ECL-EMC Test Report No.: 06-004

Equipment under test: **Innovaphone IP6000**
Power supplied via PoE

Type of test: **FCC 47 CFR Part 15 Subpart B Class B**

Measurement Procedures: **ANSI C63.4 (2001)**

Test result: **Passed**

Date of issue:	04.01.06			Signature:
Issue-No.:	01	Author:	**J.Steinbinder** Test engineer	
Date of delivery:	04.01.06	Checked:	**Zapf** Operational manager	
Test dates:	04.01.06			
Pages:	24			

Client:	**Innovaphone AG**
	Böblinger Str. 76 **D-71065 Sindelfingen** **Germany**

Test house:	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

1.1 Purpose

This report documents the qualification testing for the "IP6000" 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 conducted emission requirement per FCC 47CFR part 15 Subpart B for class B device. The conducted emissions were met with a minimum 2,5 dB margin.

This report should be read in conjunction with the test report ECL-EMC-TR-05-125-V01.00, which contains further radiated emission and conducted emission measurement results of the IP6000.

2 Equipment under test

2.1 EUT designation

Ascom / Innovaphone IP 6000 Ser. No.: 00-90-33-08-00-47

2.2 Description

The “Innovaphone VoIP Gateway” is a powerfull 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 (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
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

2.2.1 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

2.3 Configuration tested with additional equipment

Component	Manufacturer	Type	Ser. No.:
Telephon	Tiptel / Innovaphone	200	00-90-33-03-34-4E
Telephon	Tiptel / Innovaphone	200	00-90-33-03-32-86
ProSafe 10/100 Switch w/PoE	Netgear	FS116P	17Y15927000B6
Power suply (AC-DC Adapter)	Netgear	VAN70A-480A	10053400391-2A

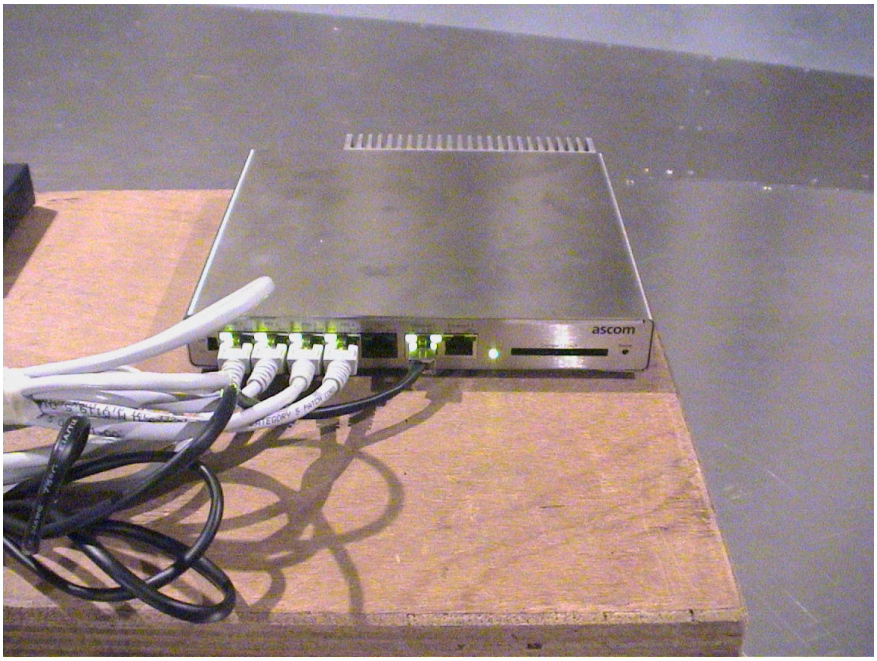


Fig. 2.3.1: EUT front side

2.4 Operating states

During the emission test an active data connection was established over Ethernet 0 and over PRI 1,2,3,4. The device was supplied by an Power over Ethernet adapter connected to the Netgear switch FS116P.

3 Description of EMC test centre

3.1 Registrations

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

Registration No. (Kraftfahrt-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 Shielded test cabins

Measurement room 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

Measurement room 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

3.6 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.

