



## EMISSION TEST REPORT

Test report file No. : **01-IST-109/FB** Date of issue : Aug. 23, 2001  
Model / Type No. : 5Q740  
Kind of product : 15" Color Display Monitor  
Applicant : Orion Electric Co., Ltd.  
Manufacturer : Orion Electric Co., Ltd.  
Address : 165 Gongdan-Dong, Gumi-City, Kyongbuk, Korea.

**Test result** according to the regulation(s)

☒ Positive ☐ Negative

at page 3.

This test report without appendix consists of 14 pages.

It is not allowed to copy this report even partly without the allowance of the Test Laboratory.

This equipment is complied with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-1992.

## DIRECTORY

### A) Documentation.

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### B) Test Data.

|                             |                    |                |
|-----------------------------|--------------------|----------------|
| Conducted emissions (Mains) | : 450 kHz - 30 MHz | <u>9 ~ 11</u>  |
| Radiated emissions          | : 30 MHz – 1 GHz   | <u>12 ~ 13</u> |

### C) Appendix

## TEST REGULATIONS

The tests were performed according to the following regulations ;

- - FCC Part 15, Subpart B (Unintentional Radiators, Class B)

## Information of Test Laboratory

### IST EMC Lab.

San 21-8 Goan-Ri, Baekam-Myun, Yongin-Si, Kyunggi-Do, Korea

International - Tel : 82-31 - 333 - 4093. Fax : 82-31 - 333 - 4094.

Domestic - Tel : 031 - 333 - 4093. Fax : 031 - 333 - 4094.

## ENVIRONMENTAL CONDITIONS

|                      |                  |
|----------------------|------------------|
| Temperature          | <u>27</u>        |
| Humidity             | <u>48</u> %      |
| Atmospheric pressure | <u>1000</u> mbar |

## TEST CONDITIONS

The measurement of the conducted emissions (Interference voltage) was performed in a shielded room.

### Test location :

■ - Shielded room. No.1

□ - Compact chamber 2

### Used testing instruments :

| <u>Name</u> | <u>Type</u>   | <u>Manufacturer</u> | <u>Calibration. Date</u> | <u>Serial Number</u> |
|-------------|---------------|---------------------|--------------------------|----------------------|
| ■ ESH 3     | Test Receiver | Rohde & Schwarz     | Jun. 11, 2001            | 861742/018           |
| ■ 3725/2    | LISN          | EMCO                | Jul. 13, 2001            | 9102-1788            |
| ■ 3825/2    | LISN          | EMCO                | Jul. 13, 2001            | 9103-1788            |
| ■ ESH 3-Z2  | Pulse Limiter | Rohde & Schwarz     | Jul. 13, 2001            | 357.8810.52          |

### Test - accessories :

| <u>Type</u>         | <u>Manufacturer</u> |
|---------------------|---------------------|
| ■ Aneroid Barometer | Sato                |
| ■ Hygrometer        | Sato                |

### Measurement Procedures :

Conducted emissions measurements were made in accordance with ANSI C-63.4-1992, "Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The measurement were performed over the frequency range of 0.45MHz to 30MHz using a 50Ω/ 50uH LISN as the input transducer to an EMI/Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within an IF bandwidth of 10kHz or for "quasi-peak" within a bandwidth of 9kHz.

All used test-instruments as well as the test-accessories are calibrated regularly.

### Test engineer :



S. G. Kim. / Research Engineer

IST EMC Lab.

The **measurement of the radiated emissions (Electric field)** in the frequency range from 30 MHz to 1GHz was performed in horizontal and vertical antenna polarization at a open-site which meet the site attenuation requirement of ANSI C63.4-1992 and a test distance of :

- - Open-site 1
- - 3 meters
- - Compact chamber
- - 10 meters

**Used testing instruments :**

| <u>Name</u> | <u>Type</u>   | <u>Manufacturer</u> | <u>Calibration. Date</u> | <u>Serial Number</u> |
|-------------|---------------|---------------------|--------------------------|----------------------|
| ■ ESVP      | Test Receiver | Rohde & Schwarz     | Jun. 12, 2001            | 861744/004           |
| ■ VULB 9160 | Antenna       | Schwarzbeck         | Jun. 04, 2001            | 3048                 |

**Test - accessories :**

| Type                | Manufacturer |
|---------------------|--------------|
| ■ Aneroid Barometer | Sato         |
| ■ Hygrometer        | Sato         |

**Measurement procedures**

Radiated measurements were in accordance with ANSI C63.4-1992 "Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The measurements were performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a EMI/Field Intensity Meter. The measurements were made with the detector set for "quasi-peak" within a bandwidth of 120kHz.

