

MEASUREMENT / TECHNICAL REPORT

SIEMENS NIXDORF AG

Model: Personal Computer Scenic Pro M6

FCC ID: HSSSCENICM603

July 13, 1998

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

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Personal Computer Scenic Pro M6

FCC Identifier:
HSSSCENICM603

Date: Jul 13, 1998

Page:
1/69

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
4.1 Block Diagram Description	18
4.2 Clockfrequencies of the EUT	19
4.3 Theory of Operation	19
Figure 4.1 Block Diagram	20
5 CONDUCTED AND RADIATED MEASUREMENT PHOTOS	21
5.1 Test setup, conducted emission, front side view	21
5.2 Test setup, conducted emission, rear side view	22
5.3 Test setup, radiated emission, front side view	23
5.4 Test setup, radiated emission, rear side view	24
5.5 Test setup, radiated emission, rear side view	25

6 CONDUCTED EMISSION DATA	26
6.1 Test Procedure	26
6.2 Measured data	26 - 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 - 42
7.3 Reference Rules Sections	43
7.4 Test Instrumentation Used, Radiated Measurement	43
7.5 Field Strength Calculation	44
7.6 Table of Correction Factors	45 - 47
8 PHOTOS OF TESTED EUT	48
8.1 Front side of EUT	48
8.2 Rear side of EUT	49
8.3 Opened case, inside view of EUT	50
8.4 Chip card reader in system unit	51
8.5 Hard disk drive, top side view	52
8.6 Floppy disk drive, top side view	53
8.7 CD-ROM drive, top side view	54
8.8 System board, front side view, part one	55
8.9 System board, front side view, part two	56
8.10 System board, rear side view, part one	57
8.11 System board, rear side view, part two	58
8.12 Graphic controller board, front side view	59
8.13 Graphic controller board, rear side view	60
8.14 SDRAM module, front side view	61
8.15 SDRAM module, rear side view	62
8.16 Chip card reader, front side view	63
8.17 Chip card reader, rear side view	64
8.18 Power supply ASTEC, closed case, top side view	65
8.19 Power supply ASTEC, opened case, inside view	66
8.20 Power supply ASTEC, regulator board, rear side view	67
8.21 Power supply ASTEC, rear side view	68
Attachment A. User Manual	69

1 GENERAL INFORMATION

1.1 Product Description

The Siemens Nixdorf Computer Scenic Pro M6 is a compact 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 up to 333 MHz.

Description of the power supply:

- Power supply:
ASTEC, model AA20050
S26113-E413-V30

Features Overview:

- System board in ATX format
- Intel Pentium II processor with MMX technology and 512 Kbyte second - level cache in the processor cache module
- Processor cache module with SEC contact technology for Intel Slot 1 processor slot (SEC = Single Edge Contact)
- 16 to 256 Mbytes main memory (SDRAM)
- 256 to 768 Mbytes main memory (SDRAM)
- Error identification and error recognition via ECC
- Flash BIOS
- AGP slot for AGP graphics controller (AGP = Accelerated Graphics Port)

- 4 PCI slots (all with busmaster capability)
- 3 ISA slots
- IDE hard disk controller connected to PCI bus for up to four IDE drives (e.g. IDE hard disk drives, ATAPI CD ROM drive), (ultra DMA33 mode capable)
- Real-time clock/calendar with integrated battery backup
- Parallel interface (ECP- and EPP compatible)
- 2 serial ports (16C550 compatible with FIFO)
- PS/2 mouse port
- PS/2 keyboard port
- USB (Universal Serial Bus)
- Connector for chip card reader
- Prepared for system monitoring
- Cover detection

The personal computer is assembled by Siemens Nixdorf 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 Nixdorf Scenic Pro M6	HSSSCENICM603	PC EUT	unshielded power cord [292]
2a	Siemens Nixdorf MCM 2110 NTD	M9U9705C97BMD	Monitor	unshielded power cord [175] shielded video cable [168]
2b	Siemens Nixdorf MCM 2108 NTD S26361-K479-V150	M9U9703C97BMD	Monitor	unshielded power cord [175] shielded video cable [168]
2c	Siemens Nixdorf MCM 1703 NTD	A3KM053	Monitor	unshielded power cord [175] shielded video cable [168]
3	Siemens Nixdorf S26381-K210	HSS01TASTK210	Keyboard	shielded keyboard cable [143]

