



ELECTROMAGNETIC RESEARCH INSTITUTE



EMI TEST REPORT

Emission of electromagnetic disturbance

Test Report No. : ERI-FCC03-0054

Equipment : LCD TV

Name of basic model: DML-3017W

Family model : N/A

Manufacturer : GUANGZHOU DEBAO YUCHANG ELECTRONICS CO.,Ltd

Applicant : D.M. Technology Co., Ltd.

Tested date : 2003. 8. 2 – 8. 4

Issued date : 2003. 8. 12

Test results : PASS

Test Standards : FCC Part 15 Subpart B (Class B)
/digital devices & peripherals (PC mode)
/ Verification (TV mode)

Test Procedure and Items:

- AC Power line Conducted emissions measurement : ANSI C63.4-1992
- Radiated emissions measurement : ANSI C63.4-1992

Tested by: GWEON, HUR

Approved by: UK-CHO, RIM

The results in this report apply only to the sample tested.

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APPENDIX

(N/A)

1. CLIENT INFORMATION

The EUT has been tested by request of :

Company : D.M. Technology Co., Ltd.
Address : 5th F1., Mando Bldg. 730 Dang-dong, Gunpo, Kyunggi-do,
Korea 435-010
Name of contact : TONG-JIN, PARK
Telephone : + 82-31-451-4526
Facsimile : + 82-31-451-4520

2. LABORATORY INFORMATION

The 10m full-anechoic chamber and/or EMC facilities are used for these testing.
These facilities were accredited by KOLAS, EK, MIC of Korea and FCC of USA.

Address

ELECTROMAGNETIC RESEARCH INSTITUTE.

66-6, JEIL-RI, YANGJI-MYUN, YOUNGIN-CITY, KYUNGGI-DO, KOREA

Telephone No. : +82-31-336-1186~7

Facsimile No. : +82-31-336-1184

Registered No.

KOLAS : 111

EK : J

MIC : KR0030

FCC Filing No. : 302567

3. EQUIPMENT UNDER TEST INFORMATION (EUT)

3.1 Identification of the EUT

Type of equipment : LCD TV
Model name : DML-3017W
Brand name : ALVA
Manufacturer : GUANGZHOU DEBAO YUCHANG ELECTRONICS CO.,Ltd
Address : DONGSI BUILDING, HONGTU, INDUSTRIAL ZONE,
LICUN VILLAGE, DASHI TOWN, PANYU CITY, UANGDONG,
CHINA
Telephone : + 86-20-3456-1885
Facsimile : + 86-20-3456-1811
Country of origin : CHINA
Rating : 110V, 60Hz

3.2 Additional information about the EUT

Class B, Family model list; None

3.3 Peripheral equipment

Defined as equipment needed for correct operation of the EUT.

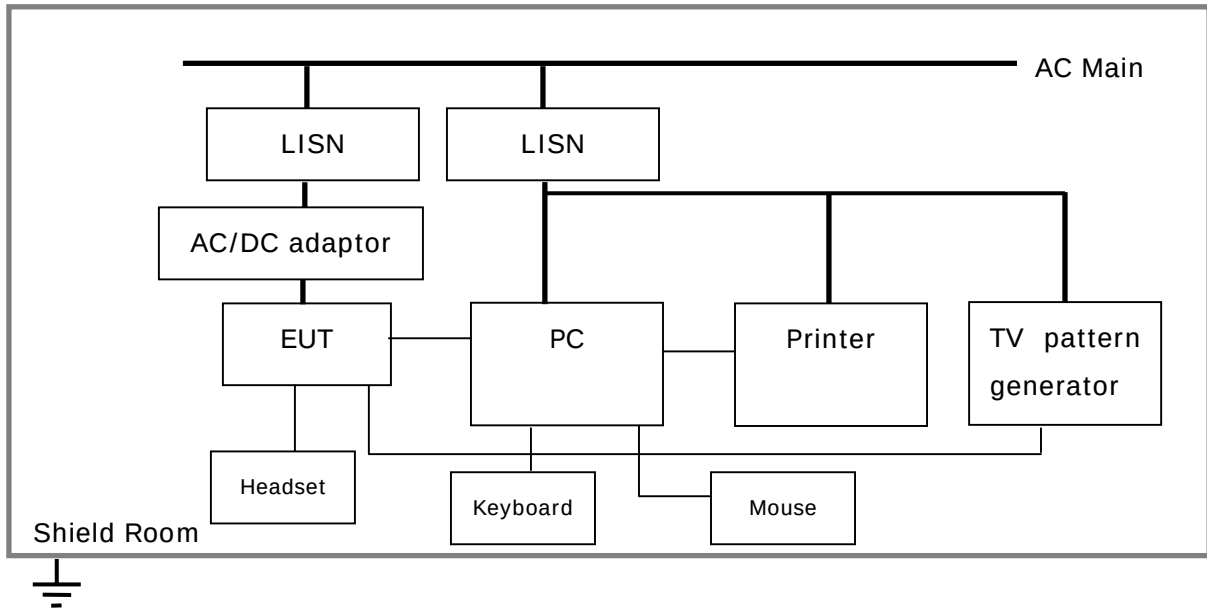
Description	Model No.	Serial No.	Manufacture
PC	Emachies/J	-	Sambo computer
Keyboard	C35757B ARA	MX03432804	HP
Mouse	A6M6524	007717	TGUBASE
AC/DC adaptor	SAD6012SE	CF1800021	H&E CO., LTD.
Printer	C6247A	CN13V1B1RY	HP
TV pattern generator	PM5418TDSI	LD642864	PHILIPS
Headset	DW-400M	None	None

