



ECL-EMC Test Report No.: 05-125

Equipment under test: IP 6000

Type of test: FCC 47 CFR Part 15 Subpart B Class B
And ICES 003 Issue 3

Measurement Procedures: ANSI C63.4 (2001)

Test result: Passed

Date of issue:	19.08.05			Signature:
Issue-No.:	01	Author:	Haas Test engineer	
Date of delivery:	14.07.05	Checked:	Zapf Operational manager	
Testdates:	15.07. – 19.08.05			
Pages:	33			



Client: Innovaphone AG

Böblinger Str. 76
D-71065 Sindelfingen
Germany

Testhouse: HERBERG Service Plus GmbH
European Compliance Laboratory (ECL)

Nordostpark 51
D-90411 Nürnberg
Tel.: +49 0911 59835 91
Fax: +49 0911 59835 90

General:

The purpose of the performed inspections and tests was to demonstrate that an equipment under defined environmental conditions can survive without irreversible failures and perform according to requirements. This report informs about the results of the EMC tests, it only refers to the equipment under test. No part of this report may be reproduced in any form, without written permission.



Table of contents

1	INTRODUCTION	4
1.1	PURPOSE	4
1.2	SUMMARY	4
2	EQUIPMENT UNDER TEST	5
2.1	EUT DESIGNATION	5
2.2	DESCRIPTION.....	5
2.3	CONFIGURATION	6
2.3.1	CONNECTIONS	7
3	DESCRIPTION OF EMC TEST CENTRE.....	8
3.1	REGISTRATIONS.....	8
3.2	SEMI ANECHOIC CHAMBER (SAC) WITH MAXIMUM 10M MEASUREMENT DISTANCE	9
3.3	FULLY ANECHOIC CHAMBER (FAC) WITH MAXIMUM 5M MEASUREMENT DISTANCE.....	10
3.4	FULLY ANECHOIC CHAMBER (FAC2) WITH MAXIMUM 3M MEASUREMENT DISTANCE.....	11
3.5	FULLY ANECHOIC CHAMBER (STRIPLINE)	12
3.6	SHIELDED TEST CABINS.....	13
3.7	INSTRUMENT ROOM	14
3.8	MEASUREMENT UNCERTAINTY.....	15
3.9	GROUND PLAN	16
	MEASUREMENT OF EMISSION	18
3.10	ELECTRIC FIELD RADIATED EMISSION IN THE FREQUENCY RANGE 30 MHz - 1 GHz	18
3.10.1	SET-UP AND TEST METHOD	18
3.10.2	TEST RESULTS	20
3.11	CONDUCTED EMISSION FROM THE POWER PORT	22
3.11.1	SET-UP AND TEST METHOD	22
3.11.2	TEST RESULTS	25
4	CALIBRATION LIST.....	28
5	ACCREDITATION CERTIFICATE.....	32



1 Introduction

1.1 Purpose

This report documents the qualification testing for the IP 6000 system to FCC 47CFR Part 15 Subpart B Class "B". The system is referred to as the EUT from here on for the purpose of this report. All emission testing was performed per ANSI C63.4 (methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz).

1.2 Summary

The EUT met the emission requirement per FCC 47CFR part 15 Subpart B for class B computing device. The radiated emissions were met with the EUT configured as stated here in this report with a minimum 0,5 dB margin below the specified limits.

The conducted emissions met with a minimum 7dB margin.

2 Equipment under test

2.1 EUT designation

IP 6000

2.2 Description

The “Innovaphone VoIP Gateway” is a powerful and extreme stable VoIP Gateway for connection to the classic telephony using four T1(DS1) PRI interfaces.

The VoIP-Gateway is available as desktop unit.

At the network side, the IP 6000 has four integrated T1 interfaces. With the integrated T1 interfaces, connection to the international leased lines are possible.

Technical Specification

Interfaces

T1 PRI 4 x TE mode for trunk interface or

2 x TE and 2 x NT to insert in trunk lines

Step-by-step license registration

ISDN BRI (TE0) ISDN interface in TE mode only, for routing, admin, synchronizing, backup or other

„Power-off“ Loop interconnect two PRI interface in power off status

2 x Ethernet: 10/100-BASE-TX auto negotiation

automatic recognition: Uplink / Downlink

Power over LAN (IEEE 802.3af)

Both interfaces individually addressable

LED for Activity and 100Mbit Modus

Compact Flash prepared for Compact Flash Cards Type I

Hardware

Housing: 210 x 184 x 32 mm

Can be fitted in 19“ equipment using an additional frame (optional), 1 height unit

Power Supply: internal mains adapter

100-240 V, 47-62 Hz, 15 W

or Power over LAN (IEEE 802.3af)

Memory: 128 MB DRAM,

16 MB Flash

Remote firmware update

CPU: RISC CPU for protocol processing

Digital Signal Processor (DSP) for voice data processing for up to 60 channels

Operation environment: Operation temperature 0°C to +45°C

Humidity 10% to 90% non-condensing

Storage temperature -10°C to +70°C

Weight: 1050 g

2.3 Configuration

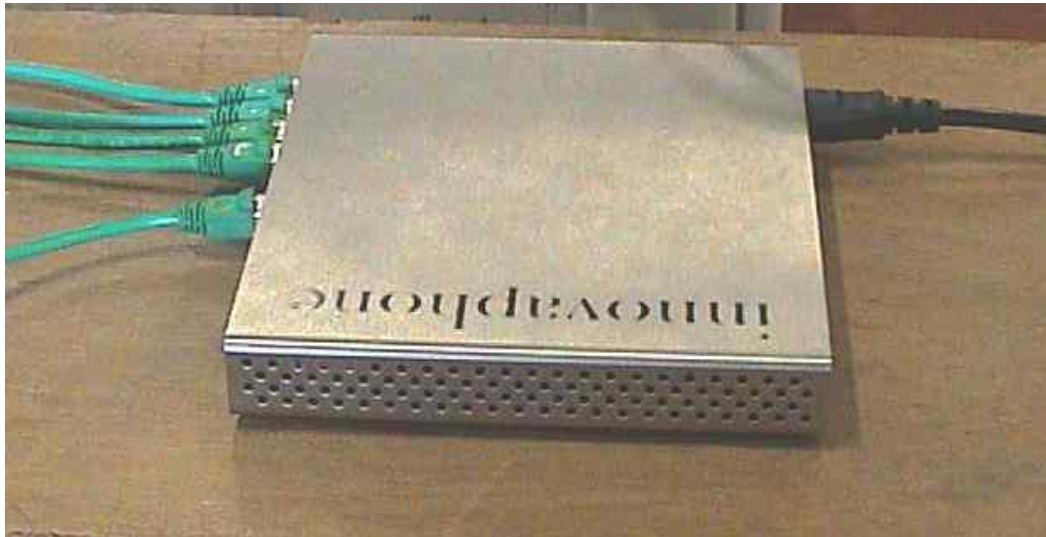
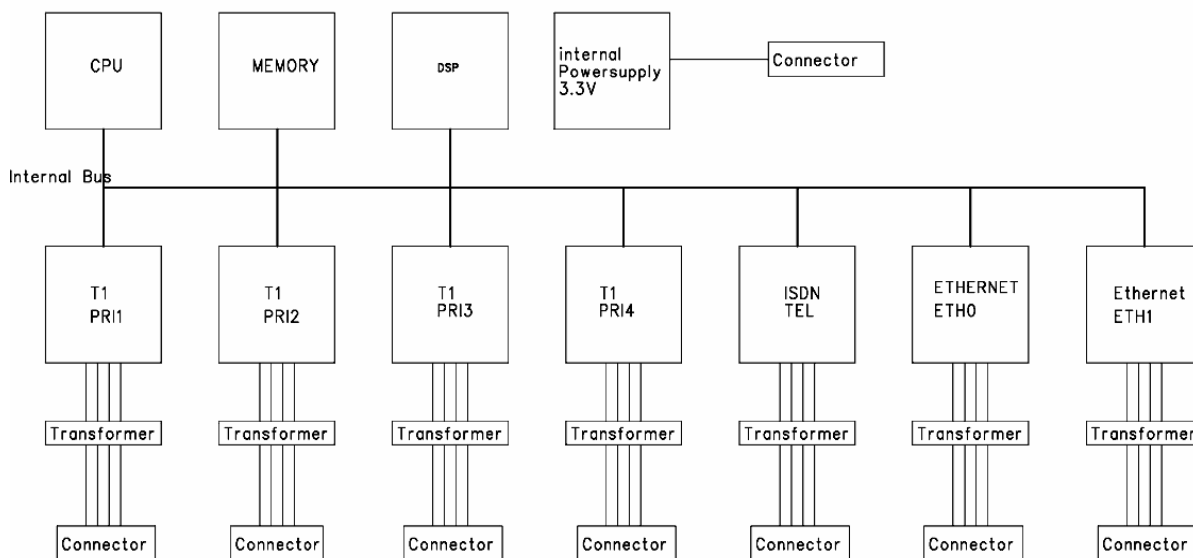


