

MEASUREMENT / TECHNICAL REPORT

SIEMENS NIXDORF AG

Model: Personal Computer Scenic Pro M7

FCC ID: HSSSCENICM701

July 31, 1998

This report concerns: ☒ Original grant (supplement) ☐ 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

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Siemens Nixdorf Informationssysteme AG
Personal Computer Scenic Pro M7

FCC Identifier:
HSSSCENICM701

Date: Jul. 31, 1998

Page:
1/57

Table of Contents

1 GENERAL INFORMATION	4
1.1 Product Description	4 - 5
1.2 Related Submittal(s)/Grant(s)	6
1.3 Tested System Details	6 - 8
1.4 Test Methodology	9
1.5 Test Facility	9
1.6 Referenced Rules Sections	9
2 PRODUCT LABELING	10
Figure 2.1 FCC ID Label	10
Figure 2.2 Location of Label on EUT	11
3 SYSTEM TEST CONFIGURATION	12
3.1 Justification	12 - 13
3.2 Video Mode Justification	14
3.3 EUT Exercise Software	15
3.4 Special Accessories	15
3.5 Equipment Modifications	16
3.6 Configuration of Tested System	16
Figure 3.1 Configuration of Tested System	17
4 BLOCK DIAGRAM OF EQUIPMENT UNDER TEST	18
5 CONDUCTED AND RADIATED MEASUREMENT PHOTOS	19
5.1 Test setup, conducted emission, front side view	19
5.2 Test setup, conducted emission, rear side view	20
5.3 Test setup, radiated emission, front side view	21
5.4 Test setup, radiated emission, rear side view	22
6 CONDUCTED EMISSION DATA	23
6.1 Test Procedure	23
6.2 Measured data	23 - 31
6.3 Referenced Rules	32
6.4 Test Instrumentation Used, Conducted Measurement	32

7 RADIATED EMISSION DATA	33
7.1 Test Procedure	33
7.2 Measured Data	34 - 49
7.3 Reference Rules Sections	50
7.4 Test Instrumentation Used, Radiated Measurement	50
7.5 Field Strength Calculation	51
7.6 Table of Correction Factors	52 - 54
8 PHOTOS OF TESTED EUT	55
8.1 Video cable with removed ferrites	55
8.2 For further figures	56

Attachment A: User Manual	57
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1 GENERAL INFORMATION

This is a supplement test according to your request, dated July 20, 1998. In this report we show, that the device complies without ferrites on the video cable when operating in the high video resolutions 1280 x 1024/100 Hz and 1600 x 1200/85 Hz.

1.1 Product Description

The Siemens Nixdorf Computer Scenic Pro M7 is a compact mini tower personal computer.

The system board integrates the Pentium Processor, memory, and I/O-technologies. The main system unit is assembled with Processors Intel Pentium II from 300 MHz up to 400 MHz.

Description of the power supply:

- Power supply: ASTEC, model S26113-E413-V30

Features Overview:

- System board in ATX format
- Intel processor Pentium II, 100 MHz clock frequency, slot 1
- second level cache, synchronous up to 512 Kbytes
- main memory 16 to 384 MBytes (SDRAM)
- 2D/3D AGP Graphic Controller on board
- up to 4 MBit Flash-BIOS

- CMOS RAM 256 Byte
- Expansion slots (on board):
 - 5 x PCI
 - 2 x AT
 - 1 x AGP

The personal computer is assembled by Siemens Nixdorf Informationssysteme AG, Buergermeister-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 Nixdorf Scenic Pro M7 S26361-K510-V1**	HSSSCENICM701	PC EUT	unshielded power cord [292]
2	Siemens Nixdorf MCM 2108 NTD S26361-K479-V150	M9U9703C97BMD	Monitor	unshielded power cord [175] shielded video cable [168]
3	Siemens Nixdorf S26381-K210	HSS01TASTK210	Keyboard	shielded keyboard cable [143]
4	Microsoft MS 2.1A	C3KKMP3	Mouse	shielded mouse cable [183]
5	Hewlett Packard HP 2225C+ (3019S70991)	DSI6XU2225	Printer, parallel I/F	unshielded AC ca- ble [180], shielded centronics cable [190]

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Personal Computer Scenic Pro M7

FCC Identifier:
HSSSCENICM701

Date: Jul. 31, 1998

Page:
6/57

Pos	Model Number (Serial Number)	FCC ID	Description	Cable Description (length in [cm])
6	Hewlett Packard HP 2225D+ (3012S70819)	DSI6XU2225	Printer, serial I/F	unshielded power cord [185], shielded serial cable [190]
7	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]
9	Siemens	N/A	USB cable	shielded cable, terminated [192]
Pos 1 contains:				
a	ASTECH (UK), AA20050 SNI S26113-E413-V30	N/A	Power supply	
b	SNI S26361-D1064-A11	N/A	System board	
c	SNI S26361-D960-V1 GS 4	N/A	Chip card reader	
d	SECKMM966G512 BQN-G8	N/A	Video RAM	

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Personal Computer Scenic Pro M7

FCC Identifier:
HSSCENICM701

Date: Jul. 31, 1998

Page:
7/57

Pos	Model Number (Serial Number)	FCC ID	Description	Cable Description (length in [cm])
e	SECKMM366S203 CT-GL (2x) SECKMM366S823 BT-GL (1x)	N/A	SDRAM	
f	Intel Pentium II 80523/PY400512 Q434ES	N/A	Processor module	
g	NEC CDR-1900A	A3DCDR-1900A	CD-ROM drive	
h	Quantum Fireball 2340 AT	N/A	Hard disk drive	
i	Mitsumi D359T5	N/A	Floppy disk drive	

Remark:

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Personal Computer Scenic Pro M7

FCC Identifier:
HSSSCENICM701

Date: Jul. 31, 1998

Page:
8/57

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. The 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 Nixdorf Informationssysteme 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: HSSSCENICM701

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 first report, dated April 29, 1998

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Personal Computer Scenic Pro M7

FCC Identifier:
HSSSCENICM701

Date: Jul. 31, 1998

Page:
11/57

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 clock frequency is 100 MHz, the system was tested with the highest possible processor:

100 MHz clock: Intel Pentium II 400 MHz

The system is provided with one kind of power supply:

– ASTEC AA20050 SNI: S26113-E413-V30

With relation to the worst case combinations (video resolution, second serial port or chip card reader) in the first report, dated April 29, 1998, the following (worst case) results are applicable:

Radiated emission:

