FCC TEST REPORT

for

CISPR PUB. 22 Class B

Equipment	:	VGA Card
Model No.	:	PT-2081
FCC ID	:	H52PT-2081
Filing Type	:	Original Grant
Applicant	:	**PURETEK INDUSTRIAL CO., LTD.** 4F, NO. 12, LANE 235, PAO-CHIAO RD., HSINTIEN CITY, TAIPEI, TAIWAN, R.O.C.

- The test result refers exclusively to the test presented test model / sample.
- Without the written authorization of the test lab., the Test Report may not be copied.
- **Certificate or Test Report must not be used by the applicant to claim the product in this test report endorsement by NVLAP or any agency of U.S. government.**

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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Certificate No. : F9O0509

CERTIFICATE OF COMPLIANCE

for

CISPR PUB. 22 Class B

Equipment : VGA Card

Model No. : PT-2081

FCC ID : H52PT-2081

Applicant : **PURETEK INDUSTRIAL CO., LTD.**
4F, NO. 12, LANE 235, PAO-CHIAO RD., HSINTIEN CITY, TAIPEI, TAIWAN, R.O.C.

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 1992** and the energy emitted by this equipment was ***passed*** **CISPR PUB. 22** both radiated and conducted emission class B limits. Testing was carried out on Oct. 7, 1999 at **SPORTON International Inc.** LAB. in Lin Kou.

_____

W. L. Huang
General Manager

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1. General Description of Equipment under Test

1.1. Applicant

PURETEK INDUSTRIAL CO., LTD.
4F, NO. 12, LANE 235, PAO-CHIAO RD., HSINTIEN CITY,
TAIPEI, TAIWAN, R.O.C.

1.2. Manufacturer

Same as 1.1.

1.3. Basic Description of Equipment under Test

Equipment	: VGA Card
Model No.	: PT-2081
FCC ID	: H52PT-2081
Trade Name	: PURETEK
Data cable	: Shielded, 1.15m
Power Supply Type	: From PC
Power Cord	: N/A

1.4. Feature of Equipment under Test

. Hight -Performance 2D / 3D / Video Accelerators:
Floating point triangle setup engine.
Single cycle 3D architecture.
128-bit rendering pipeline.
140m pixels/second trilinear fill rate.
. 3D Rendring Features:
Single-pass multiple textures.
Hardware bump mapping.
8-bit stenci1 buffer.
16- or 24-bit Z-buffering.

2. Test Configuration of Equipment under Test

2.1. Test Manner

a. The EUT has been associated with personal computer and peripherals pursuant to ANSI C63.4-1992 and configuration operated in a manner which tended to maximize its emission characteristics in a typical application.
b. The HITACHI Monitor, DELL PS/2 Keyboard, PRIMAX PS/2 Mouse, HP Printer, ACEEX Modem and EUT were connected to the FIC PC for EMI test.
c. The following display resolution were investigated during the compliance test :
   1. Horizontal frequency (640 x 480 to 1600 x 1200, 31.5Khz to 106KHz)
   2. Vertical frequency (60Hz to 85Hz)
d. According to the above tests, we listed the following display modes as the worst cases :
   1. 1600x1200 / 85Hz / 106K
   2. 1280x1024 / 85Hz / 94K
e. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 2,000 MHz.

2.2. Description of Test System

Support Unit 1. -- Personal Computer (FIC)

FCC ID	: N/A
Model No.	: P2L97
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0037
Data Cable	: Shielded, 360 degree via metal backshells
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 2. -- Monitor (HITACHI)

FCC ID	: N/A
Model No.	: CM753ET
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0176
Data Cable	: Shielded, 360 degree via metal backshells, 1.15m
Remark	: This support device was tested to compy with FCC standards and authorized under a declaration of conformity.

