MEASUREMENT / TECHNICAL REPORT

SIEMENS AG

Model: Personal Computer Scenic DT6

FCC ID: HSSSCENIC6511

Feb. 23, 1999

This report concerns:	Original grant	☐ Class II change
Equipment type:	Personal Computer	

Request issue of grant:

- Immediately upon completion of review
- ☐ Defer grant per 47 CFR 0.457(d)(1)(ii) until _____ date _____. Company Name agrees to notify the Commission by _____ date _____ of the intended date of announcement of the product so that the grant can be issued on that date.

Measurement procedure used:

- ANSI C63.4-1992
- ☐ FCC/OET MP-4(1987)
- ☐ other _____

Limits on compliance with: CISPR 22 resp. FCC class B

Application for Certification prepared by:
Guenther Roesch
Siemens AG
Buergermeister-Ulrich-Str. 100
86199 Augsburg
Germany
Tel.: +49 821 804-2821
Fax: +49 821 804 2675

Applicant for this device:

Siemens AG
Buergermeister-Ulrich-Str. 100
86199 Augsburg
Germany
Tel.: +49 821 804-0

Table of Contents

1 GENERAL INFORMATION

1.1 Product Description

The Siemens Computer Scenic DT6 is a compact desktop personal computer. The system board integrates the Pentium Processor, memory, and I/O-techno-logies. The main system unit is assembled with the Processor Intel Pentium II up to 500 MHz.

Description of the power supplies:

- Power supplies:

ASTEC, model	AA20650 S26113-E425-V30
Minebea, model	SPW1553 S26113-E425-V20

Features Overview:

<u>CPU – Intel Pentium II</u>
- 100 MHz Slot 1 specification
- Onboard voltage regulator VRM 8.2

<u>Chip Set</u>
- Vendor: Intel
- Type: Natoma 82440BX
PAC 82443BX & PIIX4E82371EB

<u>Intelligent drive electronics (IDE) interface</u>
- Feature: Enhanced bus master ATA33 IDE interface incl. EIDE

Universal serial bus (USB) interface

- Support: 12 Mbits/s
  Windows 98™ and Windows NT™
- Connector: Two external USB connectors

Super I/O

- Vendor: SMSC
- Type: FDC37M807

Keyboard and mouse interface

- Feature: Keyboard and mouse interface
- Support: Connector exchange
  Power fused with polyswitch
- External connector: Two external PS/2 Mini-DIN connectors

Parallel port interface

- Feature: One parallel port
- Support: EPP / ECP capable
  Interrupts / DMA channels route able for PnP
- Connector: One external standard parallel port

Serial port interface

- Feature: Two serial ports with FIFO, 16550 compatible
  One external serial (COM1) port
  One internal chip card reader port of external serial
  (COM2)
  Port via wire
- Support: Interrupts route able for PnP
- Connector: One external standard and one internal connector

Main memory

- Support: The system needs at least one module and can manage at most there SDRAM modules.
- Size: From 16 Mbytes up to 768 Mbytes SDRAM

- Technology: 100 MHz unbuffered DIMM modules.
  168 Pin, 3,3 V, 64 Bit, 72 Bit (with ECC), 100 MHz SDRAM
- Granularity: For one socket 16, 32, 64, 128 or 256 Mbyte.

LAN – Ethernet controller

- Vendor: Intel
- Type: 82559
- Feature: 10/100 Mbit/s

The personal computer is assembled by Siemens AG, Bürgermeister-Ulrich-Str. 100, 86199 Augsburg.

1.2 Related Submittal Grant

N/A

1.3 Tested System Details

The FCC IDs for all equipment, plus description of all cables used in the tested system are:

Pos	Model Number (Serial Number)	FCC ID	Description	Cable Description (length in [cm])
1	Siemens Scenic 651 (DT6)	HSSSCENIC6511	PC **EUT**	unshielded power cord [292]
2a	Siemens MCM 2110 NTD S26361-K500-V150	M9U9705C97BMD	Monitor	unshielded power cord [175] shielded video cable [168]
2b	Siemens MCM 1707 NTD	A3LCS762	Monitor	unshielded power cord [175] shielded video cable [168]
2c	Siemens MCM 1705 NTD	A3LCGH760	Monitor	unshielded power cord [175] shielded video cable [168]
3	Siemens S26381-K210	HSS01TASTK210	Keyboard	shielded keyboard cable [143]

Pos	Model Number (Serial Number)	FCC ID	Description	Cable Description (length in [cm])
4	Microsoft MS 2.1A	C3KKMP3	Mouse	shielded mouse cable [183]
5	Microsoft Intelli mouse 1.1A	DOC: PN X03-29688	USB mouse	shielded mouse cable [197]
6	Hewlett Packard HP 2225C+ (3019S70991)	894C2655X	Printer, parallel I/F	unshielded AC cable [180], shielded centronics cable [190]
7	Hewlett Packard HP 2225D+ (3012S70819)	DSI6XU2225	Printer, serial I/F	unshielded power cord [185], shielded serial cable [190]
8	Hewlett Packard HP 2225D+ (2952S61299)	DSI6XU2225	Printer, serial I/F	unshielded power cord [185], shielded serial cable [190]
8	Siemens	N/A	USB cable	shielded cable, terminated [192]
	Pos 1 contains:			
a_1	ASTEC (UK), AA20650 SNI: S26113-E425-V30	N/A	Power supply	