Frequency range 30 MHz - 1 GHz:

100 MHz clock/Pentium II 400 MHz, video resolution 1280 x 1024/100 Hz,
two serial printers

100 MHz clock/Pentium II 400 MHz, video resolution 1600 x 1200/
85 Hz, two serial printers

Frequency range 1 GHz - 3 GHz:

100 MHz clock/Pentium II 400 MHz, video resolution 1280 x 1024/100 Hz,
two serial printers

100 MHz clock/Pentium II 400 MHz, video resolution 1600 x 1200/85 Hz,
two serial printers

Conducted emission:

100 MHz clock/Pentium II 400 MHz, video resolution 1280 x 1024/100 Hz,
monitor power via system unit, two printers

100 MHz clock/Pentium II 400 MHz, video resolution 1600 x 1200/85 Hz
monitor power via system unit, two printers

3.2 Video mode Justification

With reference to the worst case results of the measurements for the first report, dated April 29, 1998 the system was tested in the high resolution graphic modes 1280 x 1024/100 Hz and 1600 x 1200/85 Hz. To carry out the test in this high resolution it is necessary to test with a monitor which is capable to drive this video resolution. To meet your requirement we removed the two ferrites from the video cable (see figure, page 55) which are usually fixed.

The following datas are applicable:

radiated emission:

Frequency range 30 MHz - 1 GHz:

100 MHz clock/Pentium II 400 MHz, video resolution 1280 x 1024/100 Hz,
two serial printers

100 MHz clock/Pentium II 400 MHz, video resolution 1600 x 1200/85 Hz,
two serial printers

Frequency range 1 GHz - 3 GHz:

100 MHz clock/Pentium II 400 MHz, video resolution 1280 x 1024/100 Hz,
two serial printers

100 MHz clock/Pentium II 400 MHz, video resolution 1600 x 1200/85 Hz,
two serial printers

conducted emission:

100 MHz clock/Pentium II 400 MHz, video resolution 1280 x 1024/100 Hz,
monitor power via system unit, two printers

100 MHz clock/Pentium II 400 MHz, video resolution 1600 x 1200/85 Hz
monitor power via system unit, two printers

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

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

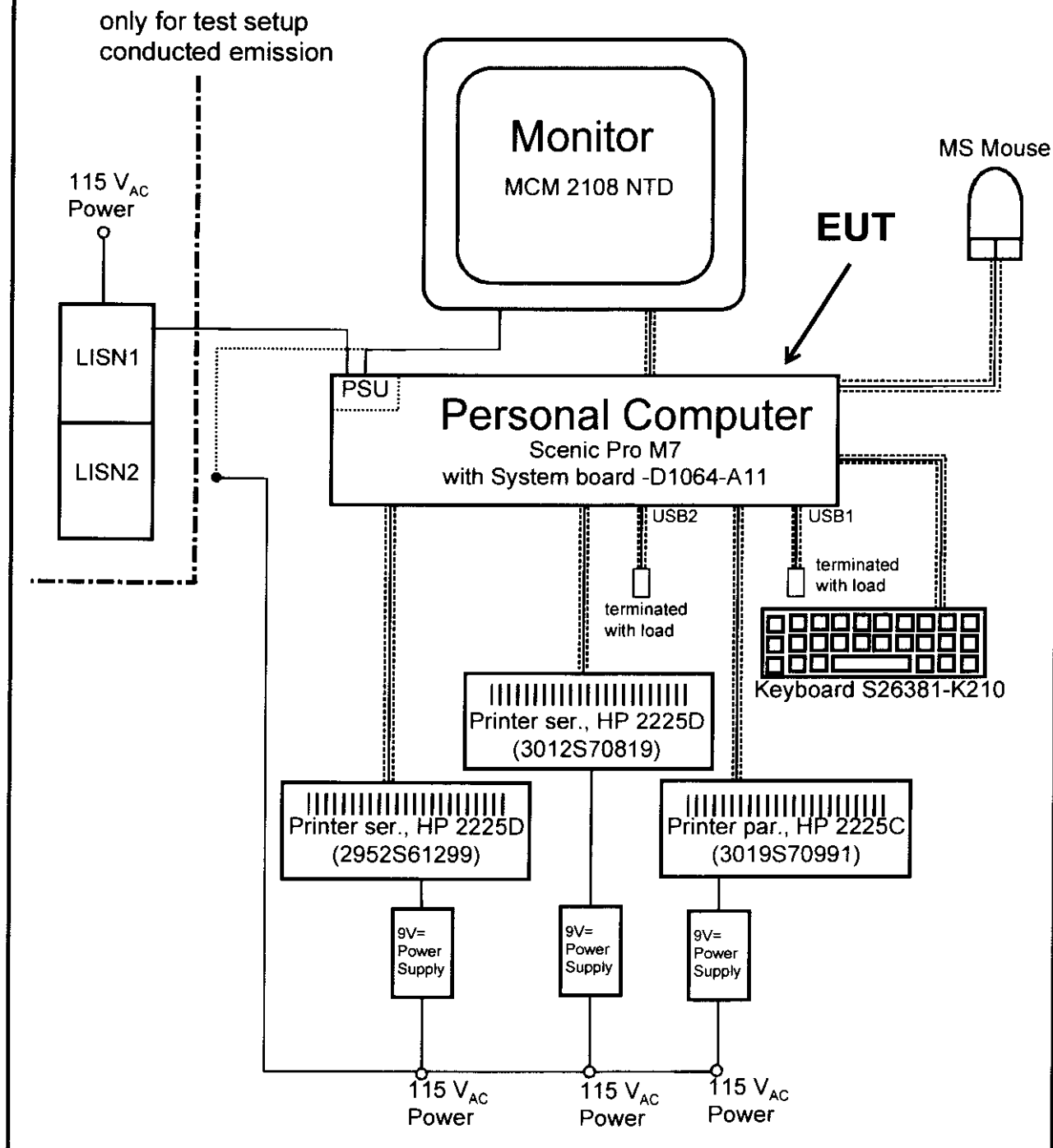
Applicant Signature _____ Date _____

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 first report, dated April 29, 1998

6 CONDUCTED EMISSION DATA

6.1 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.

