Compliance Test Report for FCC

Report Number		ESTF150305-001		
Applicant	Company name	DG Lab Co., Ltd.		
	Address	3FL MYUNGJI B/D 997-3, HWAGOK 6DONG, GANGSEO-GU, SEOUL, KOREA		
	Telephone	82-0502-878-5522		
Product	Product name	Digital Audio Player		
	Model No.	DG-100	Manufacturer	DG Lab Co., Ltd.
	Serial No.	NONE	Country of origin	Korea
Test date	2003-05-12 ~ 2003-05-12		Date of issue	2003-05-14
Testing 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 test report is not permitted to copy partly without our permission
- This test result is dependent on only equipment to be used
- This test result based on a single evaluation of one sample of the above mentioned

Contents

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

MIC : Granted Accreditation from Ministry of Information & Communication for EMC, Safety and Telecommunication
KOLAS : Accredited Lab By Korea Laboratory Accreditation Schema base on CENELEC requirements
FCC : Filed Laboratory at Federal Communications Commission
VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE

2. Description of EUT

2.1 Summary of Equipment Under Test

Product	: Digital Audio Player
Model Number	: DG-100
Serial Number	: NONE
Manufacturer	: DG Lab Co., Ltd.
Country of origin	: Korea
Rating	: DC 1.5V Battery or PC Power using
Receipt Date	: 2003-04-17

2.2 General descriptions of EUT

Digital Audio Player

- Memory : Built-in Memory (64MB/128MB)
- Interface : USB 1.1
- Download Speed : Max 12Mbps(depending on computer)
- Playback Time : Approximately 10 Hrs (AAA Battery 1EA)
- Output Frequency : 20Hz ~ 20KHz
- Supported OS : Windows 98/SE, Windows ME/2000/XP
- Size : 28.4 × 94.2 × 23.3 mm

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 decides 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 method apply to the measurement of individual units or systems comprised of multiple units

