

# MEASUREMENT / TECHNICAL REPORT

## SIEMENS NIXDORF AG

### Model: Keyboard K240

### FCC ID: HSS01TASTK240

### May 7, 1998

This report concerns:  Original grant  Class II change  
Equipment type: Keyboard

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

Application for Certification prepared by:  
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**SIEMENS**  
**NIXDORF**

Engineer: *Robert Schaeuffer*  
Robert Schaeuffer  
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Keyboard

FCC Identifier:  
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# 1 GENERAL INFORMATION

## 1.1 Product Description

The Siemens Nixdorf keyboard K240 with the product number S26381-K240 is a MF-II-compatible keyboard for personal computers. The connection between the keyboard and the personal computer is done by a cable which has on one end a western plug connection and on the other end a PS/2-connection.

### *Functions and features:*

Industry standard	MF-II-compatible
System compatibility	AT, XT and PS/2 system, automatic AT/XT switch over
Keyboard to system unit	western plug to PS/2/DIN (2m / 4m variable length)
Design	- Low-profile compact design, special ergonomic key design  - adjustable keyboard slope
Technology	Chip on board (COB) and membrane for key matrix

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*Electrical:*

Power consumption < 50 mA at 5 V

*Temperature:*

Operating temperature 5° C to 40° C (as per IEC721)

*Dimensions at minimum adjustment angles and without palm rests:*

Dimensions (H x W x D) 36 mm x 464 mm x 168 mm

*Adjustment range:*

Keyboard slope: 6° and 12°

*Standards met:*

Product safety: EN 60950  
VDE 0805

Ergonomics: "Safety-tested" mark (ZH1/618)  
ISO 9241-4 / EN 29241-4  
ISO 9995, DIN 2137

Electromagnetic Compatibility: CE symbol to EC Guideline 89/336/EWG  
(EN 55022/B, EN 50082-1)

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## 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 M5 (200 MHz)	HSSSCENICM502	PC	unshielded power cord [292]
2	Siemens Nixdorf MCM 1705 NTD S26361-K471-V150	A3LCGH760	Monitor	unshielded power cord [175] shielded video cable [186]
3	Siemens Nixdorf S26381-K240	HSS01TASTK240	Keyboard EUT	shielded keyboard cable [250]
4	Microsoft MS 2.1A	C3KKMP3	Mouse	shielded mouse cable [183]

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Pos	Model Number (Serial Number)	FCC ID	Description	Cable Description (length in [cm])
5	Hewlett Packard HP 2225C+ (3019S70991)	DSI6XU2225	Printer, parallel I/F	unshielded power cord [185], shiel- ded centronics parallel 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 [86]
9	Siemens	N/A	USB cable	shielded cable, terminated [86]
<b>Pos 1 contains:</b>				
a	Minebea Electronics (VK) ME145S2CCCV00 SNI: S26113-E406-V20	N/A	Power supply	
b	Siemens Nixdorf S26361-D969-A11 GS 1	N/A	System board	

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Pos	Model Number (Serial Number)	FCC ID	Description	Cable Description (length in [cm])
c	Intel Pentium 200 MHz	N/A	Processor	
d	Matrox MAG-MIL/2/SI	ID7057600	Graphic controller	
e	Matrox MAG- MIL/MOD6/OE	N/A	Storage piggy to Graphic controller	

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## 1.4 Test Methodology

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

## 1.5 Test Facility

The anechoic chamber and conducted measurement facility used to collect the emission data is located at Siemens Nixdorf Informationssysteme AG, Buergermeister-Ulrich-Strasse 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

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## 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). The EUT was configured with a cable of 2 m and 4 m length.

Two configurations were measured:

- 1) Keyboard K240 connected to system unit via 2 m cable
- 2) Keyboard K240 connected to system unit via 4 m cable

Both measurement results are applicable.

### 3.2 Video mode Justification

The system was tested in video graphic mode 1024 x 768/85 Hz, because this is the most commonly used resolution and reflects the worst case.

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## 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.