6.2 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 result of the corresponding configuration (video resolution, supply modus) is given next:

Kind of configuration:

- a) 100 MHz clock Pentium II 400 MHz, video resolution 1280 x 1024/
100 Hz monitor via system unit, two serial printers
- b) 100 MHz clock Pentium II 400 MHz, video resolution 1280 x 1024/85
Hz monitor via system unit, two serial printers

Judgement: Passed by

Line	Frequency [MHz]	Measured [dB(μV)]	Kind of value	Limit [dB(μV)]	Configuration
neutral	0,468	29,10	AV	47	a
phase	0,804	19,10	AV	46	a
neutral	2,082	27,50	AV	46	a
neutral	0,534	27,40	AV	46	a
neutral	0,468	28,60	AV	47	b
neutral	0,534	26,80	AV	46	b
neutral	1,812	27,00	AV	46	b
neutral	2,412	26,70	AV	46	b
neutral	3,690	25,90	AV	46	b

AV: average

QP: quasi peak

Test Personnel:

Tester Signature:

H. Zenkner

Date:

July 31, 1998

Printed Name:

H. Zenkner

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Personal Computer Scenic Pro M7

FCC Identifier:
HSSSCENICM701

Date: Jul. 31, 1998

Page:
24/57

Measurement Protocols

Page No

100 MHz clock/Pentium II 400 MHz
video resolution 1280 x 1024/100 Hz
monitor power via system unit, two serial printers

26 - 28

100 MHz clock/Pentium II 400 MHz
video resolution 1600 x 1200/85 Hz
monitor power via system unit, two serial printers

29 - 31

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Personal Computer Scenic Pro M7

FCC Identifier:
HSSSCENICM701

Date: Jul. 31, 1998

Page:
25/57

EUT: Scenic Pro M7/PII/400, D1064-A11
 Manufacturer: SNI
 Operating Condition: Scr."H" 1280x1024/100 Hz, HD/CD test
 Test Site: EMC CENTER Augsburg ; SKI
 Operator: H. Zenkner
 Comment : fully conf., monitor MCM2108, supplied via system
 Comment: video cable without ferrites
 Start of Test: 28.07.1998 / 13:08:40

SCAN TABLE: "VOLT_015-30av"

Unit: dbV
 Detector: Mode:
 Curve 1: MaxPeak
 Curve 2: Average
 Subrange 1:

Start Frequency: 150.0 KHz
 Step Size: 6.0 KHz
 Stop Frequency: 30.0 MHz
 Measure Time: 10.0 ms
 IF Bandwidth: 10 KHz

Receiver: ESH3
 Transducer: ESH3-Z5
 Signal Path: None
 Meas. Mode: lln
 Tracking Gen.: Off
 Input: Add. Transd. 2: None
 Add. Transd. 3: None

Preamplifier: --
 RF Att.: 0 dB
 Ref. Level: --
 Min. RF Att.: --
 IF Att.: --
 Autorange: On
 LowDistortion: --

Curve 1: On
 Repetition: 0
 Stop Mark: Off
 Stop Message: Off
 Stop Message: Off

MEASUREMENT RESULT: "Quasi Peak"

28.07.1998 13:38

Frequency	Level	Limit	Margin	Exceed	Line	FE
MHz	dbV	dbV	db			
0.468000	31.10	57	25.4		L1	GND
0.540000	30.10	56	25.9		L1	GND
0.600000	30.40	56	25.6		L1	GND

MEASUREMENT RESULT: "Quasi Peak"

(continued)

Frequency	Level	Limit	Margin	Exceed	Line	PE
MHz	dBµV	dBµV	dB	Mark		
0.804000	31.80	56	24.2		L1	GND
2.082000	31.50	56	24.5		N	GND
3.354000	30.60	56	25.4		N	GND
3.750000	29.70	56	26.3		N	GND
3.960000	30.30	56	25.7		N	GND
4.026000	31.20	56	24.8		N	GND
4.968000	29.80	56	26.2		N	GND

MEASUREMENT RESULT: "Average"

28.07.1998 13:38

Frequency	Level	Limit	Margin	Exceed	Line	PE
MHz	dBµV	dBµV	dB	Mark		
0.468000	29.10	47	17.4		N	GND
0.534000	27.40	46	18.6		N	GND
0.606000	24.00	46	22.0		N	GND
0.804000	29.10	46	16.9		L1	GND
2.082000	27.50	46	18.5		N	GND
3.354000	26.60	46	19.4		N	GND
3.756000	25.10	46	20.9		N	GND
3.960000	24.30	46	21.7		N	GND
4.026000	26.00	46	20.0		N	GND
4.962000	22.60	46	23.4		L1	GND

Level [dB μ V]