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Personal Computer Scenic Pro M6

FCC Identifier:
HSSSCENICM603

Date: Jul 13, 1998

Page:
6/69

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	Hewlett Packard HP 2225C+ (3019S70991)	894C2655X	Printer, parallel I/F	unshielded AC ca- ble [180], shielded centronics cable [190]
6	Hewlett Packard HP 2225D+ (3012S70819)	DSI6XU2225	Printer, serial I/F	unshielded power cord [185], shiel- ded serial cable [190]
7	Hewlett Packard HP 2225D+ (2952S61299)	DSI6XU2225	Printer, serial I/F	unshielded power cord [185], shiel- ded 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	ASTEC (UK), AA20050 SNI: S26113-E413-V30	N/A	Power supply	

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Personal Computer Scenic Pro M6

FCC Identifier:
HSSSCENICM603

Date: Jul 13, 1998

Page:
7/69

Pos	Model Number (Serial Number)	FCC ID	Description	Cable Description (length in [cm])
b	Siemens Nixdorf S26361-D1085-A10 GS 1	N/A	System board	
c	SNI S26361-D960-V1 GS 4	N/A	Chip card reader	
d	NEC ML-454AD645F-A10 (1x)	N/A	SDRAM	
e	Matrox MAG G100 AGP	DOC: G100A/4/OEM	Graphic controller board	
f	Intel Pentium II 80523/PX333512 SL2KA	N/A	Processor module	
g	Hitachi CDR-8430 S26361-H341-V500	A3DCDR-1900A	CD-ROM drive	
h	Quantum Fireball SE 4,3 AT	N/A	Hard disk drive	
i	TEAC FD-235HF SNI: 3777526	N/A	Floppy disk drive	

Remark: position 2a / 2b / 2c optional

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Personal Computer Scenic Pro M6

FCC Identifier:
HSSSCENICM603

Date: Jul 13, 1998

Page:
8/69

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 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

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 66,6 MHz, the clock frequency was tested with the highest possible processor:

66,6 MHz clock: Intel Pentium II 333 MHz

The system is provided with one kind of power supply:

– ASTEC, AA20050 SNI: S26113-E413-V30

The power supply has been measured in each video resolution.

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

Frequency range 30 MHz - 1 GHz:

66,6 MHz clock/Pentium II 333 MHz, video resolution 1280 x 1024/100 Hz

Frequency range 1 GHz - 3 GHz:

66,6 MHz clock/Pentium II 333 MHz, video resolution 1280 x 1024/100 Hz

Referring to conducted emission the following (worst case) result is applicable:

66,6 MHz clock/Pentium II 333 MHz, video resolution 1024 x 768/100 Hz
monitor supply via system unit

3.2 Video mode Justification

The system was tested in video graphic modes 1024 x 768, 1280 x 1024, 1600 x 1200 and 1920 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 17" monitor provided with a cable without any ferrite in a video resolution which is usual for standard monitors (1024 x 768). 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 is applicable:

radiated emission:

Frequency range 30 MHz - 1 GHz:

66,6 MHz clock/Pentium II 333 MHz, video resolution 1280 x 1024/100 Hz

Frequency range 1 GHz - 3 GHz:

66,6 MHz clock/Pentium II 333 MHz, video resolution 1280 x 1024/100 Hz

conducted emission:

66,6 MHz clock/Pentium II 333 MHz, video resolution 1024 x 768/120 Hz
monitor supply 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

