IST EMC LAB.

E M I S S I O N T E S T R E P O R T

Test report file No. : **02-IST-191/FB** Date of issue : Nov. 11, 2002

Model / Type No. : D19BL □ Basic ■ Alternate

Kind of product : 19" Color Display Monitor

Brand name : Hansol

Applicant : Hansol Electronics Inc.

Manufacturer : Hansol Electronics Inc.

License holder : Hansol Electronics Inc.

Address : #27-29, Hanchun-Ri, Ducksan-Myun, Jinchun-Kun, Choongbuk, Korea

Test result according to the regulation(s)

■ Positive □ Negative

at page 3.

This test report with appendix consists of 17 pages.
The test result only responds to the tested sample.
It is not allowed to copy this report even partly without the allowance of the Test Laboratory.
This equipment is complied with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-1992.

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DIRECTORY

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TEST REGULATIONS

The tests were performed according to the following regulations ;

■ - FCC Part 15, Subpart B (Unintentional Radiators, Class B)

Information of Test Laboratory

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EQUIPMENT UNDER TEST

Equipment Description :

CRT Type		19”, 90°deflection, Flat
CRT Horizontal Dot pitch		0.20mm
CRT Surface		Anti-Reflection & Anti-Static
Input Signal	Sync	H/V Separate, TTL, positive/negative H/V Composite, TTL, positive/negative
	Video	RGB Analog(0.7Vp-p), positive 75Ω Terminated
Scanning frequency	Horizontal	30kHz ~ 96kHz (Automatically)
	Vertical	50Hz ~ 160Hz (Automatically)
Maximum Resolution		1600 dots x 1299 lines (Non-interlace)
Power Consumption(Normal)		95W
Power Supply		AC110~240V(±10%), 50/60Hz ±3Hz
Input Connector		D-sub, 15Pin Connectors (3layer)

EUT Type :

☒ Table-Top.
☐ Floor-Standing.
☐ Table-Top and Floor-Standing(Combination).

Operation – mode of the E.U.T. :

The equipment under test was operated during the measurement under following conditions :

☐ Standby.
☒ Operational Condition : Scrolling "H" characters under MS Windows 98,
Test mode : 1600 X 1200, 75 Hz

Configuration of the equipment under test :

Following peripheral devices and interface cables were connected during the measurement :

Equipment	Type	Brand	Serial No.
PC	Pavilion 8877	HP	KR12011347
Keyboard	5181	GOODNICE	BM10206995
PS/2 Mouse	M-S48a	Logitech	LZA10251257
Serial Mouse	M-S428	Logitech	LCA53305547
Printer	A0302384	Northern Telecom	26633S60168

Connecting Interface Cables :
- Unshielded AC power cable : 1.8 m
- Shielded monitor's signal cable : 1.5 m
- Shielded printer's signal cable : 1.5 m

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Description of Difference

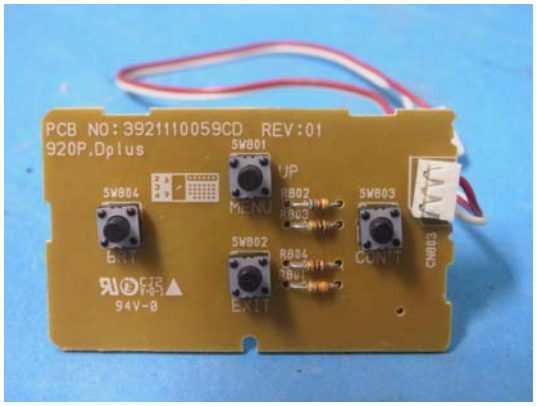
(Difference Between Original and Changed D19BL)

1. Front

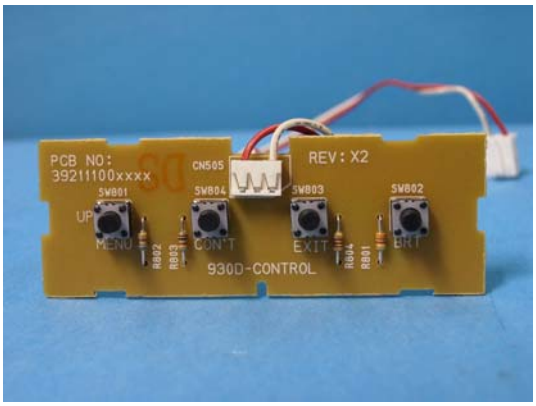
Original D19BL Front

Changed D19BL Front

2. Control board



Original D19BL Control board



Changed D19BL Control board

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TEST CONDITIONS

The **measurement of the conducted emissions (Interference voltage)** was performed in a shielded room.