All used test-instruments as well as the test-accessories are calibrated regularly.

**Test engineer :**



S. G, Kim. / Research Engineer

IST EMC Lab.

## EQUIPMENT UNDER TEST

### Equipment Description

|                     |                                                     |
|---------------------|-----------------------------------------------------|
| CRT Type            | - 15.0" Dynamic focus                               |
|                     | - Dot pitch : 0.28mm                                |
| Resolution          | - 1280 X 1024, 60 Hz                                |
| Scanning Frequency  | - Horizontal: 30~70 kHz, Vertical: 50~150 Hz        |
| Input Signal        | - Video : RGB Analog (0.7Vp-p, 75Ω)                 |
|                     | - Sync : Horizontal (4.0 Vp-p), Vertical (4.0 Vp-p) |
| Weight              | - Net 12.0 Kg, Gross 14.0 Kg                        |
| Active Display Area | - 282 mm X 212 mm                                   |
| Dimension (WxDxH)   | - 487mm X 463mm X 447 mm                            |
| Power Rating        | - 100~240Vac, 50/60Hz (input)                       |
|                     | - Universal Power                                   |
| Power Consumption   | - 75 W (Power Saving: Less than 5 W)                |

### Operation - mode of the E.U.T. :

The equipment under test was operated during the measurement under following conditions :

- Standby.
- Operation for Test : Scrolling "H" characters under MS Windows98,  
Resolution : 1280 x 1024, 60 Hz

### Configuration of the equipment under test :

Following peripheral devices and interface cables were connected during the measurement :

| Equipment | Type           | Brand            | Serial No   | FCC ID        |
|-----------|----------------|------------------|-------------|---------------|
| PC        | Brio BA600/550 | HP               | SG01603782  | DoC           |
| Keyboard  | SK-2502C       | HP               | M000456678  | DoC           |
| Printer   | A0302384       | Northern Telecom | 26633S60168 | BS16XU2225C-L |
| Mouse1    | M-S48a         | HP               | LZE01000039 | JNZ201213     |
| Mouse2    | M-M28          | Logitech         | LCA53305547 | DZL210365     |

### Connection Cables :

- Unshielded AC power cable : 1.8 m
- Shielded monitor's signal cables(Analog) : 1.5m
- Shielded printer's signal cables(Analog) : 1.5m

## TEST RESULT

### Conducted emissions : 450 kHz - 30 MHz

The requirements are.

☒ KEPT

☐ NOT KEPT

Min. limit margin

8.4 dB at 0.487 MHz

Remarks : See test-graph to be attached at pages 9 ~ 11.

### Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are

☒ KEPT

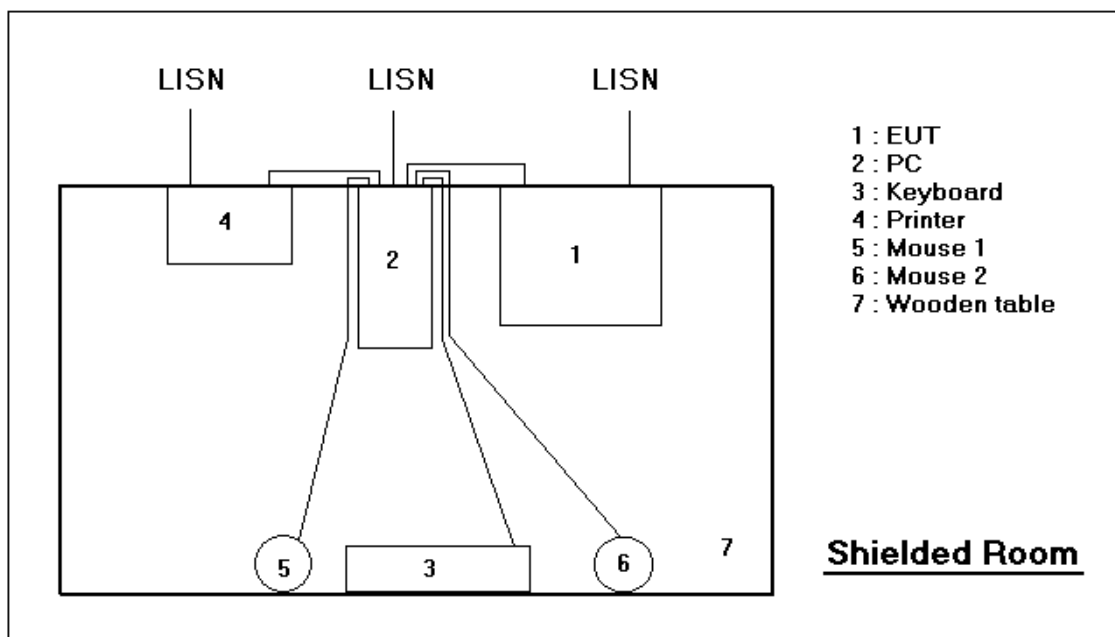
☐ NOT KEPT

Min. limit margin

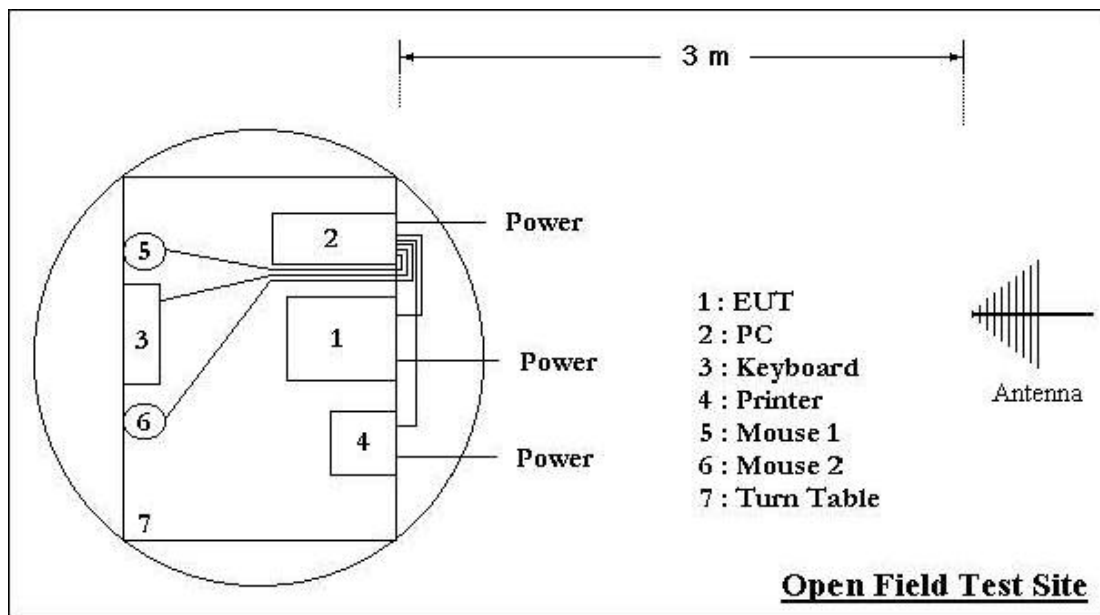
4.9 dB at 302.5 MHz

Remarks : See test-data at page 12 ~ 13.

**Test Set-Up  
(Type : 5Q740)**



**Picture 1 : Conducted emission 450kHz ~ 30MHz**



**Picture 2 : Radiated emission 30MHz ~ 1000MHz**

## Conducted Emission Test Data

Type : 5Q740  
 Manufacturer : Orion Electric Co., Ltd.  
 Operation mode : Scrolling "H" pattern display 1280 X 1024, 60 Hz  
 Date : Aug. 10, 2001

