

Compliance Test Report for FCC

Report Number		ESTF150308-001			
Applicant	Company name	VDL CO., LTD			
	Address	Rm503 Dangil Bldg, #314 Dangsang-dong 6-ga, yeongdeungpo-gu, Seoul, Korea			
	Telephone	82-2-3677-2355			
Product	Product name	MP3 Player			
	Model No.	U4Ria	Manufacturer	VDL CO., LTD	
	Serial No.	NONE	Country of origin	KOREA	
Test date	2003-08-04 ~ 2003-08-04		Date of issue	2003-08-11	
Test location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea				
Standard	FCC PART 15 2002 , ANSI C 63.4 2001				
Test item	☒ Conducted Emission	☐ Class A	☒ Class B	Test result	OK
	☒ Radiated Emission	☐ Class A	☒ Class B	Test result	OK
Measurement facility registration number		94696			
Tested by	Senior Engineer J.M. Yang		(Signature) 		
Reviewed by	Director T.K. Lee		(Signature) 		
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable				
* Note - This is certified that the above mentioned products have been tested for the sample provided by client - No part of this document may be duplicated or reproduced by any means without the express written permission of the Estech Co., Ltd.					

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1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and is tested in accordance with the measurement procedures as indicated in this report.

ESTECH attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.

ESTECH assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name : ESTECH Co. Ltd

Head Office : 3 rd Fl., Chungdam Bldg., 119-1 Chungdam-dong Kangnam-gu , Seoul, Korea
(Safety & Telecom. Test Lab)

EMC Test Lab : 58-1 Osan-Ri, GaNam-Myon, YeoJoo-Gun, KyungKi-Do, Korea
97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea

1.3 Official Qualification(s)

FCC : Filed Laboratory at Federal Communications Commission

2. Description of EUT

2.1 Summary of Equipment Under Test

Product : MP3 Player

Model Number : U4Ria

Serial Number : NONE

Manufacturer : VDL CO., LTD

Country of origin : KOREA

Rating : DC 1.5V Battery

Receipt Date : 2003-07-25

2.2 General descriptions of EUT

- MP3 Player
- FM Radio.
 - Voice Recorder (Voice Activity Detection)
 - Encoder (from CD/MD/radio/Internet/TV)
 - Mass Storage (128/256/512 Mega Bytes Built in Memory)

3. Test Standards

Test Standard : FCC PART 15 (2002)

This Standard sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

Test Method : ANSI C 63.4 (2001)

This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain devices that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment. These methods apply to the measurement of individual units or systems comprised of multiple units.