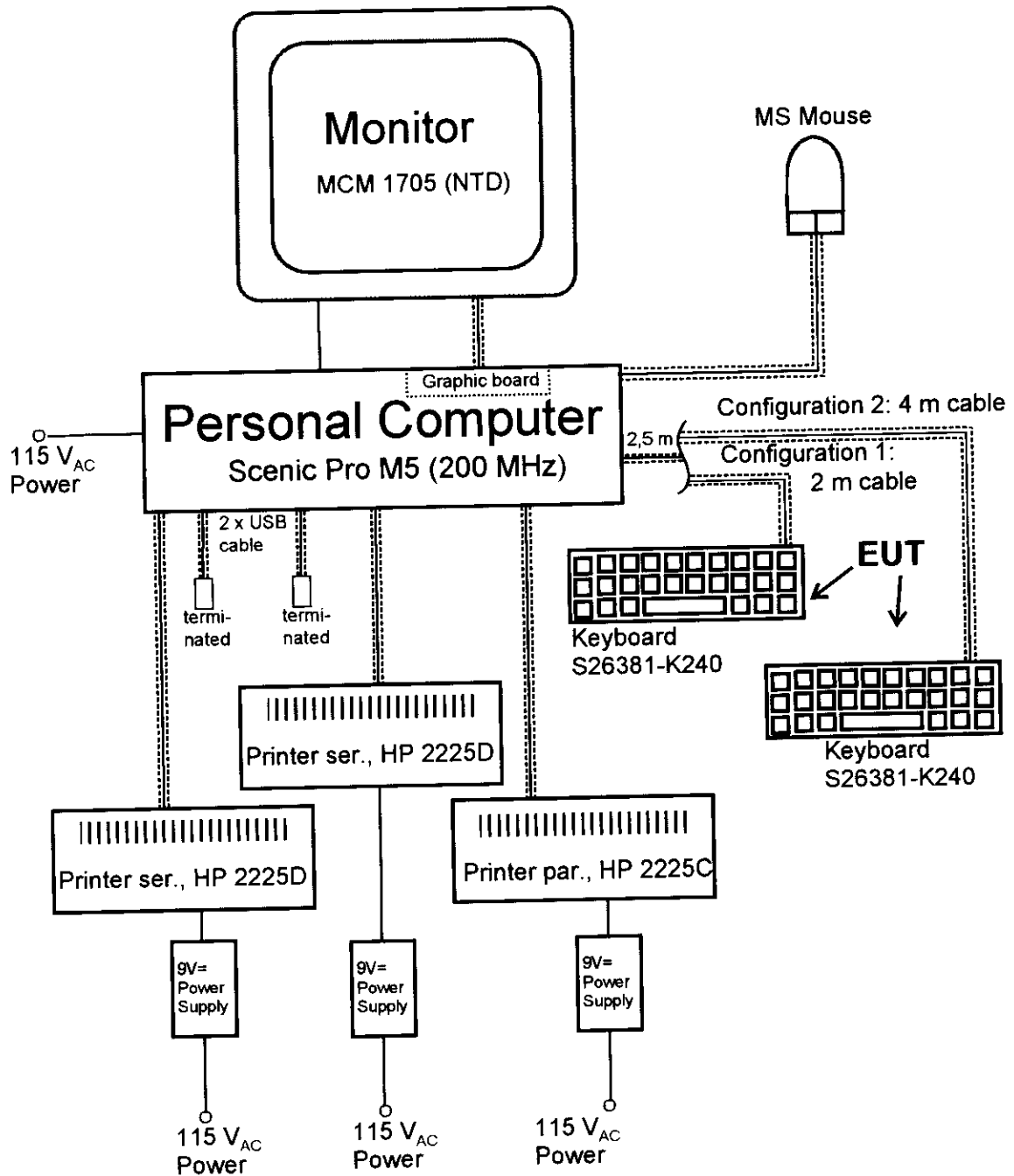
The used sequence is:

- 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.