3.7 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 150 kHz - 30 MHz		± 4,0 dB ± 3,6 dB
Harmonics (EN 61000-3-2)	2 ... 40 x $f_{N;}$ f_N = 50 Hz	Voltage Current	± 1% ± 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 Voltage amplitude	± 30% ± 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 Voltage amplitude	± 20% ± 4,1%
SURGE (EN 61000-4-5)	1,2/50 µs 8/20 µs	Voltage rise time / half life Current rise time / half life Charged voltage	± 30% / ±20% ± 20% / ±20% ± 4,1%
HF-Injection (EN 61000-4-6)	150 kHz - 80 MHz		± 9%
Voltage Dips, Interruptions (EN 61000-4-11)		Voltage level Time	± 1% ± 0,1%
Power induction	ITU-K.20	Frequency Amplitude	± 0,1Hz ± 1%

3.8 Ground plan

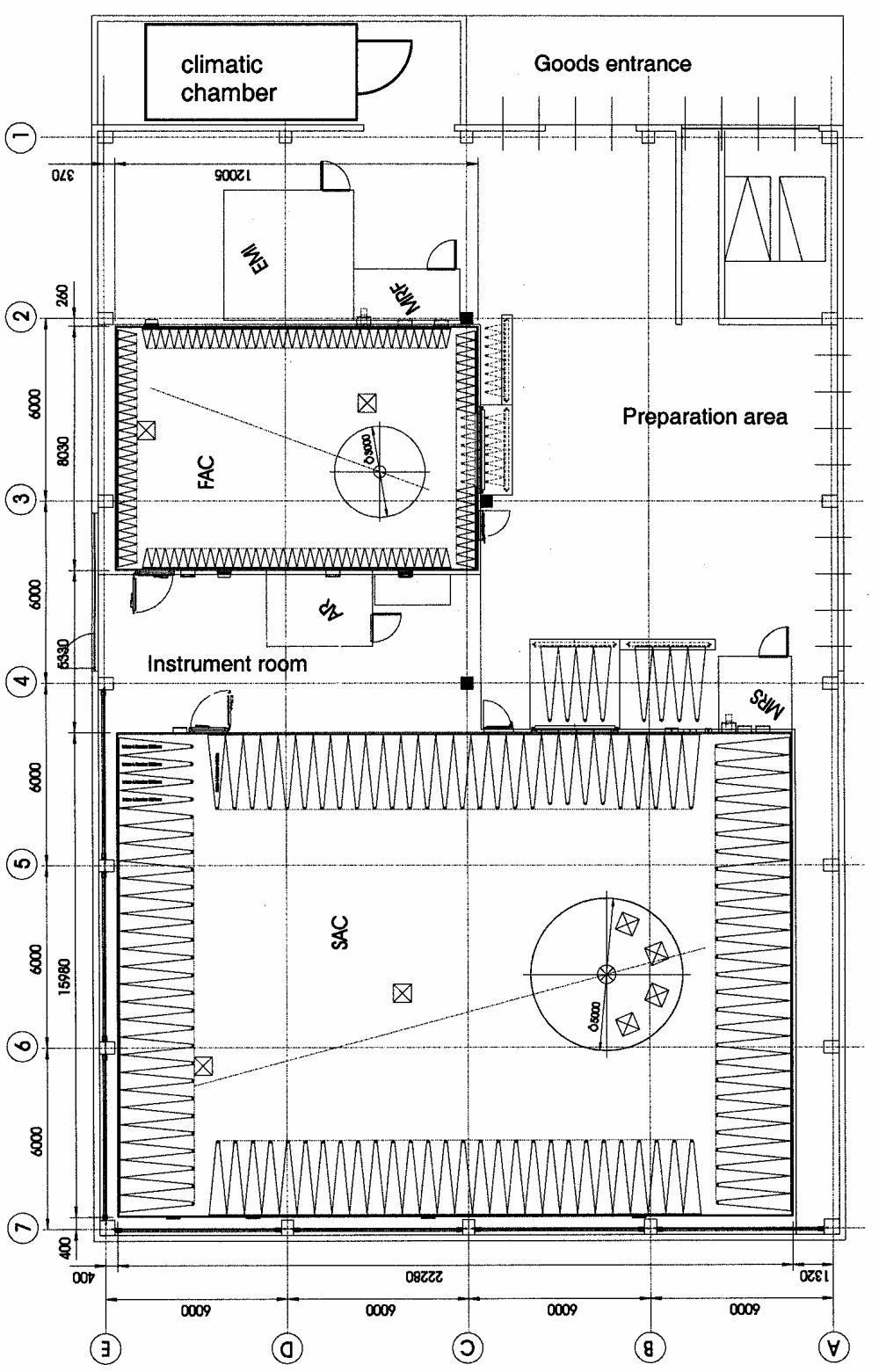


Abb. 3.8.1: Partition of the European Compliance Laboratory (Thurn-und-Taxis-Strasse 18)