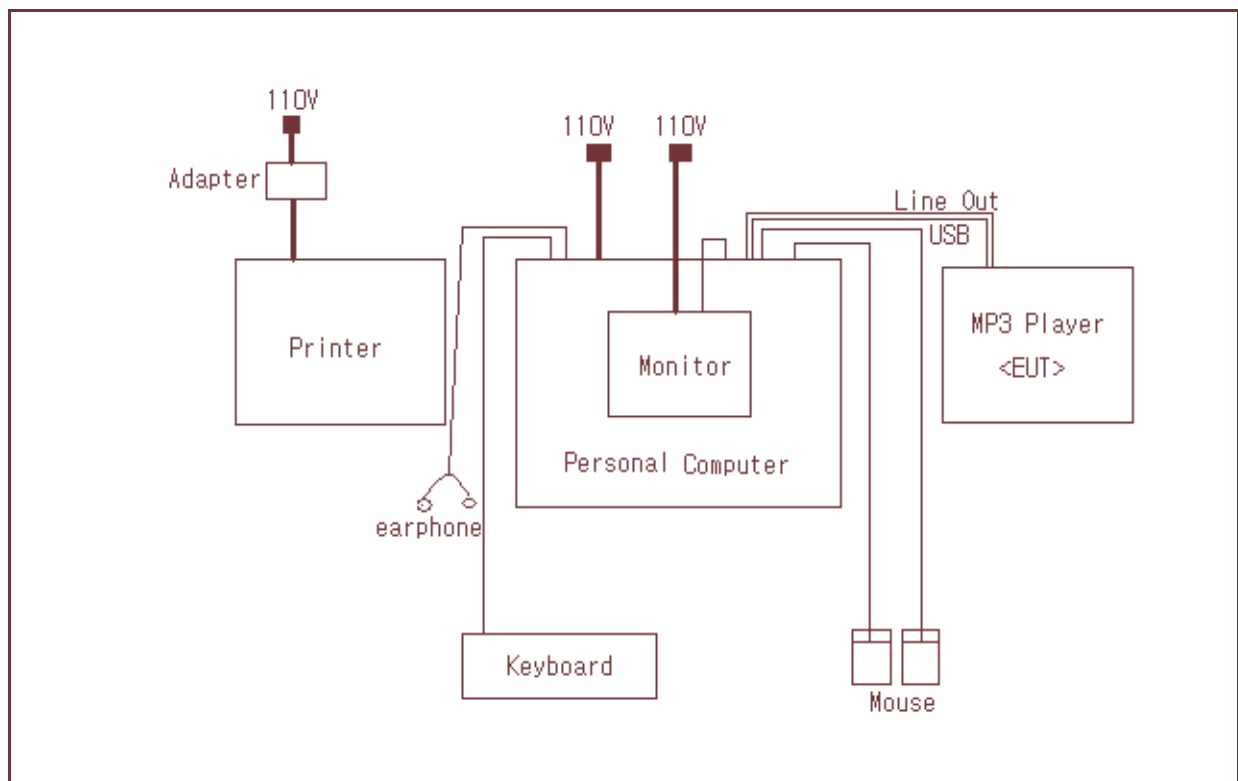
★ Testing EUT Under connecting PC

4. Measurement Condition

4.1 EUT Operation.

- * The EUT was in the following operation mode during all testing
- * The operational conditions of the EUT was determined by the manufacturer according to the typical use of the EUT with respect to the expected highest level of emission
- * The EUT Configured as following drawing. During test, it tested as read/write with "H" characters between PC and EUT. The MP3 Player played during test.

4.2 Configuration and Peripherals



4.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
MP3 Player	U4Ria	NONE	VDL CO., LTD	EUT
earphone	NONE	NONE	NONE	—
Monitor	FS740	045CJ64DD100	Compaq	—
Personal Computer	DCP(OptiPlex GX115)	NONE	Dell	—
Keyboard	SEM-DT35	32006555	Samsung Electro-Mechanics Co., Ltd.	—
Mouse	M-S48a	HCA31409057	Logitech	—
Mouse	MSW-5	NONE	A4TECH	—
Printer	C6414J	TH18M149P2	HP	—
Adapter	C6409-60152	NONE	YOLOGAWA	—

4.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
MP3 Player	USB	Personal Computer	USB	1.3	Y	—
MP3 Player	LINE OUT	Personal Computer	LINE IN	1.0	Y	—
Personal Computer	Video	Monitor	Video	2.0	Y	—
Personal Computer	Parallel	Printer	Parallel	2.0	Y	—
Personal Computer	PS/2 Keyboard	Keyboard	PS/2 Keyboard	2.0	N	—
Personal Computer	PS/2 Mouse	Mouse	PS/2 Mouse	2.0	N	—
Personal Computer	Serial	Mouse	Serial	2.0	N	—
Personal Computer	LINE OUT	earphone	—	1.0	Y	—
Printer	Power	Adapter	—	2.0	N	—

5. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2002) & ANSI C 63.4 (2001). The test setup was made according to FCC Part 15 (2002) & ANSI C 63.4 (2001) on an open test site, which allows a 3m distance measurement. The EUT was placed in the center of wooden turntable. The height of this table was 0.8m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test set-up.

5.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Receiver	ESPC	Rohde & Schwarz	845296/021	2004.6.17
Spectrum Analyzer	R3261B	ADVANTEST	1720302	2004.2.7
LogBicon Antenna	VULB 9160	S/B	3107	2004.6.13
Turn Table	2087	EMCO	2129	–
Antenna Mast	2070-01	EMCO	9702-203	–
ANT Mast Controller	2090	EMCO	1535	–
Turn Table Controller	2090	EMCO	1535	–