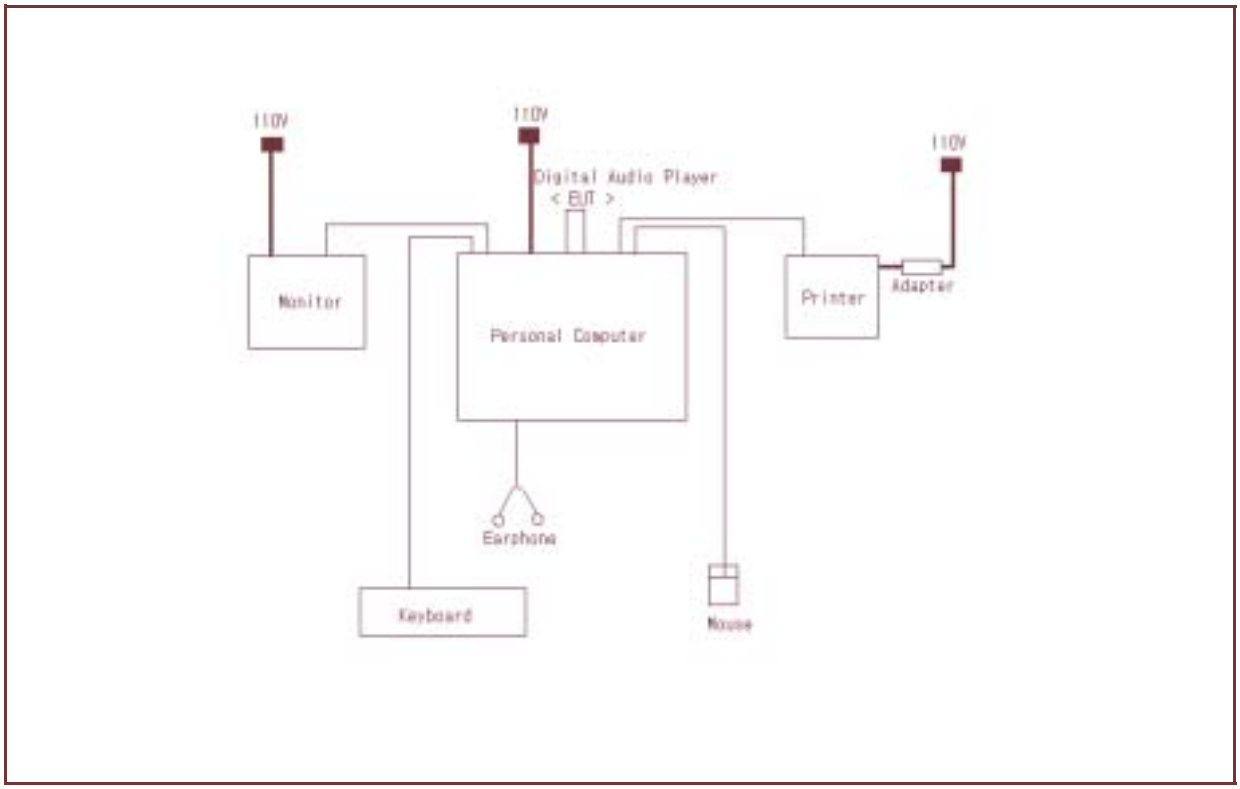
★ Testing EUT Under connecting PC

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 hightest level of emission
* After setting as test arrangement diagram, we test EUT under audio out and "H" character display

4.2 Configuration and Peripherals



4.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
Digital Audio Player	DG-100	NONE	DG Lab Co., Ltd.	EUT
Personal Computer	DHS(OptiPlex GX50)	NONE	Dell Computer	-
Monitor	CD177DP	P305H2RTC04742	Samsung Electronics Co., Ltd.	-
Keyboard	SDL2500	06038295	Samsung Electro-Mechanics Ltd.	-
Mouse	X05-51692	9404461-10000	Mircosoft Corporation	-
Printer	C6414J	TH18M149P2	HEWLETT PACKARD	-
Adapter	C6409-60152	NONE	YOKOGAWA	-
Headset	TSOUND	NONE	TSOUND	-

4.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
Digital Audio Player	USB	Personal Computer	USB	0.0	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	VIDEO	Monitor	VIDEO	2.0	N	-
Personal Computer	Parallel	Printer	Parallel	2.0	Y	-
Printer	Power	Adpater	-	2.0	N	-
Personal Computer	Speak	Headset	Speak	2.0	Y	-

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	2003.6.21
Spectrum Analyzer	R3261B	ADVANTEST	1720302	2004.2.7
LogBicon Antenna	VULB 9160	S/B	3107	2003.6.7
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) : 21 ℃
Humidity (%) : 41 %

5.3 Test data

Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dBμV/m)
58.73	13.70	H	3.3	12.44	1.1	40.0	27.26	-12.74
64.15	14.50	H	3.3	12.71	1.2	40.0	28.38	-11.62
80.18	20.10	H	3.2	8.77	1.3	40.0	30.19	-9.81
88.21	20.20	H	3.2	8.75	1.4	43.5	30.36	-13.14
108.25	18.20	H	3.0	10.38	1.5	43.5	32.10	-11.40
144.02	14.70	H	3.0	13.40	1.9	43.5	33.47	-10.03
186.14	22.40	H	1.7	12.53	2.1	43.5	29.31	-14.19
199.90	19.20	H	1.5	11.30	2.2	43.5	35.93	-7.57
214.78	19.10	H	1.5	10.69	2.3	43.5	32.16	-11.34
240.04	20.40	H	1.4	11.71	2.4	46.0	33.21	-12.79
257.73	12.60	H	1.2	12.09	2.4	46.0	34.90	-11.10
286.36	18.60	H	1.4	12.95	2.6	46.0	28.14	-17.86
320.61	15.90	H	1.5	13.66	2.8	46.0	35.02	-10.98
336.04	18.10	H	1.6	13.99	2.8	46.0	32.71	-13.29
432.07	16.30	H	1.0	16.01	3.2	46.0	37.35	-8.65
Remark	H : Horizontal, V : Vertical							