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

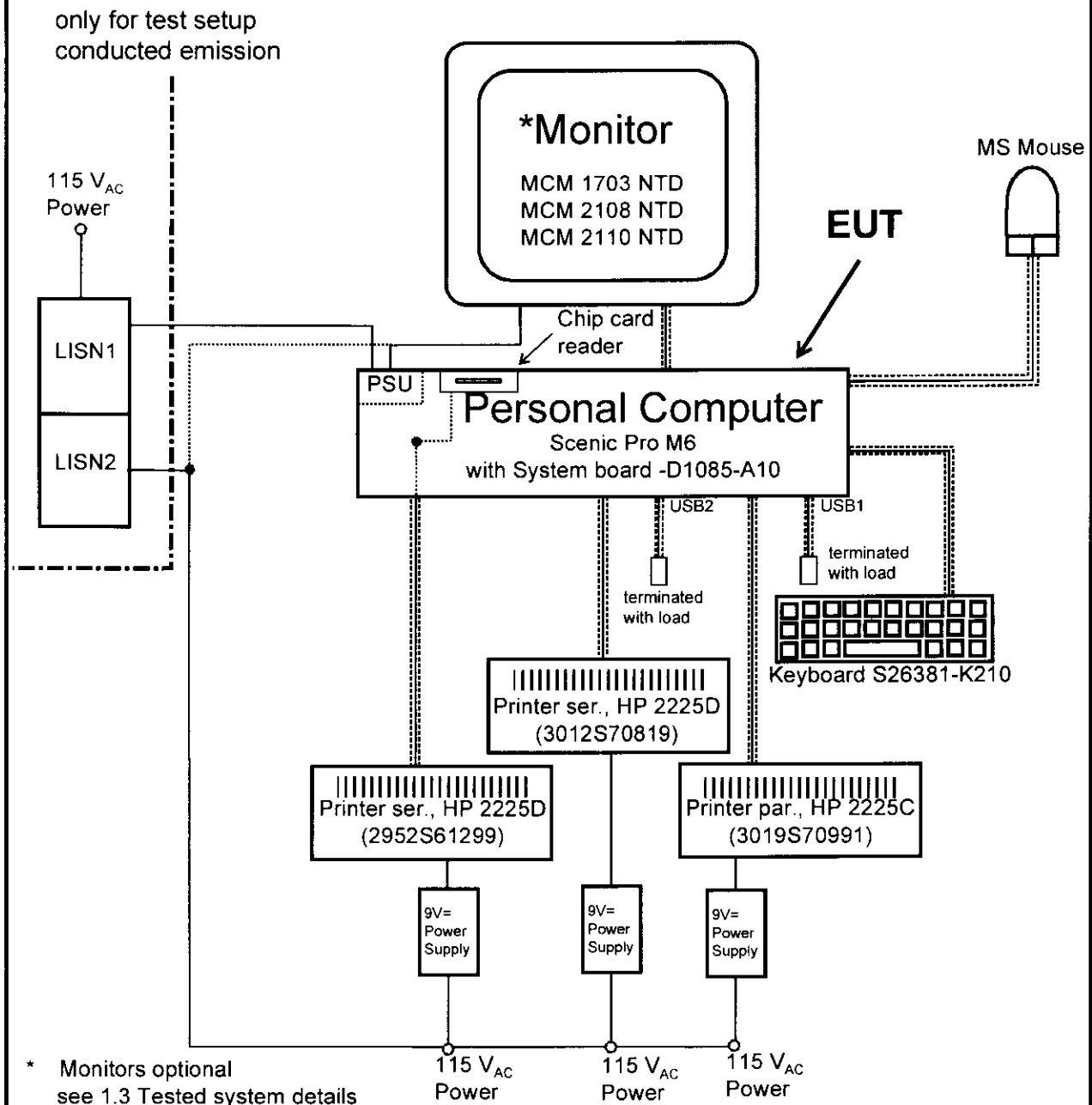
Applicant Signature _____ Date _____

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 20

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, Ser. 2, Parallel Port 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
Memory	66,6 MHz
PCI-bus	33,3 MHz
PIIX4 to IDE and USB	33,3 MHz
ISA Bus	8,2 MHz
I/O controller	33,3 MHz
USB	48 MHz

