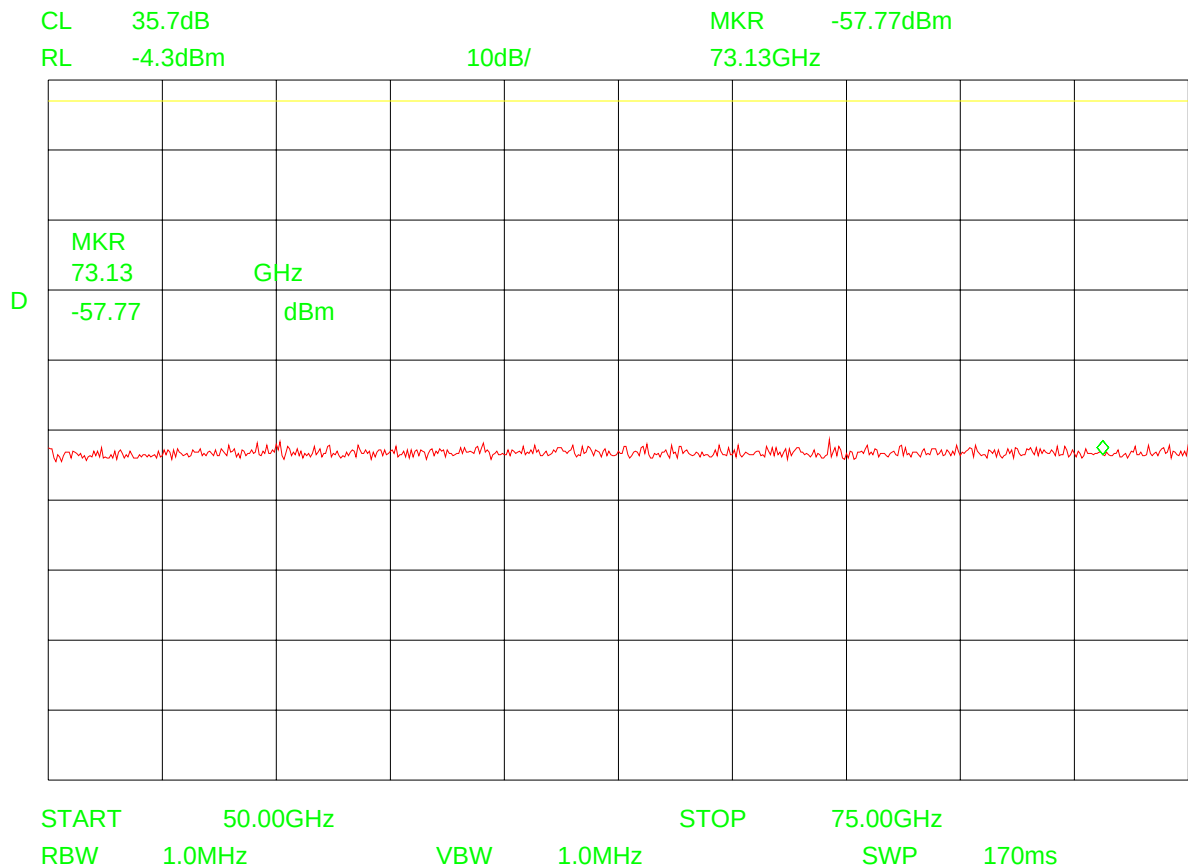


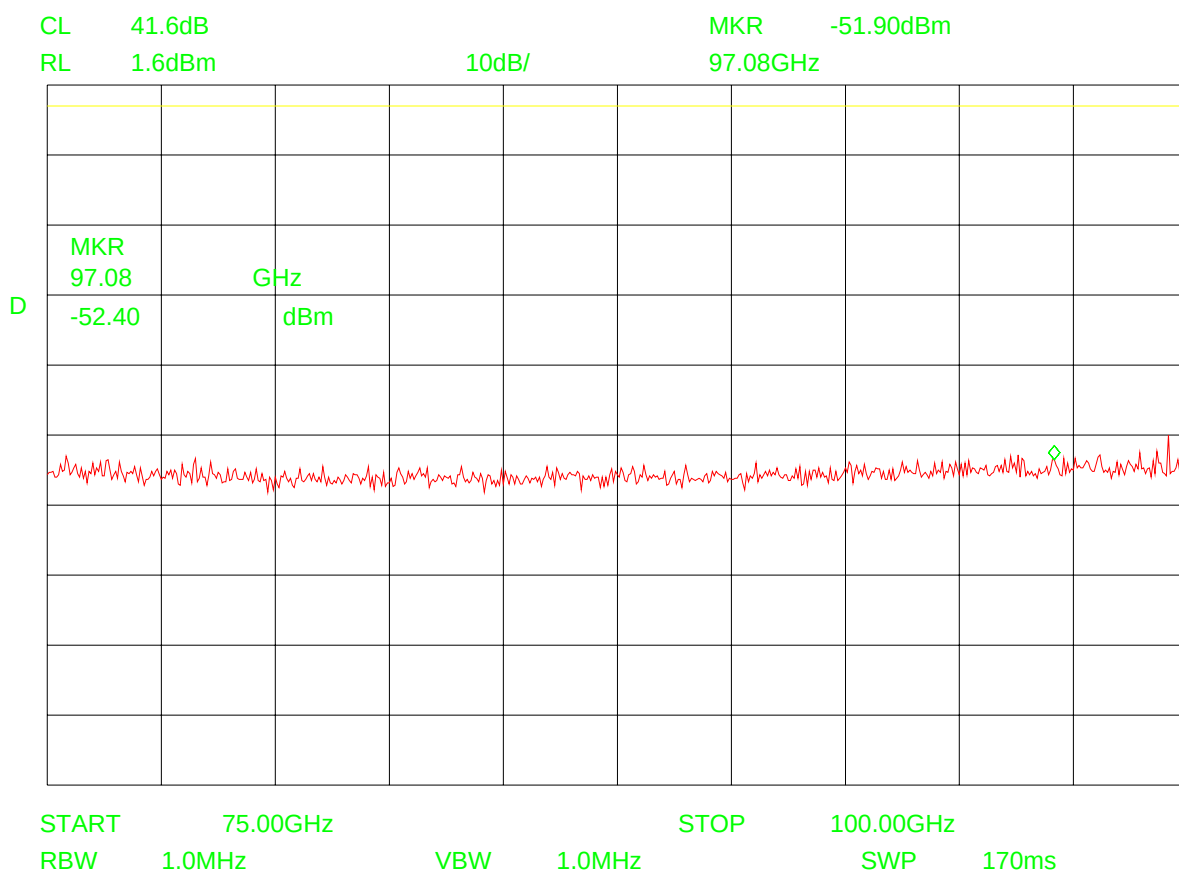
Plot 8

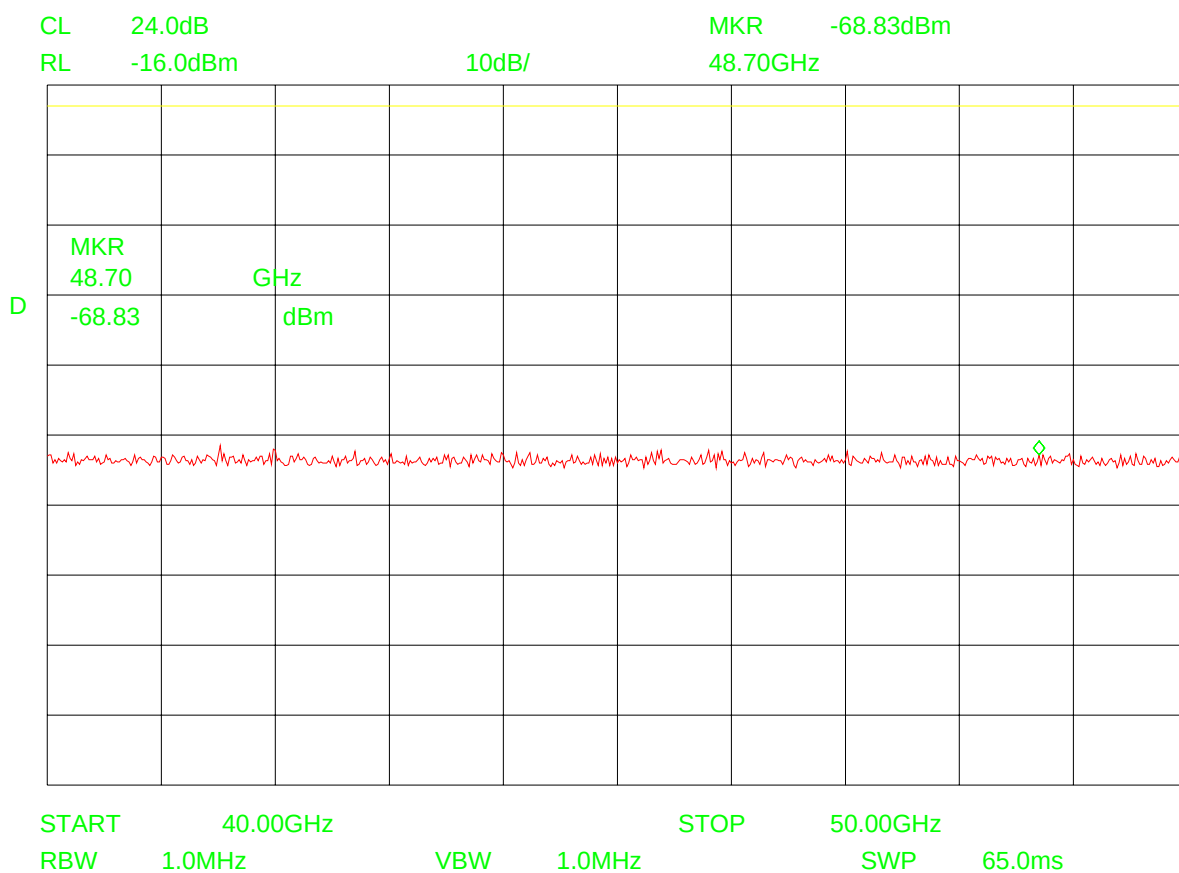


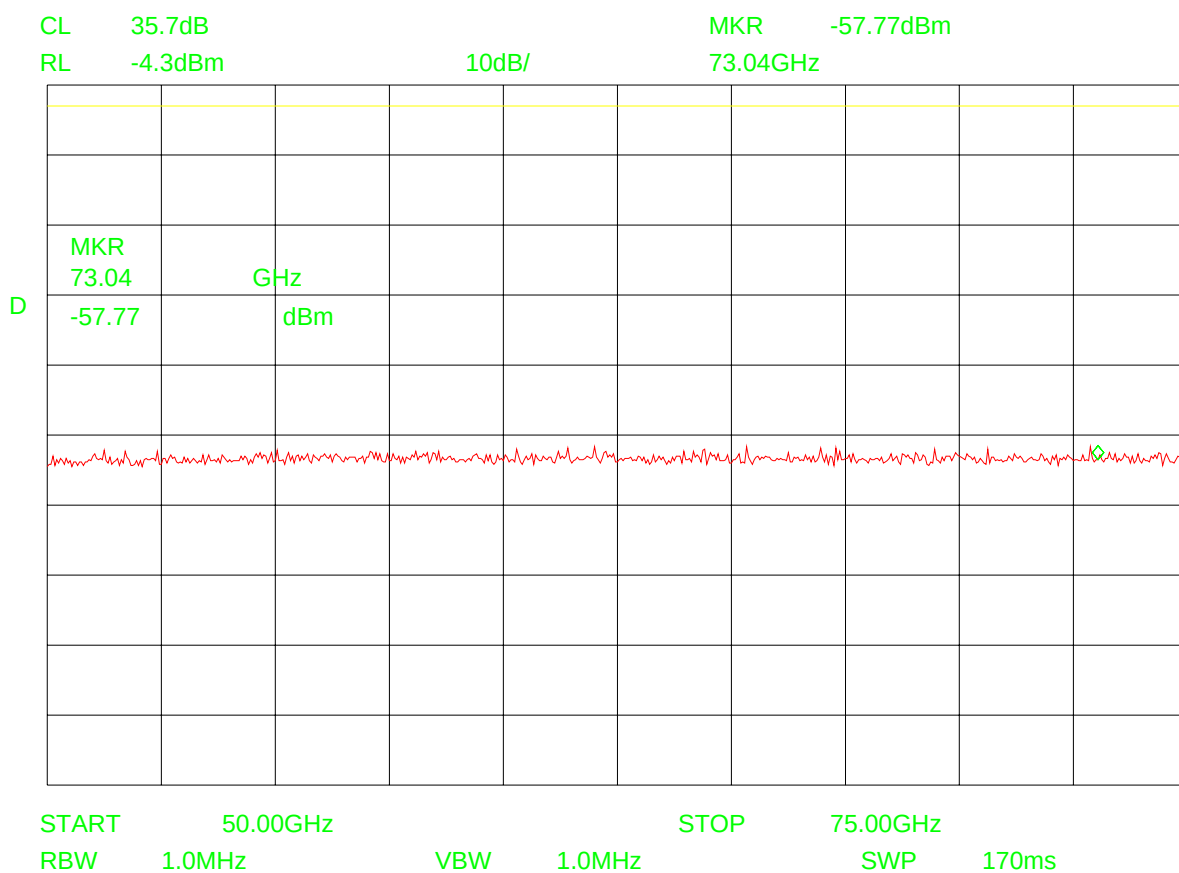


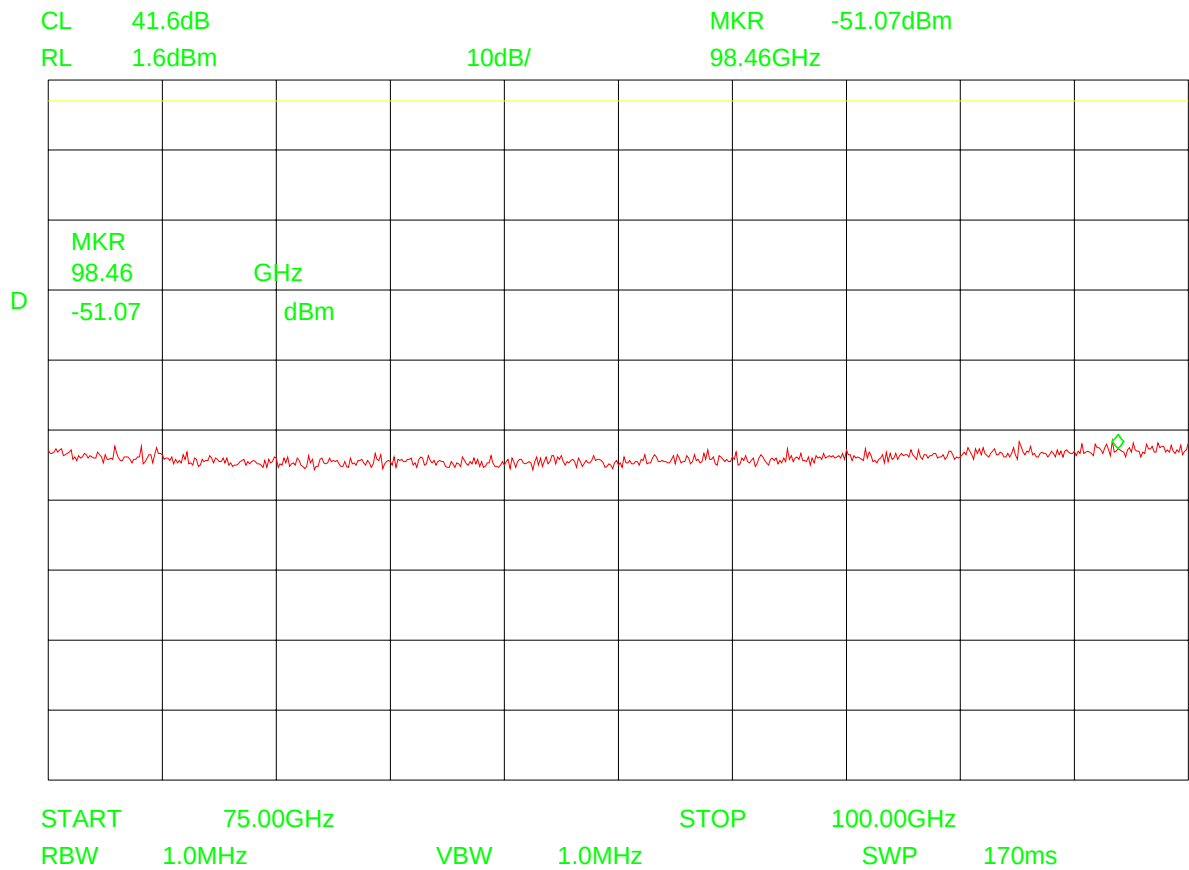
Plot 10



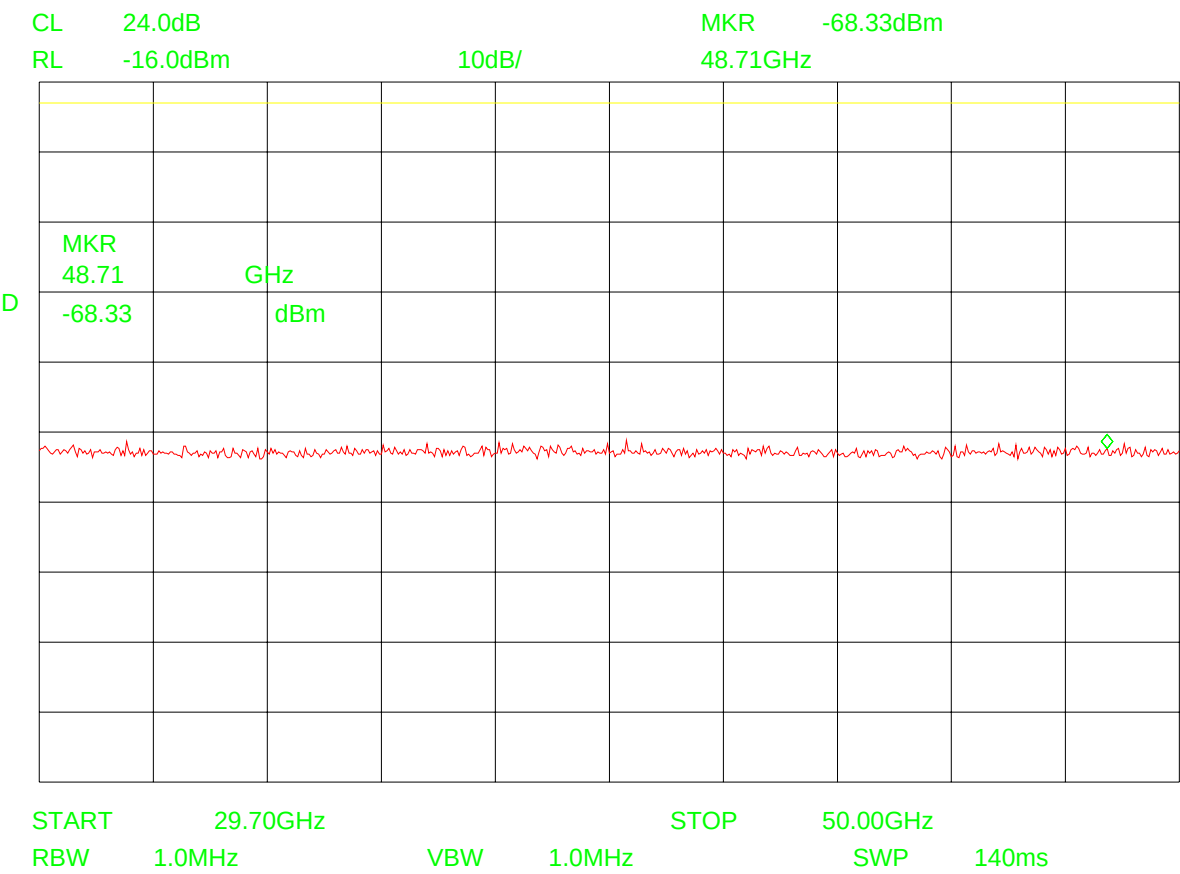




