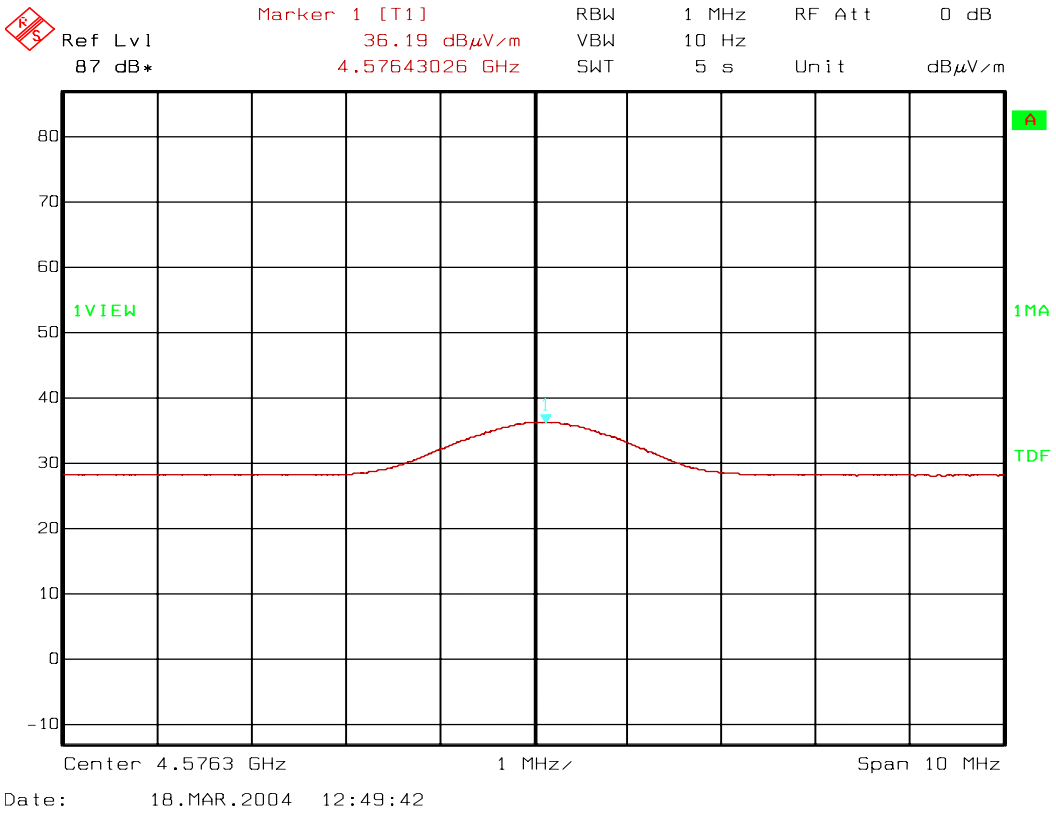
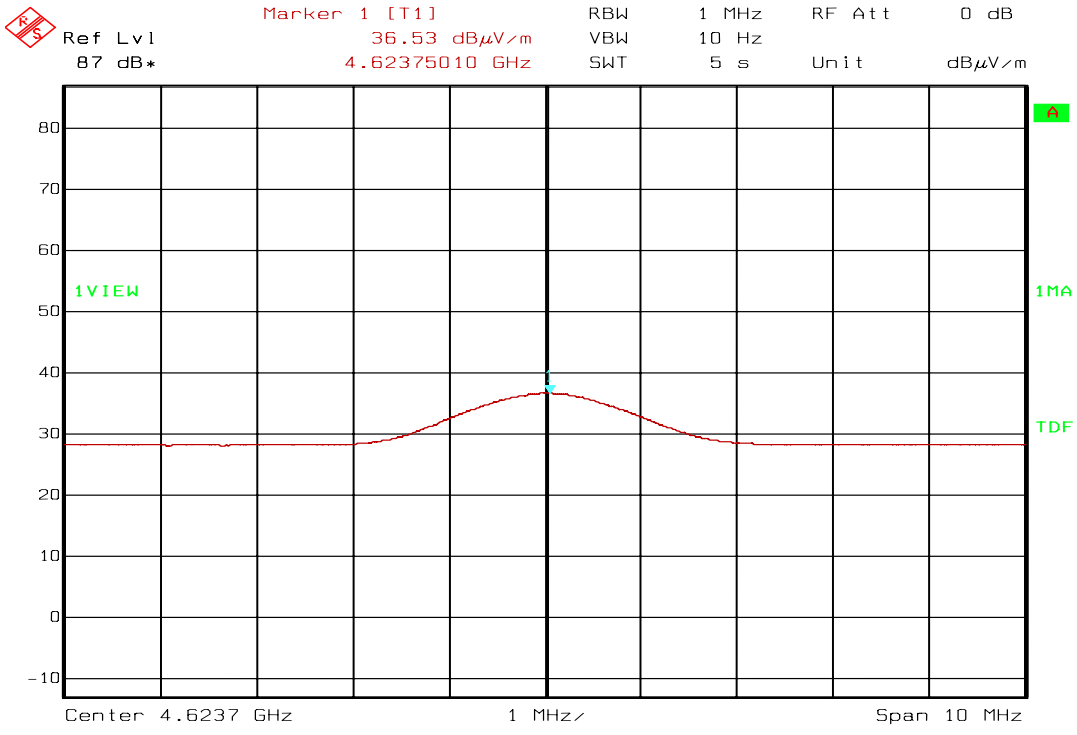


Max field strength(10HzVBW) –radiated emission(detachable ant) 5th Harmonic , ch 12



Max field strength(10HzVBW) –radiated emission(detachable ant) 5th Harmonic , ch 24

Radiated emission 10 kHz-30 MHz. (detachable ant)

Measuring distance 10 m, measured with Peak detector.

No component detected, see attached graph.

Limit is converted to 10 m using 40 dB/decade according to 15.31 (f) (2).

NEMKO COMLAB AS
Peak

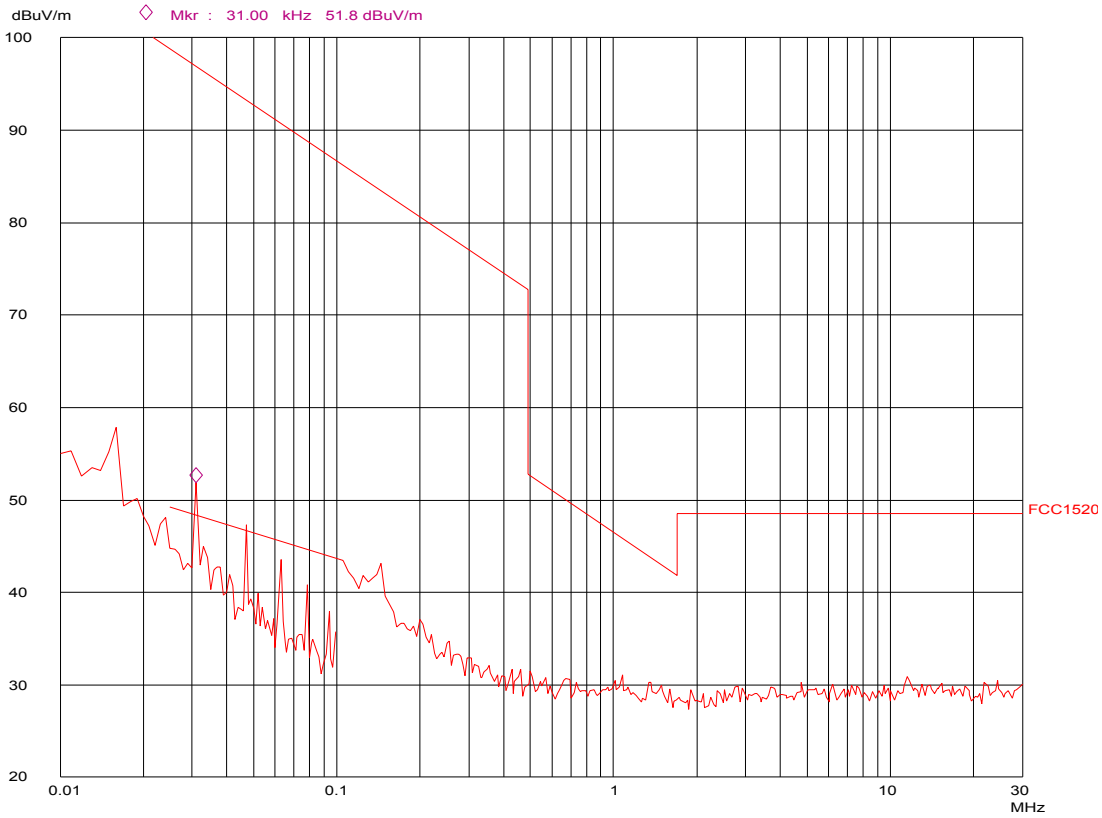
17. Mar 04 13:33

Operator: gns
Comment: BlueChip
hp

Scan Settings (4 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp OpRge
10k	100k	1k	1k	PK	20ms	0dB	LN OFF 60dB
20k	20k	5k	9k	PK	20ms	AUTO	LN ON 60dB
20k	10M	5k	9k	PK	20ms	AUTO	LN OFF 60dB
10M	30M	5k	9k	PK	20ms	AUTO	LN OFF 60dB

Transducer No.	Start	Stop	Name
13	10k	30M	HFH2Z2



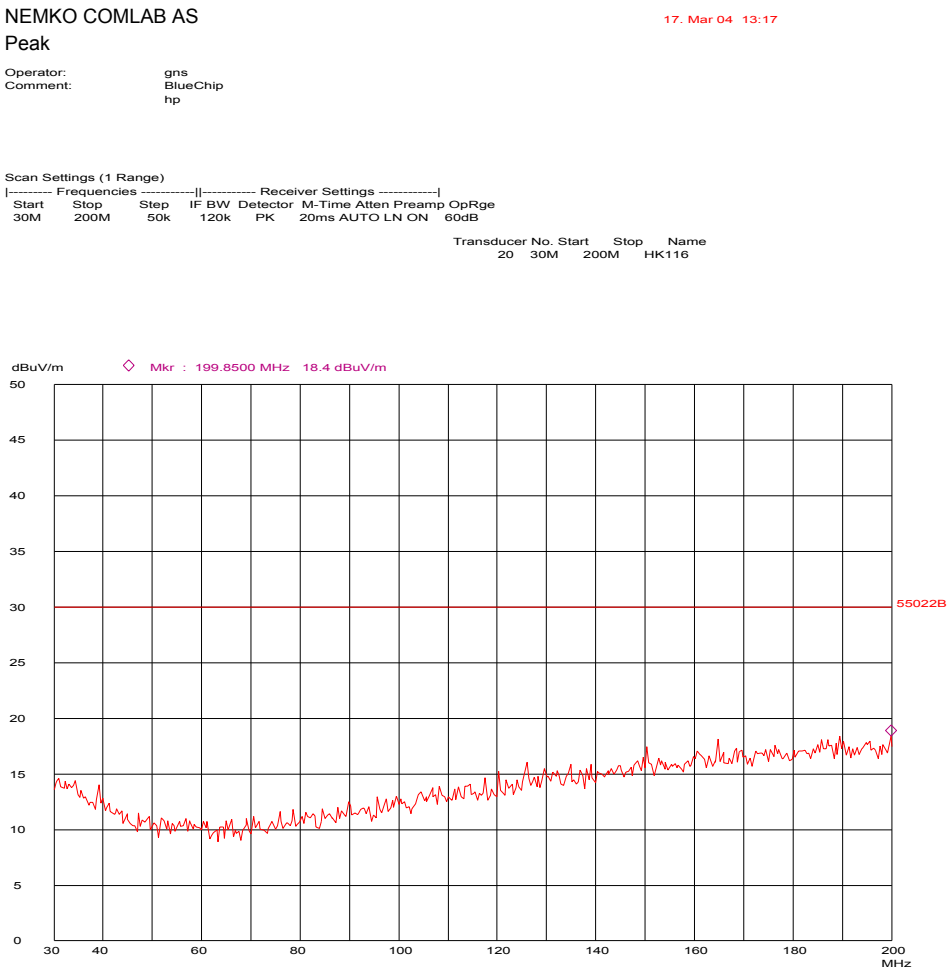
10 kHz – 30MHz –radiated emission(detachable ant)

Radiated emission 30 – 1000 MHz. (detachable ant)

Detector: Quasi-Peak

Measuring distance 10 m according to CISPR 22.