5.2 Environmental Condition

Test Place : Open site(3m)
 Temperature (°C) : 30 °C
 Humidity (%) : 49 %

5.3 Test data

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB μ V/m)
127.75	14.60	H	1.8	12.13	1.72	43.5	28.45	-15.05
136.02	16.40	H	1.8	12.70	1.73	43.5	30.83	-12.67
155.11	20.80	H	1.9	13.94	1.90	43.5	36.65	-6.85
169.82	12.10	H	1.6	13.96	2.03	43.5	28.09	-15.41
194.65	14.20	H	1.5	11.20	2.20	43.5	27.60	-15.90
201.98	11.20	H	1.6	10.43	2.19	43.5	23.82	-19.68
208.01	16.70	H	1.5	10.57	2.22	43.5	29.49	-14.01
225.07	14.70	H	1.4	10.89	2.32	43.5	27.91	-15.59
231.16	16.70	H	1.4	11.26	2.36	46.0	30.32	-15.68
243.80	20.80	V	1.0	11.80	2.42	46.0	35.01	-10.99
260.00	10.60	H	1.3	12.13	2.45	46.0	25.18	-20.82
300.00	13.40	H	1.2	13.19	2.70	46.0	29.29	-16.71
341.29	13.60	H	1.0	14.12	2.84	46.0	30.55	-15.45
383.24	10.60	H	1.0	14.95	3.06	46.0	28.61	-17.39
500.00	9.80	H	1.0	17.06	3.55	46.0	30.41	-15.59
536.35	12.30	V	1.0	17.62	3.63	46.0	33.55	-12.45
Remark	H : Horizontal, V : Vertical							

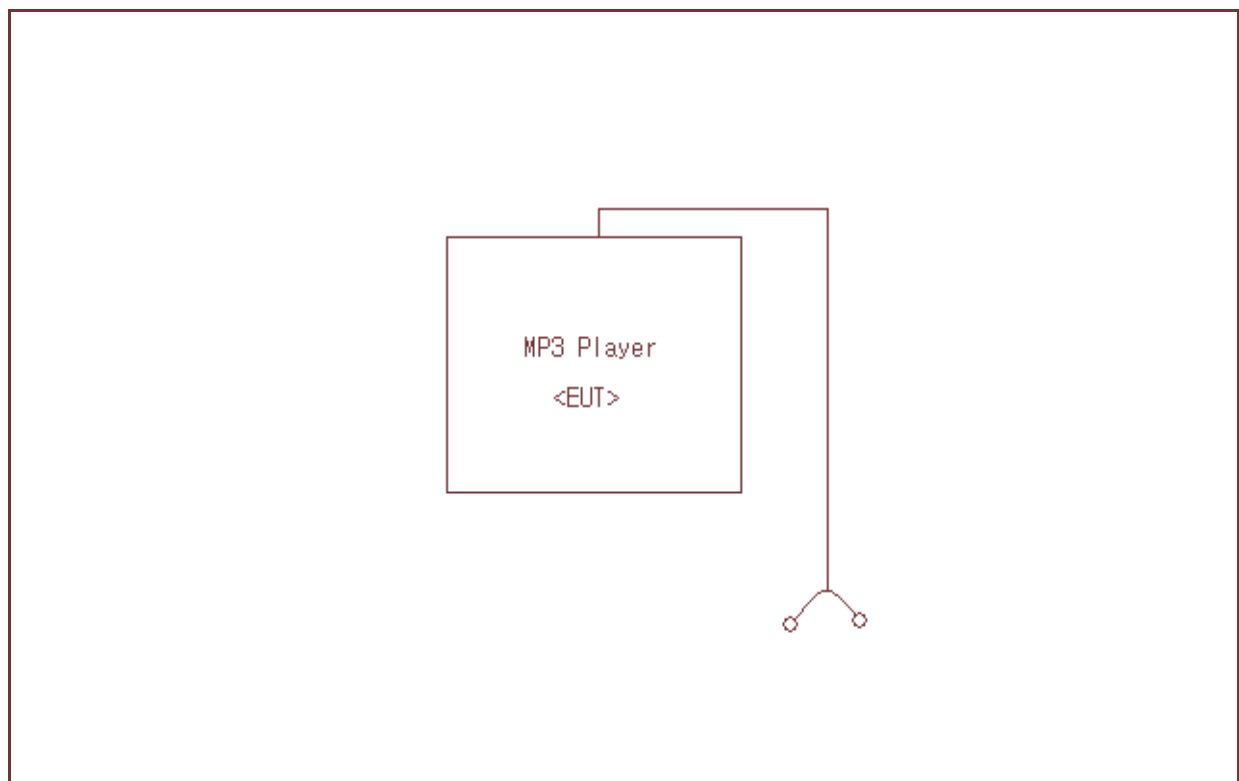
★ Testing only EUT

6. Measurement Condition

6.1 EUT Operation.

- * The EUT was in the following operation mode during all testing
- * The operational conditions of the EUT was determined by the manufacturer according to the typical use of the EUT with respect to the expected highest level of emission
- * Test Configuration
 - The eaphone connected to the EUT
 - Normal status (EUT played the media)