Support Unit 3. -- PS/2 Keyboard (DELL)

FCC ID	: GYUM92SK
Model No.	: AT101(DE8M)
Serial No.	: SP0054
Data Cable	: Shielded, 360 degree via metal backshells, 1.9m

Support Unit 4. -- PS/2 Mouse (PRIMAX)

FCC ID	: EMJMUSJQ
Model No.	: MUS9J
Serial No.	: SP0045
Data Cable	: Shielded, 360 degree via metal backshells, 1.7m

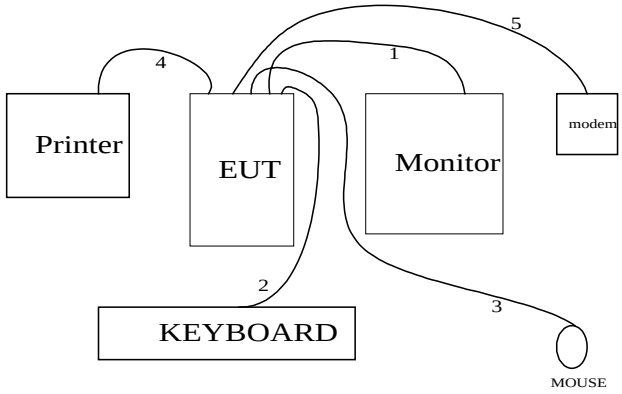
Support Unit 5. -- Printer (HP)

FCC ID	: B94C2642X
Model No.	: DeskJet 400
Power Supply Type	: Linear
Power Cord	: Non-Shielded
Serial No.	: SP0048
Data Cable	: Braided-Shielded, 360 degree via metal backshells, 1.35m

Support Unit 6. -- Modem (ACEEX)

FCC ID	: IFAXDM1414
Model No.	: DM1414
Power Supply Type	: Linear
Power Cord	: Non-Shielded
Serial No.	: SP0015
Data Cable	: Shielded, 360 degree via metal backshells, 1.15m

2.3. Connection Diagram of Test System



1. The I/O cable is connected from EUT to the support unit 2.
2. The I/O cable is connected from PC to the support unit 3.
3. The I/O cable is connected from PC to the support unit 4.
4. The I/O cable is connected from PC to the support unit 5.
5. The I/O cable is connected from PC to the support unit 6.

3. Test Software

An executive program, WINFCC.EXE, which generates a complete line of continuously repeating “H“ pattern was used as the test software.

The program was executed as follows :

a. Turn on the power of all equipment.

b. The PC reads the test program from the floppy disk drive and runs it.

c. The PC sends “H” messages to the monitor, and the monitor displays “H“ patterns on the screen.

d. The PC sends “H” messages to the printer, then the printer prints them on the paper.

e. The PC sends “H” messages to the modem.

f. The PC sends “H” messages to the internal Hard Disk, and the Hard Disk reads and writes the message.

g. Repeat the steps from b to f.

4. General Information of Test

4.1. Test Facility

This test was carried out by SPORTON International Inc.

Test Site Location : No. 30-2, Lin 6, Diing-Fwu Tsuen, Lin-Kou-Hsiang,
Taipei Hsien, Taiwan, R.O.C.
TEL : 886-2-2601-1640
FAX : 886-2-2601-1695

4.2. Standard for Methods of Measurement

ANSI C63.4-1992

4.3. Test in Compliance with

CISPR PUB. 22 Class B

4.4. Frequency Range Investigated

a. Conduction: from 150 kHz to 30 MHz
b. Radiation : from 30 MHz to 2,000 MHz

4.5. Test Distance

The test distance of radiated emission from antenna to EUT is 10 M.

5. Test of Conducted Powerline

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 115 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-1992 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 5.3. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