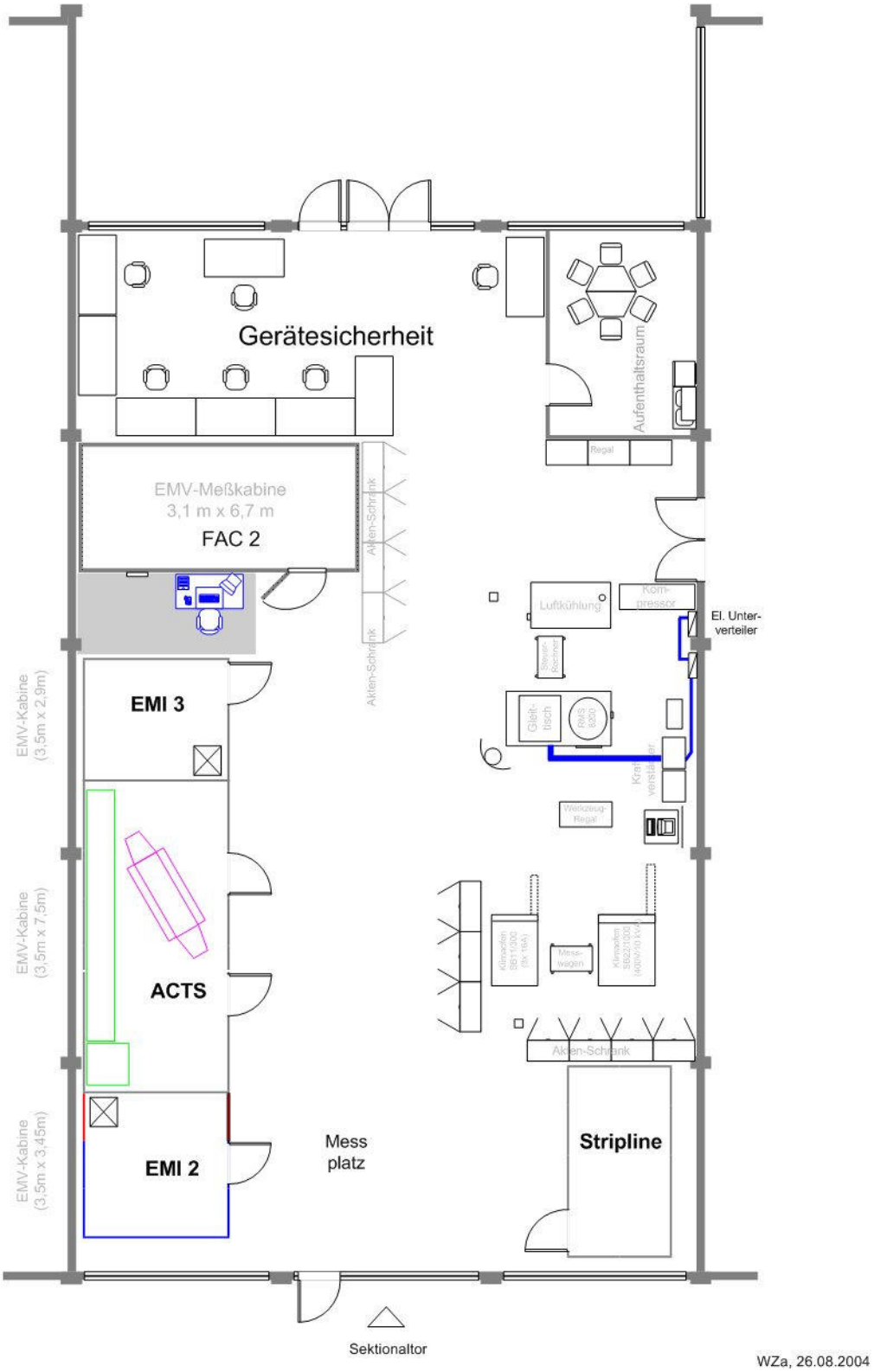


Abb. 3.8.2: Partition of the European Compliance Laboratory (Nordostpark 76)

4 Measurement of emission

4.1 Conducted emission from the power port (in PoE mode)

4.1.1 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	115 VAC power supply line	FCC 47 CFR Part 15 Subpart B Class B	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: table top equipment

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:

See sub clause „operating states“.