Test location :

☒ Shielded room. No.1 ☐ Compact chamber 2

Used testing instruments :

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESH 3	Test Receiver	Rohde & Schwarz	Jul. 25, 2002	892108/018
3725/2	LISN	EMCO	Aug. 22, 2002	9101-2068
KNW-407	LISN	Hyup-Rip	Aug. 21, 2002	8-883-10
ESH 3-Z2	Pulse Limiter	Rohde & Schwarz	Jul. 25, 2002	357.8810.52

Test - accessories :

Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

Measurement Procedures :

Conducted emissions measurments were made in accordance with ANSI C-63.4-1992, "Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The measurement were performed over the frequency range of 0.45MHz to 30MHz using a 50Ω/50uH LISN as the input transducer to an EMI/Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within an IF bandwidth of 10kHz or for "quasi-peak" within a bandwidth of 9kHz.

All used test-instruments as well as the test-accessories are calibrated regularly.

Test engineer :

Y. J. Kim / Research Engineer
IST EMC Lab.

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The **measurement of the radiated emissions (Electric field)** in the frequency range from 30 MHz to 1GHz was performed in horizontal and vertical antenna polarization at a open-site which meet the site attenuation requirement of ANSI C63.4-1992 and a test distance of :

Location :	☒ Open Site No. 1	☐ Open Site No. 2	☐ Open Site No. 3
Distance :	☒ 3 meters	☐ 10 meters	

Used testing instruments :

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESVP	Test Receiver	Rohde & Schwarz	Aug. 16, 2002	861744/004
VULB 9160	Antenna	Schwarzbeck	Jul. 10, 2002	3048

Test - accessories :

Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

Measurement procedures

Radiated measurements were in accordance with ANSI C63.4-1992 "Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The measurements were performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a EMI/Field Intensity Meter. The measurements were made with the detector set for "quasi-peak" within a bandwidth of 120kHz.

All used test-instruments as well as the test-accessories are calibrated regularly.

Test engineer :

Y. J. Kim / Research Engineer
IST EMC Lab.

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TEST RESULT

Conducted emissions : 450 kHz - 30 MHz

The requirements are. ☒ KEPT ☐ NOT KEPT

Min. limit margin 7.3 dB at 20.2509 MHz

Remarks : See test-graph to be attached at pages 12 ~ 14.

Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are. ☒ KEPT ☐ NOT KEPT

Min. limit margin 6.9 dB at 263.3 MHz

Remarks : See test-data at page 15 ~ 16.

