

Test Report

Electromagnetic Compatibility



DAT- P-121 / 02-00

Test report file no:
Applicant:

E-0012-1453-01 MG
VESTEL ELEKTRONIK SANAYI VE TICARET A.S.
Organze Sanayi Bölgesi
45030 MANISA

Contact person:
Model:

Hülya Döner
Vestel Promega PC

Kind of Product:

PC

Manufacturer:

VESTEL Kommunikation A.S.
Ege Serbest Bölgesi
Akay Cad. Ayfer Sk. No: 144/1
35410 Gaziemir
Izmir, Turkey

Test result Emission tests:

The tested sample meets the requirements stated on page 6
according to FCC Part 15 Subpart B

Date of issue:

2004-November-18

The testresult only responds to the tested sample.
It is not allowed to copy this report partly without the allowance of the test laboratory.

DIRECTORY

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IDENTIFICATION OF THE TEST LABORATORY

Company name: *emitel* AG

Address: Landshuter Str. 211a
D-94315 Straubing
Germany

Contact person: Dieter Fröhlich

Contact address: Phone: +49 9421 9746-0
Fax.: +49 9421 9746-70
eMail: germany@emitel.de
Homepage: www.emitel.de

FCC Registration number: 765810

DESCRIPTION OF THE EQUIPMENT UNDER TEST (EUT):

Date of receipt of test sample: 2004-November-02
Testing Start Date: 2004-November-05
Testing End Date: 2004-November-09

Number of received/tested samples: 1
Serial Number: 7160803000005
FCC-ID: SOQ-VESTELPROMEGA
Voltage consumption: 120V/60 Hz
Product status:
☐ Development Sample
☒ Preproduction Sample
☐ Production Sample

Dimensions: L x W x H: 49cm x 20cm x 43,5cm

Following system devices are parts of the EUT and were connected during the measurement:

Mouse:	Genius Power Scroll Eye PS/2 Optical	S/N 23002682751401
Keyboard:	Samsung SDM 4510P	S/N 43000822

Following cables were connected during the measurement:

Power supply cord:	2m, unshielded
LPT I cable:	3m, shielded
RS 232 cable:	2m, shielded
Headphone:	1,5m, unshielded
Network	3m, unshielded
USB cable	3m, shielded
FIR cable	2m shielded (port internal not connected to mainboard)

OPERATION MODES

OPERATION MODES:

Windows Desktop on screen – Mediaplayer is working for sound.

EUT MONITORING

Monitor	17" ADI Miroscan	S/N 167030
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ENVIRONMENTAL CONDITIONS

Temperature	20 °C
Humidity	50 %
Atmospheric pressure:	860-1060 mbar

STATEMENT OF MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report according to NIS 81 /5.1994 „The Treatment of Uncertainty in EMC Measurements“ and is documented in the emitel quality system according to EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

TEST SPECIFICATION

The tests were performed according to the following specifications:

- ☒ FCC Part 15 Subpart A Code of Regulations Part 15 (Radio Frequency Devices), December, 2003
Subpart A (General) of the Federal Communication Commission (FCC)
- ☒ FCC Part 15 Subpart B Code of Regulations Part 15 (Radio Frequency Devices), December, 2003
Subpart B (Unintentional Radiators) of the Federal Communication Commission (FCC)
- ☒ ANSI C63.4 American National Standard for Methods of 2001
Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz - 40 GHz

FCC Part 15 Subpart B

Specification	Result	Remarks
§15.107 Conducted emission	limit kept	
§15.109 Radiated emission	limit kept	

SUMMARY:

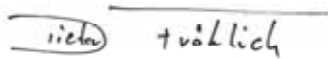
FINAL JUDGEMENT

The tested sample meets the requirements according to the technical regulations stated on page 6 of

**Code of Regulations Part 15 Subpart B (intentional radiators)
of the Federal Communication Commission (FCC)**

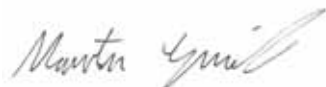
Straubing, 2004-November-18

emitel AG

 *Dieter Fröhlich*

Dieter Fröhlich
Dipl. Ing. (FH)
Director

Test engineer:

 *Martin Greil*

Martin Greil

Emission test

Conducted emission

(150 kHz - 30 MHz)

TEST CONDITIONS AND RESULTS:

Conducted emissions were measured in the frequency range 0.15 MHz to 30 MHz. The bandwidth of the EMI-Receiver was set to 10 kHz and the detector-function was set to CISPR quasi-peak.

The test setup was made in accordance with ANSI C63.4-2001.

Measurements were performed on phase and neutral lines of the power-cords of the tested system. Preliminary scans were taken with the detector-function of the EMI-receiver set to peak to determine the conducted EMI-profile of the EUT. At the final test the cables and equipment were placed and moved within the range of positions likely to find their maximum emissions.

The measurements were performed in a shielded room.

☐ Test not applicable

Testlocation: ☒ Shielded room 1
 ☐ Shielded room 2
 ☐ Shielded room 3
 ☐ Shielded room 4

Used test instruments and test accessories:

Test instrument	Type	Manufacturer	ID - No.
Test receiver	ESH 3	Rohde & Schwarz	01-01/01-01-065
LISN	ESH2-Z5	Rohde & Schwarz	01-01/01-01-041
LISN	NSLK 8128	Schwarzbeck	01-01/01-01-056
HF-cable	RG 223	Emitel	01-05/02-01-046
HF-cable	RG 214	Emitel	01-05/02-01-038

TEST RESULTS:

The requirements are: ☒ MET ☐ NOT MET

Remarks:

TEST CONDUCTED EMISSIONS:

Project file: E-0012-1453-01
Applicant: Vestel
Model: PC Vestel Promega 10031026
Date of test: 05.11.2004
Operator: Martin Greil

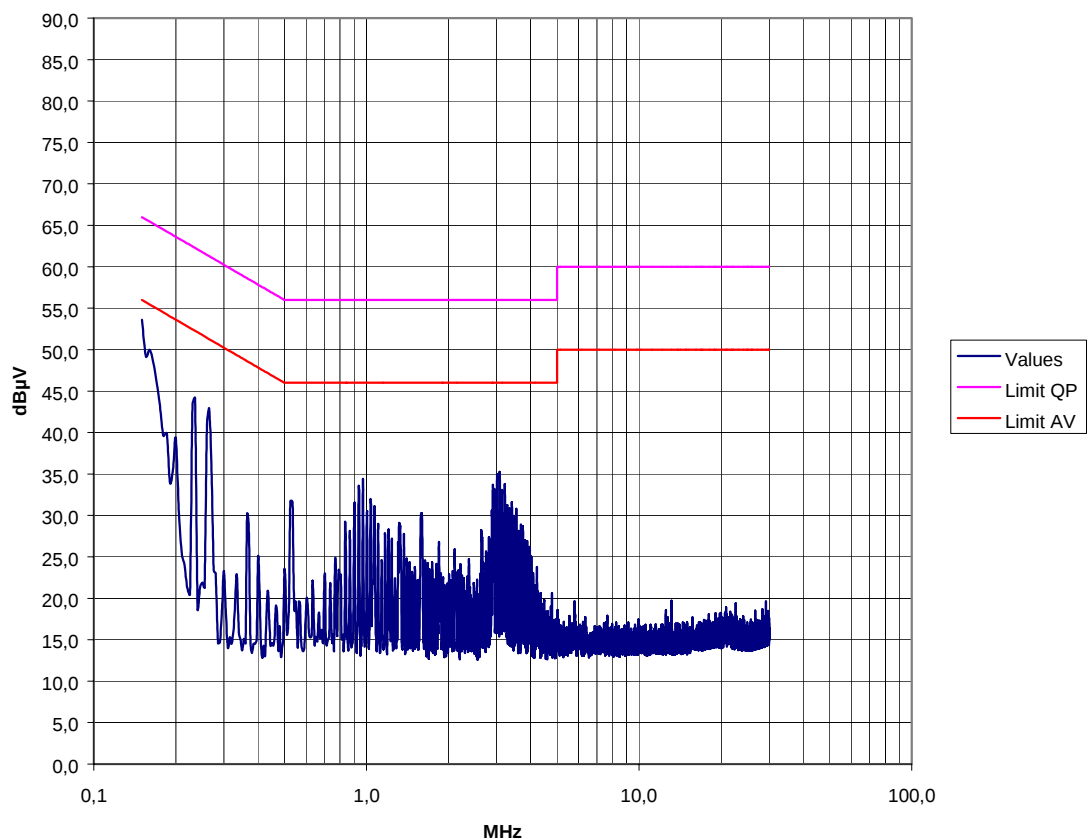
Mode:
PC Mode, Windows Desktop
(1024x768)