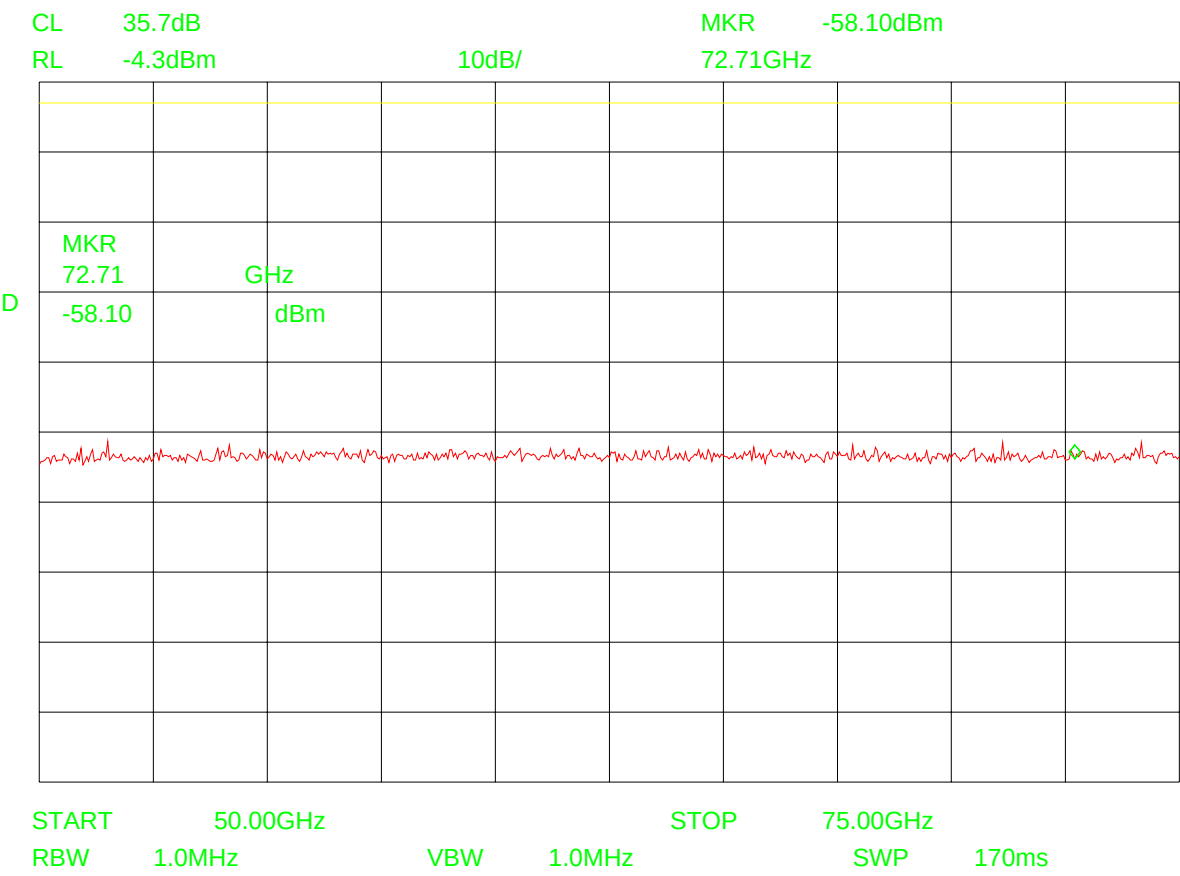


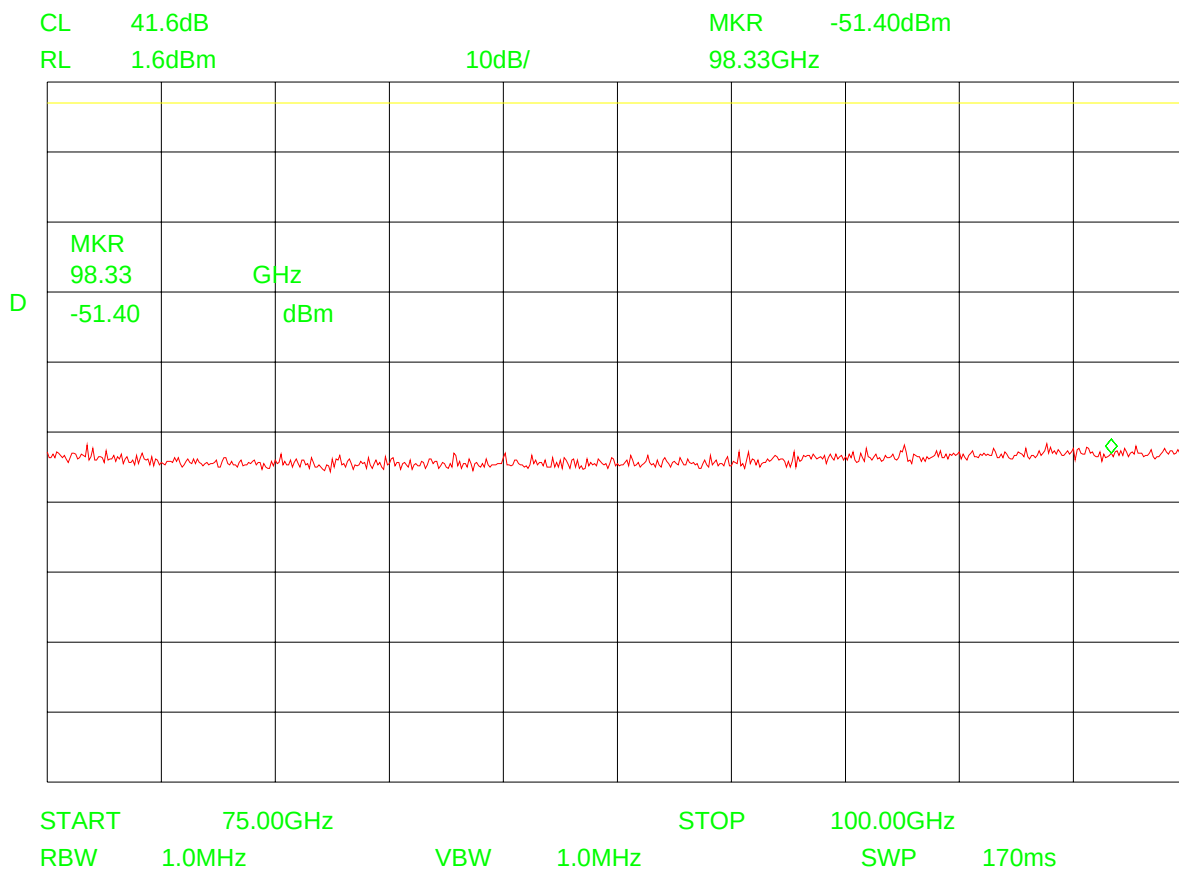


Plot 15

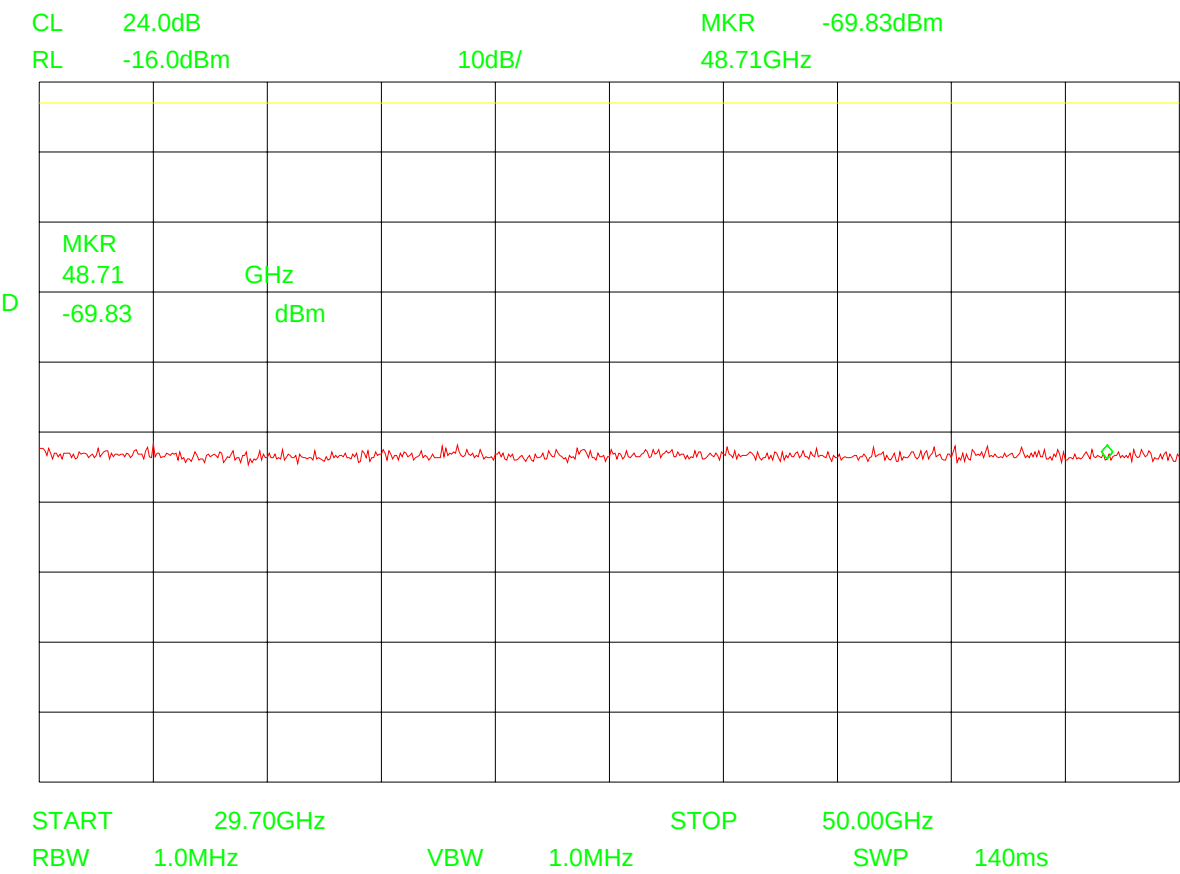


Plot 16

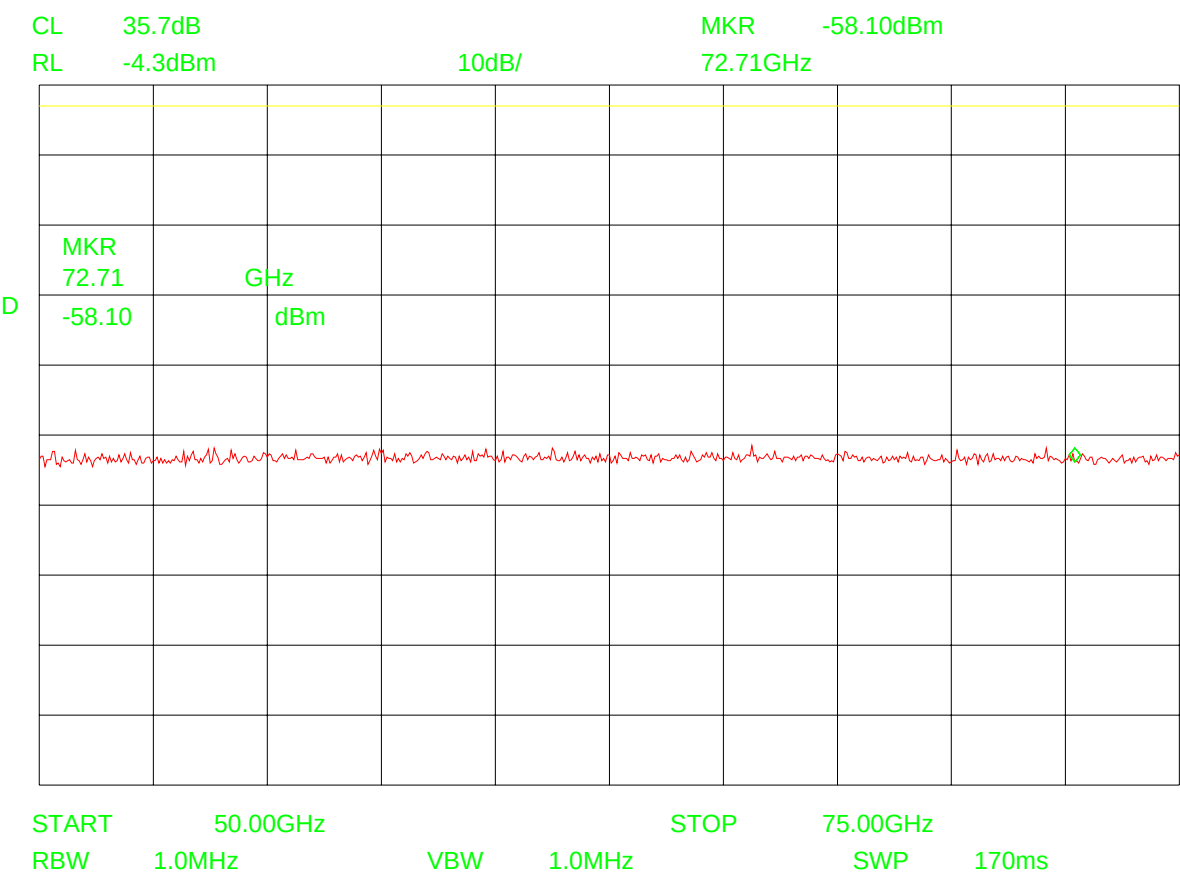




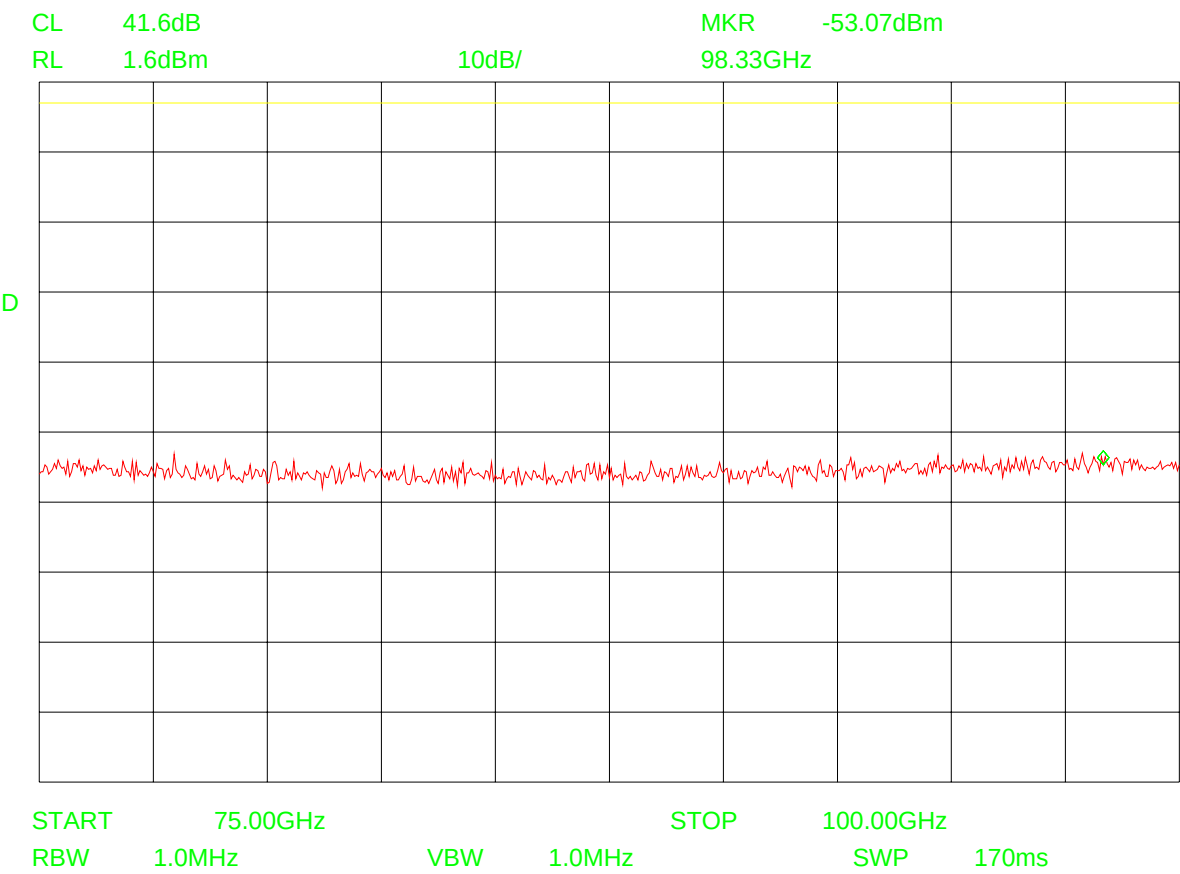
Plot 18



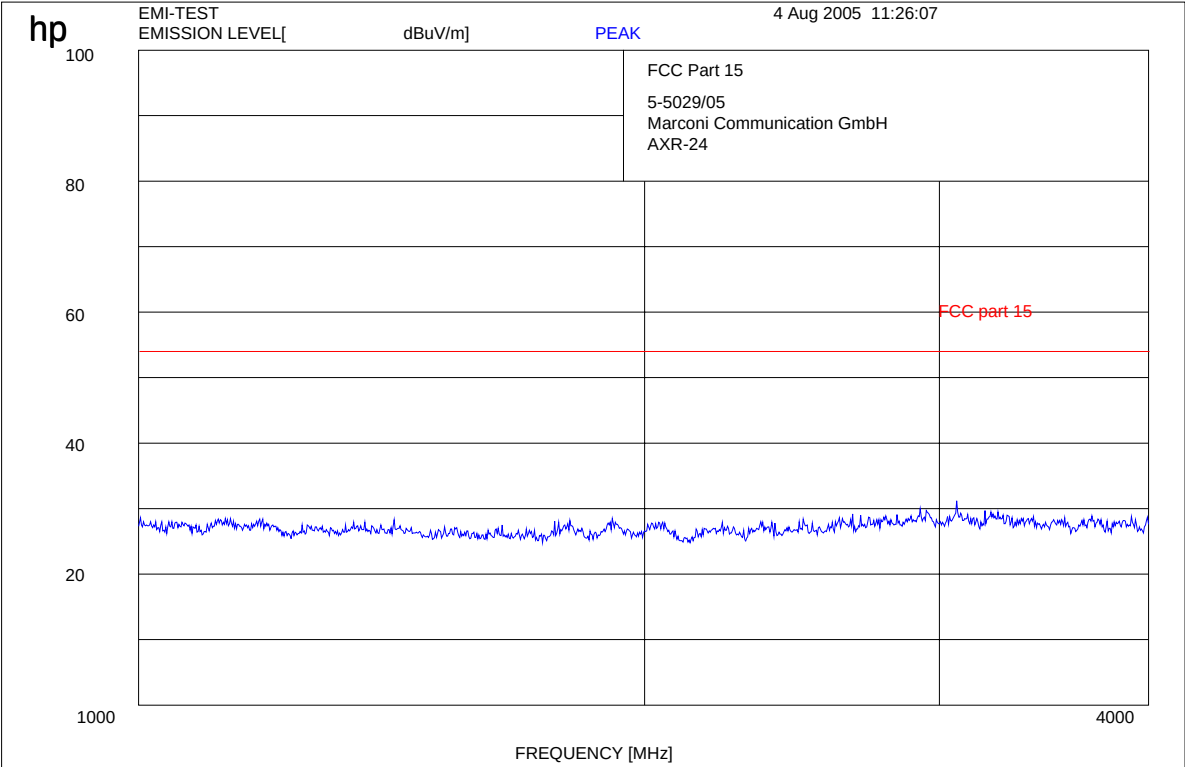
