



# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

**Test Report No.** : E054R-089

**Applicant** : NEWQ SYSTEM CO., LTD.

**Address** : 3FL., Byucksan Valley, No. 212-16, Guro-3Dong, Guro-Ku, Seoul, Korea

**Manufacturer** : WOO SHIN INDUSTRIAL CO., LTD.

**Address** : 663, Kanap-Ri, Kwangjuk-Myun, Yangju-City, Kyunggi-Do, Korea

**Type of Equipment** : LCD MONITOR

**FCC ID** : POHNR190DT

**Model Name** : NR190DT

**Multiple Model Name** : NR190V, NR190VB

**Serial number** : N/A

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

**Date of Incoming** : January 28, 2005

**Date of Issuing** : April 26, 2005

## 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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**1. VERIFICATION OF COMPLIANCE**

APPLICANT : NEWQ SYSTEM CO., LTD.  
ADDRESS : 3FL., Byucksan Valley, No. 212-16, Guro-3Dong, Guro-Ku, Seoul, Korea  
CONTACT PERSON : Mr. Yu-Sun, Baek / Associate Engineer  
TELEPHONE NO : +82-2-2107-2876  
FCC ID : POHNR190DT  
MODEL NO/NAME : NR190DT  
SERIAL NUMBER : N/A  
DATE : April 26, 2005

|                                                         |                                                |
|---------------------------------------------------------|------------------------------------------------|
| DEVICE TYPE                                             | Peripheral Device for Class B Computing Device |
| E.U.T. DESCRIPTION                                      | LCD MONITOR                                    |
| THIS REPORT CONCERNS                                    | ORIGINAL GRANT                                 |
| MEASUREMENT PROCEDURES                                  | ANSI C63.4: 2001                               |
| TYPE OF EQUIPMENT TESTED                                | PRE-PRODUCTION                                 |
| KIND OF EQUIPMENT<br>AUTHORIZATION REQUESTED            | CERTIFICATION                                  |
| EQUIPMENT WILL BE OPERATED<br>UNDER FCC RULES PART(S)   | PART 15 SUBPART B, SECTION 15.101              |
| MODIFICATIONS ON THE EQUIPMENT<br>TO ACHIEVE COMPLIANCE | No                                             |
| 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 NEWQ SYSTEM CO., LTD., Model NR190DT (referred to as the EUT in this report) is a LCD MONITOR. The verification report for the TV tuner part shall be issued with other test report number. 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) | 24.576 MHz and 20.25 MHz on the Main Board                                     |
| NUMBER OF LAYERS                             | 2 Layers: Main Board and OSD Control Board                                     |
| ELECTRICAL RATING                            | Input : AC100-240V, 50/60Hz, 1.5A, Output : DC 12V, 4.16A, 50W (AC/DC Adaptor) |
| TUNER M/N / MFR                              | TCMN3080DA29A(H) / SAMSUNG                                                     |
| EXTERNAL TERMINALS                           | DC In, DVI-D, D-SUB MINI-D, Audio In/Out, S-VHS In, Composite In, TV           |

### 2.2 Model Differences

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

|                | Model Name | Model Differences                                                                                                   |
|----------------|------------|---------------------------------------------------------------------------------------------------------------------|
| Basic Model    | NR190DT    | -                                                                                                                   |
| Multiple Model | NR190V     | This model is same to basic model, but the TV function is not included.                                             |
|                | NR190VB    | This model is same to basic model, but the TV function is not included and the type of composite input jack is BNC. |

### 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                     | FCC ID     | Description       | Connected to |
|--------------|----------------------------------|------------|-------------------|--------------|
| NR190DT      | WOO SHIN INDUSTRIAL CO., LTD.    | POHNR190DT | LCD MONITOR (EUT) | Notebook PC  |
| LSE9901B1250 | Li Shin International Enterprise | N/A        | AC/DC Adaptor     | EUT          |
| PP05LC       | Dell Computer Corp               | DoC        | Notebook PC       | -            |
| 2225C        | HP                               | DSI6XU2225 | Printer           | Notebook PC  |
| 020-0470     | Cardinal                         | GDE0196    | Modem             | Notebook PC  |



# ONETECH

*Testing & Evaluation Lab.*

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|        |        |     |           |     |
|--------|--------|-----|-----------|-----|
| SH-627 | Samick | N/A | Headphone | EUT |
|--------|--------|-----|-----------|-----|