100

80

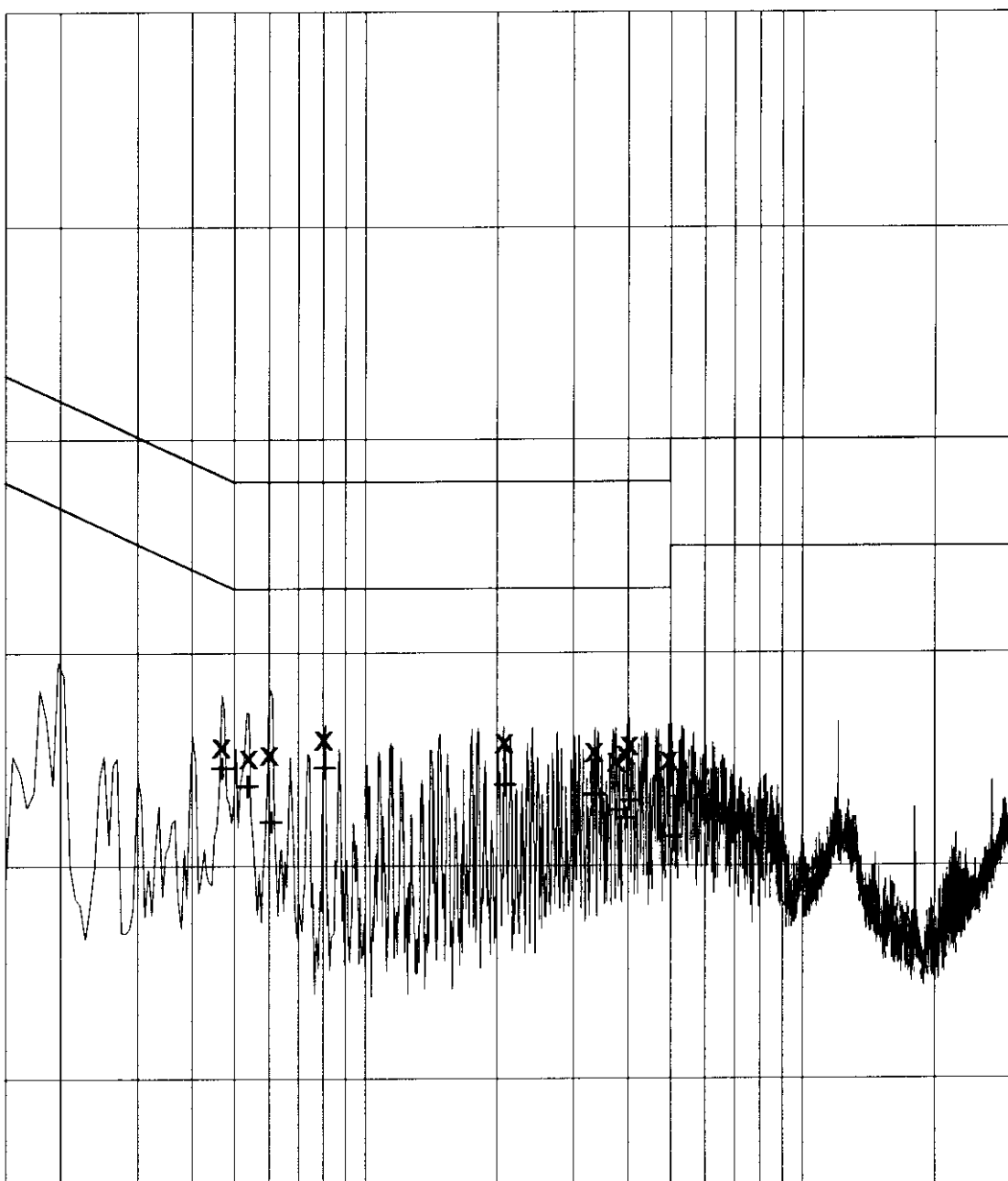
60

40

20

0

-10



150k 400k 1M 2M 4M 10M 30M
Frequency [Hz]

x x	MES	Quasi Peak
+	MES	Average
—	MES	Preview Peak
—	LIM	EN 55022/B V QP
—	LIM	EN 55022/B V AV

Conducted noise according to:

EN5022/B

EUT: Scenic Pro M7/PII/400, D1064-A11
Manufacturer: SNI
Operating Condition: Scr."H" 1600x1200/85Hz, HD/CD test
Test Site: EMC CENTER Augsburg ; SK1
Operator: H. Zenkner
Comment : fully conf., monitor MCM2108, supplied via system
Comment: video cable without ferrites
Start of Test: 28.07.1998 / 15:01:48

SCAN TABLE: "Volt_015-30av"

Unit: dBµV

Detector: Mode:

Curve 1: MaxPeak MaxHold
Curve 2: Average MaxHold

Subrange 1:

Start Frequency: 150.0 kHz Step Size: 6.0 kHz
Stop Frequency: 30.0 MHz
Measure Time: 10.0 ms
IF Bandwidth: 10 kHz

Receiver: ESH3 Transducer: ESH3-Z5
Signal Path: None System Transducer: None
Meas. Mode: Lin Add. Transd. 1: ESH3-Z2
Tracking Gen.: Off Add. Transd. 2: None
Input: -- Add. Transd. 3: None

Preamplifier: -- Demodulation: A3
RF Att.: 0 dB Volume: --
Ref. Level: -- Squelch: --
Min. RF Att.: -- Option: None
IF Att.: LowDistortion
Autorange: On

Curve 1: On Repetition: 0
Curve 2: On Stop Mark: Off
Stop Message: Off
Stop Message:

MEASUREMENT RESULT: "Quasi Peak"

28.07.1998 15:31

Frequency	Level	Limit	Margin	Exceed	Line	PE
MHz	dBµV	dBµV	dB	Mark		
0.468000	30.80	57	25.7		L1	GND
0.534000	31.40	56	24.6		N	GND
0.606000	32.20	56	23.8		N	GND

MEASUREMENT RESULT: "Quasi Peak"

(continued)

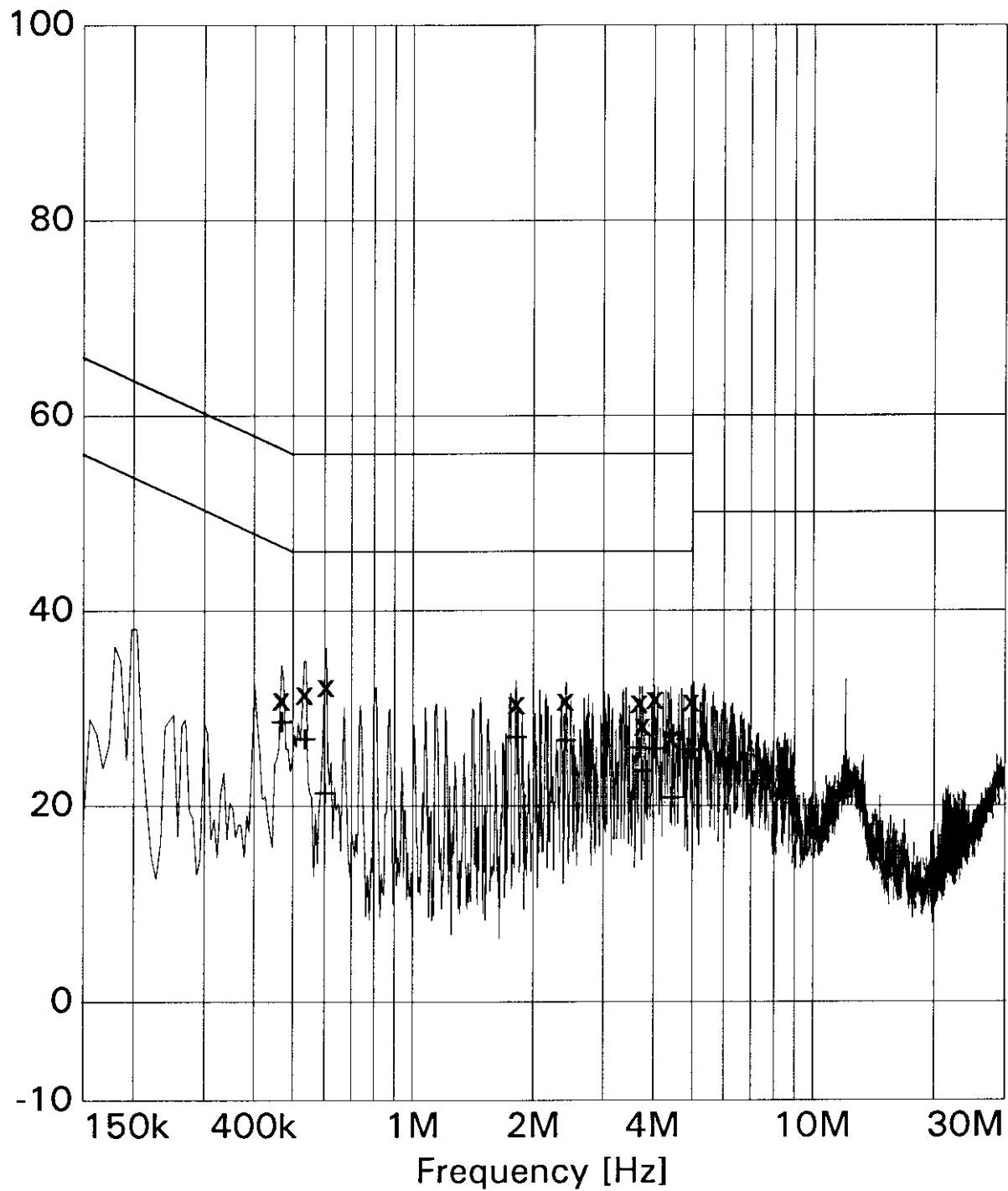
Frequency	Level	Limit	Margin	Exceed	Line	PE
MHz	dBµV	dBµV	dB	Mark		
1.812000	30.40	56	25.6		N	GND
2.412000	30.70	56	25.3		N	GND
3.690000	30.50	56	25.5		N	GND
3.756000	28.20	56	27.8		N	GND
4.026000	30.90	56	25.1		N	GND
4.422000	26.80	56	29.2		N	GND
4.962000	30.60	56	25.4		N	GND

