



Accredited EMC-Test-Laboratory

accredited by:

Regulatory Authority for Telecommunications and Posts (Reg TP)

DAR-No.: TTI-P-G 081/94-D0

Listed by

FEDERAL COMMUNICATIONS COMMISSION (FCC)

Registration Number: 90462

FCC Website: www.fcc.gov

Test report no. : 4-1449-01-01a/04
Type identification : PSD-I
Test standards : FCC part 15 B
FCC-ID : SSGPSD-I
:

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1 General Information

1.1 Notes

The test results of this test report relate exclusively to the test item tested as specified in 1.5

The 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 operator:



Date

Name

Signature

2004-12-20

Rainer Folz

Technical responsibility for area of testing:



Date

Name

Signature

2004-12-20

Bernd Rebmann

1.2 EMC-Test-Laboratory

CETECOM ICT Services GmbH

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Internet: <http://www.cetecom.de>

Accredited test laboratory

State of accreditation: The test laboratory (area of testing) is accredited according to
DIN EN ISO/IEC 17025
DAR registration number: TTI-P-G 081/94-D0

Accredited by: Federal Motor Transport Authority (KBA)
DAR registration number: KBA-P 00070-97

1.3 Details of applicant

Name:	FRAMA AG
Street:	Unterdorf
Town:	CH-3438 Lamperswil
Country:	
Telephone:	+41 34 496 98 98
Fax:	+41 34 496 98 00
Contact:	Mr. Beat Wälti
Telephone:	

1.4 Application details

Date of receipt of order	2004-08-30
Date of receipt of test item	2004-12-20
Date of test	2004-12-20

1.5 Test item

Description of the test item:

kryptografische Baugruppe für Büromaschinen

Type identification:

PSD-I

Manufacturer:

Name:

FRAMA AG

Street:

Unterdorf

Town:

CH-3438 Lamperswil

Country:

Serial number:

Additional information:

Components of the test item

No.	Purpose	Type of the component	Type name of manufacturer	Serial number
1	Kryptographic board	PSD-I	FRAMA AG	309311090D4187
2	AC/DC adapter 92-265 VAC *	HAIGIS TNG 8		6971906
3	RS 232 level adapter	none		
4				
5				
6				
7				
8				

* The AC/DC adapter is changed by customer as following: The resistor 240 Ω (7,5V) were changed to 400 Ω (5.1V). After the changing is declared the output power 5.1V/ 100 mA.