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EMC-004 (Rev.0)

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## 2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2001. Radiated testing was performed at a distance of 3 meters from 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-Eup, Kwangju-City, Kyunggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Commission on April 04, 2003. (Registration Number: 340658)



### 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     | NEWQ         | NQADRT4.0         | N/A    |
| Inverter Board | FRONTEK      | N/A               | N/A    |
| LCD Panel      | SAMSUNG      | LTM190E1-L03      | N/A    |
| Front Board    | NEWQ         | NQOSDRT 4.0       | N/A    |
| Tuner Board    | NEWQ         | NQTVRT1.0         | N/A    |
| Tuner          | SAMSUNG      | TCMN3080DA29A(H)  | 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)     |
|---------------|---------------------------|--------------------------|----------------|
| LCD MONITOR   | N                         | Y                        | 1.5(P), 1.5(D) |
| AC/DC Adaptor | N                         | N                        | 1.5(P), 1.0(D) |
| Notebook PC   | N                         | -                        | 1.5(P)         |
| Printer       | N                         | Y                        | 1.5(P), 1.5(D) |
| Modem         | N                         | Y                        | 1.5(P), 1.5(D) |
| Headphone     | N                         | N                        | 1.5(D)         |

\* The marked "(P)" means the Power Cable and "(D)" means Signal Cable.

### 3.4 Noise Suppression Parts on Cable

|               | Ferrite Bead (Y/N) | Location | Metal Hood (Y/N) | Location |
|---------------|--------------------|----------|------------------|----------|
| LCD MONITOR   | Y                  | BOTH END | Y                | BOTH END |
| AC/DC Adaptor | Y                  | EUT END  | Y                | EUT END  |
| Notebook PC   | -                  | -        | -                | -        |
| Printer       | N                  | N/A      | Y                | BOTH END |
| Modem         | N                  | N/A      | Y                | BOTH END |
| Headphone     | N                  | N/A      | Y                | BOTH END |

### 3.5 Equipment Modifications

-. None

### 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: 2001 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: 2001 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: 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: 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 : 43 %

Temperature: 20 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107(a)

Type of Test : CLASS B

Result : PASSED BY -13.58 dB at 4.52 MHz

EUT : LCD MONITOR

Date: March 21, 2005

Operating Condition : Continuously displayed "H" characters on the screen of the EUT

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Resolution : 1280 x 1024, 75Hz

| Frequency<br>(MHz) | Line | Peak (dBuV)    |            | Margin<br>(dB) |
|--------------------|------|----------------|------------|----------------|
|                    |      | Emission level | Q.P Limits |                |
| 4.52               | N    | 42.42          | 56.00      | -13.58         |
| 4.59               | H    | 42.34          | 56.00      | -13.66         |
| 14.35              | H    | 45.14          | 60.00      | -14.86         |
| 15.19              | N    | 45.51          | 60.00      | -14.49         |
| 20.43              | N    | 44.92          | 60.00      | -15.08         |
| 20.82              | H    | 46.11          | 60.00      | -13.89         |
| Frequency<br>(MHz) | Line | Average (dBuV) |            | Margin<br>(dB) |
|                    |      | Emission level | Limits     |                |
| -                  |      |                |            |                |
| -                  |      |                |            |                |