No component detected, see attached graphs.



Radiated emission 30 –200MHz, Horizontal polarization(detachable ant)

Frequency	Operational condition	Field strength	Measuring distance	Limit FCC15.209	Margin
MHz		dBµV/m	metres	dBµV/m	dB
200	TX on	19.8	10	33.0	13.2

Correction factor from 10 meter to 3 meter : 20 log (10/3) = 10.4575 dB

In the column 3 peak values are given for 10 meter and values in the the margin column is corrected for 3 meter. E.g.: 43.5 –(19.8+10.5) = 13.2 dB

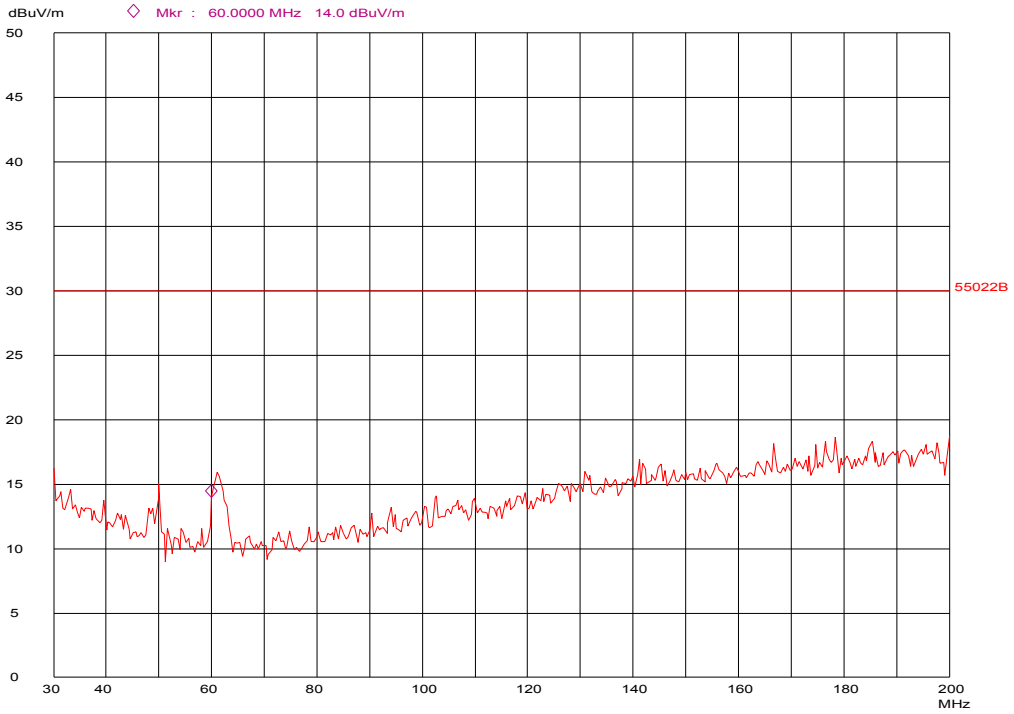
NEMKO COMLAB AS
Peak

17. Mar 04 13:13

Operator: gns
Comment: BlueChip
vp

Scan Settings (1 Range)
|--------- Frequencies ----------||---------- Receiver Settings ----------|
Start Stop Step IF BW Detector M-Time Atten Preamp OpRge
30M 200M 50k 120k PK 20ms AUTO LN ON 60dB

Transducer No. Start Stop Name
20 30M 200M HK116



Radiated emission 30 –200MHz, Vertical polarization(detachable ant)

Frequency	Operational condition	Field strength	Measuring distance	Limit FCC15.209	Margin
MHz		dBµV/m	meters	dBµV/m	dB
60	TX on	15.8	10	33.0	17.2

NEMKO COMLAB AS
Peak

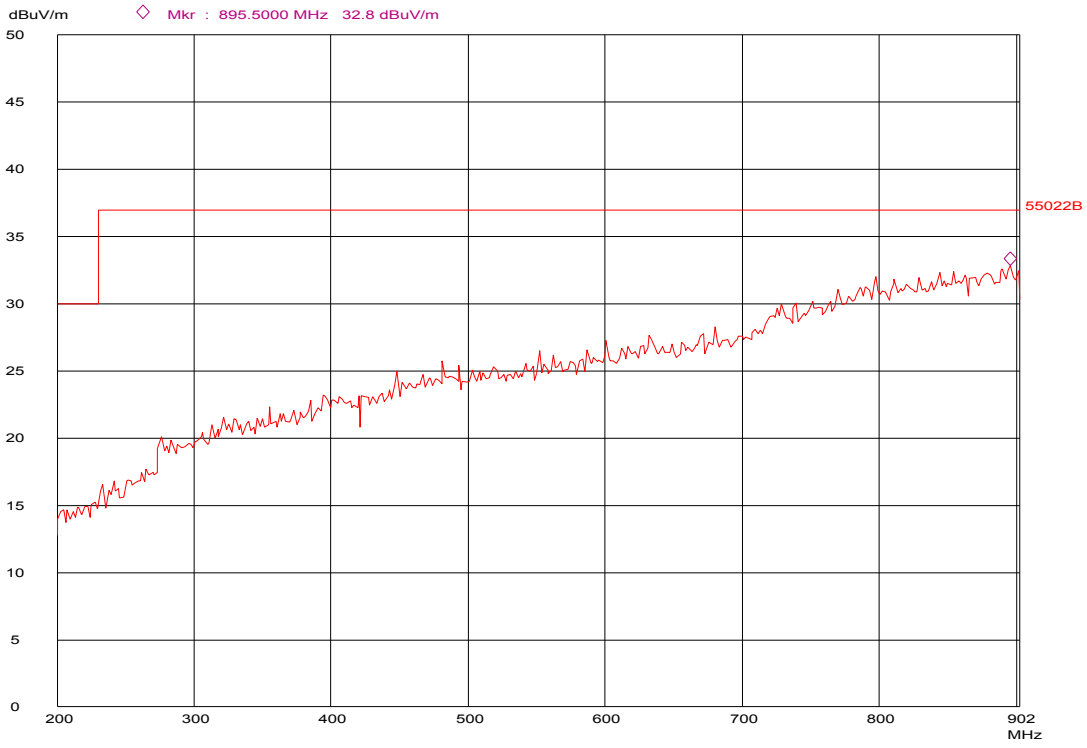
17. Mar 04 12:54

Operator: gns
Comment: BlueChip
hp

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
200M	902M	50k	120k	PK	20ms AUTO LN ON			60dB

Transducer No.	Start	Stop	Name
21	200M	1000M	HL223



Radiated emission 200 –902 MHz, Horizontal polarization(detachable ant)

NEMKO COMLAB AS

17. Mar 04 12:43

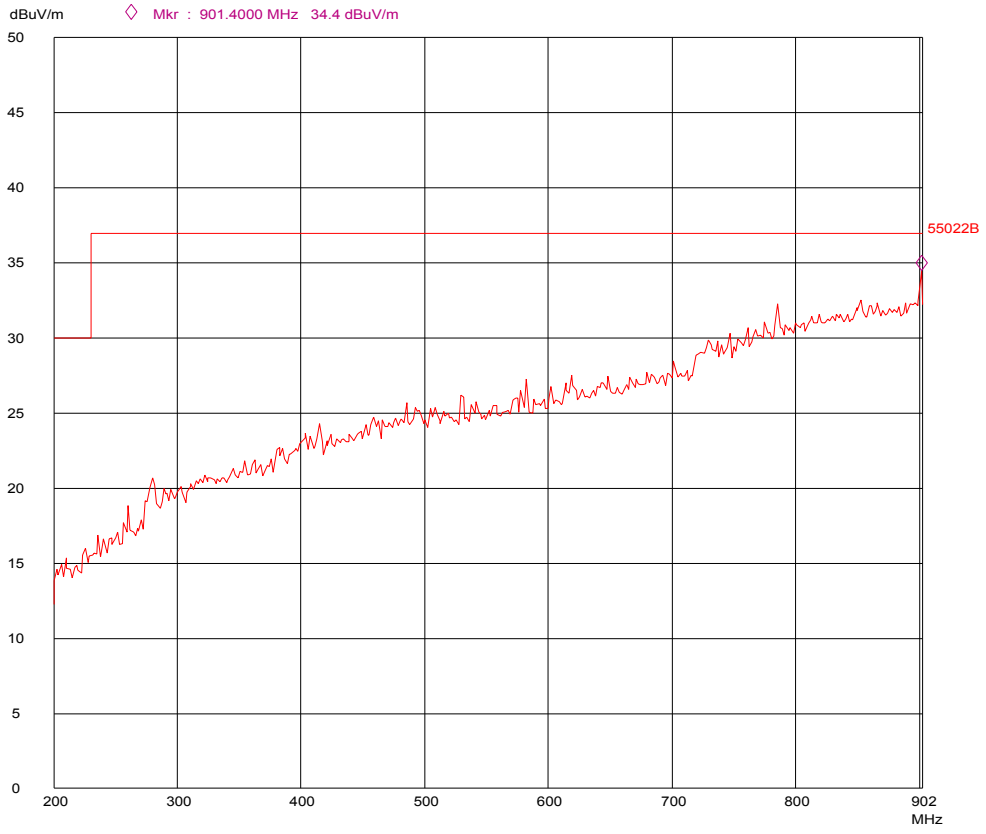
Peak

Operator: gns
Comment: BlueChip
VP

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
200M	902M	50k	120k	PK	20ms	AUTO	LN ON	60dB

Transducer No.	Start	Stop	Name
21	200M	1000M	HL223



Radiated emission 200 –902MHz, Vertical polarization (detachable ant)

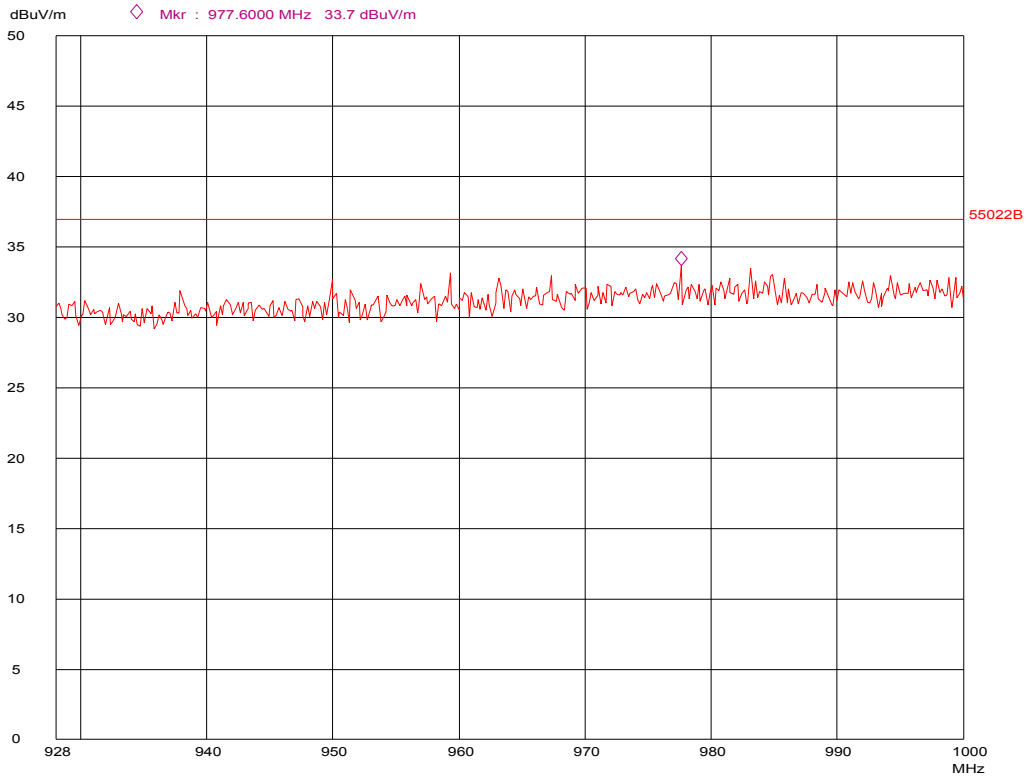
NEMKO COMLAB AS
Peak

17. Mar 04 13:03

Operator: gns
Comment: BlueChip
hp

Scan Settings (1 Range)
|--------- Frequencies ----------||---------- Receiver Settings ----------|
Start Stop Step IF BW Detector M-Time Atten Preamp OpRge
928M 1000M 50k 120k PK 20ms AUTO LN ON 60dB

