

	ESTECH Co., Ltd. 3rd Fl., Chungdam Bldg., 119-1 Chungdam-dong, Kangnamgu, Seoul	   	Electromagnetic Interference Test Report

Compliance Test Report for FCC

Report Number		ESTF150204-001			
Applicant	Company name	GLONIX			
	Address	Rm702-1, Daelim Opera Tower, Kuro6-Dong #98, Kuro-Ku, Seoul			
	Telephone	82-2-6346-1011			
Product	Product name	7" TFT LCD TV			
	Model No.	PD-180	Manufacturer	GLONIX	
	Serial No.	NONE	Country of origin	KOREA	
Test date	2002-04-12 ~ 2002-04-15		Date of issue	2002-04-16	
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea				
Standard	FCC PART 15 2001 , 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	3
2. Description of EUT	4
3. Test Standards	5
4. Measurement condition	6
5. Measurement of radiated emission	8
5.1 Measurement equipment	8
5.2 Environmental conditions	8
5.3 Test data	9
6. Measurement of conducted emission	10
6.1 Measurement equipment	10
6.2 Environmental conditions	10
6.3 Test data	11
7. Measurement of TV Interface Device	12
7.1 Description of Interface Device	12
7.2 Test Data	12
8. Photographs of test setup	14
9. Photographs of EUT	16

Appendix 1. Spectral Diagram

Appendix 2. Photographs of EUT in side PCB

Appendix 3. Block Diagram of EUT

Appendix 4. Circuit Diagram

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

Branch Office : USA-ESTECH INC.
21801 Stevens Creek Blvd. Suite 2A Cupertino, CA95014

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 : 7" TFT LCD TV

Model Number : PD-180

Serial Number : NONE

Manufacturer : GLONIX

Country of origin : KOREA

Rating : Power Adaptor using(DC 12V, 1.2A)

Receipt Date : 9-Apr-02

2.2 General descriptions of EUT

- * Panasonic digital wide 7" TFT color LCD
- * TV tuner and monitor integrated into one unit with a high sensitivity PLL synthesizer tuner
- * On-screen display (OSD) function to enhance convenience
- * High-speed automatic channel memory function
- * Input of high resolution DVD video and audio
- * Automatic video signal reception between NTSC and PAL

3. Test Standards

Test Standard : FCC PART 15 (2001)

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.



ESTECH Co., Ltd.
3rd Fl., Chungdam Bldg.,
119-1 Chungdam-dong,
Kangnamgu, Seoul



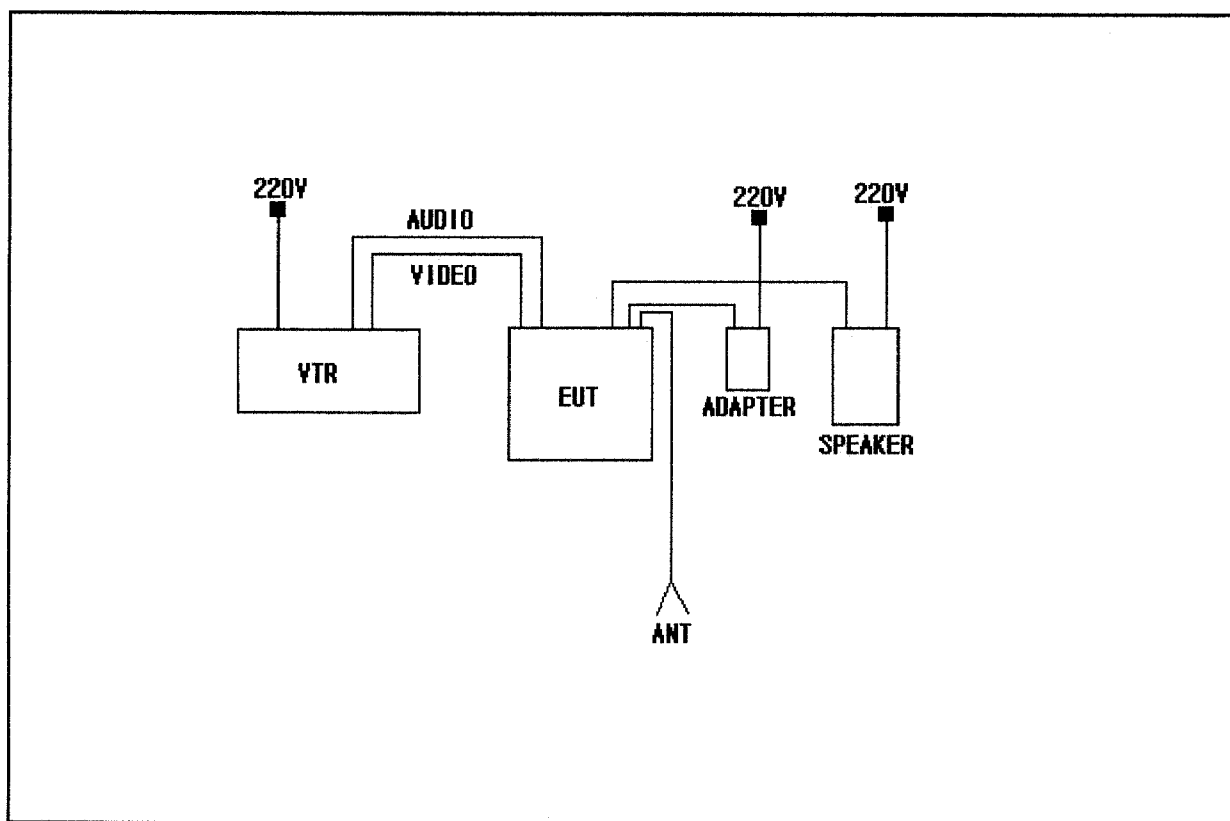
**Electromagnetic
Interference
Test Report**