Pos	Model Number (Serial Number)	FCC ID	Description	Cable Description (length in [cm])
a_2	Minebea SPW1553 SNI: S26113-E425-V20	N/A	Power supply	
b	Siemens S26361-D1107-A10 GS 1	N/A	System board	
c	Hyundai PC100-322-620	N/A	SDRAM	
d	Intel Pentium II 80525/PY500512	N/A	Processor module	
e	Matrox G100 AGP	DOC: G100A/4/OEM	Graphic controller board	
f	Siemens S26361-S1783-V2	N/A	Slot with additional serial port	
g	Quantum Fireball EX 6.4A S26361-H426-V100	N/A	Hard disk drive	
h	Toshiba XM-6302B S26361-H402-V500	CJ6AT98-032	CD-ROM drive	
i	SONY MPF920-C	N/A	Floppy disk drive	

Remark: position 2a / 2b / 2c /$1a_1$ / $1a_2$ optional

1.4 Test Methodology

Both, conducted and radiated tests were performed according to the procedures in ANSI C63.4-1992. Radiated testing below 1 GHz was performed at an antenna to EUT distance of 10 meters above 1 GHz at an antenna to EUT distance of 3 meters. All radiated emission measurements were done in an anechoic chamber. Limits for radiated and conducted emission are in compliance with CISPR 22 resp FCC class B.

1.5 Test Facility

The anechoic chamber and conducted measurement facility used to collect the emission data is located at Siemens AG, Bürgermeister Ulrich Str. 100, 86199 Augsburg, Germany. This site has been fully described in a report dated January 24, 1997 submitted to your office, and accepted in a letter dated March 03, 1997 (31040/SIT).

1.6 Referenced Rules Sections

N/A

2 PRODUCT LABELING

2.1 FCC ID Label

FCC ID: HSSSCENIC6511

This device complies with part 15 of the FCC Rules and meets all requirements of the Canadian Interference-Causing-Equipment Regulations. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2.2 Location of Label on EUT: see attached files

3 SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a maximum fashion (as a customer can use it). Each type of external ports was connected with a peripheral unit (e.g. serial port connected to a serial printer, external keyboard port connected to a keyboard and so on). During radiated emission the monitor was powered via system unit, during conducted emission also the external monitor supply was tested.
The system clock is 100 MHz, the clock frequency was tested with the corresponding worst case processor:

100 MHz clock: Intel Pentium II 500 MHz

The system is provided with two kinds of power supplies:

– ASTEC, AA20650 SNI: S26113-E425-V30

– Minebea, SPW1553 SNI: S26113-E425-V20

Each power supply has been measured with each video resolution (worst case).
Referring to radiated emission the following (worst case) results are applicable:
ASTEC PSU:
Frequency range 30 MHz - 1 GHz:
100 MHz clock/Pentium II 500 MHz, video resolution 1024 x 768/100 Hz
100 MHz clock/Pentium II 500 MHz, video resolution 1600 x 1200/70 Hz

Frequency range 1 GHz - 5 GHz:
100 MHz clock/Pentium II 500 MHz, video resolution 1024 x 768/100 Hz

Minebea PSU:
Frequency range 30 MHz - 1 GHz:
100 MHz clock/Pentium II 500 MHz, video resolution 1024 x 768/100 Hz
100 MHz clock/Pentium II 500 MHz, video resolution 1600 x 1200/70 Hz

Frequency range 1 GHz - 5 GHz:
100 MHz clock/Pentium II 500 MHz, video resolution 1024 x 768/100 Hz

Referring to conducted emission the following (worst case) results are applicable:

ASTEC PSU:
100 MHz clock/Pentium II 500 MHz, video resolution 1024 x 768/100 Hz
monitor power via system unit
100 MHz clock/Pentium II 500 MHz, video resolution 1600 x 1200/70 Hz
monitor power via system unit

Minebea PSU:
100 MHz clock/Pentium II 500 MHz, video resolution 1024 x 768/100 Hz
monitor power via system unit
100 MHz clock/Pentium II 500 MHz, video resolution 1600 x 1200/70 Hz
monitor power via system unit

3.2 Video mode Justification

The system was tested in video graphic modes 1024 x 768 and 1600 x 1200. To get comparable results when measuring different video resolutions it is necessary to carry out the test with one monitor which is capable to drive all high resolutions. Such a high performance monitor has a special ferrite loaded video cable. To prove the compliance of the EUT without ferrite on the host side, we additionally tested the system with a representative standard 21" monitor provided with a cable without any ferrite in a video resolution which is usual for standard monitors (1600 x 1200). The worst case combination (with clock frequency, video mode and power supply) of the system was used to collect the included data.