1.6 Test standards:

FCC part 15 B

1.7 Photo documentation

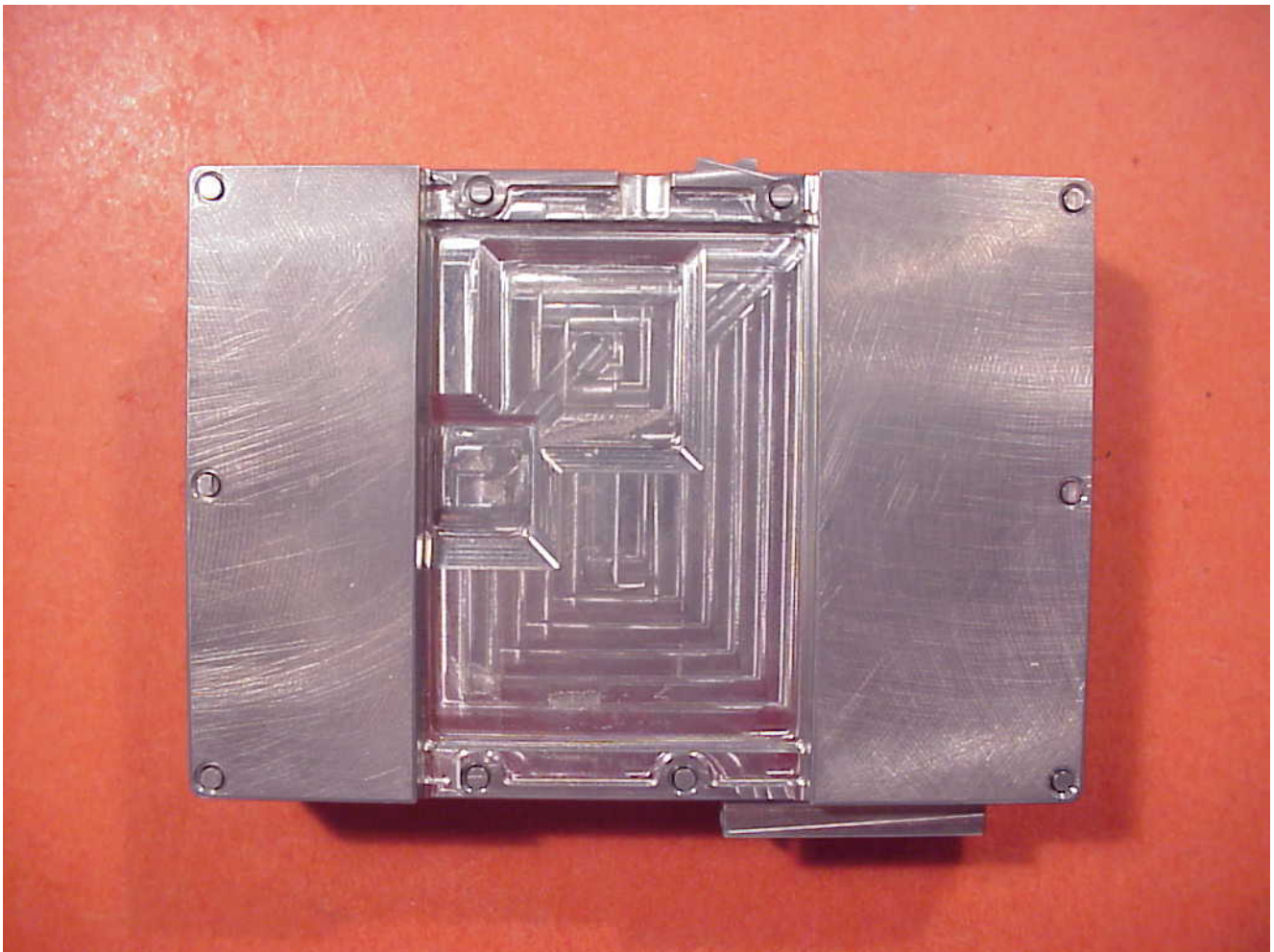
1.7.1.1 Photo documentation of the EUT

Photo 1



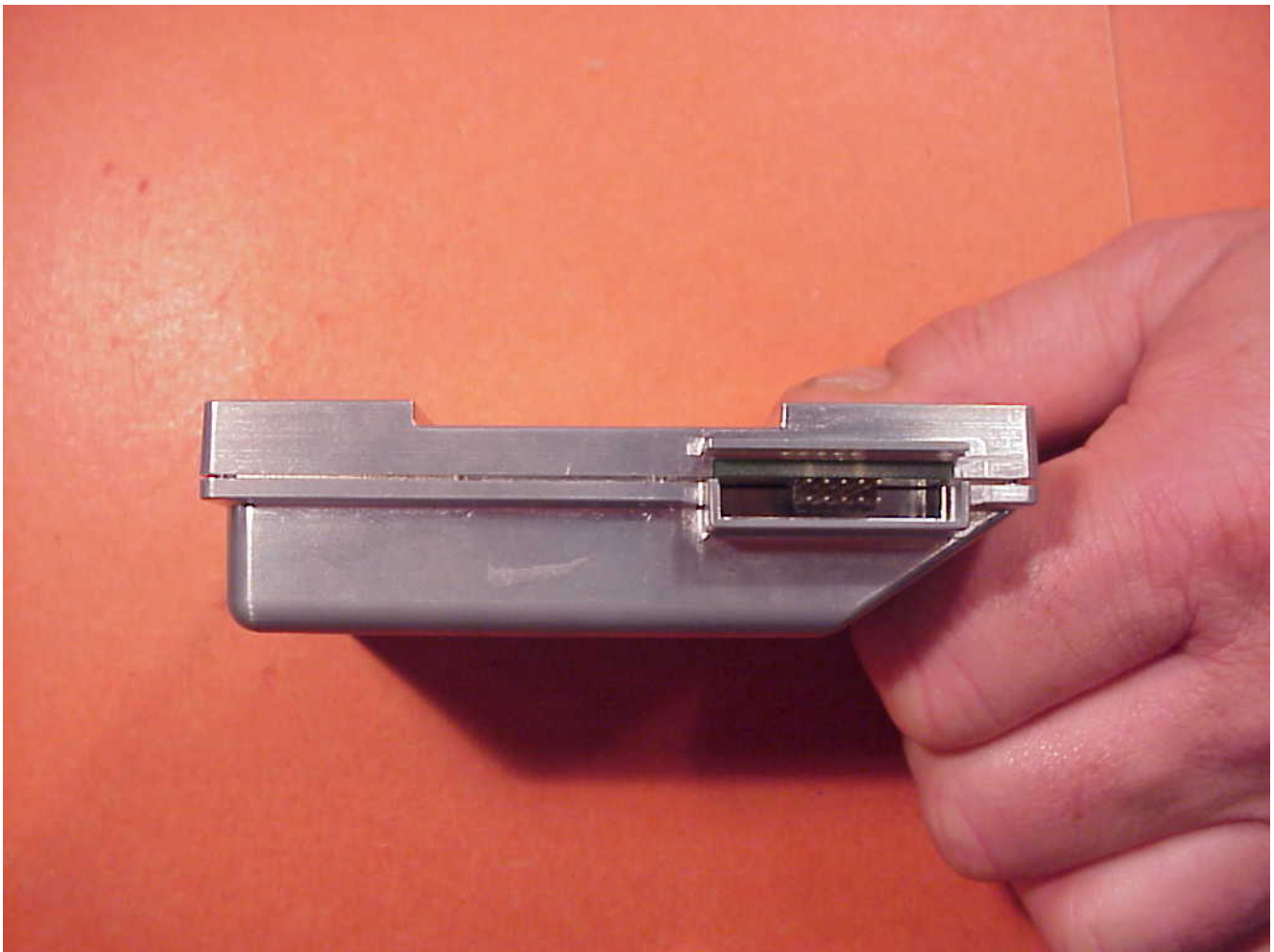
1.7.1.2 Photo documentation of the EUT

Photo 2



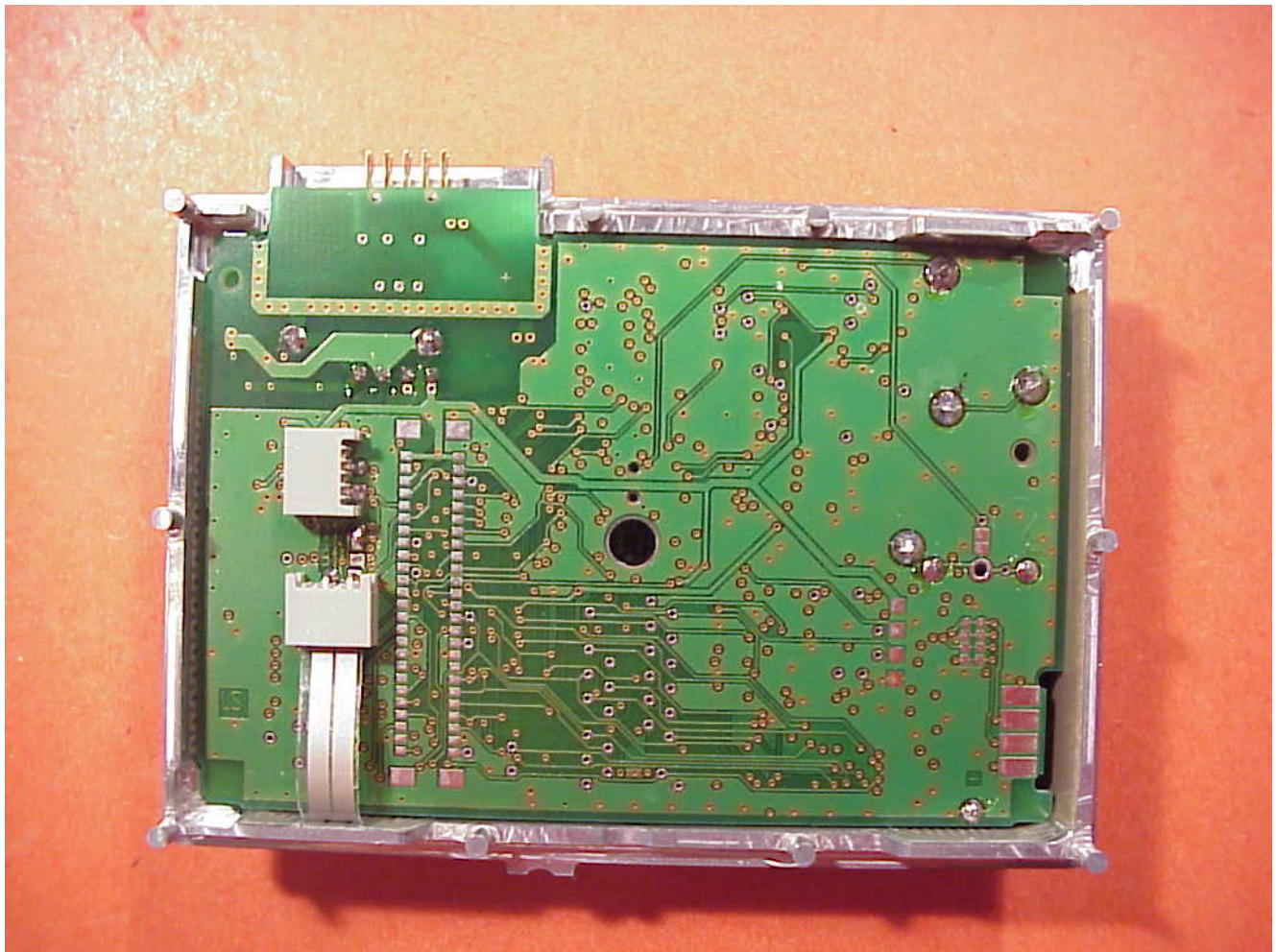
1.7.1.3 Photo documentation of the EUT

Photo 3



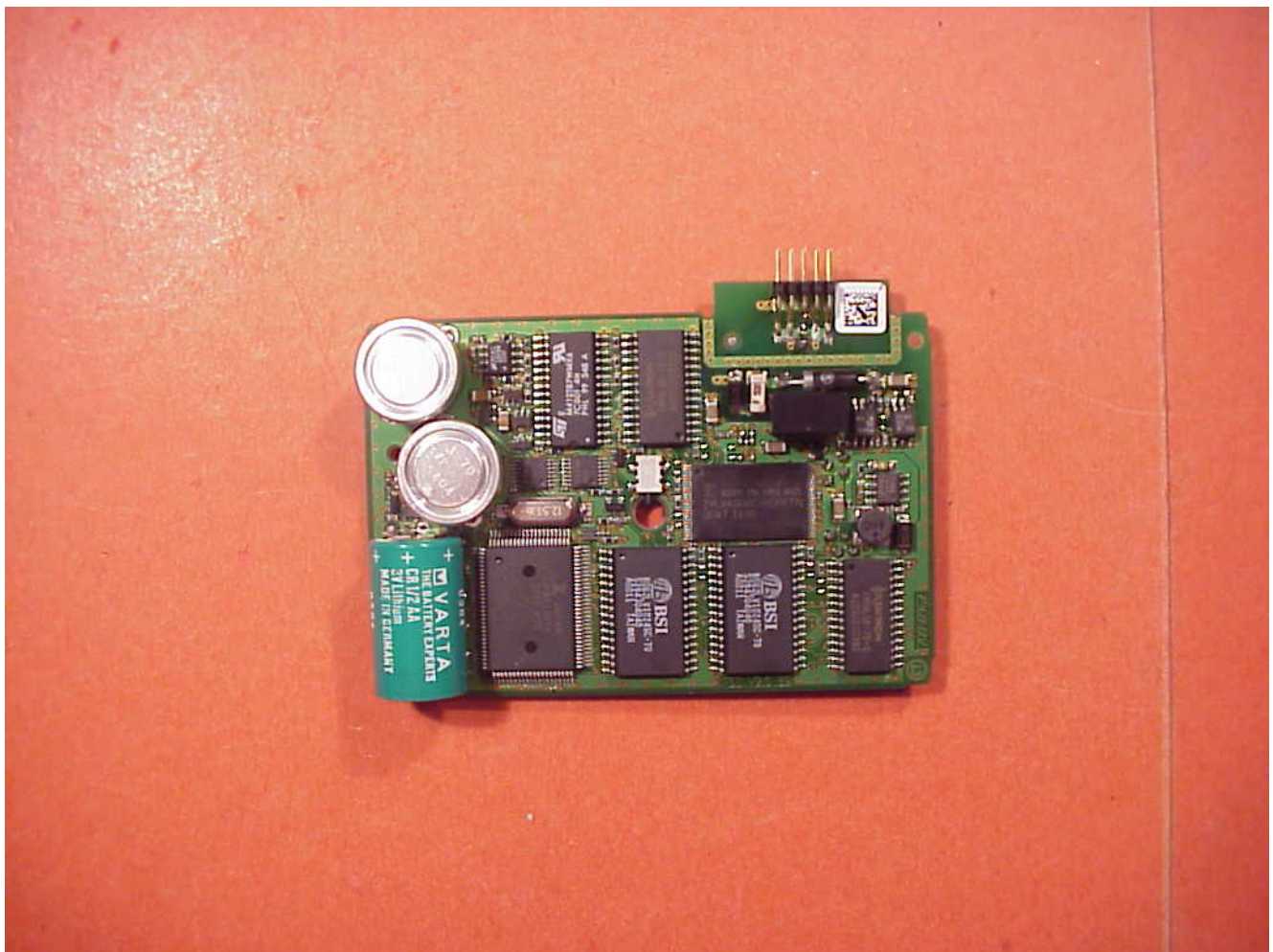
1.7.1.4 Photo documentation of the EUT

Photo 4



1.7.1.5 Photo documentation of the EUT

Photo 5



1.7.1.6 Photo documentation of the EUT

Photo 6



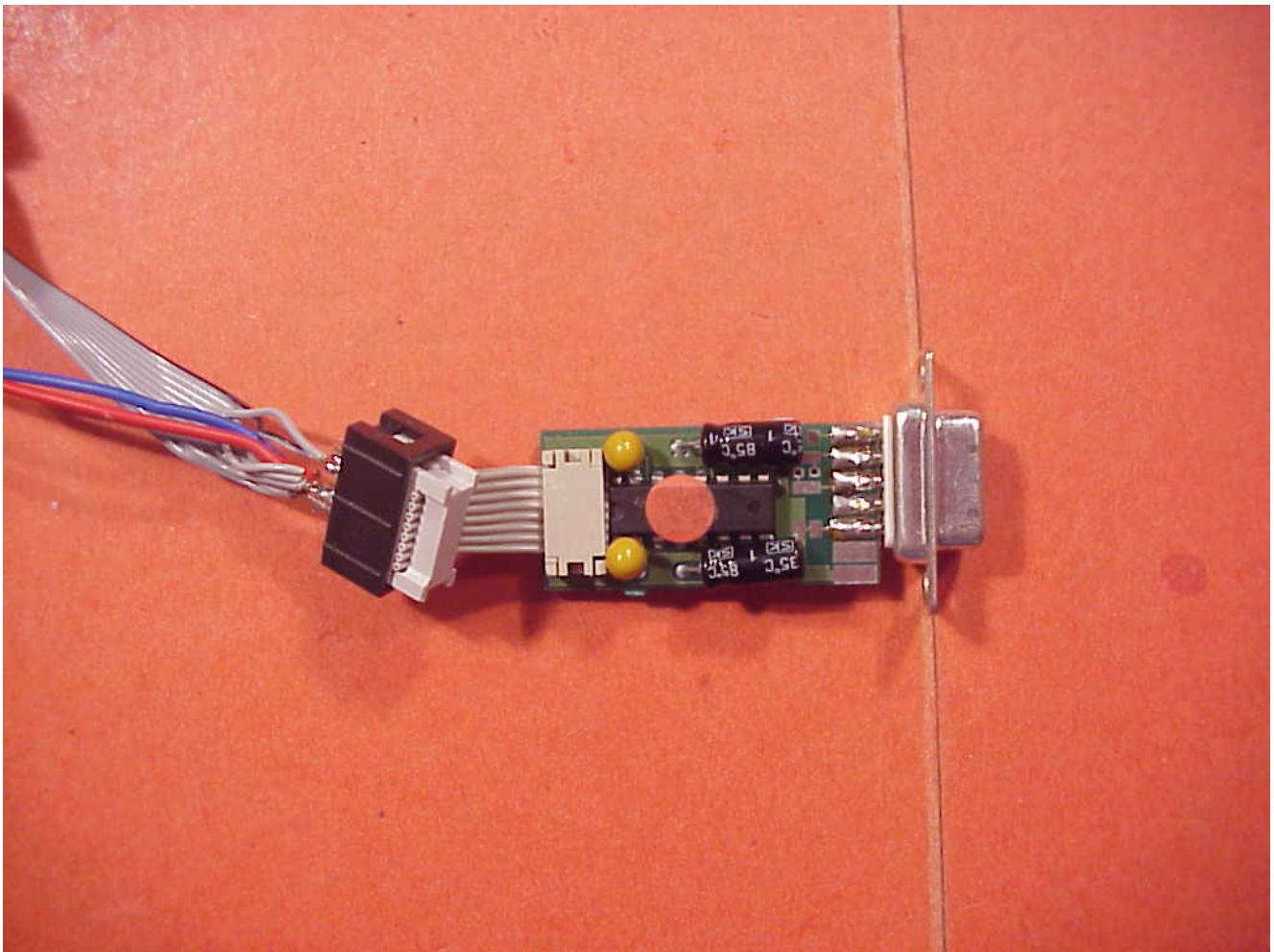
1.7.1.7 Photo documentation of the EUT

Photo 7



1.7.1.8 Photo documentation of the EUT

Photo 8



2 Technical test

2.1 Summary of test results

- ☒ **No deviations from the technical specifications were ascertained**
- ☐ There were following deviations from the technical specifications ascertained

2.1.1 Emission

Standards corresponding point 1.6	Basic Standard	test performed		deviation	
		yes	no	yes	no
Conducted emission on main	ANSI C63.4	☒	☐	☐	☒
Conducted emission on telephone line	EN 55 022	☐	☒	☐	☐
Electromagnetic field	ANSI C63.4	☒	☐	☐	☒