Transducer No. Start Stop Name
21 200M 1000M HL223



Radiated emission 928 - 1000 MHz, Horizontal polarization(detachable ant)

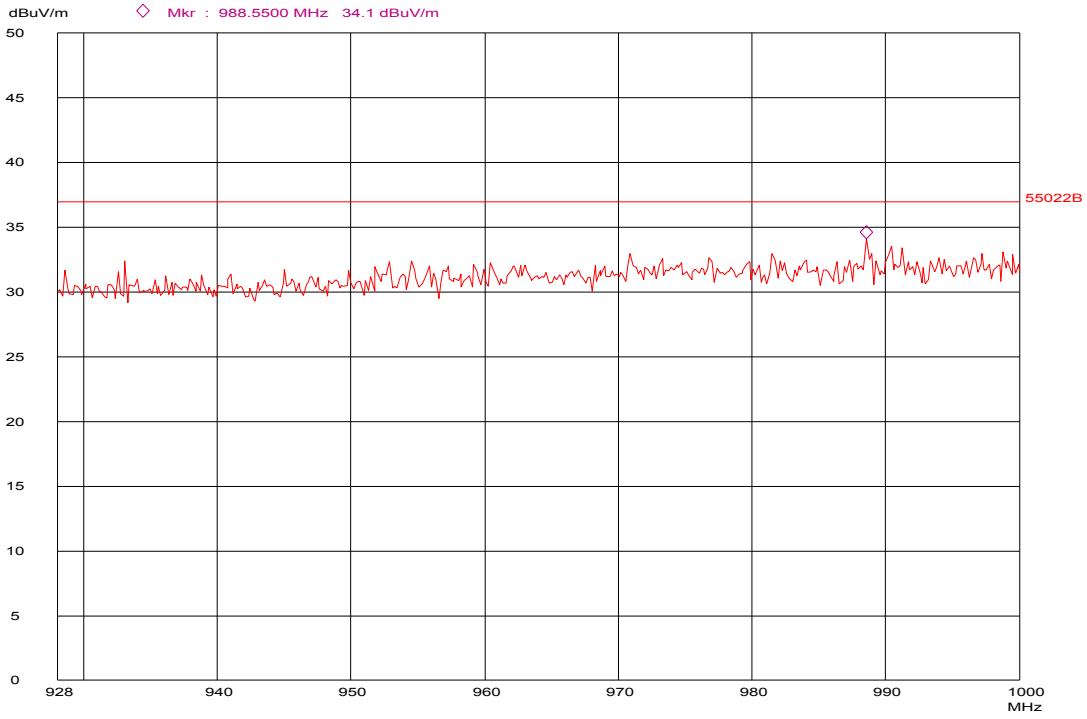
NEMKO COMLAB AS
Peak

17. Mar 04 13:05

Operator: gns
Comment: BlueChip
vp

Scan Settings (1 Range)
|--------- Frequencies ----------||---------- Receiver Settings ----------|
Start Stop Step IF BW Detector M-Time Atten Preamp OpRge
928M 1000M 50k 120k PK 20ms AUTO LN ON 60dB

Transducer No. Start Stop Name
21 200M 1000M HL223



Radiated emission 928 – 1000 MHz, Vertical polarization(detachable ant)

Radiated Emission 1 – 25 GHz, Peak (for integrated antenna)

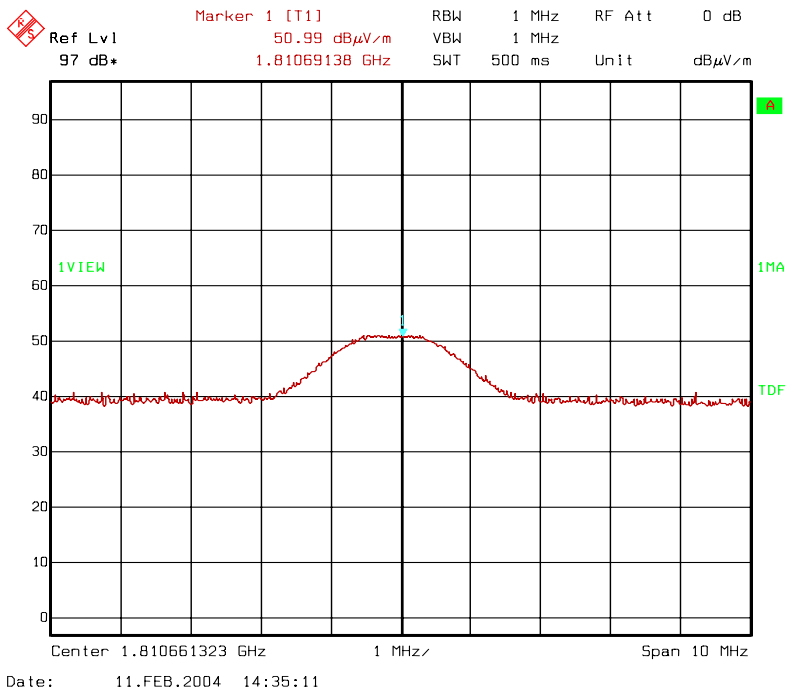
Measured with Peak Detector

Frequency	RF channel	Dist. corr. factor	Field strength, Peak, 3 metres	Duty cycle	Limit	Margin
GHz	0-24	dB	dBμV/m	dB	dBμV/m	dB
1.810	0	0	50.97		74	23.03
1.830	12	0	50.18		74	23.82
1.849	24	0	49.52		74	24.48
2.715	0	0	44.49		74	29.51
2.745	12	0	47.35		74	26.65
2.774	24	0	48.56		74	25.44
4.526	0	0	None detected		74	
4.576	12	0	None detected		74	
4.623	24	0	None detected		74	
5.431	0	0	None detected		74	
5.491	12	0	None detected		74	
5.548	24	0	None detected		74	

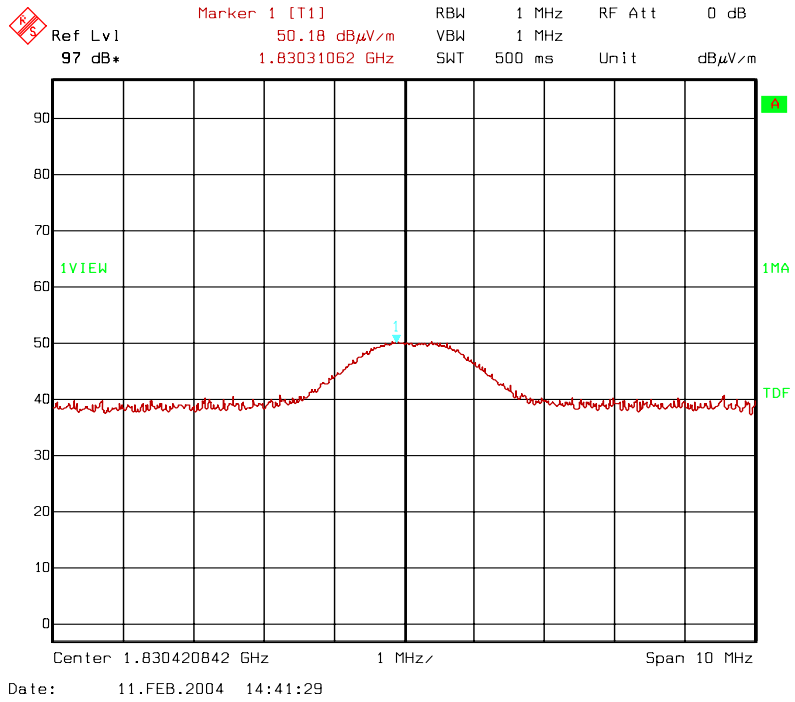
Radiated emission 1- 25 GHz, Average(for integrated antenna)

Measured with Peak Detector

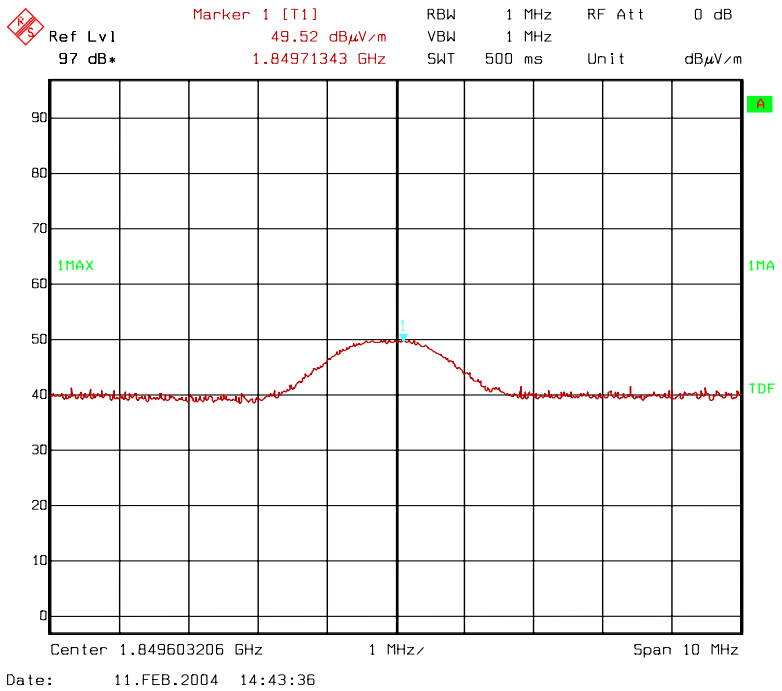
Frequency	RF channel	Dist. corr. factor	Field strength, Peak, 3 metres	Duty cycle	Limit	Margin
GHz	0-24	dB	dBμV/m	dB	dBμV/m	dB
1.810	0	0	50.97	-6.74	54	9.77
1.830	12	0	50.18	-6.74	54	10.56
1.849	24	0	49.52	-6.74	54	11.22
2.715	0	0	44.49	-6.74	54	16.25
2.745	12	0	47.35	-6.74	54	13.39
2.774	24	0	48.56	-6.74	54	12.18
4.526	0	0	None detected	-6.74	54	
4.576	12	0	None detected	-6.74	54	
4.623	24	0	None detected	-6.74	54	
5.431	0	0	None detected	-6.74	54	
5.491	12	0	None detected	-6.74	54	
5.548	24	0	None detected	-6.74	54	



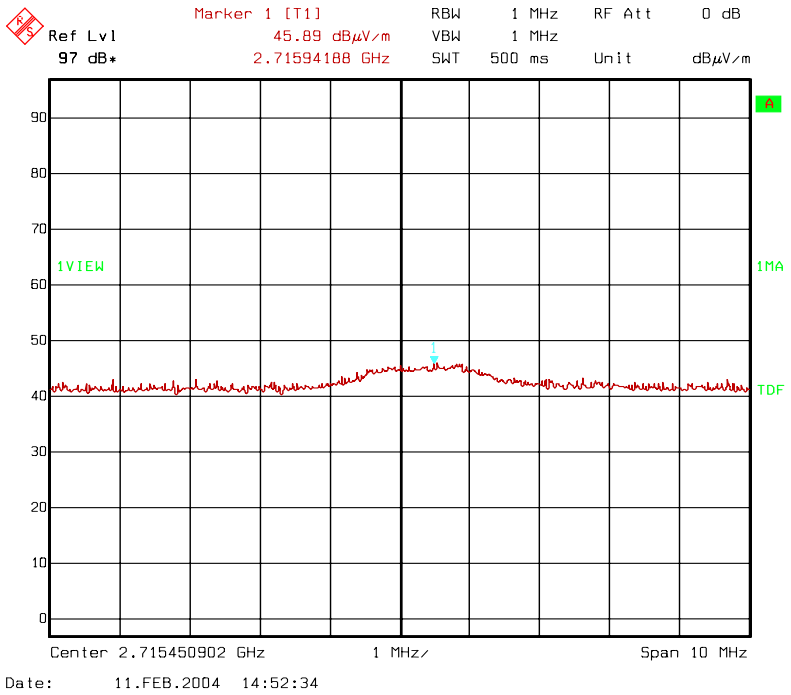
Max field strength – radiated emission(integrated ant) 2nd Harmonic , ch 0