Plot 19



Plot 20

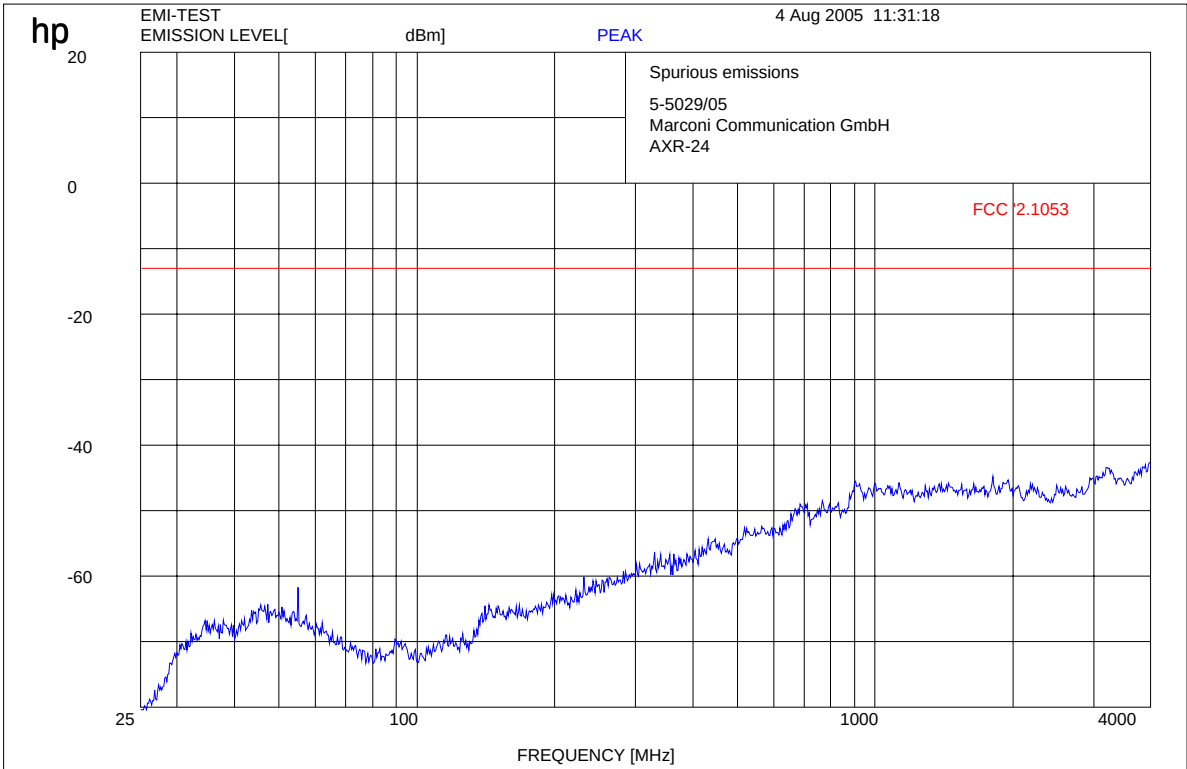


Plot 21



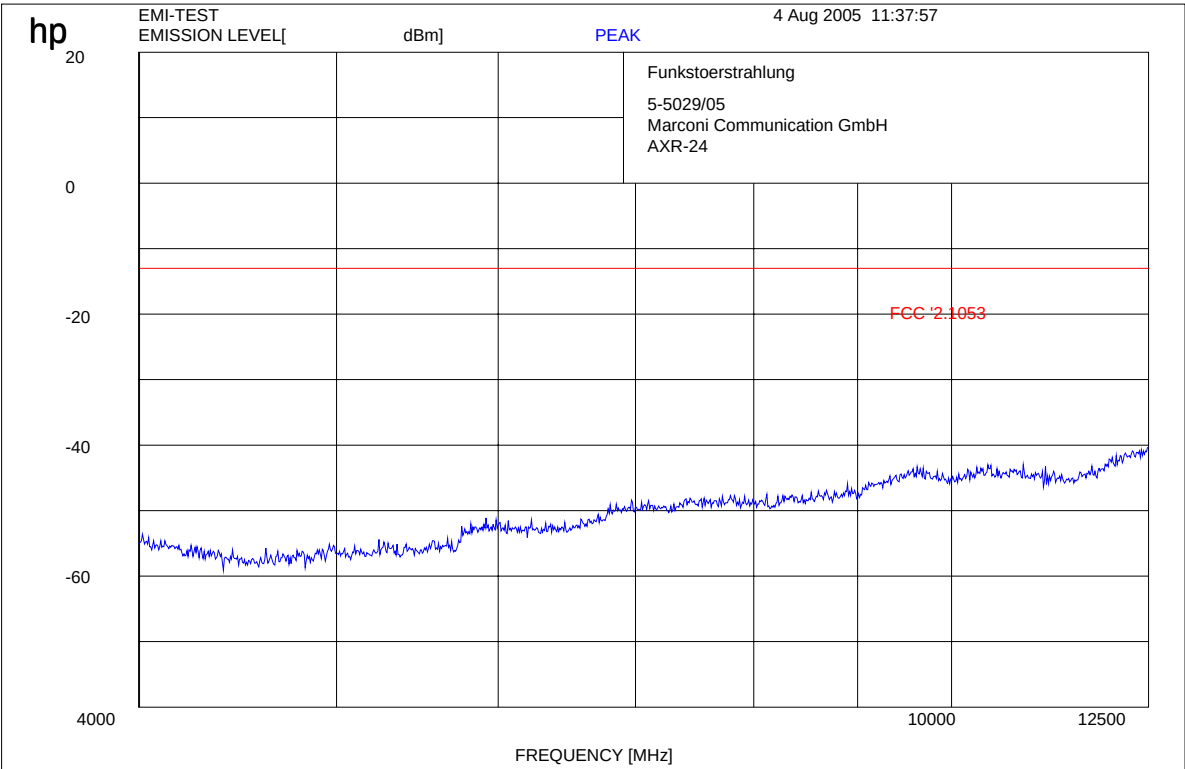
F ≥ 1 GHz : RBW / VBW 1.0 MHz

Plot 22



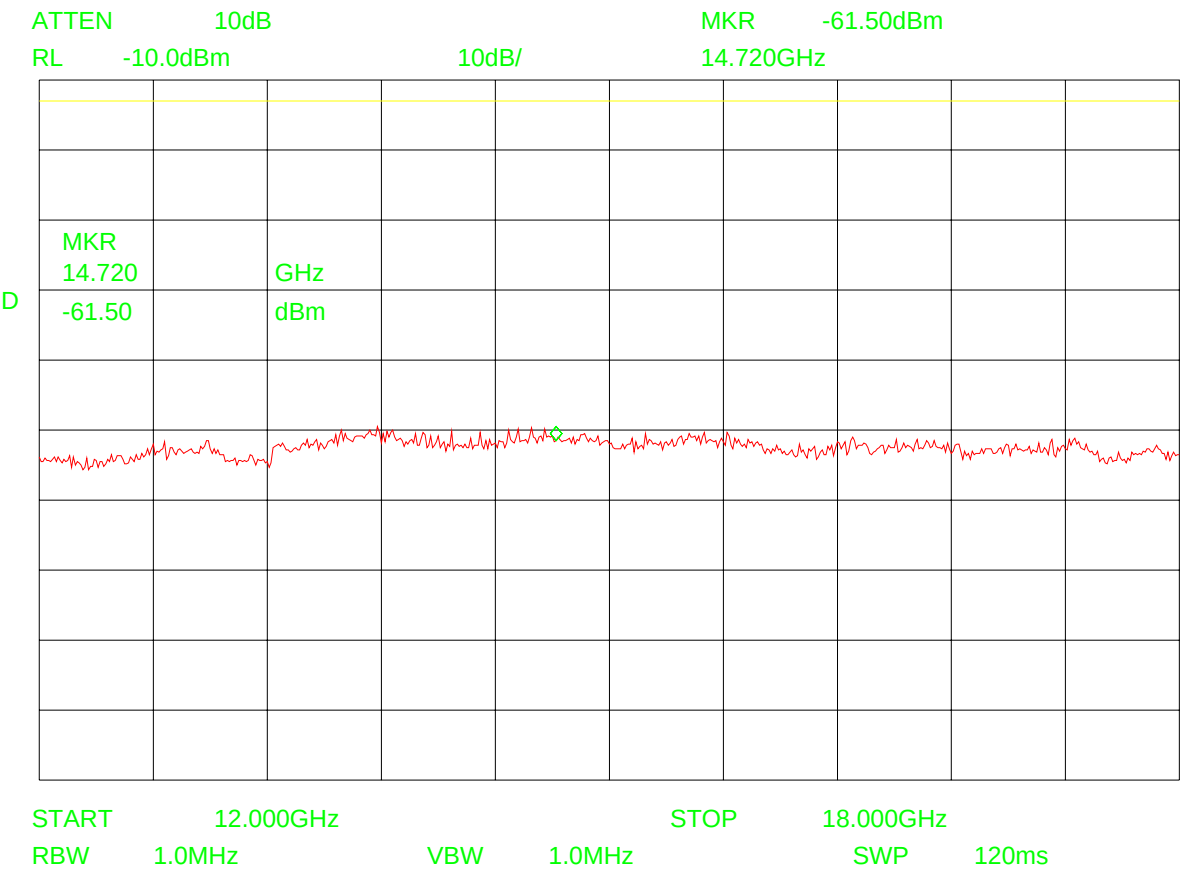
F < 1 GHz : RBW / VBW: 100 kHz
F ≥ 1 GHz : RBW / VBW 1.0 MHz