Climatic test conditions during measurement:

Ambient temperature:	22 °C
Relative humidity:	41 %
Air pressure:	1013 hPa

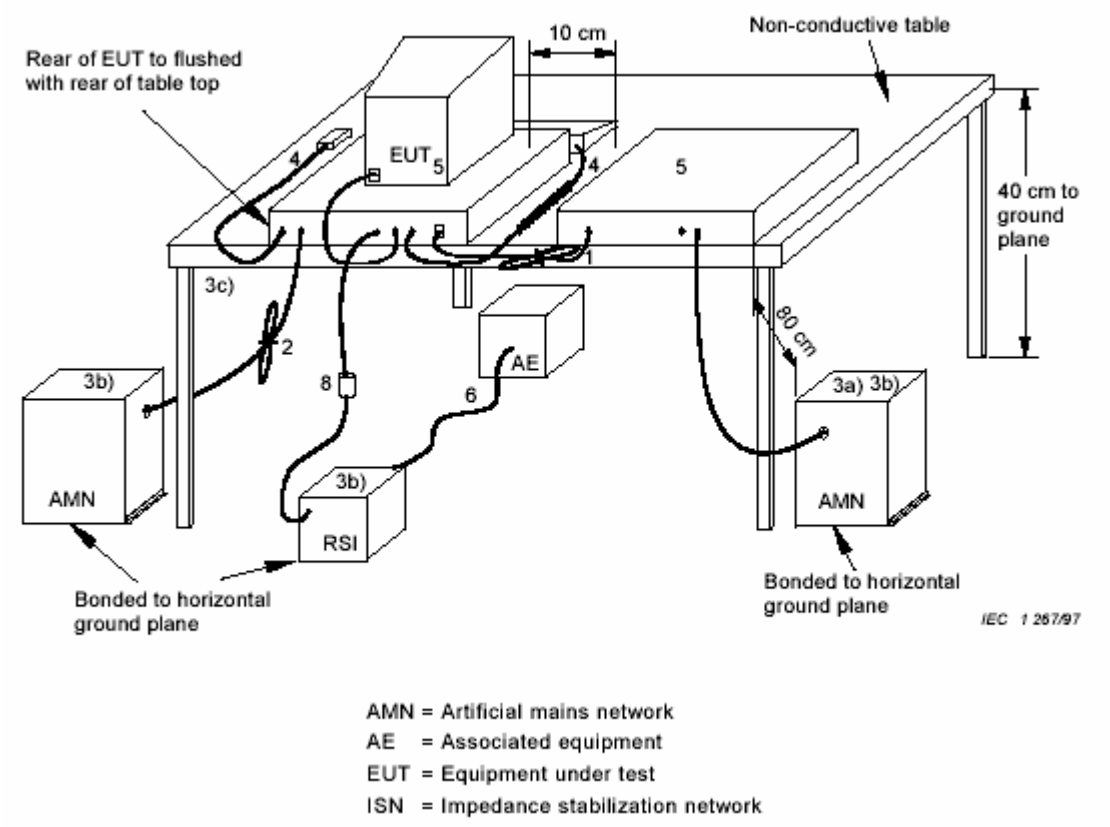