Figure 3.1 Configuration of Tested System



## 4 BLOCK DIAGRAM OF EUT

see fig 4.1 page 18

### 4.1 Block Diagram Description (see fig. 4.1)

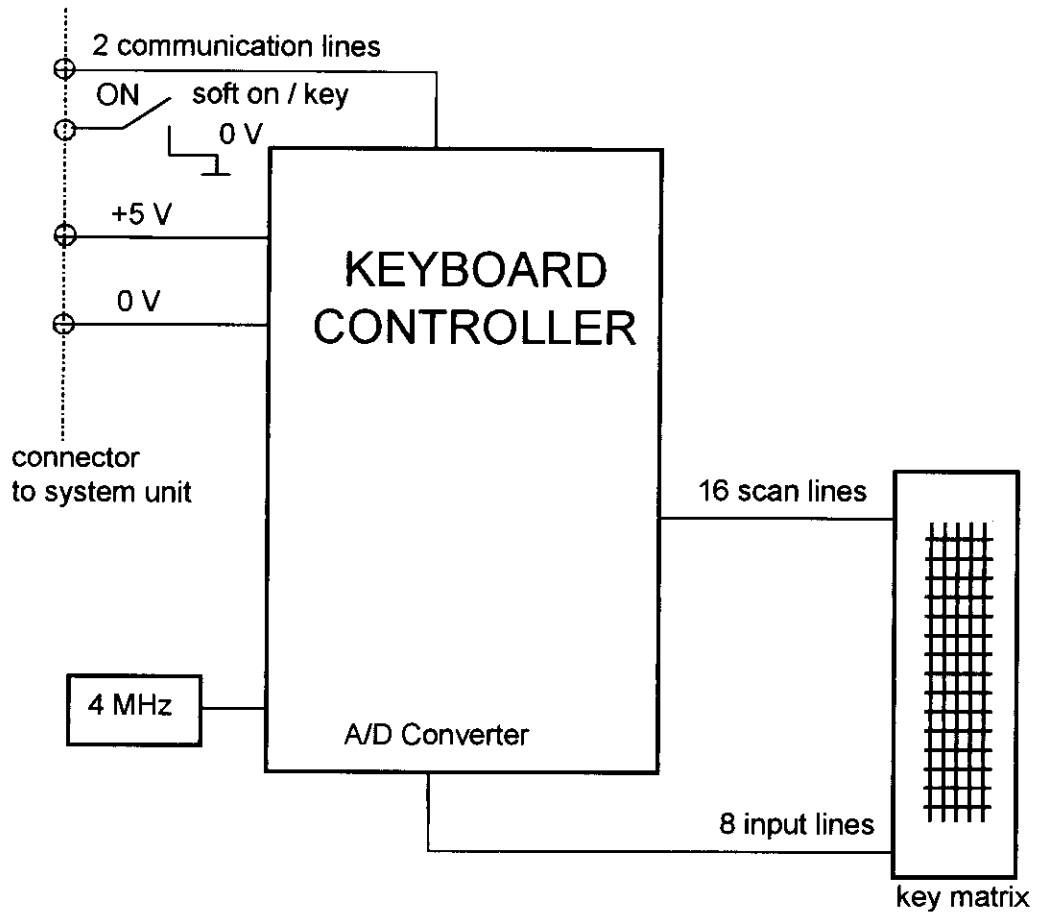
The major parts of the system are (fig 4.1).

- Keyboard Controller
- Key matrix

The diagram of the system board is shown in fig 4.2

The keyboard works exactly like a traditional keyboard.

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 and the monitor are supplied with power via a second LISN. Two configurations were measured:

- Configuration a: Keyboard K240 with 2 m cable  
Configuration b: Keyboard K240 with 4 m cable

Judgement: Passed by

	Frequency [MHz]	Measured [dB(μV)]	Kind of value	Limit [dB(μV)]	Configuration
neutral	0.354	37.80	AV	49	b
neutral	0.354	37.30	AV	49	a
phase	4.254	32.10	AV	46	a

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	Frequency [MHz]	Measured [dB(μV)]	Kind of value	Limit [dB(μV)]	Configuration
phase	4.482	33.00	AV	46	b
phase	4.488	32.80	AV	46	a
phase	4.602	33.70	AV	46	b
phase	4.608	33.20	AV	46	a
phase	4.722	33.50	AV	46	b
phase	4.836	33.20	AV	46	b
phase	4.842	32.80	AV	46	a

AV: average  
QP: quasi peak

Test Personnel:

Tester Signature: *W. Richter* Date: May 09, 1998

Printed Name: W. Richter

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# Measurement Protocols

**Configuration a:**  
Keyboard K240 with 2 m cable

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**Configuration b:**  
Keyboard K240 with 4 m cable

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conducted noise according to:

EN55022/B

EUT: Keyboard : KBPC P2 (S26381-K240)  
Manufacturer: SNI  
Operating Condition: scr."H" 1024 x 768, 100Hz ,Keyboard+HD-Test  
Test Site: EMC CENTER Augsburg ; SK2  
Operator: W. Richter  
Comment : meas. point: N, L1 of PC  
Comment: Keyboard cable length: 2m  
Start of Test: 31.03.1998 / 09:01:45