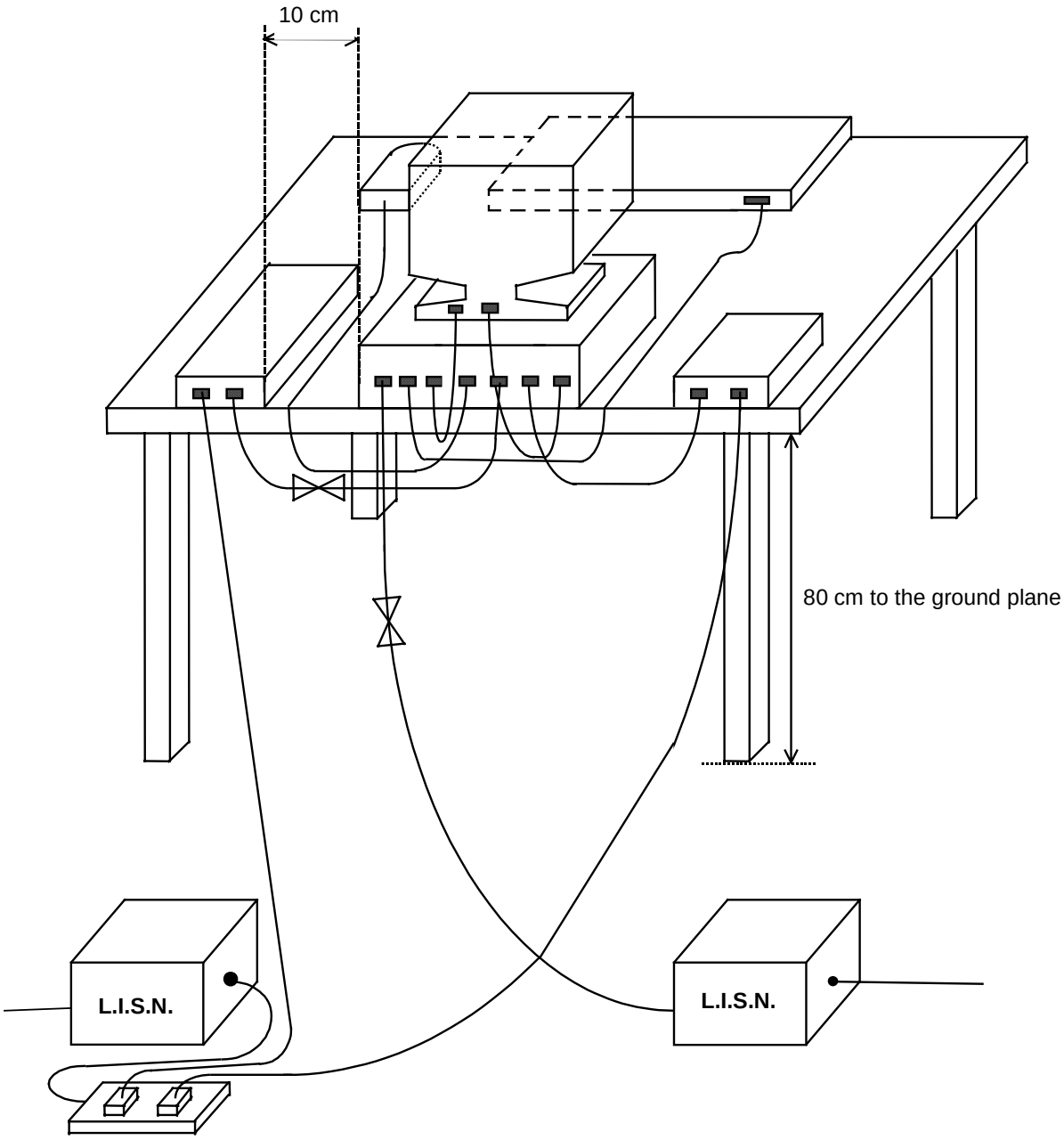
5.1. Major Measuring Instruments

Test Receiver	HP 8591EM
Attenuation	0 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
Step MHz	0.007 MHz
IF Bandwidth	9 kHz

5.2. Test Procedures

a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connect to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
i. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 6 dB margin will be retested one by one using the quasi-peak method and reported.

5.3. Typical Test Setup Layout of Conducted Powerline



5.4. Test Result of AC Powerline Conducted Emission

5.4.1. Test mode : 1280 x 1024 85Hz / 94K

- Temperature : 25°C
- Relative Humidity : 51 %
- Test Date : Oct. 7, 1999

The Conducted Emission test was passed at minimum margin

LINE 0.189 MHz / 49.60 dBuV.