The following data are applicable:

radiated emission:

ASTEC PSU:

Frequency range 30 MHz - 1 GHz:

100 MHz clock/Pentium II 500 MHz, video resolution 1024 x 768/100 Hz

100 MHz clock/Pentium II 500 MHz, video resolution 1600 x 1200/70 Hz

Frequency range 1 GHz - 5 GHz:

100 MHz clock/Pentium II 500 MHz, video resolution 1024 x 768/100 Hz

Minebea PSU:

Frequency range 30 MHz - 1 GHz:

100 MHz clock/Pentium II 500 MHz, video resolution 1024 x 768/100 Hz

100 MHz clock/Pentium II 500 MHz, video resolution 1600 x 1200/70 Hz

Frequency range 1 GHz - 5 GHz:

100 MHz clock/Pentium II 500 MHz, video resolution 1024 x 768/100 Hz

conducted emission:

ASTEC PSU:

100 MHz clock/Pentium II 500 MHz, video resolution 1024 x 768/100 Hz monitor power via system unit

100 MHz clock/Pentium II 500 MHz, video resolution 1600 x 1200/70 Hz monitor power via system unit

Minebea PSU:

100 MHz clock/Pentium II 500 MHz, video resolution 1024 x 768/100 Hz monitor power via system unit

100 MHz clock/Pentium II 500 MHz, video resolution 1600 x 1200/70 Hz monitor power via system unit

3.3 EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to typical use.

The used sequence is:

- scrolling ”H” with applicable video mode (see 3.2)
- internal Floppy drive writes to the HD and reads back
- internal CD-ROM writes to the HD
- ”H`s” are sent to the printer ports
- data is sent to USB ports
- LAN data communication

3.4 Special Accessories

As shown in Figure 3.1, all interface cables used for compliance testing are shielded like normally supplied by the manufacturer. All cable connectors feature integral metal hoods for shielding.

3.5 Equipment Modifications

To achieve compliance to Class B levels, the following modifications were made during compliance testing:

no modifications

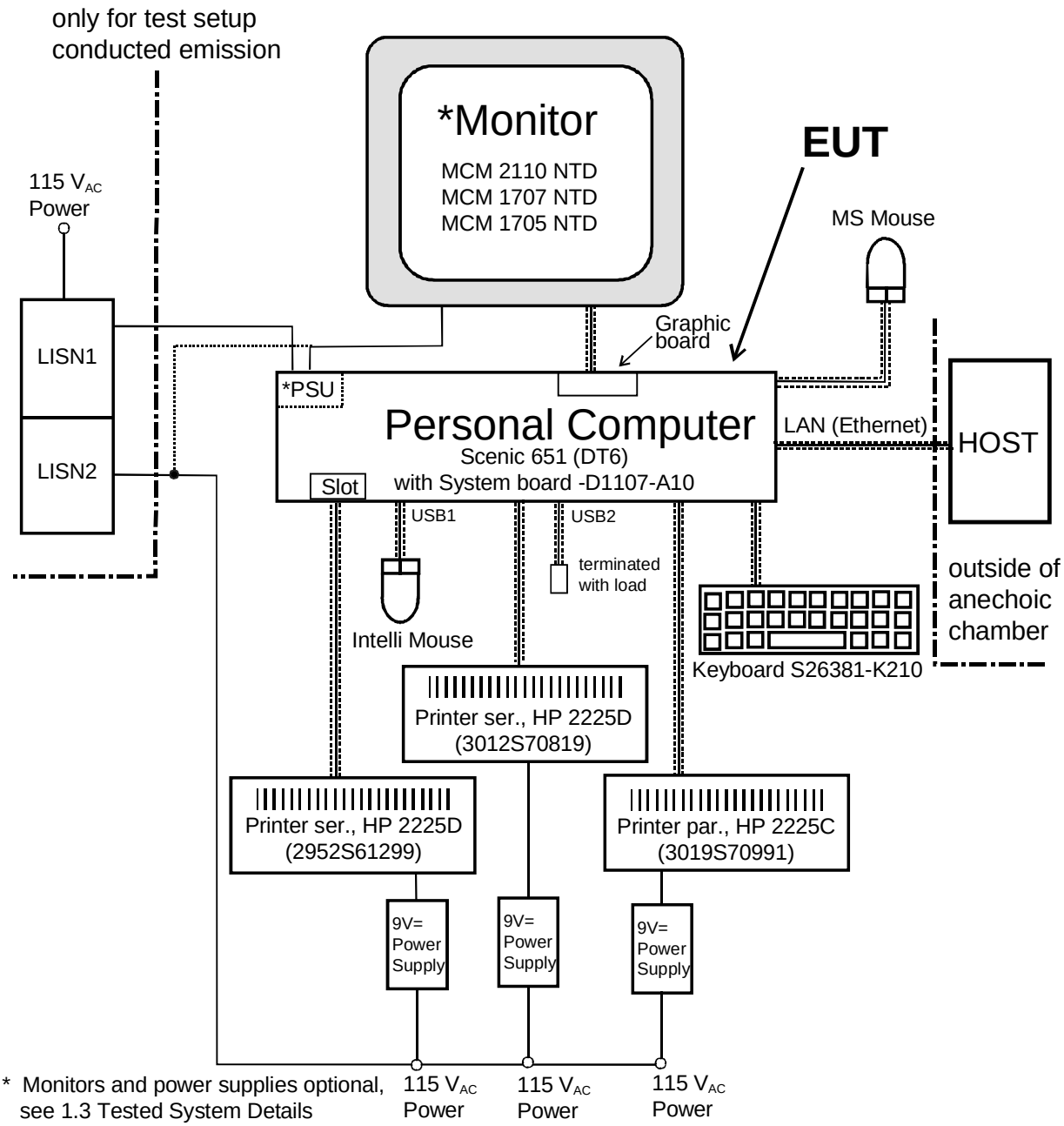
Applicant Signature _____ Date _____

Typed/Printed Name _____ Position _____

3.6 Configuration of Tested System

All necessary tests were carried out like figure 3.1. The system was used according to paragraph 1.1. During test for conducted emission the EUT was connected to a LISN. All peripherals were supplied by a second LISN. The equipment was configured according to ANSI C63.4-1992 Fig 11.