Fig. 2.3.1: EUT

EUT Block Diagram





2.3.1 Connections

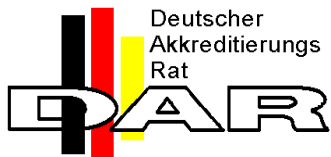
T1 PRI 4 x TE mode for trunk interface or
2 x TE and 2 x NT to insert in trunk lines
Step-by-step license registration
ISDN BRI (TEÖ) ISDN interface in TE mode only, for routing, admin, synchronizing, backup or other
„Power-off“ Loop interconnect two PRI interface in power off status
2 x Ethernet: 10/100-BASE-TX auto negotiation
automatic recognition: Uplink / Downlink
Power over LAN (IEEE 802.3af)
Both interfaces individually addressable
LED for Activity and 100Mbit Modus

3 Description of EMC test centre

3.1 Registrations



Registration No. (DATech): TTI-P-G 004/92-03



Registration No. (Krafftahrt-Bundesamt): KBA-P 00053-03



Registration No.: 96997



Registration No.
for conducted emission: C-2169
for radiated emission: R-2016
for conducted emission on telecommunication ports: T-140



Registered within Verizons ITL program.

3.2 Semi anechoic chamber (SAC) with maximum 10m measurement distance

Dimensions (LxWxH):	22.28 m x 15.98 m x 9.00 m with ground plane
Shielding:	Chrome steel frame with steel panels in modular design, screwed, insulated design
Shielding attenuation:	> 85 dB at 10 kHz > 100 dB at 156 kHz > 120 dB at 1 MHz > 100 dB at 100 MHz up to 1 GHz > 80 dB at 10 GHz > 80 dB at 18 GHz
Absorber:	Franko _{Sorb} P2400; length 2.4m; on sidewalls, endwalls and ceiling
Turntable:	5 m diameter; 3 t load-bearing capacity
EMC test system:	Rohde & Schwarz; ESH3; ESVS30; ESAI; ESI40
Antennas:	Loop antenna; biconical antennas, log. periodic antennas, horn antennas Emission frequency range: 10 kHz - 40 GHz Immunity frequency range: 10 kHz - 18 GHz
Chamber filters:	AC chamber filter max. 100A / 3 phase system DC chamber filter max. 100V / 100A 32 filters with 2 Mbit/s 20 filters with 64 kBit/s 20 filters with 3.4 kHz
Video:	Pontis
Power supplies:	DC: 100V / 100A (with chamber filter) or 70V / 500A (without chamber filter)



3.3 Fully anechoic chamber (FAC) with maximum 5m measurement distance

Dimensions (LxWxH):	12.01 m x 8.03 m x 6.00 m
Shielding:	Chrome steel frame with steel panels in modular design, screwed, insulated design
Shielding attenuation:	> 85 dB at 10 kHz > 100 dB at 156 kHz > 120 dB at 1 MHz > 100 dB at 100 MHz up to 1 GHz > 80 dB at 10 GHz > 80 dB at 18 GHz
Absorber:	Franko _{Sorb} H600; length 0.6 m; on sidewalls, endwalls, ceiling and bottom
Turntable:	3 m diameter; 1 t load-bearing capacity
EMC test system:	Rohde & Schwarz; ESH3; ESVS30; ESAI; ESI40
Antennas:	Loop antenna; biconical antennas, log. periodic antennas, horn antennas Emission frequency range: 10 kHz - 40 GHz Immunity frequency range: 10 kHz - 18 GHz
Chamber filters:	AC chamber filter max. 100A / 3 phase system DC chamber filter max. 100V / 100 A 32 filters with 2 Mbit/s 20 filters with 64 kBit/s 20 filters with 3.4 kHz
Video:	Pontis
Power supply:	DC: 100V / 100A

3.4 Fully anechoic chamber (FAC2) with maximum 3m measurement distance

Dimensions (LxWxH):	6.7 m x 3.1 m x 3.00 m
Shielding:	Chrome steel frame with steel panels in modular design, screwed, insulated design
Shielding attenuation:	> 85 dB at 10 kHz > 100 dB at 156 kHz > 100 dB at 1 MHz > 120 dB at 100 MHz up to 1 GHz > 80 dB at 10 GHz > 80 dB at 18 GHz
Absorber:	Ferrite Absorber 600mm * 600mm * 6 mm on sidewalls, endwalls, ceiling and bottom and Pyramid Absorber length 0.2 m;
Turntable:	1 m diameter;
EMC test system:	Rohde & Schwarz; ESH3; ESVS30; ESVS10
Antennas:	Loop antenna; biconical antennas, log. periodic antennas, horn antennas Open Stripline (EN 55020) Emission frequency range: 10 kHz – 18 GHz Immunity frequency range: 20MHz – 4 GHz
Chamber filters:	AC chamber filter max. 30A / 2 phase system



3.5 Fully anechoic chamber (Stripline)

Dimensions (LxWxH):	4,5 m x 2,5 m x 2.55
Shielding:	Chrome steel frame with steel panels in modular design, screwed, insulated design
Shielding attenuation:	> 85 dB at 10 kHz > 100 dB at 156 kHz > 100 dB at 1 MHz > 120 dB at 100 MHz up to 1 GHz > 80 dB at 10 GHz > 80 dB at 18 GHz
Absorber:	Ferrite Absorber 600mm * 600mm * 6 mm on sidewalls, endwalls, ceiling and bottom and Pyramid Absorber length 0.2 m;
EMC test system:	Rohde & Schwarz; ESH3; ESVS30; ESVS10
Antennas:	Stripline
Chamber filters:	AC chamber filter max. 30A / 2 phase system



3.6 Shielded test cabins

Measurementroom for SAC (MRS):

Dimensions (LxWxH): 2.5 m x 2.4 m x 2.5 m

Use: Isolation of auxiliary equipment from the equipment under test inside SAC

Measurementroom for FAC (MRF):

Dimensions (LxWxH): 3.5 m x 1.7 m x 2.5 m

Use: Isolation of auxiliary equipment from the equipment under test inside FAC

Shielded cabin (EMI):

Dimensions (LxWxH): 4.31 m x 4.31 m x 2.8 m

Use: ESD test cabin, RFI voltage measurement and conducted interference immunity tests.

Cabin filters: AC chamber filter max. 25 A
DC chamber filter max. 60 A
2 filters with cut-off frequency 3.4 kHz
5 filters (4-w) with cut-off frequency 500 kHz

Amplifier room (AR):

Dimensions (LxWxH): 3.5 m x 2.5 m x 2.5 m

Use: Location for RF amplifiers

Shielded cabin (EMI2)

Dimensions (LxWxH): 3.5 m x 3.45.m x 2.5 m

Use: Immunity Test for sound broadcast receivers and associated equipment

Cabin filters: AC chamber filter max. 25 A

Shielded cabin (EMI3)



Dimensions (LxWxH): 3.5m x 2.9 m x 2.5 m

Use: Immunity Test for television broadcast receivers and associated equipment

Cabin filters: AC chamber filter max. 16 A

Shielded cabin (ACTS)

Dimensions (LxWxH): 3.5 m x 7.5 m x 2.5 m

Use: Interference Power and Interference Voltage Test for Sound, television broadcast receivers and associated equipment

Cabin filters: AC chamber filter max. 25 A

3.7 Instrument room

Dimensions (LxWxH): 12 m x 5.33 m x 3.3 m

Use: Location for measurement equipment as like as spectrum analyzers, receivers and PCs with EMI software. There are also located: Control devices for antenna/turntable movement and audio/video.