**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"**

31.03.1998 09:30

Frequency	Level	Limit	Margin	Exceed	Line	PE
MHz	dBµV	dBµV	dB	Mark		
0.234000	43.80	62	18.5		N	GND
0.354000	42.20	59	16.7		N	GND
0.474000	32.70	56	23.7		N	GND

**MEASUREMENT RESULT: "Quasi Peak"**

(continued)

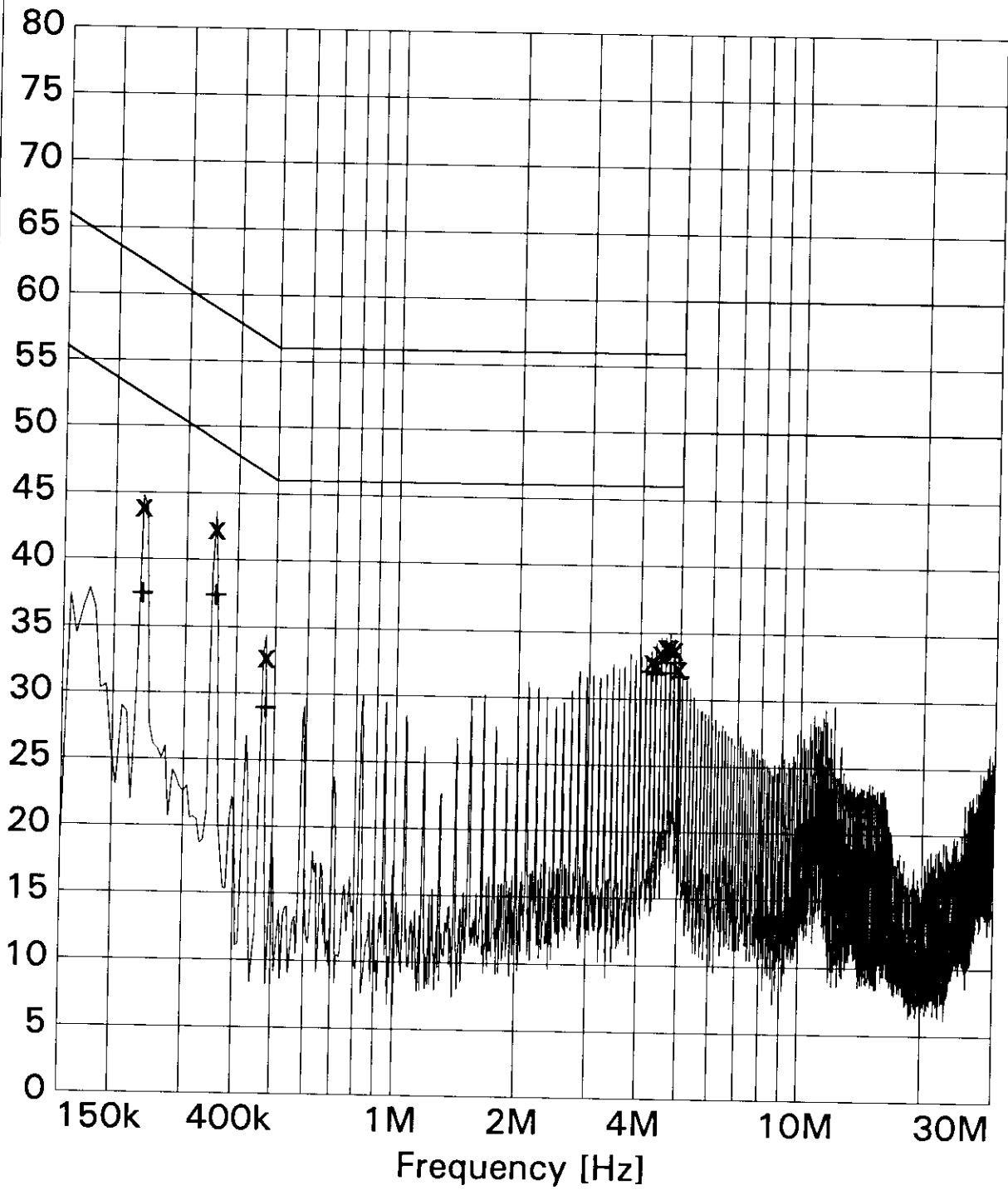
Frequency	Level	Limit	Margin	Exceed	Line	PE
MHz	dB $\mu$ V	dB $\mu$ V	dB	Mark		
4.254000	32.80	56	23.2		L1	GND
4.374000	32.60	56	23.4		L1	GND
4.488000	33.40	56	22.6		L1	GND
4.608000	33.90	56	22.1		L1	GND
4.728000	33.90	56	22.1		L1	GND
4.842000	33.70	56	22.3		L1	GND
4.962000	32.30	56	23.7		L1	GND