Fig. 4.1.1: Test configuration: table top equipment

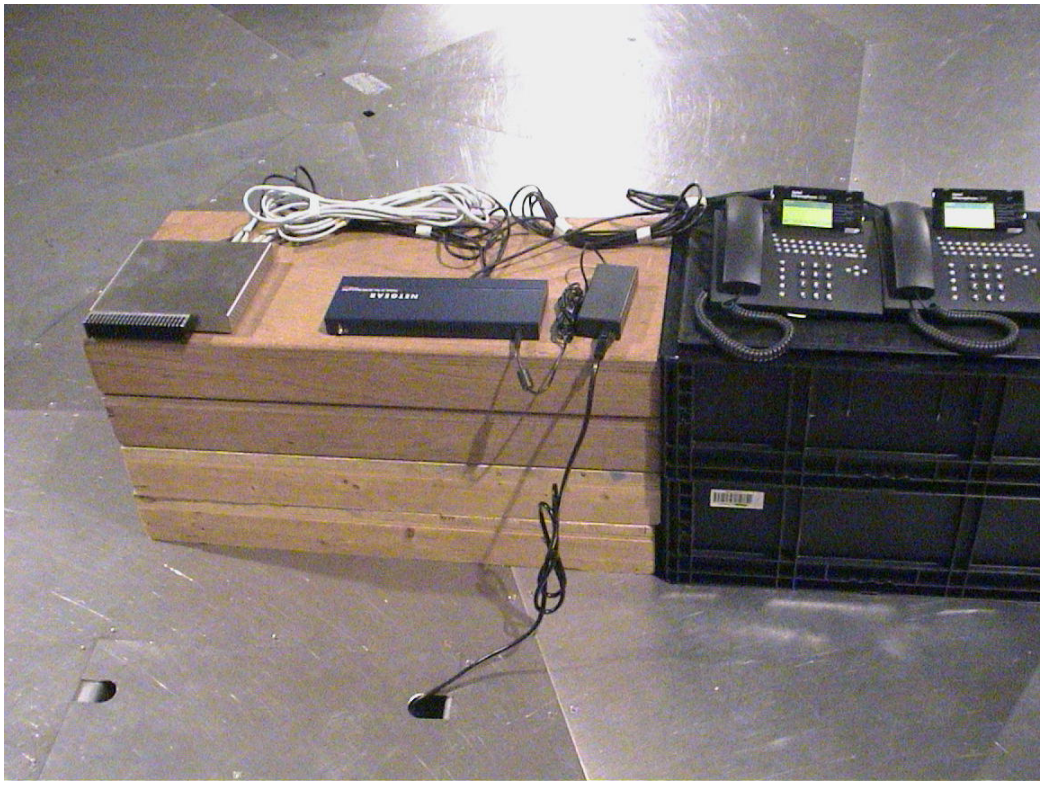
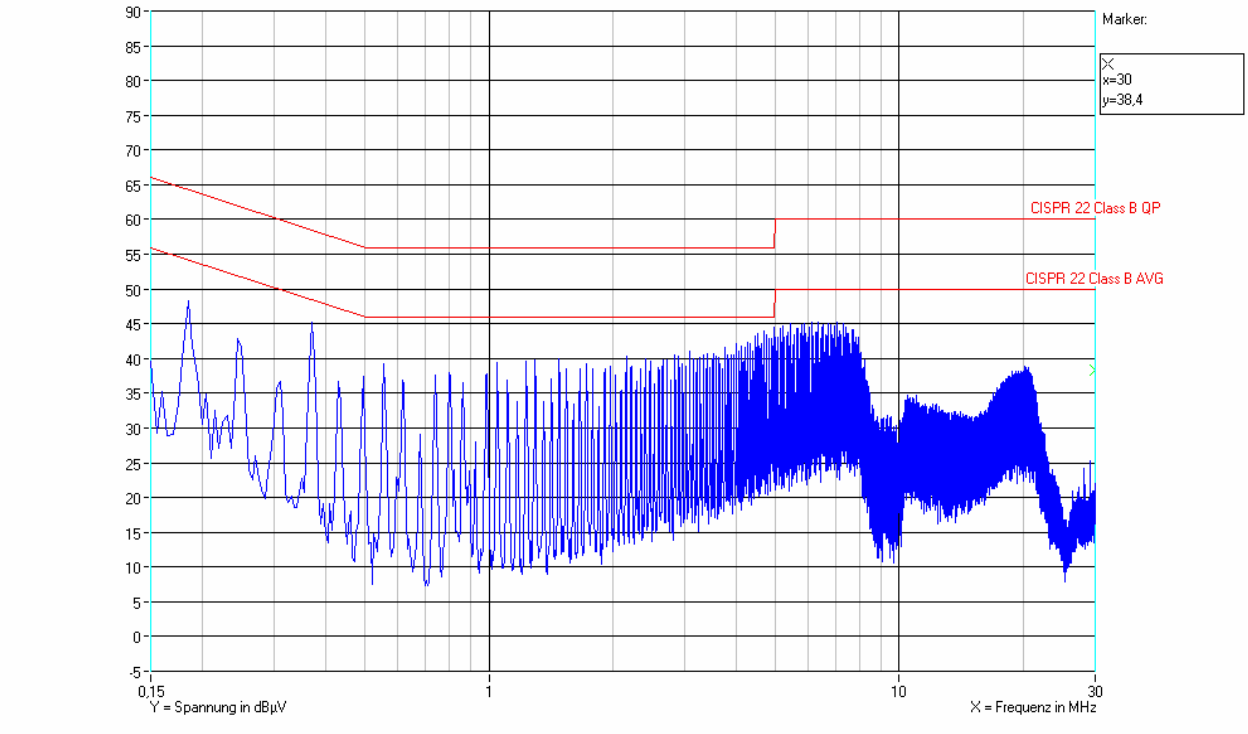