3.8 Measurement Uncertainty

The table below shows the measurement uncertainties for each measurement method. The expanded uncertainty was calculated with worst case values over the complete frequency area.

Measurement method	Frequency area impulse duration time	Description	expanded Uncertainty (95% or k=2)
Radiated emission (EN 55022; ANSI C63.4 etc.)	30 MHz - 1 GHz	Semi anechoic chamber	± 4,7 dB
	1 GHz - 18 GHz	Fully anechoic chamber	± 3,9 dB
Conducted emission (EN 55022; ANSI C63.4 etc.)	9 kHz - 150 kHz		± 4,0 dB
	150 kHz - 30 MHz		± 3,6 dB
Harmonics (EN 61000-3-2)	2 ... 40 x f _N ;	Voltage	± 1%
	f _N = 50 Hz	Current	± 1%
Flicker (EN 61000-3-3)	f _N = 50 Hz	P _{st}	± 1,5%
ESD (EN 61000-4-2)	5/30ns	Rise time / half life	± 30%
		Voltage amplitude	± 10%
Radiated Immunity (EN 61000-4-3)	80 MHz - 1 GHz		± 42,7%
BURST (EN 61000-4-4)	5/50 ns	Rise time / half life	± 20%
		Voltage amplitude	± 4,1%
SURGE (EN 61000-4-5)	1,2/50 μs 8/20 μs	Voltage rise time / half life	± 30% / ±20%
		Current rise time / half life	± 20% / ±20%
		Charged voltage	± 4,1%
HF-Injection (EN 61000-4-6)	150 kHz - 80 MHz		± 9%
Voltage Dips, Interruptions (EN 61000-4-11)		Voltage level	± 1%
		Time	± 0,1%
Power induction	ITU-K.20	Frequency	± 0,1Hz
		Amplitude	± 1%

3.9 Ground plan

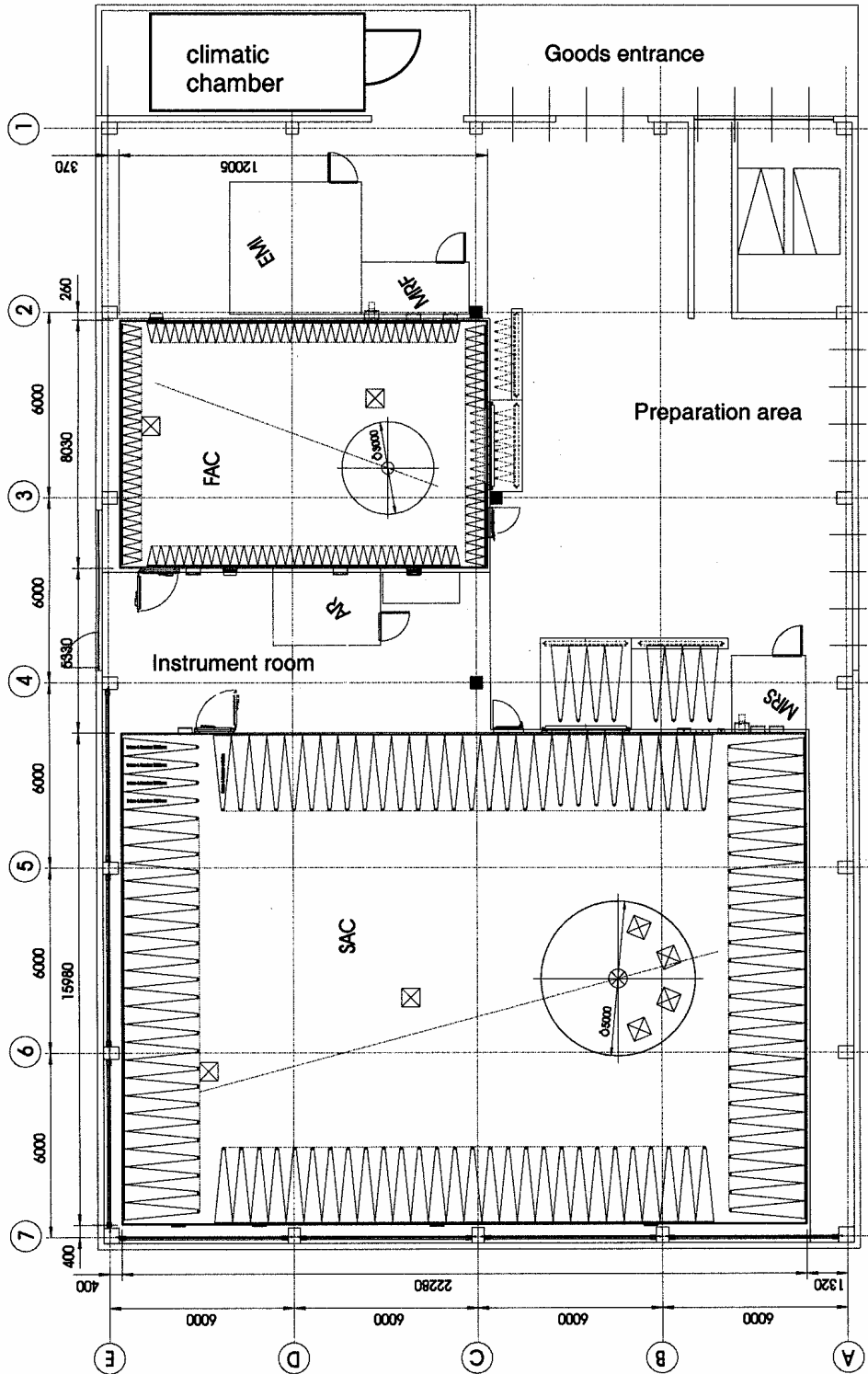


Abb. 3.9.1: Partition of the European Compliance Laboratory (Thurn-und-Taxis-Strasse 18)

Measurement of emission

3.10 Electric field radiated emission in the frequency range 30 MHz - 1 GHz

3.10.1 Set-up and test method

This clause specifies requirements for the measurement of radiated emission.

Frequency range	Distance: EUT <-> antenna	Limit	Test method
30 MHz - 1 GHz	10 metres	Class A / B FCC 47 CFR Part 15 Subpart B Class B	EN 55022 ANSI C63.4

Test equipment used:

Designation	Equipment	Manufacturer	Frequency range	used
EMI test receiver	ESI40	Rohde & Schwarz	20 Hz – 40 GHz	X
Antenna	CBL 6111	Chase	30 MHz – 1 GHz	X
Antenna	3141	EMCO	26 MHz – 2 GHz	

Test set-up:

Test location: SAC

Type of EUT: GEART

The measurements were made in the operating mode, with the EUT producing the maximum emission, consistent with normal applications. The EUT load was adjusted within the range specified by manufacturer in order to maximize the emission.

For this test, the EUT was placed on the turntable at a distance of 10 m from the receive antenna. The EUT was positioned on a 10 cm high wooden pallet or on a wooden table. The connecting lines to the EUT were fed in from above (as in the installation). The system ground was connected to the ground plane. The turntable was connected directly to the ground system of the test chamber.

While EUT power is on, an operator manually scans the selected frequency range using an EMI test receiver to identify signals being generated by the EUT. At this time the operator determines which signals generated by EUT are significant enough to assign to the final data list in the computer. The signals on the final list are automatically characterized while the antenna is in both horizontal and vertical polarity. The tower and turntable are controlled by the operator. The maximized signal indication on the receiver is then combined with the calibration factors, cable insertion loss and the proper antenna factors to provide the emission level in dB μ V/m which is compared directly with the requirement stored in the program libraries. The maximum RFI field strength was determined during the measurement by rotating the turntable (± 180 degrees) and varying the height of the receive antenna ($h = 1 \dots 4$ m).

Field Strength Calculations

$$FS = SA + AF + CL$$

Where as;

- FS** = Total Field Strength
- SA** = EMC test receiver Reading
- AF** = Antenna Factor
- CL** = Cable Loss

Operating state during measurements:

See subclause „operating states“.