**MEASUREMENT RESULT: "Average"**

31.03.1998 09:30

Frequency	Level	Limit	Margin	Exceed	Line	PE
MHz	dB $\mu$ V	dB $\mu$ V	dB	Mark		
0.234000	37.40	52	14.9		N	GND
0.354000	37.30	49	11.6		N	GND
0.474000	28.90	46	17.5		N	GND
4.254000	32.10	46	13.9		L1	GND
4.368000	31.90	46	14.1		L1	GND
4.488000	32.80	46	13.2		L1	GND
4.608000	33.20	46	12.8		L1	GND
4.728000	32.00	46	14.0		L1	GND
4.842000	32.80	46	13.2		L1	GND
4.962000	31.70	46	14.3		L1	GND

Level [dB $\mu$ V]



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:

EN55022/B

EUT: Keyboard : KBPC P2 (S26381-K240)  
Manufacturer: SNI  
Operating Condition: scr."H" 1024 x 768, 100Hz ,Keyboard+HD-Test  
Test Site: EMC CENTER Augsburg ; SK2  
Operator: W. Richter  
Comment : meas. point: N, L1 of PC  
Comment: Keyboard cable length: 4m  
Start of Test: 31.03.1998 / 09:49:28

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"

31.03.1998 10:18

Frequency	Level	Limit	Margin	Exceed	Line	PE
MHz	dBµV	dBµV	dB	Mark		
0.234000	44.40	62	17.9		N	GND
0.354000	42.90	59	16.0		N	GND
3.900000	23.90	56	32.1		L1	GND

**MEASUREMENT RESULT: "Quasi Peak"**

(continued)

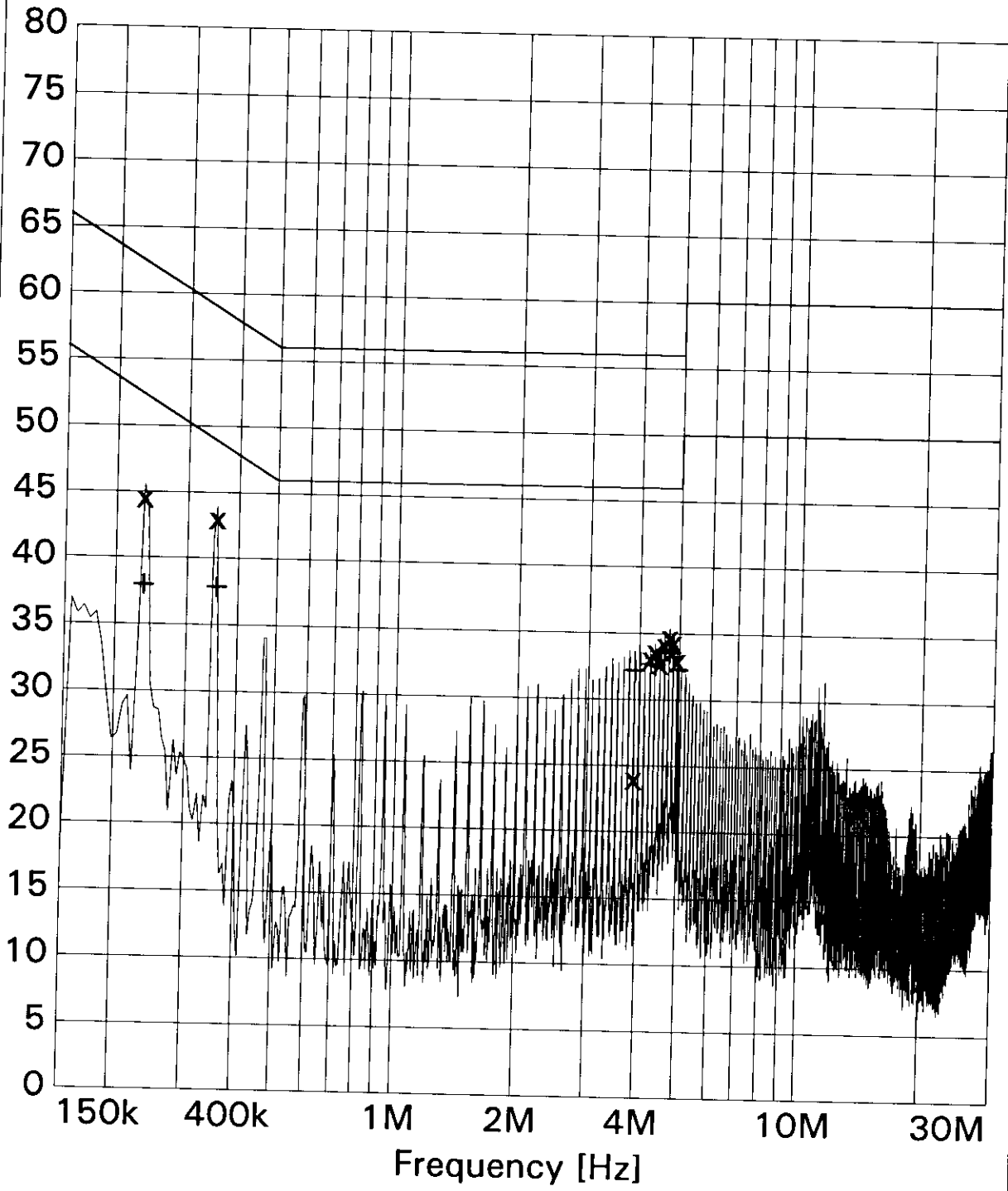
Frequency	Level	Limit	Margin	Exceed	Line	PE
MHz	dBµV	dBµV	dB	Mark		
4.248000	33.00	56	23.0		L1	GND
4.368000	33.50	56	22.5		L1	GND
4.488000	32.70	56	23.3		L1	GND
4.602000	34.00	56	22.0		L1	GND
4.722000	34.60	56	21.4		L1	GND
4.836000	34.20	56	21.8		L1	GND
4.956000	32.90	56	23.1		L1	GND