Detector: PEAK
Result: **SCAN**

FCC Part 15 Subpart B

Limit Class B

Phase L1



TEST CONDUCTED EMISSIONS:

Project file: E-0012-1453-01
Applicant: Vestel
Model: PC Vestel Promega 10031026
Date of test: 05.11.2004
Operator: Martin Greil

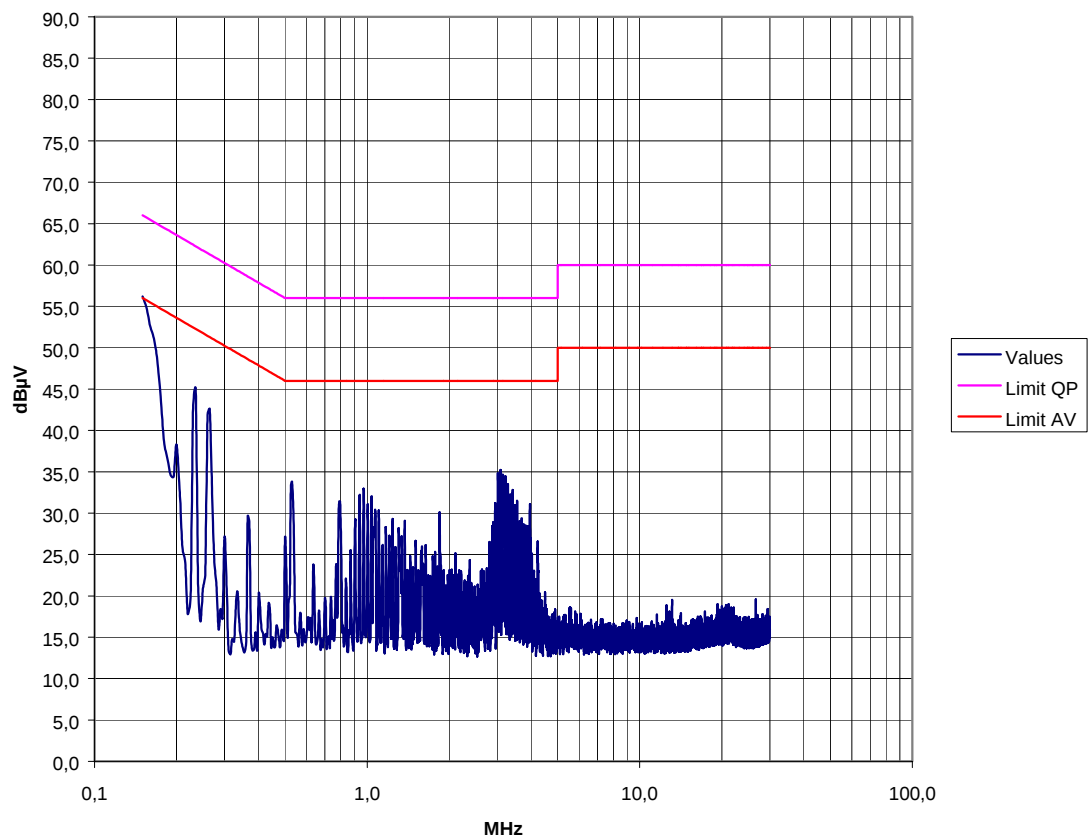
Mode:
PC Mode, Windows Desktop
(1024x768)

Detector: PEAK
Result: **SCAN**

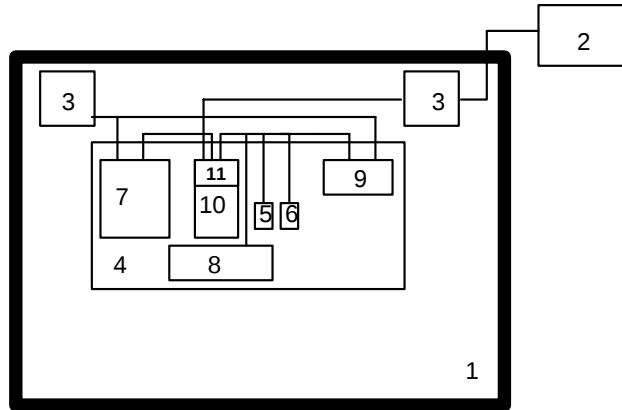
FCC Part 15 Subpart B

Limit Class B

Phase N



MEASUREMENT SETUP CONDUCTED EMISSIONS



- | | | |
|-----------------|-----------------------------|---------------------------------|
| 1 Shielded room | 2 Test receiver | 3 LISN |
| 4 Wooden table | 5 Optical PS/2 Mouse | 6 Serial Peripheral (mouse) |
| 7 Monitor | 8 PS2 Peripheral (keyboard) | 9 Parallel Peripheral (printer) |
| 10 EUT | 11 Headphone | |

PHOTO TESTSETUP CONDUCTED EMISSIONS



Radiated emission

(25 MHz – 1000 MHz)

TEST CONDITIONS AND RESULTS:

Radiated emissions are measured over the frequency range from 25 MHz to 1 GHz. The bandwidth of the EMI-receiver is set to 120 kHz and the detector-function is set to CISPR quasi-peak.

The test setup is made in accordance with ANSI C63.4-2001. Measurements are made in both the horizontal and vertical planes of polarization. Preliminary scans are taken in a full-anechoic room using a spectrum analyzer with the detector function set to peak. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.

All tests are performed at a test-distance of 3 meters. For final testing an open-area test-site is used. During the tests the EUT is rotated all around and the receiving-antenna is raised and lowered from 1 meter to 4 meters to find the maximum levels of emissions. The cables and equipment is placed and moved within the range of position likely to find their maximum emissions.

☐ Test not applicable

Test location: ☒ Shielded room 2, Pretest
☒ Open site, Final test

Antenna EuT distance: ☒ 3 m, Pretest
☒ 3 m, Final test

Used test instruments and test accessories:

Test instrument	Type	Manufacturer	ID - No.
Pretest:			
Spectrum Analyser	FSP 30	Rohde & Schwarz	01-01/01-01-063
Antenna	3142 B	EMCO	01-01/01-01-067
HF-Cable	RG 213	Suhner	01-05/02-01-043
HF-Cable	RG 213	Emitel	01-05/02-01-038
Preamplifier	TVV 695	MTS	01-05/02-01-016
Final test:			
Receiver	ESVP	Rohde & Schwarz	01-01/01-01-035
Antenna	VULB 9163	Schwarzbeck	01-01/01-01-059
HF-Cable	RG 217	Suhner	01-05/02-01-048
HF-Cable	RG 214	Emitel	01-05/02-01-050

TEST RESULTS:

The requirements are: ☒ MET ☐ NOT MET

Remarks:

RADIATED EMISSIONS:

Horizontal Antenna Polarization

Test distance: 3 m

Project file: E-0012-1453-01

Mode:

Applicant: Vestel

PC Mode, Windows Desktop

Model: Promega PC

(1024x768)