Figure 3.1 Configuration of Tested System



4 BLOCK DIAGRAM OF EUT

see fig 4.1 page 22

4.1 Block Diagram Description (see fig. 4.1)

The major parts of the system are (fig 4.1).

- System board
- Power supply
- Floppy disk drive
- Hard disk drive
- CD-ROM drive
- Chip card reader
- Peripheral connector area (Keyboard, Mouse, Ser. 1, Parallel Port, LAN and USB)

The detailed diagram of the system board is shown in fig 4.1

The personal computer works exactly like a traditional P.C..

4.2 Clockfrequencies of EUT

Clock synthesizer	14,318 MHz
Front side bus	66,6 / 100 MHz
Memory	66,6 / 100 MHz
PCI-bus	33,3 MHz
PIIX4 to IDE and USB	33,3 MHz
ISA Bus	8,2 MHz
I/O controller	14,3 MHz
USB	48 MHz
AGP bus	66,6 MHz

4.3 Theory of Operation

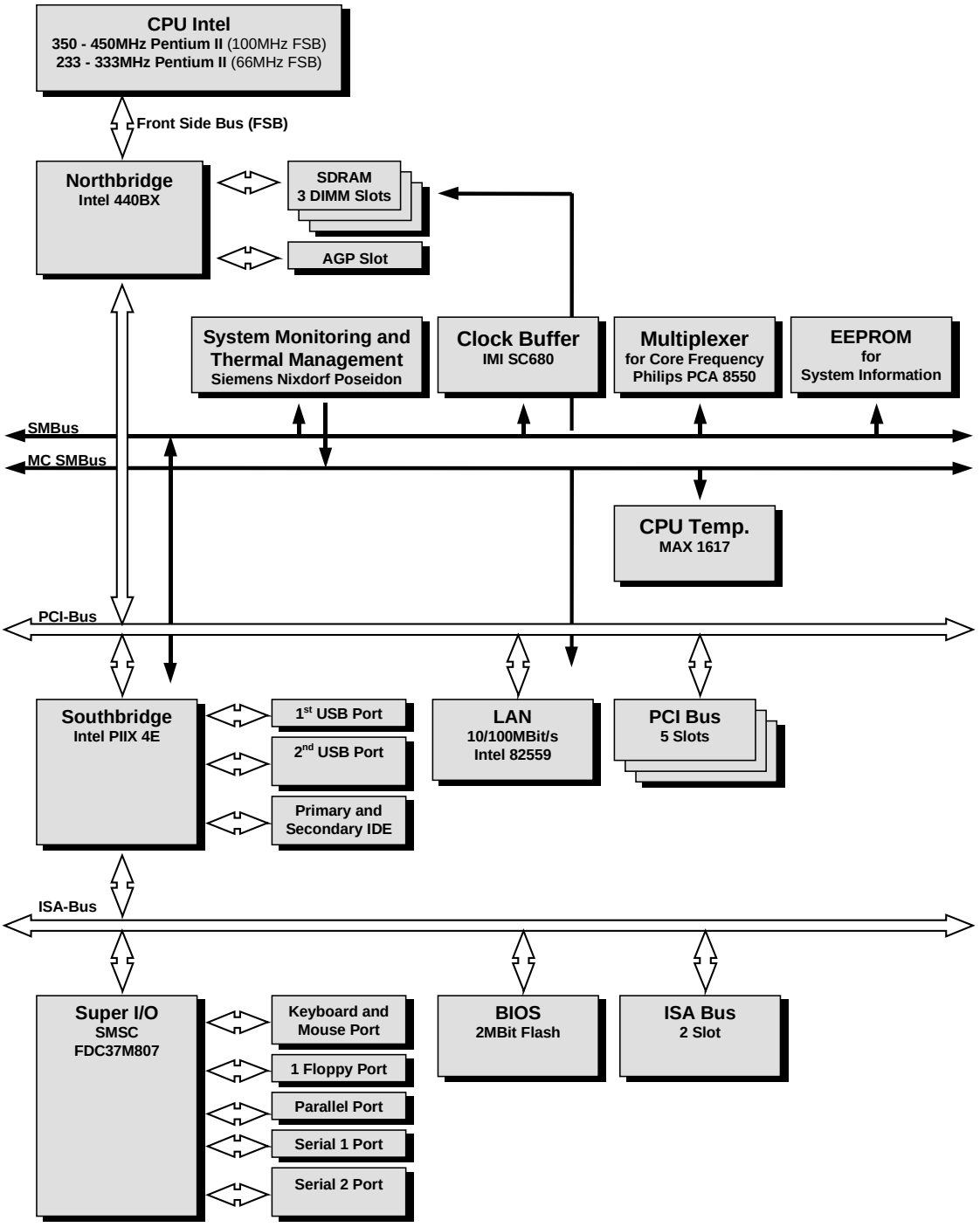
The compact desktop PC works exactly as a traditional PC.