Line Conducted Emission Tabulated Data

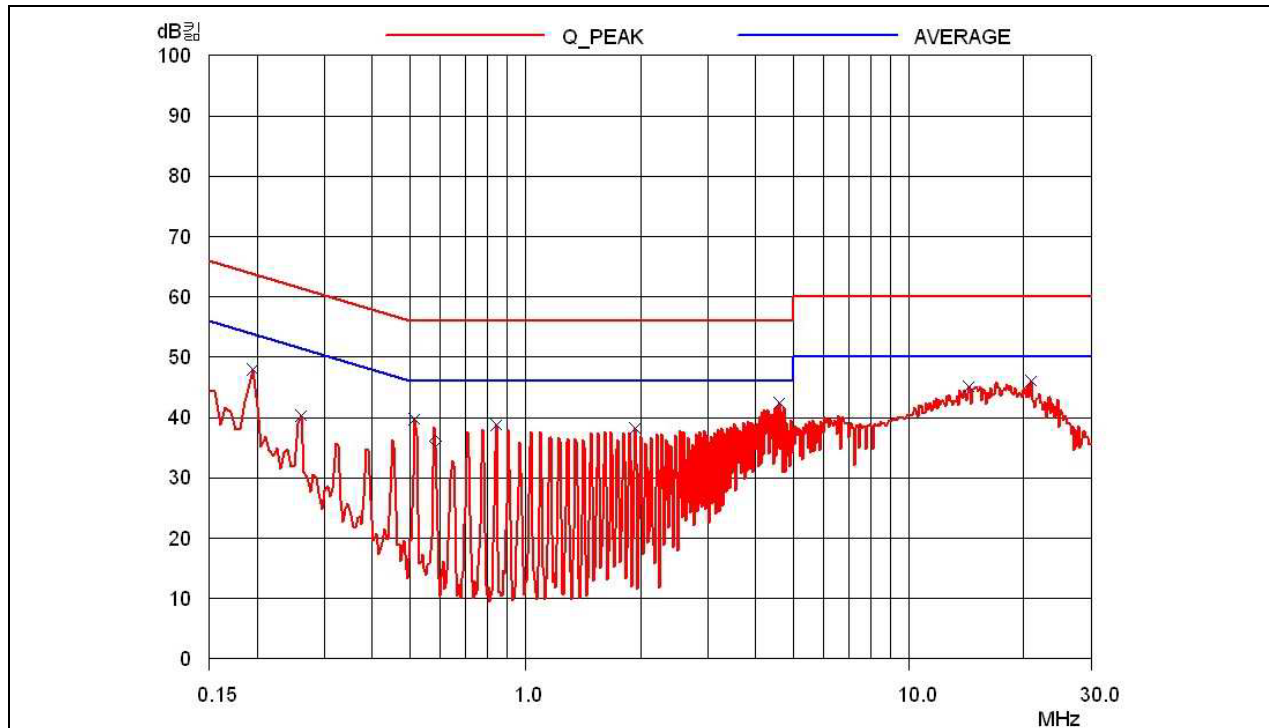
Remark : "H": Hot Line, "N": Neutral line

Average data was not recorded, because peak values were under the Average limit.

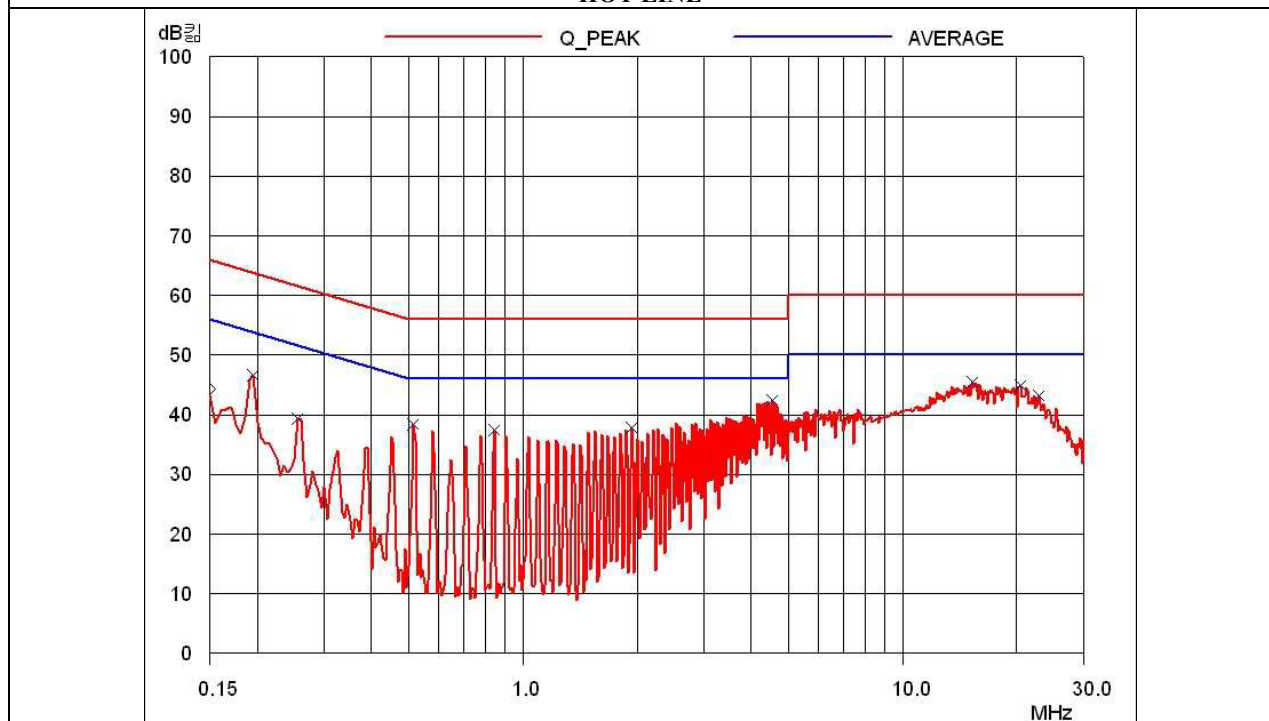
See next page for an overview sweep performed with peak and average detector.