Climatic test conditions during measurement:

Ambient temperature:	21 °C
Relative humidity:	45 %
Air pressure:	1012 hPa

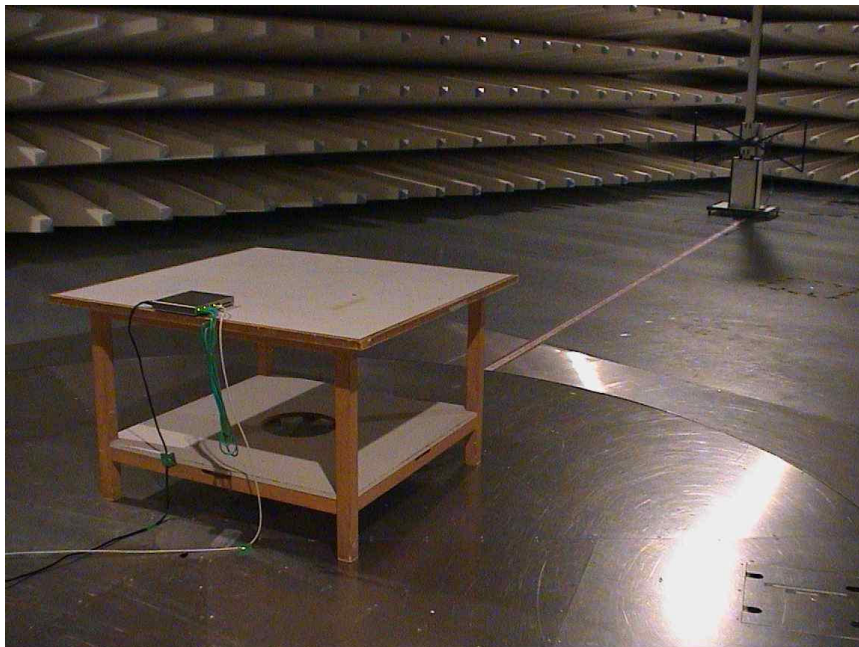


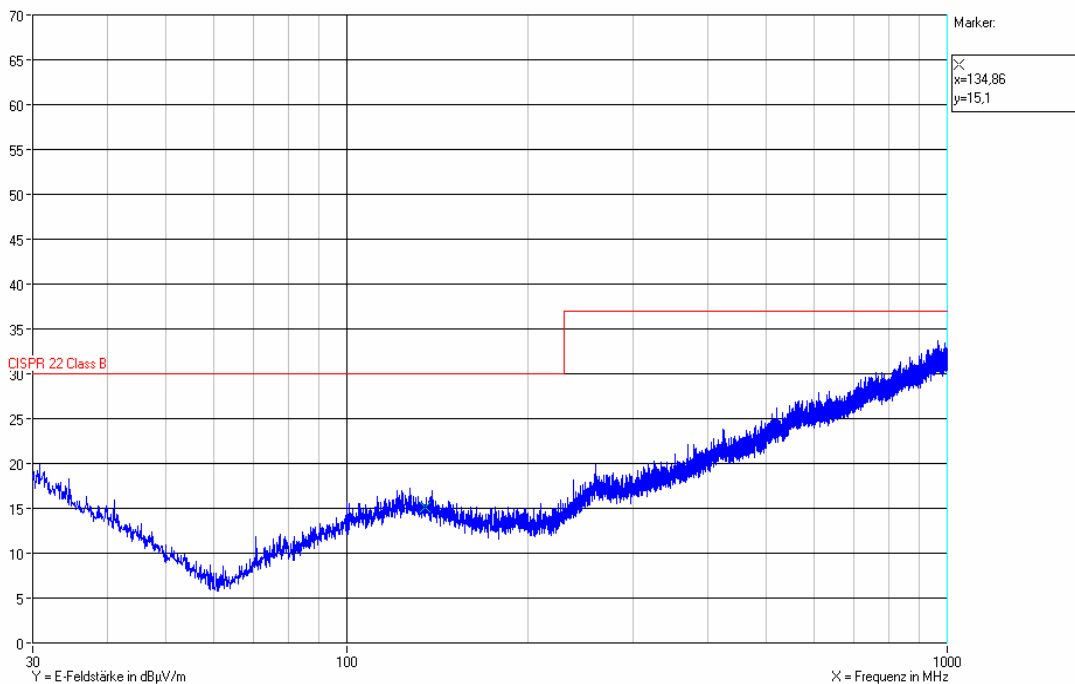
Fig. 3.10.1: Basic set-up for radiated emission; 30 MHz - 1 GHz

3.10.2 Test results

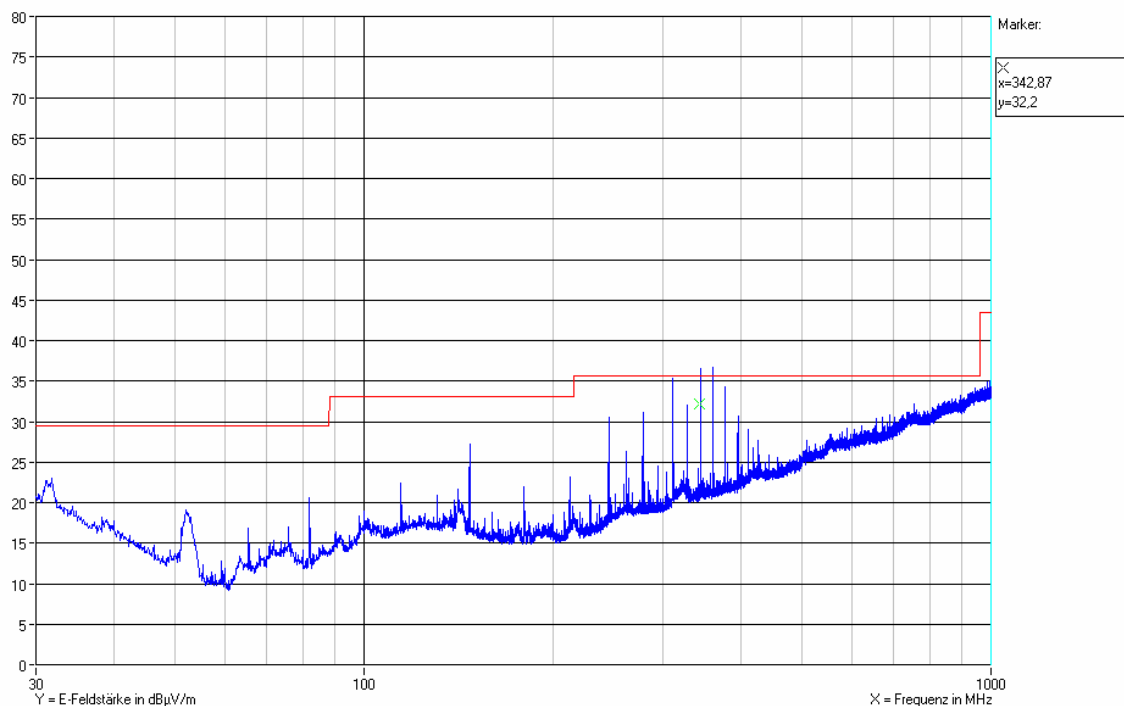
The curves on the diagrams show the measurements using the peak detector or if necessary the quasi-peak detector. A functional test of the test equipment was carried out before and after the measurements. Measurement report 1 shows the ambient noise.

Frequency range	Mode	Antenna	Detector	Measurement report
30 MHz - 1 GHz	speaking	horizontal + vertical	Peak	2

Frequency	EUT	Antenna	Antenna	Meter	Cable	Antenna	Field	Spec	Margin
(MHz)	Azimuth (deg.)	Height (m)	Polarity (H/V)	Reading (dB μ V)	Loss (dB)	Factor (dB/m)	Intensity (dB μ V/m)	Limit (dB μ V/m)	(dB)
147,48	-180	1,0	V	12,25	1,60	10,70	24,55	33,10	8,55
213,04	150	1,0	V	7,46	1,80	10,20	19,46	33,10	13,64
245,71	150	1,0	V	15,80	1,90	12,00	29,70	35,60	5,90
262,1	-150	1,0	V	8,27	2,00	13,30	23,57	35,60	12,03
278,49	-150	1,0	V	16,00	2,10	13,30	31,40	35,60	4,20
311,27	-150	1,0	V	19,11	2,20	13,80	35,11	35,60	0,49
327,66	-180	1,0	V	14,24	2,30	13,90	30,44	35,60	5,16
344,,05	-180	1,0	V	17,35	2,40	14,30	34,05	35,60	1,55
360,44	-180	1,0	V	17,63	2,40	14,90	34,93	35,60	0,67
393,22	-180	1,0	V	14,49	2,50	15,40	32,39	35,60	3,21
395,97	-150	1,0	V	7,42	2,50	15,80	25,72	35,60	9,88
409,61	-180	1,0	V	11,98	2,55	15,90	30,43	35,60	5,17



Measurement report 1: ambient noise scan



Measurement report 2: Result of the automatically measurement; Graph includes horizontal and vertical polarity

3.11 Conducted emission from the power port

3.11.1 Set-up and test method

This clause specifies requirements for the measurement of conducted emission.