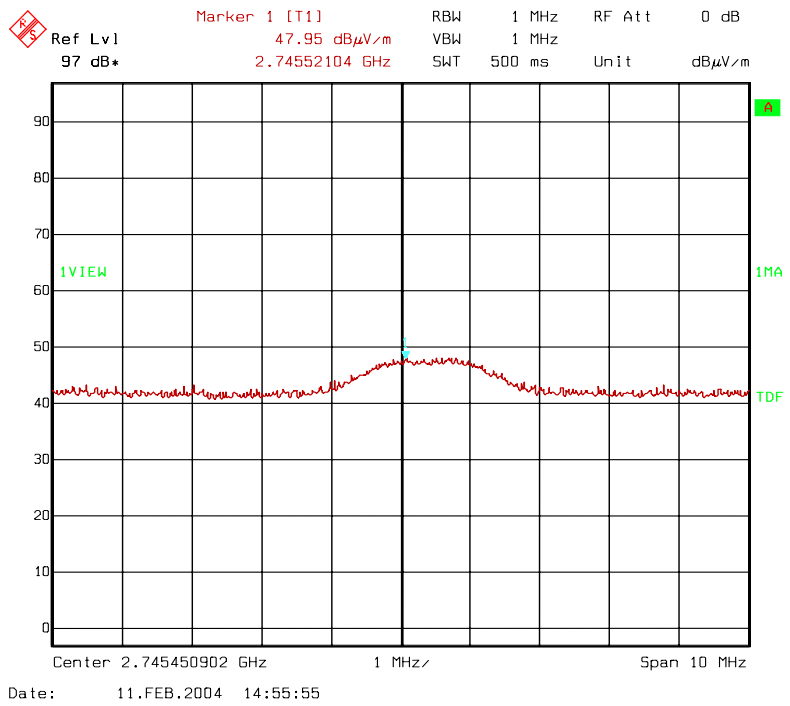
Max field strength – radiated emission(integrated ant) 2nd Harmonic , ch 12



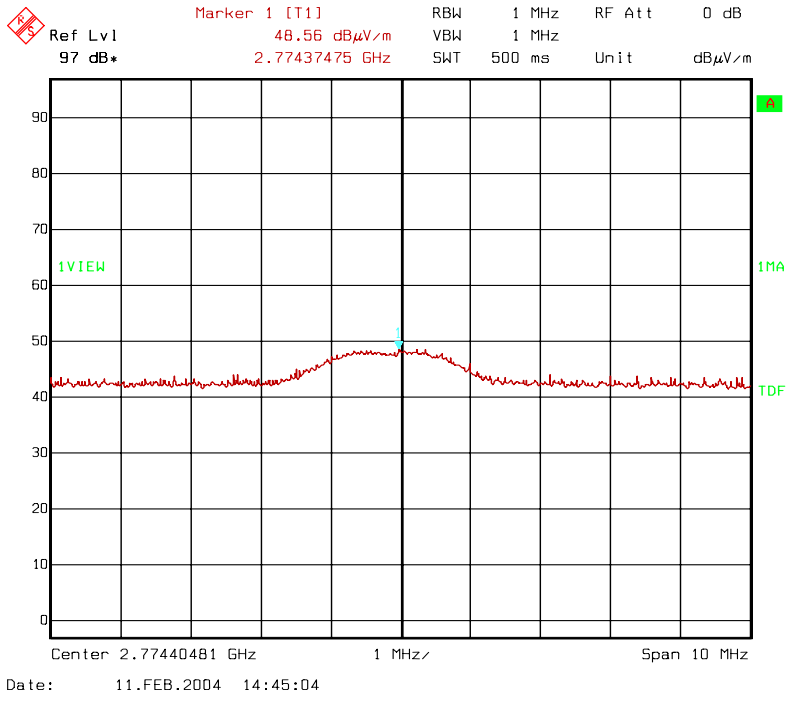
Max field strength –radiated emission(integrated ant) 2nd Harmonic , ch 24



Max field strength –radiated emission(integrated ant) 3rd Harmonic , ch 0.



Max field strength –radiated emission(integrated ant) 3rd Harmonic , ch 12



Max field strength –radiated emission(integrated ant) 3rd Harmonic , ch 24

Radiated emission 10 kHz-30 MHz. (integrated ant)

Measuring distance 10 m, measured with Peak detector.

No component detected, see attached graph.

Limit is converted to 10 m using 40 dB/decade according to 15.31 (f) (2).

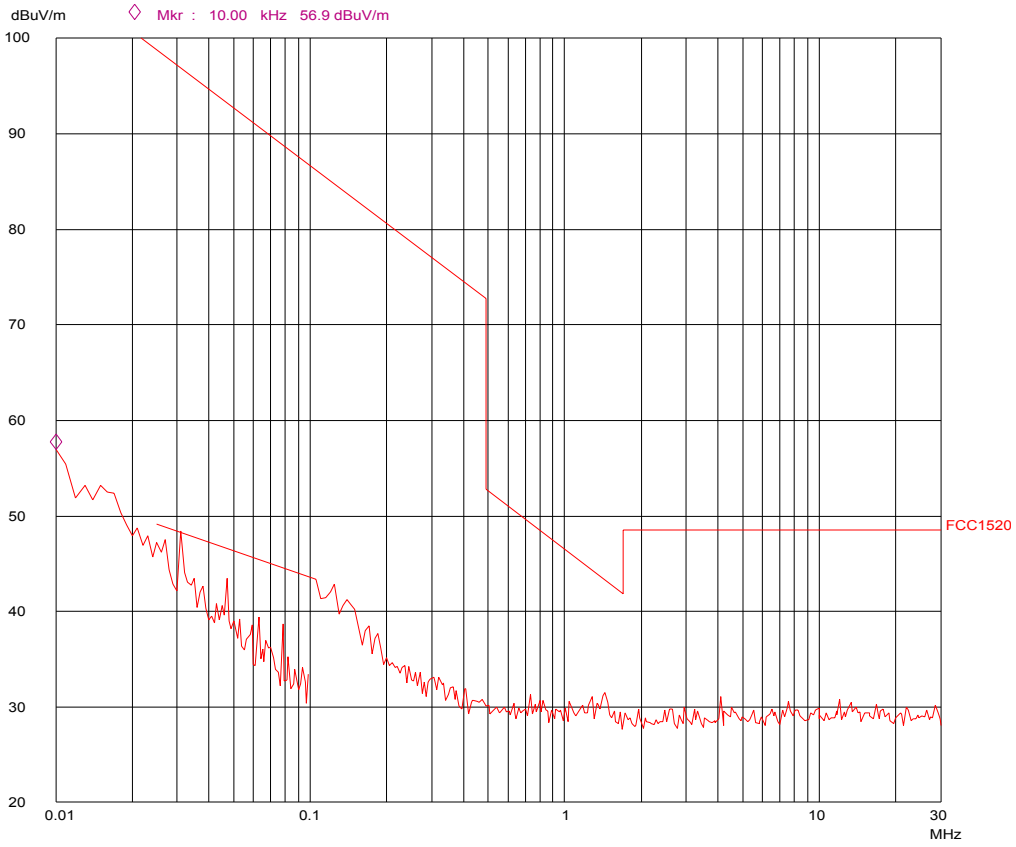
NEMKO COMLAB AS 09. Feb 04 15:11
Peak

Operator: gns
Comment: BlueChip

Scan Settings (4 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp OpRge
10k	100k	1k	1k	PK	20ms	0dB	LN OFF 60dB
20k	20k	5k	9k	PK	20ms	AUTO	LN ON 60dB
20k	10M	5k	9k	PK	20ms	AUTO	LN OFF 60dB
10M	30M	5k	9k	PK	20ms	AUTO	LN OFF 60dB

Transducer No.	Start	Stop	Name
13	10k	30M	HFH2Z2



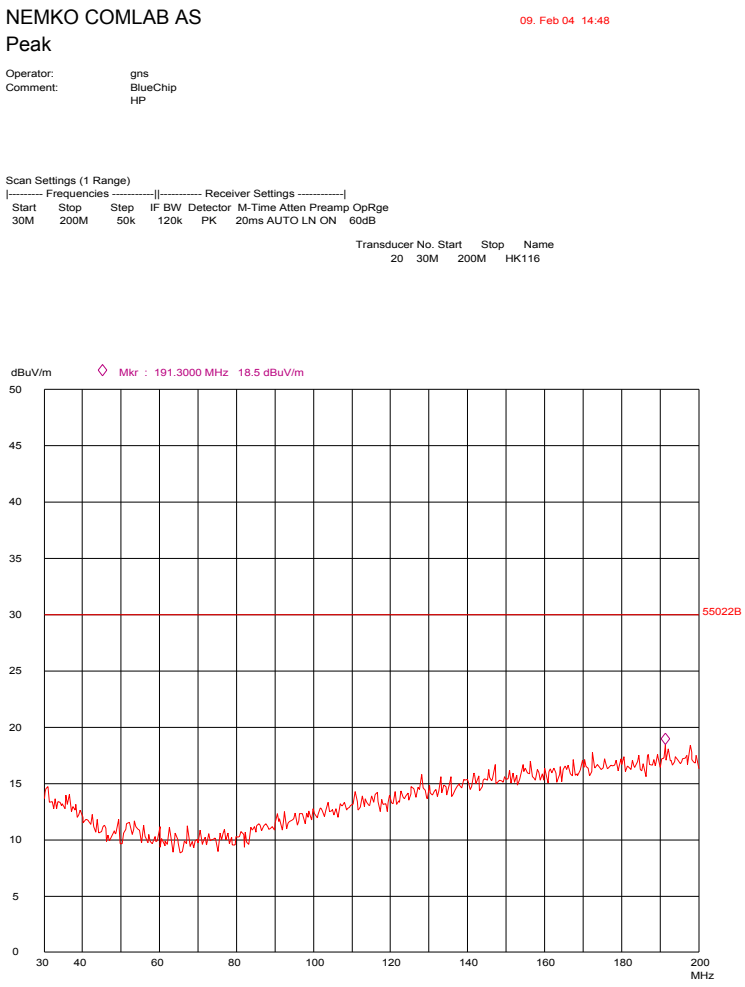
10 kHz – 30MHz –radiated emission(integrated ant),

Radiated emission 30 – 1000 MHz. (integrated ant)

Detector: Quasi-Peak

Measuring distance 10 m according to CISPR 22.

No component detected, see attached graphs.



Radiated emission 30 –200MHz, Horizontal polarization(integrated ant)

Frequency	Operational condition	Field strength	Measuring distance	Limit FCC15.209	Margin
MHz		dBµV/m	metres	dBµV/m	dB
191.3	TX on	18.5	10	33.0	14.5

Correction factor from 10 meter to 3 meter : 20 log (10/3) = 10.4575 dB

In the column 3 peak values are given for 10 meter and values in the margin column is corrected for 3 meters. E.g.: 43.5 –(18.5+10.5) = 14.5 dB

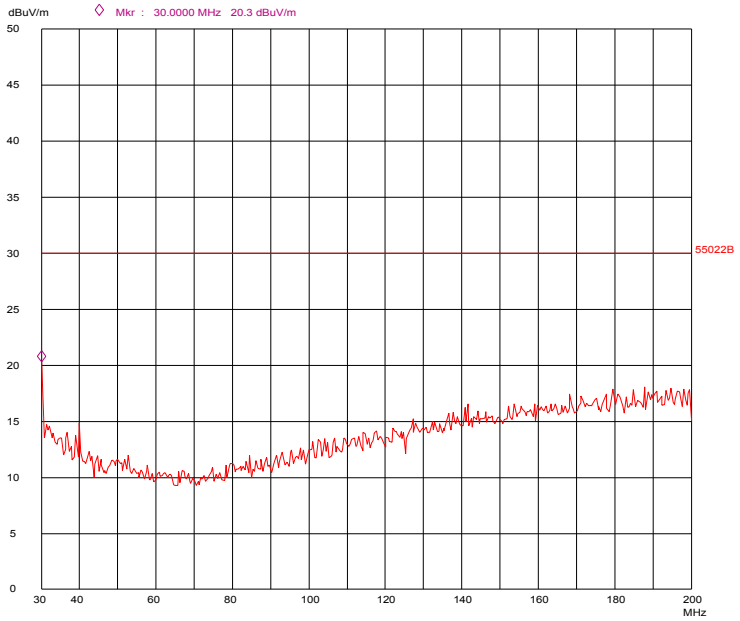
NEMKO COMLAB AS
Peak

09. Feb 04 14:53

Operator: gns
Comment: BlueChip
VP

Scan Settings (1 Range)
|--------- Frequencies ----------||---------- Receiver Settings ----------|
Start Stop Step IF BW Detector M-Time Atten Preamp OpRge
30M 200M 50k 120k PK 20ms AUTO LN ON 60dB

