

[RETURN TO TOP OF THE PAGE](#)

Federal Communications Commission (FCC) Notice (U.S. Only)



This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Use only RF shielded cable that was supplied with the monitor when connecting this monitor to a computer device.



WHEN POSITIONING THIS EQUIPMENT ENSURE THAT THE POWER PLUG AND SOCKET ARE EASILY ACCESSIBLE.

To prevent damage which may result in fire or shock hazard, do not expose this appliance to rain or excessive moisture.

THIS CLASS B DIGITAL APPARATUS MEETS ALL REQUIREMENTS OF THE CANADIAN INTERFERENCE-CAUSING EQUIPMENT REGULATIONS.

[RETURN TO TOP OF THE PAGE](#)

Commission Federale de la Communication (FCC Declaration)



Cet équipement a été testé et déclaré conforme aux limites des appareils numériques de class B, aux termes de l'article 15 Des règles de la FCC. Ces limites sont conçues de façon à fournir une protection



raisonnable contre les interférences nuisibles dans le cadre d'une installation résidentielle. CET appareil produit, utilise et peut émettre des hyperfréquences qui, si l'appareil n'est pas installé et utilisé selon les consignes données, peuvent causer des interférences nuisibles aux communications radio. Cependant, rien ne peut garantir l'absence d'interférences dans le cadre d'une installation particulière. Si cet appareil est la cause d'interférences nuisibles pour la réception des signaux de radio ou de télévision, ce qui peut être décelé en fermant l'équipement, puis en le remettant en fonction, l'utilisateur pourrait essayer de corriger la situation en prenant les mesures suivantes:

- Réorienter ou déplacer l'antenne de réception.
- Augmenter la distance entre l'équipement et le récepteur.
- Brancher l'équipement sur un autre circuit que celui utilisé par le récepteur.
- Demander l'aide du marchand ou d'un technicien chevronné en radio/télévision.



Toutes modifications n'ayant pas reçu l'approbation des services compétents en matière de conformité est susceptible d'interdire à l'utilisateur l'usage du présent équipement.

N'utiliser que des câbles RF armés pour les connections avec des ordinateurs ou périphériques.

CET APPAREIL NUMERIQUE DE LA CLASSE B RESPECTE TOUTES LES EXIGENCES DU REGLEMENT SUR MATERIEL BROUILLEUR DU CANADA.

[RETURN TO TOP OF THE PAGE](#)

The Introduction of CM25+, 21” Monitor

1. General Description
2. Description of Circuit Diagram
 - A. Power Supply / Power Saving Management
 - B. Horizontal / Vertical Deflection
 - C. Video board & DDC 1/2B
 - D. Digital Circuit & Micro-controller
3. Video preset Modes

1. GENERAL DESCRIPTION

The CM25+, 21" is a Digital Controlled Auto-scan color Display Monitor with high resolution. This monitor can operate at horizontal scan frequencies from 30 to 107kHz and vertical scan frequencies from 50 to 160 Hz.

This monitor is equipped with an embedded micro-controller which can preset the required modes. The CM25+ provides many functions, such as digital adjustable picture, DDC1/2B, power management, low emission, high immunity, etc.

This monitor complies with TCO low emission standard and also fulfills TCO'99 automatic power saving requirements. To reduce power consumption less than 8 watts in standby or suspend mode and less than 3 watts in off mod, the monitor also complies with energy star computer program initiated by the EPA.

2. DESCRIPTION OF CIRCUIT DIAGRAM

This description mainly introduces the functions, including power supply / power saving management, horizontal / vertical deflection, video amplifier, micro-controller, etc.

A. POWER SUPPLY / POWER SAVING MANAGEMENT

POWER SUPPLY:

The monitor is designed as switch mode power supply which can operate mains input from 90VAC to 264 VAC. The power supply uses an IC(STR-F6656) for QUASI-RESONANT MODE. The control scheme transforms a switching converter from a voltage source into a multi-output voltage. The control concept is exhibited many desirable properties such as inherent over-load protection, stable and fast system response.