Date of test: 05.11.2004

Operator: Martin Greil

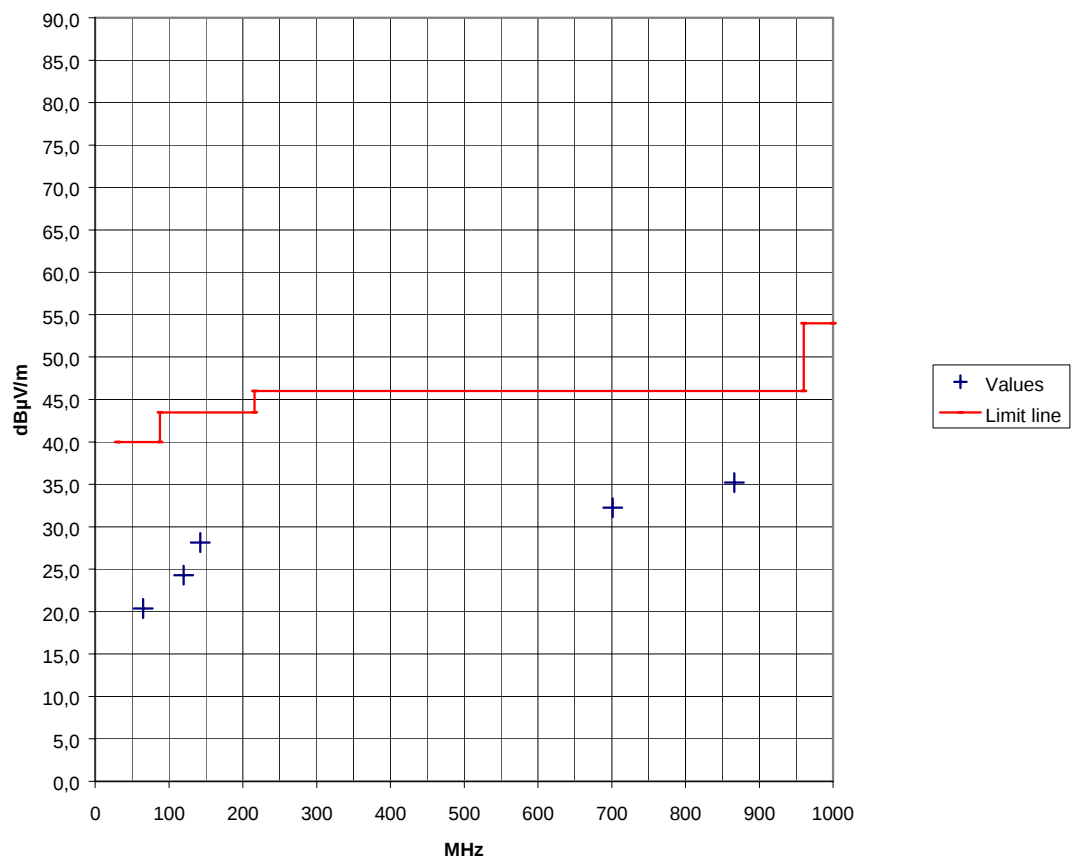
Detector: QuasiPeak

Result: Limit kept

FCC Part 15

Subpart B, Limit QP

Horizontal Polarization



FINAL TEST RADIATED EMISSION (TABLE):

Horizontal Antenna Polarization

Test distance: 3 m

Project file: E-0012-1453-01
Applicant: Vestel
Model: Promega PC
Date of test: 05.11.2004
Operator: Martin Greil

Mode:
PC Mode, Windows Desktop
(1024x768)

Detector: QuasiPeak
Result: Limit kept

FCC Part 15

Subpart B, Limit QP

Horizontal Polarization

Frequency [MHz]	Reading [dBμV]	Correction [dB]	Value [dBμV/m]	Limit [dBμV/m]	Limit exceeded [dB]
64,9	7,9	12,5	20,4	40,0	
119,9	12,2	12,1	24,3	43,5	
142,5	17,9	10,3	28,2	43,5	
701,4	7,2	25,0	32,2	46,0	
866,1	7,5	27,7	35,2	46,0	

Remarks: Field strength value (dBμV/m) = Reading (dBμV) + Correction (dB)
Frequencies which are not listed have a margin more than 6dB to the limit.

RADIATED EMISSIONS:

Vertical Antenna Polarization

Test distance: 3 m

Project file: E-0012-1453-01
Applicant: Vestel
Model: Promega PC
Date of test: 05.11.2004
Operator: Martin Greil

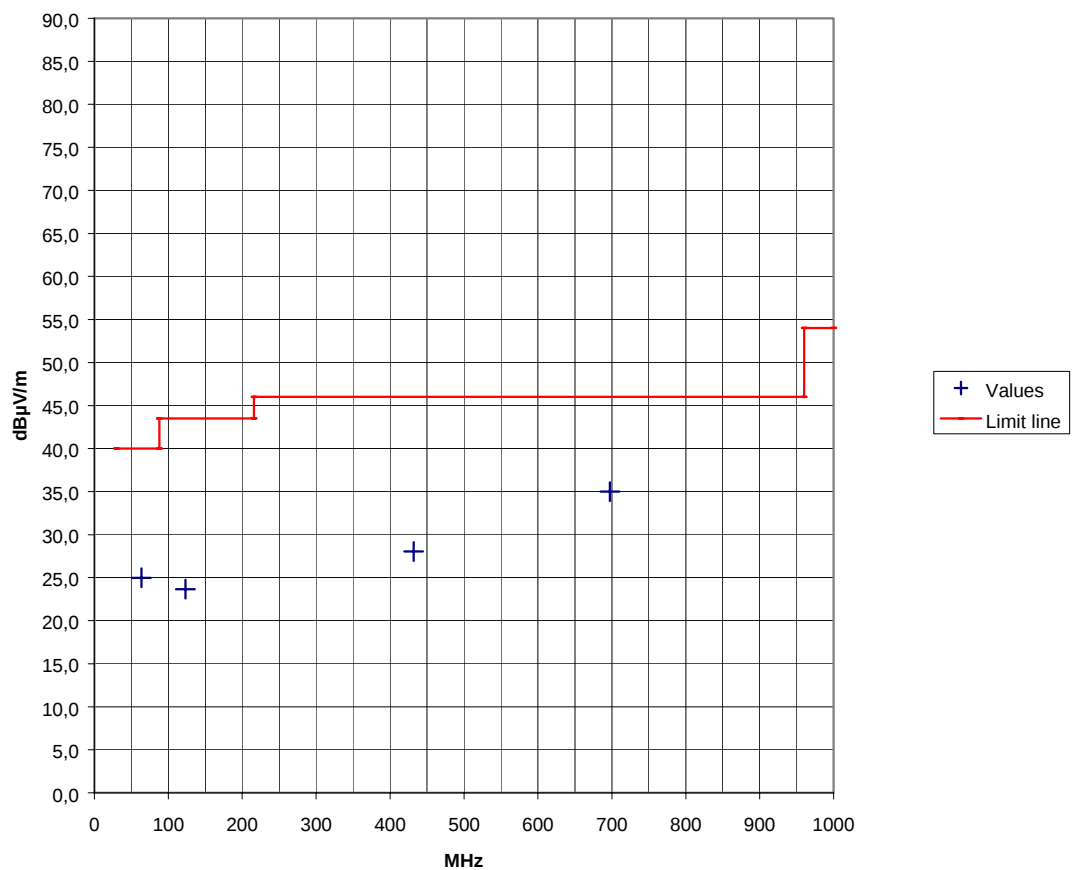
Mode:
PC Mode, Windows Desktop
(1024x768)

Detector: QuasiPeak
Result: Limit kept

FCC Part 15

Subpart B, Limit QP

Vertical Polarization



FINAL TEST RADIATED EMISSIONS (TABLE):

Vertical Antenna Polarization

Test distance: 3 m

Project file: E-0012-1453-01
Applicant: Vestel
Model: Promega PC
Date of test: 05.11.2004
Operator: Martin Greil

Mode:
 PC Mode, Windows Desktop
 (1024x768)

Detector: QuasiPeak
Result: Limit kept

FCC Part 15

Subpart B, Limit QP

Vertical Polarization

Frequency [MHz]	Reading [dBμV]	Correction [dB]	Value [dBμV/m]	Limit [dBμV/m]	Limit exceeded [dB]
63,5	12,5	12,5	25,0	40,0	
123,1	11,7	12,0	23,7	43,5	
432,1	7,6	20,4	28,0	46,0	
697,4	10,0	25,0	35,0	46,0	

Remarks: Field strength value (dBμV/m) = Reading (dBμV) + Correction (dB)
Frequencies which are not listed have a margin more than 6dB to the limit.

Radiated emission

(1 GHz – 20 GHz)

TEST CONDITIONS AND RESULTS:

Radiated emissions are measured over the frequency range from 1 GHz to 20 GHz. The bandwidth of the spectrum analyser is set to 1 MHz and the detector-function is set to average.