4.3 Theory of Operation

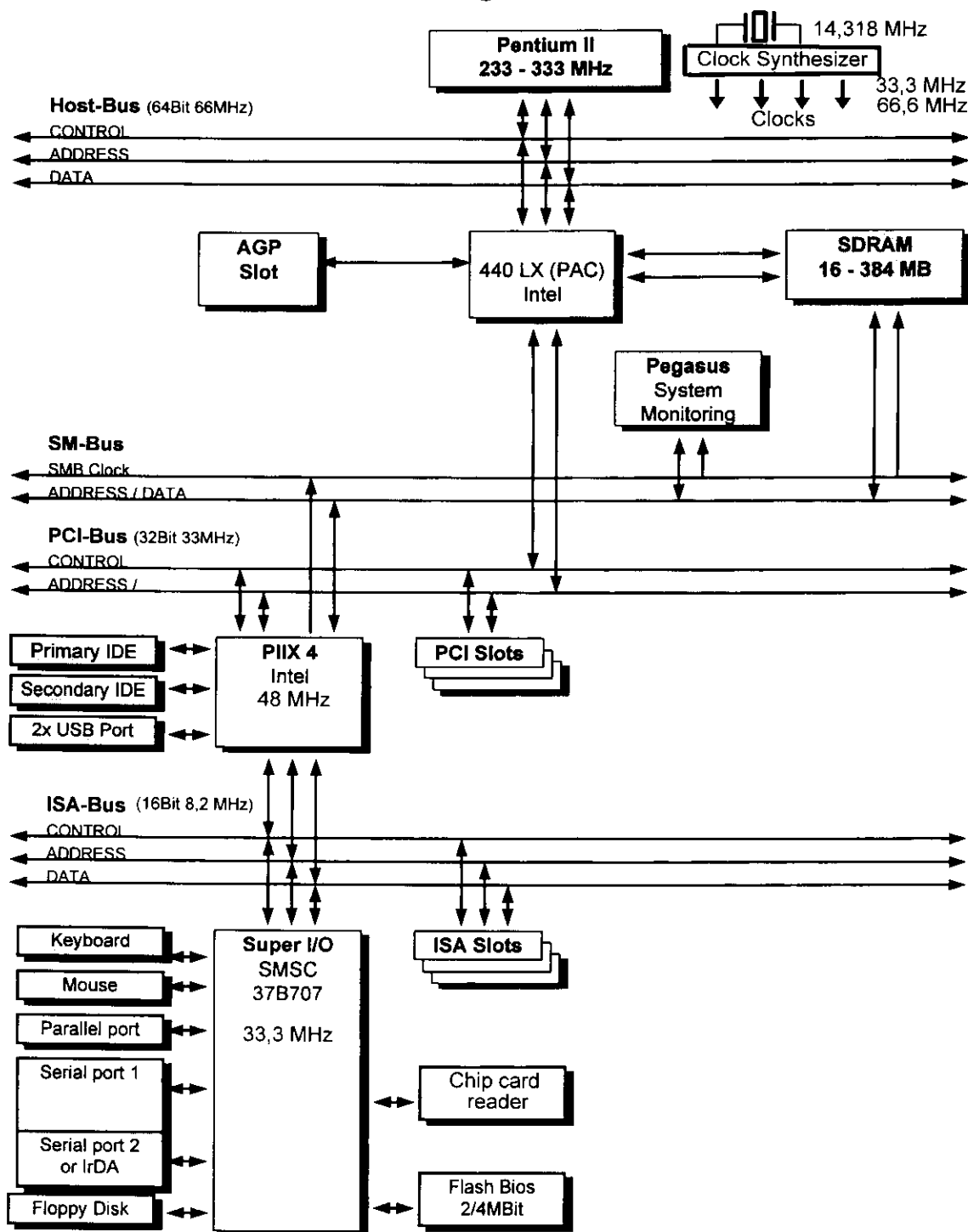
The compact tower PC works exactly as a traditional PC.

The processors run internally between 233 and 333 MHz, the type is selected by switches, the system clock is in each case the same - 66,6 MHz and is multiplied by the processors internally by 3,5, 4,0, 4,5 or 5,0.