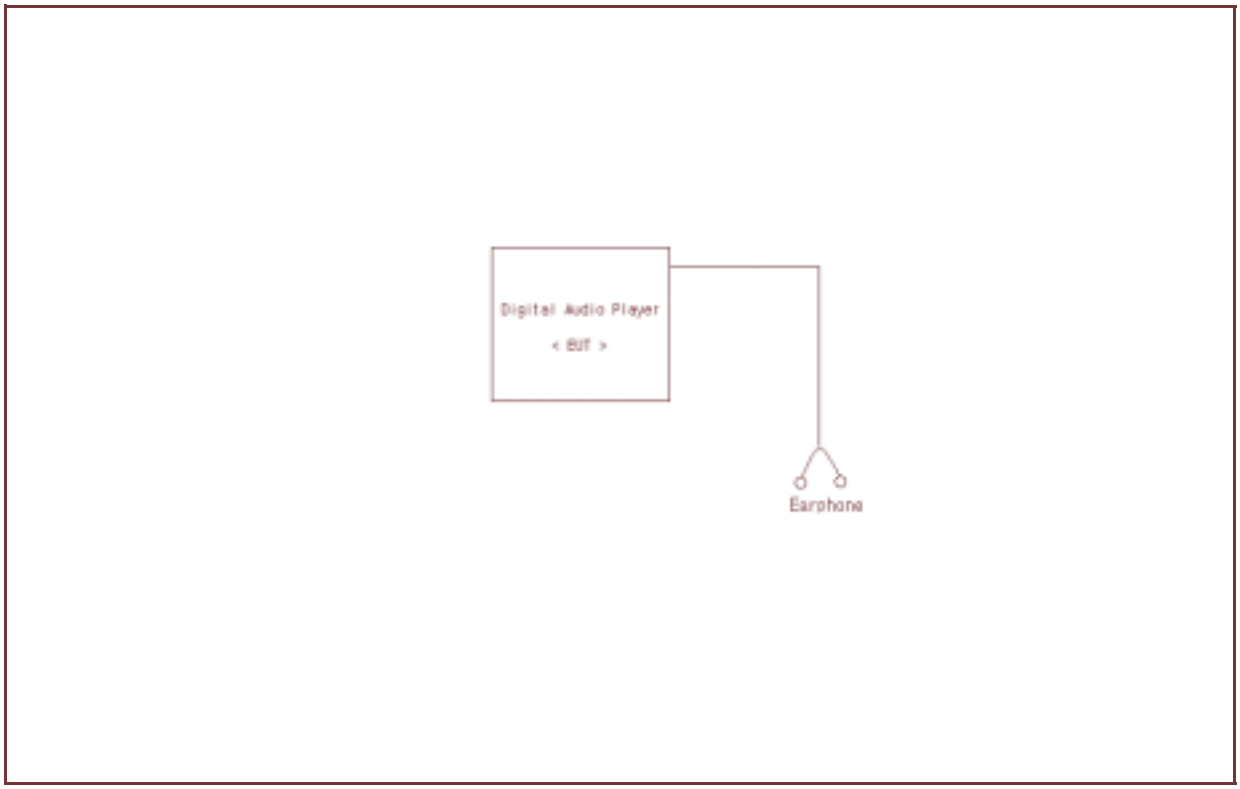
★ We test only EUT

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 hightest level of emission
* Only, we test EUT under connecting earphone and audio out.

6.2 Configuration and Peripherals



6.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
Digital Audio Player	DG-100	NONE	DG Lab Co., Ltd.	EUT
Earphone	-	-	-	-

6.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
Digital Audio Player	Earphone	Earphone	-	2.0	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	2003.6.21
Spectrum Analyzer	R3261B	ADVANTEST	1720302	2004.2.7
LogBicon Antenna	VULB 9160	S/B	3107	2003.6.7
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) : 21 ℃
Humidity (%) : 41 %

7.3 Test data

Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dBμV/m)
77.82	10.10	H	3.0	9.92	1.3	40.0	21.31	-18.69
113.02	10.10	H	2.5	11.12	1.6	43.5	22.83	-20.67
184.34	19.90	H	1.8	12.50	2.1	43.5	34.47	-9.03
192.10	19.30	H	1.7	11.14	2.2	43.5	32.63	-10.87
196.62	23.40	H	1.7	11.24	2.2	43.5	36.84	-6.66
214.77	7.10	H	1.6	10.69	2.3	43.5	20.06	-23.44
260.00	14.90	H	1.5	12.13	2.5	46.0	29.48	-16.52
270.36	17.40	H	1.3	12.48	2.5	46.0	32.38	-13.62
271.38	13.10	H	1.3	12.50	2.5	46.0	28.11	-17.89
282.59	12.40	H	1.2	12.87	2.6	46.0	27.85	-18.15
395.29	8.40	H	1.0	15.22	3.1	46.0	26.72	-19.28
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 Receive	ESPC	Rohde & Schwarz	845296/021	2003.6.21
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	2003.7.4