6.2 Configuration and Peripherals



6.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
MP3 Player	U4Ria	NONE	VDL CO., LTD	EUT
earphone	NONE	NONE	NONE	—

6.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
MP3 Player	USB	Personal Computer	USB	1.0	Y	—

7. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2002) & ANSI C 63.4 (2001). The test setup was made according to FCC Part 15 (2002) & ANSI C 63.4 (2001) on an open test site, which allows a 3m distance measurement. The EUT was placed in the center of wooden turntable. The height of this table was 0.8m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test set-up.

7.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Receiver	ESPC	Rohde & Schwarz	845296/021	2004.6.17
Spectrum Analyzer	R3261B	ADVANTEST	1720302	2004.2.7
LogBicon Antenna	VULB 9160	S/B	3107	2004.6.13
Turn Table	2087	EMCO	2129	–
Antenna Mast	2070-01	EMCO	9702-203	–
ANT Mast Controller	2090	EMCO	1535	–
Turn Table Controller	2090	EMCO	1535	–

7.2 Environmental Condition

Test Place : Open site(3m)
 Temperature (°C) : 30 °C
 Humidity (%) : 48 %

7.3 Test data

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB μ V/m)
154.04	10.60	H	2.0	13.93	1.90	43.5	26.43	-17.07
158.27	14.60	H	2.0	13.97	1.92	43.5	30.49	-13.01
169.56	12.60	H	1.9	13.96	2.02	43.5	28.58	-14.92
219.02	11.60	H	1.8	10.79	2.29	43.5	24.68	-18.82
221.86	13.40	H	1.7	10.81	2.31	43.5	26.51	-16.99
226.10	25.10	H	1.6	10.91	2.33	43.5	38.34	-5.16
230.32	17.10	H	1.6	11.24	2.35	46.0	30.69	-15.31
237.39	26.00	H	1.5	11.41	2.38	46.0	39.79	-6.21
248.68	17.30	H	1.5	11.91	2.44	46.0	31.64	-14.36
282.61	16.90	H	1.5	12.87	2.58	46.0	32.35	-13.65
305.21	18.80	H	1.4	13.30	2.72	46.0	34.82	-11.18
316.52	20.90	H	1.5	13.55	2.77	46.0	37.21	-8.79
384.31	13.60	H	1.4	14.98	3.07	46.0	31.64	-14.36
Remark	H : Horizontal, V : Vertical							

8. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.15 to 30 MHz was measured in accordance to FCC Part 15 (2002) & ANSI C 63.4 (2001). The test setup was made according to FCC Part 15 (2002) & ANSI C 63.4 (2001) in a shielded. The EUT was placed on a non-conductive table at least 80 above the ground plan. A grounded vertical reference plane was positioned in a distance of 40cm from the EUT. The distance from the EUT to other metal surfaces was at least 0.8m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0m.. The test receiver with Quasi Peak detector complies with CISPR 16.

8.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
LISN	ESH3-Z5	Rohde & Schwarz	838979/010	2004. 2. 7
LISN	NNLA8120A	Schwarzbeck	NONE	2004. 2. 7
TEST Receiver	ESPC	Rohde & Schwarz	845296/021	2004. 6. 17
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	2004. 6. 17