4. CONTINUOUS DISTURBANCE VOLTAGE, MAIN TERMINAL : Frequency range 0.15 MHz to 30 MHz

4.1 Operating environment

Temperature : 20.0 °C
Relative Humidity : 69.0 %

4.2 Test set-up and test procedures



The mains terminal disturbance voltage was measured with the equipment under test(EUT) in a shield room. The EUT was connected to an artificial mains network(LISN) placed on the floor. The EUT was placed on non-metallic table 0.4m above the metallic, grounded floor. The distance to other metallic surface was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

Operation condition: During the test, we kept receiving signal from TV pattern generator, and then we have the data came out on the monitor.

4.3 Test instrument

Instrument	Model No	Serial No.	Makers	Next cal.date	Used
Test receiver	ESCS30	100021	R&S	2004. 1. 24	x
L.I.S.N.	ESH3-Z5	827246/008	R&S	2004. 3. 19	x
	ESH3-Z5	831887/018	R&S	2004. 3. 19	x
Shield room	8 × 6 × 3.3m/H	-	-	-	x

4.4 Test results(TV with GND)

Date of test: Aug 08, 2003.

An overview sweep performed with peak detector & average detector are included in the report **as test reports.**

< Measurement rating : 110V, 60Hz >

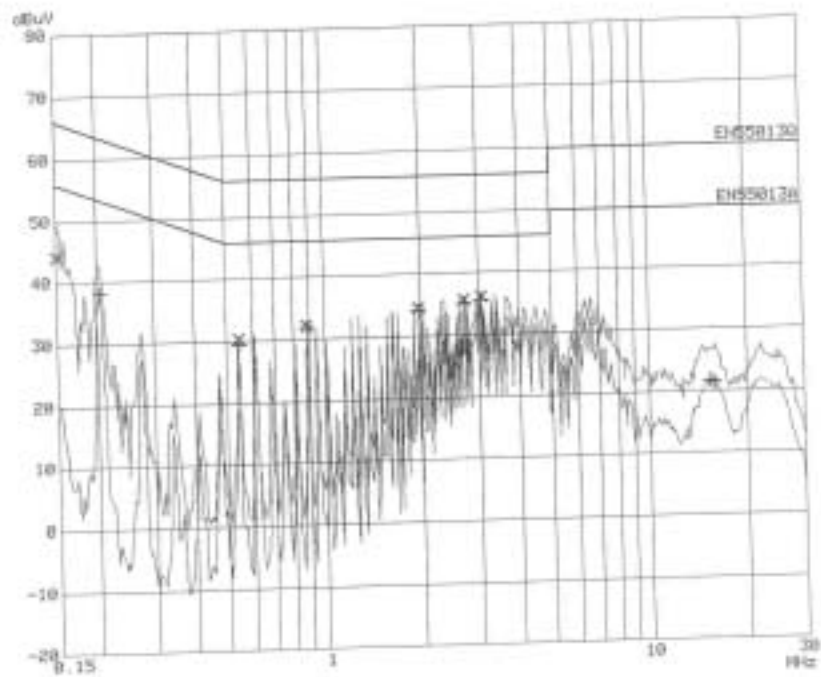
Frequency Range	Tested Freq.	LISN	Meter Reading		Limits		Margin	
			QP	AV	QP	AV	QP	AV
			[dBuV]		[dBuV]		[dBuV]	
0.15-30	0.150	H	44.3	38.2	66.0	56.0	21.7	17.8
	0.543	N	33.8	32.9	56.0	46.0	22.2	13.1
	0.882	N	33.9	33.7	56.0	46.0	22.1	12.3
	2.712	H	35.7	35.0	56.0	46.0	20.3	11.0
	3.050	H	36.2	35.7	56.0	46.0	19.8	10.3