Transducer No. Start Stop Name
20 30M 200M HK116



Radiated emission 30 –200MHz, Vertical polarization(integrated ant)

Frequency	Operational condition	Field strength	Measuring distance	Limit FCC15.209	Margin
MHz		dBµV/m	meters	dBµV/m	dB
30	TX on	20.3	10	33.0	12.7

NEMKO COMLAB AS
Peak

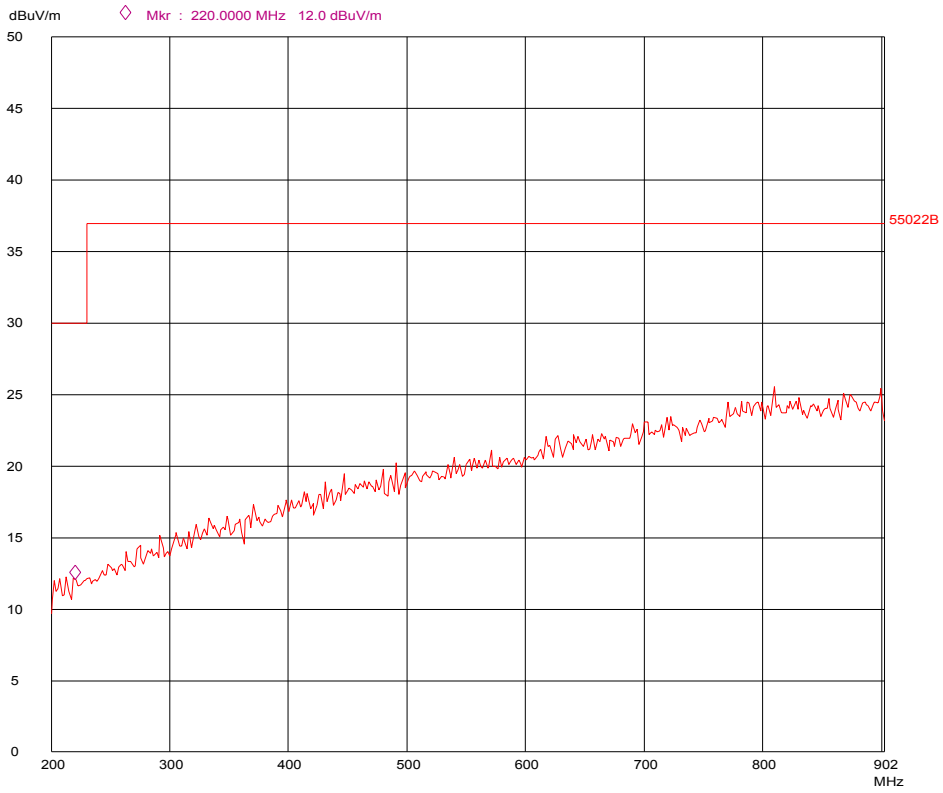
09. Feb 04 13:50

Operator: gns
Comment: BlueChip
HP

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
200M	902M	50k	120k	PK	20ms	AUTO	LN ON	60dB

Transducer No.	Start	Stop	Name
22	200M	1000M	HL223HP



Radiated emission 200 –902 MHz, Horizontal polarization(integrated ant)

NEMKO COMLAB AS

09. Feb 04 14:31

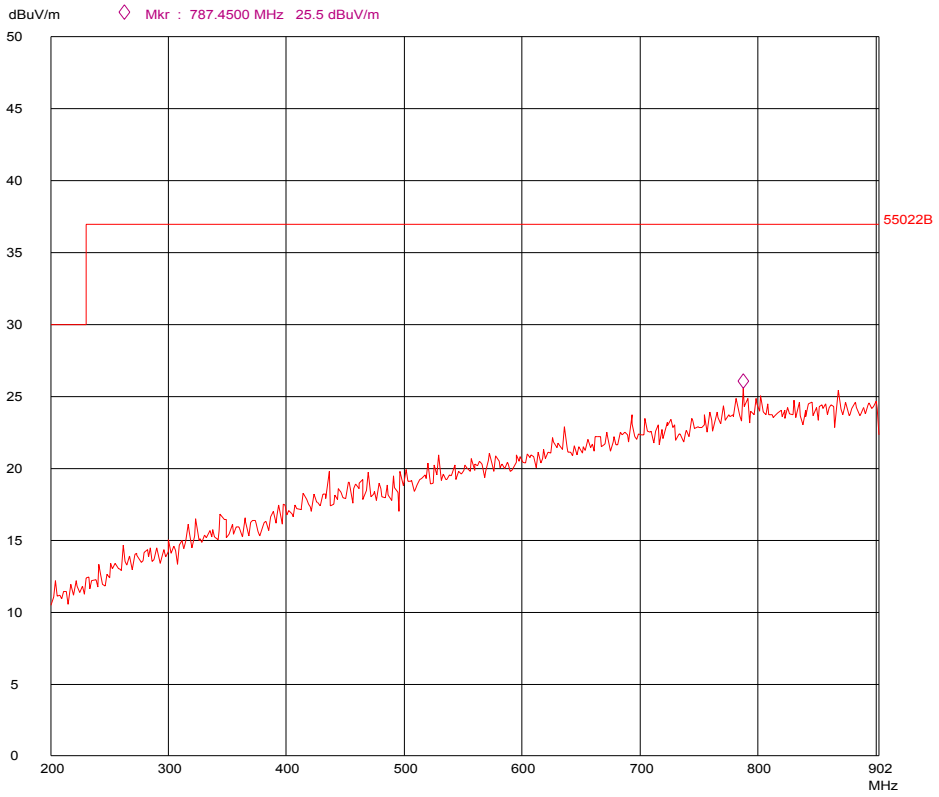
Peak

Operator: gns
Comment: BlueChip
VP

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
200M	902M	50k	120k	PK	20ms	AUTO	LN ON	60dB

Transducer No.	Start	Stop	Name
22	200M	1000M	HL223HP



Radiated emission 200 –902MHz, Vertical polarization (integrated ant)

NEMKO COMLAB AS

09. Feb 04 14:04

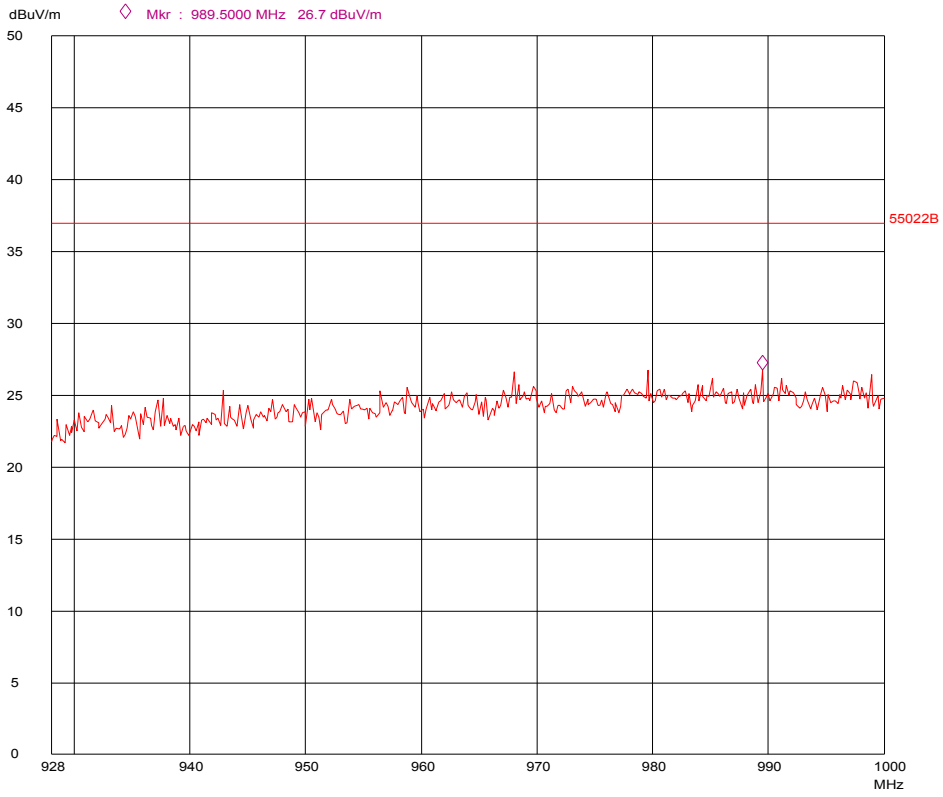
Peak

Operator: gns
Comment: BlueChip
HP

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
928M	1000M	50k	120k	PK	20ms	AUTO	LN ON	60dB

Transducer No.	Start	Stop	Name
22	200M	1000M	HL223HP



Radiated emission 928 - 1000 MHz, Horizontal polarization(integrated ant)

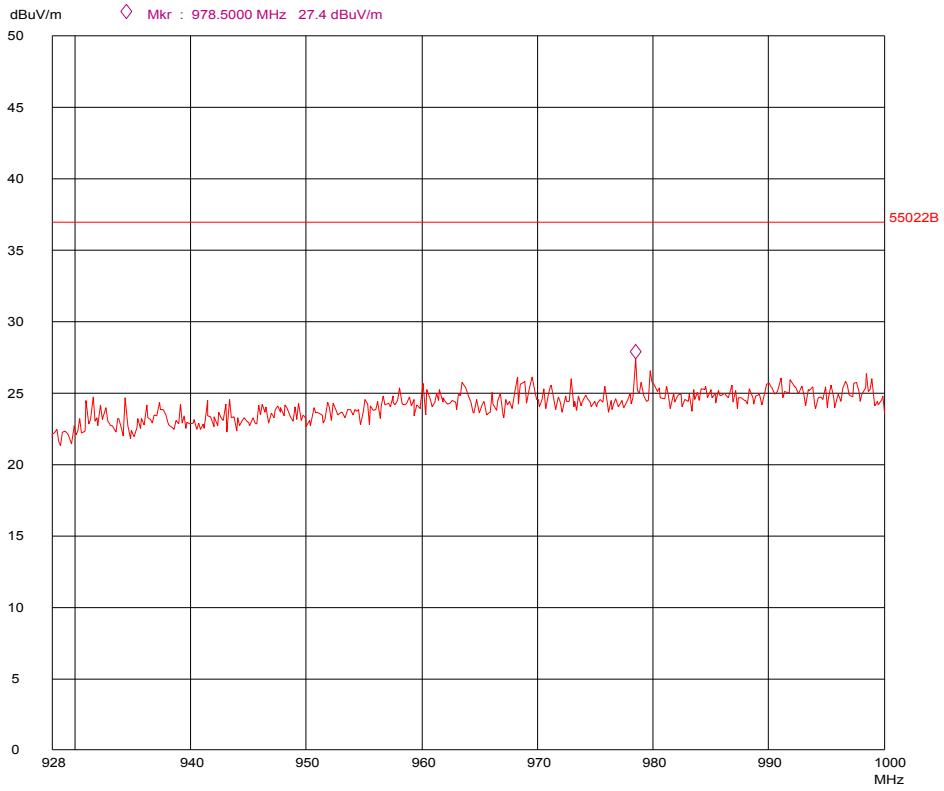
NEMKO COMLAB AS
Peak

09. Feb 04 14:40

Operator: gns
Comment: BlueChip
VP

Scan Settings (1 Range)
|--------- Frequencies ----------||---------- Receiver Settings ----------|
Start Stop Step IF BW Detector M-Time Atten Preamp OpRge
928M 1000M 50k 120k PK 20ms AUTO LN ON 60dB

Transducer No. Start Stop Name
22 200M 1000M HL223HP



Radiated emission 928 – 1000 MHz, Vertical polarization(integrated ant)

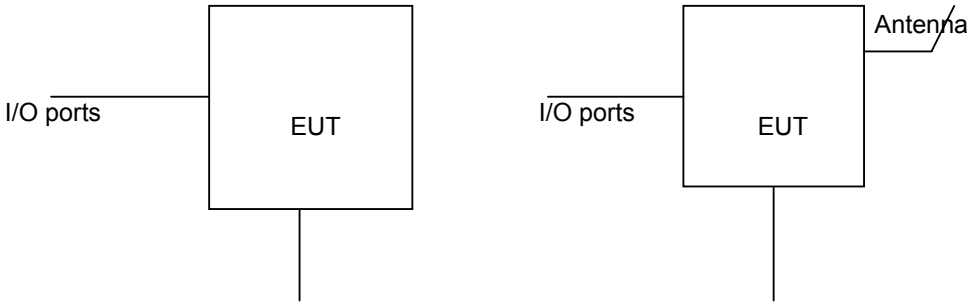
LIST OF TEST EQUIPMENT

To facilitate inclusion of the test equipment used for related tests on each page, each item is numbered by the test house.