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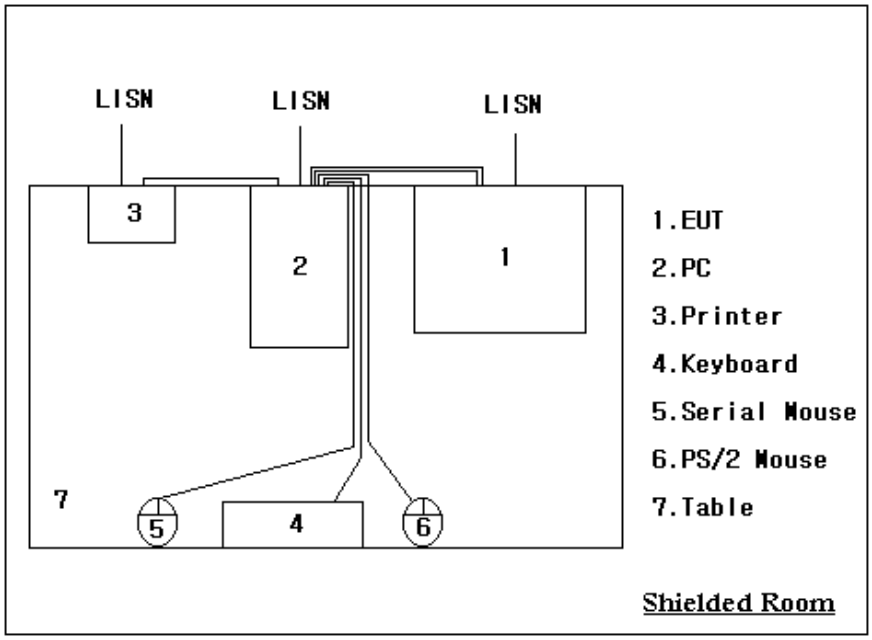
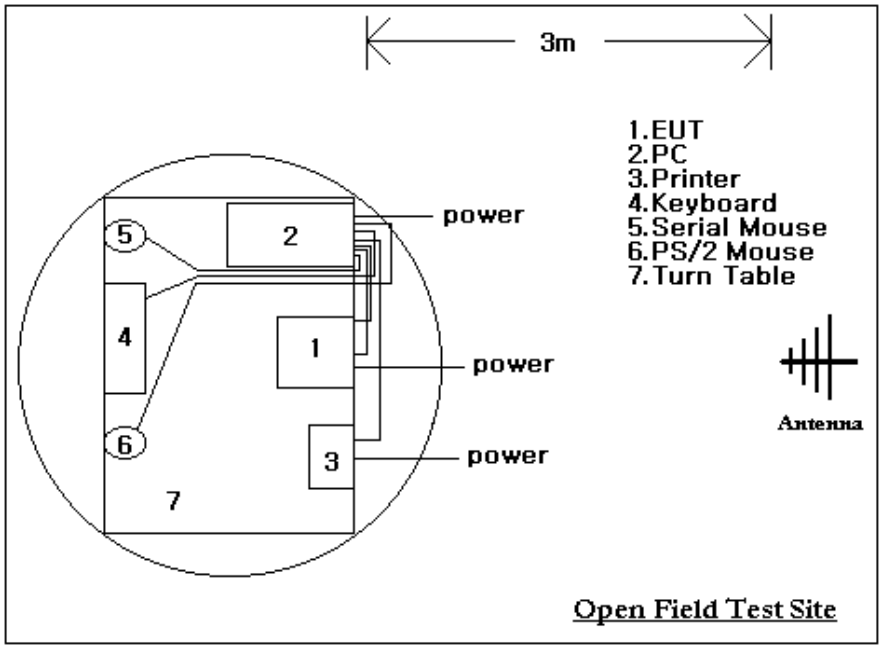
TEST SETUP (Drawings)

