

JEITA-ITR-3003

GUIDELINES FOR ELECTROSTATIC FIELDS  
EMITTED FROM VIDEO DISPLAY TERMINALS  
FOR INFORMATION TECHNOLOGY EQUIPMENT  
(4th edition)

Feb. 2004

Japan Electronics and Information Technology Industries Association  
Japan Business Machine and Information System Industries Association

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## 1. PREFACE

The effects that video display terminals (VDTs) used for information technology and office equipment, specially the electrostatic field emitted by VDTs fitted with cathode ray tubes (CRT), have on human health recently been a topic of discussion. There have been some cases reported overseas of these effects, yet none have found a distinct relation with the VDT. The effects that VDTs have on the human body may take a long period of study to ascertain, but countermeasures may mislead the market and VDT users.

It is the responsibility of us as manufacturers of these products to promote the study of these health effects within the limitations of the technologies available and costs involved as the information society evolves.

To now, only Sweden has guidelines in place concerning the electrostatic field caused by VDTs; no international standards or set of guidelines has been set in place. In addition to this, no scientific has proven the health effects of electrostatic fields on the human body.

The guidelines below are intended to therefore act as a voluntary guideline for industrial societies, and shall be revised when necessary (for example, when any international standards are proposed, or when new scientific evidence is published).

## 2. OBJECTIVES

VDTs used for ITE and office equipment that contain CRTs that employ relatively high-voltage may emit electrostatic fields around the screen. This Guideline specifies the measurement protocol and its limited values for these electrostatic fields.

## 3. DEFINITIONS

### 3-1 Center-Center point

The point on the screen surface is both the horizontal and vertical mid-point.

### 3-2 Tangential Plane

The plane is tangent to the surface of the VDT screen at the center-center point. For a flat screen, the plane is its surface.

### 3-3 Screen Surface

The screen surface is the outermost surface of the visual screen of the VDT. When a screen filter is added, the screen surface is the external surface of the filter.

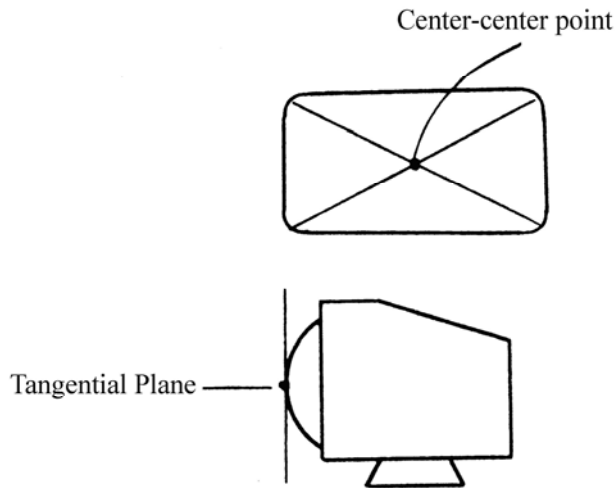


Fig 1: Ex: Cathode Ray Tube

#### 4. SCOPE

The Guidelines apply to all Video Display Terminals (VDTs) used for ITE and office equipment that may emit electrostatic fields. VDTs that use less than 500V DC for the screen portion will be regarded as complying with these guidelines.

The term Information Technology Equipment (ITE) is defined as any apparatus designed for the following purposes;

- (1) Data input (periodic binary pulse) through data input lines, keyboard, or similar device,
- or
- (2) Data processing such as the performance of arithmetic calculations, data conversion, data storage, and data transfer,
- or
- (3) Output of processed data through data output lines or to a VDT.

Note that home electronic equipment or consumer audio/visual devices fall outside this present scope, even if they contain micro-processors.

#### 5. RECOMMENDED VALUES

The electrostatic potential  $U$  should be less than or equal to  $\pm 500V_{dc}$  in 20 minutes after power on the EUT.