No.	Instrument/ancillary	Type of instrument/ancillary	Manufacturer	Ref. no.
1.	FSEK	Spectrum Analyzer	Rohde & Schwarz	LR 1337
2.	ESAI	Spectrum Analyzer	Rohde & Schwarz	LR 1090
3.	3115	Antenna horn	EMCO	LR 1330
4.	PM7320X	Antenna horn	Siverts lab	LR 103
5.	DBF-520-20	Antenna horn	Systron Donner	LR 101
6.	638	Antenna horn	Narda	LR 098
7.	ESH3-Z3	LISN	Rohde & Schwarz	LR 1076
8.	8449B	Amplifier	Hewlett Packard	LR 1322
9.	959C	Printer	Hewlett Packard	LR 1414
10.	HFH2-Z2	Antenna loop	Rohde and Schwarz	LR 285
11.	10855A	Amplifier	Hewlett Packard	LR 1445
12.	HL223	Antenna log.per	Rohde & Schwarz	LR 1261
13.	3104C	Antenna biconical	EMCO	LR 1262
14.	R3271	Spectrum Analyzer	Advantest	LR 1123
15.	ESN	Test Receiver	R&S	LR1237
16.	HP6032A	Power Supply, program.	HP	1062
17.	5VF2000/400	Filter Band Pass	Texn	042
18.	5VF1000/2000	Filter Band Pass	Trilithic	1174
19.	643	Antenna Horn	Narda	93
20.	642	Antenna Horn	Narda	220
21.	PM 7320X	Antenna Horn	Sivers	102
22.	DBF-520-20	Antenna Horn	Systron	100