The test setup is made in accordance with ANSI C63.4-2001. Measurements are made in both the horizontal and vertical planes of polarization. Preliminary scans are taken in a full-anechoic room using a spectrum analyzer with the detector function set to peak. This preliminary scans were performed at the lowest, middle and highest channel to find the worst case. Final measurement was performed with in this worst case. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.

All tests are performed at a test-distance of 3 meters. For final testing an open-area test-site is used. During the tests the EUT is rotated all around and the receiving-antenna is raised and lowered from 1 meter to 4 meters to find the maximum levels of emissions. The cables and equipment is placed and moved within the range of position likely to find their maximum emissions.

☐ Test not applicable

Test location: ☒ Shielded room 2, Pretest
☒ Open site, Final test

Antenna EuT distance: ☒ 3 m, Pretest
☒ 3 m, Final test

Used test instruments and test accessories:

Test instrument	Type	Manufacturer	ID - No.
Spectrum Analyser	FSP 30	Rohde & Schwarz	01-01/01-01-063
Preamplifier	AMF-40-005-180-24-10P	MITEQ Inc.	01-02/01-02-005
Antenna Horn 1-18GHz	3115	ETS EMC Systems LP	01-01/01-01-062
Antenna Horn 18-26,5GHz	3160-09	ETS EMC Systems LP	01-05/02-01-002
HF-cable	FA210A0050M	Anritsu GmbH	01-05/02-01-034

TEST RESULTS:

The requirements are: ☒ MET ☐ NOT MET

Remarks: _____

FINAL TEST RADIATED EMISSIONS:

Horizontal Antenna Polarization

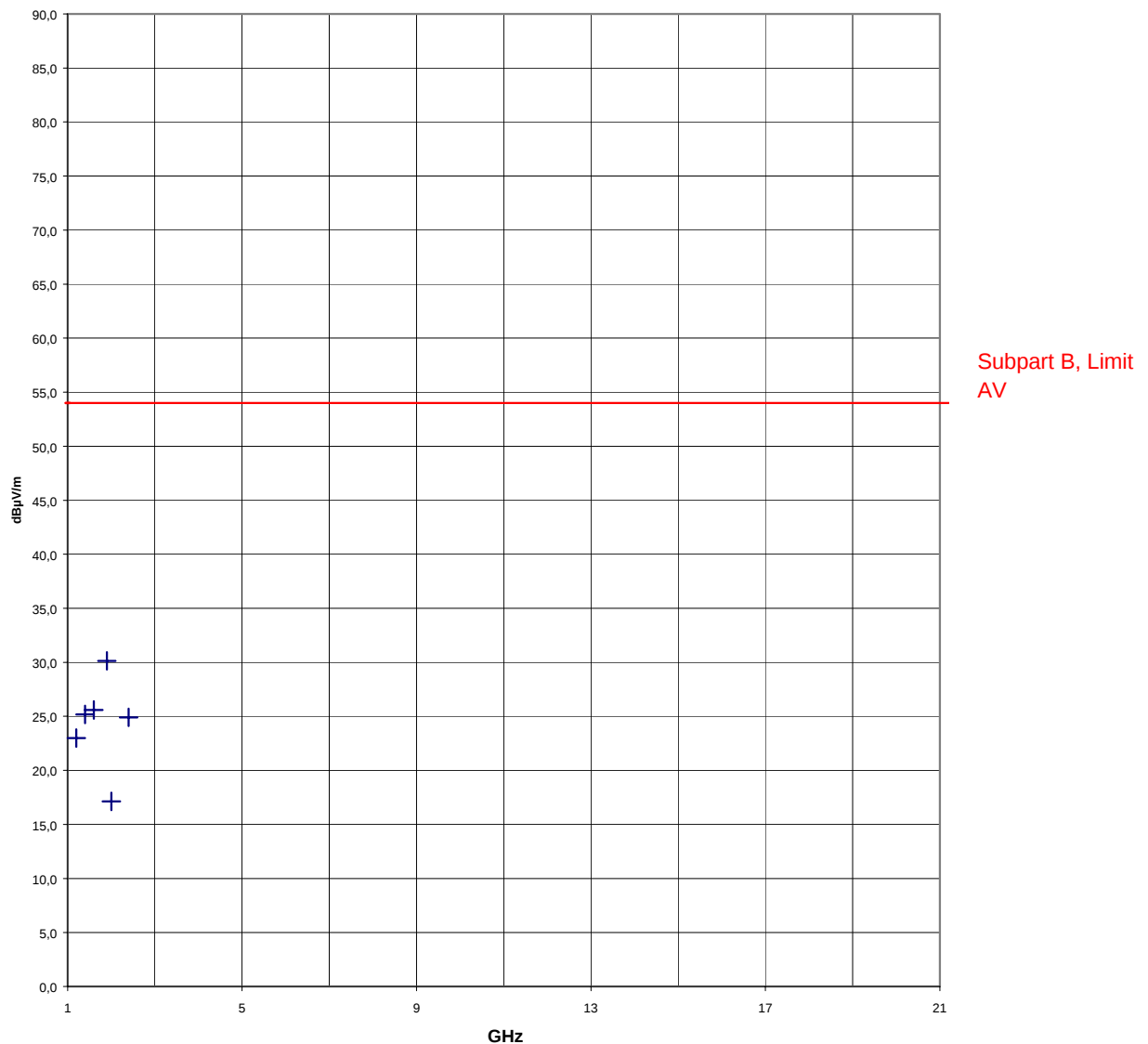
Test distance: 3 m

Project file: E-0012-1453-01
Applicant: Vestel
Model: Promega PC
Date of test: 08.11.2004
Operator: Martin Greil
Detector: AV
Result: Limit kept

Mode:
 PC Mode, Windows Desktop
 (1024x768)

FCC Part 15 Subpart B, Limit AV

Horizontal Polarization



FINAL TEST RADIATED EMISSION (TABLE):

Horizontal Antenna Polarization

Test distance: 3 m

Project file: E-0012-1453-01
Applicant: Vestel
Model: Promega PC
Date of test: 08.11.2004
Operator: Martin Greil
Detector: AV
Result: Limit kept

Mode:
 PC Mode, Windows Desktop
 (1024x768)

FCC Part 15 Subpart B, Limit AV

Horizontal Polarization

Frequency [GHz]	Reading [dBμV]	Correction [dB]	Value [dBμV/m]	Limit [dBμV/m]	Limit exceeded [dB]
1,20	33,0	-10,0	23,0	54,0	
1,40	34,0	-8,8	25,2	54,0	
1,60	33,2	-7,6	25,6	54,0	
1,90	35,7	-5,6	30,1	54,0	
2,00	22,0	-4,9	17,1	54,0	
2,40	29,2	-4,3	24,9	54,0	

Remarks: Frequencies which are not listed have a margin more than 6dB to the limit.

FINAL TEST RADIATED EMISSION:

Vertical Antenna Polarization

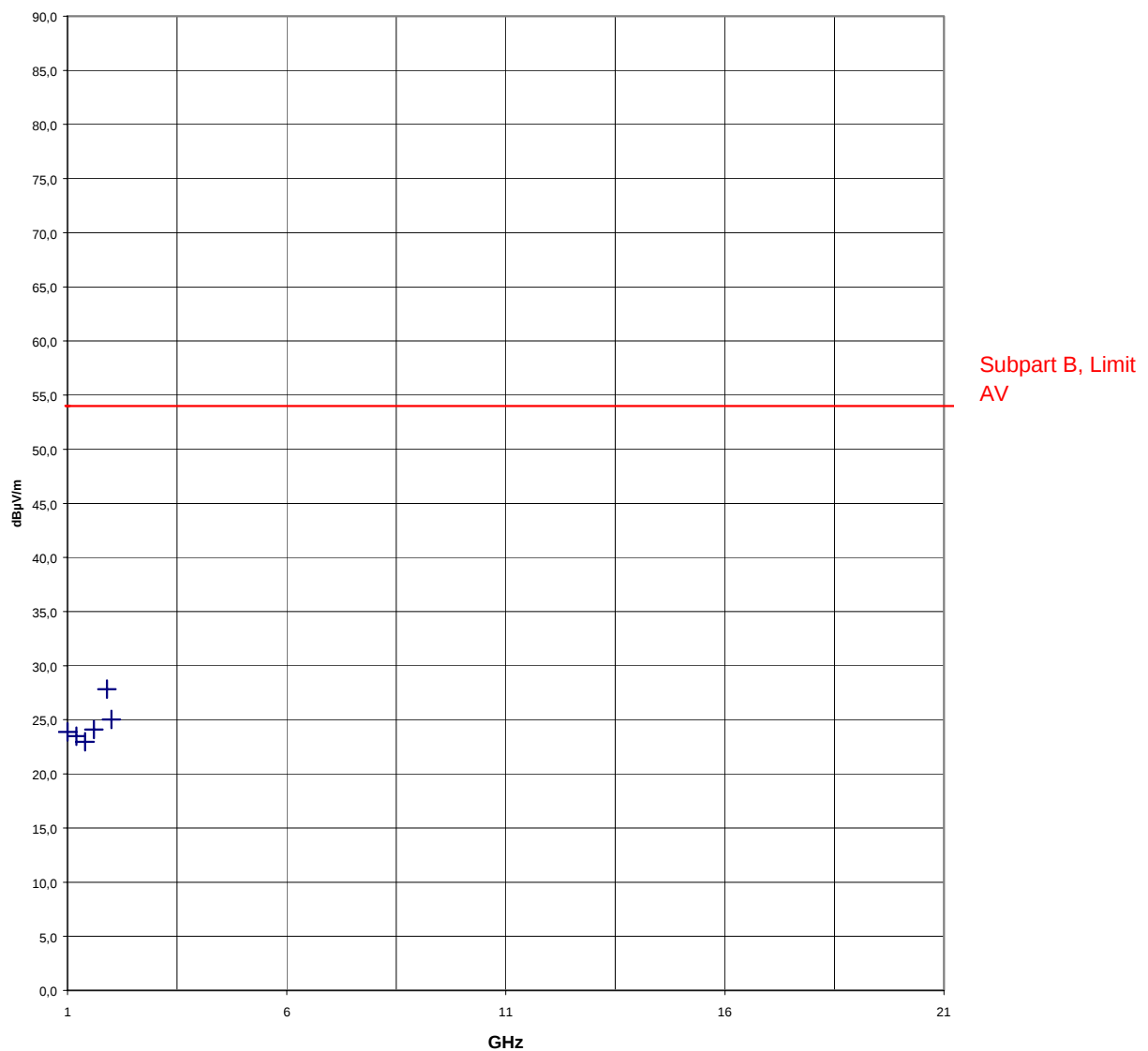
Test distance: 3 m

Project file: E-0012-1453-01
Applicant: Vestel
Model: Promega PC
Date of test: 08.11.2004
Operator: Martin Greil
Detector: AV
Result: Limit kept

Mode:
PC Mode, Windows Desktop
(1024x768)

FCC Part 15 Subpart B, Limit AV

Vertical Polarization



FINAL TEST RADIATED EMISSIONS (TABLE):

Vertical Antenna Polarization

Test distance: 3 m

Project file: E-0012-1453-01
Applicant: Vestel
Model: Promega PC
Date of test: 08.11.2004
Operator: Martin Greil
Detector: AV
Result: Limit kept

Mode:
 PC Mode, Windows Desktop
 (1024x768)

FCC Part 15 Subpart B, Limit AV

Vertical Polarization

Frequency [GHz]	Reading [dBμV]	Correction [dB]	Value [dBμV/m]	Limit [dBμV/m]	Limit exceeded [dB]
1.00	34,8	-10,9	23,9	54,0	
1.20	33,5	-10,0	23,5	54,0	
1.40	31,8	-8,8	23,0	54,0	
1.60	31,7	-7,6	24,1	54,0	
1.90	33,4	-5,6	27,8	54,0	
2.00	29,9	-4,9	25,0	54,0	

Remarks: Frequencies which are not listed have a margin more than 6dB to the limit.

