



# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test report file number : E03OR-014

Applicant : LPS Device Co., Ltd.

Address : Rm 606, Joongang Induspia2 Apartment Factory, 144-5, Sangdaewon-Dong,  
Joongwon-Gu, Sungnam-Si, Kyunggi-Do, Korea

Manufacturer : LPS Device Co., Ltd.

Address : Rm 606, Joongang Induspia2 Apartment Factory, 144-5, Sangdaewon-Dong,  
Joongwon-Gu, Sungnam-Si, Kyunggi-Do, Korea

Type of Equipment : 17 Inch TFT LCD Color Monitor

FCC ID. : QY6LPS-170M

Model Name : LPS-170M

Multiple Model Name : LCD17LPM, D170M

Serial Number : N/A

Total page of Report : 13 pages (including this page)

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## SUMMARY

The equipment complies with the regulation; **PART 15 SUBPART B, Class B Computing Device Peripherals.**

This test report contains only the result of a single test of the sample supplied for the examination.

It is not a general valid assessment of the features of the respective products of the mass-production.

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ONETECH Corp.

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## CONTENTS

	Page
<b>1. VERIFICATION OF COMPLIANCE.....</b>	<b>3</b>
<b>2. GENERAL INFORMATION .....</b>	<b>4</b>
<b>2.1 PRODUCT DESCRIPTION .....</b>	<b>4</b>
<b>2.2 MODEL DIFFERENCES: .....</b>	<b>4</b>
<b>2.3 RELATED SUBMITTAL(S) / GRANT(S).....</b>	<b>4</b>
<b>2.4 TEST SYSTEM DETAILS .....</b>	<b>5</b>
<b>2.5 TEST METHODOLOGY .....</b>	<b>5</b>
<b>2.6 TEST FACILITY .....</b>	<b>5</b>
<b>3. SYSTEM TEST CONFIGURATION.....</b>	<b>6</b>
<b>3.1 JUSTIFICATION .....</b>	<b>6</b>
<b>3.2 EUT EXERCISE SOFTWARE.....</b>	<b>6</b>
<b>3.3 CABLE DESCRIPTION.....</b>	<b>7</b>
<b>3.4 NOISE SUPPRESSION PARTS ON CABLE .....</b>	<b>7</b>
<b>3.5 EQUIPMENT MODIFICATIONS.....</b>	<b>7</b>
<b>4. PRELIMINARY TEST .....</b>	<b>8</b>
<b>4.1 AC POWER LINE CONDUCTED EMISSION TEST.....</b>	<b>8</b>
<b>4.2 RADIATED EMISSION TEST .....</b>	<b>8</b>
<b>5. FINAL RESULT OF MEASUREMENT .....</b>	<b>9</b>
<b>5.1 CONDUCTED EMISSION TEST .....</b>	<b>9</b>
<b>5.2 RADIATED EMISSION TEST FOR DIGITAL MODE.....</b>	<b>11</b>
<b>6. FIELD STRENGTH CALCULATION .....</b>	<b>12</b>
<b>7. LIST OF TEST EQUIPMENT.....</b>	<b>13</b>

**1. VERIFICATION OF COMPLIANCE**

APPLICANT : LPS Device Co., Ltd.  
ADDRESS : Rm 606, Joongang Induspia2 Apartment Factory, 144-5, Sangdaewon-Dong, Joongwon-Gu,  
Sunnam-Si, Kyunggi-Do, Korea  
CONTACT PERSON : Mr. Jin-Kyu, Jung / Senior Engineer  
TELEPHONE NO. : +82-31-737-6305  
FCC ID : QY6LPS-170M  
MODEL NAME : LPS-170M  
SERIAL NUMBER : N/A  
DATE : October 08, 2003

DEVICE TYPE	Peripheral Device for Class B Personal Computing Device -UNINTENTIONAL RADIATOR
E.U.T. DESCRIPTION	17 Inch TFT LCD Color Monitor
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4/1992
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART (S)	PART 15 SUBPART B, SECTION 15.101
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	YES
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

- This device has shown compliance with the conducted emissions limits in 15.107 adopted under FCC 02-107 (ET Docket 98-80). The device may be marketed after July 11, 2005 affected by the 15.37(j) transition provisions.
- The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.