Harmonic current emissions	EN 61000-3-2	☐	☒	☐	☐
Voltage fluctuations and flicker	EN 61000-3-3	☐	☒	☐	☐

2.1.2 Immunity

Standards corresponding point 1.6	Basic Standard	test performed		deviation	
		yes	no	yes	no
Immunity against electrostatic discharge	EN 61000-4-2	☐	☒	☐	☐
Immunity against radiated fields	EN 61000-4-3	☐	☒	☐	☐
Immunity against BURST on power line	EN 61000-4-4	☐	☒	☐	☐
Immunity against BURST on telephone line	EN 61000-4-4	☐	☒	☐	☐
Immunity against Surges 1,2/50µs or 8/20µs on power line	EN 61000-4-5	☐	☒	☐	☐
Immunity against Surges 1,2/50µs or 8/20µs on telephone line	EN 61000-4-5	☐	☒	☐	☐
Conducted immunity on telephone line	EN 61000-4-6	☐	☒	☐	☐
Conducted immunity on power line	EN 61000-4-6	☐	☒	☐	☐
Voltage dips and interruptions	EN 61000-4-11	☐	☒	☐	☐

2.2 Test environment

Temperature	:22 °C
Relative humidity content	:55 %
Air pressure	:101 kPa
Details of power supply	:115 V
Other parameters	:

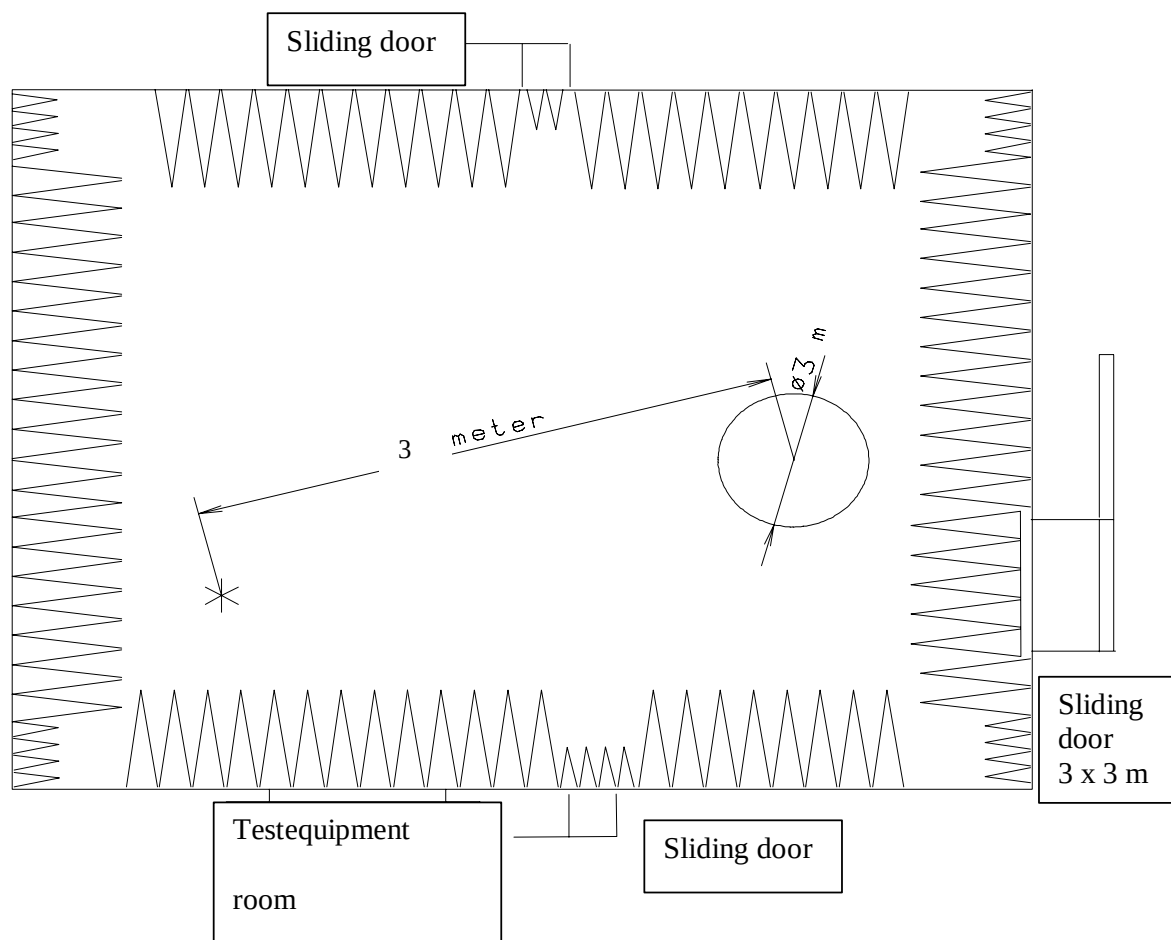
2.3 Measurement and test set-up

Note: The test configuration is in accordance with the requirements given in the standards in point 1.6

Details are documented in point 2.5 by text, photos, plots or others.