* <5 : mean less than 5dB

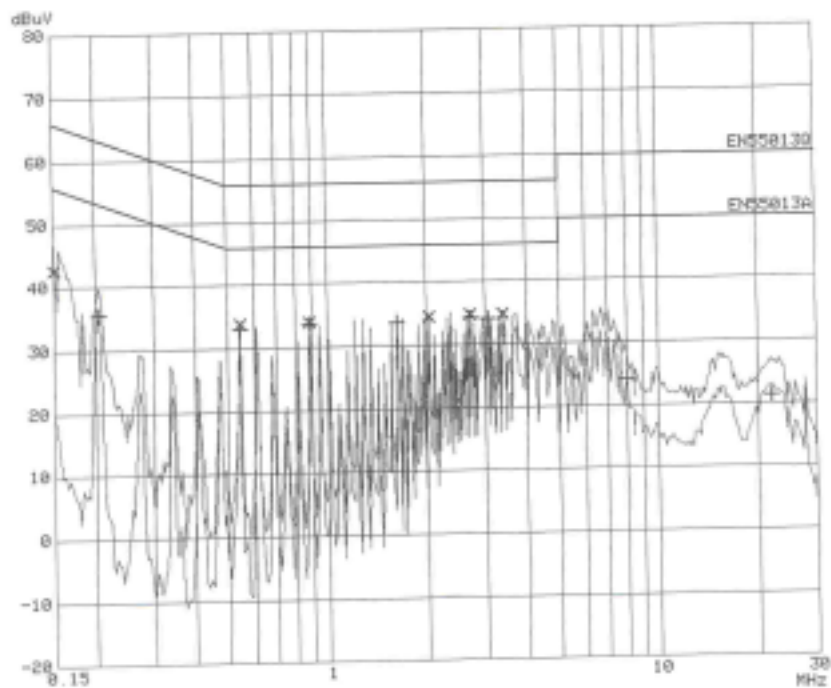
* Other frequency keep over 20dB margin.

Result: Pass

The measured emissions level of the EUT have found the below of the specified limit.



[Live line]



[Neutral line]

4.5 Test results(TV with Non-GND)

Date of test: Aug 08, 2003.

An overview sweep performed with peak detector & average detector are included in the report **as test reports.**