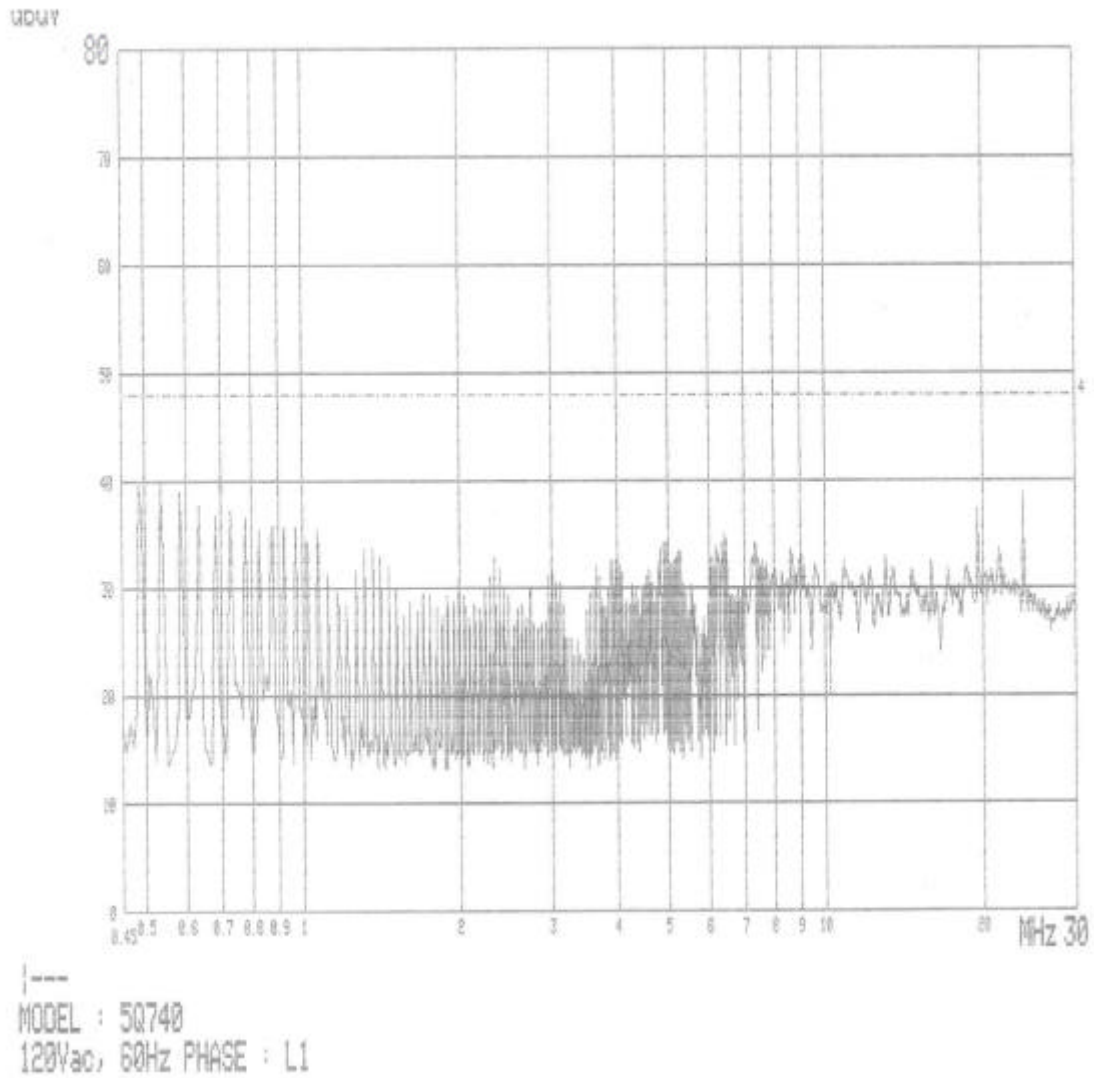
### Highest Emissions relative to the limit