MEASUREMENT SETUP RADIATED EMISSIONS

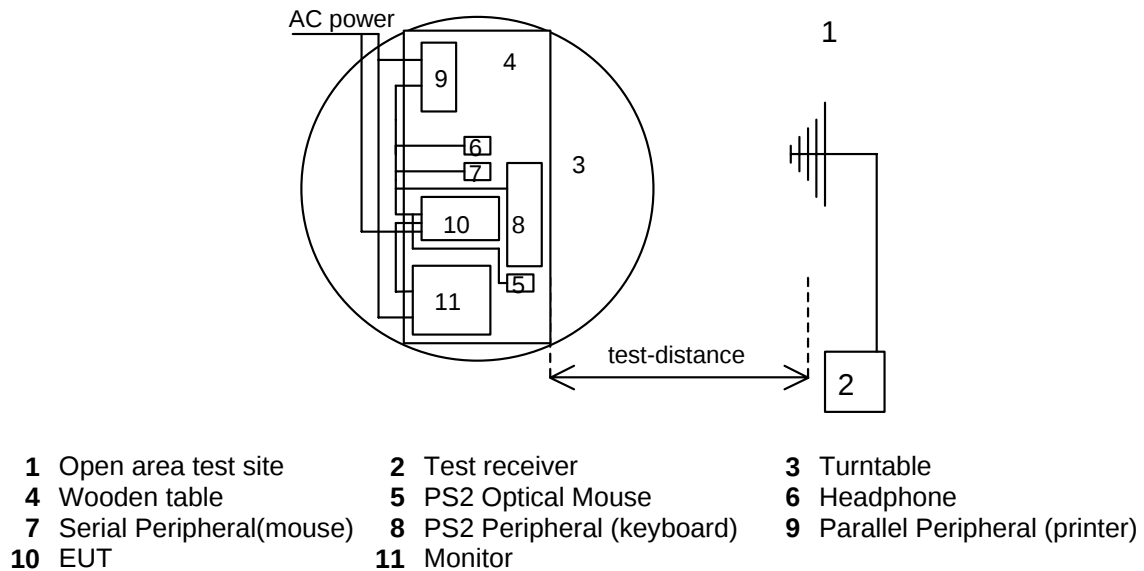


PHOTO TESTSETUP RADIATED EMISSION

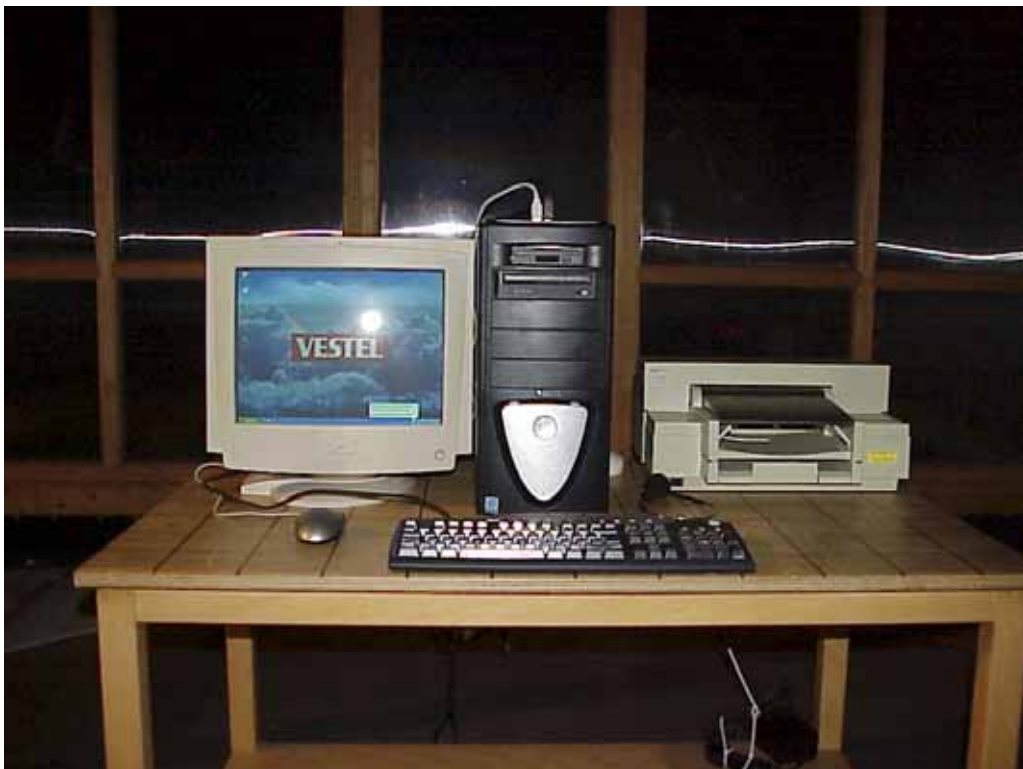


PHOTO OF THE TESTSAMPLE

FRONT VIEW



REAR VIEW



SIDE VIEW



OPEN COVER VIEW



KEYBOARD TOP VIEW



KEYBOARD BOTTOM VIEW



MOUSE TOP VIEW



MOUSE BOTTOM VIEW



HARD DISK TOP VIEW



HARD DISK BOTTOM VIEW



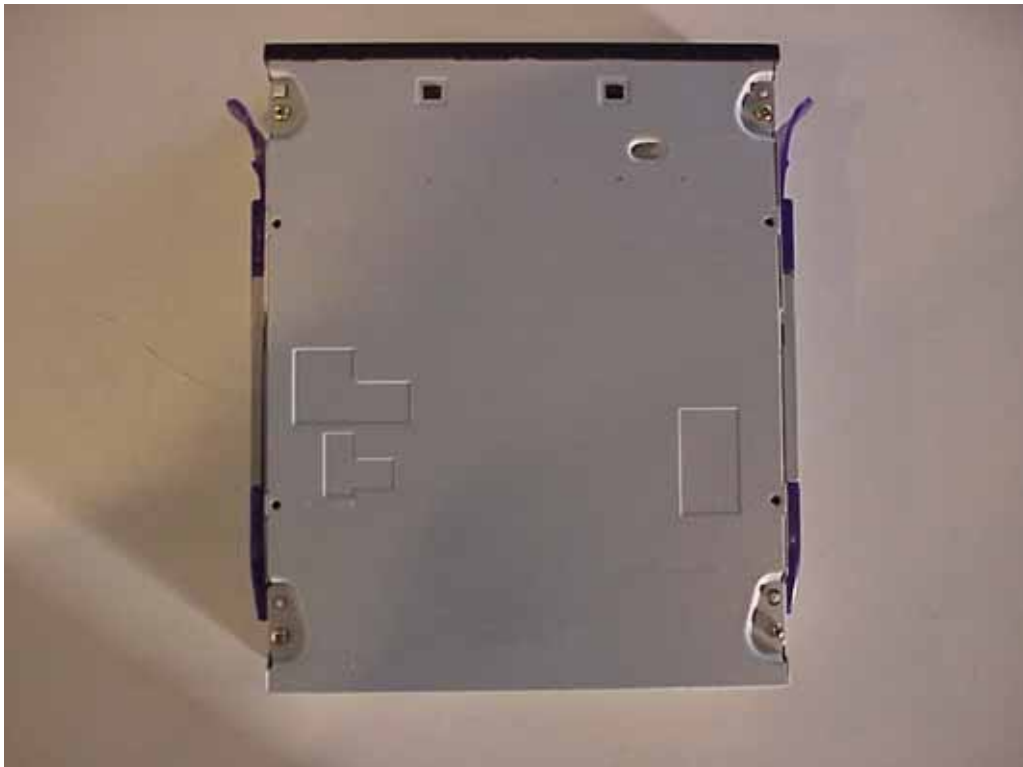