Plot 23

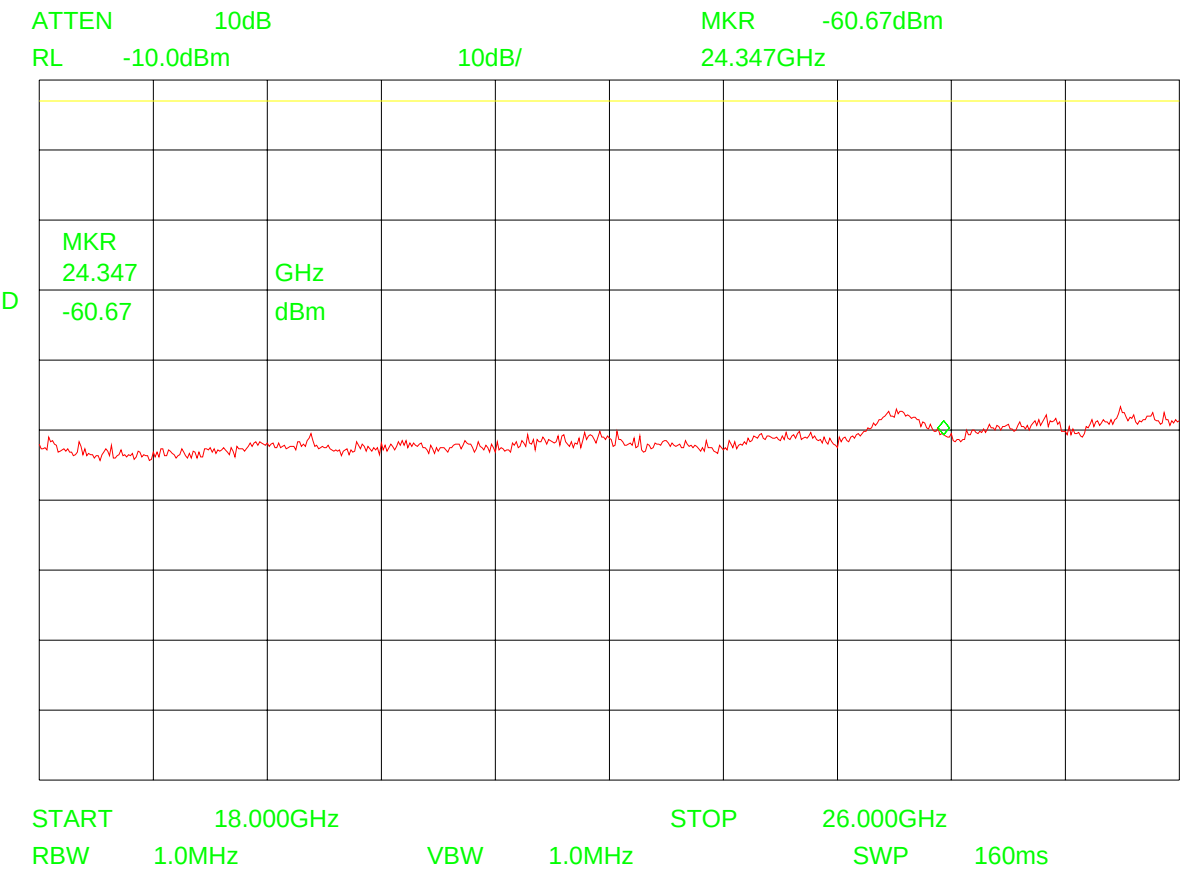


F ≥ 1 GHz : RBW / VBW 1.0 MHz

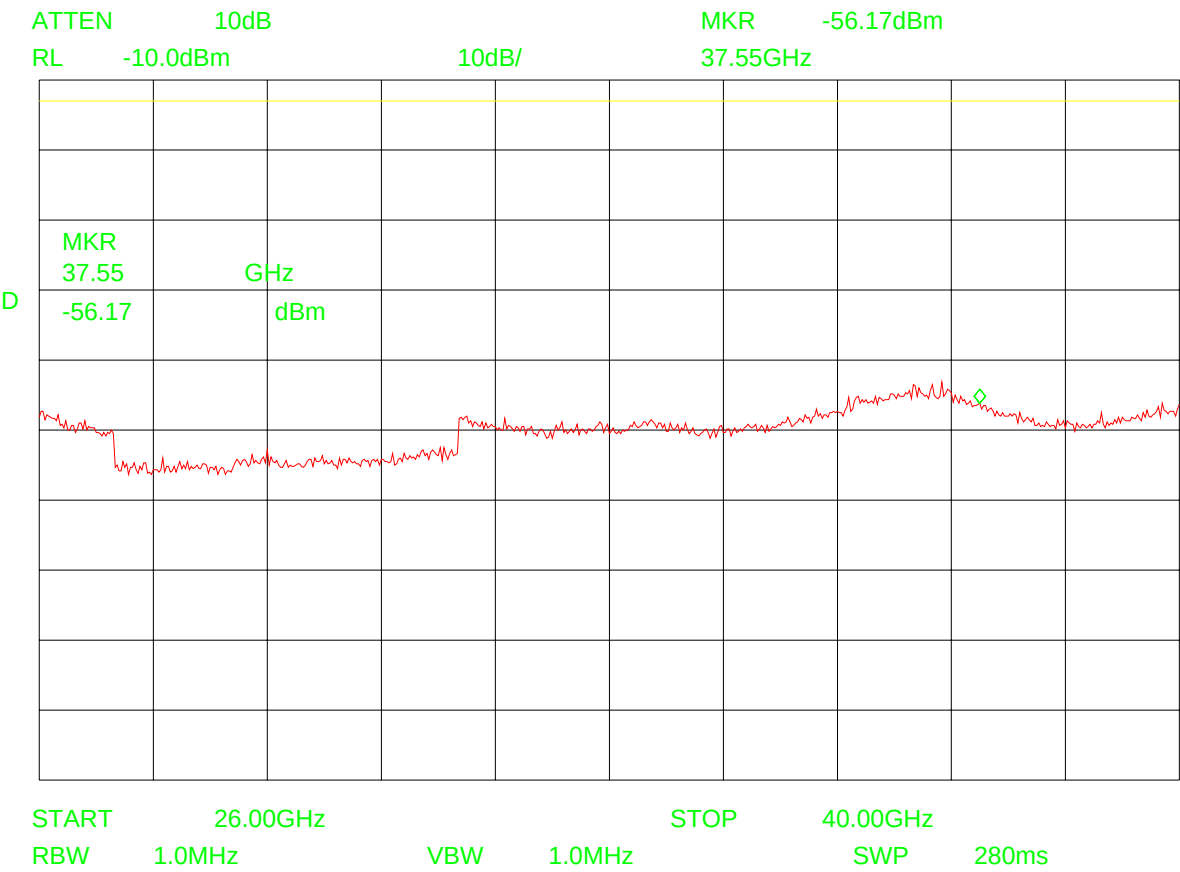
Plot 24

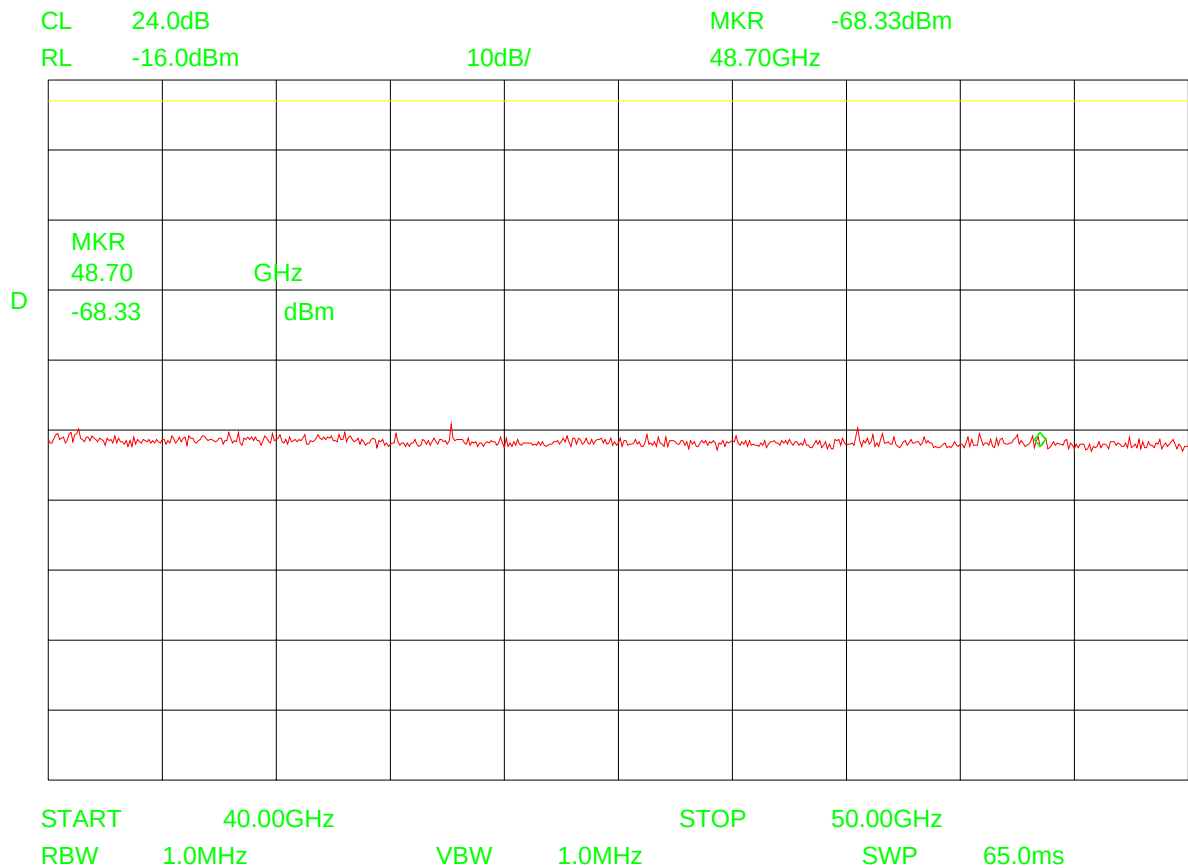


Plot 25

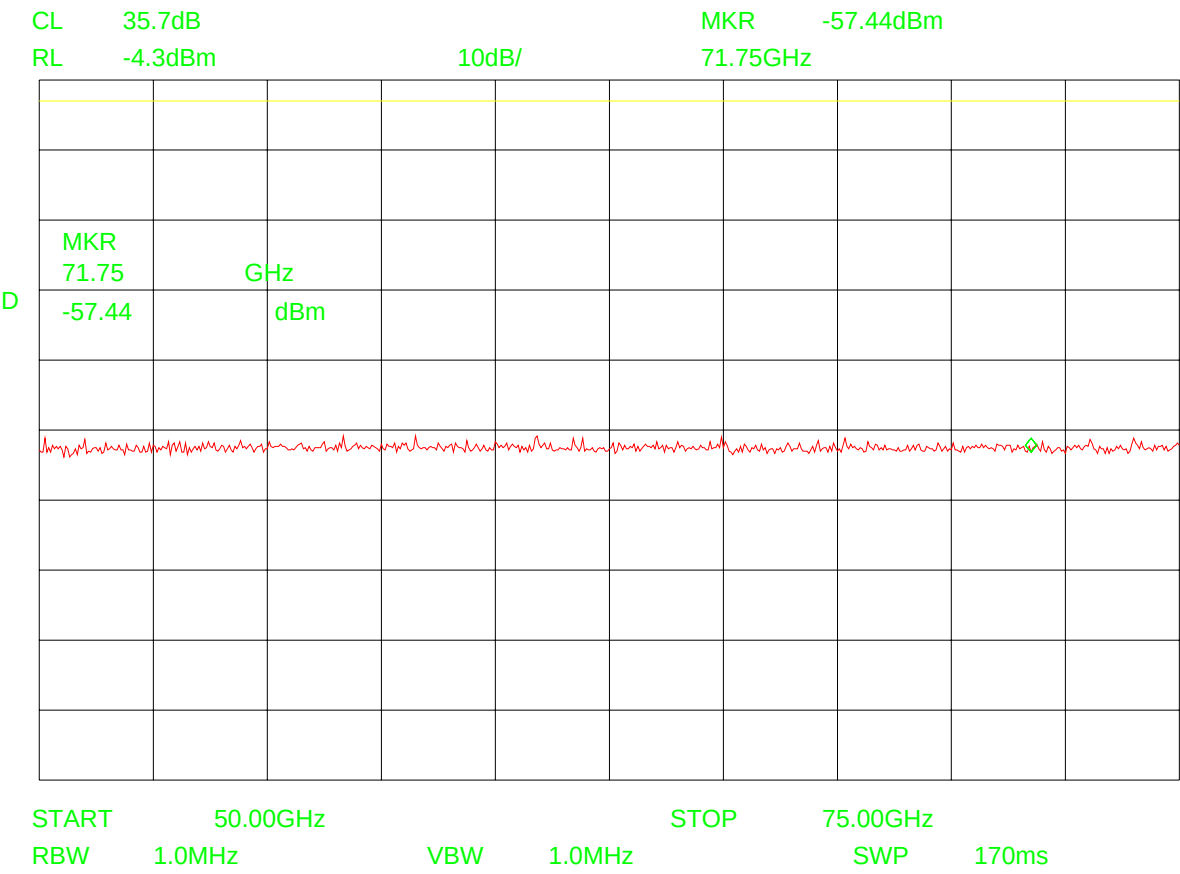


Plot 26

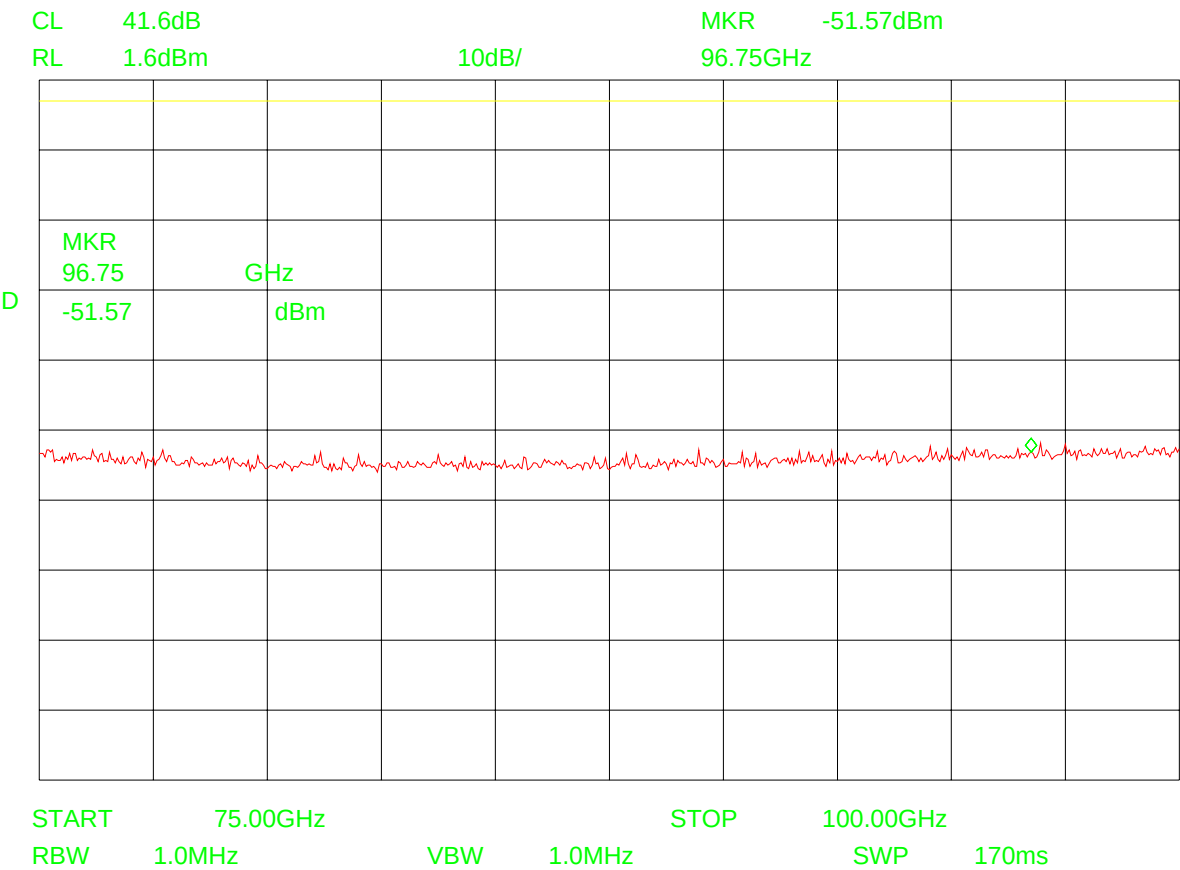




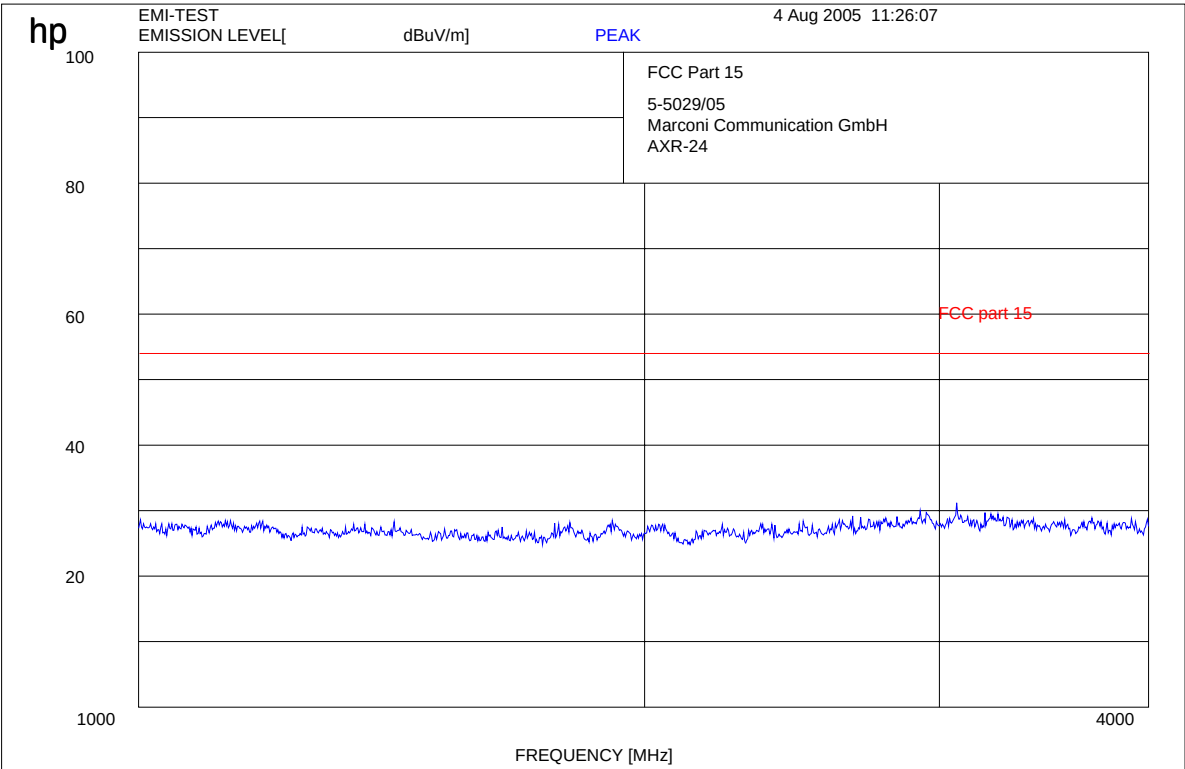
Plot 28



Plot 29

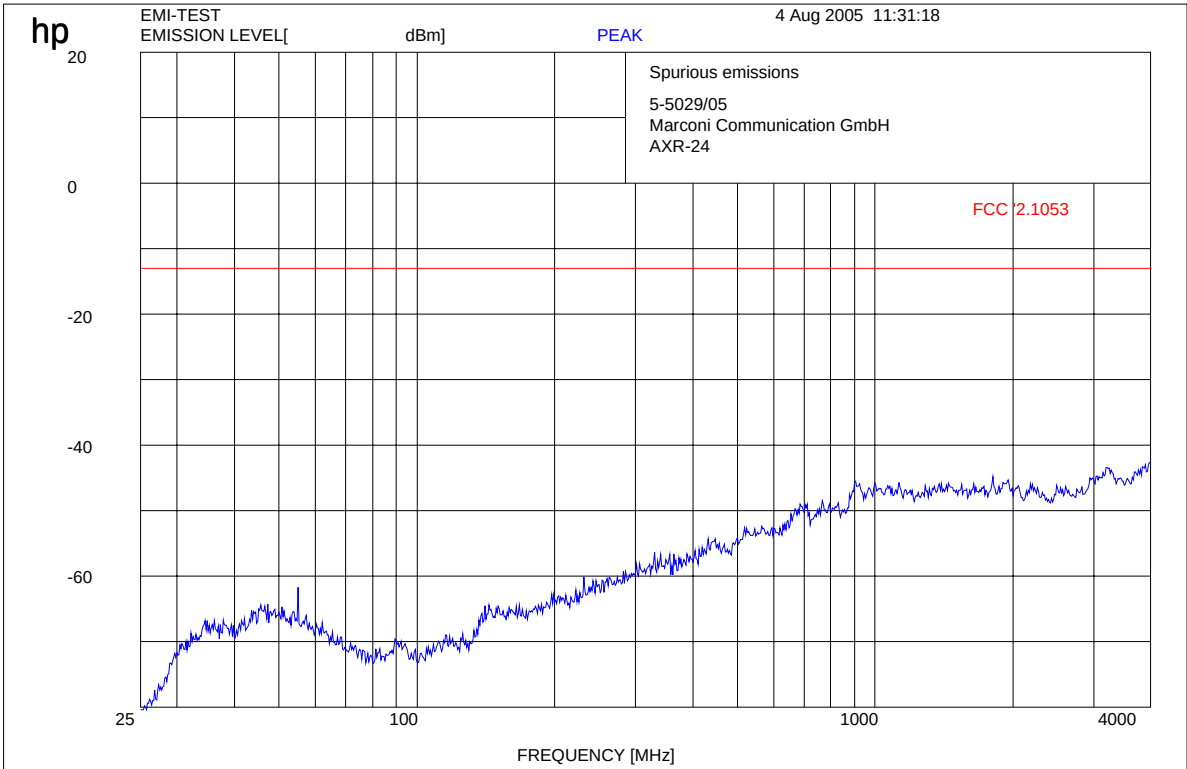


Plot 30



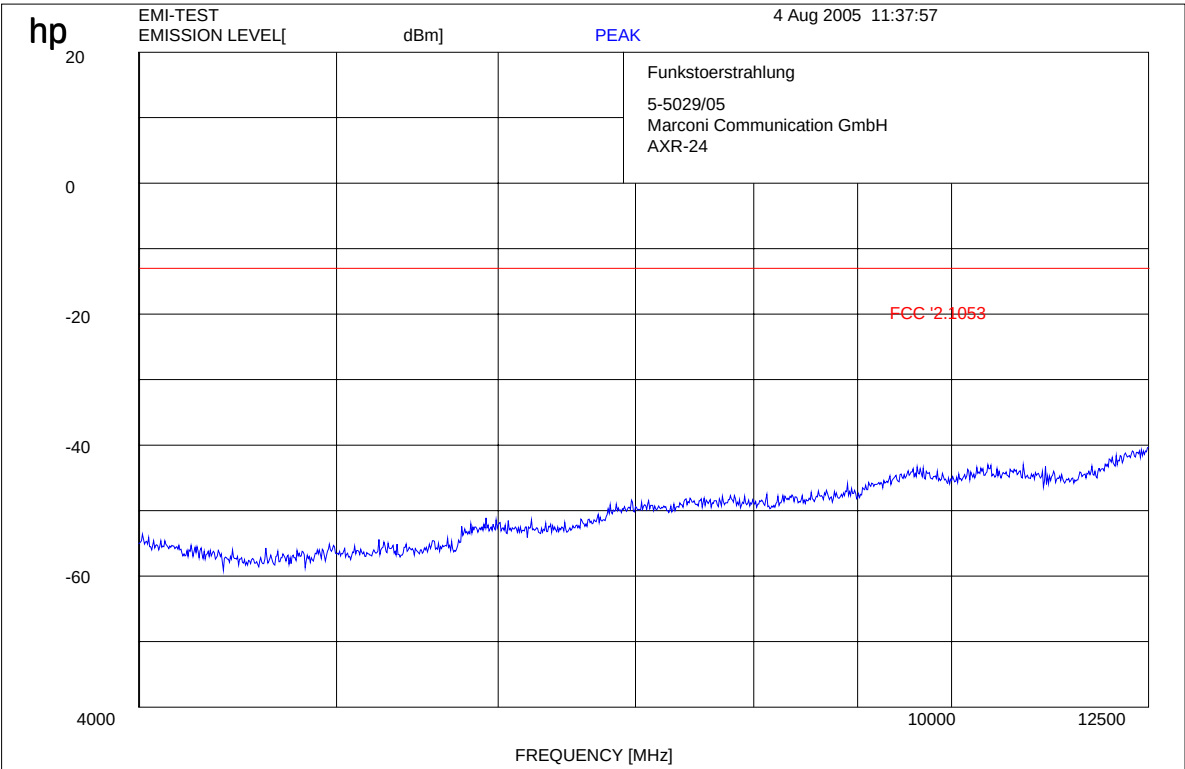
F ≥ 1 GHz : RBW / VBW 1.0 MHz

Plot 31



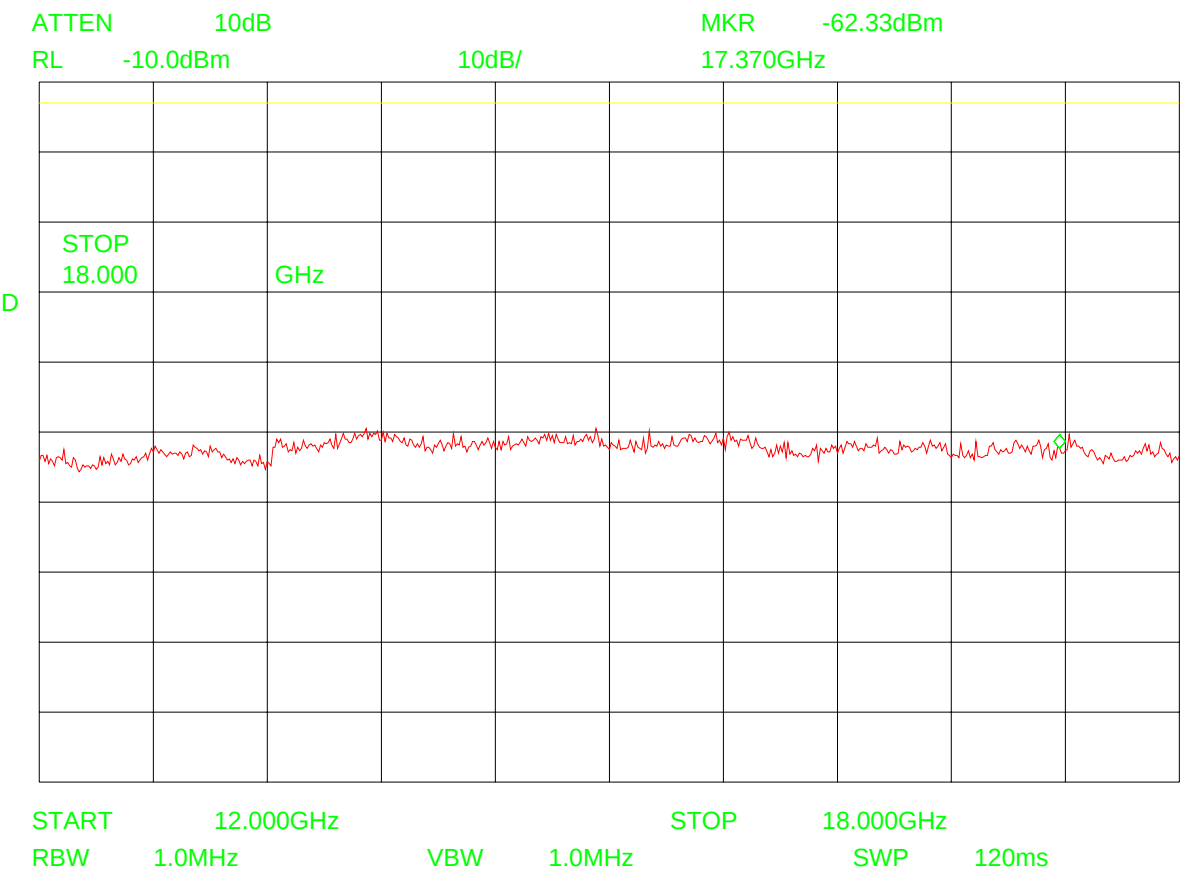
F < 1 GHz : RBW / VBW: 100 kHz
F ≥ 1 GHz : RBW / VBW 1.0 MHz