< Measurement rating : 110V, 60Hz >

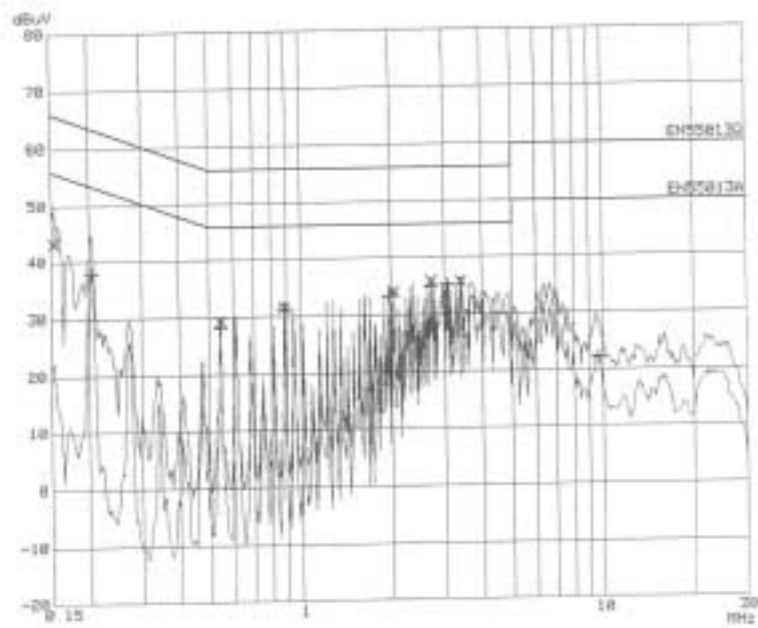
Frequency Range [MHz]	Tested Freq. [MHz]	LISN	Meter Reading		Limits		Margin	
			QP	AV	QP	AV	QP	AV
			[dBuV]		[dBuV]		[dBuV]	
0.15-30	0.150	N	47.9	35.2	66.0	56.0	18.1	20.8
	0.543	N	30.5	29.8	56.0	46.0	25.5	16.2
	0.951	N	31.8	31.5	56.0	46.0	24.2	14.5
	2.034	H	34.0	33.3	56.0	46.0	22.0	12.7
	2.712	H	35.9	34.9	56.0	46.0	20.1	11.1
	3.390	H	35.7	35.1	56.0	46.0	20.3	10.9

* <5 : mean less than 5dB

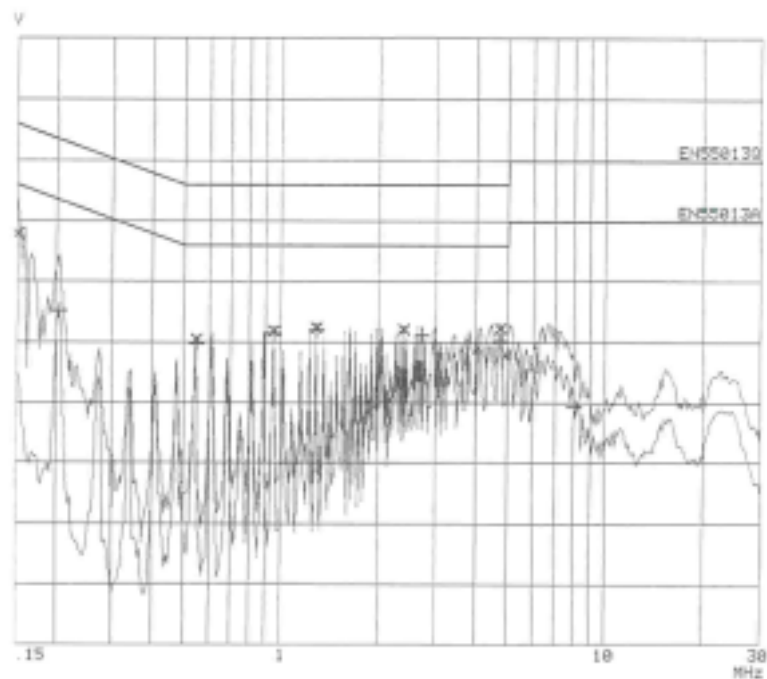
* Other frequency keep over 20dB margin.

Result: Pass

The measured emissions level of the EUT have found the below of the specified limit.



[Live line]



[Neutral line]

4.6 Test results(PC mode)

Date of test: Aug 04, 2003.

An overview sweep performed with peak detector & average detector are included in the report **as test reports**.