Freq.	Line	Meter Reading				Limits				Margin	
	or	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.
(MHz)	Neutral	(dBuV)	(dBuV)	(uV)	(uV)	(dBuV)	(dBuV)	(uV)	(uV)	(dB)	(dB)
0.189	L	50.00	49.60	316.23	302.00	64.10	54.10	1602.88	506.88	-14.1	-4.5
0.660	L	32.90	31.20	44.16	36.31	56.00	46.00	630.96	199.53	-23.1	-14.8
2.260	L	28.20	25.40	25.70	18.62	56.00	46.00	630.96	199.53	-27.8	-20.6
0.189	N	47.00	46.70	223.87	216.27	64.10	54.10	1603.69	507.13	-17.1	-7.4
0.942	N	30.80	29.00	34.67	28.18	56.00	46.00	630.96	199.53	-25.2	-17.0
2.260	N	31.10	29.20	35.89	28.84	56.00	46.00	630.96	199.53	-24.9	-16.8

Test Engineer : _____
KENNY CHUANG

5.4.2. Test mode : 1600 x 1200 85Hz / 106K

- Temperature : 25°C
- Relative Humidity : 51 %
- Test Date : Oct. 7, 1999

The Conducted Emission test was passed at minimum margin

LINE 0.189 MHz / 49.60 dBuV.

Freq.	Line	Meter Reading				Limits				Margin	
	or	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.
(MHz)	Neutral	(dBuV)	(dBuV)	(uV)	(uV)	(dBuV)	(dBuV)	(uV)	(uV)	(dB)	(dB)
0.189	L	49.90	49.60	312.61	302.00	64.08	54.08	1599.64	505.85	-14.2	-4.5
0.944	L	29.80	27.20	30.90	22.91	56.00	46.00	630.96	199.53	-26.2	-18.8
3.111	L	27.60	24.10	23.99	16.03	56.00	46.00	630.96	199.53	-28.4	-21.9
0.188	N	46.80	46.40	218.78	208.93	64.12	54.12	1606.95	508.16	-17.3	-7.7
0.944	N	30.70	28.90	34.28	27.86	56.00	46.00	630.96	199.53	-25.3	-17.1
2.736	N	31.80	30.20	38.90	32.36	56.00	46.00	630.96	199.53	-24.2	-15.8

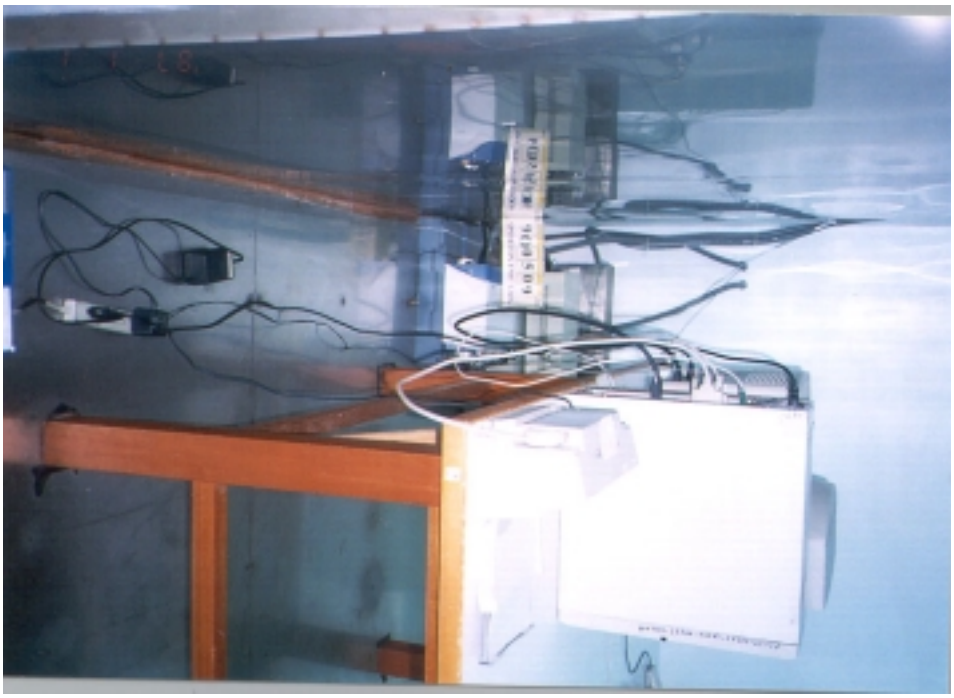
Test Engineer : _____
KENNY CHUANG

5.5. Photographs of Counducted Powerline Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW

REAR VIEW



SIDE VIEW

6. Test of Radiated Emission

Radiated emissions from 30 MHz to 2,000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in ANSI C63.4-1992. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in section 6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