Plot 32

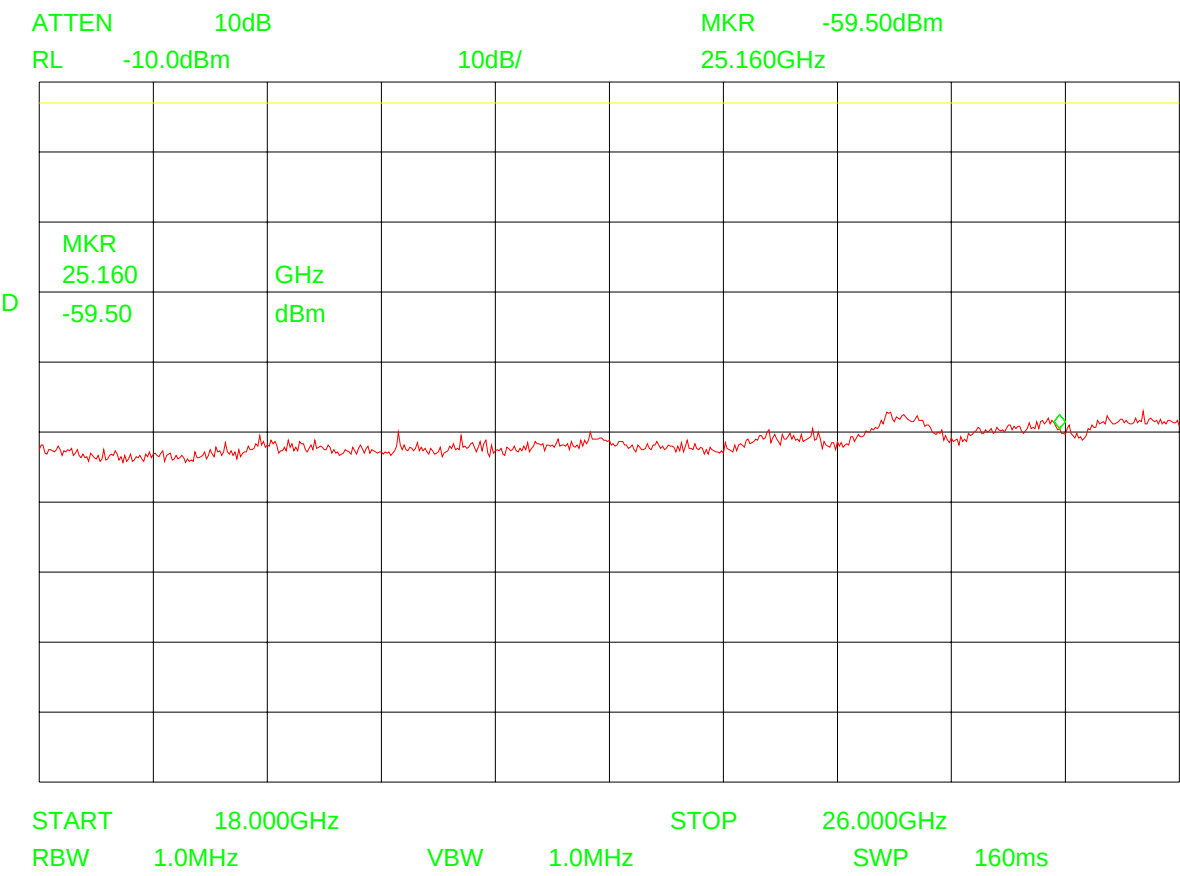


F ≥ 1 GHz : RBW / VBW 1.0 MHz

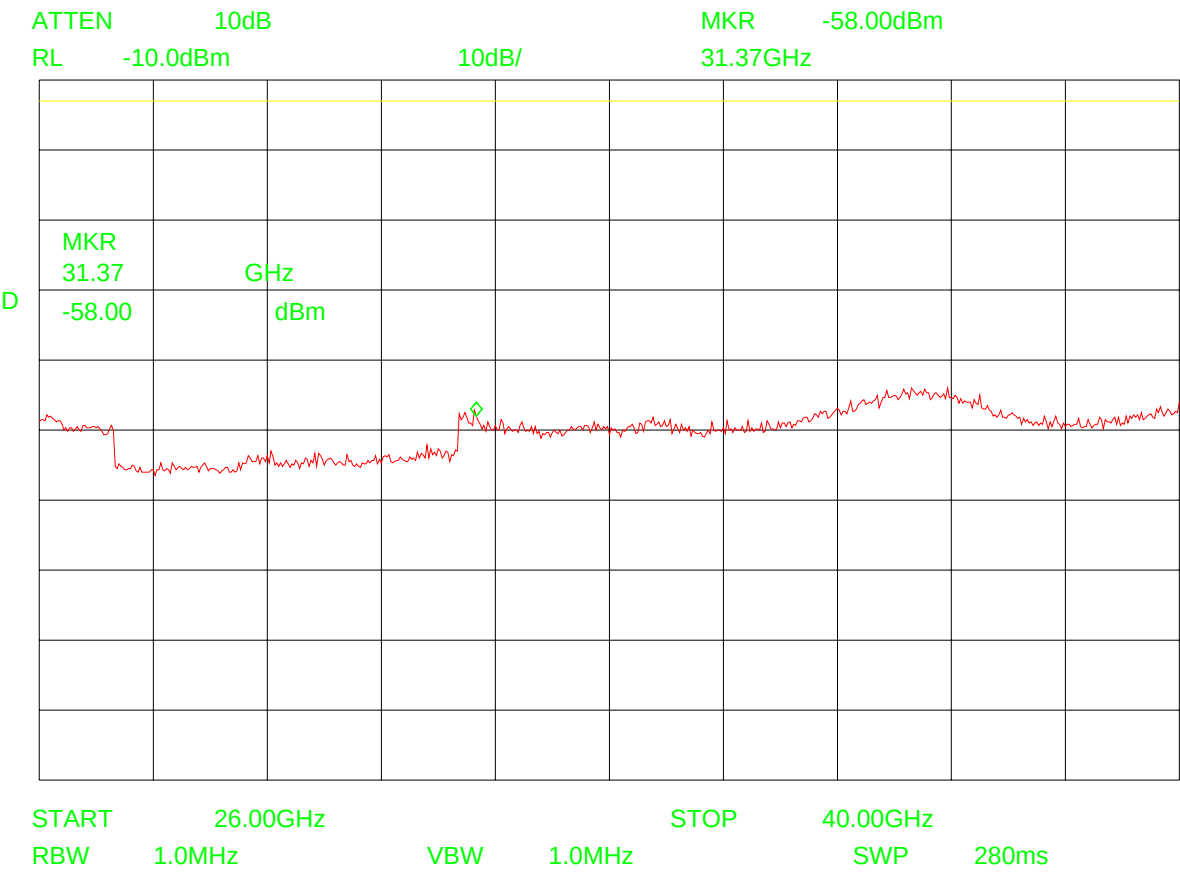
Plot 33



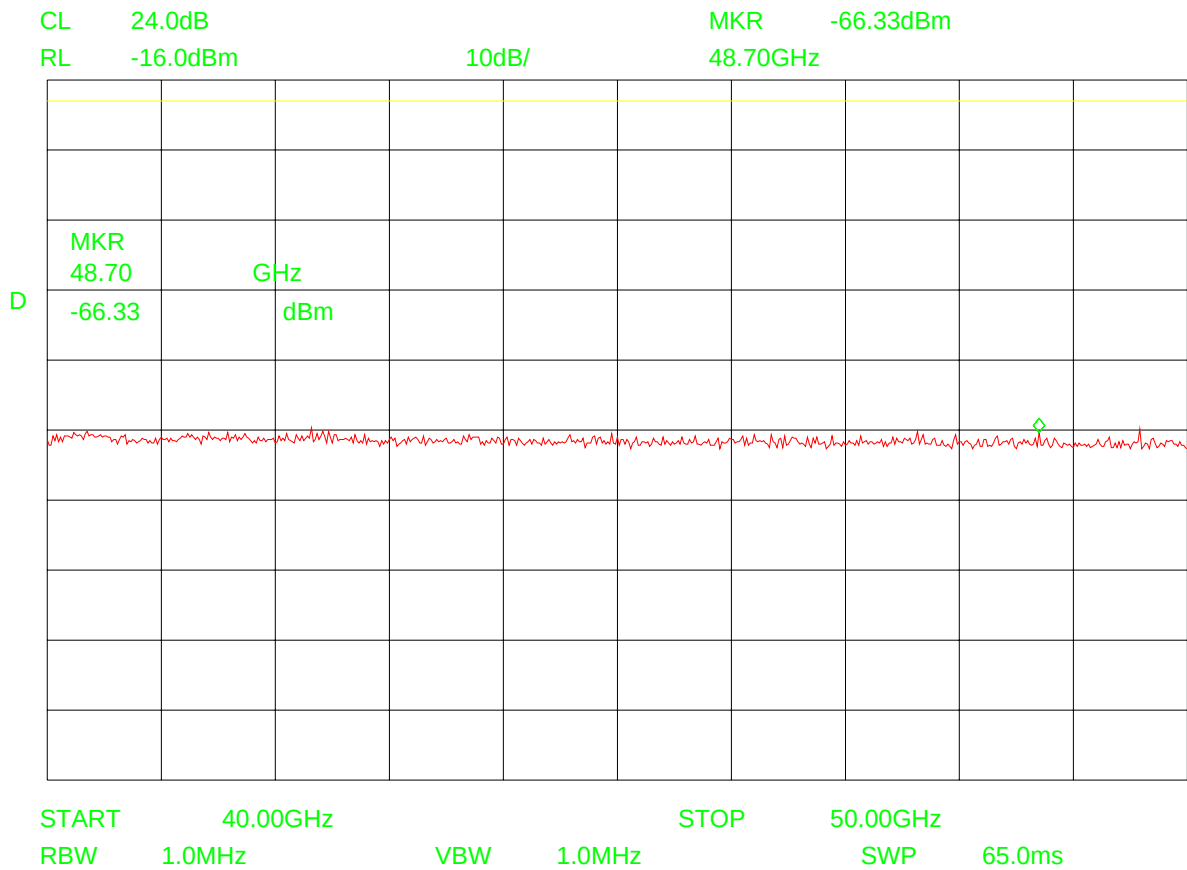
Plot 34

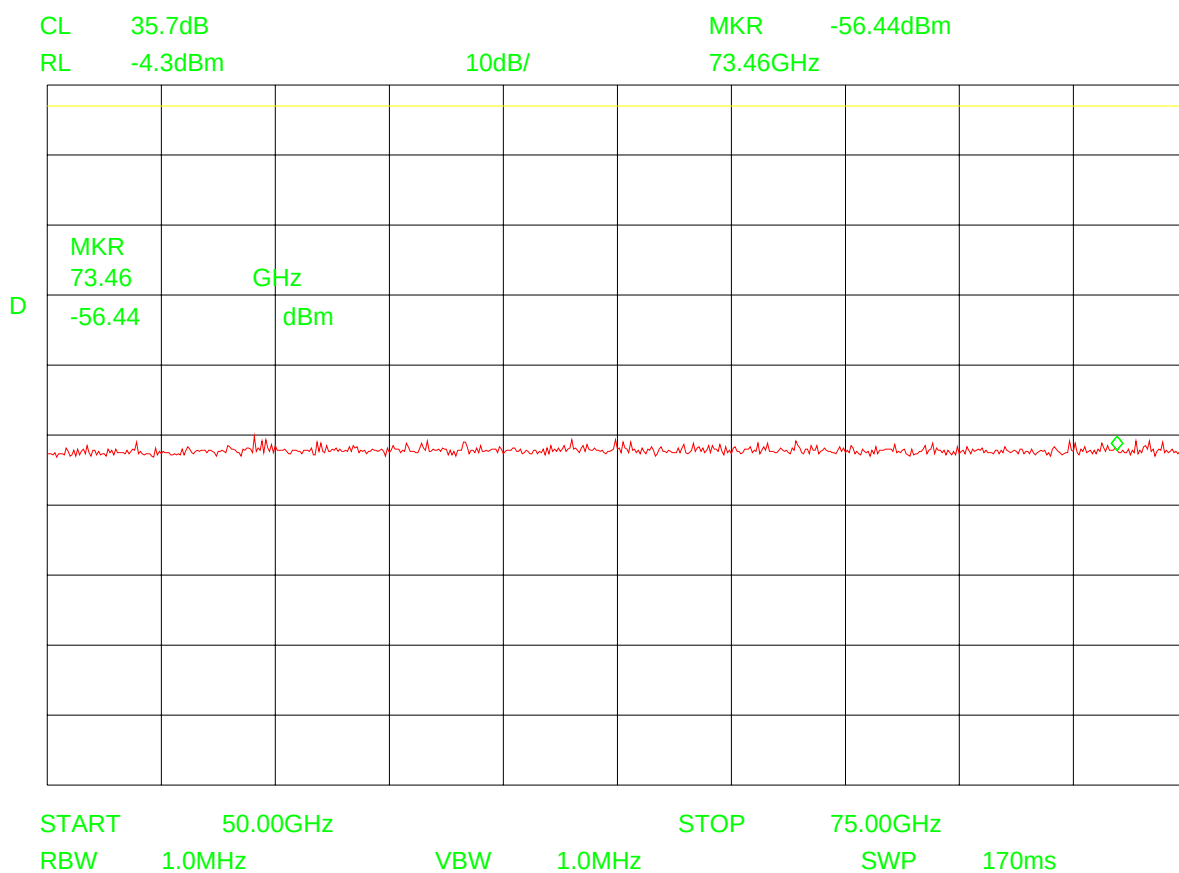


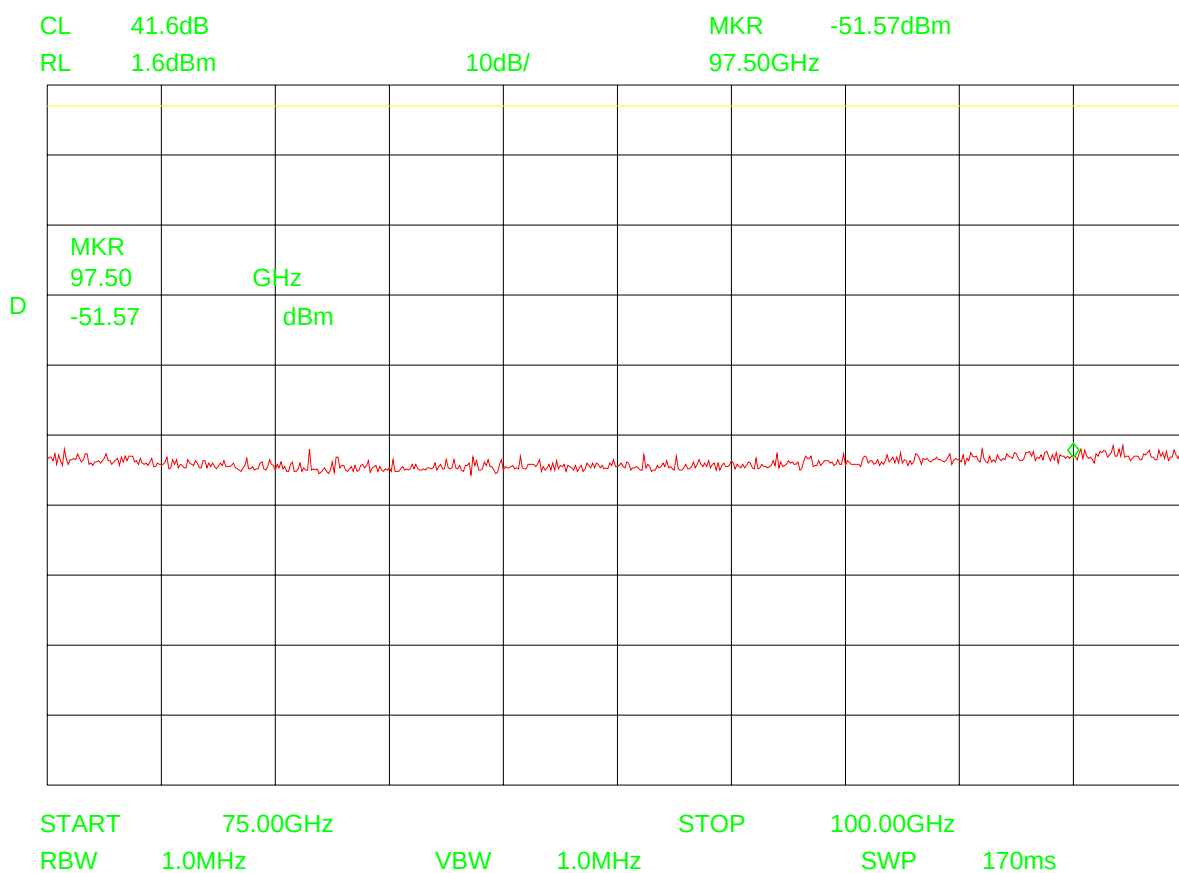
Plot 35