Type : D19BL



Conducted Emissions 450kHz - 30 MHz



Radiated Emissions 30 MHz - 1000 MHz

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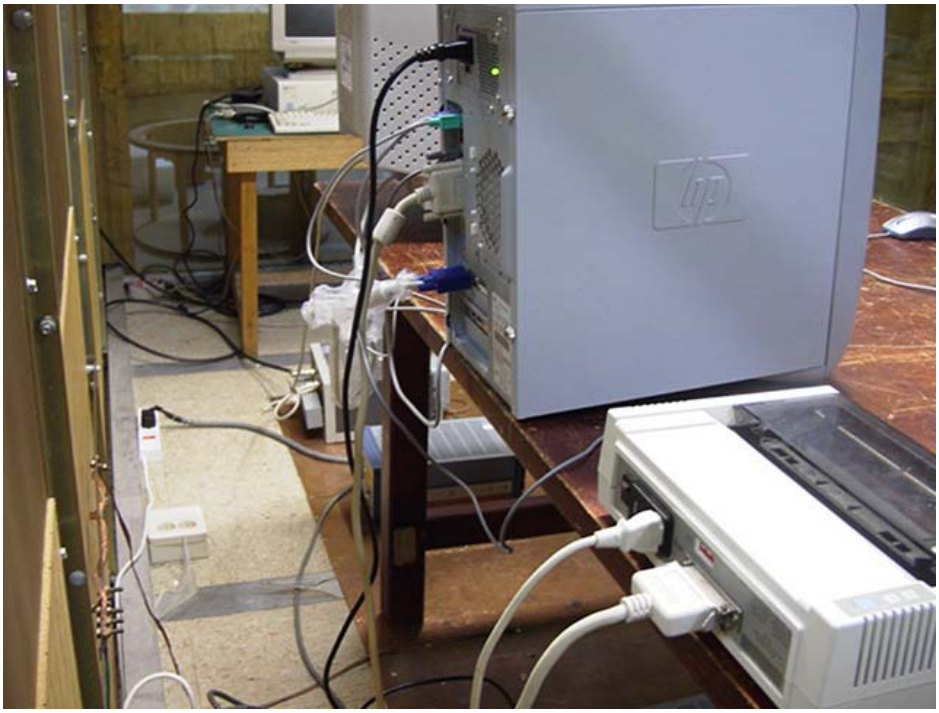
TEST SETUP (Photos)

Type : D19BL

Conducted Emissions 450kHz - 30 MHz



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TEST SETUP (Photos)

Type : D19BL

Radiated Emissions 30 MHz - 1000 MHz

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Conducted Emission Test Data

Type	D19BL		
Manufacturer	Hansol Electronics Inc.		
Operation mode	Scrolling "H" pattern display 1600 x 1200, 75Hz		
Environmental Conditon	Temperature	:	20 °C
	Humidity	:	36 %
	Atmospheric pressure	:	1004 mbar
Date	Oct. 30, 2002		

Highest Emissions ralative to the limit

Frequency [MHz]	Reading [dBμV]	Insertion loss [dB]	Phase (L1/N)	Result [dBμV]	Limit [dBμV]	Margin [dB]
0.4683	38.9	0.8	L1	39.7	48.0	8.3
0.5614	34.3	0.8		35.1	48.0	12.9
20.2509	39.9	0.8		40.7	48.0	7.3
0.4687	38.3	0.8	N	39.1	48.0	8.9
1.1250	34.1	0.8		34.9	48.0	13.1
20.2491	30.5	0.8		31.3	48.0	16.7
Cable loss are less than 0.1 dB						