Fig. 4.1.2: Basic set-up for conducted emission test from power ports

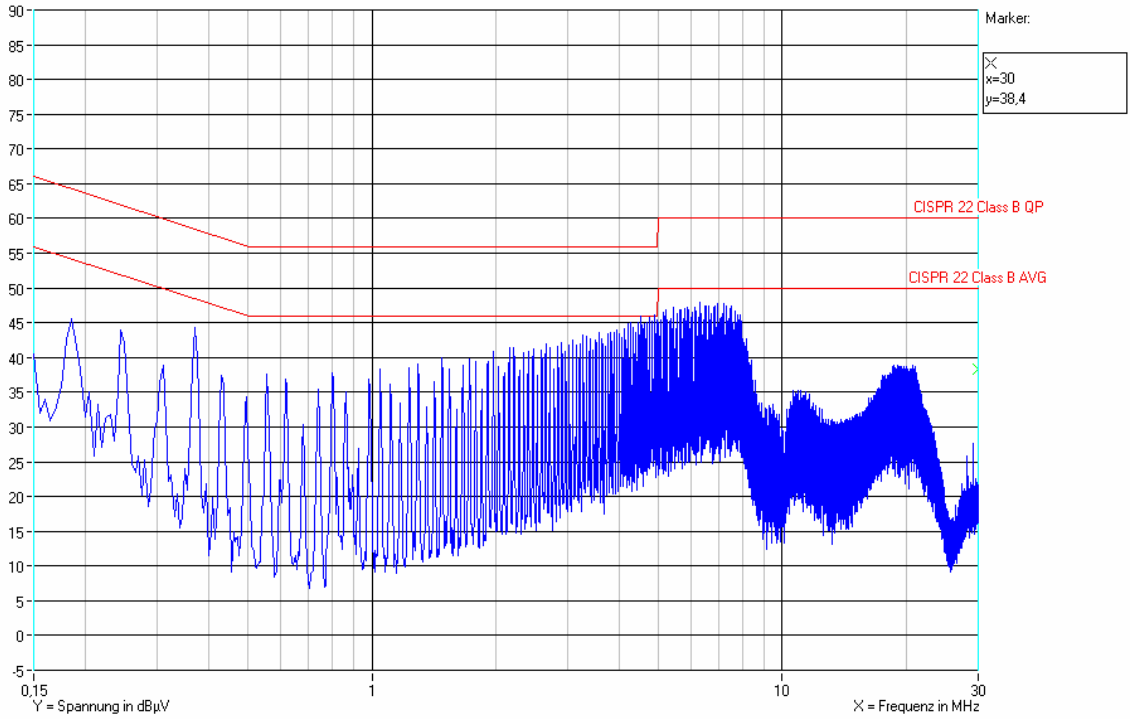
4.1.2 Test results

A functional test of the test equipment was carried out before and after the measurements.

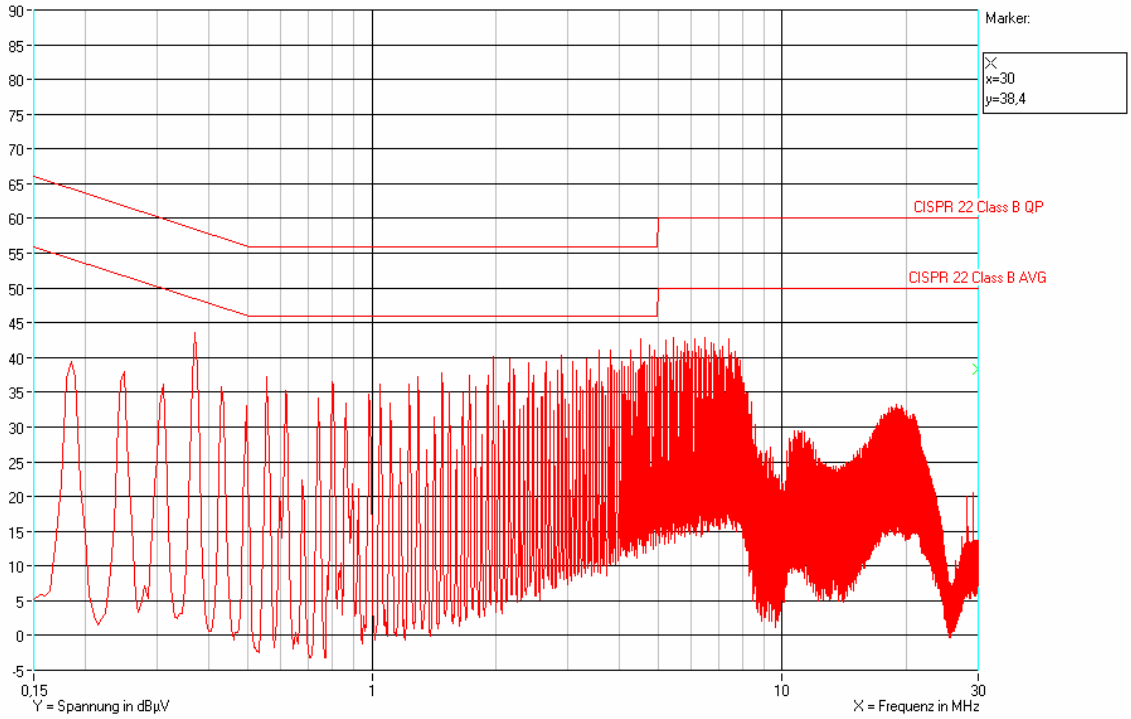
Frequency range	Mode	Line	Detector	Measurement report
150 kHz - 30 MHz	Normal operation Active data connection	N	Peak	1
		L	Peak	2
			Average	3