< Measurement rating: 110V, 60Hz >

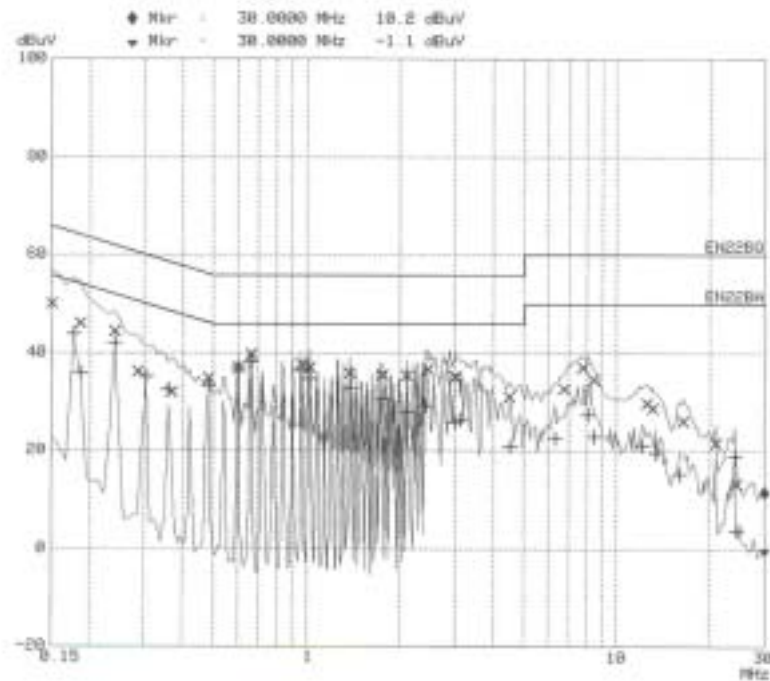
Frequency Range [MHz]	Tested Freq. [MHz]	LISN	Meter Reading		Limits		Margin	
			QP	AV	QP	AV	QP	AV
			[dBuV]		[dBuV]		[dBuV]	
0.15-30	0.150	H	50.0	42.2	66.0	56.0	16.0	13.8
	0.186	H	46.0	35.9	64.1	54.1	18.1	18.2
	0.240	N	44.9	37.0	62.0	52.0	17.1	15.0
	0.285	H	36.2	35.2	60.6	50.6	24.4	15.4
	0.663	H	39.7	38.3	56.0	46.0	16.3	7.7
	0.960	H	37.7	36.4	56.0	46.0	18.3	9.6
	1.023	H	37.2	34.9	56.0	46.0	18.8	11.1
	1.374	H	36.0	32.9	56.0	46.0	20.0	13.1
	1.743	H	35.6	30.6	56.0	46.0	20.4	15.4
	2.094	H	35.4	28.1	56.0	46.0	20.6	17.9
	2.454	H	36.8	29.3	56.0	46.0	19.2	16.7
	2.994	H	35.2	26.0	56.0	46.0	20.8	20.0
	3.000	H	35.3	26.6	56.0	46.0	20.7	19.4
	7.780	H	37.2	27.5	60.0	50.0	22.8	22.5

* <5 : mean less than 5dB

* Other frequency keep over 20dB margin.

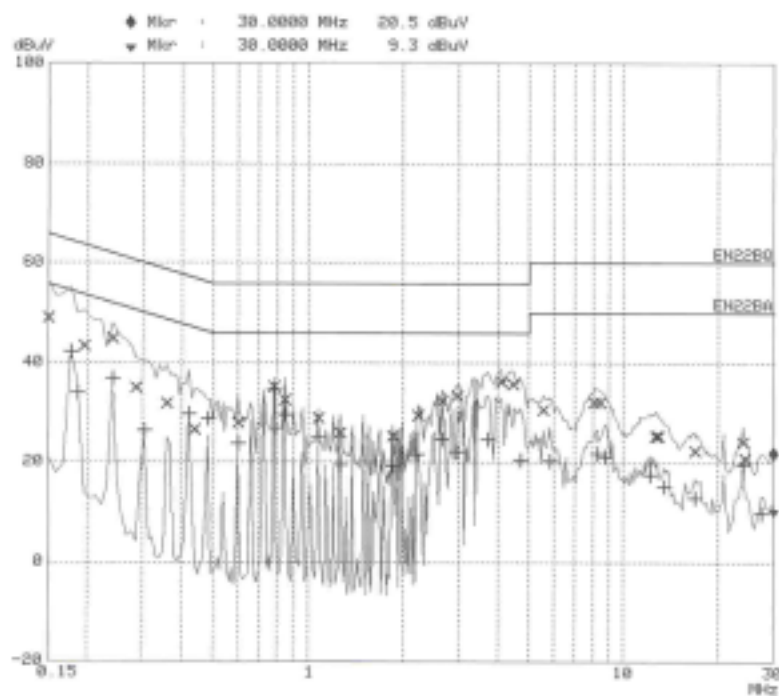
Result: Pass

The measured emissions level of the EUT have found the below of the specified limit.