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

Figure 4.1 Block Diagram of the EUT



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

Judgement: Passed by

	Frequency [MHz]	Measured [dB(μV)]	Kind of value	Limit [dB(μV)]
neutral	0,486	30,36	AV	46
neutral	0,552	27,17	AV	46
phase	0,762	28,10	AV	46

	Frequency [MHz]	Measured [dB(μV)]	Kind of value	Limit [dB(μV)]
phase	0,828	29,16	AV	46
neutral	1,464	32,95	QP	56
neutral	1,524	33,61	QP	56
neutral	1,872	32,84	QP	56
neutral	2,136	32,83	QP	56

AV: average

QP: quasi peak

Test Personnel:

Tester Signature: *Michael Bosse* Date: *July 13, 1998*

Printed Name: M. Bosse

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Personal Computer Scenic Pro M6

FCC Identifier:
HSSSCENICM603

Date: Jul 13, 1998

Page:
27/69

Measurement Protocols

Page No

66,6 MHz clock/Pentium II 333 MHz
video resolution 1024 x 768/120 Hz
monitor power via system unit

29 - 31

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Personal Computer Scenic Pro M6

FCC Identifier:
HSSSCENICM603

Date: Jul 13, 1998

Page:
28/69

Conducted noise according to:

PDP8E045

EUT: Scenic Pro M6 D1085-A10 LX PII/333 E413-V30 Astec
Manufacturer: SNI
Operating Condition: Keyboard, HD/CD-ROM-test, scr"H", 1024*768/120 Hz
Test Site: EMC CENTER Augsburg, SK1
Operator: M.Bosse
Configuration: full conf., Monitor MCM2108 PSU via System Unit
Comment: PSU: E413-V30 Astec
Start of Test: 27.05.1998 / 09:49:18

SCAN TABLE: "Volt_015-30MHZ"

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: ESHS Transducer: ESH2-Z5
Signal Path: None System Transducer: None
Meas. Mode: Lin Add. Transd. 1: ESH3-Z2
Tracking Gen.: -- Add. Transd. 2: None
Input: -- Add. Transd. 3: None

Preamplifier: Off Demodulation: A3
RF Att.: 0 dB Volume: --
Ref. Level: -- Squelch: --
Min. RF Att.: 10 dB Option: None
IF Att.: LowNoise
Autorange: On

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

MEASUREMENT RESULT: "Quasi Peak"

27.05.1998 10:13

Frequency	Level	Limit	Margin	Exceed	Line	PE
MHz	dBµV	dBµV	dB	Mark		
0.486000	34.07	56	22.2		N	GND
0.768000	33.11	56	22.9		L1	FLO
0.828000	35.09	56	20.9		L1	GND

MEASUREMENT RESULT: "Quasi Peak"

(continued)