## 2. GENERAL INFORMATION

### 2.1 Product Description

The LPS Device Co., Ltd., Model LPS-170M (referred to as the EUT in this report) is a 17 Inch TFT LCD Color Monitor that is connected a personal computer. The Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)	24.000 MHz on the main board
LCD PANEL SPEC.	LM170E01 / LG Philips LCD
INPUT VIDEO SIGNAL	VGA Compatible Analog RGB
DISPLAY MODE	Normally White
DISPLAY RESOLUTION	Maximum: 1280 X 1024, 75Hz
POWER REQUIREMENT	DC 12V, 3.3A from the AC/DC Adaptor
USED AC/DC ADAPTERS	FSP040-1AD101C manufactured by FSP Group Inc.
NUMBER OF LAYERS	Main Board: 4 Layers
EXTERNAL CONNECTORS	Audio In/Out, DC In

### 2.2 Model Differences:

The difference(s) compared to the EUT is as follows:

		Model Differences
Basic Model	LPS-170M	-
Multiple Model	LCD17LPM, D170M	Only type designation because of buyer's request

### 2.3 Related Submittal(s) / Grant(s)

-. Original submittal only



## 2.4 Test System Details

The model numbers for all the equipments, which were used in the tested system, is:

Model	Manufacturer	Description	FCC ID	Connected to
LPS-170M	LPS Device Co., Ltd.	17 Inch TFT LCD Color Monitor(EUT)	QY6LPS-170M	PC
FSP040-1AD101C	FSP Group Inc.	AC/DC ADAPTER	N/A	EUT
GX240	DELL Computer Corp.	PC	DoC	-
SK-8110	SILITEK	KEYBOARD	DoC	PC
M-SAS51	Logitech	MOUSE	JNZ211167	PC
2225C	HP	PRINTER	DSI6XU2225	PC
020-0470	Cardinal	MODEM	GDE0196	PC
SMS-015N	Sungil Precision Co., Ltd.	SPEAKER	N/A	PC

## 2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4/1992.

Radiated testing was performed at a distance of 3 meters from the EUT to the antenna.

## 2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myun, Gwangju-Si, Gyeonggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Commission on January 18, 2002. (Registration Number: 92819)



### 3. SYSTEM TEST CONFIGURATION

#### 3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	N/A	N/A	N/A
OSD Board	N/A	170SD-01A	N/A
Inverter Board	Frontek Co., Ltd.	P1742E02	N/A
LCD Panel	LG Philips LCD	LM170E01	N/A

#### 3.2 EUT exercise Software

The windows program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. This program was included into HOST. Once loaded, this program sequentially exercises each system component in turn. The sequence used is: (1) series of “H” characters are printed on the monitor until the screen is completely full, (2) copy series of “H” characters to mass storage device (if one is used), (3) print series of “H” characters to printer. The complete cycle is repeated continuously.

The test was performed about each resolution from minimum resolution to maximum resolution for getting maximum noise level and the investigated maximum resolution mode of the EUT was 1280 X 1024, 75Hz.

**3.3 Cable Description**

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
17 Inch TFT LCD Color Monitor (EUT)	N	Y	1.5(P), 1.5(D)
AC/DC ADAPTER	N	N/A	1.5(P)
PERSONAL COMPUTER	N	-	1.8(P), -
KEYBOARD	N/A	Y	1.5(D)
MOUSE	N/A	Y	1.5(D)
PRINTER	N	Y	1.8(P), 1.5(D)
SPEAKER	N/A	N	1.5(D)
MODEM	N	Y	1.8(P), 1.5(D)

\* The marked "(D)" means the I/O Cable and "(P)" means the Power Cable.

**3.4 Noise Suppression Parts on Cable**

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
17 Inch TFT LCD Color Monitor (EUT)	Y	BOTH END	Y	BOTH END
AC/DC ADAPTER	Y	EUT END	Y	EUT END
PERSONAL COMPUTER	-	-	-	-
KEYBOARD	N	N/A	Y	PC END
MOUSE	N	N/A	Y	PC END
PRINTER	N	N/A	Y	BOTH END
SPEAKER	N	N/A	Y	BOTH END
MODEM	N	N/A	Y	BOTH END

**3.5 Equipment Modifications**

- The rating of R135, R136 and R138 were changed from 0 Ohm to 65 Ohm.
- The resistors(R177) was changed to bead(200 Ohm).
- The bead(120 Ohm) was added to the pins(70, 74-81, 86-93, 96, 97) of U4.
- The bead(120 Ohm) was added to the pin(3) of J102.
- The bead(1 KOhm) was added to the pins(1, 10, 11) of J102.
- The bead(120 Ohm) was added to the pin(3) of J103.
- The bead(1 KOhm) was added to the pin(1) of J103.
- The ferrite core was added to the J108 cable.
- The EMI gasket was added to the LCD Panel.