2.4 Test configuration

2.4.1 Anechoic chamber (Overview)



Dimension of semi- anechoic chamber

Length outside: 22,00 m

Length inside: 18,60 m

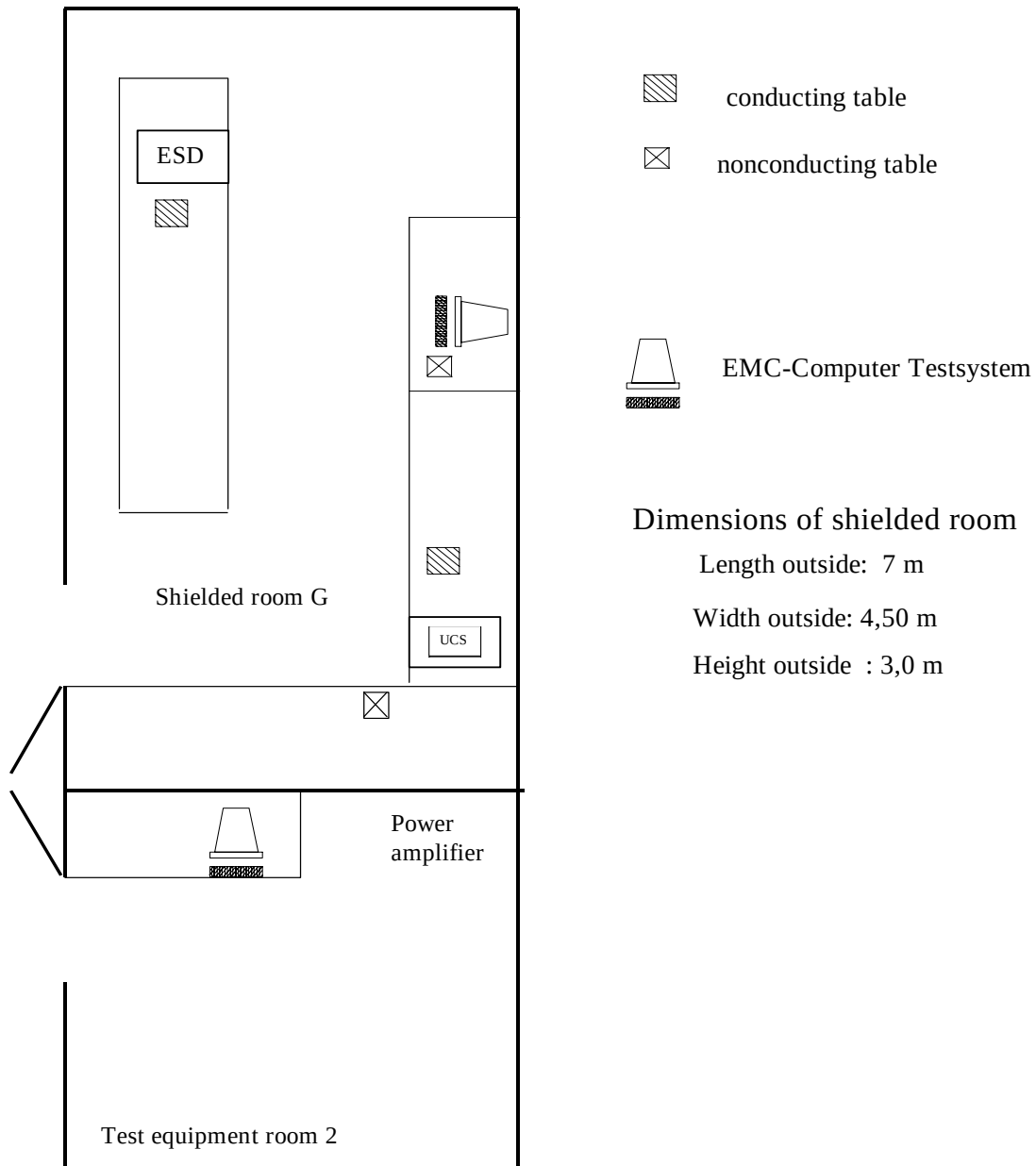
Height outside: 8,70 m

Height inside: 6,50 m

Width outside: 15,00 m

Width inside: 12,50 m

2.4.2 Shielded room 2 (overview)



2.4.3 List of instrumentation for test

ICT-Nr	Model/ Typ	Typ:	Serial No.	Spezifikation
0210	Flicker, Harmonics Analyzer PHE4500/B/D	Spitzenberger & Spies	B5976	EN 60555/IEC 555
0211	HF-Power Amplifier HP 83006	Hewlett Packard	3104 A 00499	0.01-26 MHz
0213	Horn Antenna 3115	EMCO	5289	1-18 GHz
0217	Adjustable transformer RT 5A	Grundig	01005	25-260 Volt
0237	Feeding bridge B	Bosse	no	-
0324	Spectrum-Analyzer 8566 OB No.1	Hewlett Packard	2637 A 03480	100 Hz- 22 GHz
0358	No.2		2747 A 05349	
0325	Quasi-Peak-Adapter 85650 A No.1	Hewlett Packard	2521 A 00806	
	No.2		2811 A 01145	
0327	AC/DC Power Supply	Zentro		
0346	Power Sensor 8482 A	Hewlett Packard	2652 A 18811	0.1-4.2 GHz
0347	Power Sensor 8481 A	Hewlett Packard	2702 A 71333	0.01-18 GHz
0353	Synthesized-Signal-Generator 8662 A	Hewlett Packard	2811 A 03269	10 kHz-1.2GHz
0355	HF-Generator 8671 B	Hewlett Packard	2823 A 00656	2-18 GHz
0357	Dual Power Meter 438	Hewlett Packard	2804 U 01015	
0369	Signal-Generator 8657 A	Hewlett Packard	2838 A 00638	10 kHz - 1040 MHz
0372	Multimeter	Hewlett Packard	2619 A 44829	
0385	Power-Meter 437 B	Hewlett Packard	2861 A 00774	
0386	Power Sensor 8482 B	Hewlett Packard	2703 A 03024	0.01-4.2 GHz
0524	Isotropic-Field-Probe 7122	EMCO	9305-1160	10 kHz - 1 GHz
0527	Ferrit Clamp MDS 21	Rohde & Schwarz	301404-038	20 - 1000 MHz
0528	Logger Antenna AT 1080	EMCO		80 - 1000 MHz
0529	RF-Amplifier 100 W 1000 M1	ar	13161	80 - 1000 MHz
0530	Logger Antenna HL 223	Rohde & Schwarz	832727/007	0.2-1.3 GHz
0532	Bicon Antenna HK 116	Rohde & Schwarz	833162/004	20-300 MHz
0534	CDN M2/M3 L801-	Lüth	9350105	
0538	Injection Probe F-120-4	FCC	23	10-100 MHz
0549	RF-Amplifier LD 220 - 200	ar	910 130 06	0.01 -220 MHz
0552	Ferrit Clamp MDS 21	Rohde & Schwarz	301404-039	20 - 1000 MHz
0552	Audio-Analyzer UPA	Rohde & Schwarz	883.864/014	10 Hz - 100 kHz
0561	PC Siemens Scenic 4T PCI	Siemens	S26361-K345V	
0567	DC-NNBM 8125	Rohde & Schwarz	8125401	
0568	EMI Receiver 8542 E	Hewlett Packard	3617A00170	9 kHz-2,9 GHz
0573	Bilog Antenne CBL 6112	Rohde & Schwarz	2110	0.03-2 GHz
0574	CDN 801-S9	FCC	56	
0575	Bicon Antenne 3109	EMCO	8906-2309	20-300 MHz
0577	Oscilloscope HM 303-4	HAMEG	Z 30948	
0578	Logger Antenne 3146	EMCO	8905-2435	0.2-1 GHz
0580	Power Supply 6032 A	Hewlett Packard	2920 A 04466	0-60 Volt
0582	V-ISN ESH 3-Z5	Rohde & Schwarz	893445/003	230V/AC
0584	V-ISN ESH 3-Z5	Rohde & Schwarz	893445/003	230V/AC
0585	V-ISN ESH 3-Z5	Rohde & Schwarz	893445/003	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	
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

ICT-Nr	Model/ Typ	Typ:	Serial No.	Spezifikation
2439 2444	Spectrum-Analyzer-Display 8566 2A	Hewlett Packard	2542 A 13175 No.1 2816 A 16665 No.2	
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 Pres-link 2.1	Siemens		
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 URV5-Z-4	R&S	839080/005	9KHz-3GHz 10Volt
F031	Power Sensor URV5-Z-4	R&S	838314/030	100KHz-3GHz 100Volt
F032	Power Sensor URV5-Z-4	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		

2.5 Test results

Measurement uncertainty

The uncertainty of the measurement equipment fulfils CISPR 16 and the related European and national standards.

The semi anechoic chamber fulfils the requirements of CISPR 16-1 (ANSI C63.4) for a test volume of 3m Ø.

Notes

The test are carried out first as a preview measurement in peak mode. These results are documented as plot file. In this graphic the limit lines are corrected by the transducer factors of antennas, cables etc. The values shown in this graphics are not finally maximised.

These values are stored in a table, maximised and remeasured in quasi peak mode. The used mode is shown in the table. The limits used are shown in the column „spec limit“ and the difference to the limit in the column „dLim“. This table is plotted as a graphic. The frequency range is automatically adapted to the listed frequencies.

The test are carried out in different operating modes and the worst case is documented in this test report.

The radiated measurements were performed vertical and horizontal over the whole frequency range. We start at 1 m high with vertical receiving antenna and rotate the dish continuously. During rotation we use the antenna lift system to vary the high from 1 m to 4 m. So we find maximum rotation output. At this points we do manual remeasurments. After this we do the same measurements in horizontal position of the receiving antenna. This (horizontal and vertical) is made for all the three planes of the test sample. We use the maximum received results.

The detector function and selection of bandwidth are according ANSI C63.2-1996 item 8.2.1 And ANSI C63.4-2003 item 4.2

Antennas are conform with ANSI C63.2-1996 item 15.

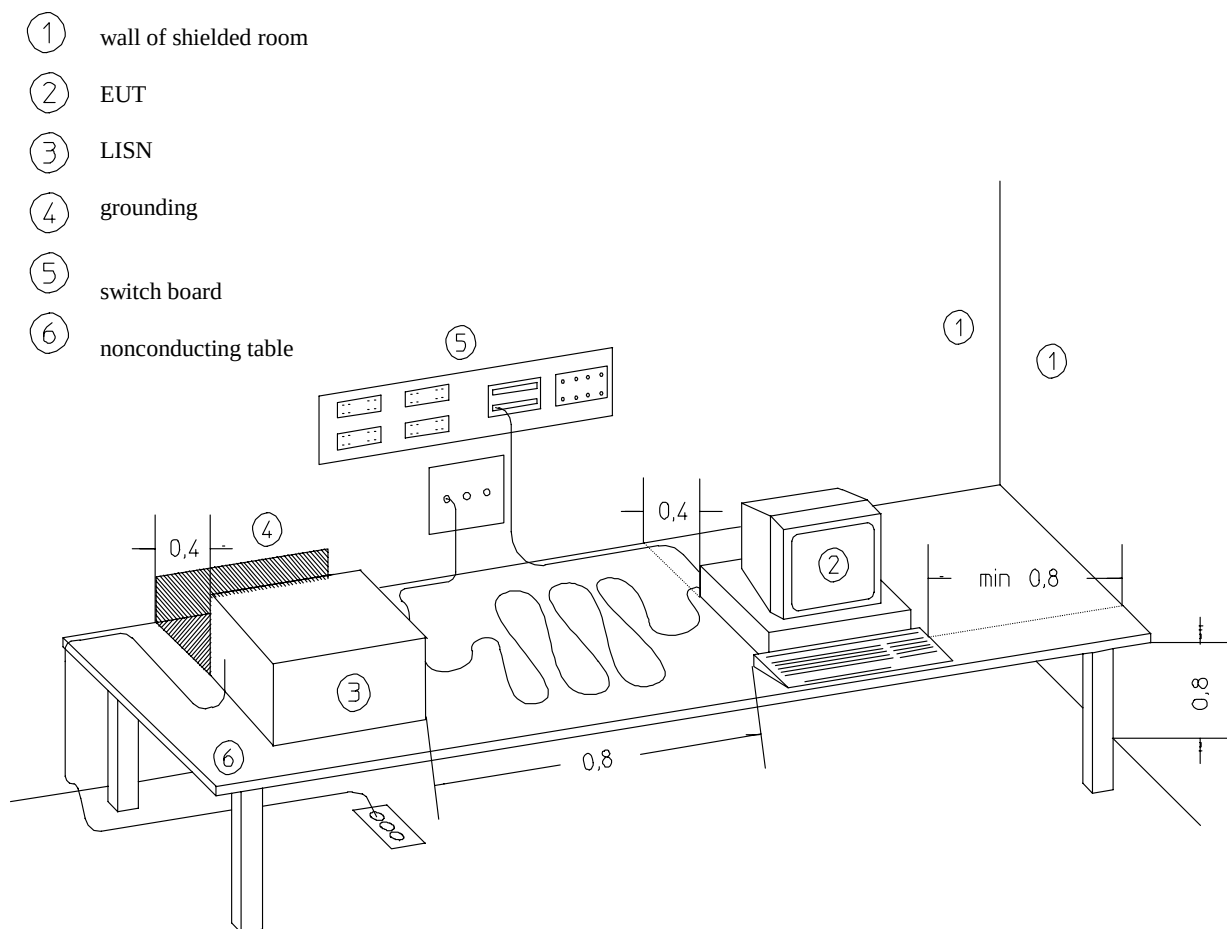
150 kHz – 30 MHz: Quasi Peak measurement, 9 kHz Bandwidth, loop antenna.