Frequency range	Line	Limit	Test method
150 kHz - 30 MHz	AC power supply line	Class A / B EN 300 386 FCC 47 CFR Part 15 Subpart B Class B	EN 55022 ANSI C63.4

Test equipment used:

Designation	Equipment	Manufacturer	Frequency range	used
EMI test receiver	ESI40	Rohde & Schwarz	20 Hz – 40 GHz	X
EMI test receiver	ESH-3	Rohde & Schwarz	9 kHz – 30 MHz	
Transient Limiter	ESH3-Z2	Rohde & Schwarz	9 kHz – 30 MHz	X
LISN (4x25 A)	LISN4-25/32	Bajog	9 kHz – 30 MHz	X
LISN (2x100 A)	LISN2-100/200	Bajog	9 kHz – 30 MHz	
LISN (4x100 A)	LISN4-100/200	Bajog	9 kHz – 30 MHz	

Test set-up:

Test location: SAC

Type of EUT: GEART

The supply voltage for the EUT was provided via a Line impedance stabilizing network (LISN). The LISNs were under the turntable and connected to the chamber ground.

The EUT, when intended for table-top use, was placed 0,4m from a vertical metal reference plane of at least 2m by 2m, and was kept at least 0,8m from any other metal surface or other ground plane was not part of the EUT. If the measurement was made in a screened enclosure, the distance of 0,4m was referred to one of the walls of the enclosure. If the measurement was made in a screened enclosure, the distance of 0,4m was referred to the horizontal metal ground plane.

A floor-standing EUT was placed on a horizontal metal ground plane, the points of contact were consistent with normal use, but not in metallic contact with the ground plane. The reference ground plane was at least 0,5m beyond the boundaries of the EUT, and had minimum dimensions of 2m by 2m.

Operating state during measurements:

Speaking

Climatic test conditions during measurement:

Ambient temperature: 21 °C
 Relative humidity: 45 %
 Air pressure: 1014 hPa

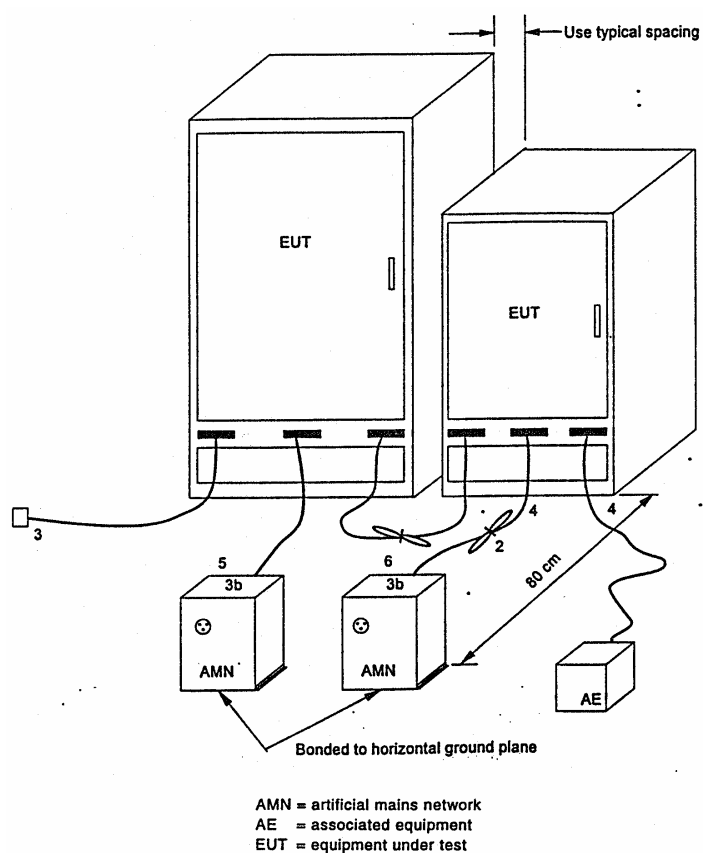
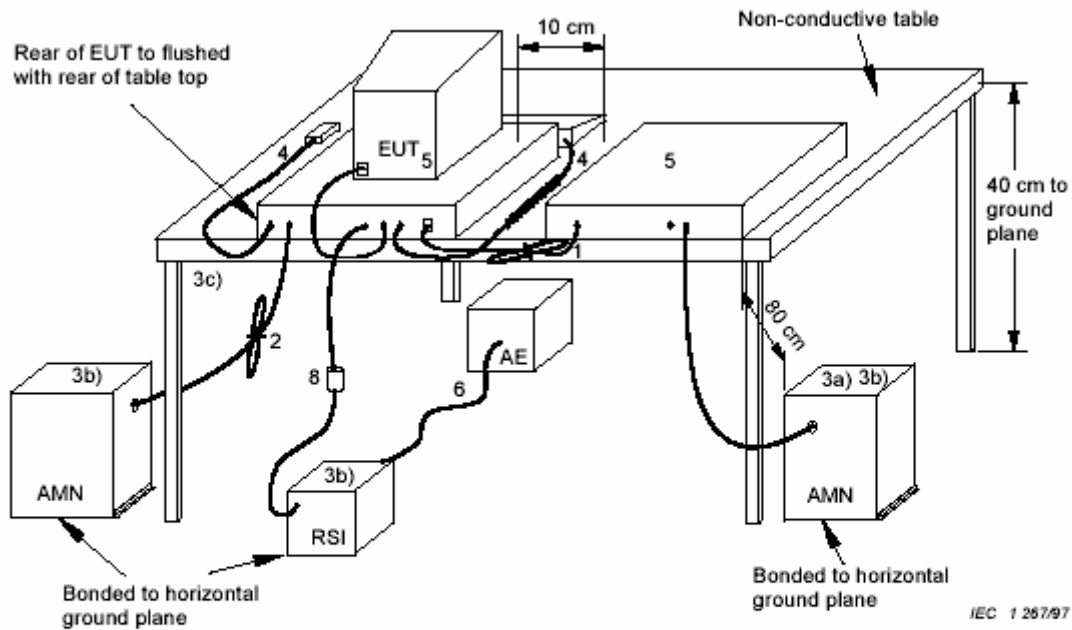


Fig. 3.11.1: Test configuration: floor-standing equipment



AMN = Artificial mains network
 AE = Associated equipment
 EUT = Equipment under test
 ISN = Impedance stabilization network