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
- * Capturing Broadcast frequency, outputting audio and video at LCD TV.

4.2 Configuration and Peripherals





ESTECH Co., Ltd.
3rd Fl., Chungdam Bldg.,
119-1 Chungdam-dong,
Kangnamgu, Seoul



Electromagnetic Interference Test Report

4.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
7" TFT LCD TV	PD-180	NONE	GLONIX	EUT
VTR	LV-M320	NONE	LG Electronic	-
SPEAKER	NONE	NONE	JBL	-
ADAPTER	DR-121200	NONE	Dream Electronic Co., Ltd.	-

4.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
7" TFT LCD TV	ANT	Antenna	-	2.5	Y	
7" TFT LCD TV	Audio in	VTR	Audio out	3.0	Y	
7" TFT LCD TV	Audio out	SPEAKER	-	1.0	Y	
7" TFT LCD TV	Video in	VTR	Video out	3.0	Y	
7" TFT LCD TV	Power	Adapter	-	2.0	N	

5. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2001) & ANSI C 63.4 (2001). The test setup was made according to FCC Part 15 (2001) & 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	838248/001	2003. 1. 31
LogBicon Antenna	VULB 9160	S/B	3107	2002.5.9
Turn Table	2087	EMCO	2129	-
Antenna Mast	2070-01	EMCO	9702-203	-
Amplifier	310N	Sonoma Instrument	185817	2002.9.27
ANT Mast Controller	2090	EMCO	1535	-
Turn Table Controller	2090	EMCO	1535	-

5.2 Environmental Condition

Test Place : Open site (3m)
 Temperature (°C) : 22 °C
 Humidity (%) : 60 %

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)
42.96	23.50	V	1.1	12.00	1.3	40.0	36.76	-3.24
85.93	24.50	H	4.0	8.07	1.8	40.0	34.40	-5.60
128.88	17.50	H	2.4	11.83	2.4	43.5	31.71	-11.79
171.82	24.50	V	1.0	12.44	2.8	43.5	39.76	-3.74
214.76	22.00	H	1.5	10.16	3.2	43.5	35.36	-8.14
257.73	25.80	H	1.2	11.81	3.6	46.0	41.19	-4.81
300.86	14.50	H	1.0	13.09	3.8	46.0	31.40	-14.60
343.64	13.50	V	1.7	14.14	4.3	46.0	31.94	-14.06
386.58	16.80	H	1.0	15.13	4.6	46.0	36.57	-9.43
429.52	15.00	H	1.0	16.13	4.9	46.0	36.02	-9.98
472.49	20.00	V	1.1	17.00	5.1	46.0	42.10	-3.90
515.43	9.70	V	1.0	17.58	5.5	46.0	32.73	-13.27
558.36	18.50	V	1.0	18.48	5.7	46.0	42.66	-3.34
601.33	6.50	H	1.5	19.55	5.7	46.0	31.77	-14.23
644.28	14.00	V	1.0	19.94	6.1	46.0	40.06	-5.94
730.21	11.50	V	1.8	21.33	6.6	46.0	39.43	-6.57
733.99	6.30	H	1.0	21.45	6.6	46.0	34.39	-11.61
Remark	H : Horizontal, V : Vertical							

6. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.45 to 30 MHz was measured in accordance to FCC Part 15 (2001) & ANSI C 63.4 (2001) The test setup was made according to FCC Part 15 (2001) & 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.