5 BLOCK DIAGRAM

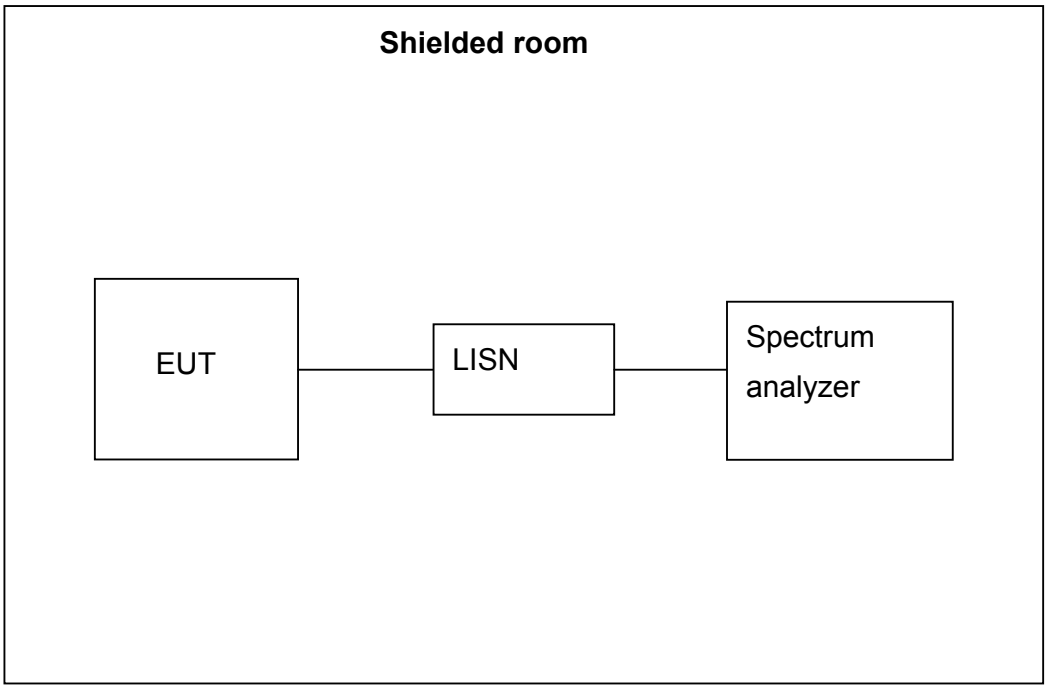
5.1 System set up



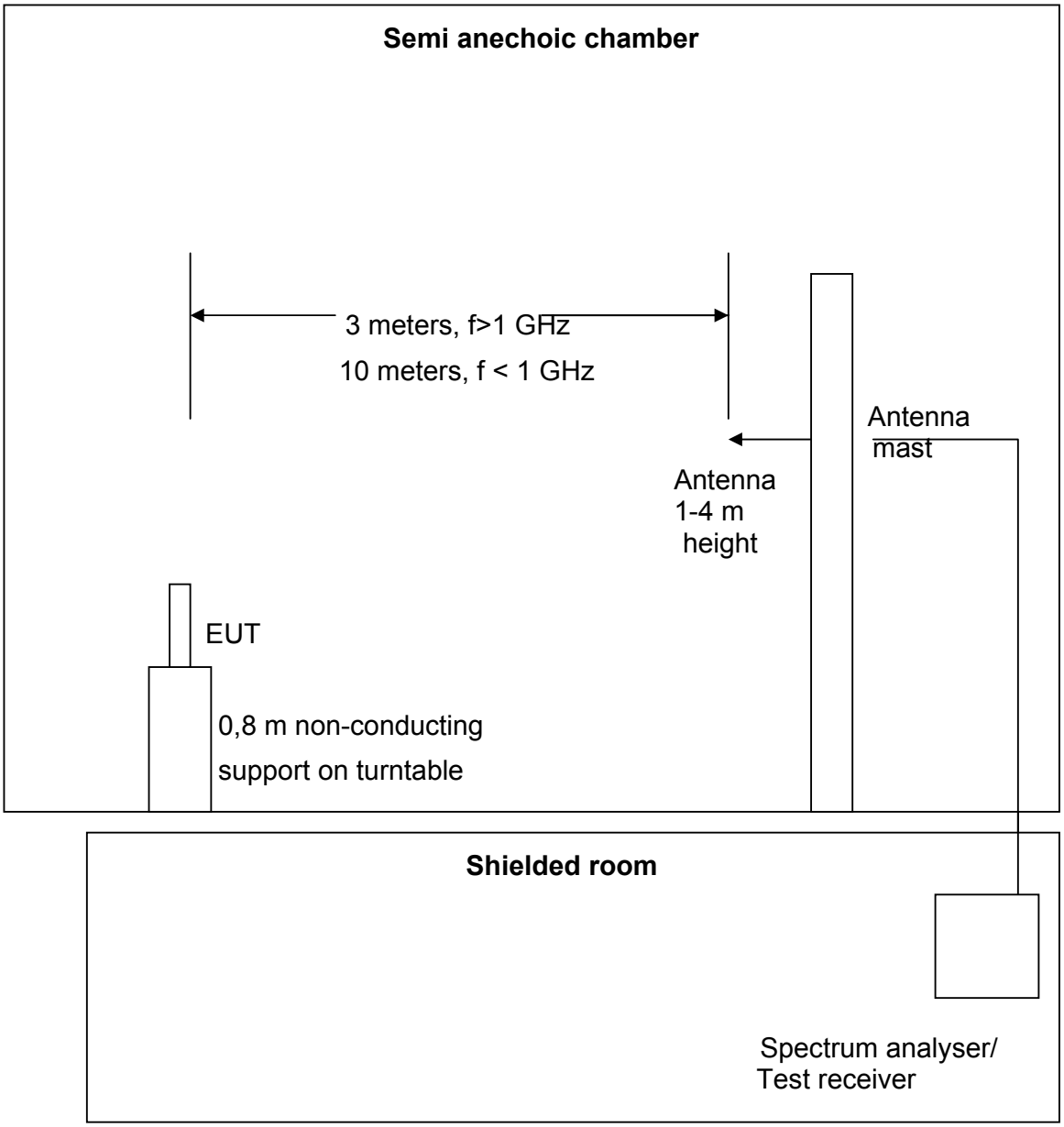
Unit with integral antenna

Unit with Detachable antenna

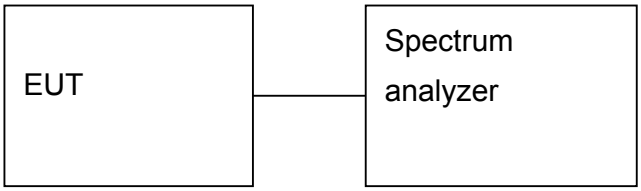
5.2 Powerline Conducted Emission



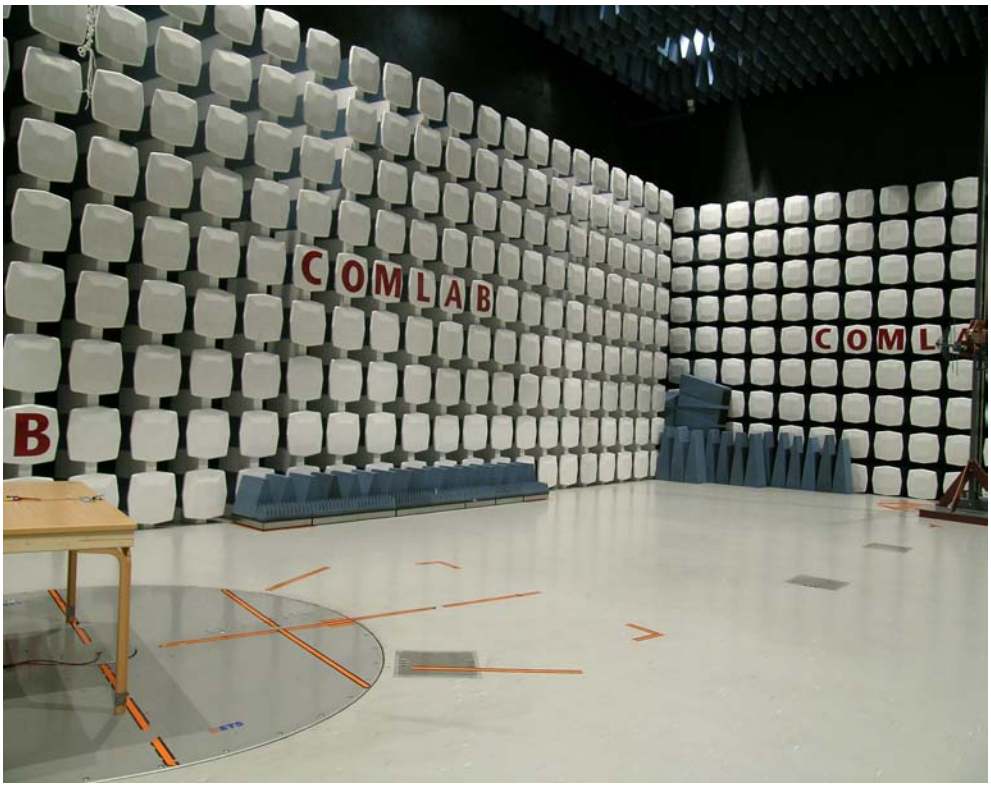
5.3 Test Site Radiated Emission



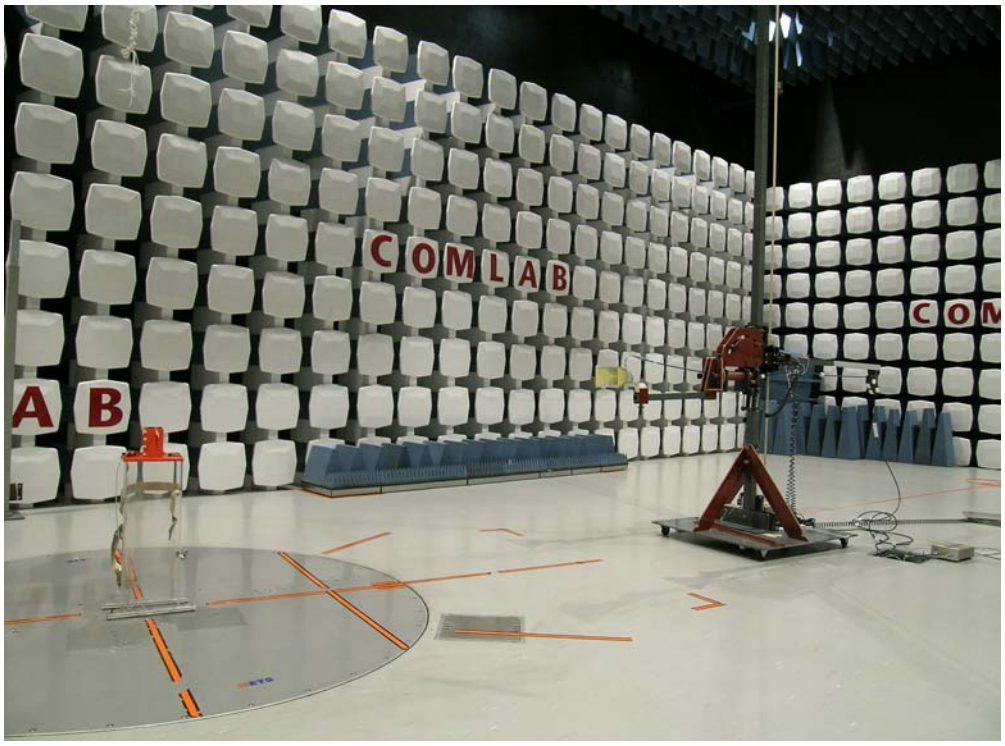
5.4 Peak Power Output



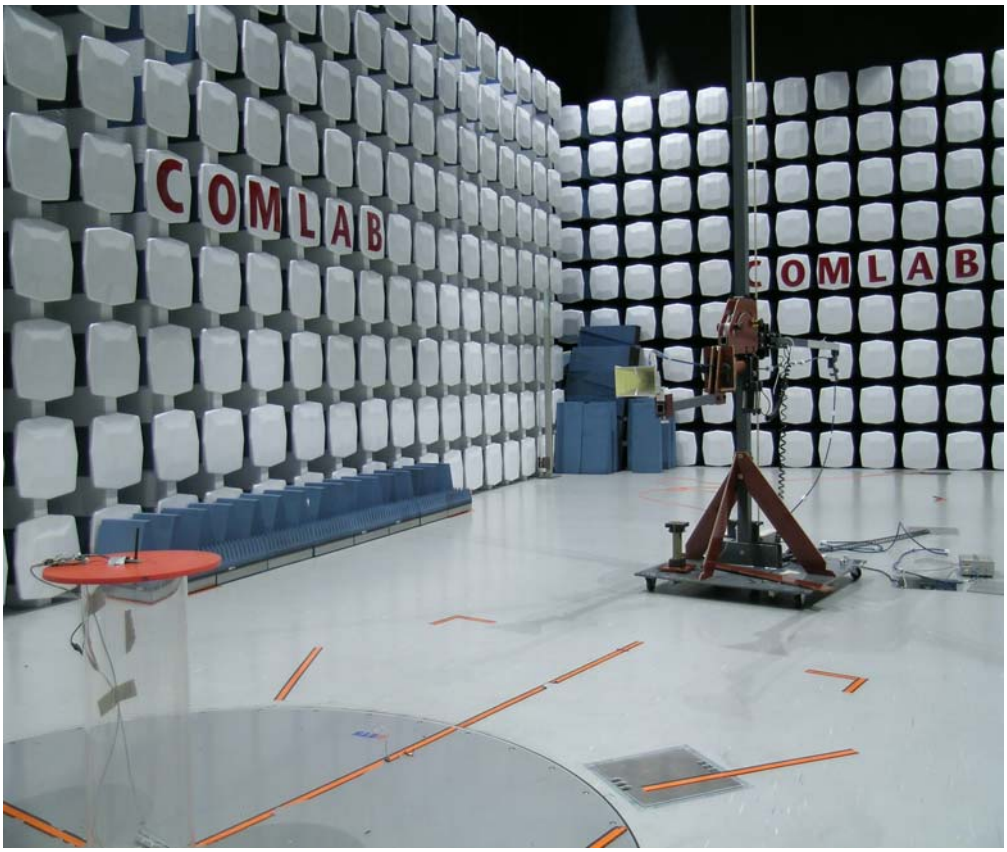
6 PICTURES OF TEST SET-UP AND THE TESTED EQUIPMENT



Radiated emissions below 1000 MHz (integrated ant)



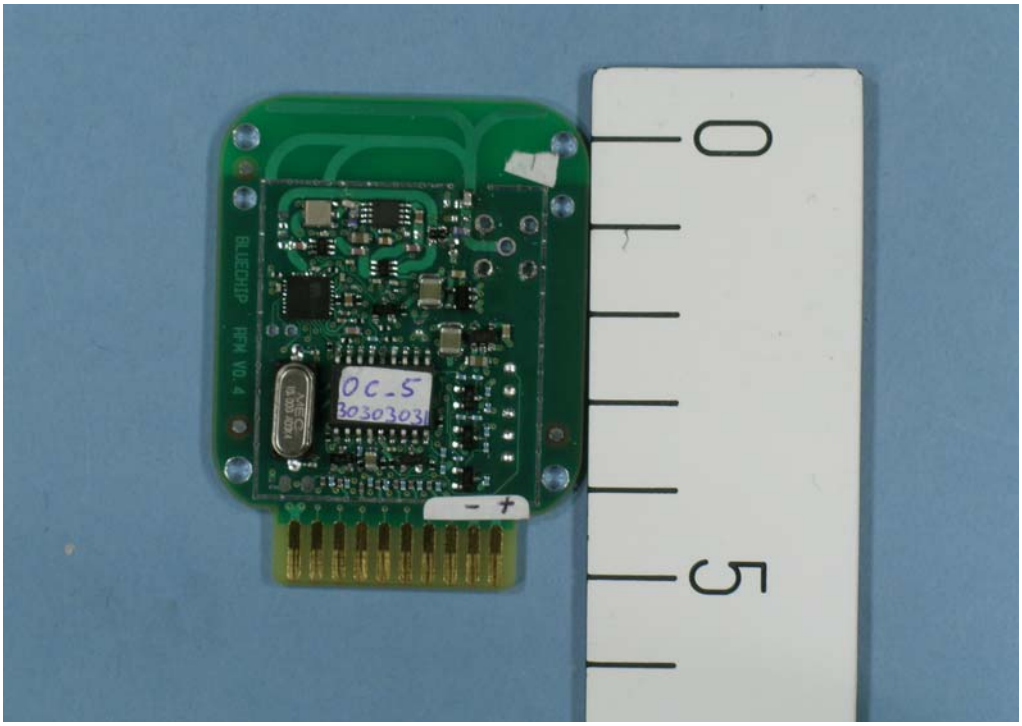
Radiated emission above 1 GHz (Integrated ant)



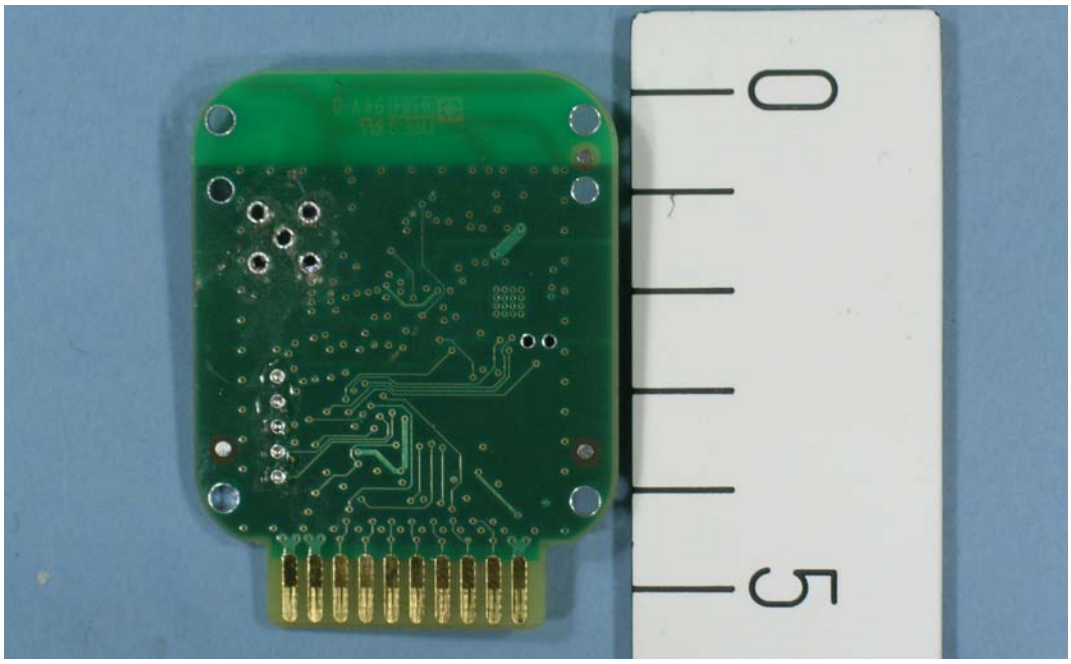
Radiated emission above 1 GHz (detachable ant)

Radiated emissions below 1000 MHz (detachable ant)