MEASUREMENT RESULT: "Average"

28.07.1998 15:31

Frequency	Level	Limit	Margin	Exceed	Line	PE
MHz	dBµV	dBµV	dB	Mark		
0.468000	28.60	47	17.9		N	GND
0.534000	26.80	46	19.2		N	GND
0.600000	21.30	46	24.7		N	GND
1.812000	27.00	46	19.0		N	GND
2.412000	26.70	46	19.3		N	GND
3.690000	25.90	46	20.1		N	GND
3.756000	23.60	46	22.4		N	GND
4.026000	25.80	46	20.2		N	GND
4.428000	20.80	46	25.2		N	GND
4.962000	25.70	46	20.3		N	GND

Level [dB μ V]



x x	MES	Quasi Peak
+	MES	Average
—	MES	Preview Peak
—	LIM	EN 55022/B V QP
—	LIM	EN 55022/B V AV

6.3 Referenced Rules Sections

N/A

6.4 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	KWA20870662	May 98	12 months
LISN	ESHS-Z5 Rohde&Schwarz	831.5518.52	May 98	12 months
Pulse limiter	ESH3-Z2 Rohde&Schwarz	60813	May 98	12 months

7 RADIATED EMISSION DATA

7.1 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 pre-scan 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 3000 MHz. The bandwidth of the EMI-receiver was set to 1 MHz and the detector was set to peak. During pre-scan 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 3000 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.

For further data see enclosed test results.

7.2 Measured Data

The EUT was measured with the Processor Pentium II 400 MHz in video modes 1280 x 1024 and 1600 x 1200. The test results below reflect the worst case with:

- MHz clock/Pentium II 400 MHz, video resolution: 1280 x 1024/100 Hz, two serial printers
- 100 MHz clock/Pentium II 400 MHz, video resolution: 1600 x 1200/85 Hz, two serial printers

Video resolution: 1280 x 1024/100 Hz:

Part 1: frequency range 30 MHz - 1000 MHz:

Judgement: Passed by

Frequency [MHz]	Level* [dB(µV/m)]	Limit [dB(µV/m)]	Exceeding [dB]	Ant Pol	Height in [m]	Angle in deg
94.53000	26.63	30.000	-3.4	ver	1.0000	180.00
695.16000	33.11	37.000	-3.9	ver	4.0000	150.00
700.26000	34.26	37.000	-2.7	ver	2.2000	150.00
827.19000	33.15	37.000	-3.9	ver	3.4000	210.00
893.73000	32.72	37.000	-4.3	ver	1.6000	150.00

all levels are quasi-peak levels

Part 2: frequency range 1 GHz - 3 GHz:

Judgement: Passed by

Frequency [MHz]	Level* [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]	Exceed Mark	Height [cm]	Azimuth [deg]	Ant Pol
1000.000000	22.96	54.0	31.0		150.0	300.00	ver
1007.500000	21.00	54.0	33.0		150.0	300.00	hor

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Personal Computer Scenic Pro M7

FCC Identifier:
HSSSCENICM701

Date: Jul. 31, 1998

Page:
34/57

Frequency [MHz]	Level* [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Exceed Mark	Height [cm]	Azimuth [deg]	Ant Pol
1017.400000	20.84	54.0	33.2		150.0	300.00	hor
1033.900000	20.77	54.0	33.2		150.0	300.00	hor
1350.100000	20.82	54.0	33.2		150.0	270.00	hor

all levels are average levels

Video resolution: 1600 x 1200/85 Hz:

Part 1: frequency range 30 MHz - 1000 MHz:

Judgement: Passed by

Frequency [MHz]	Level* [dB(μV/m)]	Limit [dB(μV/m)]	Exceeding [dB]	Ant Pol	Height in [m]	Angle in deg
33.75000	25.40	30.000	-4.6	ver	1.0000	150.00
101.25000	26.34	30.000	-3.7	ver	2.2000	150.00
354.42000	31.52	37.000	-5.5	ver	1.0000	30.00
700.26000	30.50	37.000	-6.5	hor	1.0000	30.00
984.60000	31.43	37.000	-5.6	hor	3.4000	300.00

all levels are quasi-peak levels

Part 2: frequency range 1 GHz - 3 GHz:

Judgement: Passed by

Frequency [MHz]	Level* [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Exceed Mark	Height [cm]	Azimuth [deg]	Ant Pol
1350.100000	25.44	54.0	28.6		150.0	0.00	hor
1366.600000	23.82	54.0	30.2		150.0	0.00	hor
1390.300000	26.49	54.0	27.5		100.0	0.00	hor
1400.200000	26.13	54.0	27.9		100.0	0.00	hor
1798.900000	26.19	54.0	27.8		200.0	59.00	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.