PAGE 1

[Live line]



PAGE 1

[Neutral line]

5. RADIATED DISTURBANCE & VOLTAGE AT THE ANTENNA TERMINALS: 30MHz – 1000MHz, 30MHz – 2150MHz

5.1 Operating environment

Temperature : 21.0 °C
Relative Humidity : 73.0 %

5.2 Test set-up

The frequency range investigated was 30 MHz to 1000 MHz.

All readings are quasi-peak unless stated otherwise.

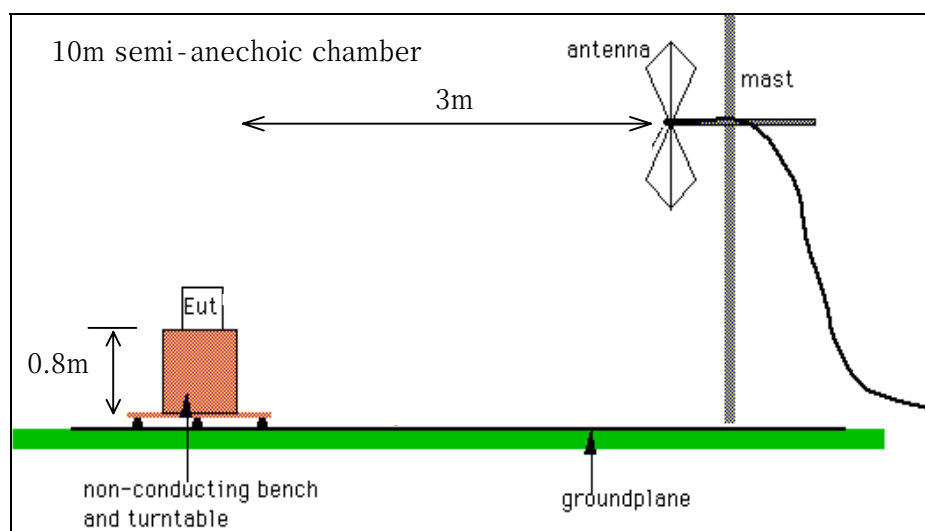
The half-wave dipole antenna was tuned to the frequency found during Preliminary radiated measurements. The EUT, support equipment and Interconnecting cables were re-configured to the set-up to the producing the Maximum emission for the frequency and were placed on top of a 0.8 meter High non-metallic 1 X 1.5 meter table. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission.

The turntable containing the system was rotated the antenna height was varied 1 to 4 meters

and stopped at the azimuth or height producing the maximum emission.

And this device(EUT) was tested in 3 orthogonal planes.

The antenna measured both horizontal and vertical polarization.



<General test set-up for radiated emissions>

5.3 Operation Conditions

During the test, we kept receiving signal from TV pattern generator, and then we have the data came out on the monitor.

5.4 Test instrument

Instrument	Model No.	Serial No.	Makers	Next cal.date	Used
Test receiver	ESCS30	100021	R&S	2004. 1. 24	x
L.I.S.N.	ESH3-Z5	827246/008	R&S	2004. 3. 19	x
	ESH3-Z5	831887/018	R&S	2004. 3. 19	x

5.5 Test results(PC mode: Resolution Bandwidth → 1024*768, Ver: 60Hz)

Date of test: Aug 02, 2003.

Tested Frequency [MHz]	ANT Pol.	Meter Reading [A] [dBuV/m]	Antenna Factor [B] [dB]	Cable Loss [C] [dB]	Results [A+B+C] [dBuV/m]	Limits [dBuV/m]
44.20	H	21.11	14.25	1.70	37.06	40.00
131.30	V	22.49	13.86	2.60	38.95	43.50
162.30	V	19.35	15.59	2.90	37.84	43.50
292.60	H	18.57	19.13	3.80	41.50	46.00
500.00	H	20.20	17.34	4.70	42.24	46.00
568.00	H	19.22	18.16	5.00	42.38	46.00
809.00	H	14.26	20.84	5.90	41.00	46.00

- Receiving Antenna Mode : **Horizontal, Vertical**
- Test site : **10m anechoic chamber**

* <5 : mean less than 5dB

Note : Reading = Test Receiver meter, P= Polarization → POL H = Horizontal POL V = Vertical A = Angle, AF = Antenna Factor CL = Cable Loss Result = Field Strength(AF + CL + Reading)

5.6 Test results(TV Tuner mode)

Date of test: Aug 02, 2003.