**MEASUREMENT RESULT: "Average"**

31.03.1998 10:18

Frequency	Level	Limit	Margin	Exceed	Line	PE
MHz	dBµV	dBµV	dB	Mark		
0.234000	37.90	52	14.4		N	GND
0.354000	37.80	49	11.1		N	GND
3.894000	32.20	46	13.8		L1	GND
4.248000	32.70	46	13.3		L1	GND
4.368000	32.60	46	13.4		L1	GND
4.482000	33.00	46	13.0		L1	GND
4.602000	33.70	46	12.3		L1	GND
4.722000	33.50	46	12.5		L1	GND
4.836000	33.20	46	12.8		L1	GND
4.956000	32.30	46	13.7		L1	GND

Level [dB $\mu$ 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	ESH3 Rohde & Schwarz	873676/014	March 97	12 months
LISN	NSLK 8126 Schwarzbeck	KWA20870662	March 97	12 months
LISN	ESH2-Z5 Schwarzbeck	846695/027	March 97	12 months
Pulse limiter	ESH3-Z2 Rohde & Schwarz	60813	March 97	12 months



# 7 RADIATED EMISSION DATA

## 7.1 Test Procedure

The radiated emission was measured between 30 MHz and 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.

The test was performed in a semi anechoic chamber in a distance of 10 meters between antenna and EUT. During tests the EUT was turned 360° the 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 the whole range one antenna was used:

30 MHz to 1000 MHz:                      Bilog 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 Pentium 200 MHz in video mode 1024 x 768.

### Configuration a:

Keyboard K240 with 2 m cable

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
30.87000	15.75	30.000	-14.25223	hor	2.8000	0.0000
115.86000	16.74	30.000	-13.25932	ver	1.0000	240.00
199.38000	22.63	30.000	-7.370345	ver	1.0000	150.00
270.48000	23.75	37.000	-13.24889	ver	1.0000	240.00
997.02000	34.79	37.000	-2.208493	ver	1.0000	90.000

all levels are quasi-peak levels

### Configuration b:

Keyboard K240 with 4 m cable

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
36.06000	19.59	30.000	-10.41136	ver	1.6000	150.00
81.12000	19.40	30.000	-10.59845	ver	2.2000	300.00
149.79000	14.50	30.000	-15.49519	ver	2.2000	180.00
166.14000	17.21	30.000	-10.37320	hor	2.2000	60.000
279.45000	26.63	37.000	-10.37320	hor	3.4000	60.000
946.71000	32.79	37.000	-4.208393	ver	1.6000	150.00

all levels are quasi-peak levels

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\*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: W. Richter Date: May 14, 1998