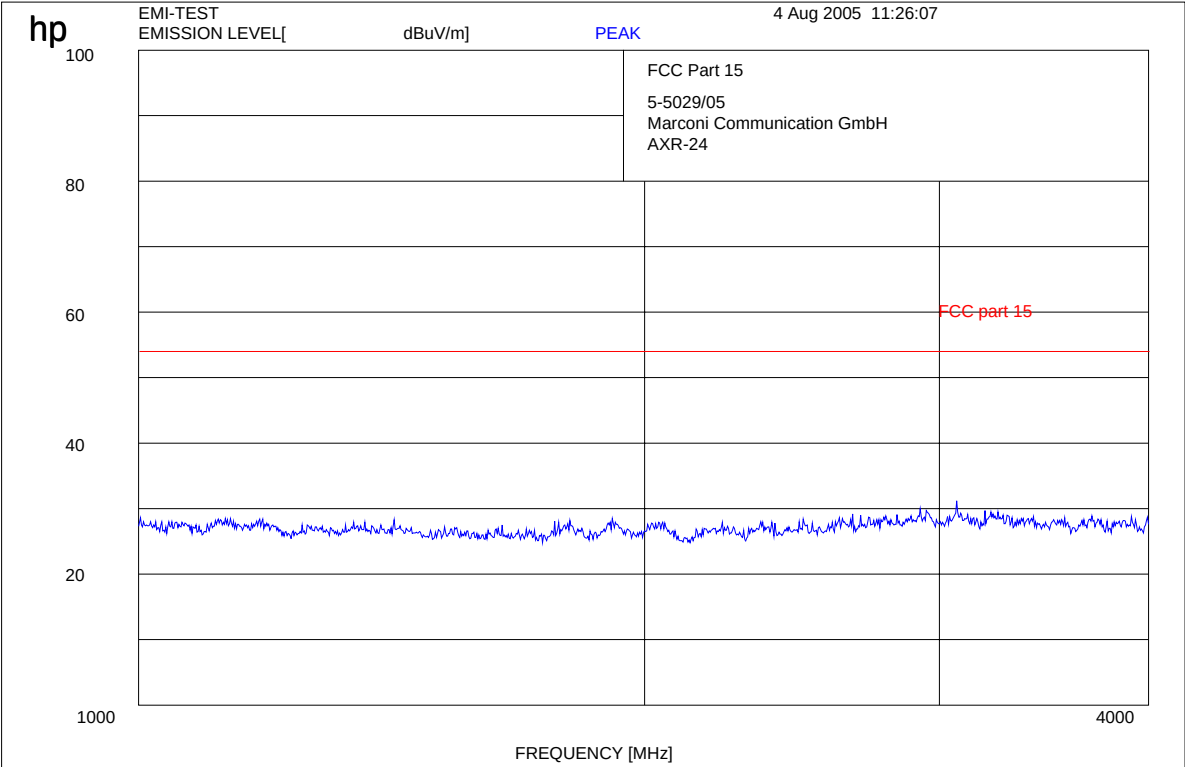
Plot 36





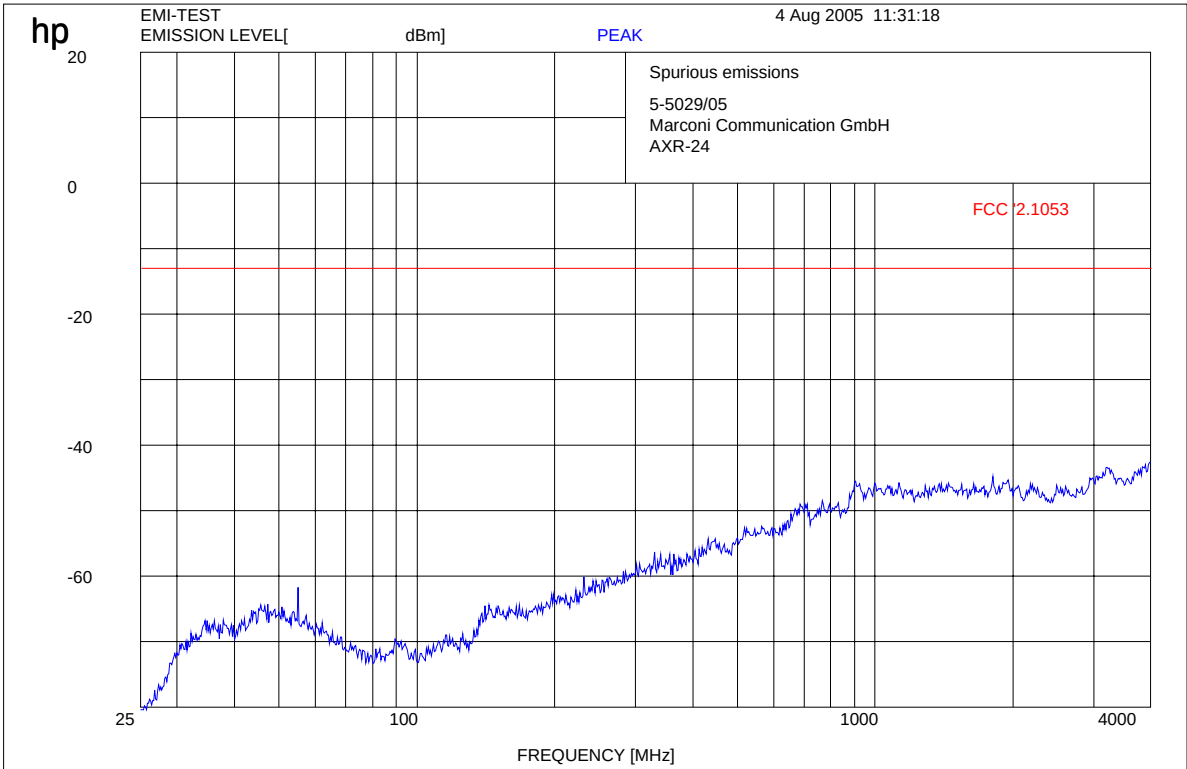


Plot 39



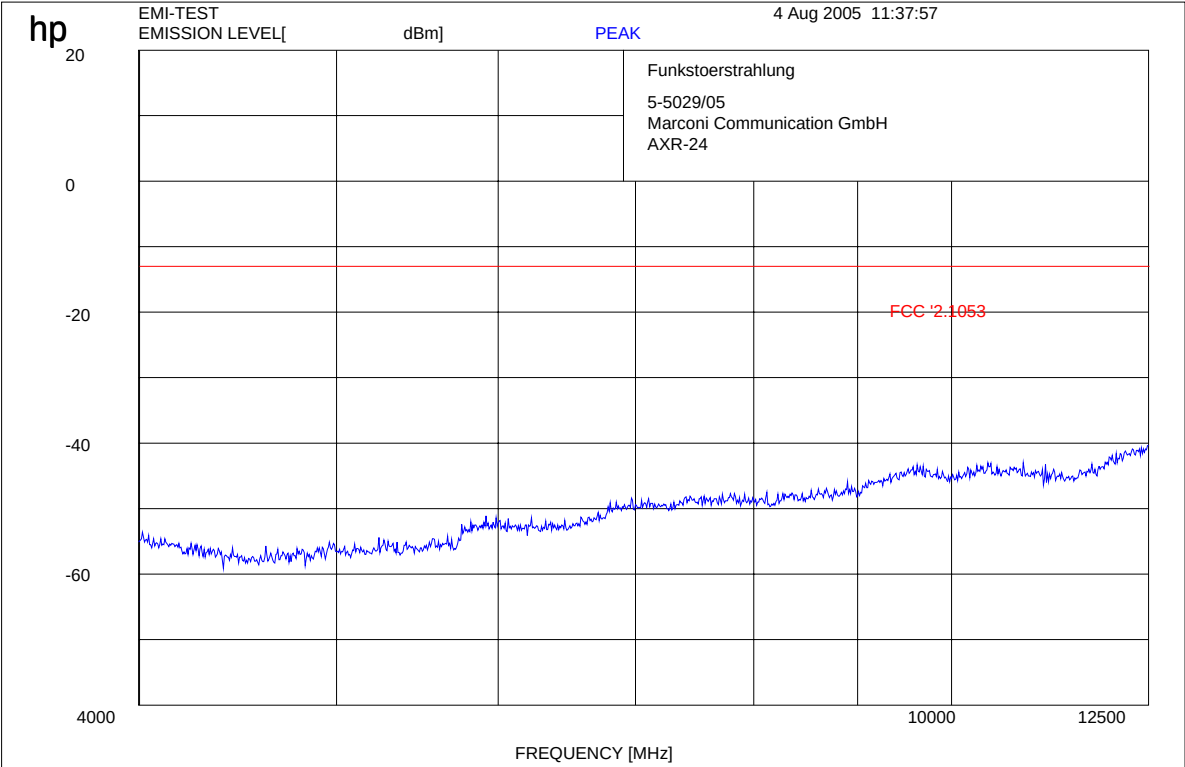
F ≥ 1 GHz : RBW / VBW 1.0 MHz

Plot 40



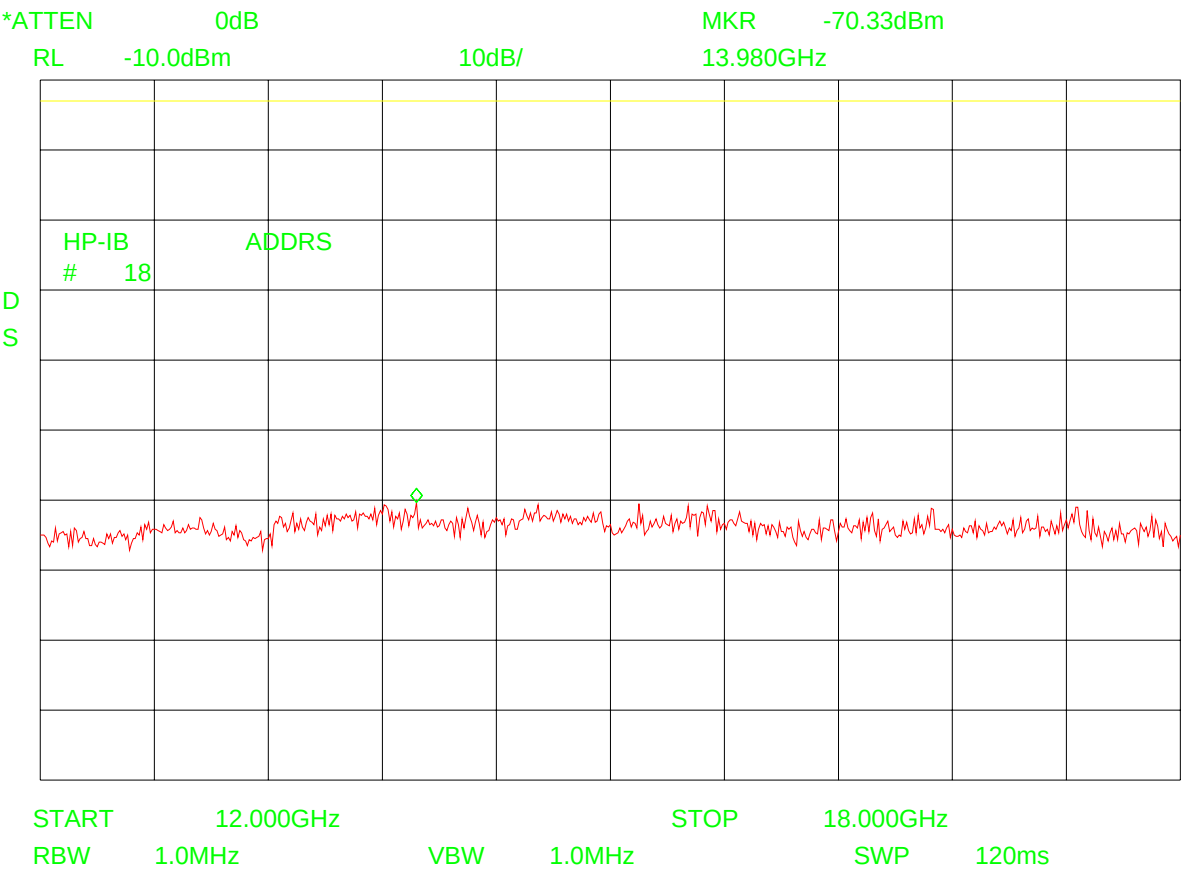
F < 1 GHz : RBW / VBW: 100 kHz
F ≥ 1 GHz : RBW / VBW 1.0 MHz