Fig. 3.11.2: Test configuration: table-top equipment

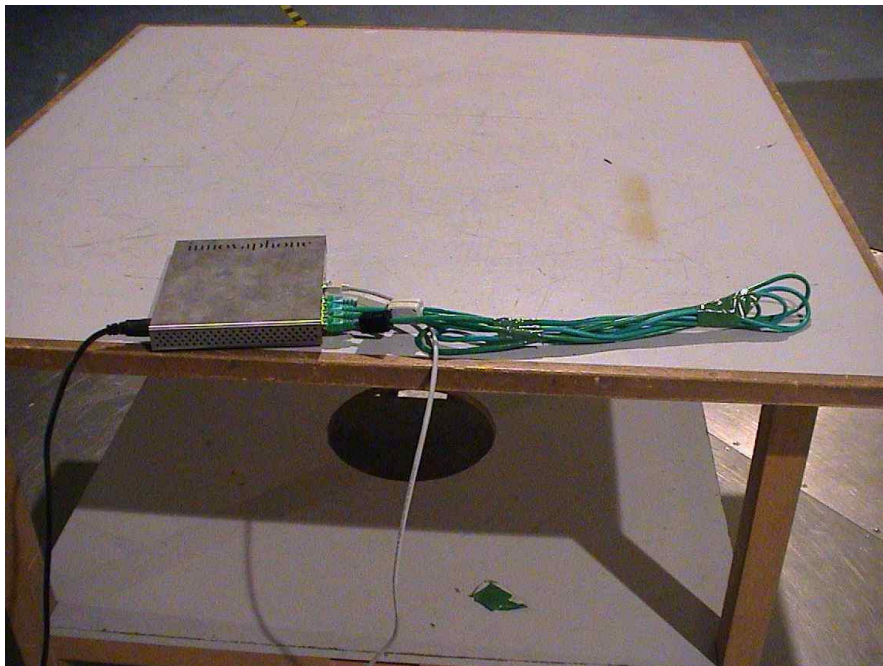
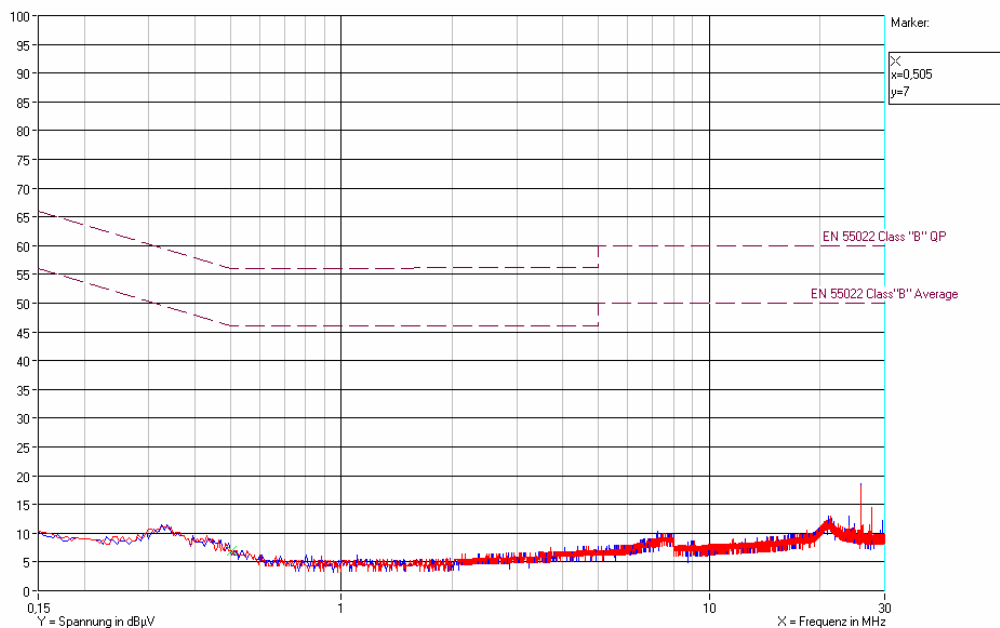


Fig. 3.11.3: Basic set-up for conducted emission test from power ports

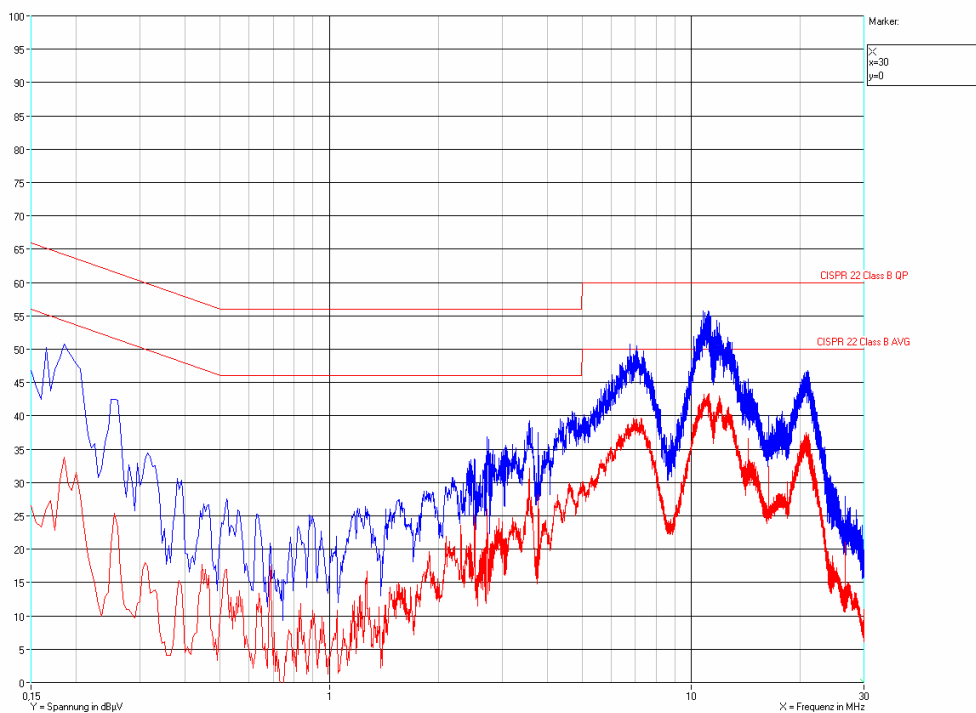
3.11.2 Test results

A functional test of the test equipment was carried out before and after the measurements. Measurement report 1 shows the ambient noise.

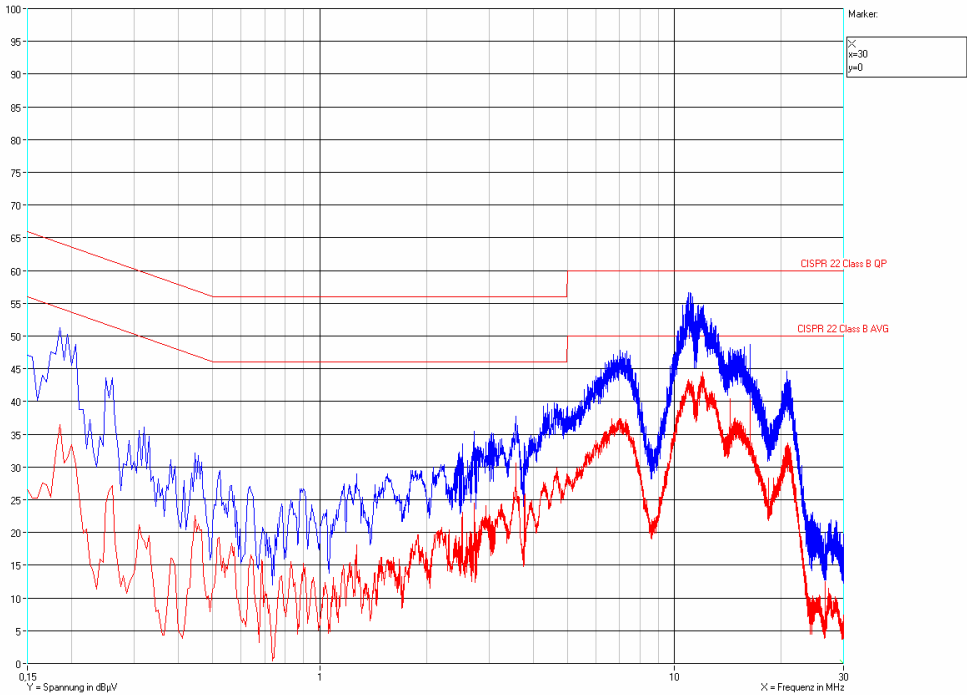
Frequency range	Mode	Line	Detector	Measurement report
150 kHz - 30 MHz 20 kHz - 30 MHz	Spüpeaking	N	Peak/ Average	2
		L	Peak/ Average	3