CD-ROM FRONT VIEW



CD-ROM TOP VIEW



CD-ROM BOTTOM VIEW



CD-ROM REAR VIEW



FDD-FRONT VIEW



FDD-TOP VIEW



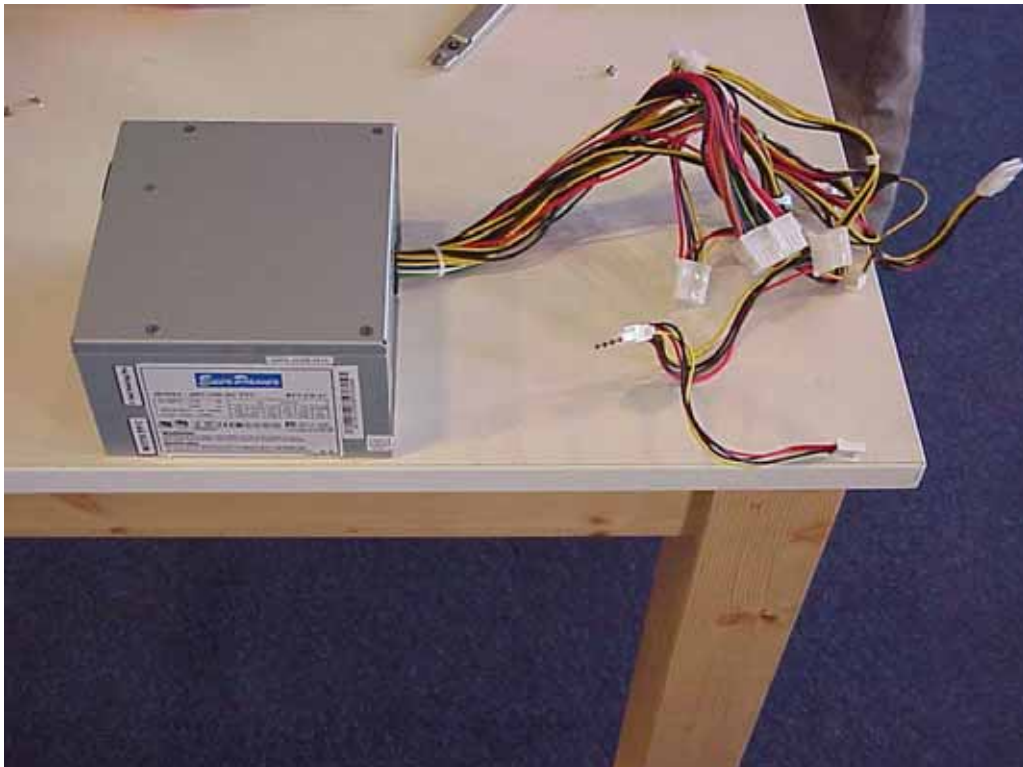
FDD-BOTTOM VIEW



POWER SUPPLY SIDE VIEW



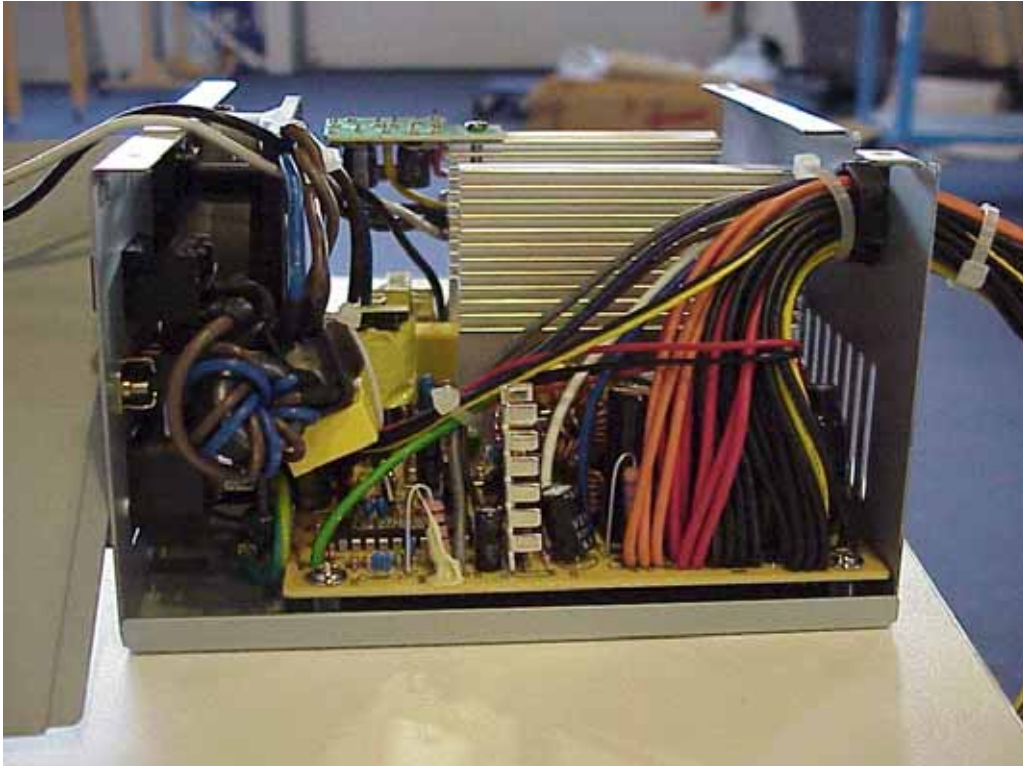
POWER SUPPLY TOP VIEW



POWER SUPPLY PCB TOP VIEW



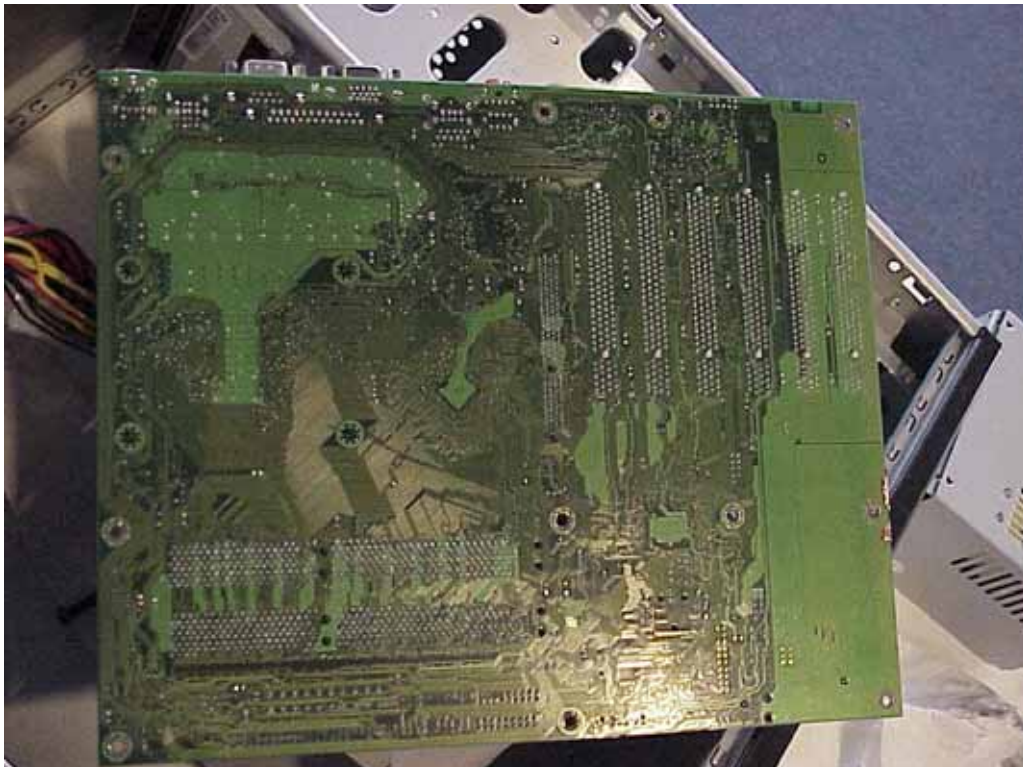
POWER SUPPLY PCB SIDE VIEW



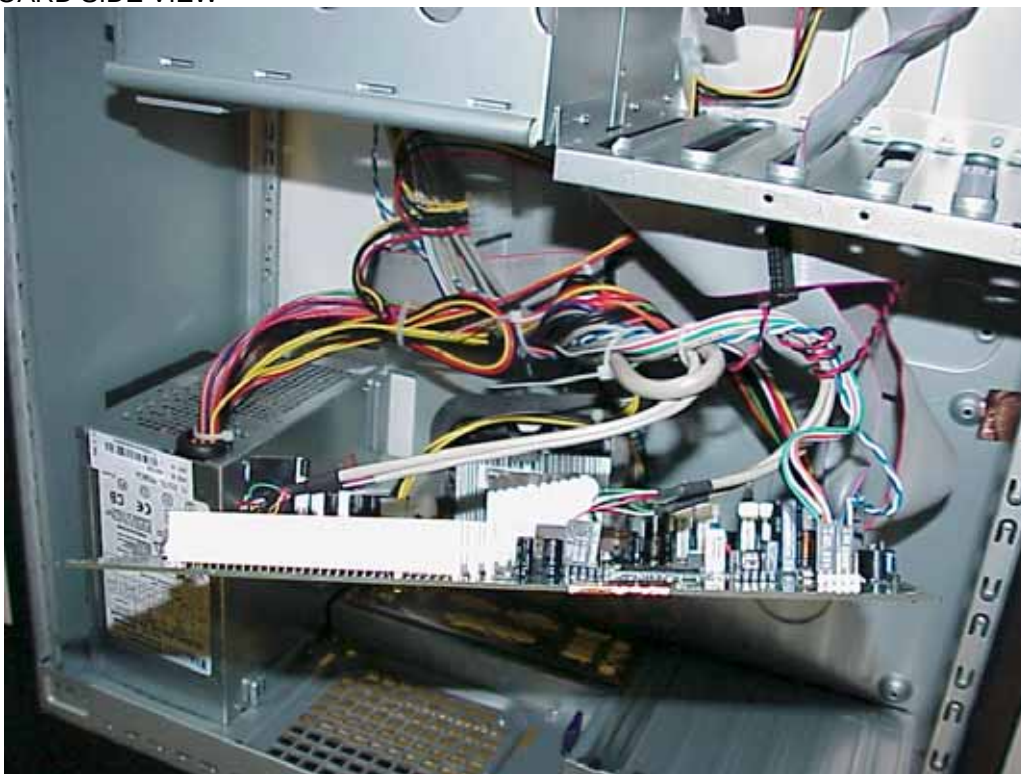