## 6. MEASUREMENT PROCEDURES

### 6-1. Condition of Testing Site

Temperature: normal temperature (20 +/-5 degree C)

Relative Humidity: less than 40%

Air Flow: low as possible, similar air flow as typical office environment

### 6-2. Pre-treatment of EUT

Any conductive dusts on the screen of VDT and/or the filter with which may be provided shall be washed away by industrial pure water and, following this, the screen shall be kept at the testing site for more than 6 hours. During this time, the EUT will be switched off.

### 6-3. Testing Procedure

#### 1) Display on the Screen

The entire screen should be filled with the capital letter H (or similar letters if H is not displayed) in *hankaku* (alphanumeric) characters or *zenkaku* (2-bite shift-JIS) characters, in light characters on a dark background or dark characters on a light background.

#### 2) Contrast and Brightness Setting

Set contrast and brightness control to normal operating condition.

#### 3) Allocation of EUT and Measurement Equipment

See Figure 2. The measurement plate shall be placed on a tangential plane to the EUT in parallel and at a distance of 100mm from the screen surface, and with a tolerance of +/-2mm at the center and +/-5mm at the edge. The center-center point of the EUT and the center of the measurement plate shall be at the same height and left/right distance.

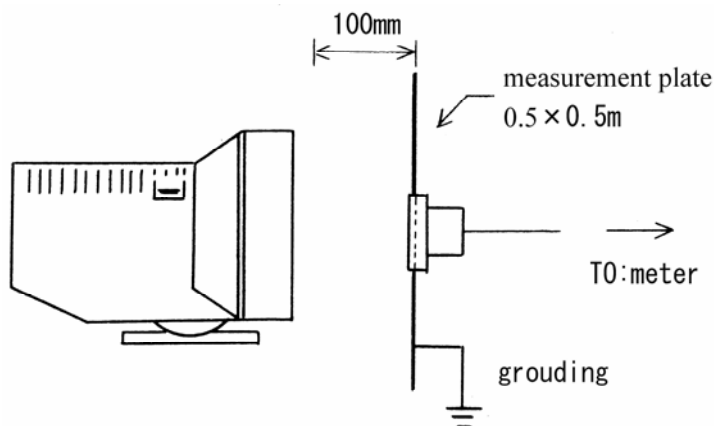


Figure 2: Setting of EUT and Measurement Equipment

4) Discharge any electrostatic-charge around the EUT by a grounded metallic discharger (e.g. carbon brush)

while the EUT power is turned off.

#### 6-4. Measurement

Power on the EUT and read the value R on the measurement equipment for 20 minutes after the power has been turned on. Measurement may be terminated if surface potential U is reached to +/-500V within 20minutes.

#### 6-5. Calculation the Surface Potential U

Electric field strength E should be calculated firstly by the following equation:

$$E=R \times F$$

Where E: electric field strength in V/m

R: reading value by measurement equipment in V/m

F: conversion factor

Surface Potential U should be then calculated by the following equation

$$U=E \times d \times (1 + (0.12/D)^2)$$

Where U: Surface Potential in Volt

d: 0.1 (m)

D: Diagonal screen size in meters

### 7. Measurement Equipment

#### 7-1. Setting

Measurement equipment should be placed in accordance with the description in Figure 2.

Measurement plate should be a metallic plate of 0.5m x 0.5m in size, and grounded to the same point the EUT is grounded to.

The measurement probe should be placed in the center of the measurement plate. The probe should also be earthed to the measurement plate.

#### 7-2. Calibration

Figure 3 describes the calibration procedure.

Calibration plate shall be made using a metallic plate of 0.5m x 0.5m.

Place the calibration plate and measurement plate in parallel at a distance of 100mm.

Connect DC voltage, 500V+/-10V to the Calibration plate (polarity + side) and ground (polarity - side). In ideal conditions, electric field strength of 5000V/m may be obtained. However, in some cases, a correlation factor may be required.

Correction factor F is obtained by doing the following.