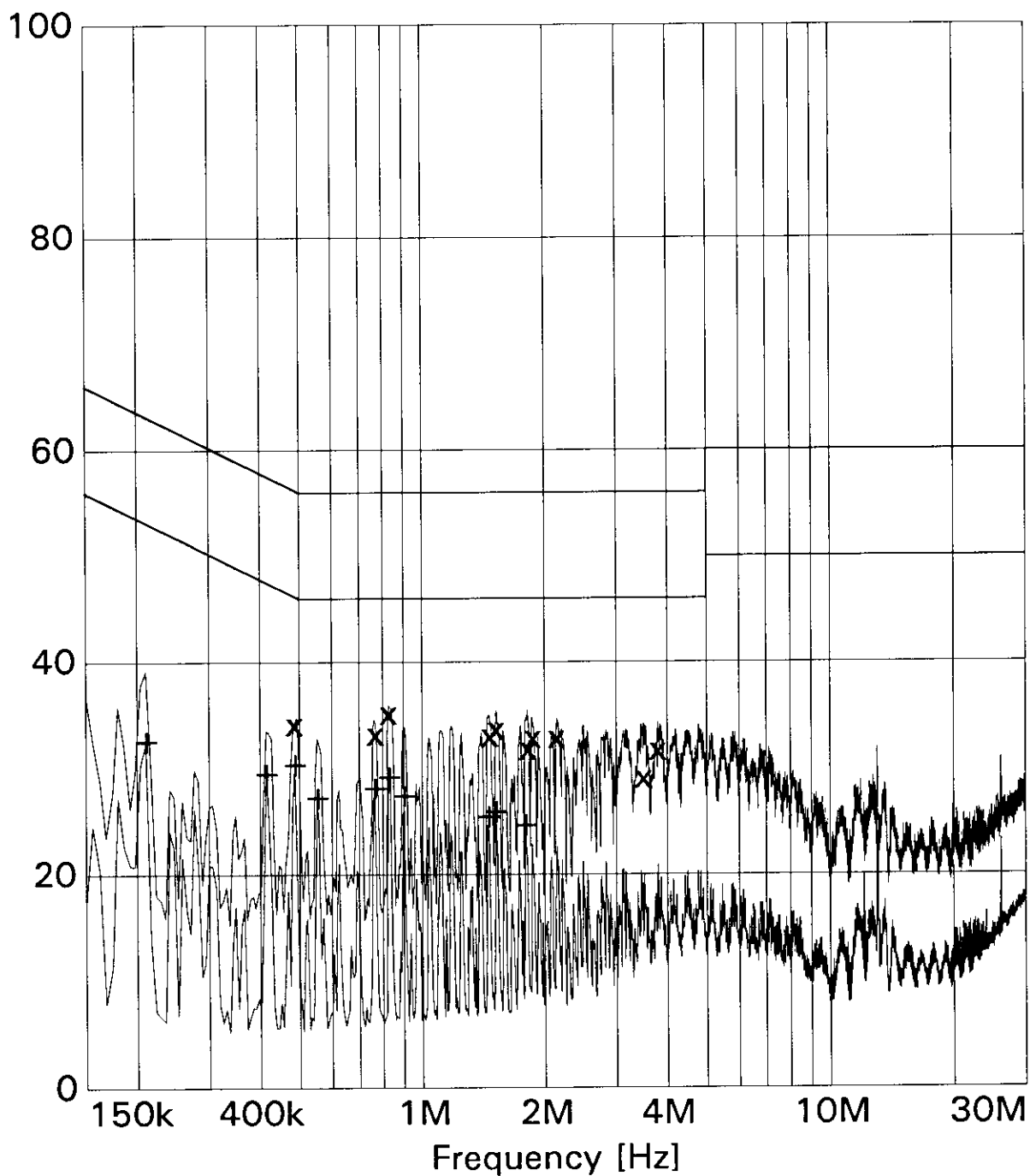
Frequency	Level	Limit	Margin	Exceed Mark	Line	PE
MHz	dBµV	dBµV	dB			
1.464000	32.95	56	23.1		N	GND
1.524000	33.61	56	22.4		N	GND
1.818000	31.74	56	24.3		N	FLO
1.872000	32.84	56	23.2		N	GND
2.136000	32.83	56	23.2		N	FLO
3.492000	29.04	56	27.0		L1	FLO
3.792000	31.63	56	24.4		L1	GND

MEASUREMENT RESULT: "Average"

27.05.1998 10:13

Frequency	Level	Limit	Margin	Exceed Mark	Line	PE
MHz	dBµV	dBµV	dB			
0.210000	32.56	53	20.6		N	FLO
0.414000	29.52	48	18.0		N	FLO
0.486000	30.36	46	15.9		N	GND
0.552000	27.17	46	18.8		N	GND
0.762000	28.10	46	17.9		L1	GND
0.828000	29.16	46	16.8		L1	GND
0.900000	27.38	46	18.6		L1	GND
1.452000	25.43	46	20.6		N	GND
1.518000	25.87	46	20.1		N	FLO
1.794000	24.63	46	21.4		N	FLO

Level [dB μ V]



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 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 3000 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 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 333 MHz in video modes 1024 x 768, 1280 x 1024, 1600 x 1200 and 1920 x 1200. The test results below reflect the worst case with:

66,6 MHz clock/Pentium 333 MHz, video resolution: 1280 x 1024/100 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
92.25000	22.78	30.000	-7.2	ver	1.6000	210.000
133.62000	23.48	30.000	-6.5	ver	2.2000	0.000
735.00000	31.89	37.000	-5.1	hor	1.6000	0.000
976.26000	31.15	37.000	-5.9	ver	3.4000	90.000

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
1053.10000	26.07	54.0	27.9		100.0	180.00	hor
1068.70000	29.32	54.0	24.7		100.0	180.00	hor
1069.00000	31.16	54.0	22.8		100.0	180.00	hor
1269.40000	37.58	54.0	16.4		100.0	180.00	hor
1336.30000	31.27	54.0	22.7		100.0	150.00	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 13, 1998

Printed Name: M. Bosse

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Personal Computer Scenic Pro M6

FCC Identifier:
HSSSCENICM603

Date: Jul 13, 1998

Page:
35/69

Measurement Protocols

Page No

Frequency range 30 MHz - 1 GHz:
66,6 MHz clock/Pentium II 333 MHz
video resolution 1280 x 1024/100 Hz

37 - 39

Frequency range 1 GHz - 3 GHz:
66,6 MHz clock/ Pentium II 333 MHz
video resolution 1280 x 1024/100 Hz

40 - 42

Radiation Test according to:

EN 55022/B

EUT: Scenic Pro M6/333MHz, Pentium II, Board: D1085-A10
Manufacturer: SNI
Operating Condition: Scr."H" 1280 x 1024, 100Hz + HD/CD-test
Test Site: EMC Center Augsburg
Operator: M. Bosse
Job No: PDP8E045
Comment: full configured, MCM2110
Comment: PSU: E413-V30 Astec

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
30.00000	21.67	VER	3.4000	150.00
92.51111	23.87	VER	1.6000	210.00

134.54444	24.26	VER	2.2000	0.0000
369.50000	28.13	HOR	2.2000	300.00
462.18888	27.60	VER	2.8000	330.00
468.65555	28.46	VER	2.8000	150.00
735.94444	32.98	HOR	1.6000	0.0000
975.21111	34.74	VER	3.4000	90.000

MEASUREMENT RESULT: "Quasi Peak"

Frequency MHz	Level dBμV/m	LIMIT dBμV/m	EXCEEDING dB	ANT POL	HEIGHT in [m]	ANGLE in deg
30.09000	16.89	30.000	-13.10524	VER	3.4000	150.00
92.25000	22.78	30.000	-7.224026	VER	1.6000	210.00
133.62000	23.48	30.000	-6.518060	VER	2.2000	0.0000
368.97000	28.25	37.000	-8.750603	HOR	2.2000	300.00
461.22000	27.31	37.000	-9.690568	VER	2.8000	330.00
467.73000	28.73	37.000	-8.266884	VER	2.8000	150.00
735.00000	31.89	37.000	-5.106629	HOR	1.6000	0.0000
976.26000	31.15	37.000	-5.854880	VER	3.4000	90.000

Level [dB μ V/m]