30 MHz – 200 MHz: Quasi Peak measurement, 120 kHz Bandwidth, bicon or bilog antenna

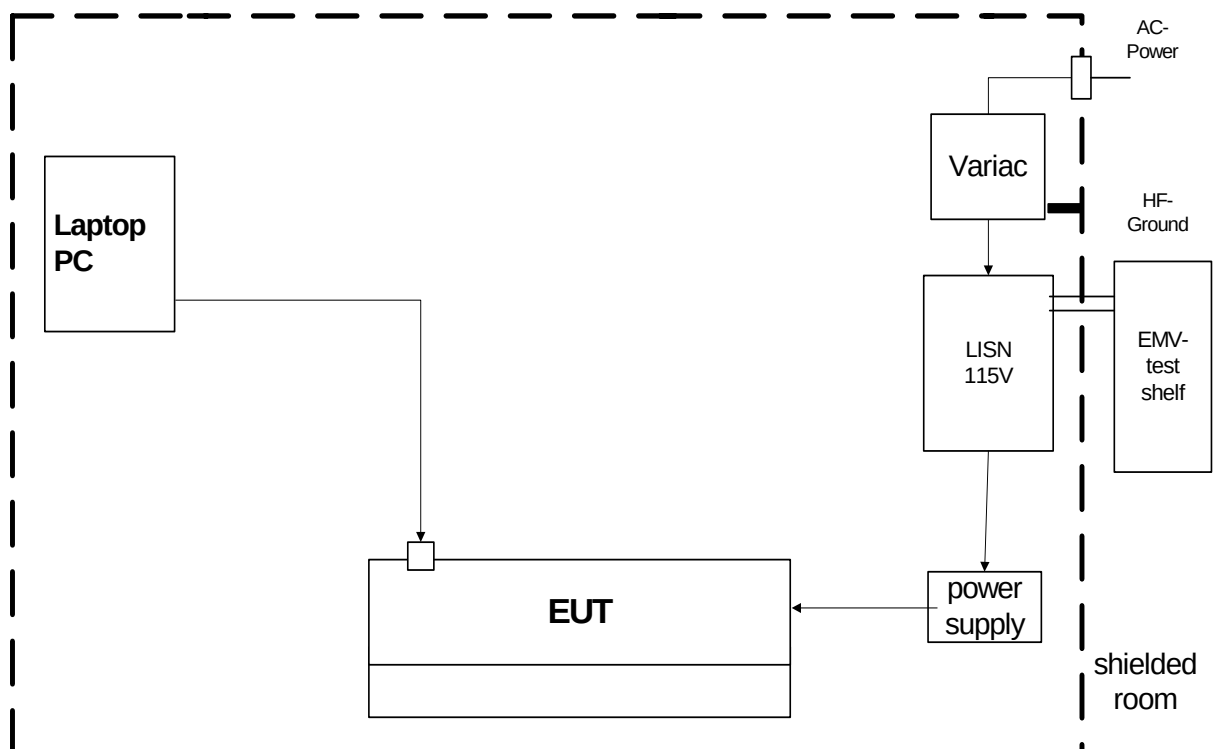
200 MHz – 1 GHz: Quasi Peak measurement, 120 kHz Bandwidth, bicon or bilog antenna