Correction factor  $F = 5000(\text{V/m}) / \text{actual measurement of field strength meter (V/m)}$

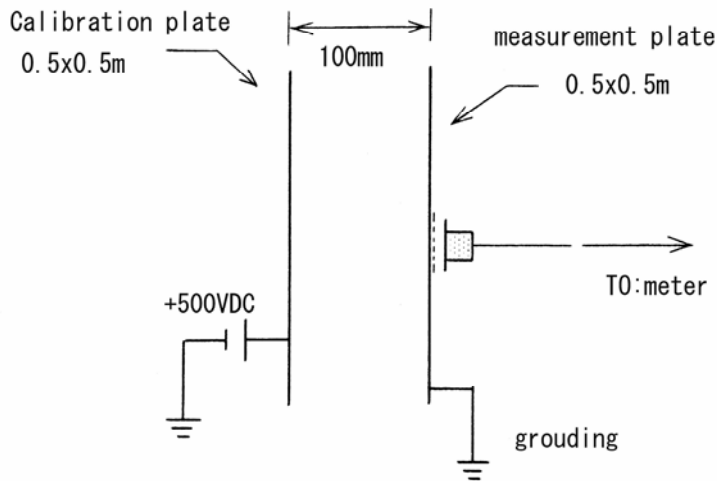


Fig. 3: Setting the calibration

### 7-3. Measurement equipment

Measurement equipment should be used that comply with the requirement of Swedish MPR-2 recommendation (MPR-1990:8 published 01 Dec. 1990) or equivalent one.

For example: EMF 200 made by Combinova (Postal address; PO Box 20050, Bromma, S-1610 Sweden).

### 8. Test Report

(1) Record the electrostatic potential U.

Record “electrostatic potential is less than 500V” as measurement data of screen of EUT if less than 500V.

(2) Temperature and humidity of measurement site shall be recorded.

(3) If the EUT has any electrostatic coating that has been applied (non-permanent type; for example by aerosol spray), the coating type and name of manufacturer shall be recorded.

(4) If the EUT is fitted with an easily removable screen filter, the filter type and manufacturer’s name shall be recorded.

### 9. GUIDELINE IMPLEMENTATION

#### 9-1 Effective Date

The Guidelines apply to newly designed VDTs and should be applied in the following manner:

- (1) The period from 1992 through December 1994 is a trial period, and it is recommended that member companies apply the Guidelines to their products where possible.
- (2) After January 1995, the Guidelines should apply to all new model shipped to the market.

## 9-2 Marking

Following marking may be used.

- 1) The following Japanese wording may be used in the owner manual.

“本製品（もしくはモデル等）は社団法人 電子情報技術産業協会（もしくは社団法人 ビジネス機械・情報システム産業協会）が定めた「表示装置の静電気に関するガイドライン」に適合している。”

(English translation)

“This product confirms to the GUIDELINES FOR ELECTROSTATIC FIELD EMITTED FROM VIDEO DISPLAY TERMINALS FOR INFORMATION TECHNOLOGY EQUIPMENT, issued by the Japan Electronics and Information Technology Industries Association (JEITA) (or the Japan Business Machine and Information System Industries Association (JBMIA)).

- 2) The following Japanese wording may be used on the catalogue or leaflets for sales promotions.

“本製品（もしくはモデル等）は社団法人 電子情報技術産業協会（もしくは社団法人 ビジネス機械・情報システム産業協会）が定めた「表示装置の静電気に関するガイドライン」に適合している。”

(English translation)

“This product confirms to the GUIDELINES FOR ELECTROSTATIC FIELD EMITTED FROM VIDEO DISPLAY TERMINALS FOR INFORMATION TECHNOLOGY EQUIPMENT, issued by the Japan Electronics and Information Technology Industries Association (JEITA) (or the Japan Business Machine and Information System Industries Association (JBMIA)).

- 3) If product is also complies the with JEITA ITR-3004 GUIDELINES For LOW-FREQUENCY ELECTRIC AND MAGNETIC FIELDS EMITTED BY VIDEO DISPLAY TERMINALS USED BY INFORMATION TECHNOLOGY EQUIPMENT, the following sample wording may be used instead of 1) and 2) above.