Plot 41

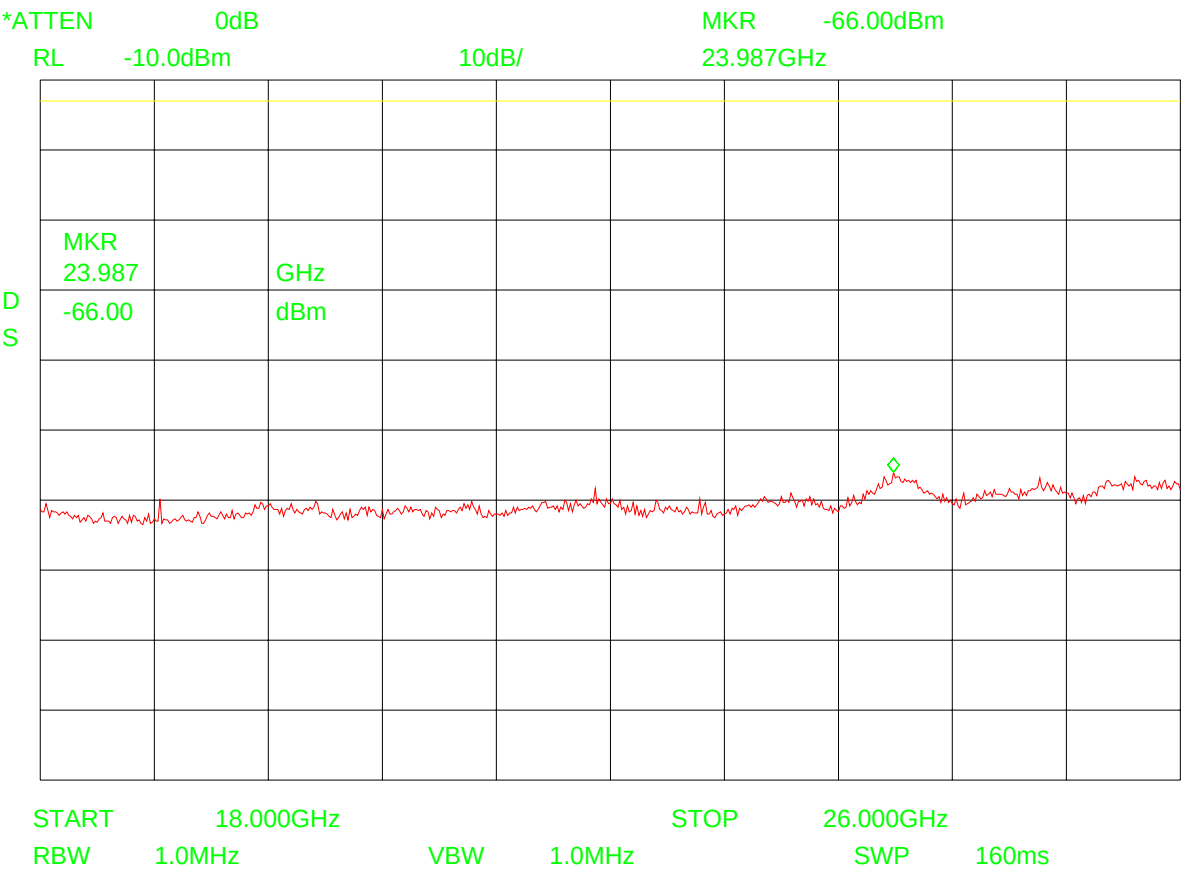


F ≥ 1 GHz : RBW / VBW 1.0 MHz

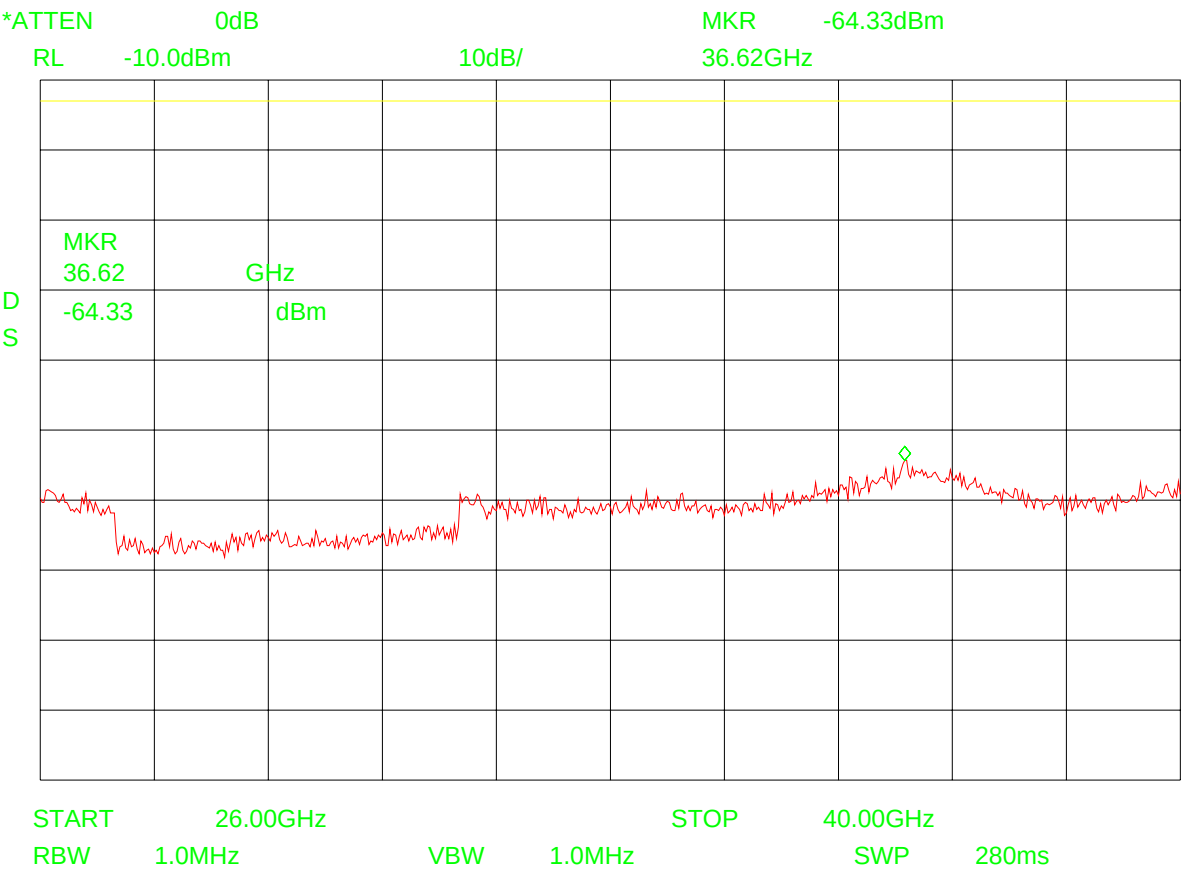
Plot 42

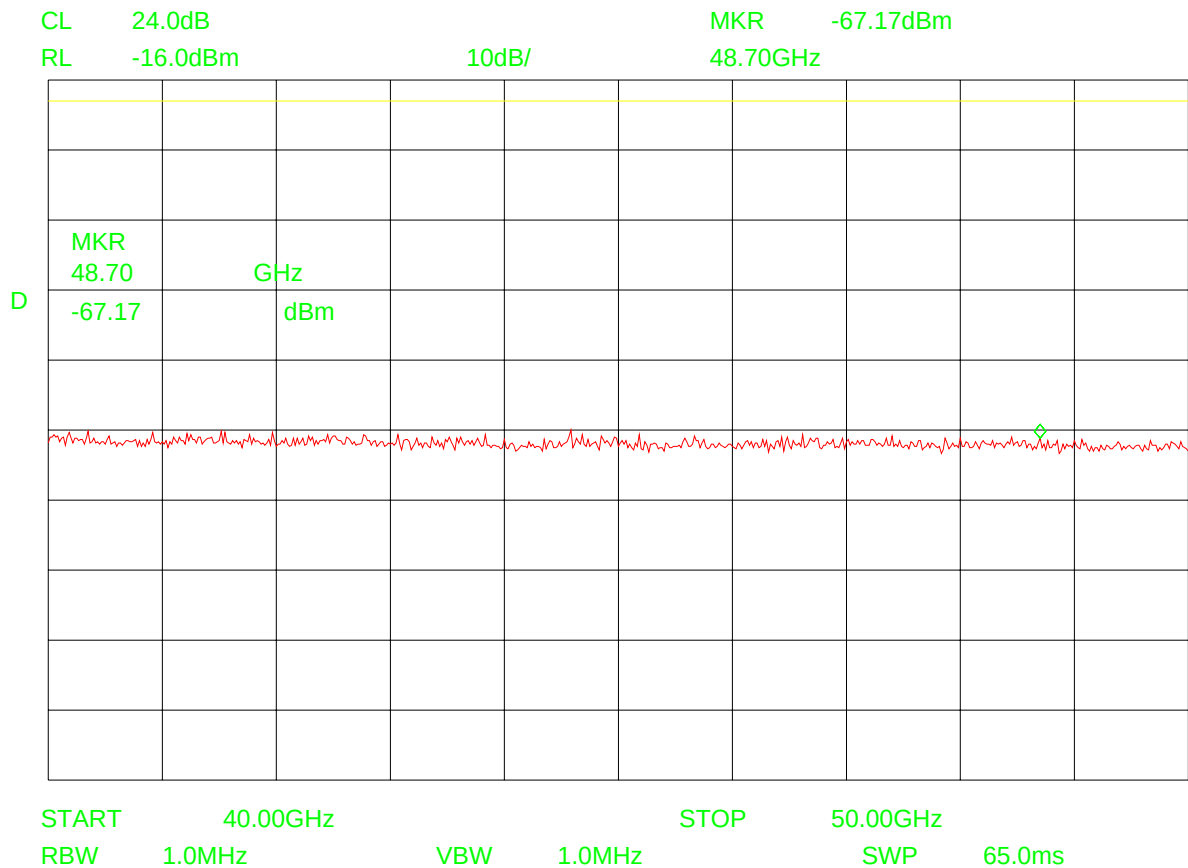


Plot 43

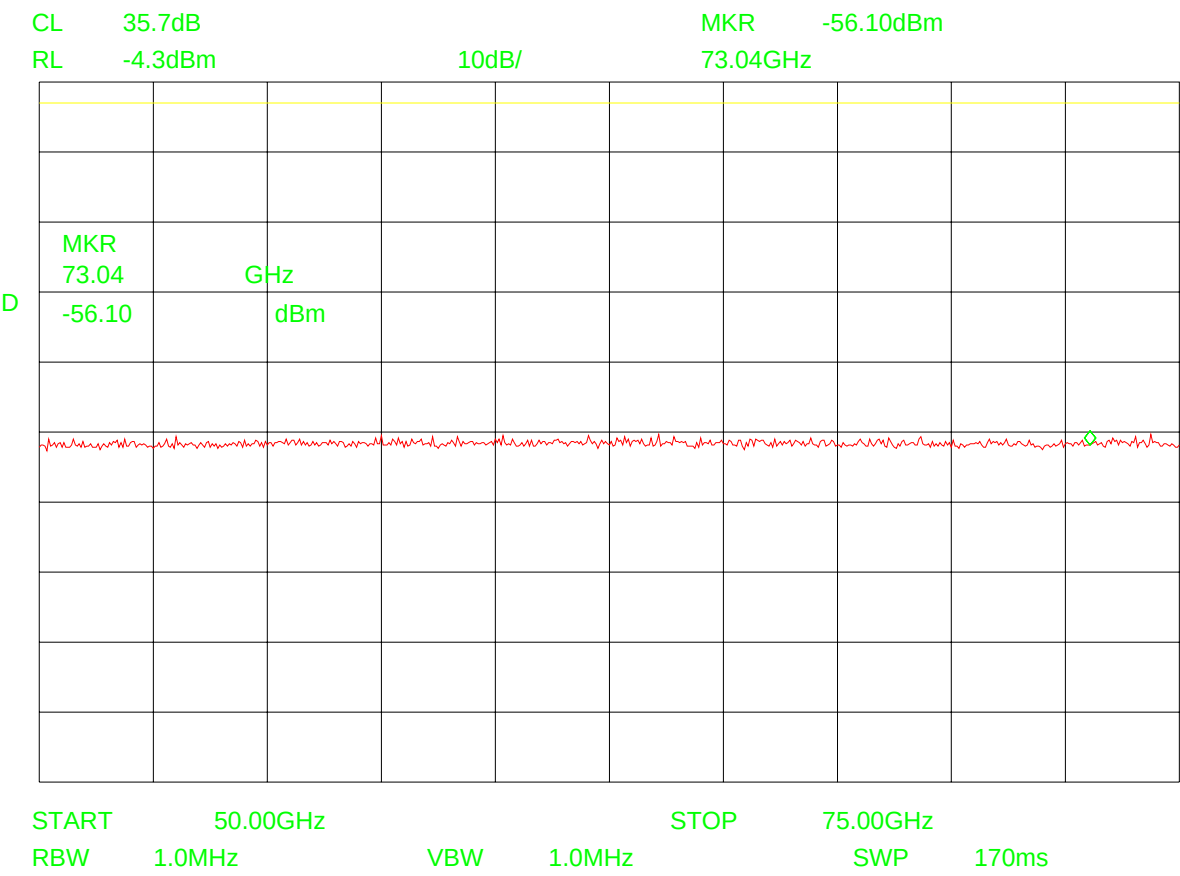


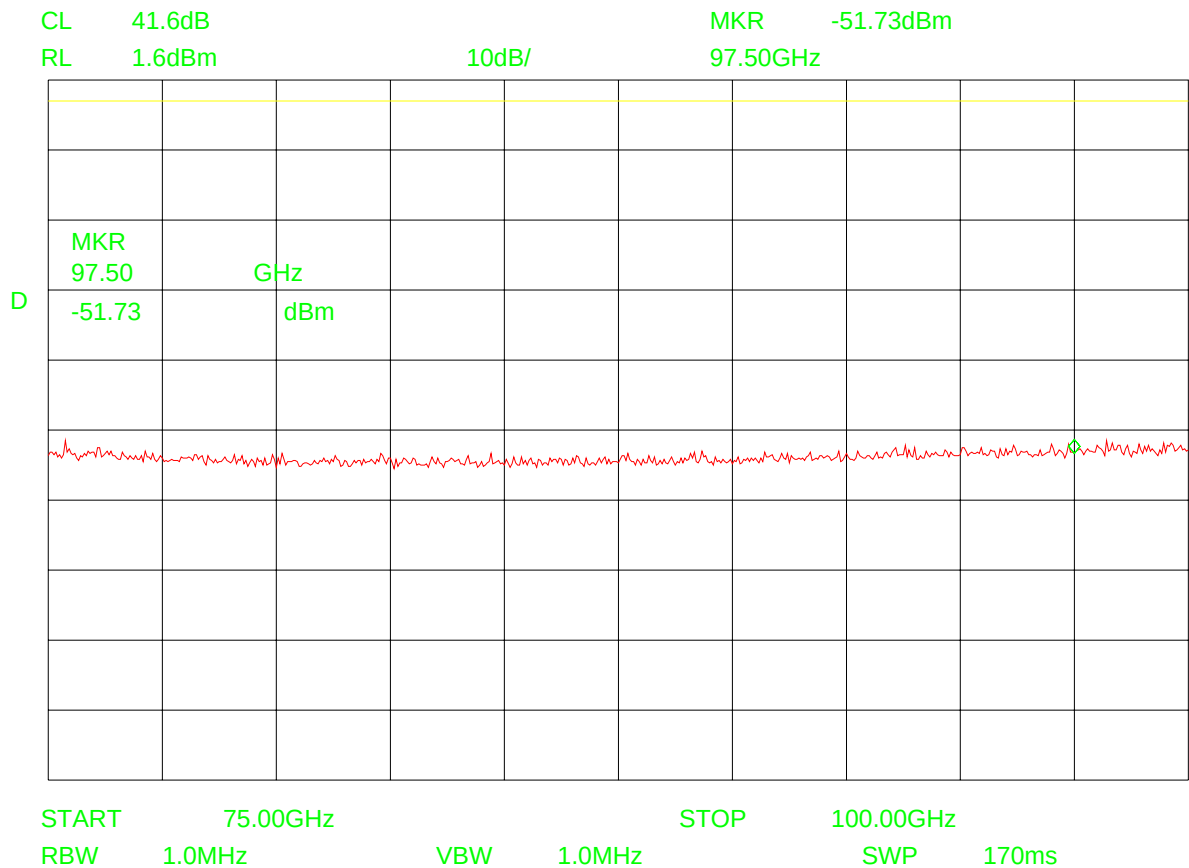
Plot 44





Plot 46





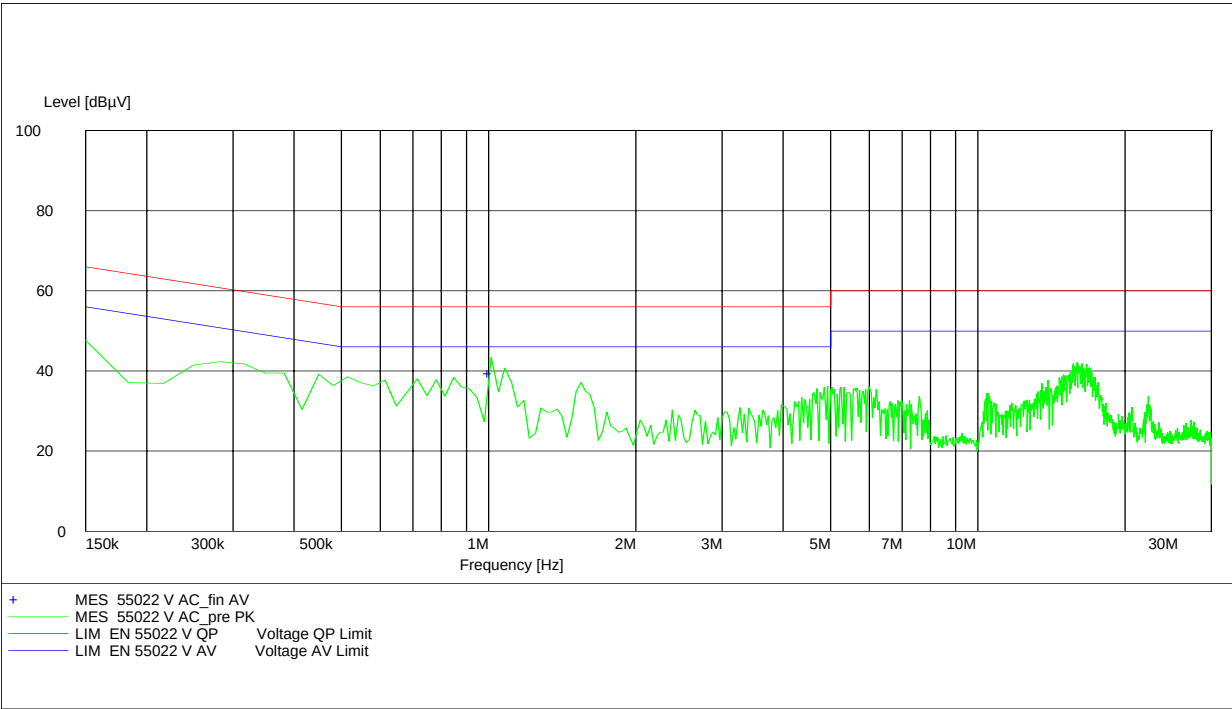
Plot 48

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	Stop	Step	Detector	Meas.	IF	Transducer
Frequency	Frequency	Width	Time	Bandw.		
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	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
1.020000	39.20	10.5	46	6.8	L1 / FLO	