The processors run internally between 233 and 500 MHz, the system clock is 66,6 MHz or 100 MHz and is multiplied by the processors internally by 3,5, 4,0, 4,5, 5,0 or 5,5 (only with 66,6 MHz clock).

The highest possible frequencies and the corresponding processors are:

System clock	Processor	factor
66,6 MHz	233 MHz	3,5
66,6 MHz	266 MHz	4,0
66,6 MHz	300 MHz	4,5
66,6 MHz	333 MHz	5,0
66,6 MHz	366 MHz	5,5
100 MHz	350 MHz	3,5
100 MHz	400 MHz	4,0
100 MHz	450 MHz	4,5
100 MHz	500 MHz	5,0

Figure 4.1 Block Diagram of the EUT



5 CONDUCTED EMISSION DATA

5.1 Test Procedure

The initial step in collecting conducted emission data is a Rohde & Schwarz Test Receiver (ESHS10). During first scan all data in peak mode is measured, then all significant peaks are explored either in quasi-peak mode or in average mode. In case of low noise (no peak value reaches the quasi peak limit), only average checks are done.

5.2 Measured Data

The conducted emission was measured the following way:

1. Peak noise on L
2. Peak noise on N

During the emission measurement the printers are supplied with power via a second LISN, the monitor was either powered via the system unit or separately.

The worst case results of the corresponding configuration (video resolution, supply modus: monitor via system unit or external) is given next:

ASTEC PSU
a) video resolution 1024 x 768/100 Hz, monitor power via system unit
b) video resolution 1600 x 1200/70 Hz, monitor power via system unit

Judgement: Passed by

	Frequency [MHz]	Measured [dB(µV)]	Kind of value	Limit [dB(µV)]	Configuration
neutral	0,162	48,40	QP	65,3	a

Judgement: Passed by

	Frequency [MHz]	Measured [dB(µV)]	Kind of value	Limit [dB(µV)]	Configuration
neutral	0,240	45,80	QP	62,0	a
phase	0,162	42,00	AV	55,3	a
phase	0,240	40,00	AV	52,0	a
phase	0,354	37,50	AV	48,8	a
neutral	0,486	30,40	AV	46,2	a
neutral	0,648	30,00	AV	46,0	a
neutral	0,168	47,90	QP	65,0	b
phase	0,354	40,90	QP	58,8	b
neutral	0,510	35,80	QP	56,0	b
neutral	0,594	38,30	QP	56,0	b
phase	0,168	40,70	AV	55,0	b
neutral	0,240	36,70	AV	52,0	b
phase	0,354	37,60	AV	48,8	b
phase	0,510	30,30	AV	46,0	b
phase	0,594	31,00	AV	46,0	b

AV: average
QP: quasi peak

Minebea PSU
a) video resolution 1024 x 768/100 Hz, monitor power via system unit
b) video resolution 1600 x 1200/70 Hz, monitor power via system unit

Judgement: Passed by

	Frequency [MHz]	Measured [dB(µV)]	Kind of value	Limit [dB(µV)]	Configuration
neutral	0,162	47,70	QP	65,3	a
neutral	0,222	44,10	QP	62,7	a
phase	0,240	43,20	QP	62,0	a
neutral	0,486	36,90	QP	56,2	a
phase	0,570	40,00	QP	56,0	a
phase	0,648	36,00	QP	56,0	a
phase	4,362	36,00	QP	56,0	a
neutral	4,452	36,80	QP	56,0	a
phase	4,548	39,20	QP	56,0	a
phase	4,926	39,20	QP	56,0	a
phase	0,570	34,90	AV	46,0	a
phase	4,362	34,90	AV	46,0	a
phase	4,452	35,60	AV	46,0	a
neutral	4,548	37,90	AV	46,0	a
neutral	4,644	39,90	AV	46,0	a
phase	4,740	3940	AV	46,0	a
phase	4,836	38,30	AV	46,0	a

	Frequency [MHz]	Measured [dB(µV)]	Kind of value	Limit [dB(µV)]	Configuration
neutral	4,926	37,40	AV	46,0	a
phase	5,022	38,70	AV	50,0	a
neutral	5,118	38,90	AV	50,0	a
neutral	0,222	43,60	QP	62,7	b
phase	0,378	38,30	QP	58,3	b
phase	0,570	38,90	QP	56,0	b
neutral	4,452	34,50	QP	56,0	b
neutral	4,548	37,90	QP	56,0	b
phase	4,644	39,50	QP	56,0	b
phase	4,740	40,00	QP	56,0	b
neutral	4,836	39,80	QP	56,0	b
phase	4,926	36,70	QP	56,0	b
phase	5,118	39,70	QP	60,0	b
neutral	4,458	36,40	AV	46,0	b
phase	4,548	36,40	AV	46,0	b
neutral	4,644	38,40	AV	46,0	b
phase	4,740	39,20	AV	46,0	b
neutral	4,836	39,00	AV	46,0	b
neutral	4,932	38,40	AV	46,0	b
neutral	5,022	36,90	AV	50,0	b