Measurement report 1: N-Line; Peak detector used;



Measurement report 2: L-Line; Peak detector used;



Measurement report 3: L-Line; Average detector used;

5 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
D707	IX 077	Modell 49	Kontron	Attenuator	10/11/2006
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	03/11/2006
E1294	3202U00422	8593 A	Agilent Technologies	Spectrum-Analyzer	19/04/2006
E1416	60908	HI-4400-01	Pötschke	Field strength meter	16/11/2005
E1455	353701902	ESV-Z1	Rohde&Schwarz	HF Current converter	18/03/2005
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
E2000	836421/025	UPL	Rohde&Schwarz	Audio Analyzer	14/10/2006
E426	514633 E	SPM-11	WUG	Selectiv Levelmeter	03/12/2005
E678	872317/025	ESH 3	Rohde&Schwarz	Receiver	04/11/2006
E881	881363/13	ESH2-Z1	Rohde&Schwarz	HF Current converter	01/04/2006
E996	871650/036	ESH3	Rhode & Schwarz	Receiver	30/11/2005
F1574	3531A00126	6843 A	Agilent Technologies	Harmonic/Flicker Test System	15/07/2005
G1021	2520G04678	8116 A	Agilent Technologies	Signalgenerator	07/03/2006
G1029	879856/038	SMPC	Rohde&Schwarz	Signalgenerator	31/10/2006
G1060	080723-08-85	P 6 T	Haefely	Transient generator	13/10/2006
G1068	881209/002	SMPC	Rohde&Schwarz	Signalgenerator	25/04/2006
G1106	080865-23-86	PC6-288	Haefely	Transient generator	13/10/2006
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
G1632	0201-02	EFT 800-16 A	EM Test	Burst-Generator	13/10/2006
G1633	0301-04	VCS 500 M/8	EM Test	Surge-Generator	11/10/2006
G1634	1201-14	DITO	EM Test	ESD-Generator	05/04/2006
G1672	0203-01	TSS 500 M4B	EM Test	Surge-Generator	02/06/2005
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

Asset no.	Serial no.	Model	Manufacturer	Designation	Cal. date
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
G2011	833241	SBUF/SBTF2	Rohde&Schwarz	TV Modulator	01/09/2006
G2013	1341	VG 1100	Grundig	Video generator	19/10/2006
G2014	001268	VTG 700	Grundig	Video generator	27/10/2006
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
K1017	24901	DC 7350	EMV GmbH	Directional coupler	01/04/2006
K1019	9911001C	CDN-M5/100A	EM Test	LISN/CDN/ISN	04/10/2006
K1020	699-01	CNI 503-8/100	EM Test	LISN/CDN/ISN	12/10/2006
K1026	2624	CBL 6111 C	Chase	Antenna	21/02/2006
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
K1034	0003-50963	95241-1	EMCO	Calibration Jig	10/11/2006
K1042	1041	MWH-1826/B	ARA Inc.	Antenna	20/12/2005
K1043	1021	MWH-2640/B	ARA Inc.	Antenna	20/12/2005
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
K1105	99-4-0005	LISN 4-100/200	Bajog	LISN/CDN/ISN	21/10/2006
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	10/11/2006
K1119	16093	CDN ST08	Schaffner	LISN/CDN/ISN	04/10/2006
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
K1129	---	---	Lucent	Helmholtz Coil	12/05/2006
K1130	1740	91550-1B	Ailtech	Current probe	10/11/2006
K1149	1371	CBL 6111	Chase	Antenna	21/02/2006
K1154	304143	200S1G4	EMV	Amplifier	01/10/2006
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
K1170	100108	ESH3-Z6	Rohde&Schwarz	LISN/CDN/ISN	14/10/2006
K1174	962809	AM 1431 N	Parzich Miteq	Amplifier	01/12/2006
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