Test Personnel:

Tester Signature: Michael Bosse Date: July 31, 1998

Printed Name: M. Bosse

Test Personnel:

Tester Signature: H. Zenkner Date: July 31, 1998

Printed Name: H. Zenkner

SIEMENS
NIXDORF

Siemens Nixdorf Informationssysteme AG
Personal Computer Scenic Pro M7

FCC Identifier:
UGCCGEMCM701

Date: Jul. 31, 1998

Page:
36/57

Measurement Protocols

	Page No
<u>Frequency range 30 MHz - 1 GHz:</u>	
100 MHz clock/Pentium II 400 MHz video resolution 1280 x 1024/100 Hz, two serial printers	38 - 40
100 MHz clock/Pentium II 400 MHz video resolution 1600 x 1200/85 Hz, two serial printers	41 - 43
<u>Frequency range 1 GHz - 3 GHz:</u>	
100 MHz clock/Pentium II 400 MHz video resolution 1280 x 1024/100 Hz, two serial printers	44 - 46
100 MHz clock/Pentium II 400 MHz video resolution 1600 x 1200/85 Hz, two serial printers	47 - 49

Radiation Test according to:

EN 55022/B

EUT: Scenic Pro M7 with D1064-A11 / 400MHz
Manufacturer: SNI
Operating Condition: scr. "H" 1280 x 1024/100Hz + HD/CD data transfer
Test Site: EMC Center Augsburg
Operator: H. Zenkner
Job No: PDP8E026
Comment : fully configured, with ASTEC PSU
Comment: video cable without ferrite cores (21" Monitor)

SCAN TABLE: "10m/30-1000"

Unit: dB μ V/m

Detector: Mode:

Curve 1: MaxPeak ClearWrite
Curve 2: QuasiPeak ClearWrite

Subrange 1:

Start Frequency: 30.0 MHz Step Size: 30.0 kHz
Stop Frequency: 1.0 GHz
Measure Time: 0.01 s
IF Bandwidth: 120 kHz

Receiver: ESMI Probe Transducer: CBL6111 cal. 4/95
Signal Path: 2DC-CP1X1 System Transducer: RFin2-CP1/X1
Scan Mode: Lin Add. Transd. 1: cable30-1000
Tracking Gen.: Off Add. Transd. 2: NONE
Input: 2DC Add. Transd. 3: NONE

Preamplifier: 10 dB Demodulation: AM
RF Att.: 0 dB Volume: 70.0 %
Ref. Level: -60 dBm Squelch: --
Min. RF Att.: 0 dB Option: None
IF Att.: --
Autorange: On

Curve 1: On Repetition: 1
Curve 2: On Stop Mark: Off
Stop Message: Off
Text: 1

MEASUREMENT RESULT: "Peak"

Frequency MHz	Level dB μ V/m	ANT POL	HEIGHT in [m]	ANGLE in deg
94.66666	28.33	VER	1.0000	180.00
192.74444	26.31	HOR	3.4000	150.00

696.06666	36.53	VER	4.0000	150.00
701.45555	36.04	VER	2.2000	150.00
827.55555	35.16	VER	3.4000	210.00
894.37777	33.81	VER	1.6000	150.00

MEASUREMENT RESULT: "Quasi Peak"

Frequency MHz	Level dB μ V/m	LIMIT dB μ V/m	EXCEEDING dB	ANT POL	HEIGHT in [m]	ANGLE in deg
94.53000	26.63	30.000	-3.367245	VER	1.0000	180.00
191.91000	16.57	30.000	-13.42586	HOR	3.4000	150.00
695.16000	33.11	37.000	-3.886647	VER	4.0000	150.00
700.26000	34.26	37.000	-2.740489	VER	2.2000	150.00
827.19000	33.15	37.000	-3.851834	VER	3.4000	210.00
893.73000	32.72	37.000	-4.277012	VER	1.6000	150.00

Level [dB μ V/m]

60

50

40

30

20

10

0

30M 40M 50M 70M 100M

200M

300M 400M 600M

1G

Frequency [Hz]

x x x MES
MES
— LIM
LIM (-20 dB)

Quasi Peak
Preview Peak
EN55022/B
EN55022/B

Radiation Test according to:

EN 55022/B

EUT: Scenic Pro M7 with D1064 / 400MHz
Manufacturer: SNI
Operating Condition: Scr."H" 1600 x 1280/85Hz + HD/CD data transfer
Test Site: EMC Center Augsburg
Operator: H. Zenkner
Job No: PDP8E026
Comment : fully configured , with ASTEC PSU
Comment: video cable without ferrite cores (21" Monitor)

SCAN TABLE: "10m/30-1000"

Unit: dB μ V/m

Detector: Mode:

Curve 1: MaxPeak ClearWrite
Curve 2: QuasiPeak ClearWrite

Subrange 1:

Start Frequency:	30.0 MHz	Step Size:	30.0 kHz
Stop Frequency:	1.0 GHz		
Measure Time:	0.01 s		
IF Bandwidth:	120 kHz		

Receiver:	ESMI	Probe Transducer:	CBL6111 cal. 4/95
Signal Path:	2DC-CP1X1	System Transducer:	RFin2-CP1/X1
Scan Mode:	Lin	Add. Transd. 1:	cable30-1000
Tracking Gen.:	Off	Add. Transd. 2:	NONE
Input:	2DC	Add. Transd. 3:	NONE

Preamplifier:	10 dB	Demodulation:	AM
RF Att.:	0 dB	Volume:	70.0 %
Ref. Level:	-60 dBm	Squelch:	--
Min. RF Att.:	0 dB	Option:	None
IF Att.:	--		
Autorange:	On		

Curve 1:	On	Repetition:	1
Curve 2:	On	Stop Mark:	Off
		Stop Message:	Off
		Text:	1

MEASUREMENT RESULT: "Peak"

Frequency MHz	Level dB μ V/m	ANT POL	HEIGHT in [m]	ANGLE in deg
34.31111	28.62	VER	1.0000	150.00
101.13333	29.22	VER	2.2000	150.00

118.37777	24.36	VER	1.0000	180.00
355.48888	31.30	VER	1.0000	30.000
700.37777	33.44	HOR	1.0000	30.000
984.91111	34.07	HOR	3.4000	300.00

MEASUREMENT RESULT: "Quasi Peak"