CHASSIS FAN TOP VIEW



MAINBOARD BOTTOM VIEW



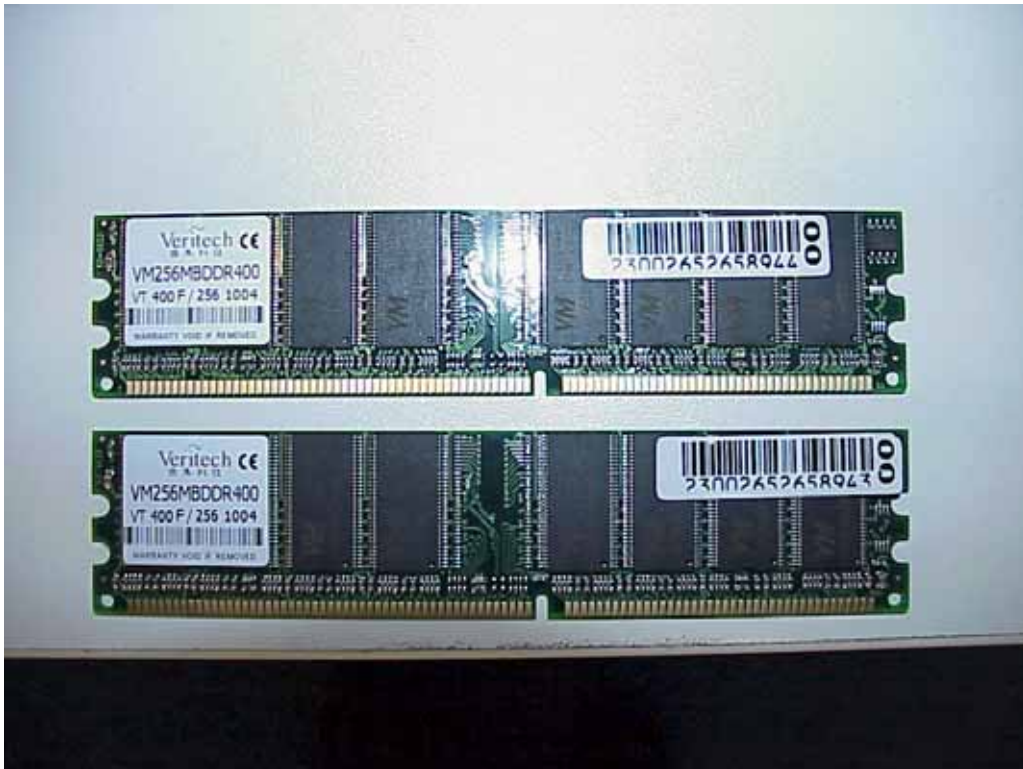
MAINBOARD SIDE VIEW



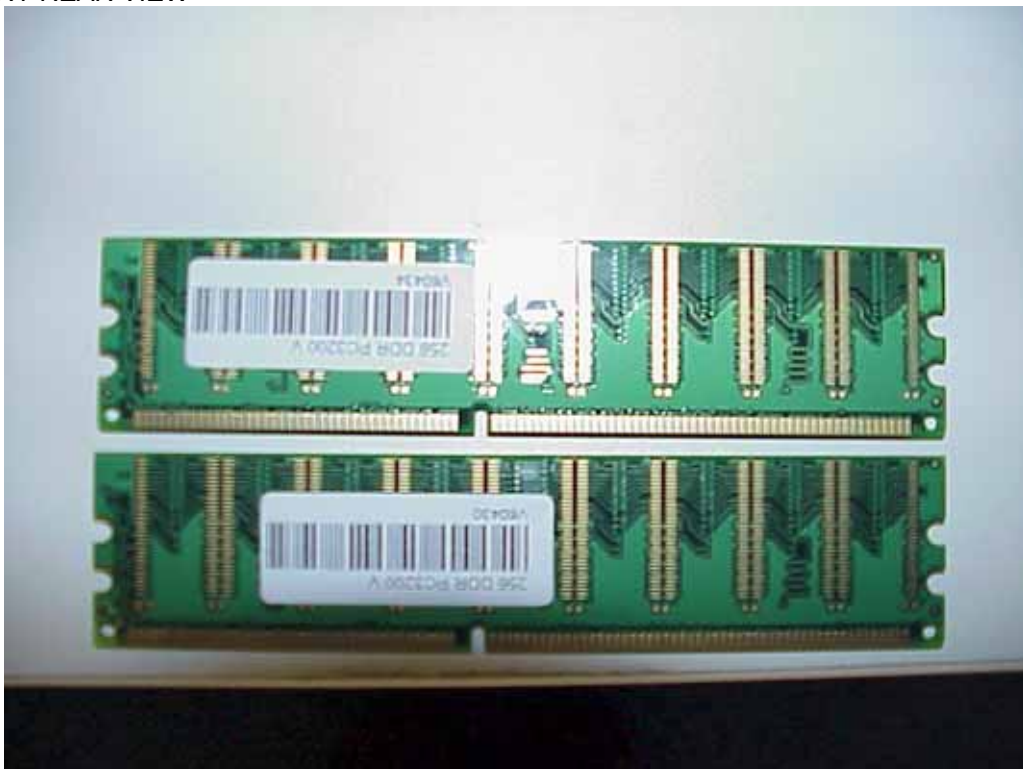
MAINBOARD REAR VIEW



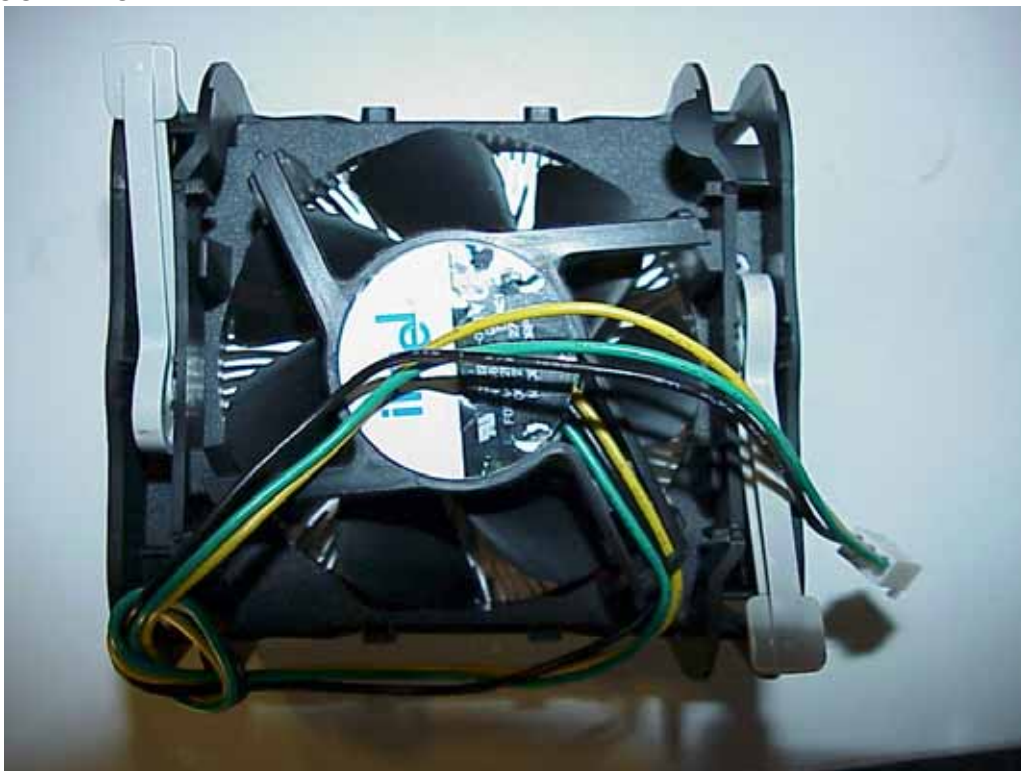
MEMORY FRONT VIEW



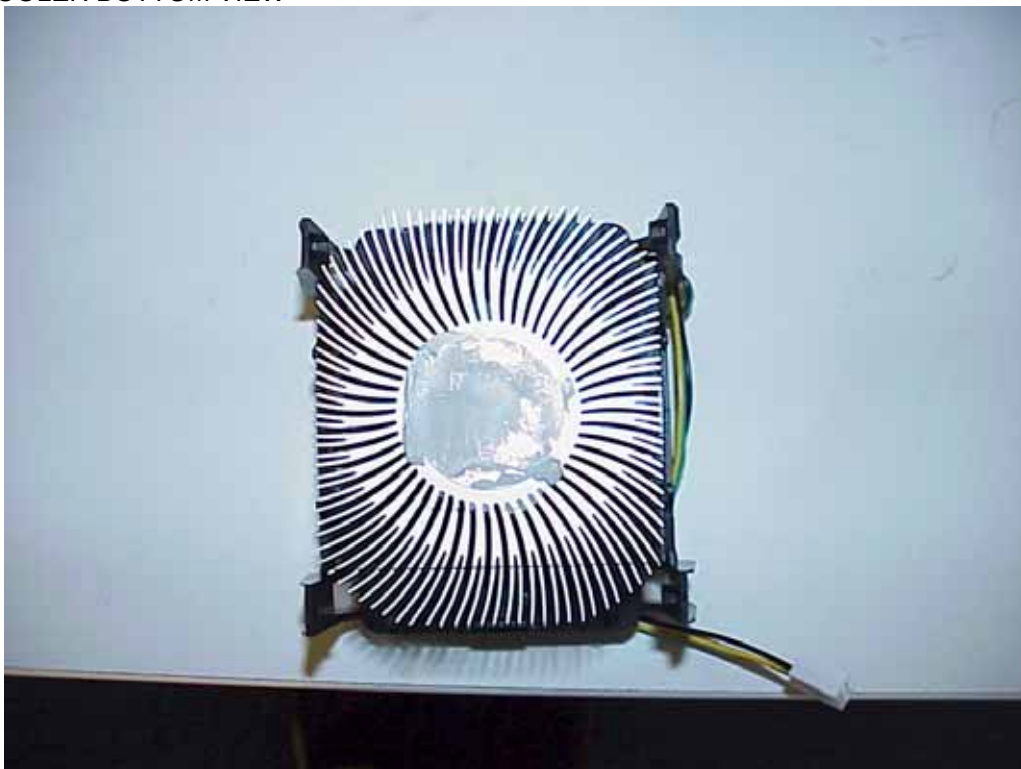
MEMORY REAR VIEW



CPU COOLER TOP VIEW



CPU COOLER BOTTOM VIEW



CPU TOP VIEW



CPU BOTTOM VIEW