8.2 Environmental Condition

Test Place : Shield Room
Temperature (°C) : 20 ℃
Humidity (%) : 41 %

8.3 Test data

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dBμV)	Reading (dBμV)	Result (dBμV)	Limit (dBμV)	Reading (dBμV)	Result (dBμV)
0.154	0.07	0.0	H	65.80	45.97	46.04	55.80	28.91	28.98
0.156	0.07	0.0	N	65.67	45.66	45.73	55.67	28.71	28.78
0.186	0.07	0.0	H	64.21	41.74	41.83	54.21	26.51	26.60
0.232	0.07	0.1	H	62.36	32.66	32.78	52.36	24.84	24.96
0.291	0.07	0.1	H	60.51	28.52	28.68	50.51	24.32	24.48
0.295	0.07	0.1	N	60.37	27.80	27.97	50.37	24.34	24.51
2.684	0.13	0.3	H	56.00	24.56	24.99	46.00	24.22	24.65
2.749	0.13	0.3	N	56.00	24.63	25.06	46.00	24.95	25.38
3.123	0.14	0.3	N	56.00	25.95	26.39	46.00	25.82	26.26
4.434	0.18	0.3	N	56.00	31.38	31.86	46.00	31.69	32.17
4.689	0.19	0.3	N	56.00	28.18	28.67	46.00	31.03	31.52
4.997	0.20	0.3	H	56.00	29.32	29.82	46.00	22.63	23.13
6.246	0.25	0.4	N	60.00	35.26	35.87	50.00	35.47	36.08
7.684	0.30	0.4	N	60.00	33.82	34.56	50.00	31.88	32.62
8.869	0.33	0.5	H	60.00	32.88	33.73	50.00	30.47	31.32
9.682	0.35	0.6	N	60.00	35.87	36.80	50.00	33.83	34.76
11.175	0.42	0.6	H	60.00	34.07	35.14	50.00	32.22	33.29
13.422	0.53	0.7	H	60.00	31.63	32.90	50.00	28.68	29.95
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]