	Frequency [MHz]	Measured [dB(µV)]	Kind of value	Limit [dB(µV)]	Configuration
neutral	5,118	38,40	AV	50,0	b
phase	5,310	38,60	AV	50,0	b
phase	5,406	37,10	AV	50,0	b

AV: average
QP: quasi peak

Test Personnel:

Tester Signature: _____ Date: _____

Printed Name: H. Zenkner

Measurement Protocols: see attached file

ASTEC PSU:
100 MHz clock/Intel Pentium II 500 MHz
video resolution 1024 x 768/100 Hz

100 MHz clock/Intel Pentium II 500 MHz
video resolution 1600 x 1200/70 Hz

Minebea PSU:
100 MHz clock/Intel Pentium II 500 MHz
video resolution 1024 x 768/100 Hz

100 MHz clock/Intel Pentium II 500 MHz
video resolution 1600 x 1200/70 Hz

5.3 Referenced Rules Sections

N/A

5.4 Test Instrumentation Used, Conducted Measurement

Type	Manufacturer/ Model No.	Serial No.	Last Cal.	Cal. Interval
Receiver	ESHS10 Rohde&Schwarz	842884/011	May 98	12 months
LISN	NSLK 8126 Schwarzbeck	8126160	May 98	12 months
LISN	ESHS-Z5 Rohde&Schwarz	871884/004	May 98	12 months
Pulse limiter	ESH3-Z2 Rohde&Schwarz	357.8810.52	May 98	12 months

6 RADIATED EMISSION DATA

6.1 Test Procedure

The radiated emission was measured in two parts:

1. in the frequency range from 30 MHz to 1000 MHz. The bandwidth of the EMI-receiver was set to 120 kHz and the detector was set to peak. During prescan all data in peak mode are accumulated automatically. At final measurement the detector was set to CISPR quasi peak and values above the acceptance line were verified automatically.

2. in the frequency range from 1000 MHz to 5000 MHz. The bandwidth of the EMI-receiver was set to 1 MHz and the detector was set to peak. During prescan all data in peak mode are accumulated automatically. At final measurement the detector was set to average and values above the acceptance line were verified automatically.

Both tests were performed in a semi anechoic chamber, measurements below 1000 MHz in a distance of 10 meters between antenna and EUT, above 1 GHz with a distance of 3 meters between antenna and EUT. During tests the EUT was turned 360° and the actual used receiving antenna was moved from 1 to 4 meters and the antenna polarisation was changed from horizontal to vertical for finding the maximum levels of emission.

For each range one antenna for the whole span was used

1. 30 MHz to 1000 MHz: log.-per antenna
2. 1000 MHz to 5000 MHz: rigid tensor antenna

After automatic tests during manual verification the cables and the equipment were placed and moved within the range of position in order to find the maximum of emission.

6.2 Measured Data

The EUT was measured with the Processor Pentium II 500 MHz in video modes 1024 x 768 and 1600 x 1200. The test results below reflect the worst case with:

ASTEC PSU:
a) 100 MHz clock/Intel Pentium II 500 MHz,
video resolution 1024 x 768/100 Hz

Part 1: frequency range 30 MHz - 1000 MHz:

Judgement: Passed by

Frequency [MHz]	Level* [dB(µV/m)]	10 Meter Limit [dB(µV/m)]	Exceeding [dB]	Ant Pol	Height in [m]	Angle in deg
66.72000	21.20	30.000	-8.7	ver	4.0000	300.000
89.13000	25.80	30.000	-4.1	ver	2.0000	300.000
96.90000	24.50	30.000	-5.4	ver	2.0000	119.000
108.99000	21.40	30.000	-8.5	ver	2.0000	119.000
432.09000	30.80	37.000	-6.1	hor	3.0000	239.000
950.73000	32.20	37.000	-4.7	ver	2.0000	180.000

all levels are quasi-peak levels

Part 2: frequency range 1 GHz - 5 GHz:

Judgement: Passed by

Frequency [MHz]	Level* [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]	Exceed Mark	Height [cm]	Azimuth [deg]	Ant Pol
1290.40000	30.30	53.9	23.5		100.0	29.00	ver
1588.00000	29.90	53.9	23.9		100.0	29.00	ver

Frequency [MHz]	Level* [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]	Exceed Mark	Height [cm]	Azimuth [deg]	Ant Pol
2503.00000	29.10	53.9	24.7		100.0	0.00	ver
4005.10000	31.80	53.9	22.0		180.0	0.00	ver
4499.20000	30.80	53.9	23.0		140.0	29.00	hor
4966.90000	33.30	53.9	20.5		100.0	330.00	hor

all levels are average levels

*****The correction factor is considered automatically by the test receiver.
A table of correction factors is listed in paragraph 7.4.

b) 100 MHz clock/Intel Pentium II 500 MHz,
video resolution 1600 x 1200/70 Hz

Part 1: frequency range 30 MHz - 1000 MHz:

Judgement: Passed by

Frequency [MHz]	Level* [dB(µV/m)]	10 Meter Limit [dB(µV/m)]	Exceeding [dB]	Ant Pol	Height in [m]	Angle in deg
30.48000	17.10	30.000	-12.8	ver	1.0000	239.000
124.20000	21.10	30.000	-8.8	hor	4.0000	90.000
141.96000	24.80	30.000	-5.1	ver	2.2000	210.000
216.12000	15.30	30.000	-14.6	hor	4.0000	180.000
500.52000	28.60	37.000	-8.3	hor	1.6000	59.000
992.52000	32.50	37.000	-4.4	hor	1.0000	300.000

all levels are quasi-peak levels

*****The correction factor is considered automatically by the test receiver.
A table of correction factors is listed in paragraph 7.4.