*L1 : Live Line

**N : Neutral Line

*** **Please refer to data graphs at page 13 ~ 14.**

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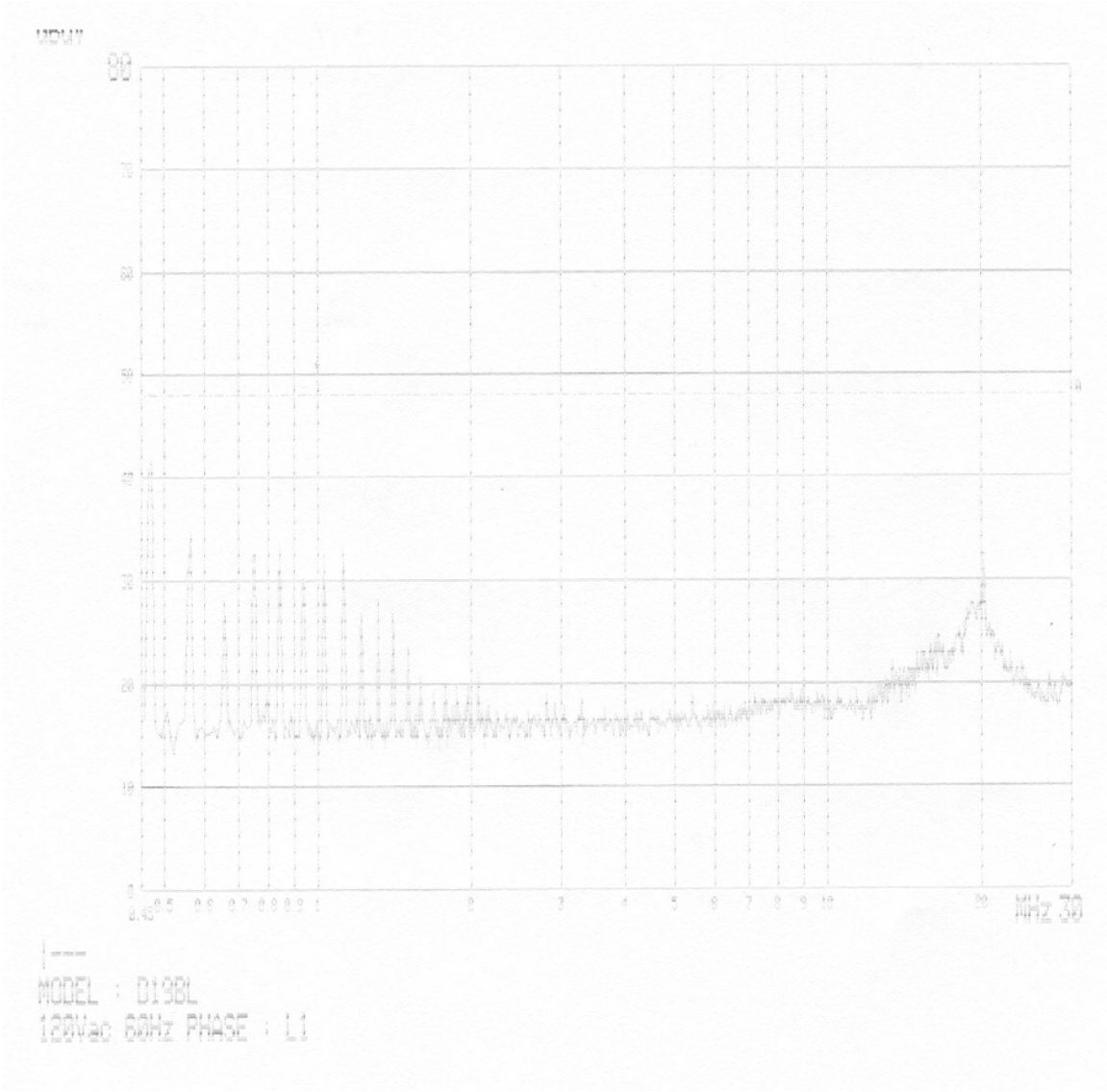