Frequency MHz	Level dBμV/m	LIMIT dBμV/m	EXCEEDING dB	ANT POL	HEIGHT in [m]	ANGLE in deg
33.75000	25.40	30.000	-4.602764	VER	1.0000	150.00
101.25000	26.34	30.000	-3.660043	VER	2.2000	150.00
118.11000	22.33	30.000	-7.667051	VER	1.0000	180.00
354.42000	31.52	37.000	-5.482697	VER	1.0000	30.000
700.26000	30.50	37.000	-6.500489	HOR	1.0000	30.000
984.60000	31.43	37.000	-5.574668	HOR	3.4000	300.00

Level [dB μ V/m]

60

50

40

30

20

10

0

30M 40M 50M 70M 100M 200M 300M 400M 600M 1G

Frequency [Hz]

x x x

MES

MES

LIM

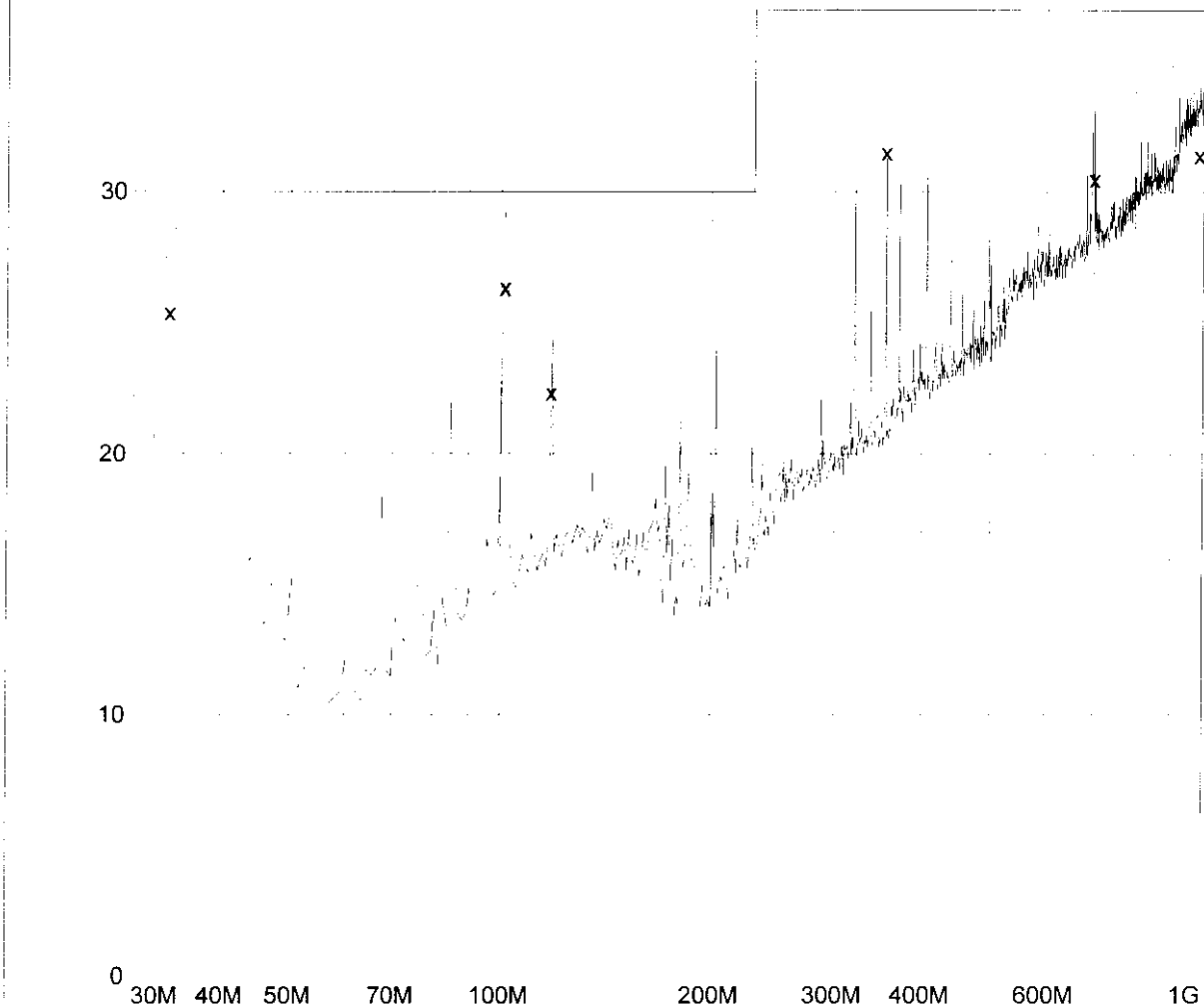
LIM (-20 dB)

Quasi Peak

Preview Peak

EN55022/B

EN55022/B



Fieldstrength according to :

FCC class B

EUT: Scenic Pro M7 with D1064 /PII/ 400MHz
Manufacturer: SNI
Operating Condition: scr. "H" , 1280 * 1024/ 100Hz and periph. test
Test Site: EMC Center Augsburg
Operator: H. Zenkner
Job No: PDO8E063
Comment : fully configured, MCM2108
Start of Test: 28.07.1998 / 08:38:07

SCAN TABLE: "3m/1-3GHz"

Unit: dBµV/m

Detector: Mode:

Curve 1: Average MaxHold

Subrange 1:

Start Frequency:	1.0 GHz	Step Size:	300.0 kHz
Stop Frequency:	3.0 GHz		
Measure Time:	10.0 ms		
IF Bandwidth:	1 MHz		

Receiver:	ESXI	Transducer:	Tensor 4105 h
Signal Path:	2DC-CP7X1	System Transducer:	RFin2-CP7/X1
Meas. Mode:	Lin	Add. Transd. 1:	Rosenberger 8m
Tracking Gen.:	Off	Add. Transd. 2:	None
Input:	2DC	Add. Transd. 3:	None

Preamplifier:	10 dB	Demodulation:	AM
RF Att.:	Coupled	Volume:	75 %
Ref. Level:	-40.0 dBm	Squelch:	--
Min. RF Att.:	0 dB	Option:	None
IF Att.:	--		
Autorange:	On		

Curve 1:	On	Repetition:	0
		Stop Mark:	Off
		Stop Message:	Off
		Stop Message:	

MEASUREMENT RESULT: "Final_Average"