8.2 Environmental Condition

Test Place : Shield Room
 Temperature (°C) : 23 °C
 Humidity (%) : 49 %

8.3 Test data

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dB μ V)	Reading (dB μ V)	Result (dB μ V)	Limit (dB μ V)	Reading (dB μ V)	Result (dB μ V)
0.15	0.07	0.00	N	65.93	50.09	50.16	55.93		
0.20	0.07	0.03	N	63.62	41.82	41.92	53.62		
0.24	0.07	0.06	N	61.96	34.98	35.11	51.96		
0.31	0.07	0.10	N	60.04	41.53	41.70	50.04		
0.46	0.07	0.18	N	56.67	37.96	38.21	46.67		
0.47	0.07	0.18	H	56.60	35.93	36.18	46.60		
0.61	0.08	0.20	H	56.00	39.53	39.81	46.00		
0.62	0.08	0.20	N	56.00	34.99	35.27	46.00		
0.77	0.09	0.20	H	56.00	37.61	37.90	46.00		
0.92	0.09	0.20	H	56.00	38.22	38.51	46.00		
3.58	0.16	0.30	H	56.00	34.37	34.83	46.00		
3.63	0.16	0.30	H	56.00	35.07	35.53	46.00		
6.00	0.24	0.35	N	60.00	29.00	29.59	50.00		
6.30	0.25	0.36	H	60.00	29.54	30.16	50.00		
6.87	0.27	0.39	N	60.00	28.55	29.22	50.00		
9.53	0.35	0.57	H	60.00	31.99	32.91	50.00		
12.01	0.46	0.68	H	60.00	30.47	31.61	50.00		
12.20	0.47	0.69	N	60.00	31.49	32.65	50.00		
Remark	H : Hot Line, N : Neutral Line								

9. Photographs of test setup

★ Testing EUT Under connecting PC

9.1 Setup for Radiated Test : 30 ~ 1000 MHz

[Front]



[Rear]



★ Testing only EUT

9.2 Setup for Radiated Test : 30 ~ 1000 MHz

[Front]



[Rear]



9.3 Setup for Conducted Test : 0.15 ~ 30 MHz

[Front]



[Rear]



10. Photographs of EUT

[Front]