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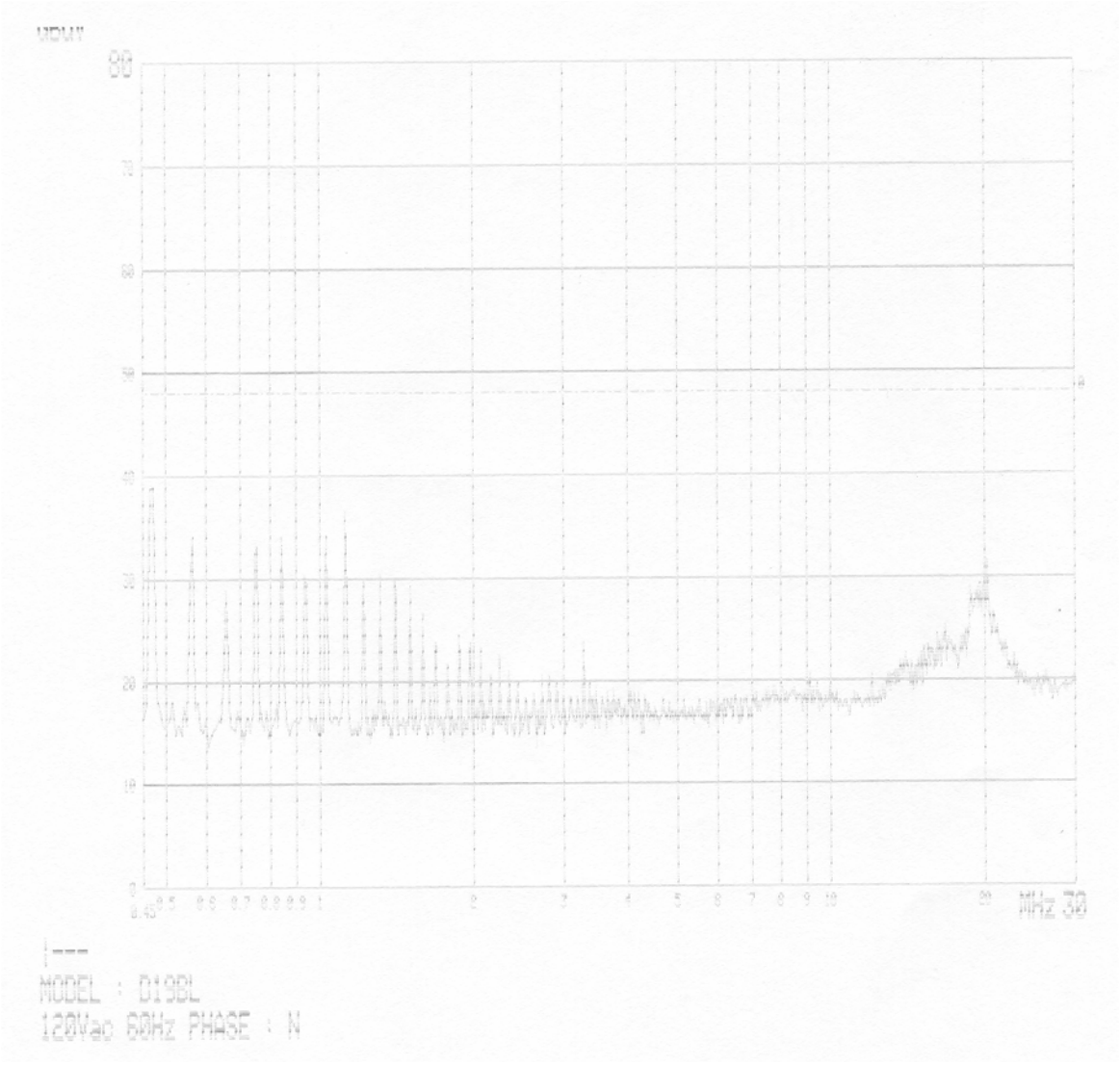

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Radiation Test Data

Type	D19BL		
Manufacturer	Hansol Electronics Inc.		
Operation mode	Scrolling "H" pattern display 1600 x 1200, 75Hz		
Environmental Conditon	Temperature	:	18 °C
	Humidity	:	38 %
	Atmospheric pressure	:	1004 mbar
Test distance	3 m		
Antenna	VULB9160		
Date	Oct. 31, 2002		

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
40.7	12.7	13.6	1.2	277	100	V	27.5	40.0	12.5
60.7	12.0	11.3	1.4	160	100	V	24.7	40.0	15.3
110.1	22.7	9.4	1.9	243	100	V	34.0	43.5	9.5
141.8	14.1	11.7	2.2	330	100	V	28.0	43.5	15.5
243.0	17.6	10.4	2.9	350	100	V	30.9	46.0	15.1
263.3	24.8	11.4	2.9	175	388	H	39.1	46.0	6.9
303.8	20.8	11.7	3.3	263	100	V	35.8	46.0	10.2
344.4	17.1	11.7	3.6	359	400	H	32.4	46.0	13.6
405.0	16.6	13.3	4.3	12	105	V	34.2	46.0	11.8
425.3	17.2	13.7	4.4	23	100	V	35.3	46.0	10.7
465.8	15.7	14.3	4.7	300	100	V	34.6	46.0	11.4