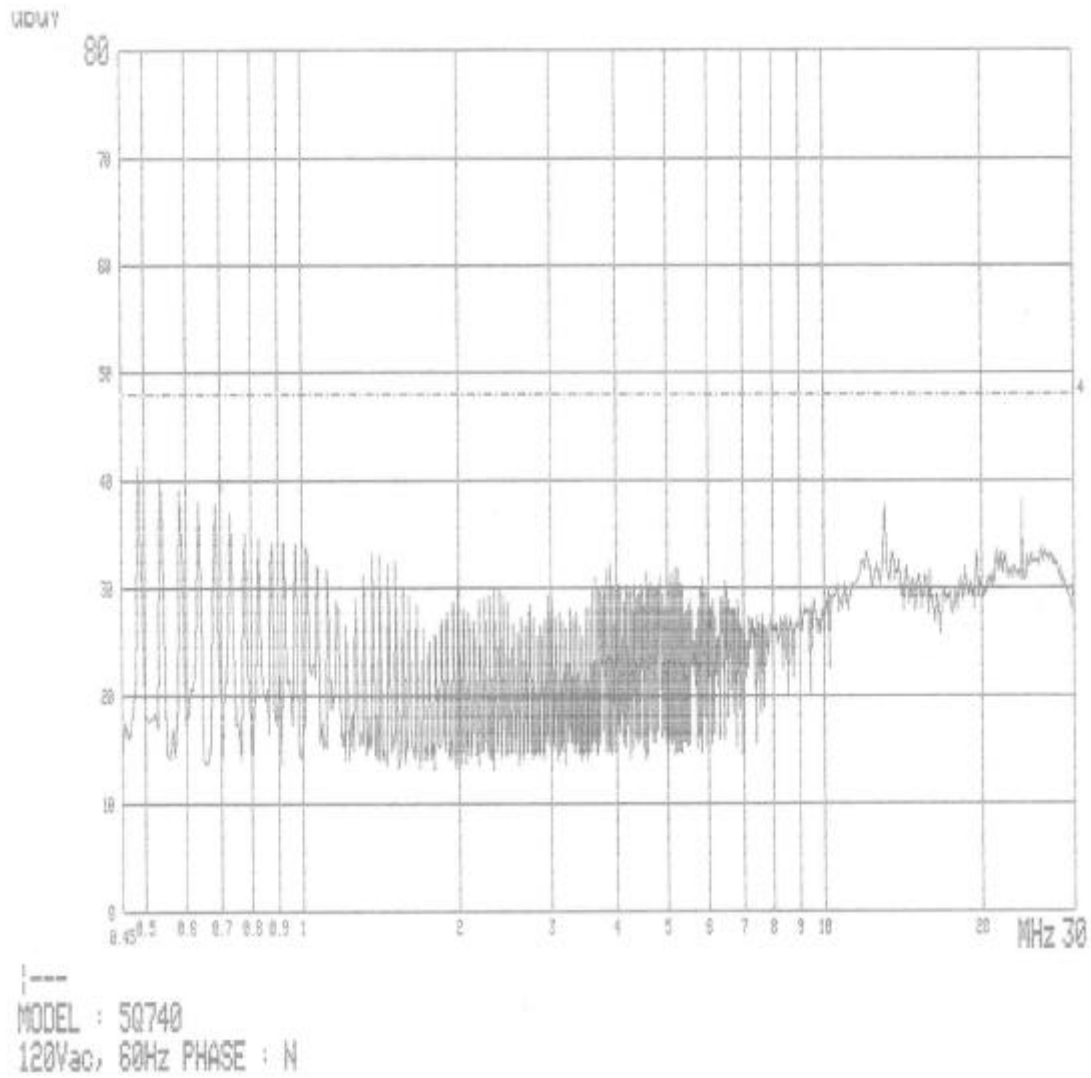
| Frequency<br>[MHz]              | Reading<br>[dBμV] | Insertion<br>loss<br>[dB] | Phase<br>(L1/N) | Result<br>[dBμV] | Limit<br>[dBμV] | Margin<br>[dB] |
|---------------------------------|-------------------|---------------------------|-----------------|------------------|-----------------|----------------|
| 0.487                           | 38.2              | 0.8                       | L1              | 39.0             | 48.0            | 9.0            |
| 0.534                           | 37.8              | 0.8                       |                 | 38.6             | 48.0            | 9.4            |
| 1.364                           | 32.5              | 0.8                       |                 | 33.3             | 48.0            | 14.7           |
| 3.889                           | 30.1              | 0.8                       |                 | 30.9             | 48.0            | 17.1           |
| 13.078                          | 37.6              | 0.8                       |                 | 38.4             | 48.0            | 9.6            |
| 23.921                          | 34.4              | 0.8                       |                 | 35.2             | 48.0            | 12.8           |
| 0.487                           | 38.8              | 0.8                       | N               | 39.6             | 48.0            | 8.4            |
| 0.534                           | 38.1              | 0.8                       |                 | 38.9             | 48.0            | 9.1            |
| 1.362                           | 33.5              | 0.8                       |                 | 34.3             | 48.0            | 13.7           |
| 3.888                           | 30.8              | 0.8                       |                 | 31.6             | 48.0            | 16.4           |
| 19.592                          | 35.7              | 0.8                       |                 | 36.5             | 48.0            | 11.5           |
| 23.938                          | 36.2              | 0.8                       |                 | 37.0             | 48.0            | 11.0           |
| Cable loss are less than 0.1 dB |                   |                           |                 |                  |                 |                |