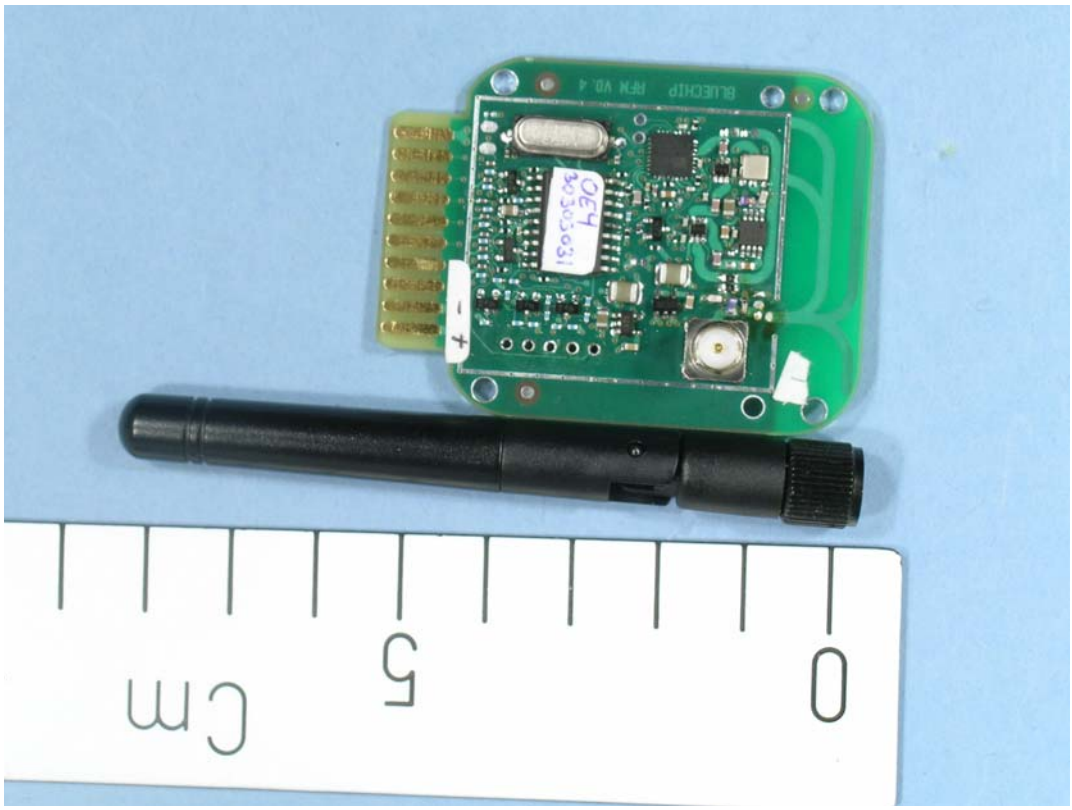
Test setup, Conducted emissions



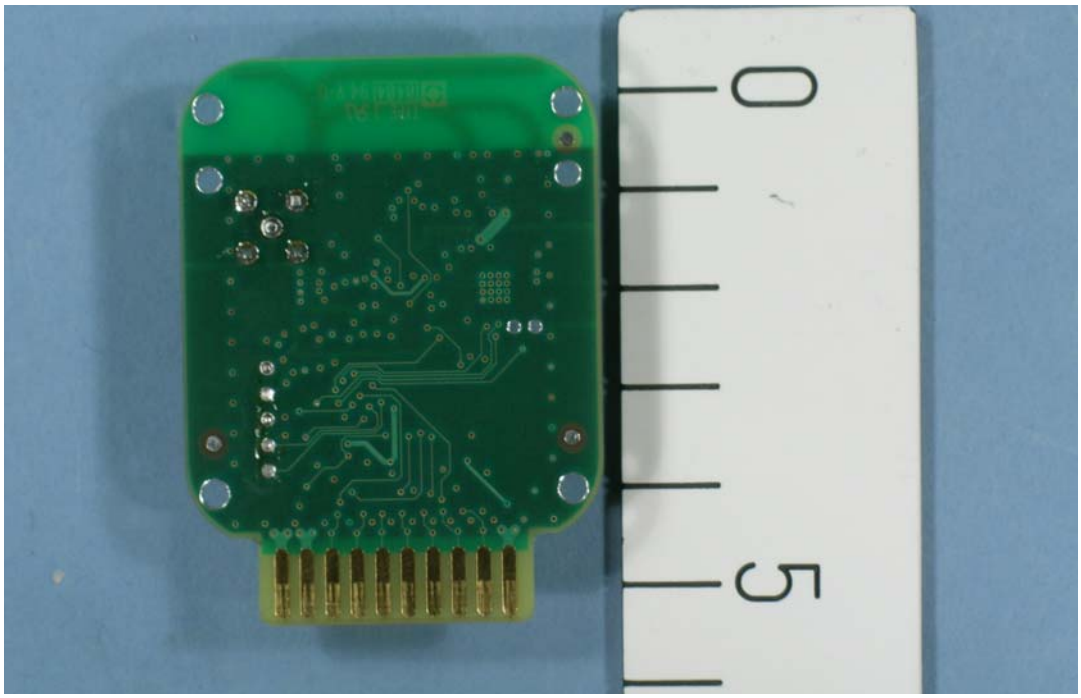
RF module with integrated antenna



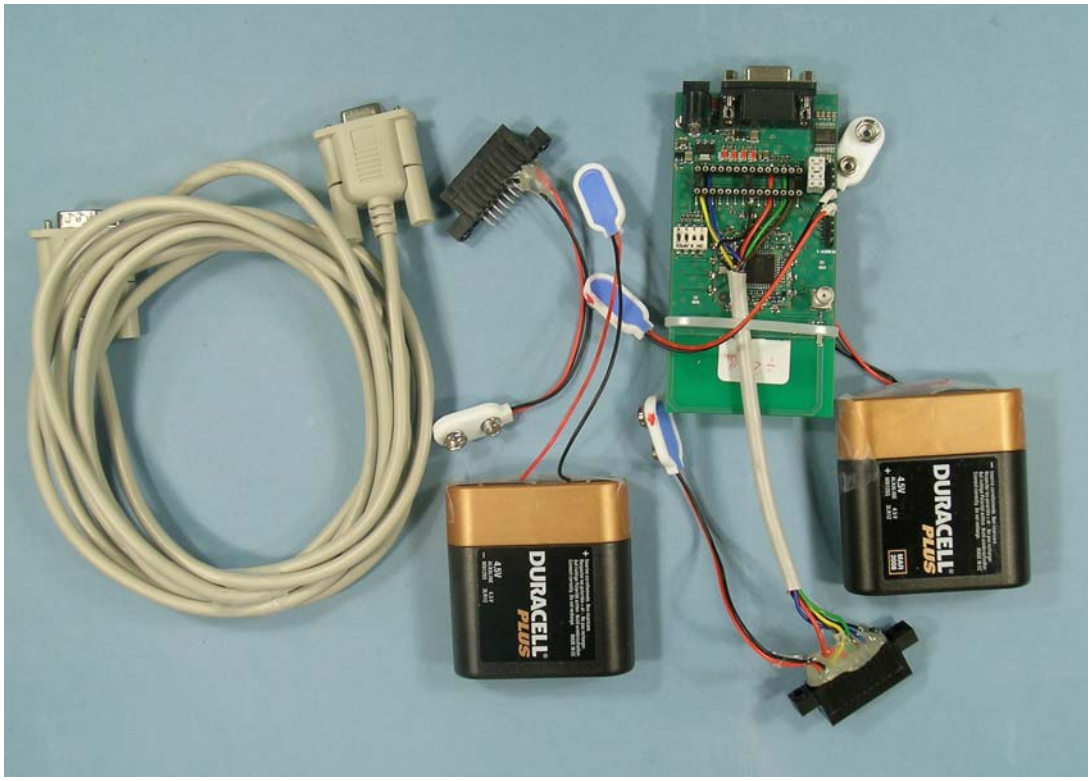
RF module with integrated antenna, back view



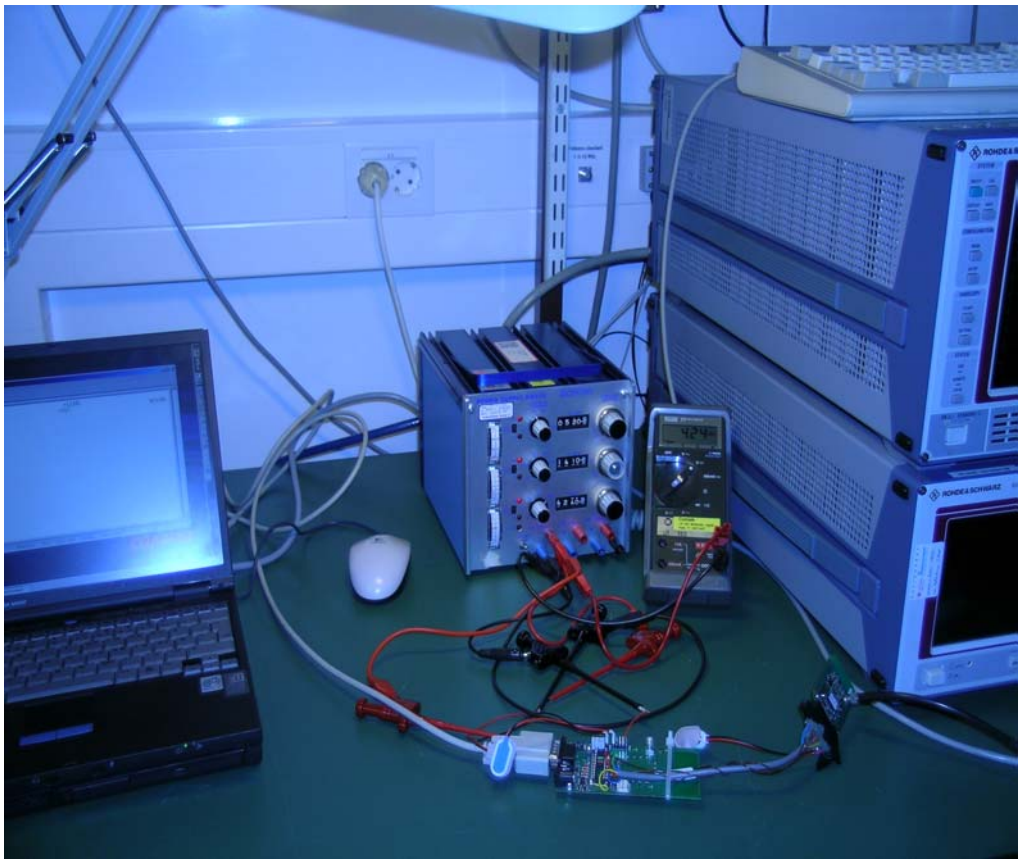
RF module with detachable antenna



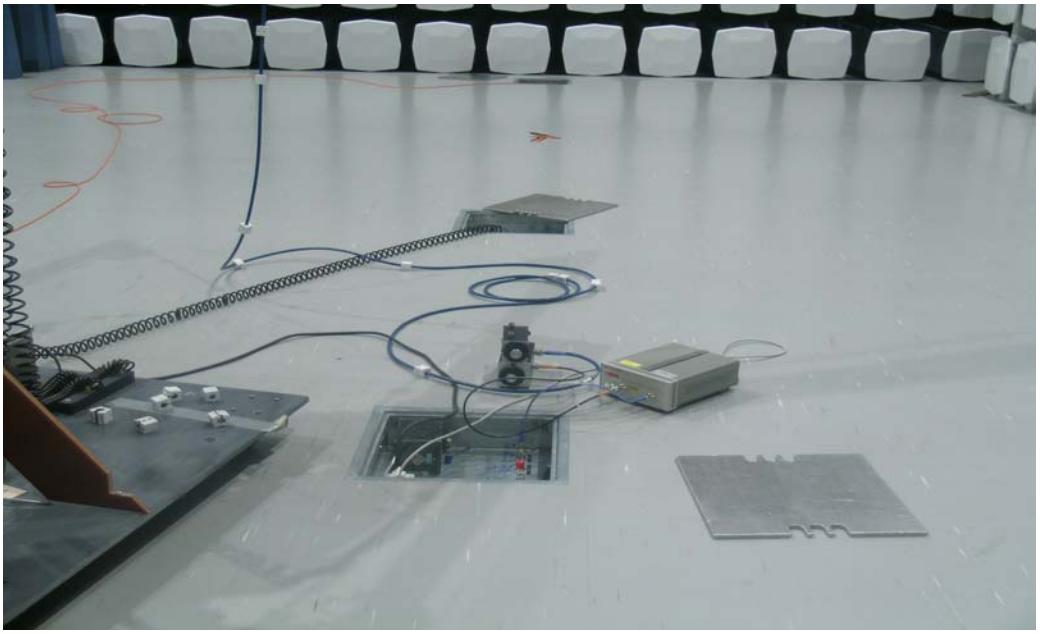
RF module with detachable antenna, back view



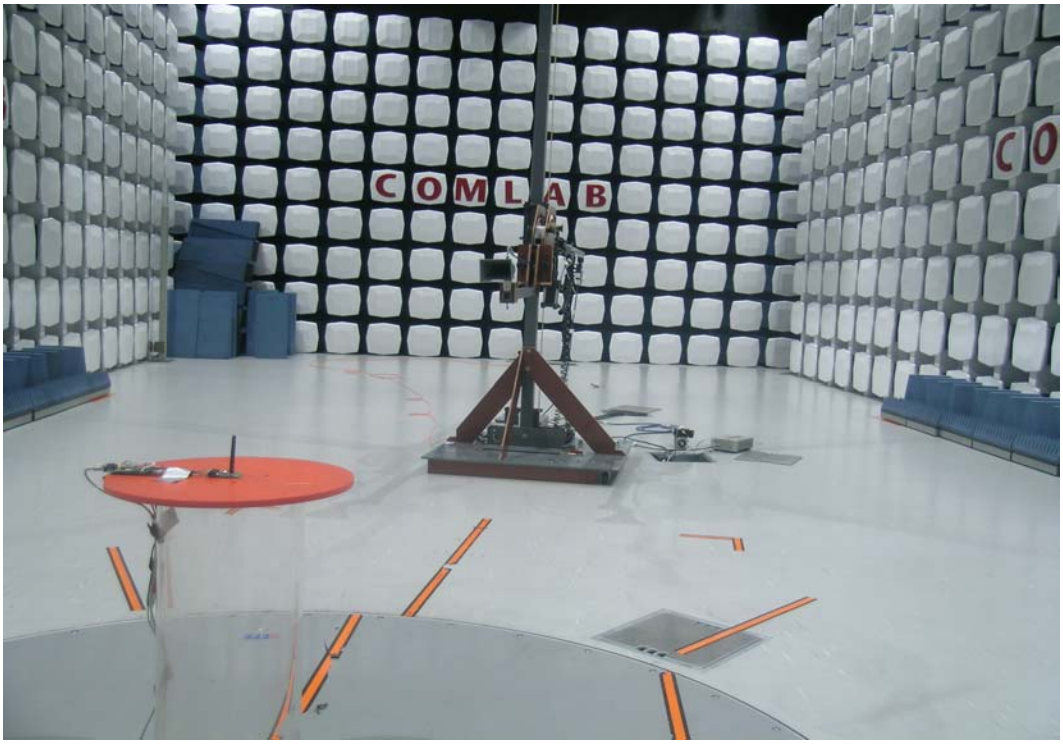
Supplied accessories for Testing



Test setup during radiated and conducted measurements, with regulated power supply and I/O ports of the device were loaded



Band pass filter at the input of the amplifier is used in order to eliminate overloading the amplifier from the radiated power for 2^{nd} , 3^{rd} & 4^{th} Harmonics



Directive antennas are used in order to measure harmonics above 4th