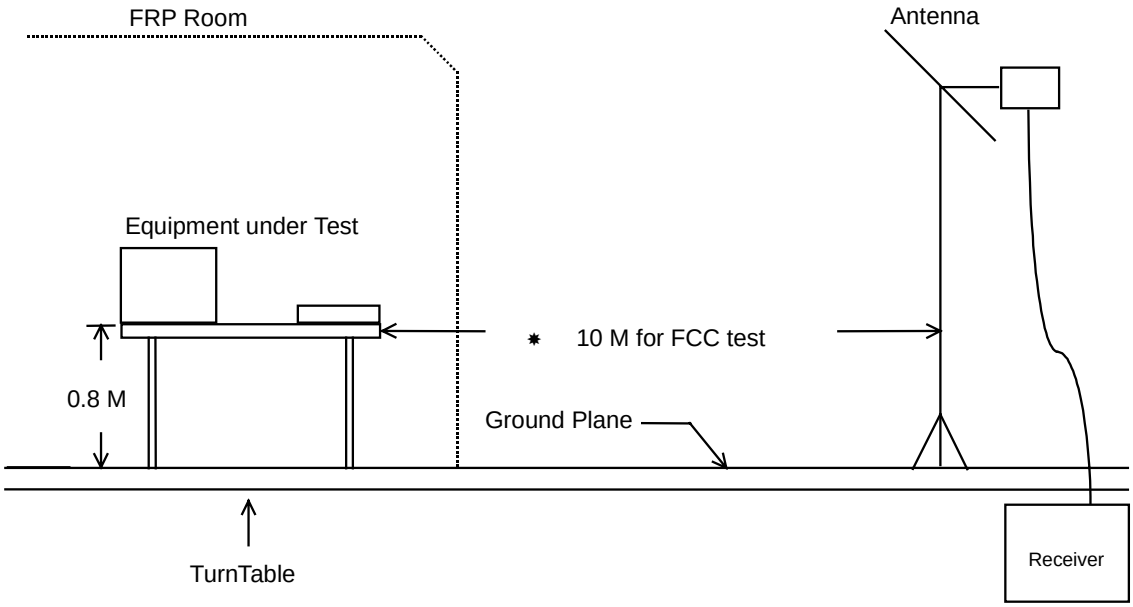
6.1. Major Measuring Instruments

Amplifier	(HP 87405A)
Attenuation	0 dB
RF Gain	25 dB
Signal Input	10 MHz to 3.0 GHz
Spectrum Analyzer	(ADVANTEST R3261C)
Attenuation	0 dB
Start Frequency	30 MHz
Stop Frequency	2,000 MHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	9 KHz to 2.6 GHz

6.2. Test Procedures

a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 6 dB margin will be repeated one by one using the quasi-peak method and reported.

6.3. Typical Test Setup Layout of Radiated Emission



6.4. Test Result of Radiated Emission

6.4.1. Test mode : 1280 x 1024 85Hz / 94K

- Test Distance : 10 M
- Temperature : 31°C
- Relative Humidity : 67 %
- Test Date : Oct. 6, 1999
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Reading = Emission

The Radiated Emission test was passed at minimum margin

200.000 MHz / 22.36 dBuV (HORIZONTAL) Antenna Height 4 Meter, Turntable Degree 136 °.

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV/m)	Limits (uV/m)	Emission (dBuV/m)	Level (uV/m)	Margin (dB)
118.200	H	12.50	1.50	6.59	30.00	31.62	20.59	10.70	-9.41
200.000	H	9.06	1.85	11.45	30.00	31.62	22.36	13.12	-7.64
272.800	H	13.50	2.18	12.16	37.00	70.79	27.84	24.66	-9.16
59.200	V	6.60	1.07	13.10	30.00	31.62	20.77	10.93	-9.23
109.400	V	11.94	1.36	8.30	30.00	31.62	21.60	12.02	-8.40
137.400	V	11.66	1.56	6.34	30.00	31.62	19.56	9.51	-10.44