Minebea PSU:
a) 100 MHz clock/Intel Pentium II 500 MHz,
video resolution 1024 x 768/100 Hz

Part 1: frequency range 30 MHz - 1000 MHz:

Judgement: Passed by

Frequency [MHz]	Level* [dB(µV/m)]	10 Meter Limit [dB(µV/m)]	Exceeding [dB]	Ant Pol	Height in [m]	Angle in deg
30.96000	27.10	30.000	-2.8	ver	1.0000	150.000
74.25000	21.60	30.000	-8.3	ver	2.2000	59.000
132.90000	24.30	30.000	-5.6	ver	1.0000	180.000
135.81000	21.70	30.000	-8.2	ver	1.0000	150.000
500.52000	30.00	37.000	-6.9	hor	2.2000	29.000
801.03000	33.10	37.000	-3.8	ver	2.2000	210.000

all levels are quasi-peak levels

Part 2: frequency range 1 GHz - 5 GHz:

Judgement: Passed by

Frequency [MHz]	Level* [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]	Exceed Mark	Height [cm]	Azimuth [deg]	Ant Pol
1401.70000	30.50	53.9	23.3		100.0	300.00	ver
1491.10000	34.40	53.9	19.4		180.0	330.00	ver
1588.00000	30.00	53.9	23.8		100.0	300.00	ver
1614.40000	30.70	53.9	23.1		100.0	300.00	ver
4128.40000	31.00	53.9	22.8		300.0	59.00	ver
4967.20000	33.30	53.9	20.5		180.0	90.00	ver

all levels are average levels

*****The correction factor is considered automatically by the test receiver.
A table of correction factors is listed in paragraph 7.4.

b) 100 MHz clock/Intel Pentium II 500 MHz,
video resolution 1600 x 1200/70 Hz

Part 1: frequency range 30 MHz - 1000 MHz:

Judgement: Passed by

Frequency [MHz]	Level* [dB(µV/m)]	10 Meter Limit [dB(µV/m)]	Exceeding [dB]	Ant Pol	Height in [m]	Angle in deg
100.08000	20.60	30.000	-9.3	ver	1.0000	90.000
132.03000	19.70	30.000	-10.3	ver	2.2000	180.000
179.97000	22.80	30.000	-7.2	ver	1.6000	150.000
228.15000	19.50	30.000	-11.5	ver	1.6000	239.000
300.30000	31.10	37.000	-5.8	ver	1.0000	150.000
992.61000	30.40	37.000	-6.5	hor	2.8000	330.000

all levels are quasi-peak levels

*****The correction factor is considered automatically by the test receiver.
A table of correction factors is listed in paragraph 7.4.

Test Personnel:

Tester Signature: _____ Date: _____

Printed Name: A. Siebenhütter

Test Personnel:

Tester Signature: _____ Date: _____

Printed Name: R. Schaufler

Measurement Protocols: see attached files

ASTEC PSU:
Frequency range 30 MHz - 1 GHz:
100 MHz clock/Intel Pentium II 500 MHz
video resolution 1024 x 768/100 Hz

100 MHz clock/Intel Pentium II 500 MHz
video resolution 1600 x 1200/70 Hz

Frequency range 1 GHz - 5 GHz:
100 MHz clock/Intel Pentium II 500 MHz
video resolution 1024 x 768/100 Hz

Minebea PSU:
Frequency range 30 MHz - 1 GHz:
100 MHz clock/Intel Pentium II 500 MHz
video resolution 1024 x 768/100 Hz

100 MHz clock/Intel Pentium II 500 MHz
video resolution 1600 x 1200/70 Hz

Frequency range 1 GHz - 5 GHz:
100 MHz clock/Intel Pentium II 500 MHz
video resolution 1024 x 768/100 Hz

6.3 Referenced Rules Sections

N/A

6.4 Test Instrumentation Used, Radiated Measurement

Type	Manufacturer/ Model No.	Serial No.	Last Cal.	Cal. Interval
Receiver	ESMI Rohde&Schwarz	840607/006	May 98	15 months
Antenna	CBL 6112 Chase	0003	May 98	12 months
Active Ridged antenna	Tensor 4105 Rohde&Schwarz	2063	May 98	12 months

6.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor automatically to the measured value. The display of the Receiver shows the corrected value. The complete table of correction factors is given on next page. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF

where FS = Field Strength

AF = Antenna Factor (incl. Preamplifier factor)

CF = Cable Attenuation Factor

Assume a receiver reading of 28,5 dBµV is obtained. The Antenna Factor of 10,5 and a Cable Factor of 1,3 is added, giving a field strength of 40,3 dBµV/m.