Band	CH. [NO]	Pic. Freq. [MHz]	Local OSC (MHz)	Freq. [MHz]	Meter reading(a) [dBuV / m]	Total loss(b) [dB]	Results (a) + (b) [dBuV / m]	Limits [dBuV / m]
VLF	2	55.25	Fundamental	101.00	10.5(H)	12.8	23.3	43.5
			Harmonics	202.00	8.0(V)	12.3	20.3	43.5
				303.00	19.21(V)	17.6	36.8	46.0
				404.00	-	21.0	-	46.0
				505.00	1.56(H)	23.4	25.0	46.0
				606.00	-	26.4	-	46.0
				707.00	-	28.5	-	46.0
				808.00	-	30.5	-	46.0
				909.00	-	32.7	-	46.0
	4	67.25	Fundamental	108.5	9.5(V)	13.0	22.5	43.5
			Harmonics	217.0	-	13.2	-	46.0
				325.5	29.15(H)	18.5	47.7	46.0
				434.0	-	22.0	-	46.0
				542.5	-	25.0	-	46.0
				651.0	-	27.5	-	46.0
				759.5	-	29.8	-	46.0
				868.0	-	31.5	-	46.0
				976.5	-	33.7	-	46.0
	6	83.25	Fundamental	129.00	10.2(H)	12.9	23.1	43.5
			Harmonics	258.00	-	15.7	-	46.0
				387.00	-	20.5	-	46.0
				516.00	-	24.0	-	46.0
				645.00	-	27.2	-	46.0
				774.00	-	30.0	-	46.0
				903.00	-	32.6	-	46.0
VHF	7	175.25	Fundamental	221.00	9.0(H)	13.1	22.1	46.0
			Harmonics	442.00	-	22.3	-	46.0
				663.00	-	27.9	-	46.0
				884.00	-	32.0	-	46.0
	10	193.25	Fundamental	239.00	1.5(H)	14.3	15.8	46.0
			Harmonics	478.00	-	22.9	-	46.0
				717.00	-	28.9	-	46.0
				956.00	-	33.4	-	46.0
	13	211.25	Fundamental	257.00	-	15.7	-	46.0
			Harmonics	514.00	1.4(H)	23.9	25.3	46.0
				771.00	-	29.9	-	46.0
UHF	14	471.25	Fundamental	517.00	5.3(H)	24.1	29.4	46.0
	19	501.25	Fundamental	547.00	6.3(H)	25.2	31.5	46.0
	28	555.25	Fundamental	601.00	0.7(H)	26.3	27.0	46.0
	36	603.25	Fundamental	649.00	7.2(H)	27.4	34.6	46.0
	44	-	Fundamental	697.00	0.5(H)	28.3	28.8	46.0
	53	-	Fundamental	751.00	0.8(H)	29.8	30.6	46.0
	61	-	Fundamental	799.00	7.9(H)	30.4	38.3	46.0
	69	801.25	Fundamental	847.00	4.9(H)	31.1	36.0	46.0

' < ' Means equal or less than

Total loss[dB] : Antenna factor [dB] + Cable loss[dB]

Others

Date of test: Aug 04, 2003.

Tested Frequency	ANT	Meter	Antenna	Cable	Results	Limits
	Pol.	Reading	Factor	Loss		
[MHz]		[A] [dBuV/m]	[B] [dB]	[C] [dB]	[A+B+C] [dBuV/m]	[dBuV/m]
44.20	H	18.65	14.25	1.70	34.60	40.00
131.30	V	22.54	13.86	2.60	39.00	43.50
337.00	H	22.80	13.80	3.90	40.50	46.00
673.00	H	15.80	19.50	5.50	40.80	46.00
785.00	H	14.76	20.28	5.50	40.54	46.00
974.00	H	12.06	22.30	6.50	40.86	54.00

* Receiving Antenna Mode : **Horizontal, Vertical**

* Test distance: **3m** (10m Anechoic Chamber)

* <5 : mean less than 5dB

Note : Reading = Test Receiver meter, P= Polarization → POL H = Horizontal POL V = Vertical A = Angle, AF = Antenna Factor CL = Cable Loss Result = Field Strength(AF + CL+ Reading)

5.7 Test results<Test mode: TV- Voltage at the Antenna terminals >

Date of test: Aug 02, 2003.