### 3.6 Configuration of Test System

**Line Conducted Test:** The power of the EUT was supplied by AC/DC adapter and the adapter was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4/1992 7.2.3 to determine the worse operating conditions.

**Radiated Emission Test:** Preliminary radiated emission test was conducted using the procedure in ANSI C63.4/1992 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 meters open area test site.

## 4. PRELIMINARY TEST

### 4.1 AC Power line Conducted Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Resolution: 640 X 480	-
Resolution: 800 X 600	-
Resolution: 1024 X 768	-
Resolution: 1280 X 1024	X

### 4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Resolution: 640 X 480	-
Resolution: 800 X 600	-
Resolution: 1024 X 768	-
Resolution: 1280 X 1024	X

**5. FINAL RESULT OF MEASUREMENT**

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level.

**5.1 Conducted Emission Test**

Humidity Level : 38% Temperature : 22°C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107(a)  
 Type of Test : CLASS B  
 Result : PASSED BY -3.79 dB at 0.51 MHz when used an Average detector mode

EUT : 17 Inch TFT LCD Color Monitor Date : August 20, 2003  
 Operating Condition : Continuously displayed "H" characters on the screen of the EUT  
 Detector : CISPR Quasi-Peak and Average(6 dB Bandwidth: 9 kHz)  
 Resolution : 1280 X 1024, 75Hz

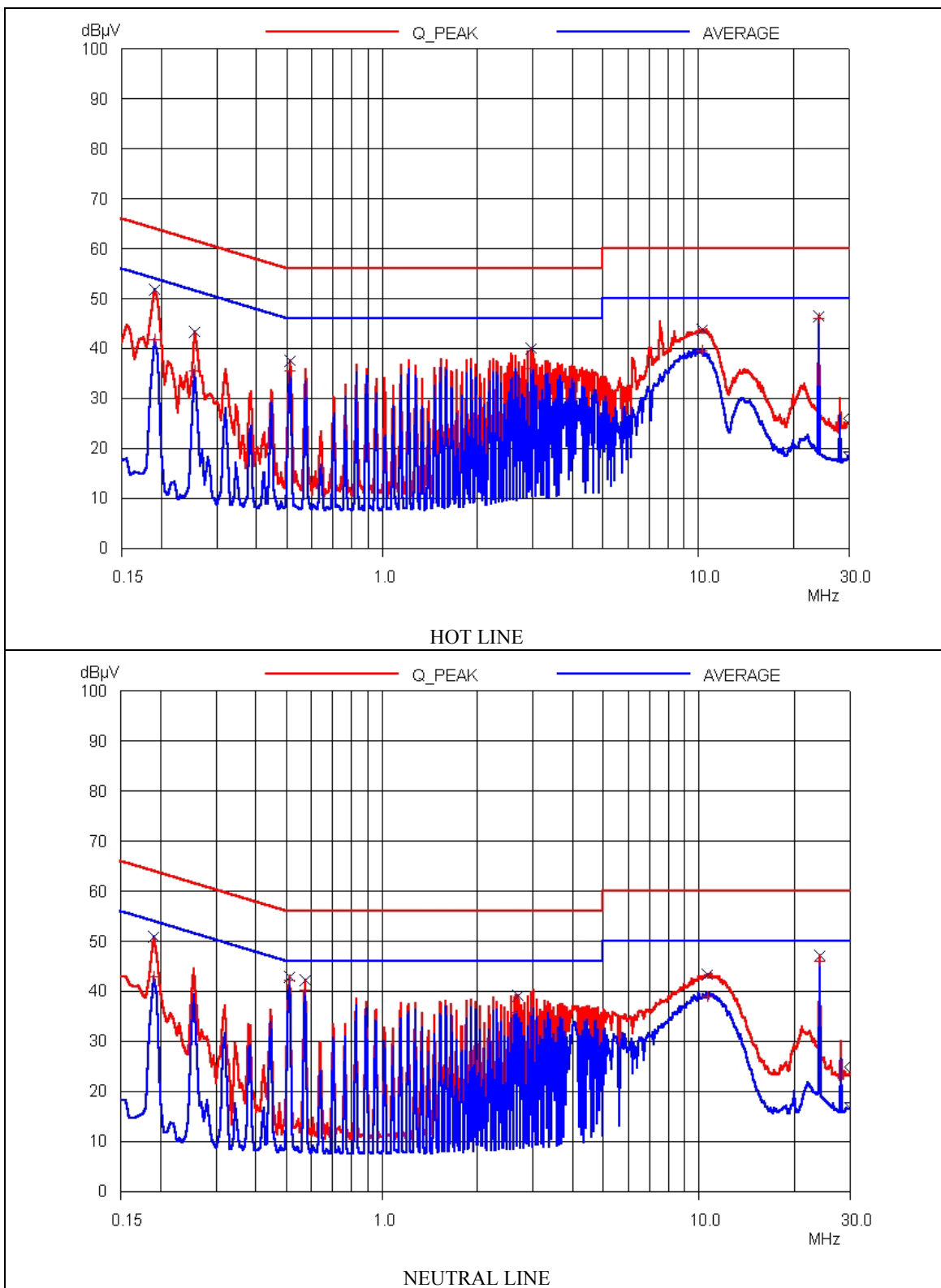
Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.19	H	51.88	64.04	-12.16
0.51	N	42.96	56.00	-13.04
0.57	N	42.12	56.00	-13.88
2.94	H	39.96	56.00	-16.04
10.23	H	43.71	60.00	-16.29
24.00	N	47.00	60.00	-13.00
Frequency (MHz)	Line	Average (dBuV)		Margin (dB)
		Emission level	Limits	
0.19	H	41.86	54.04	-12.18
0.51	N	42.21	46.00	-3.79
0.57	N	40.21	46.00	-5.79
2.94	H	35.96	46.00	-10.04