4 Photos

Photo 1

Set-up radiated emission, 10 m measurement distance

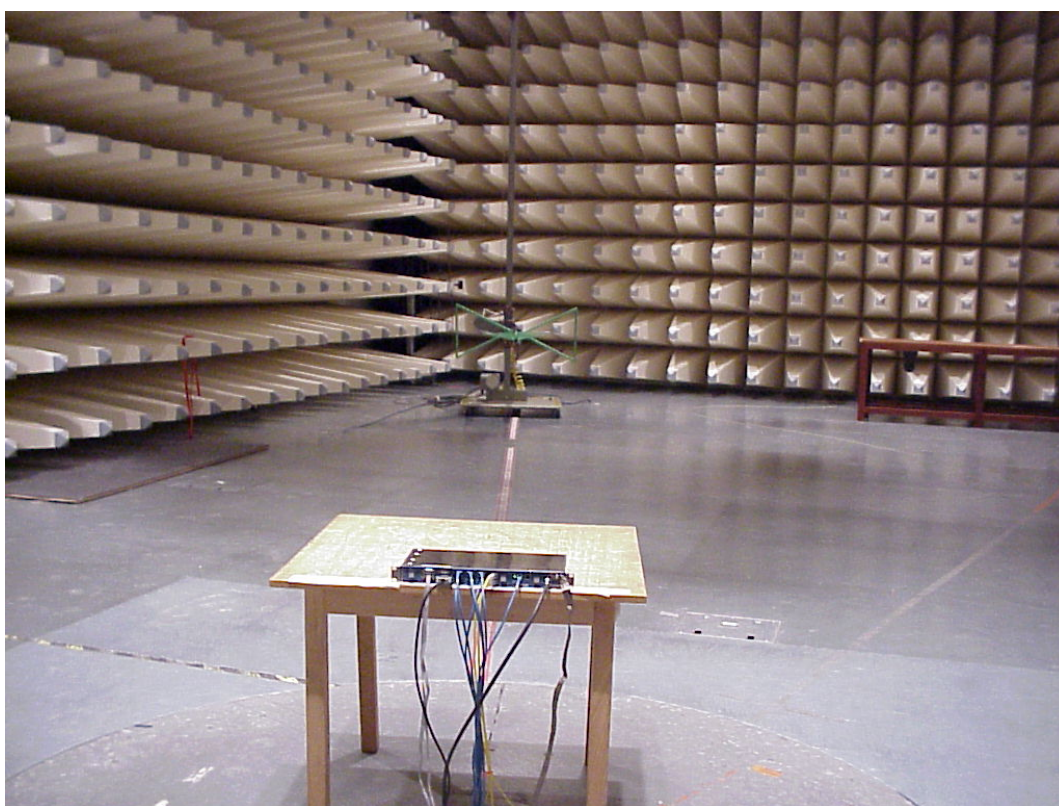


Photo 2

Set-up radiated emission, 10 m measurement distance

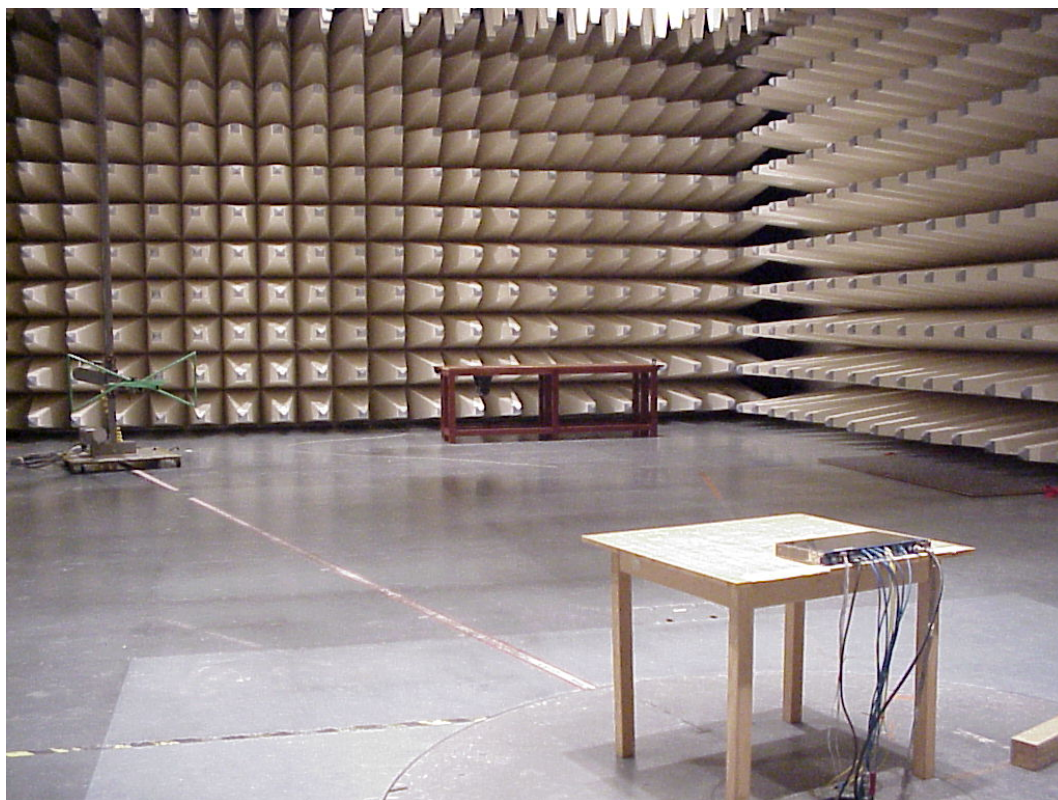


Photo 3

Set-up radiated emission, 3 m measurement distance

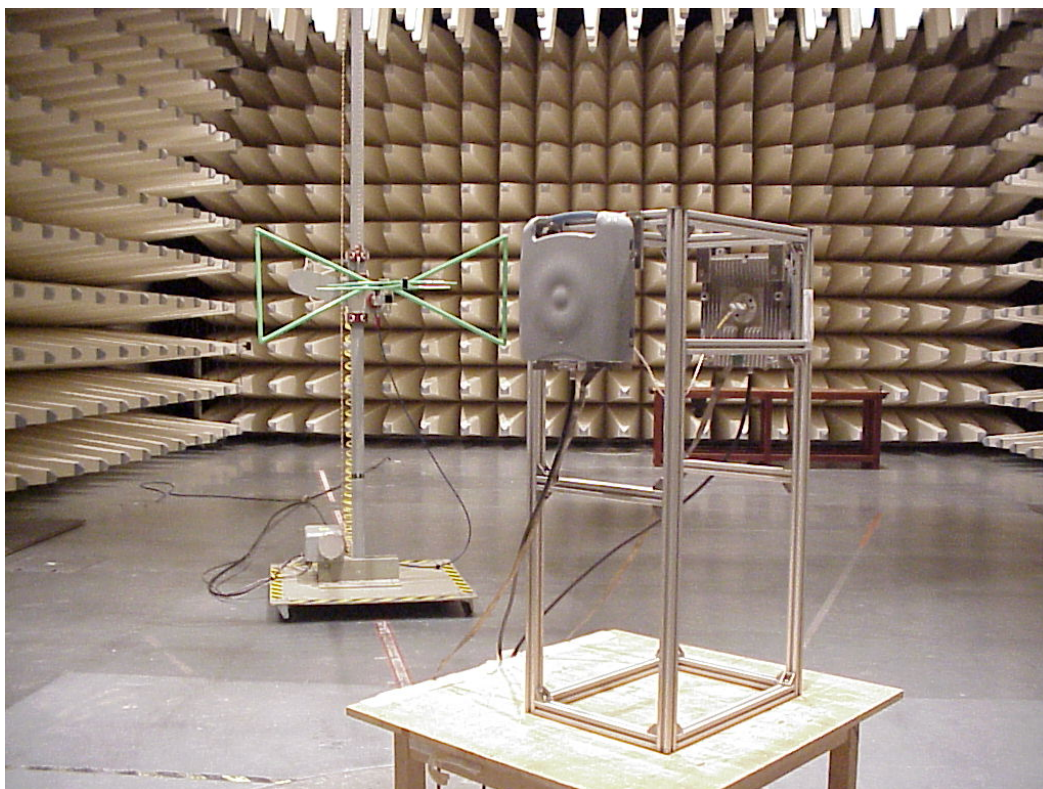


Photo 4

Set-up radiated emission, 3 m measurement distance

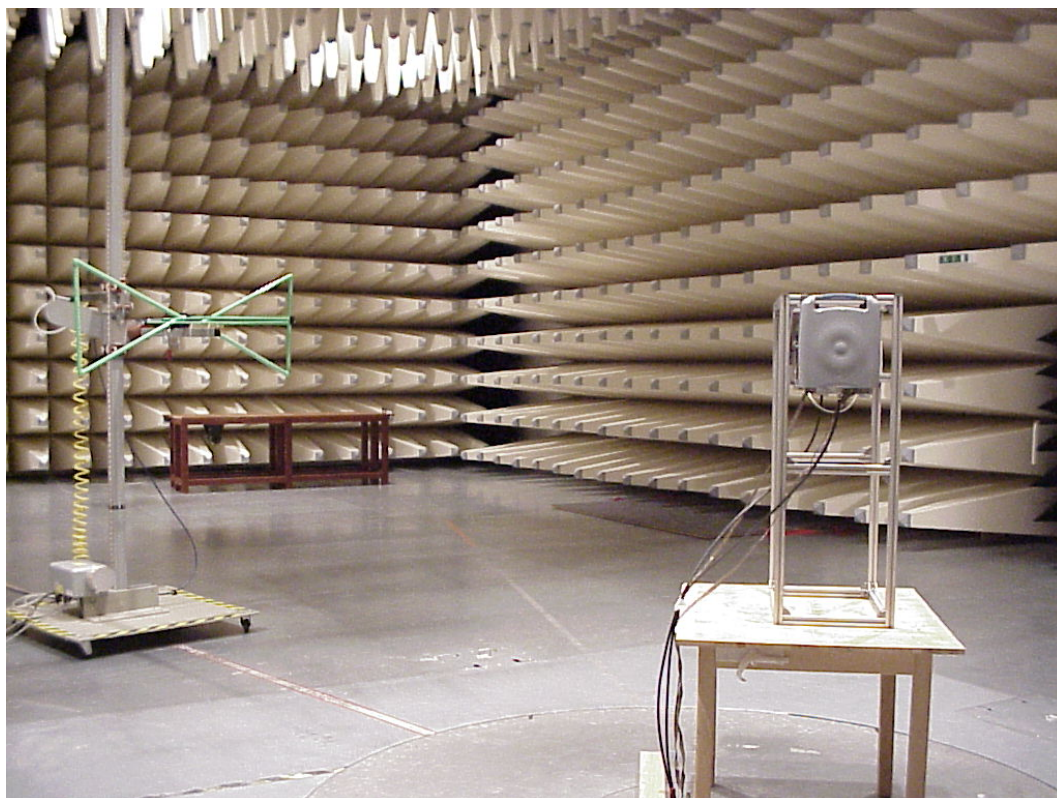


Photo 5

AXR-24 Spurious radiated measurement 0.30 GHz – 12 GHz

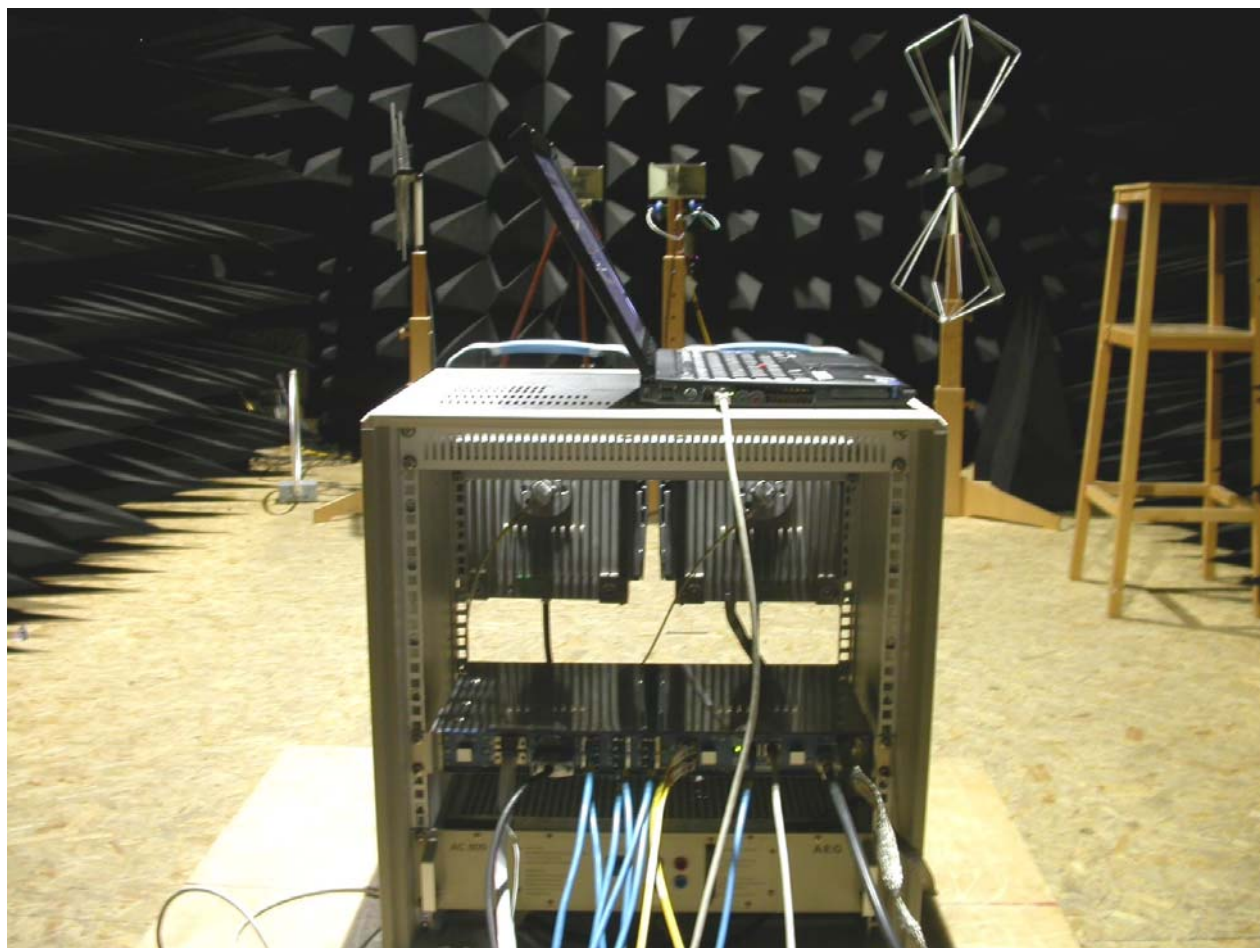


Photo 6

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