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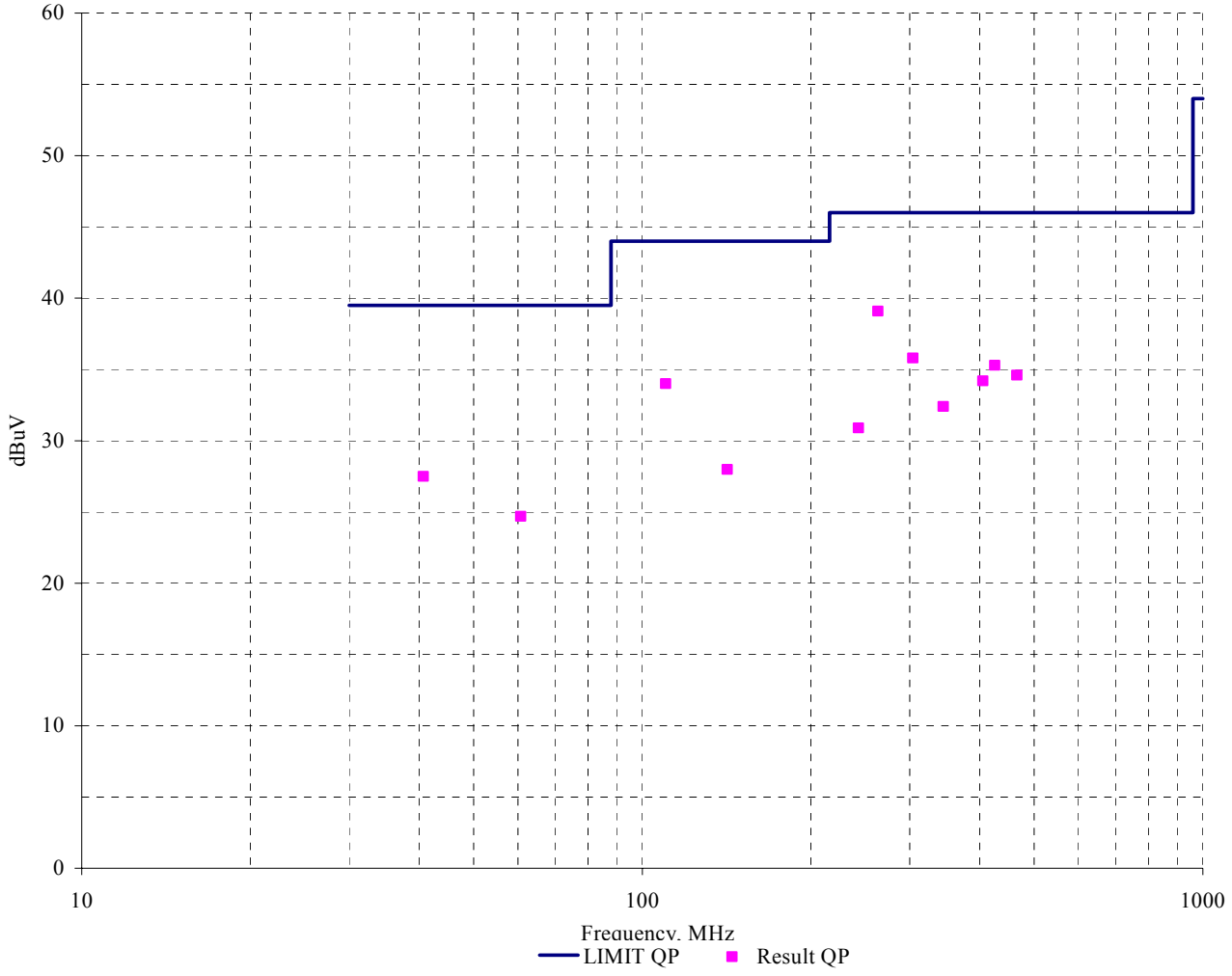
MEASUREMENT OF DISTURBANCE RADIATION



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SUMMARY

GENERAL REMARKS :

The equipment is not modified anything, mechanical or circuit to improve EMI status during a measurement and complied the regulation "Part 15 subpart B Class B of CFR 47"

FINAL JUDGMENT :

The requirements according to the technical regulations are

☒ Kept ☐ Not kept

The equipment under test does

☒ Fulfill the general approval requirements mentioned on page 3.
☐ Not fulfill the general approval requirements mentioned on page 3.

Begin of testing : Oct. 30, 2002

End of testing : Oct 31, 2002

Reviewed by :	Approved by :
Joon H. Lee / EMC Manager IST EMC Lab.	G. Chung / Chief of EMC Lab.

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