Measurement report 1: ambient noise scan



Measurement report 2: Line N blue: Peak red: average



Measurement report 3: Line L blue: Peak red: average

4 Calibration list

Asset no.	Serial no.	Model	Manufacturer	Designation	Cal. date
D2157	611462	CTR 2	EM Test	Calibration shunt	23/03/2006
D2500	---	6515.17.A	Suhner	Terminator 50 Ohm	27/04/2006
D2501	445P-29	K6226311	Kathrein	Terminator 50 Ohm	27/04/2006
D2502	---	6515.17.A	Suhner	Terminator 50 Ohm	06/05/2006
D3000	894381/019	DPSP	Rohde&Schwarz	Step Attenuator	09/06/2006
D3010	---	18N5W-20dB	INMET	Attenuator	21/01/2006
D4000	390363	50FHAM-006-500	INMET	Attenuator	09/03/2006
D4001	5210/6	AT50-6-250	BNOS Electronics	Attenuator	07/09/2006
D4002	7389	53 AS 120-K10	Rosenberger	Attenuator	07/09/2006
D669	2200	769-3	Narda	Attenuator	08/03/2006
D670	D 32240	53 16 21	Spinner	Attenuator	09/03/2006
D683	D41796	53 16 21	Spinner	Attenuator	09/03/2006
D710	---	765-3	Transtech	Attenuator	01/04/2006
D898	---	2N150W-6DB	Tactron	Attenuator	10/03/2006
D899	---	2N150W-6DB	Tactron	Attenuator	08/03/2006
E1057	81510070	R 4131	Advantest	Spectrum-Analyzer	15/06/2006
E1229	894702/027	ESAI	Rohde&Schwarz	Receiver	21/10/2005
E1294	3202U00422	8593 A	Agilent Technologies	Spectrum-Analyzer	19/04/2006
E1416	60908	HI-4400-01	Pötschke	Field strength meter	16/11/2005
E1482	C-0009	EFA-2	WUG	Field strength meter	24/03/2006
E1607	829909/005	ESI-40	Rohde&Schwarz	Receiver	24/01/2006
E1626	830516/009	ESVS30	Rohde&Schwarz	Receiver	24/05/2006
E1687	837808/003	ESI-40	Rohde&Schwarz	Receiver	28/07/2006
E1742	US39440167	E7405A	Agilent Technologies	Spectrum-Analyzer	11/05/2006
E1771	55040328086	CL55C	AFJ	Click Meter	16/02/2006
E426	514633 E	SPM-11	WUG	Selectiv Levelmeter	03/12/2005
E716	1750A02940	3585 A	Agilent Technologies	Spectrum-Analyzer	30/09/2005
E881	881363/13	ESH2-Z1	Rohde&Schwarz	HF Current converter	01/04/2006
E996	871650/036	ESH3	Rhode & Schwarz	Receiver	30/11/2005
G1021	2520G04678	8116 A	Agilent Technologies	Signalgenerator	07/03/2006
G1068	881209/002	SMPC	Rohde&Schwarz	Signalgenerator	25/04/2006
G1234	0390-02	ESD 30	EM Test	ESD-Generator	09/08/2006
G1325	3145A0455	83623 A	Agilent Technologies	Signalgenerator	22/04/2006
G1444	843575/012	SMY 02	Rohde&Schwarz	Signalgenerator	14/04/2006
G1634	1201-14	DITO	EM Test	ESD-Generator	05/04/2006
G1637	0102-01	TSS 500 M10	EM Test	Surge-Generator	08/03/2006
G1674	0204-06	EFT 500	EM Test	Transient generator	13/04/2006
G2000	894368/048	SMG	Rohde&Schwarz	Signalgenerator	10/06/2006
G2001	883554/007	SMG	Rohde&Schwarz	Signalgenerator	13/06/2006
G2002	844484/032	SMY 01	Rohde&Schwarz	Signalgenerator	31/08/2006
G2003	862859/004	SMG	Rohde&Schwarz	Signalgenerator	13/06/2006
G2004	302.4012.24	SMS	Rohde&Schwarz	Signalgenerator	15/06/2006
G2005	001112	AFG 100	Grundig	Function generator	05/08/2006
G2006	828141/001	SMT 02	Rohde&Schwarz	Signalgenerator	26/08/2006
G2007	827461/024	SMT 03	Rohde&Schwarz	Signalgenerator	30/08/2006
G2009	860977/005	SBUF/SBTF2	Rohde&Schwarz	TV Modulator	01/09/2006
G2010	861615	SBUF	Rohde&Schwarz	TV Test Transmitter	01/09/2006



Asset no.	Serial no.	Model	Manufacturer	Designation	Cal. date
G2011	833241	SBUF/SBTF2	Rohde&Schwarz	TV Modulator	01/09/2006
G2016	2751	TG40	Grundig	Signalgenerator	01/10/2005
G2017	4015	TG40	Grundig	Signalgenerator	11/10/2005
G2020	1202-18	ESD 30 C	EM Test	ESD-Generator	17/11/2005
G2022	V0504100070	VDS 200 B3	EM Test	Voltage Drop Generator	07/04/2006
G2023	V0504100071	LD 200 B1 S2	EM Test	Load Dump Generator	07/04/2006
G2024	V0504100069	UCS 200 M - 100A	EM Test	Ultra Compact Simulator	07/04/2006
K1029	99-40004	LISN 4-100/200	Bajog	LISN/CDN/ISN	13/10/2005
K1030	99-40006	LISN 2-100/200	Bajog	LISN/CDN/ISN	13/10/2005
K1031	99-40005	LISN 4-25/32	Bajog	LISN/CDN/ISN	13/10/2005
K1049	---	S1	Lucent	LISN/CDN/ISN	23/09/2005
K1050	---	S1	Lucent	LISN/CDN/ISN	23/09/2005
K1068	996	VHAP	Schwarzbeck	Antenna	10/04/2006
K1069	997	VHAP	Schwarzbeck	Antenna	10/04/2006
K1099	16910	CDNT 400	MEB	LISN/CDN/ISN	06/12/2005
K1100	15994	CDNT 246	MEB	LISN/CDN/ISN	06/12/2005
K1102	100040	ENY-22	Rohde&Schwarz	LISN/CDN/ISN	08/11/2005
K1103	100042	ENY-41	Rohde&Schwarz	LISN/CDN/ISN	08/11/2005
K1108	---	FAP1	Frankonia	Filterboard	20/01/2008
K1109	---	FAP2	Frankonia	Filterboard	20/01/2008
K1110	---	FAP3	Frankonia	Filterboard	27/01/2008
K1111	---	SAP1	Frankonia	Filterboard	20/01/2008
K1112	---	SAP2	Frankonia	Filterboard	20/01/2008
K1113	---	SAP3	Frankonia	Filterboard	26/01/2008
K1114	100109	HL 025	Rohde&Schwarz	Antenna	20/04/2006
K1116	17635	KEMZ-801	Schaffner	Ferrite clamp	01/12/2005
K1117	141	SBA 9113	Schwarzbeck	Antenna	15/06/2006
K1118	2023	CDN-M2/75A	EM Test	LISN/CDN/ISN	25/11/2005
K1119	16093	CDN ST08	Schaffner	LISN/CDN/ISN	06/12/2005
K1120	16097	CDN ST08S	Schaffner	LISN/CDN/ISN	23/09/2005
K1121	---	SAC-Antenne	Frankonia	HF cable	14/10/2005
K1122	---	SAC	Frankonia	HF cable	14/10/2005
K1123	---	SAC	Frankonia	HF cable	14/10/2005
K1125	---	SAC Kabel	Frankonia	HF cable	14/10/2005
K1126	---	SAC Kabel	Frankonia	HF cable	14/10/2005
K1127	---	SAC Kabel	Frankonia	HF cable	14/10/2005
K1128	---	SAC Kabel	Frankonia	HF cable	30/11/2005
K1149	1371	CBL 6111	Chase	Antenna	21/02/2006
K1155	---	---	---	HF cable	13/12/2005
K1156	---	---	---	HF cable	23/06/2006
K1157	---	---	---	HF cable	26/11/2005
K1161	105232/4	Sucoflex	Suhner	HF cable	13/01/2006
K1500	28308	DC6180M4	Amplifier Research	Directional coupler	08/09/2006
K1511	---	Antenne	Frankonia	HF cable	16/12/2005
K1512	---	Antenne	Frankonia	HF cable	16/12/2005
K1513	---	Antenne	Lucent	HF cable	16/12/2005
K1601	1076680	AU-1447-350	Parzich	Amplifier	13/07/2006
K1602	405	F-120-9A	FCC	Current Clamp	22/08/2006
K593	32551	3020 A	Narda	Directional coupler	11/01/2006
K615	322798/064	HL 023-A1	Rohde&Schwarz	antenna	15/12/2005
K617	986	C 1460	Werlatone	Directional coupler	10/01/2006
K639	1088	C 1460	Werlatone	Directional coupler	15/04/2006
K661	44279	110	Pearson	Current clamp	21/04/2006
K745	2676	3301 B	EMCO	Antenna	19/04/2006
K759	8812-3085	3115	Kontron	Antenna	10/03/2006
K806	9101-2989	3146	Kontron	Antenna	15/12/2005
K817	604897	Miteq	Parzich	Amplifier	29/06/2006