2.5.1 Conducted emissions on main

2.5.1.1 Drawing of test set-up

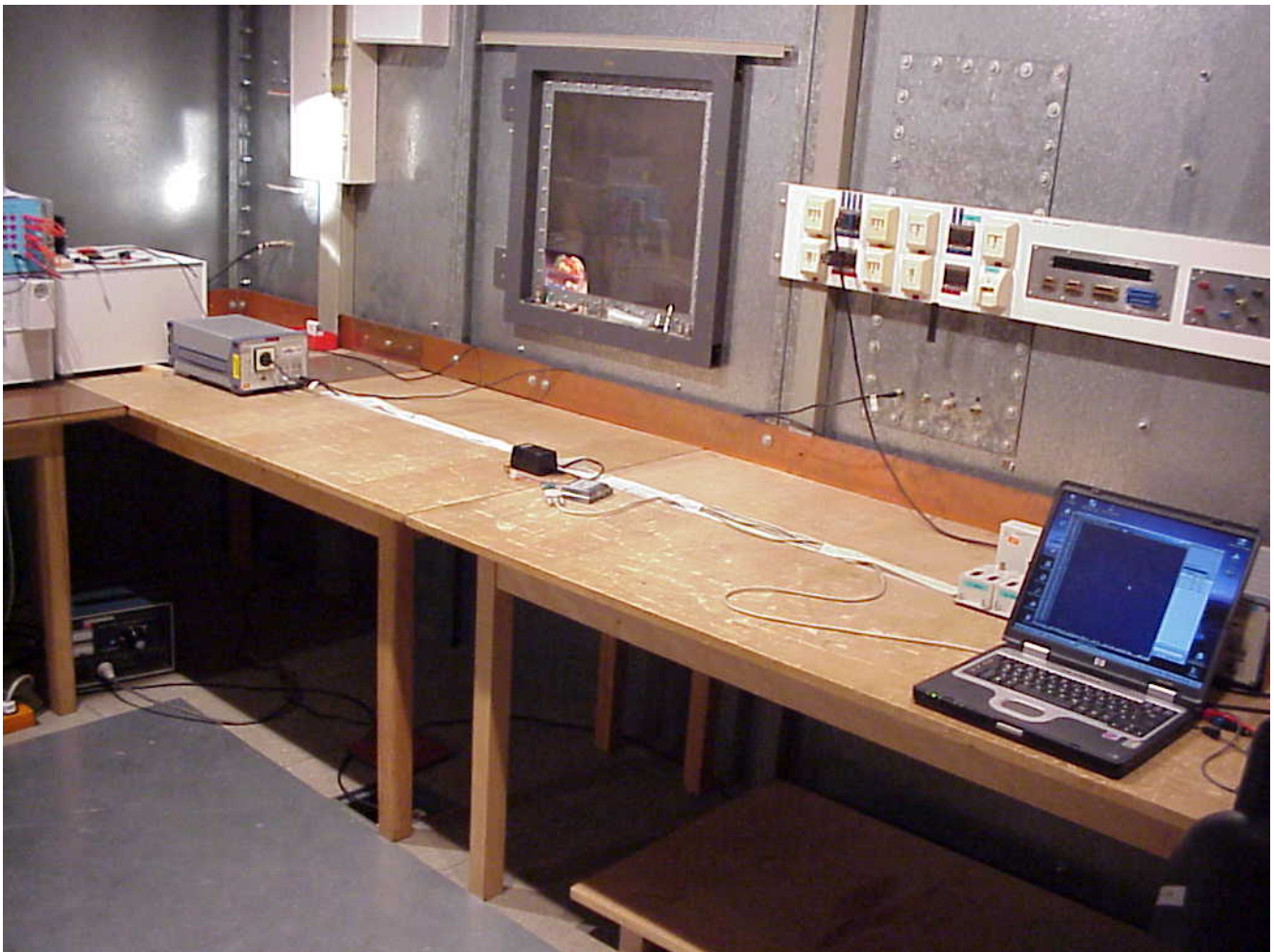


2.5.1.2 Test configuration for the EUT in the shielded room



2.5.1.3 Photo documentation of the test set-up

Photo 9



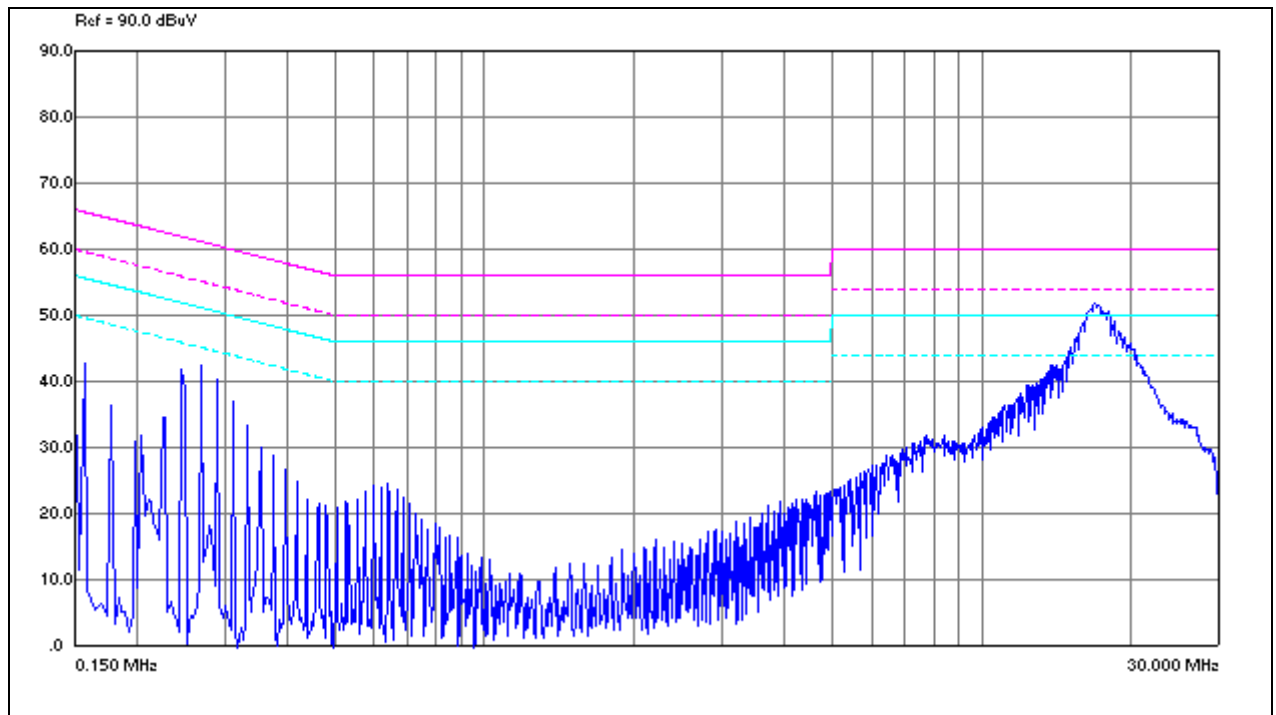
List of results on main (Phase L1)

Text 1: EC_L1_LST.DOC

Frequency MHz	Peak Lim dBuV	Peak dBuV	QP Lim dBuV	QP dBuV	DelLim-QP dB	Avg Lim dBuV	Avg dBuV	DelLim-Avg dB
16.537538	50.00	51.17	60.00	49.69	-10.31	50.00	47.24	-2.76
16.642034	50.00	51.58	60.00	49.99	-10.01	50.00	47.43	-2.57
16.740171	50.00	51.84	60.00	50.23	-9.77	50.00	47.13	-2.87
16.843482	50.00	51.81	60.00	50.37	-9.63	50.00	48.01	-1.99
16.947654	50.00	51.92	60.00	50.14	-9.86	50.00	47.93	-2.07
17.048986	50.00	51.92	60.00	49.93	-10.07	50.00	48.14	-1.86
17.148611	50.00	51.73	60.00	49.95	-10.05	50.00	48.12	-1.88
17.249900	50.00	51.53	60.00	49.84	-10.16	50.00	48.19	-1.81
17.349176	50.00	51.15	60.00	48.95	-11.05	50.00	44.93	-5.07
17.965068	50.00	50.81	60.00	49.09	-10.91	50.00	46.04	-3.96

Remarks:

A measurement with spectrum analyser and peak-detector is performed. If no limit exceeding of specified limits occur, the measurement is concluded at this stage. If the limit exceeding occur, measurement are carried out with the quasi-peak detector at the frequencies at which the exceeding occur.

2.5.1.4 Plot of results on main (Phase L1)**Graphic: EC_L1_LST.DOC**

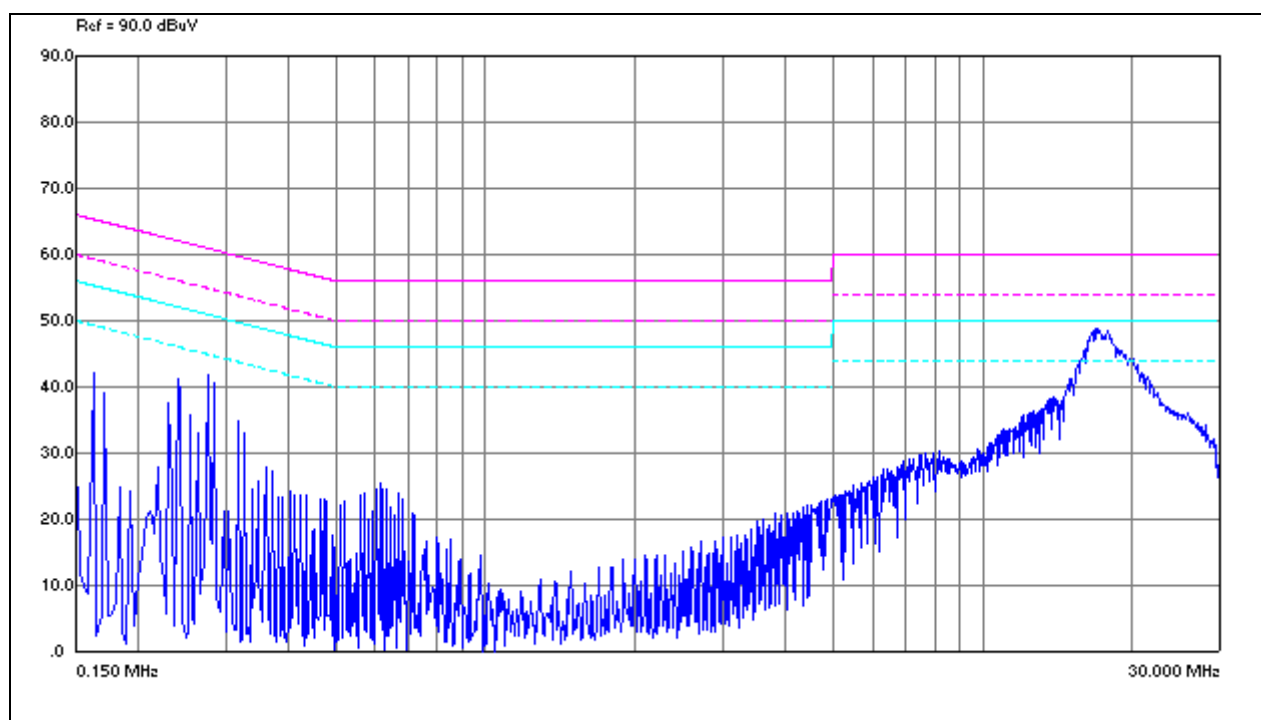
Frequency range : 150 kHz - 30 MHz

2.5.1.5 List of results on main (neutral conductor N)**Text 2: EC_N_LST.DOC**

Frequency MHz	Peak dBuV	Lim dBuV	Peak dBuV	QP dBuV	Lim dBuV	QP dB	DelLim-QP dB	Avg dBuV	Lim dBuV	Avg dB	DelLim-Avg dB
16.641492	50.00	48.52	60.00	47.35	-12.65	50.00	44.90	-5.10			
16.742250	50.00	48.61	60.00	47.58	-12.42	50.00	45.12	-4.88			
16.845042	50.00	48.90	60.00	47.75	-12.25	50.00	45.51	-4.49			
16.945744	50.00	49.22	60.00	47.76	-12.24	50.00	45.62	-4.38			
17.045550	50.00	48.87	60.00	47.42	-12.58	50.00	45.01	-4.99			
17.145503	50.00	48.94	60.00	47.30	-12.70	50.00	44.98	-5.02			
17.248542	50.00	48.85	60.00	47.31	-12.69	50.00	45.77	-4.23			
17.760162	50.00	48.67	60.00	47.14	-12.86	50.00	45.18	-4.82			
17.858374	50.00	49.13	60.00	46.95	-13.05	50.00	43.12	-6.88			
17.963140	50.00	48.27	60.00	46.95	-13.05	50.00	44.30	-5.70			

2.5.1.6 Plot of results on main (neutral conductor N)

Graphic: EC_N_LST.DOC



Frequency range : 150 kHz - 30 MHz

2.5.1.7 Instruments for test (Labor Nr.)

0568	0584										
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Instruments for Simulate (Labor Nr.)

G											
---	--	--	--	--	--	--	--	--	--	--	--

Conducted limits

Frequency- range	EN 55022/ FCC part 15 Class B		EN 55022/ FCC part 15 Class A	
	Quasi-Peak dB μ V	Average dB μ V	Quasi-Peak dB μ V	Average dB μ V
0,15 MHz – 0,5 MHz	66-56	56-46	79	66
0,5 MHz -5 MHz	56	46	73	60
5 MHz -30 MHz	60	50	73	60

Operation mode

- ☒ Connection to a laptop PC
(read out of temperature)

Results

Frequency range	Class B		Class A		Effect
	pass	fail	pass	fail	
0,15 MHz - 30 MHz	☒	☐	☒	☐	no

Test result:

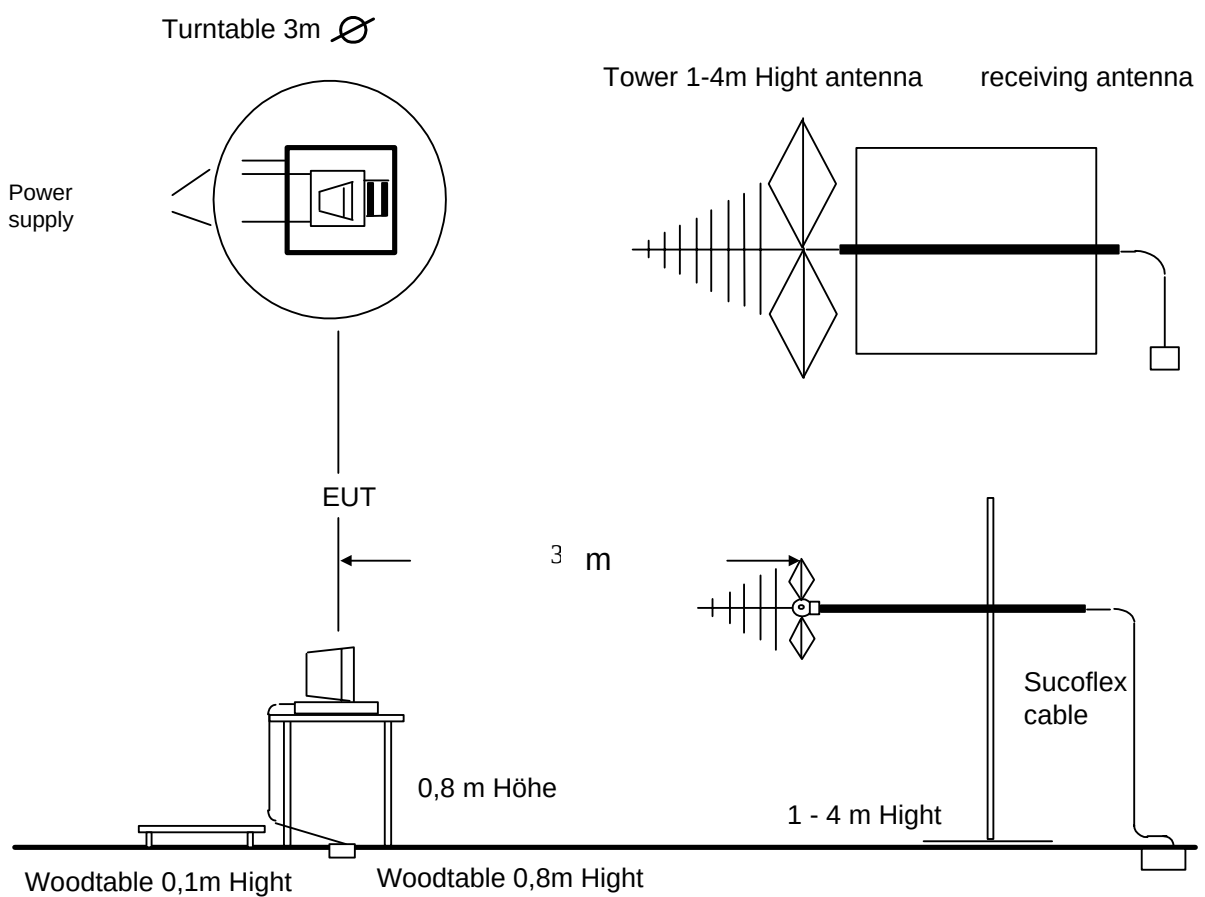
- ☒ normal performance within the specification limits

- ☒ description of the test

The AC/DC adapter is changed by customer as following: The resistor 240 Ω (7,5V) were changed to 400 Ω (5.1V). After the changing is declared the output power 5.1V/ 100 mA. It were powered with 115 V AC

2.5.2 Results of the electromagnetic radiated emissions (distance 3 m)

2.5.2.1 Drawing of test set-up



2.5.2.2 Photo documentation of test set-up

Photo 10



2.5.2.3 Photo documentation of test set-up

Photo 11



2.5.2.4 List of the results of radiated emission
(horizontal and vertical polarisation)

Text 3:ER_H_LST.DOC

Data File : /1449F_05.doc

20 Dec 2004 09:11:39

No	EMISSION	SPEC LIMIT	MEASUREMENTS			SITE			CORR FACTOR	COMMENTS
	FREQUENCY MHz		ABS	dLIM	MODE	POL	HGT cm	AZM deg		
1	42.4	40.0	32.8	-7.2	PK	V	96	360	N/T	
2	49.3	40.0	33.9	-6.1	PK	V	96	359	N/T	
3	59.596	40.0	33.0	-7.1	QP	V	102	161	7.5	

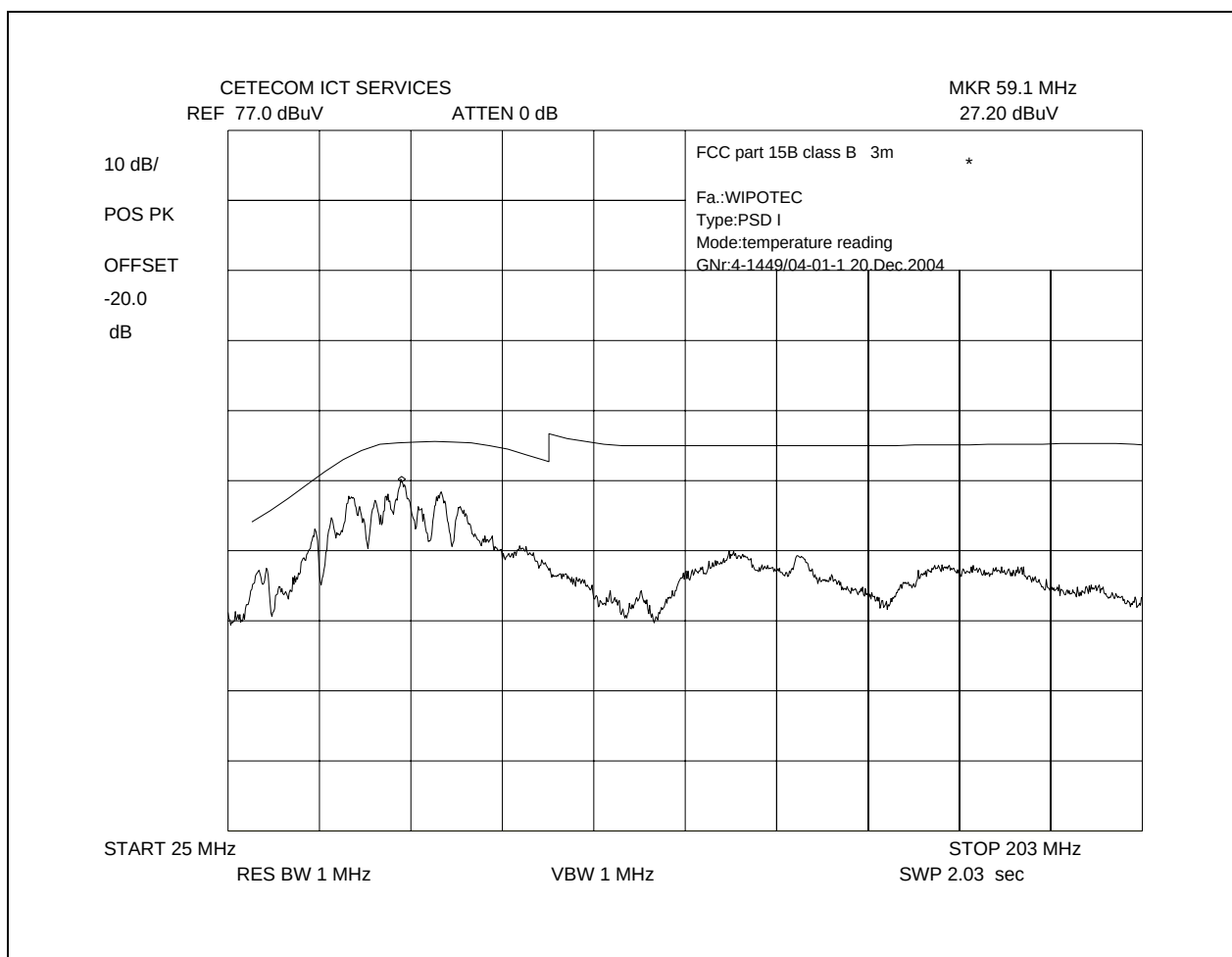
N/T in CORR FACTOR column denotes a non-traceable signal.

Remarks:

A measurement with spectrum analyser and peak-detector is performed. If no limit exceeding of specified limits occur, the measurement is concluded at this stage. If the limit exceeding occur, measurement are carried out with the quasi-peak detector at the frequencies at which the exceeding occur.