Test Engineer : _____
MARK CHEN

6.4.2. Test mode : 1600 x 1200 85Hz / 106K

- Test Distance : 10 M
- Temperature : 31°C
- Relative Humidity : 67 %
- Test Date : Oct. 6, 1999
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Reading = Emission

The Radiated Emission test was passed at minimum margin

57.300 MHz / 26.75 dBuV (VERTICAL) Antenna Height 1 Meter, Turntable Degree 162 °.

Frequency	Polarity	Antenna Factor	Cable Loss	Reading	Limits		Emission	Level	Margin
(MHz)		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(uV/m)	(dBuV/m)	(uV/m)	(dB)
57.300	V	7.01	1.06	18.68	30.00	31.62	26.75	21.75	-3.25
85.900	V	8.21	1.23	16.52	30.00	31.62	25.96	19.86	-4.04
199.700	V	9.06	1.85	10.05	30.00	31.62	20.96	11.17	-9.04
57.200	H	7.01	1.06	15.88	30.00	31.62	23.95	15.76	-6.05
86.100	H	8.21	1.23	14.15	30.00	31.62	23.59	15.12	-6.41
200.000	H	9.06	1.85	12.05	30.00	31.62	22.96	14.06	-7.04

Test Engineer : _____
MARK CHEN

6.5. Photographs of Radiated Emission Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW

REAR VIEW

7. Antenna Factor & Cable Loss

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	18.1	0.8
35	16.2	0.8
40	14.0	0.8
45	10.9	0.9
50	8.5	0.9
55	7.4	1.1
60	6.4	1.1
65	6.4	1.2
70	6.5	1.2
75	6.8	1.2
80	7.2	1.2
85	8.0	1.2
90	8.9	1.3
95	10.1	1.3
100	11.3	1.3
110	12.0	1.4
120	12.6	1.5
130	12.0	1.5
140	11.6	1.6
150	10.7	1.7
160	9.7	1.7
170	8.9	1.7
180	9.1	1.8
190	9.1	1.8
200	9.1	1.8
220	10.6	2.0
240	12.0	2.1
260	13.1	2.1
280	13.8	2.3
300	14.4	2.4
320	14.5	2.4
340	14.6	2.5
360	14.9	2.6
380	15.4	2.6
400	15.9	2.6
450	16.6	3.0
500	17.6	3.2
550	19.0	3.3
600	19.6	3.4
650	19.3	3.6
700	18.3	3.8
750	18.7	4.0
800	19.5	4.1
850	19.9	4.4
900	21.6	4.7
950	21.1	4.7
1000	20.9	4.8
2000	0.0	7.6

LKOP7

8. List of Measuring Equipment Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver (site 2)	HP	8591EM	3710A01187	9 KHz – 1.8 GHz	Sep. 06. 1999	Conduction
LISN (EUT) (site 2)	Telemeter	NNB-2/16Z	98009	50 ohm / 50 uH	Jan. 26, 1999	Conduction
LISN (Support Unit) (site 2)	Telemeter	NNB-2/16Z	98089	50 ohm / 50 uH	Dec. 01, 1998	Conduction
Spectrum Analyzer (site 7)	ADVANTEST	R3261C	71720606	9KHz – 2.6GHz	Jan. 12, 1999	Radiation
Amplifier (Site 7)	HP	87405A	3207A01437	10MHz –3.0GHz	Jun. 24, 1999	Radiation
Bilog Antenna (Site 7)	CHASE	CBL6112A	2446	30MHz -2GHz	Jun. 25, 1999	Radiation
Antenna Mast (site 7)	EMCO	2075-2	9804-2147	1MHz – 4MHz	N/A	Radiation
Turn Table (site 7)	EMCO	2080-1.21	9806-2070	0° ~ 360°	N/A	Radiation
Controller (site 7)	EMCO	2090	9804-1328	N/A	N/A	Radiation