Printed Name: W. Richter

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# Measurement Protocols

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<b>Configuration a:</b> Keyboard K240 with 2 m cable	37 - 39
<b>Configuration b:</b> Keyboard K240 with 4 m cable	40 - 42

# Radiation Test according to:

## EN 55022/B

EUT: Keyboard : KBPC P2 (S26381-K240)  
Manufacturer: SNI  
Operating Condition: scr. "H" 1024 \* 768, 100Hz, Keyboard+HD-Test  
Test Site: EMC Center Augsburg  
Operator: W.Richter  
Job No: SCT8E009  
Comment : full conf. with Scenic Pro M5  
Comment: MCM1705; K240, cable length 2m

### SCAN TABLE: "10m/30-1000"

Unit: dBµV/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 dBµV/m	ANT POL	HEIGHT in [m]	ANGLE in deg
30.00000	21.49	HOR	2.8000	0.0000
116.22222	20.22	VER	1.0000	240.00
200.28888	22.69	VER	1.0000	150.00
271.42222	24.38	VER	1.0000	240.00
1000.00000	21.07	VER	1.0000	90.000

**MEASUREMENT RESULT: "Quasi Peak"**

Frequency MHz	Level dB $\mu$ V/m	LIMIT dB $\mu$ V/m	EXCEEDING dB	ANT POL	HEIGHT in [m]	ANGLE in deg
30.87000	15.75	30.000	-14.25223	HOR	2.8000	0.0000
115.86000	16.74	30.000	-13.25932	VER	1.0000	240.00
199.38000	22.63	30.000	-7.370345	VER	1.0000	150.00
270.48000	23.75	37.000	-13.24889	VER	1.0000	240.00
997.02000	34.79	37.000	-2.208493	VER	1.0000	90.000

Level [dB $\mu$ V/m]