60

50

40

30

20

10

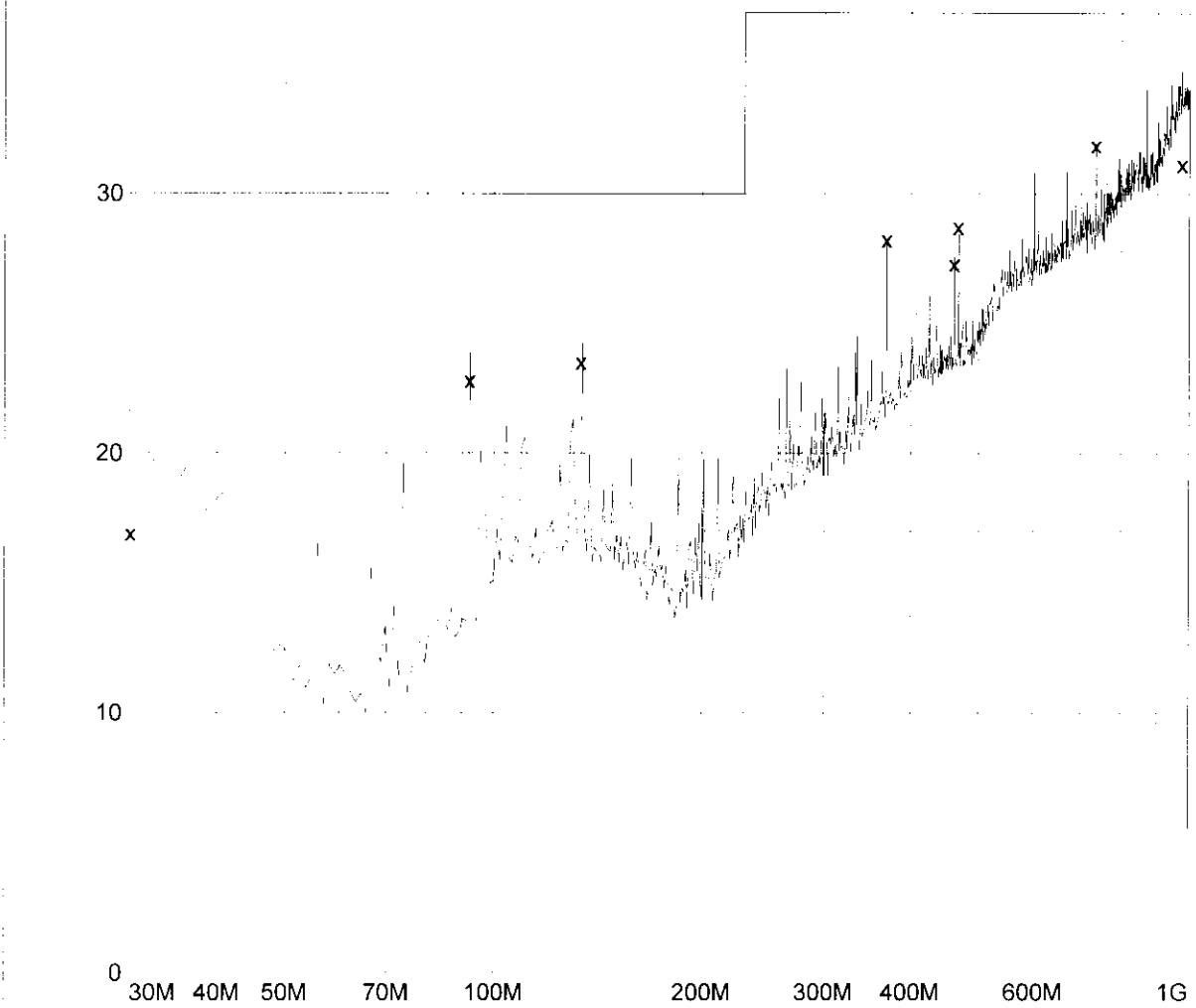
0

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 M6 with D1085-A10/333MHz
Manufacturer: SNI
Operating Condition: scrolling "H" 1280 x 1024 / 100Hz + CD/HD-test
Test Site: EMC Center Augsburg
Operator: M.Bosse
Job No: PDP8E045
Comment : full configuration
Start of Test: 09.06.1998 / 08:20:42

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:

MEASUREMENT RESULT: "Final_Average"

09.06.1998 09:13

Frequency	Level	Limit	Margin	Exceed	Height	Azimuth	Polarisation
MHz	dB μ V/m	dB μ V/m	dB	Mark	cm	deg	
1053.100000	26.07	54.0	27.9		100.0	180.00	HORIZONTAL
1059.400000	24.62	54.0	29.4		100.0	180.00	HORIZONTAL
1068.700000	29.32	54.0	24.7		100.0	180.00	HORIZONTAL
1069.000000	31.16	54.0	22.8		100.0	180.00	HORIZONTAL
1269.400000	37.58	54.0	16.4		100.0	180.00	HORIZONTAL
1336.300000	31.27	54.0	22.7		100.0	150.00	HORIZONTAL
1366.000000	25.90	54.0	28.1		100.0	150.00	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 =

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

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