Band	CH. [NO]	Pic. Freq. [MHz]	Local OSC (MHz)	Freq. [MHz]	Meter reading(a) [dBuV / m]	MPL loss(b) [dB]	Results (a) + (b) [dBuV / m]	Limits [dBuV / m]
VLF	2	55.25	Fundamental	101.00	10.9	6.8	17.7	51.8
			Harmonics	202.00	6.3	6.8	13.1	51.8
				303.00	10.6	6.8	17.4	51.8
				404.00	6.6	6.8	13.4	51.8
				505.00	11.5	6.8	18.3	51.8
				606.00	9.1	6.8	15.9	51.8
				707.00	11.0	6.8	17.8	51.8
				808.00	11.8	6.8	18.6	51.8
				909.00	9.9	6.8	16.7	51.8
	4	67.25	Fundamental	108.5	6.0	6.8	12.8	51.8
			Harmonics	217.0	6.9	6.8	13.7	51.8
				325.5	6.6	6.8	13.4	51.8
				434.0	6.6	6.8	13.4	51.8
				542.5	9.1	6.8	15.9	51.8
				651.0	8.9	6.8	15.7	51.8
				759.5	8.2	6.8	15.0	51.8
				868.0	8.6	6.8	15.4	51.8
				976.5	8.8	6.8	15.6	51.8
	6	83.25	Fundamental	129.00	16.8	6.8	23.6	51.8
			Harmonics	258.00	8.5	6.8	15.3	51.8
				387.00	14.6	6.8	21.4	51.8
				516.00	9.9	6.8	16.7	51.8
				645.00	12.6	6.8	19.4	51.8
				774.00	14.5	6.8	21.3	51.8
VHF	7	175.25	Fundamental	221.00	16.9	6.8	23.7	51.8
			Harmonics	442.00	11.5	6.8	18.3	51.8
				663.00	10.9	6.8	17.7	51.8
				884.00	18.4	6.8	25.2	51.8
	10	193.25	Fundamental	239.00	21.1	6.8	27.9	51.8
			Harmonics	478.00	13.1	6.8	19.9	51.8
				717.00	12.7	6.8	19.5	51.8
				956.00	24.8	6.8	31.6	51.8
	13	211.25	Fundamental	257.00	19.7	6.8	26.5	51.8
			Harmonics	514.00	14.9	6.8	21.7	51.8
				771.00	9.1	6.8	15.9	51.8
UHF	14	471.25	Fundamental	517.00	14.1	6.8	20.9	51.8
	19	501.25	Fundamental	547.00	9.2	6.8	16.0	51.8
	28	555.25	Fundamental	601.00	14.2	6.8	21.0	51.8
	36	603.25	Fundamental	649.00	20.2	6.8	27.0	51.8
	44	-	Fundamental	697.00	23.6	6.8	30.4	51.8
	53	-	Fundamental	751.00	26.6	6.8	33.4	51.8
	61	-	Fundamental	799.00	27.9	6.8	34.7	51.8
	69	801.25	Fundamental	846.90	22.2	6.8	29.0	51.8

' < ' Means equal or less than

MPL loss[dB] : Matching pad Loss + Cable Loss

Others

Date of test: Aug 04, 2003.

Tested Frequency	Meter Reading	MPL Loss	Results	Limits
[MHz]	[A] [dBuV/m]	[C] [dB]	[A+B+C] [dBuV/m]	[dBuV/m]
81.30	15.90	2.10	25.60	40.0
129.90	10.57	2.60	26.27	43.5
486.00	11.97	4.40	33.01	46.0
500.00	12.06	4.70	34.10	46.0
568.00	11.34	5.00	34.50	46.0
811.00	6.96	5.90	33.70	46.0