Asset no.	Serial no.	Model	Manufacturer	Designation	Cal. date
K831	73721	3022	Transtech	Directional coupler	10/01/2006
K838	656297	Miteq	Parzich	Amplifier	26/04/2006
K841	---	8 G/ 2 M	Telemeter	HF cable	25/11/2005
K856	12349	AT 5000	EMV	Antenna	14/04/2006
K877	357.8810.52	ESH3-Z2	Rohde&Schwarz	Limiter	23/05/2006
K879	---	RG-214-U	F+G	HF cable	25/11/2005
K880	---	AF-2	MEB	LISN/CDN/ISN	23/09/2005
K881	---	AF-4	MEB	LISN/CDN/ISN	23/09/2005
K882	---	S4	MEB	LISN/CDN/ISN	25/11/2005
K895	---	S2	MEB BERLIN	LISN/CDN/ISN	24/11/2005
K896	---	M1	MEB	LISN/CDN/ISN	23/09/2005
K901	---	S1	MEB	LISN/CDN/ISN	23/09/2005
K910	9124-0211	VHBB 9124	Schwarzbeck	Antenna	18/05/2007
K911	9124-0214	VHBB 9124	Schwarzbeck	Antenna	18/05/2007
K912	312/93	UBA 9116	Schwarzbeck	Antenna	18/05/2007
K913	311/93	UBA 9116	Schwarzbeck	Antenna	18/05/2007
K935	12200	KEN M3-1-801	MEB	LISN/CDN/ISN	23/09/2005
K936	11298	S15	MEB	LISN/CDN/ISN	23/09/2005
K937	11328	S25	MEB	LISN/CDN/ISN	23/09/2005
K938	13001	AT 1080	EMV GmbH	Antenna	11/11/2005
K939	12446	KEN T2-801	MEB	LISN/CDN/ISN	22/09/2005
K940	11422	KEN T4-801	MEB	LISN/CDN/ISN	23/09/2005
K972	9803-1089	3141	EMCO	Antenna	11/11/2005
K978	----	Transmission	Frankonia	HF cable	08/12/2005
K979	9856	FCC-801-S9	FCC	LISN/CDN/ISN	23/09/2005
K980	9844	FCC-801-T8	FCC	LISN/CDN/ISN	25/11/2005
M1923	881375/102	URV 5	Rohde&Schwarz	Power meter	13/04/2006
M1925	881096/062	URV5-Z2	Rohde&Schwarz	HF probe	14/04/2006
M2145	DY0104017	PM 2718 X	Philips	Multimeter	23/02/2006
M2214	DY0103745	PM 2718 X	Philips	Multimeter	23/02/2006
M2292	44930413	77	Fluke	Multimeter	23/02/2006
M2407	892948/44	URV5-Z4	Rohde&Schwarz	HF probe	15/04/2006
M2541	49750325	87	Philips	Multimeter	15/11/2005
M2573	860617/029	URV 5	Rohde&Schwarz	Power meter	13/04/2006
M2659	862.806/010	URV5-Z2	Rohde&Schwarz	HF probe	06/12/2005
M2660	894823/34	URV5-Z4	Rohde&Schwarz	HF probe	14/04/2006
M2758	DM529010	PM 2525	Philips	Multimeter	05/11/2005
M2892	3125U05034	437 B	Agilent Technologies	HF power meter	25/04/2006
M2893	2702A07178	8481 B	Agilent Technologies	HF probe	25/04/2006
M3030	5570266	8842 A	Philips	Multimeter	27/01/2006
M3737	MY43100214	41800 A	Agilent Technologies	RF-Probe	04/04/2006
M4000	879152/036	UDS 5	Rohde&Schwarz	Voltmeter	05/08/2006
M4004	845125/009	NRVD	Rohde&Schwarz	Power meter	15/08/2006
M4005	845671/015	URV5-Z2	Rohde&Schwarz	HF probe	22/08/2006
M4006	844380/043	URV5-Z4	Rohde&Schwarz	HF probe	24/08/2006
M4007	870406/86	URV	Rohde&Schwarz	HF Voltmeter	31/08/2006
M4008	891583	URV-Z8	Rohde&Schwarz	HF probe	31/08/2006
M4009	5SM00563	URV-Z8	Rohde&Schwarz	HF probe	31/08/2006
M4032	X630967C	DM66 RMS	Grundig	Multimeter	03/01/2006
N2423	A251507/00500	EMV D 15000/PAS	Spitzenberger+Spieß	Test system	19/01/2006
O2152	B010166	TDS 694 C	Tektronix	Digital Storageoscilloscope	22/02/2006
O2177	B 011016	P 5210	Tektronix	High Voltage Probe	21/04/2006
O2197	B016080	TDS 3012	Tektronix	Digital Storageoscilloscope	18/04/2006
O2303	B040166	TDS 714 L	Tektronix	Digital Storageoscilloscope	17/11/2005
O3002	04239	MO 53	Grundig	Oscilloscope	29/10/2005
O3003	2979	MO 53	Grundig	Oscilloscope	03/11/2005
O3004	3441	MO52-50	Grundig	Oscilloscope	04/11/2005



Asset no.	Serial no.	Model	Manufacturer	Designation	Cal. date
V255	RX/169163	U 2233	Siemens	Noise meter	13/12/2005
V288	883792/007	UPA	Rohde&Schwarz	Audio-Analyzer	18/04/2006
V303	860339/011	UPA	Rohde&Schwarz	Audio-Analyzer	02/05/2006
V500	833115/004	UPA	Rohde&Schwarz	Audio-Analyzer	30/08/2006
X257	20	---	Conrad	Thermometer hygrometer	17/06/2006
X315	---	SAC	Frankonia	Preparation for new registration	24/10/2005
X316	---	SAC/FAC	Frankonia	Shielded door	01/04/2010
X318	---	SAC	Frankonia	Maintenance	08/10/2005
X319	---	FAC	Frankonia	Maintenance	08/10/2005
X331	---	650033-41	Conrad	Thermometer hygrometer	23/09/2005
X332	---	650033-41	Conrad	Thermometer hygrometer	23/09/2005

5 Accreditation certificate

Deutsche Akkreditierungsstelle Technik (DATech) e.V.
Unterzeichner der Multilateralen Abkommen von EA und ILAC zur
gegenseitigen Anerkennung

vertreten im

Deutschen Akkreditierungsrat



Akkreditierung

Die **Deutsche Akkreditierungsstelle Technik (DATech) e.V.** bestätigt hiermit, dass das
Prüflaboratorium

HERBERG
Service Plus GmbH
European Compliance Laboratory (ECL)
Nordostpark 51
D-90411 Nürnberg

die Kompetenz nach DIN EN ISO/IEC 17025 besitzt, Prüfungen in den Bereichen

**Elektromagnetische Verträglichkeit und Mobilfunk ,Sicherheit elektrischer
Betriebsmittel, Umweltsimulation
Telekommunikationsschnittstelle**

nach den in der Anlage aufgeführten Normen und Spezifikationen auszuführen.

Die Akkreditierung ist gültig bis: **07.02.2007**

Die Anlage ist Bestandteil der Urkunde und besteht aus **16** Seiten.

DAR-Registriernummer: **TTI-P-G004/92-03**

Frankfurt/Main, 28.03.2005



Dr. Ing. Thomas Facklam
Leiter der Akkreditierungsstelle

Mitglied im EA, ILAC, IAF

Siehe Hinweise auf der Rückseite

EMC Test Report No.: 05-125

FCC ID: 96997



******* End of test report *******