\*L1 : Live Line

\*\*N : Neutral Line

\*\*\* Please refer to data graphs at page 10 ~ 11



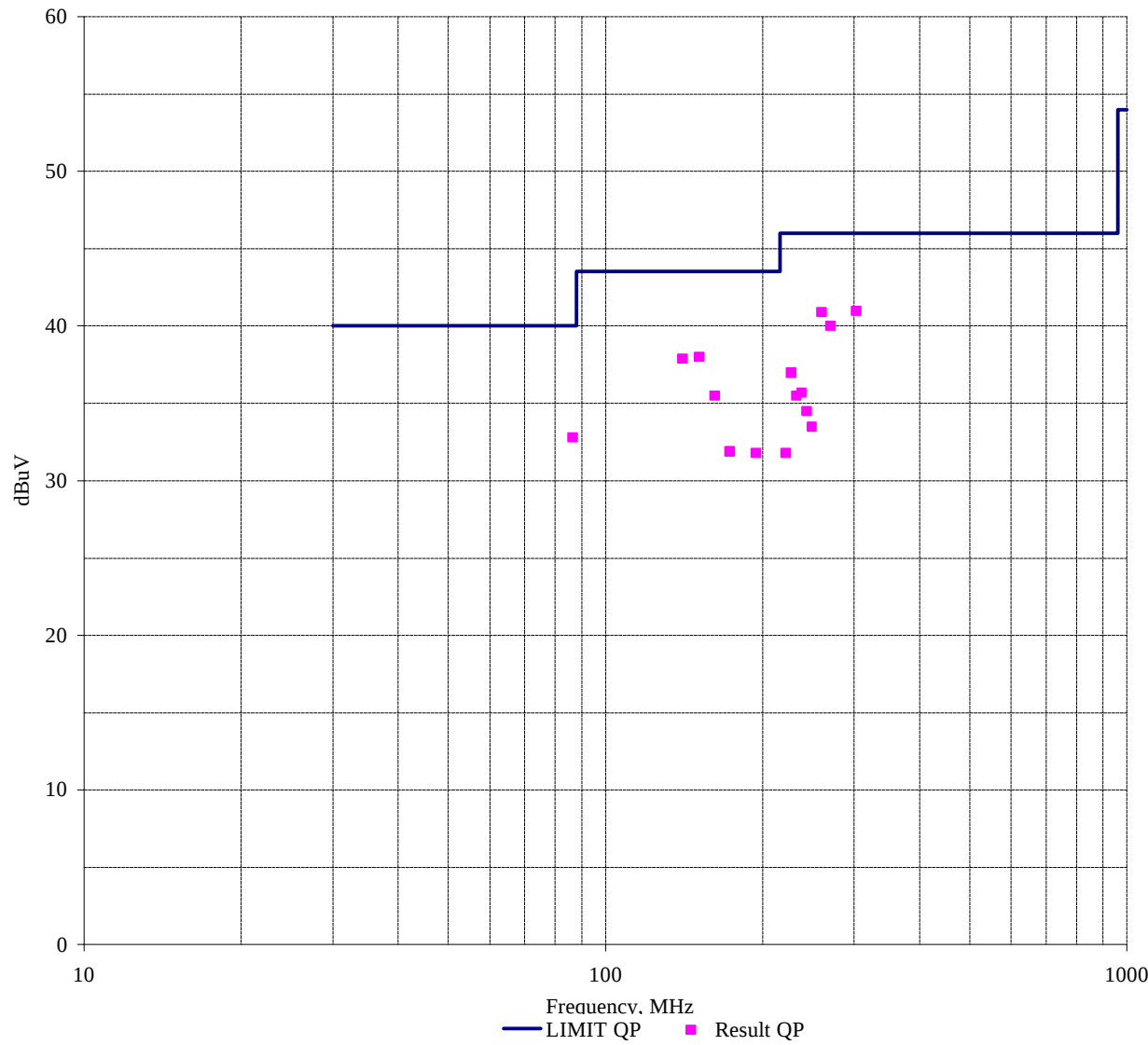


## Radiation Test Data

Type : 5Q740  
 Manufacturer : Orion Electric Co., Ltd.  
 Operation mode : Scrolling "H" pattern display 1280 X 1024, 60 Hz  
 Test distance : 3 m  
 Antenna : VULB9160  
 Date : Aug. 13, 2001.

| Freq.<br>[MHz] | Reading<br>[dBuV] | Antenna<br>Factor<br>[dB] | Cable<br>Loss<br>[dB] | Angle<br>[deg] | Height<br>[cm] | Polar<br>[H/V] | Result<br>[dBuV] | Limit<br>[dBuV] | Margin<br>[dB] |
|----------------|-------------------|---------------------------|-----------------------|----------------|----------------|----------------|------------------|-----------------|----------------|
| 86.4           | 23.9              | 7.2                       | 1.7                   | 188            | 110            | V              | 32.8             | 40.0            | 7.2            |
| 140.5          | 24.1              | 11.6                      | 2.2                   | 348            | 151            | V              | 37.9             | 43.5            | 5.6            |
| 151.3          | 23.5              | 12.2                      | 2.3                   | 344            | 132            | V              | 38.0             | 43.5            | 5.5            |
| 162.0          | 20.9              | 12.3                      | 2.3                   | 354            | 125            | V              | 35.5             | 43.5            | 8.0            |
| 172.9          | 17.6              | 11.9                      | 2.4                   | 315            | 122            | V              | 31.9             | 43.5            | 11.6           |
| 194.5          | 20.4              | 8.9                       | 2.5                   | 178            | 228            | V              | 31.8             | 43.5            | 11.7           |
| 221.5          | 20.5              | 8.5                       | 2.8                   | 177            | 348            | V              | 31.8             | 46.0            | 14.2           |