FS = 28,5 + 10,5 + 1.3 = 40,3 dBµV/m

The 40,3 dBµV/m value can be mathematically converted to its corresponding level in µV/m.

Level in µV/m =
Common Antilogarithm [(40,3 dBµV/m)/20] =

103,5 µV/m

6.6 Table of Correction Factors

Frequency range: 30 MHz to 1000 MHz

Frequency [MHz]	Correction Bilog Antenna [dB]	Correction Cable [dB]	Correction Antenna + Cable [dB]
30,0	17,90	0,65	18,55
35,0	15,20	0,67	15,87
40,0	12,80	0,68	13,48
45,0	10,00	0,73	10,73
50,0	8,20	0,74	8,94
55,0	6,90	0,82	7,72
60,0	6,50	0,84	7,34
70,0	6,40	0,90	7,30
80,0	7,20	0,95	8,15
90,0	9,30	0,99	10,29
100,0	11,10	1,10	12,20
120,0	12,10	1,14	13,24
140,0	11,30	1,27	12,57
160,0	10,60	1,35	11,95
180,0	9,60	1,45	11,05
200,0	9,50	1,51	11,01
250,0	12,40	1,71	14,11
300,0	13,80	1,84	15,64
350,0	15,00	2,00	17,00
400,0	16,40	2,18	18,58
450,0	16,90	2,35	19,25
500,0	17,40	2,43	19,83

Frequency [MHz]	Correction Bilog Antenna [dB]	Correction Cable [dB]	Correction Antenna + Cable [dB]
550,0	19,00	2,62	21,62
600,0	18,70	2,73	21,43
650,0	19,70	2,88	22,58
700,0	19,00	2,91	21,91
750,0	20,00	3,01	23,01
800,0	19,90	3,21	23,11
850,0	22,90	3,32	26,22
900,0	20,70	3,40	24,10
950,0	21,00	3,49	24,49
1000,0	25,00	3,69	28,69

Frequency range: 1 GHz to 5 GHz

Frequency [GHz]	Correction Tensor Antenna with Pre-amplifier [dB]	Correction Cable [dB]	Correction Antenna + Cable [dB]
1,0	5,70	1,62	7,32
1,1	4,80	1,68	6,48
1,2	5,10	1,75	6,85
1,3	5,00	1,80	6,80
1,4	5,10	1,96	7,06
1,5	5,90	2,00	7,90
1,6	5,60	2,15	7,75
1,7	6,70	2,30	9,00
1,8	6,60	2,32	8,92
1,9	5,90	2,35	8,25
2,0	7,20	2,44	9,64
2,1	7,30	2,62	9,92
2,2	7,40	2,75	10,15
2,3	8,40	2,70	11,10
2,4	8,00	2,69	10,69
2,5	9,30	2,65	11,95
2,6	8,70	2,75	11,45
2,7	8,70	2,92	11,62
2,8	9,00	2,98	11,98
2,9	8,60	3,10	11,70
3,0	9,50	3,12	12,62
3,1	9,20	2,37	11,57
3,2	8,60	2,40	11,00

Frequency [GHz]	Correction Tensor Antenna with Pre-amplifier [dB]	Correction Cable [dB]	Correction Antenna + Cable [dB]
3,3	8,70	2,42	11,12
3,4	9,70	2,43	12,13
3,5	9,70	2,46	12,16
3,6	10,40	2,43	12,83
3,7	10,80	2,45	13,25
3,8	11,50	2,47	13,97
3,9	11,90	2,49	14,39
4,0	10,90	2,46	13,36
4,1	10,10	2,48	12,58
4,2	8,80	2,49	11,29
4,3	8,70	2,51	11,21
4,4	8,50	2,53	11,03
4,5	8,70	2,54	11,24
4,6	9,50	2,57	12,07
4,7	10,10	2,57	12,67
4,8	11,10	2,59	13,69
4,9	11,50	2,60	14,10
5,0	11,60	2,62	14,22

7 Conducted And Radiated Emission Measurement Photos: see attached files

7.1 Test setup, conducted emission, front side view

7.2 Test setup, conducted emission, rear side view

7.3 Test setup, radiated emission, front side view

7.4 Test setup, radiated emission, rear side view

8 External Photos of EUT: see attached files

8.1 Front side of EUT

8.2 Rear side of EUT

8.3 Opened case, inside view of EUT

9 Internal Photos of EUT: see attached files

9.1 Hard disk drive, top side view
9.2 Floppy disk drive, top side view
9.3 CD-ROM drive, top side view
9.4 System board, front side view, part one
9.5 System board, front side view, part two
9.6 System board, rear side view, part one
9.7 System board, rear side view, part two
9.8 Graphic controller board, front side view
9.9 Graphic controller board, rear side view
9.10 SDRAM module, front and rear side view
9.11 Slot, top side view
9.12 Power supply ASTEC, closed case, top side view
9.13 Power supply ASTEC, opened case, inside view
9.14 Power supply ASTEC, regulator board, rear side view
9.15 Power supply ASTEC, rear side view
9.16 Power supply Minebea, closed case, top side view
9.17 Power supply Minebea, opened case, inside view
9.18 Power supply Minebea, regulator board, rear side view
9.19 Power supply Minebea, rear side view

10 User Manual: see attached files

For FCC statement please refer to user manual page 5.