Asset no.	Serial no.	Model	Manufacturer	Designation	Cal. date
K1601	1076680	AU-1447-350	Parzich	Amplifier	13/07/2006
K1602	405	F-120-9A	FCC	Current Clamp	22/08/2006
K1603	04/10027	AN 2020	messtec	LISN/CDN/ISN	07/10/2006
K1604	04/10026	AN 2020	messtec	LISN/CDN/ISN	07/10/2006
K1605	04/10186	AN 20200	messtec	LISN/CDN/ISN	10/10/2006
K1606	F543210-01	ATM CF300-2m-NM-SM	ATM / Tactron	HF cable	10/11/2006
K1607	F54321-02	ATM CF300-2m-NM-SM	ATM / Tactron	HF cable	10/11/2006
K1608	F543010	ATM CF300-13m-NM-SM	ATM / Tactron	HF cable	10/11/2006
K479	872094/089	ESH2-Z5	Rohde&Schwarz	LISN/CDN/ISN	10/10/1999
K548	880563/17	HFH2-Z1	Rohde&Schwarz	Antenna	20/12/2005
K549	880458/47	HFH2-Z2	Rohde&Schwarz	Antenna	20/12/2005
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
K618	2295	3106	EMCO	Antenna	10/09/2004
K639	1088	C 1460	Werlatone	Directional coupler	15/04/2006
K661	44279	110	Pearson	Current clamp	21/04/2006
K675	983	9411-1	Ailtech	Current clamp	10/11/2006
K678	890604/019	ESH3-Z5	Rohde&Schwarz	LISN/CDN/ISN	20/10/2006
K689	08057-19-86	FP 20/3-3	Haefely	Coupling device	13/10/2006
K745	2676	3301 B	EMCO	Antenna	19/04/2006
K759	8812-3085	3115	Kontron	Antenna	10/03/2006
K794	861189/020	ESH3-Z5	Rohde&Schwarz	LISN/CDN/ISN	20/10/2006
K806	9101-2989	3146	Kontron	Antenna	15/12/2005
K817	604897	Miteq	Parzich	Amplifier	29/06/2006
K827	825333/010	ESH3-Z6	Rohde&Schwarz	LISN/CDN/ISN	14/10/2006
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	23/04/2006
K881	---	AF-4	MEB	LISN/CDN/ISN	22/09/2006
K882	---	S4	MEB	LISN/CDN/ISN	04/10/2006
K895	---	S2	MEB BERLIN	LISN/CDN/ISN	04/10/2006
K896	---	M1	MEB	LISN/CDN/ISN	04/10/2006
K901	---	S1	MEB	LISN/CDN/ISN	29/09/2006
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
K933	11158	M2	MEB	LISN/CDN/ISN	04/10/2006
K935	12200	KEN M3-1-801	MEB	LISN/CDN/ISN	22/09/2006
K936	11298	S15	MEB	LISN/CDN/ISN	29/09/2006
K937	11328	S25	MEB	LISN/CDN/ISN	30/09/2006
K938	13001	AT 1080	EMV GmbH	Antenna	11/11/2005
K939	12446	KEN T2-801	MEB	LISN/CDN/ISN	22/09/2006
K940	11422	KEN T4-801	MEB	LISN/CDN/ISN	21/09/2006
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	04/10/2006
K980	9844	FCC-801-T8	FCC	LISN/CDN/ISN	04/10/2006
M1923	881375/102	URV 5	Rohde&Schwarz	Power meter	13/04/2006

Asset no.	Serial no.	Model	Manufacturer	Designation	Cal. date
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	10/10/2006
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	27/09/2006
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
N2329	396-01	PFS 500	EM Test	Simulator for voltage dips	20/10/2006
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	08/12/2006
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

6 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, 23.03.2005

Dr.-Ing. Thomas Facklam
Leiter der Akkreditierungsstelle

Mitglied im EA, ILAC, IAF

Siehe Hinweise auf der Rückseite

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