“本製品（もしくはモデル等）は社団法人 電子情報技術産業協会、（もしくは社団法人 ビジネス機械・情報システム産業協会）が定めた表示装置の静電気および低周波電磁界に関するガイドラインに適合している。”

(English translation)

“This product confirms to the GUIDELINES FOR ELECTROSTATIC and LOW-FREQUENCY ELECTRIC AND MAGNETIC FIELDS EMITTED BY VIDEO DISPLAY TERMINALS USED BY INFORMATION TECHNOLOGY EQUIPMENT, issued by the Japan Electronics and Information Technology Industries Association (JEITA)” (or the Japan Business Machine and Information System Industries Association



(JBMIA)).

Note 1: JEITA or JBMIA are used appropriately according to the product and the industry association it falls under.

Note 2: Manufactures shall not use as following expressions even if products comply with the Guidelines;

- 1) Resolving any adverse health effects, or
- 2) Being safe, healthy or similar wording, or
- 3) Product is superior in safety to the user than other products (or models) that do not comply with the Guidelines.

## 10. APPENDIX

10.1 The guidelines have been written with a view to harmonizing with the Swedish MPR Guidelines (MPR 1990:8 1990-12-01), with some deviations in consideration of the Japanese market and the degree that they can be quickly implemented.

Therefore, if a device complies with the Swedish MPR Guidelines, they also comply with the present guidelines and require no further action.

Differentiations to the Swedish MPR Guidelines are listed on the following table, and concern only measurement site conditions.

Term	Reason
(1) Ambient Temperature	For quick implementation, minimum cost for testing site is preferable, until publishing of any International Standard.
(2) Relative Humidity	
(3) Air Flow	
(4) Ion density of Air	
(5) Cleaning water for EUT	

Relative Humidity 40% or less is based on the Japanese normal office environment; typical relative humidity is more than 40%, and this is determined in Article 129 of the *Kenchiku Kijun Law, Sikourei* and so forth.

We also confirmed that the electrostatic potential is similar when the testing takes place at a level lower than 40% humidity. If the initial test is performed in relative humidity less than 40%, there is no need to test multiple times in all ranges of humidity below 40%.

This term of 40% or less relative humidity is a testing condition for the Guidelines. This is not intended to guarantee that EUT is capable with operation in such low relative humidity.

10.2 The trial period for implementation is set for the following reasons

Time for investigation on technology, preparing the manufacturing facility of devices for these countermeasures, preparing the measurement site is required.

Cost may go up for implementation and it is not easy to replace parts/units, in some cases model changes are requested, etc.

10.3 These Guidelines apply to any EUT with a voltage over 500V DC. Any EUT that does not meet this criterion does not require further testing.

#### 10.4 Cautions for user

The following are the three main anti-electrostatic measures:

- (1) Applying anti-electrostatic coating (conductive coating on screen surface) by device (CRT) manufactures
- (2) Spraying any conductive aerosol to screen surface
- (3) Adding external anti-electrostatic filter on EUT

Proper information should be described in owner manual for this anti-electrostatic technology for proper and effective application by user.

Particular attention should be made to non-permanent anti-electrostatic measures, and the product name, maker details, and retailer name should be described in the owner's manual so that the user can re-purchase recommended filters or sprays. If an external anti-electrostatic filter is used, the proper information shall be described in the owner's manual, including product name, maker name, and sales agent.

10.5. One example of a possible adverse health effect: "When user is seated at a distance of 30 to 50cm directly in front of the screen for long periods of time, some irritation to the skin on the face may occur due to dust moving about as a result of the electrostatic potential of the VDT."

#### 10.6 References

Test Methods for Visual VDTs MPR1990: 1990-12-01

2.02 Electrostatic Potential

Revisions:

1<sup>st</sup> Edition in Japanese: Issued as JEIDA-G-11 Oct. 1991

2<sup>nd</sup> Edition in Japanese: Revised May. 1993

3<sup>rd</sup> Edition in Japanese: Revised Aug. 1996

4<sup>th</sup> Edition in Japanese: Revised Feb. 2004 as JEITA-ITR-3003

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