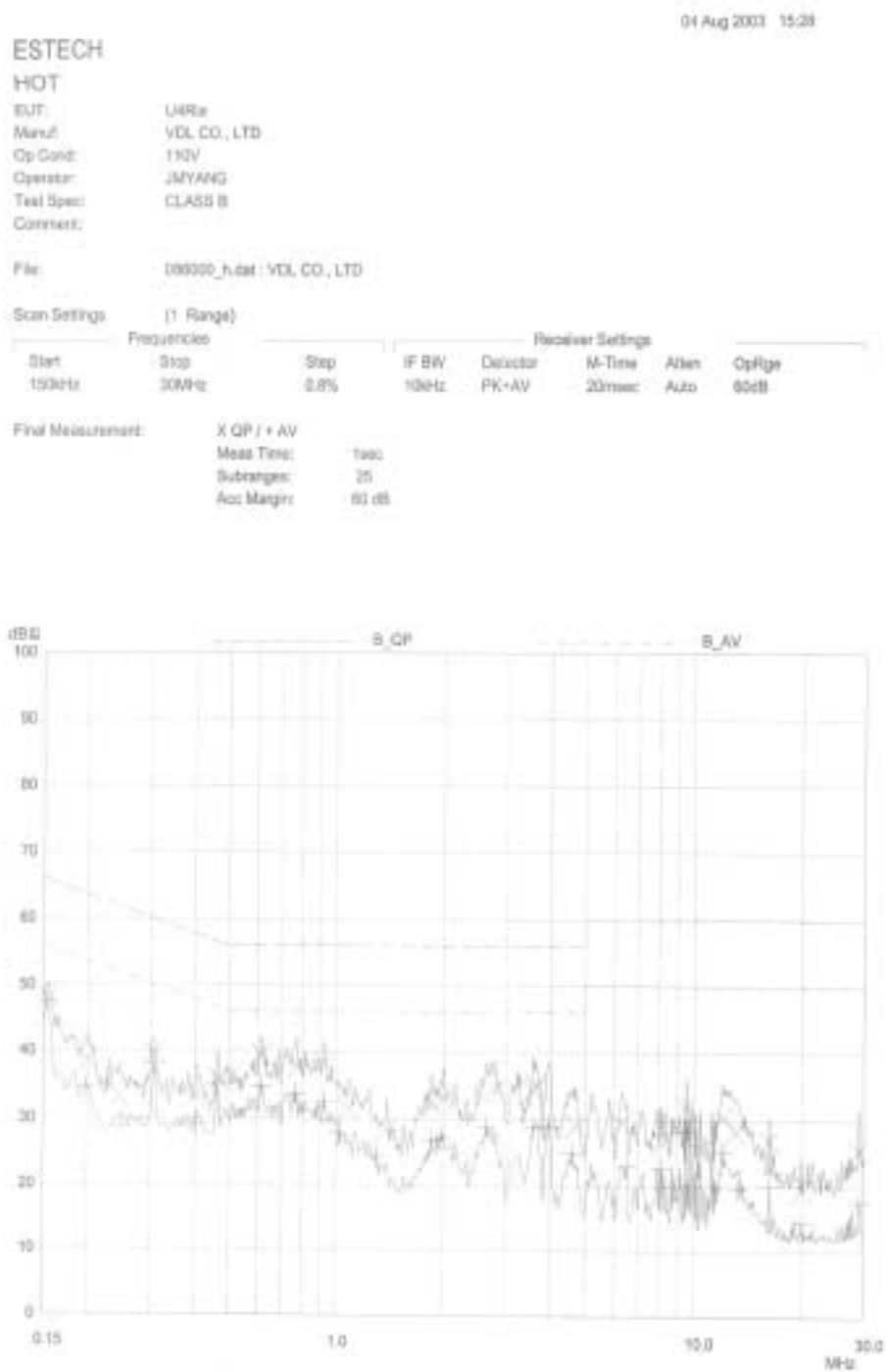


[Rear]



Appendix 1. Spectral diagram

*HOT



*NETRUL

ESTECH
NEUTRAL

04 Aug 2003 15:38

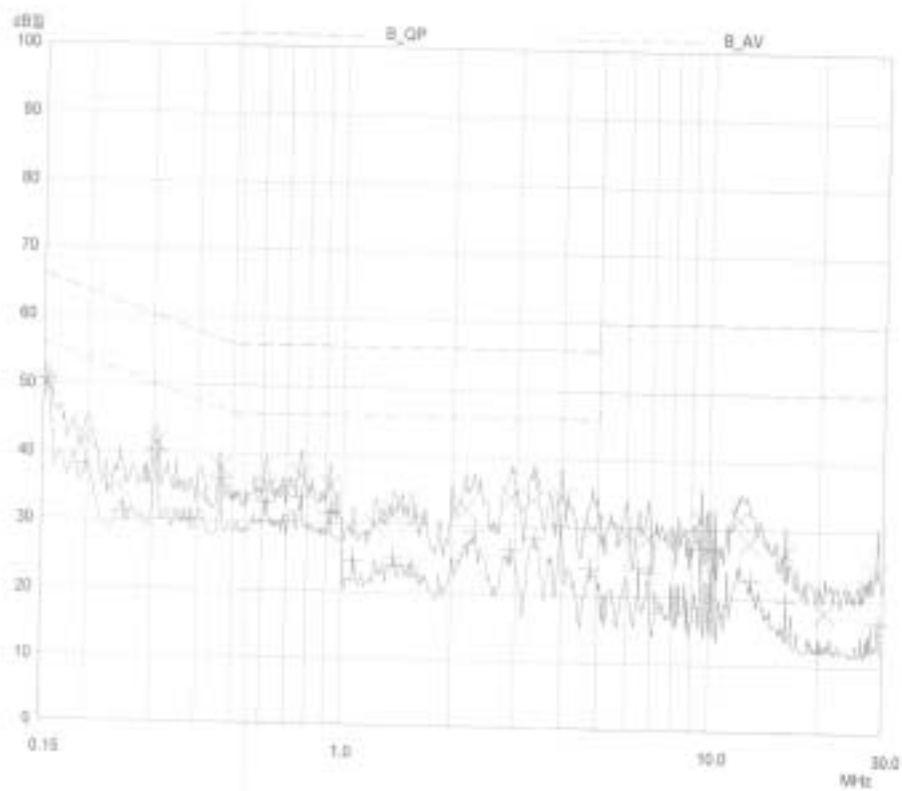
EUT: UHRig
Manuf: VDL CO., LTD
Op Cond: 110V
Operator: JN/YANG
Test Spec: CLASS B
Comment:

File: 086000_n.dat: VDL CO., LTD

Scan Settings (1 Range)