Tested by: Hyun-Suck, Lee / Test Engineer



## HOT LINE



## NEUTRAL LINE

## 5.2 Radiated Emission Test

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

Humidity Level : 44 % Temperature: 20 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109(a)  
 Type of Test : CLASS B  
 Result : PASSED BY -4.58dB at 346.50MHz

EUT : LCD MONITOR Date: March  
 25, 2005

Operating Condition : Continuously displayed "H" characters on the screen of the EUT

Frequency range : 30MHz – 1000MHz

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

Distance : 3 Meter

Resolution : 1280 x 1024, 75Hz

| Radiated Emission |                | Ant  | Correction Factors |               | Total            | FCC               |                |
|-------------------|----------------|------|--------------------|---------------|------------------|-------------------|----------------|
| Freq.<br>(MHz)    | Amp.<br>(dBuV) | Pol. | Ant.<br>(dBuV/m)   | Cable<br>(dB) | Amp.<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
| 248.00            | 19.30          | H    | 16.87              | 2.30          | 38.47            | 46.02             | -7.55          |
| 292.60            | 18.50          | H    | 20.04              | 2.71          | 41.25            | 46.02             | -4.77          |
| 346.50            | 23.60          | V    | 14.30              | 3.54          | 41.44            | 46.02             | -4.58          |
| 498.60            | 19.00          | H    | 17.20              | 3.20          | 39.40            | 46.02             | -6.62          |
| 502.80            | 19.50          | H    | 17.28              | 3.23          | 40.01            | 46.02             | -6.01          |
| 640.70            | 16.70          | H    | 19.15              | 3.64          | 39.49            | 46.02             | -6.53          |



Tested by: Hyun-Suck, Lee / Test Engineer



## 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         | ESVS10      | 827864/005   | DEC/04   | 12MONTH | ■   |
| 2.  | Test receiver            | R/S         | ESHS 10     | 834467/007   | MAY/04   | 12MONTH | ■   |
| 3.  | Spectrum analyzer        | HP          | 8566B       | 3407A08547   | JUL/04   | 12MONTH |     |
| 4.  | Spectrum analyzer        | HP          | 8568B       | 3109A05456   | JUL/04   | 12MONTH | ■   |
| 5.  | RF preselector           | HP          | 85685A      | 3107A01264   | MAR/05   | 12MONTH | ■   |
| 6.  | Quasi-Peak Adapter       | HP          | 85650A      | 3107A01542   | JUL/04   | 12MONTH | ■   |
| 7.  | TRILOG Broadband Antenna | Schwarzbeck | VULB9163    | VULB9163 166 | FEB/05   | 12MONTH |     |
| 8.  | Biconical antenna        | EMCO        | 3104C       | 9109-4443    | MAY/04   | 12MONTH | ■   |
|     |                          | Schwarzbeck | VHA9103     | 91031852     | JAN/05   |         |     |
| 9.  | Log Periodic antenna     | EMCO        | 3146        | 9109-3213    | FEB/05   | 12MONTH | ■   |
|     |                          |             |             | 9109-3217    | MAY/04   |         |     |
|     |                          | Schwarzbeck | 9108-A(494) | 62281001     | JAN/05   |         |     |
| 10. | LISN                     | EMCO        | 3825/2      | 9109-1867    | JUL/04   | 12MONTH | ■   |
|     |                          |             |             | 9109-1869    | OCT/04   |         | ■   |
| 11. | Position Controller      | HD GmbH     | HD100       | N/A          | N/A      | N/A     | ■   |
| 12. | Turn Table               | HD GmbH     | DS420S      | N/A          | N/A      | N/A     | ■   |
| 13. | Antenna Master           | HD GmbH     | MA240       | N/A          | N/A      | N/A     | ■   |