2.5.2.5 Chart for EUT of the measurement of radiated emission (vertical polarisation)

Graphic 1: ER3_V_SA.BMP

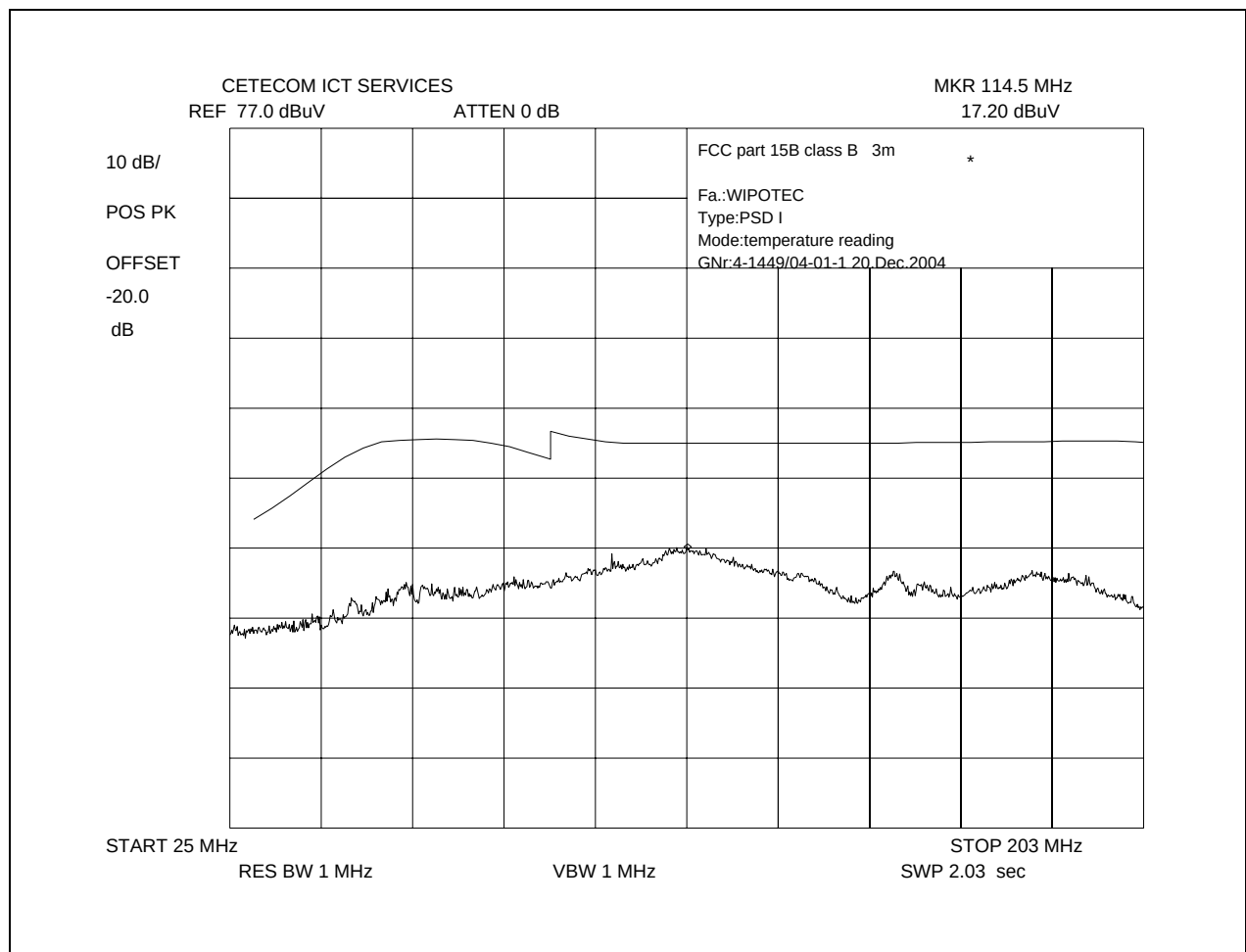


Frequency range : 30 MHz - 200 MHz

2.5.2.6 Chart for EUT of the measurement of radiated emission (horizontal polarisation)

Frequency range : 30 MHz - 200 MHz

Graphic 2: ER3_H_SA.BMP

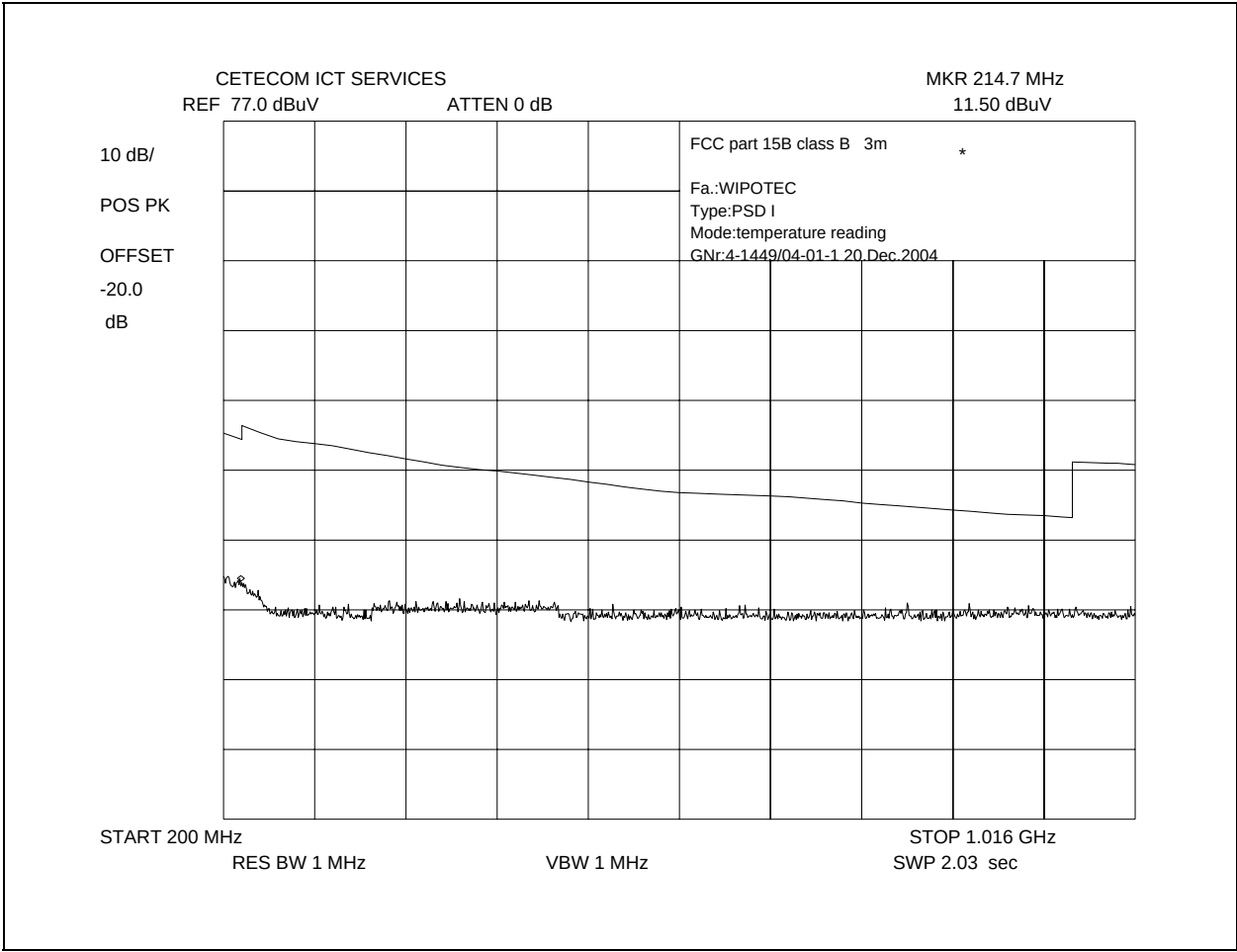




2.5.2.7 Chart for EUT of the measurement of radiated emission
(vertical polarisation)

Frequency range : 200 MHz - 1 GHz

Graphic 3: ER4_V_SA.HGL

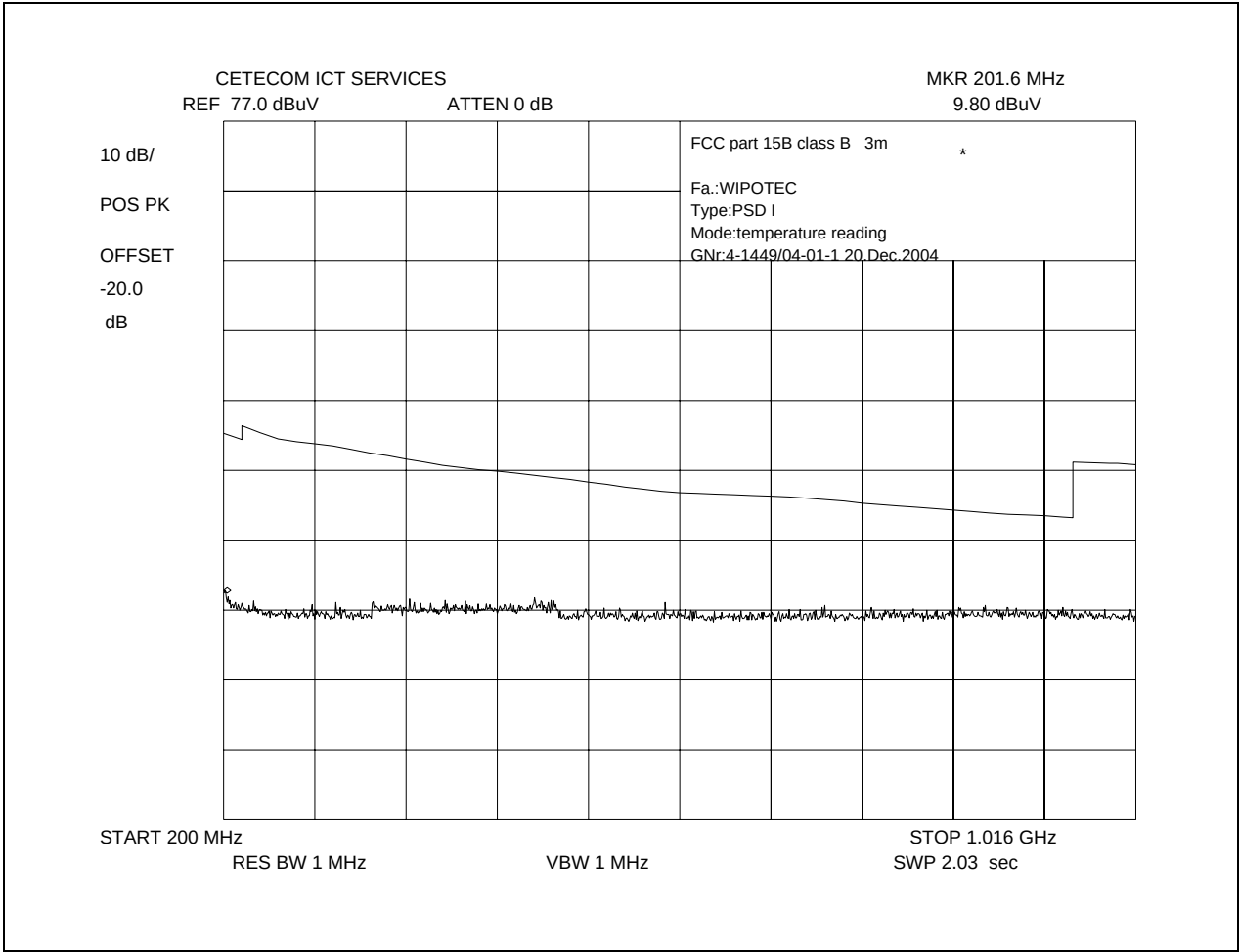




2.5.2.8 Chart for EUT of the measurement of radiated emission
(horizontal polarisation)

Frequency range : 200 MHz - 1 GHz

Graphic 4: ER4_H_SA.HGL



2.5.2.9 Instruments for test (Labor Nr.)

0573	02448	0324	0325	0625							
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Instruments for Simulate (Labor Nr.)

F	PC of customer		0210								
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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	44.0 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

Operation mode

- ☐ standby
☐ special function

- ☐ selection
☒ Connection to a laptop PC
 (read out of temperature)
☐ test software

Results

Frequency range	Class B		Class A		Effect
	pass	fail	pass	fail	
30 MHz - 1000 MHz	☒	☐	☒	☐	no

Test result:

- ☒ normal performance within the specification limits

- ☒ description of the test

The AC/DC adapter is changed by customer as following: The resistor 240Ω (7,5V) were changed to 400Ω (5.1V). After the changing is declared the output power 5.1V/ 100 mA. It were powered with 115 V AC