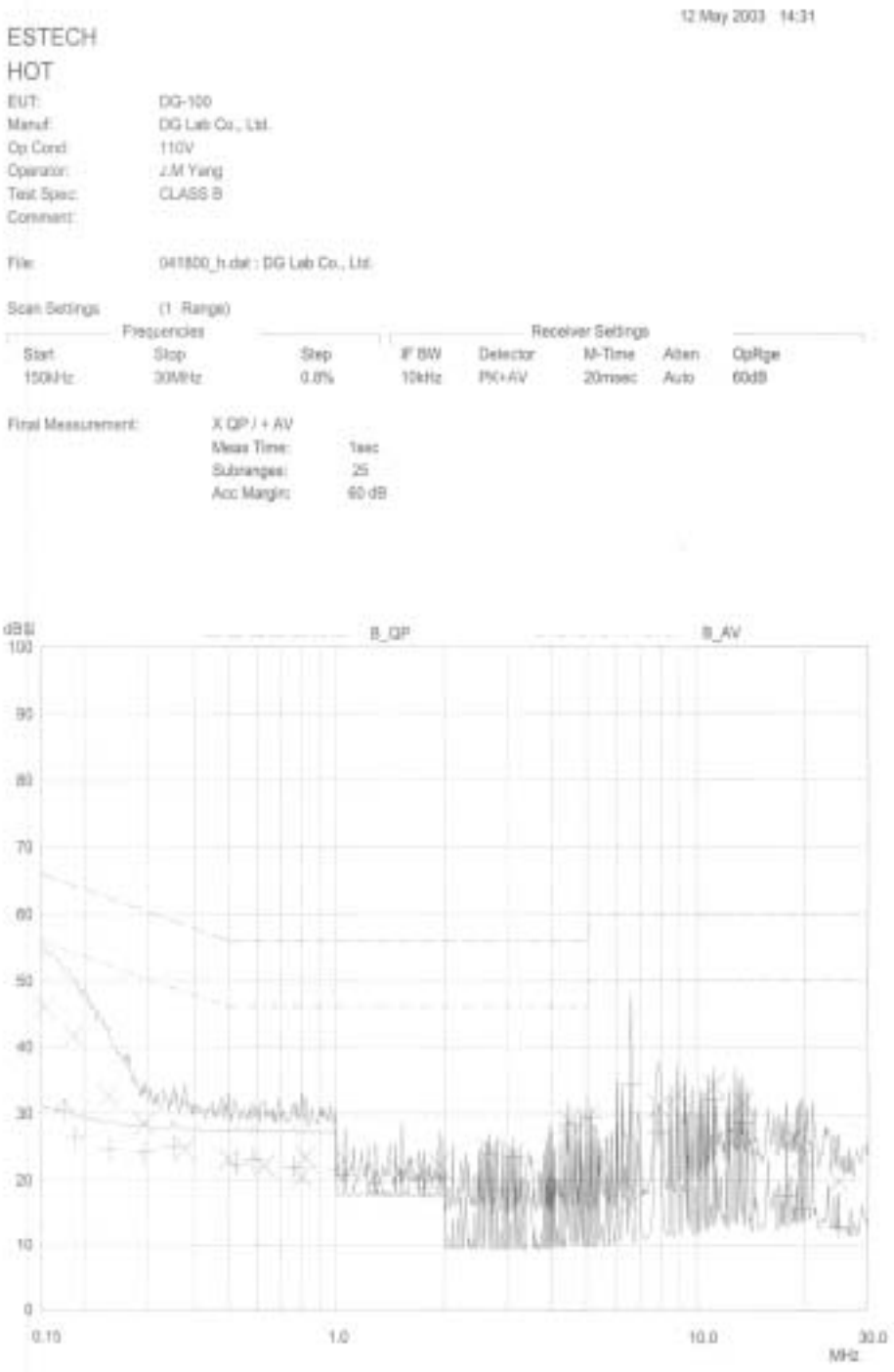
10. Photographs of EUT

[Front]

[Rear]

Appendix 1. Spectral diagram

*HOT



*NETRUL

12 May 2003 14:23

ESTECH

NEUTRAL

EUT:	DG-100
Manuf:	DG Lab Co., Ltd.
Op Cond:	110V
Operator:	J.M Yang
Test Spec:	CLASS B
Comment:	

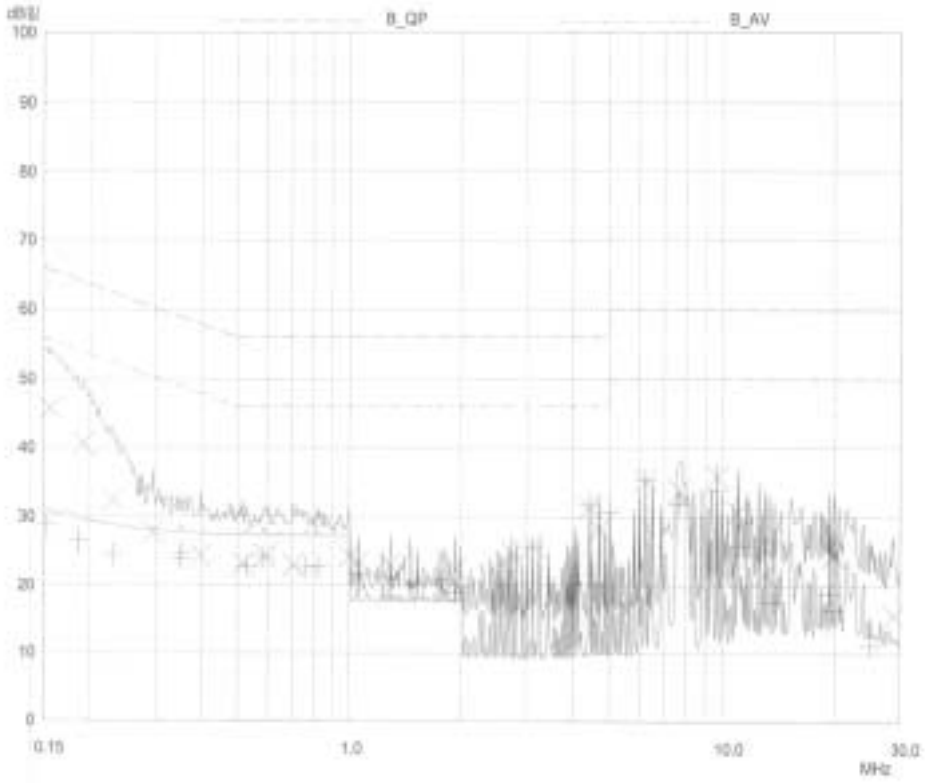
File: 041803_n.dat : DG Lab Co., Ltd.