6.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
LISN	ESHS-Z5	Rohde & Schwarz	838979/010	2003. 2. 1
LISN	NNLA81020A	Schwarzbeck	8120161	2003. 2. 1
TEST Receive	ESPC	Rohde & Schwarz	838248/001	2003. 1. 31

6.2 Environmental Condition

Test Place : Shield Room
 Temperature (°C) : 18 °C
 Humidity (%) : 45 %

6.3 Test data

Frequency (MHz)	Reading (dB μ V)	Line (H/N)	Correction Factor		Limit (dB μ V)	Result (dB μ V)	Margin (dB μ V)
			Lisn (dB)	Cable (dB)			
0.503	31.18	H	0.08	0.2	48.00	31.46	-16.54
0.524	36.10	N	0.07	0.2	48.00	36.37	-11.63
0.549	35.66	N	0.07	0.2	48.00	35.93	-12.07
0.686	25.87	N	0.08	0.2	48.00	26.15	-21.85
0.749	25.73	N	0.09	0.2	48.00	26.02	-21.98
1.190	26.02	N	0.09	0.2	48.00	26.33	-21.67
10.391	31.64	N	0.38	0.6	48.00	32.64	-15.36
11.617	33.66	N	0.44	0.7	48.00	34.77	-13.23
16.895	35.45	N	0.64	0.8	48.00	36.89	-11.11
17.722	33.88	H	0.84	0.8	48.00	35.52	-12.48
19.346	34.14	N	0.69	0.8	48.00	35.63	-12.37
21.457	32.55	H	0.95	0.8	48.00	34.33	-13.67
Remark	H : Hot Line, N : Neutral Line						

7. Measurement of TV Interface Device

7.1 Description of TV Interface Device

Tuner Maker : SAMSUNG

Tuner Type : TCPN9081DA10B

Frequency range tuned by the receiver : 54 ~ 806 MHz

This receiver meets FCC Regulations covering comparable systems of VHF and UHF TV tuning

7.2 Test Data

7.2.1 Peak Picture Sensitivity Test Data

SAMSUNG(TCPN9081DA10B) : Limit UHF-VHF < 8 dBuV, Result : OK

7.2.2 Radiated Emission Measurements

Frequency to which tuned		Frequency of the emission (MHz)	Result at 3m (dBV/M)	Limit at 3m (dBuV/M)
Channel	(MHz)			
2	55.25	101	<20	43.5
3	61.25	107	<20	43.5
4	67.25	113	<20	43.5
5	77.25	123	<20	43.5
6	83.25	129	<20	43.5
7	175.25	221	<30	46.0
8	181.25	227	<30	46.0
9	187.25	233	<30	46.0
10	193.25	239	<30	46.0
11	199.25	245	<30	46.0
12	205.25	251	<30	46.0
13	211.25	257	<30	46.0
14	471.25	517	34.7	46.0
		1034	<40	54.0
19	501.25	547	35.5	46.0
		1094	<40	54.0
28	555.25	601	39.2	46.0
		1202	<40	54.0
36	603.25	649	35.7	46.0
		1298	<40	54.0
44	651.25	697	37.6	46.0
		1394	<40	54.0
53	705.25	751	40.1	46.0
		1502	<40	54.0
61	753.25	799	40	46.0
		1598	<40	54.0
69	801.25	847	40.5	46.0
		1694	<40	54.0

7.2.3 UHF Noise Figure

Channel (UHF)	Reading (dB)	Matching Loss(dB)	Noise Fgure (dB)	Limit (dB)
14	12	1.75	8.15	14.0
19	9		7.95	
28	11		8.05	
36	8		8.05	
44	10		8.15	
53	10		8.05	
61	11.5		8.75	
69	11		9.55	
4.0dB subtracted for power splitter, <0.3 dB added for IF amp contribution				

7.2.4 Antenna Power Conduction

Frequency to which tuned		Frequency of the emission (MHz)	Result (dBV)	Limit (dBuV)
Channel	(MHz)			
2	55.25	101	17.5	51.8
3	61.25	107	16.5	
4	67.25	113	16.5	
5	77.25	123	15.5	
6	83.25	129	19	
7	175.25	221	35	
8	181.25	227	35.5	
9	187.25	233	36	
10	193.25	239	37	
11	199.25	245	38	
12	205.25	251	38.5	
13	211.25	257	38.7	
14	471.25	517	34.8	
		1034	28.5	
19	501.25	547	33	
		1094	37	
28	555.25	601	28.5	
		1202	32	
36	603.25	649	30	
		1298	36	
44	651.25	697	31.5	
		1394	30	
53	705.25	751	35	
		1502	35	
61	753.25	799	36.5	
		1598	30.5	
69	801.25	847	38.5	
		1694	43.5	