Frequencies			Receiver Settings			
Start	Stop	Step	IF BW	Detector	M-Time	Atten
150kHz	30MHz	0.8%	10kHz	Pic+AV	20msec	Auto
						OpRgs
						60dB

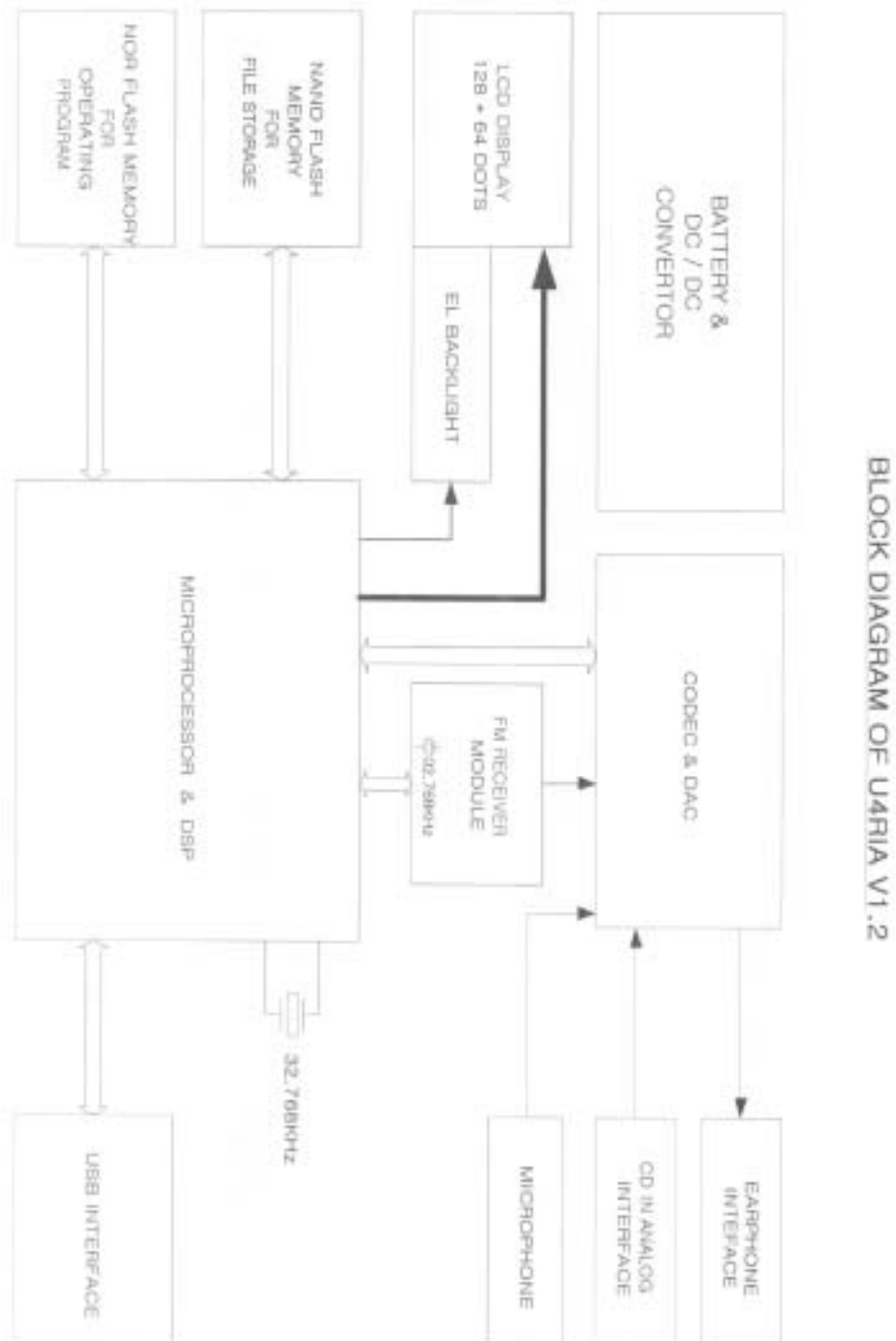
Final Measurement: X QP / + AV
Meas Time: 1sec
Subranges: 25
Acc Margin: 60 dB



Appendix 2. Photographs of EUT in side PCB



Appendix 3. Block diagram of EUT



Appendix 4. Circuit Diagram