Line Conducted Emission Tabulated Data

Remark : "H": Hot Line, "N": Neutral line

See next page for an overview sweep performed with peak and average detector.

Tested by: Sue-Yong, Lee / Test Engineer





## 5.2 Radiated Emission Test for Digital mode

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 35 % Temperature : 24°C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109(a)  
 Type of Test : CLASS B  
 Result : PASSED BY -2.93 dB at 450.56 MHz

EUT : 17 Inch TFT LCD Color Monitor Date : September 02, 2003  
 Operating Condition : Continuously displayed "H" characters on the screen of EUT  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)  
 Distance : 3 Meter  
 Resolution : 1280 X 1024, 75Hz

Radiated Emission		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
46.47	19.80	V	12.24	0.13	32.17	40.00	-7.83
81.36	21.20	V	6.94	0.50	28.64	40.00	-11.36
92.99	20.95	V	9.15	0.41	30.51	43.52	-13.01
109.46	21.84	V	11.66	0.50	34.00	43.52	-9.52
111.40	23.20	V	11.91	0.42	35.53	43.52	-7.99
168.57	15.62	V	15.61	0.66	31.89	43.52	-11.63
257.72	19.54	H	17.59	0.44	37.57	46.02	-8.45
310.05	22.51	H	13.77	0.71	36.99	46.02	-9.03
394.36	21.44	H	15.62	0.85	37.91	46.02	-8.11
405.02	21.79	H	15.86	0.79	38.44	46.02	-7.58
450.56	25.14	H	16.80	1.15	43.09	46.02	-2.93
799.40	17.28	H	20.91	1.39	39.58	46.02	-6.44

Radiated Emission Tabulated Data

Remark : In case any frequency has margin less than -3 dB, it may be exceeded restriction limits by the environment condition.

Tested by: Sue-Yong, Lee / Test Engineer

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FCC-004 (Rev.0)

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## 6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

---

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)



## 7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS 10	827864/005	NOV/02	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	APR/03	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	MAY/03	12MONTH	■
4.	Spectrum analyzer	HP	8568B	3109A05456	MAY/03	12MONTH	■
5.	RF preselector	HP	85685A	3107A01264	MAY/03	12MONTH	■
6.	Quasi-Peak Adapter	HP	85650A	3107A01542	MAY/03	12MONTH	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	FEB/03	12MONTH	
8.	Biconical antenna	EMCO Schwarzbeck	3104C VHA9103	9109-4443 9109-4444 91031852	MAY/03 JUL/03 AUG/03	12MONTH	■
9.	Log Periodic antenna	EMCO Schwarzbeck	3146 9108-A(494)	9109-3213 9109-3214 9109-3217 62281001	AUG/02 JUL/03 MAY/03 AUG/02	12MONTH	■
10.	LISN	EMCO	3825/2	9109-1867 9109-1869	AUG/03 OCT/02	12MONTH	■
11.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	■
12.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	■
13.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	■