Scan Settings (1 Range)

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

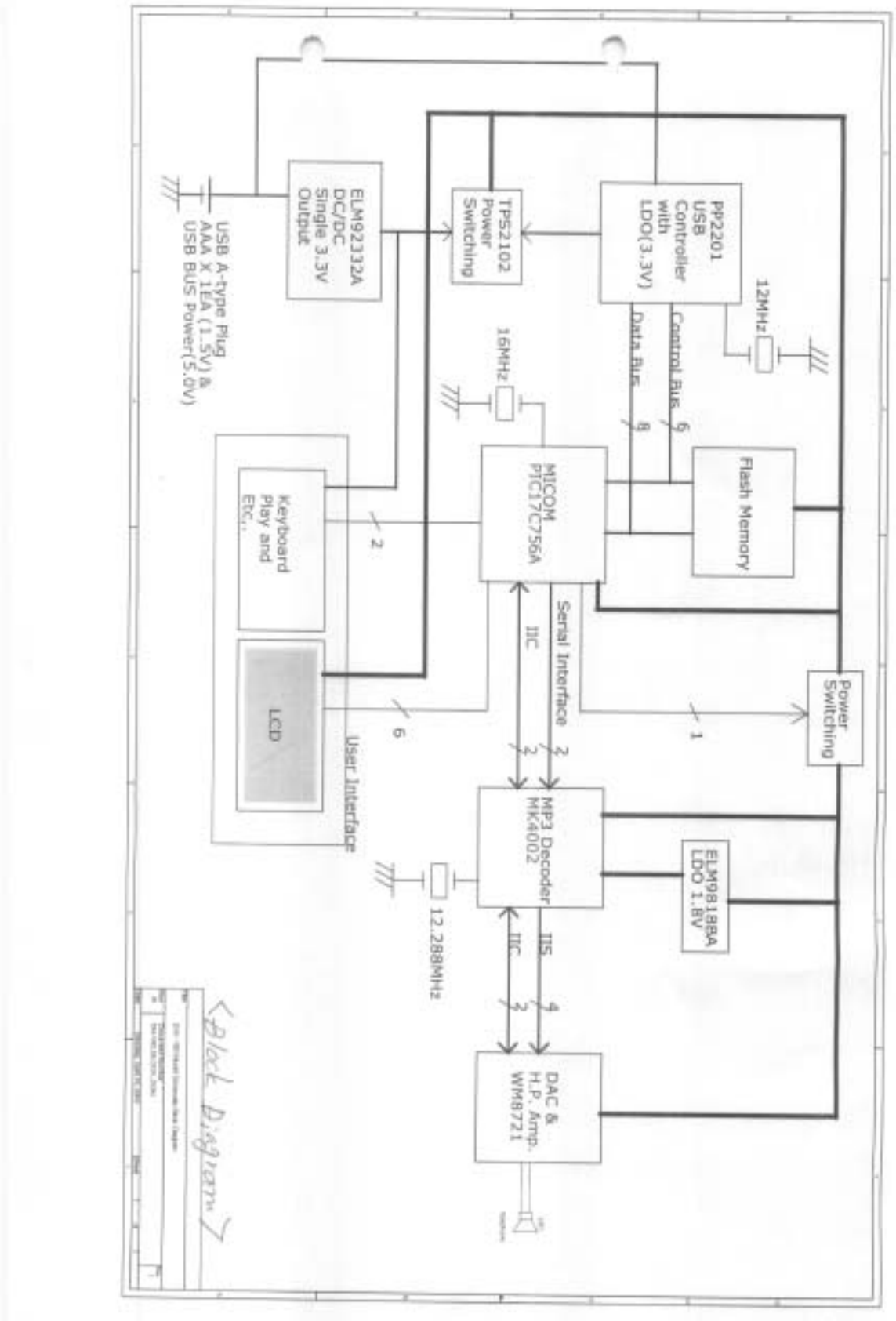
Final Measurement: X QP / + AV

Meas Time:	1sec
Subranges:	25
Acc Margin:	60 dB



Appendix 2. Phorographs of EUT in side PCB

Appendix 3. Block diagram of EUT



Appendix 4. Circuit Diagram