28.07.1998 09:32

Frequency	Level	Limit	Margin	Exceed Mark	Height	Azimuth	Polarisation
MHz	dB μ V/m	dB μ V/m	dB		cm	deg	
1000.000000	22.96	54.0	31.0		150.0	300.00	HORIZONTAL
1007.500000	21.00	54.0	33.0		150.0	300.00	HORIZONTAL
1017.400000	20.84	54.0	33.2		150.0	300.00	HORIZONTAL
1033.900000	20.77	54.0	33.2		150.0	300.00	HORIZONTAL
1248.100000	20.32	54.0	33.7		150.0	300.00	HORIZONTAL
1258.300000	20.41	54.0	33.6		150.0	300.00	HORIZONTAL
1258.900000	20.59	54.0	33.4		150.0	300.00	HORIZONTAL
1266.100000	20.31	54.0	33.7		150.0	300.00	HORIZONTAL
1282.900000	20.14	54.0	33.9		150.0	300.00	HORIZONTAL
1284.100000	20.19	54.0	33.8		150.0	300.00	HORIZONTAL
1284.400000	20.21	54.0	33.8		150.0	300.00	HORIZONTAL
1299.400000	20.55	54.0	33.4		150.0	300.00	HORIZONTAL
1300.300000	20.74	54.0	33.3		150.0	300.00	HORIZONTAL
1303.900000	20.17	54.0	33.8		150.0	300.00	HORIZONTAL
1322.200000	20.24	54.0	33.8		150.0	300.00	HORIZONTAL
1350.100000	20.82	54.0	33.2		150.0	270.00	HORIZONTAL
1368.100000	20.67	54.0	33.3		150.0	270.00	HORIZONTAL

[dB μ V/m]

80

75

70

65

60

55

50

45

40

35

30

25

20

15

10

5

0

1G

2G

3G

[Hz]

x x x	MES	Final_Average
	MES	Peak
—	LIM	FCC/B 1-3GHz
—	LIM	FCC/B 1-3GHz

Fieldstrength according to :

FCC class B

EUT: Scenic Pro M7 with D1064 /PII/ 400MHz
Manufacturer: SNI
Operating Condition: scr. "H" , 1600 * 1200/ 75Hz and periph. test
Test Site: EMC Center Augsburg
Operator: M.Bosse
Job No: PDO8E026
Comment : fully configured, MCM2108
Start of Test: 28.07.1998 / 09:43:28

SCAN TABLE: "3m/1-3GHz"

Unit: dB μ V/m

Detector: Mode:

Curve 1: Average MaxHold

Subrange 1:

Start Frequency:	1.0 GHz	Step Size:	300.0 kHz
Stop Frequency:	3.0 GHz		
Measure Time:	10.0 ms		
IF Bandwidth:	1 MHz		

Receiver:	ESXI	Transducer:	Tensor 4105 h
Signal Path:	2DC-CP7X1	System Transducer:	RFin2-CP7/X1
Meas. Mode:	Lin	Add. Transd. 1:	Rosenberger 8m
Tracking Gen.:	Off	Add. Transd. 2:	None
Input:	2DC	Add. Transd. 3:	None

Preamplifier:	10 dB	Demodulation:	AM
RF Att.:	Coupled	Volume:	75 %
Ref. Level:	-40.0 dBm	Squelch:	--
Min. RF Att.:	0 dB	Option:	None
IF Att.:	--		
Autorange:	On		

Curve 1:	On	Repetition:	0
		Stop Mark:	Off
		Stop Message:	Off
		Stop Message:	Off

MEASUREMENT RESULT: "Final_Average"

28.07.1998 10:40

Frequency	Level	Limit	Margin	Exceed	Height	Azimuth	Polarisation
MHz	dB μ V/m	dB μ V/m	dB	Mark	cm	deg	
1274.500000	20.52	54.0	33.5		150.0	239.00	HORIZONTAL
1299.100000	21.39	54.0	32.6		100.0	210.00	HORIZONTAL
1299.700000	21.99	54.0	32.0		150.0	29.00	HORIZONTAL
1300.300000	23.05	54.0	31.0		150.0	239.00	HORIZONTAL
1327.600000	20.41	54.0	33.6		150.0	239.00	HORIZONTAL
1328.200000	20.58	54.0	33.4		100.0	210.00	HORIZONTAL
1339.900000	20.79	54.0	33.2		200.0	330.00	HORIZONTAL
1340.500000	21.36	54.0	32.6		150.0	239.00	HORIZONTAL
1350.100000	25.44	54.0	28.6		150.0	0.00	HORIZONTAL
1350.400000	22.45	54.0	31.5		200.0	330.00	HORIZONTAL
1366.300000	21.53	54.0	32.5		150.0	239.00	HORIZONTAL
1366.600000	23.82	54.0	30.2		150.0	0.00	HORIZONTAL
1369.000000	20.62	54.0	33.4		150.0	239.00	HORIZONTAL
1384.600000	21.18	54.0	32.8		100.0	210.00	HORIZONTAL
1390.300000	26.49	54.0	27.5		100.0	0.00	HORIZONTAL
1400.200000	26.13	54.0	27.9		100.0	0.00	HORIZONTAL
1798.900000	26.19	54.0	27.8		200.0	59.00	HORIZONTAL
1804.300000	23.36	54.0	30.6		200.0	59.00	HORIZONTAL

[dB μ V/m]

80

75

70

65

60

55

50

45

40

35

30

25

20

15

10

5

0

1G

2G

3G

[Hz]

x x x	MES	Final_Average
	MES	Peak
—	LIM	FCC/B 1-3GHz
	LIM	FCC/B 1-3GHz

7.3 Referenced Rules Sections

N/A

7.4 Test Instrumentation Used, Radiated Measurement

Type	Manufacturer/ Model No.	Serial No.	Last Cal.	Cal. Interval
Receiver	ESMI Rohde&Schwarz	840607/006	Jan. 97	15 months
Antenna	CBL 6111 Chase	1345	May 98	12 months
Active Ridged antenna	Tensor 4105 Rohde&Schwarz	2063	May 98	12 months

7.5 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 dB μ V is obtained. The Antenna Factor of 10,5 and a Cable Factor of 1,3 is added, giving a field strength of 40,3 dB μ V/m.

$$FS = 28,5 + 10,5 + 1,3 = 40,3 \text{ dB}\mu\text{V/m}$$

The 40,3 dB μ V/m value can be mathematically converted to its corresponding level in μ V/m.

Level in μ V/m =
Common Antilogarithm $[(40,3 \text{ dB}\mu\text{V/m})/20] =$

103,5 μ V/m

7.6 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 3 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

8.2 For further figures see first report, dated April 29, 1998