60

50

40

30

20

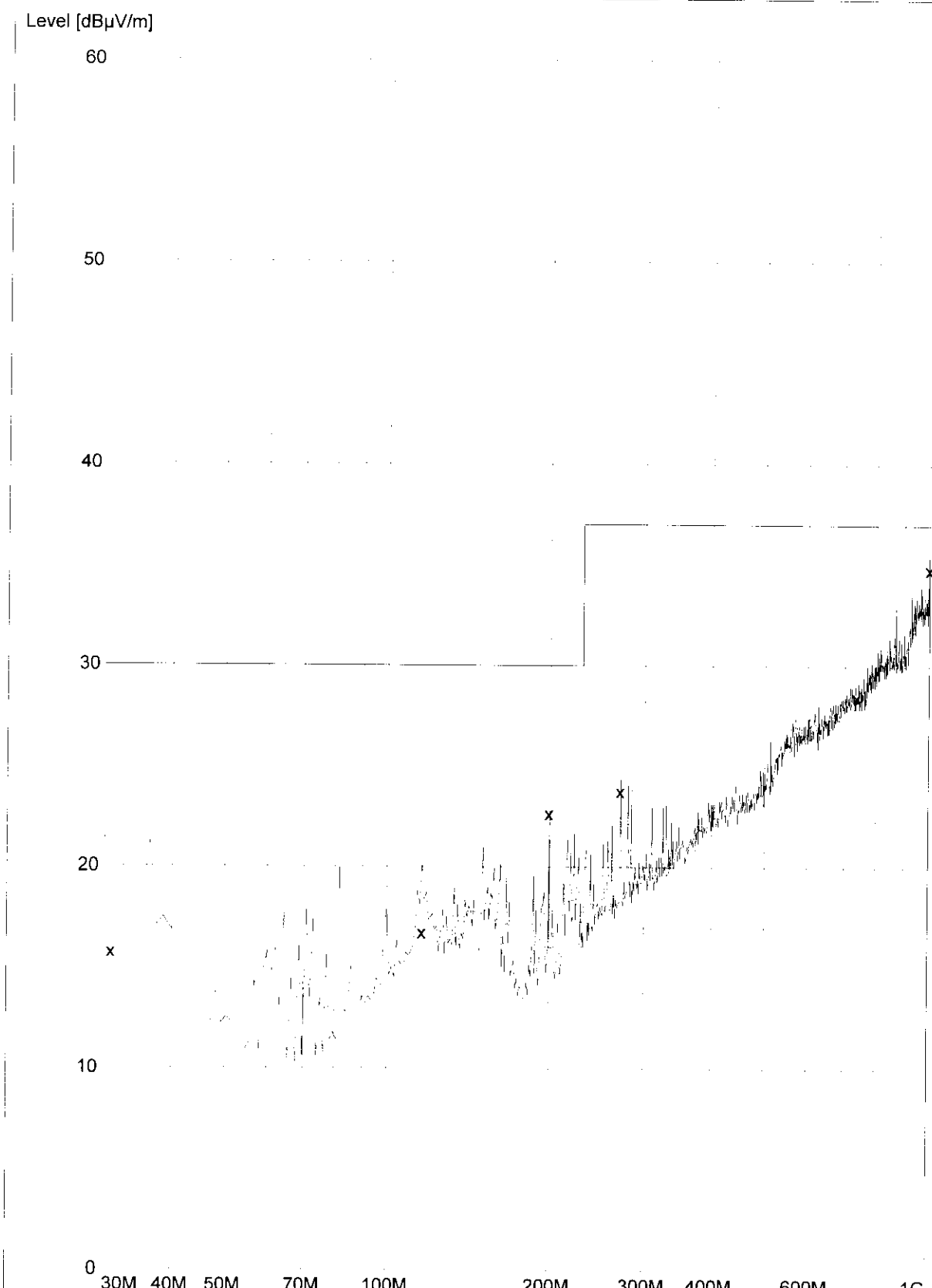
10

0

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

Frequency [Hz]

x x x MES      Quasi Peak  
MES      Preview Peak  
- - - LIM      EN55022/B  
LIM (-20 dB)      EN55022/B



# Radiation Test according to:

**EN 55022/B**

EUT: Keyboard : KBPC P2 (S26381-K240)  
Manufacturer: SNI  
Operating Condition: scr. "H" 1024 \* 768, 100Hz, Keyboard+HD-Test  
Test Site: EMC Center Augsburg  
Operator: W.Richter  
Job No: SCT8E009  
Comment : full conf. with Scenic Pro M5  
Comment: MCM1705; K240, cable length 4m

## SCAN TABLE: "10m/30-1000"

Unit: dBµV/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 dBµV/m	ANT POL	HEIGHT in [m]	ANGLE in deg
36.46666	22.87	VER	1.6000	150.00
81.73333	21.09	VER	2.2000	300.00



150.71111	22.16	VER	2.2000	180.00
166.87777	21.27	HOR	2.2000	60.000
280.04444	25.84	HOR	3.4000	60.000
947.18888	35.08	VER	1.6000	150.00

**MEASUREMENT RESULT: "Quasi Peak"**

Frequency MHz	Level dB $\mu$ V/m	LIMIT dB $\mu$ V/m	EXCEEDING dB	ANT POL	HEIGHT in [m]	ANGLE in deg
36.06000	19.59	30.000	-10.41136	VER	1.6000	150.00
81.12000	19.40	30.000	-10.59845	VER	2.2000	300.00
149.79000	14.50	30.000	-15.49519	VER	2.2000	180.00
166.14000	17.21	30.000	-12.78814	HOR	2.2000	60.000
279.45000	26.63	37.000	-10.37320	HOR	3.4000	60.000
946.71000	32.79	37.000	-4.208393	VER	1.6000	150.00

Level [dB $\mu$ 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

## 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	12 months
Antenna	CBL 6111 Chase	1345	March 97	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

CF = Cable Attenuation Factor

Assume a receiver reading of 28,5 dB $\mu$ 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 $\mu$ V/m.

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

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

Level in  $\mu$ V/m =

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

**103,5  $\mu$ V/m**

## 7.6 Table of Correction Factors

Frequency range: 30 MHz to 1000 MHz

Frequency [MHz]	Correction Bilog Antenna with Pre-amplifier [dB]	Correction Cable [dB]	Correction Antenna + Cable [dB]
30,0	17,90	0,65	28,55
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

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Keyboard

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Frequency [MHz]	Correction Bilog Antenna with Pre-amplifier [dB]	Correction Cable [dB]	Correction Antenna + Cable [dB]
450,0	16,90	2,35	19,25
500,0	17,40	2,43	19,83
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

**SIEMENS**  
**NIXDORF**

Siemens Nixdorf Informationssysteme AG  
Keyboard

FCC Identifier:  
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