| 226.9          | 25.1              | 9.1                       | 2.8                   | 186            | 241            | H              | 37.0             | 46.0            | 9.0            |
| 232.3          | 23.1              | 9.6                       | 2.8                   | 182            | 301            | H              | 35.5             | 46.0            | 10.5           |
| 237.7          | 22.7              | 10.1                      | 2.9                   | 13             | 114            | V              | 35.7             | 46.0            | 10.3           |
| 243.0          | 21.2              | 10.4                      | 2.9                   | 345            | 121            | V              | 34.5             | 46.0            | 11.5           |
| 248.5          | 20.0              | 10.7                      | 2.8                   | 324            | 122            | V              | 33.5             | 46.0            | 12.5           |
| 259.3          | 26.8              | 11.2                      | 2.9                   | 350            | 115            | V              | 40.9             | 46.0            | 5.1            |
| 270.1          | 25.4              | 11.6                      | 3.0                   | 17             | 132            | V              | 40.0             | 46.0            | 6.0            |
| 302.5          | 26.1              | 11.7                      | 3.3                   | 324            | 248            | H              | 41.1             | 46.0            | 4.9            |

MEASUREMENT OF DISTURBANCE RADIATION



## SUMMARY

### GENERAL REMARKS :

The equipment is not modified anything, mechanical or circuit to improve EMI status during a measurement and complied the regulation "Part 15 subpart B Class B of CFR 47"

### FINAL JUDGMENT :

The requirements according to the technical regulations are

- ☒ Kept ☐ Not kept

The equipment under test does

- ☒ - Fulfill the general approval requirements mentioned on page 3.  
☐ - Not fulfill the general approval requirements mentioned on page 3.

Begin of testing : Aug. 06, 2001

End of testing : Aug. 17, 2001

Reviewed by :



Joon H. Lee. EMC Manager  
IST EMC Lab.

Approved by :



G. Chung Chief of EMC Lab.