The maximum power consumption is up to 150 watts. A power limiting circuit is added for safety reason.

On main power supply circuit, secondary feedback via a photo-coupler is used to obtain a stable output voltage. The secondary feedback supplies all necessary voltages for deflection and video.

POWER SAVING MANAGEMENT:

This monitor can save power consumption while no sync pulses are detected by micro-controller and automatically recover to normal power when sync signals are detected by micro-controller.

During the Stand-by mode operation all the output voltages are reduced to around 10% of the nominal Value and only the heater voltage and the 5V to supply the up are sustained. In this condition the heater voltage is less than the nominal value and it is around 5.5V.

During Off mode operation all the output voltages are reduced to around 10% of the nominal value like in Stand-by mode and the heater voltage is removed. Only the up is supplied.

The consume power is less than 8 watts during standby / suspend modes, and less than 3 watts during off mode.

B. HORIZONTAL / VERTICAL DEFLECTION

HORIZONTAL DEFLECTION:

The heart of horizontal/vertical deflection controller is TDA486 which can offer a complete and efficient small signal sync processing for auto-sync monitors. All functions are controlled by I2C bus.

This controller provides sync processing, which can accept separate, composite (H+V) and sync-on-video input signals. A very short setting time after mode change for protection of external power components has been taken.

The TDA486 provides extensive functions like a flexible SMPS block and a geometry control with facilities, leading to excellent picture quality. This device also can directly drive the vertical deflection output stage, the line driver stage, the E/W output stage and the EHT stage. All controls are DC and tracked with the incoming frequencies.

Raster can be adjusted along horizontal direction by OSD R-shift control

Transformer (LOT) generates the required 26.8kV anode voltage.

The adjustable focus (G3) and screen (G2) voltages are internally derived from the anode voltage. Other secondary windings are used to generate the voltages for G1. For 21 inch monitor also provides dynamic focus on G4 to get a good focus performance. (G4 also adjustable).

The horizontal size and east/west correction are obtained by varying the voltage of buck converter of the lower deflection a circuit.

Five capacitors switch and DC controlled linearity coil are designed for optimal screen linearity.

For safety reasons, x-ray protection circuit is included, L4990A will shut down EHT generator if the anode voltage exceeds a certain value (28.5kV).

This circuit is also used for beam current overload protection. Shut down EHT in case the total beam current exceeds a certain limit to protect both CRT and LOT.

VERTICAL DEFLECTION:

The majority of vertical deflection functions is integrated by two ICs; TDA4856 and TDA9379

The TDA4856 takes care of sync polarity correction, automatic catching and holding of the vertical oscillator, generation of saw-tooth drive current for vertical output and vertical s-correction, and generation of a correct V-blanking pulse for video blanking during vertical retrace lines.

The TDA9379 which is a dc-coupled vertical deflection booster with differential input signals is suitable for color monitor. The output stage has thermal and soar protection, and high linear saw-tooth signal amplification to obtain the required vertical deflection current.

To obtain a fast vertical retrace for non-VGA mode an external flyback supply is used.

C. VIDEO AMPLIFIER & DDC1/2B*VIDEO AMPLIFIER:*

The heart of video circuit is TDA4886A. This controller can drive the monolithic post-amp LM2402 by buffer stage. The video DC level and gain at the cathode will be controlled by the software.

The red, green and blue video signals are amplified and inverted by the post-amplifier to output stage and AC coupled to the CRT cathodes.

Three cut-off adjustments are provided to set the video black level at cathode for all three guns. Also three individual gain adjustments are provided to adjust the white point at maximum swing. Both cut-off and gain controls are digit type control by micro-processor.

For limiting the beam current and preventing the local doming, the beam current limit will automatically reduce the video swing in case the maximum beam current is exceeded.

A spot-killer circuit is also added to prevent the CRT spot burn-in when the set is switched off

DDC 1/2B:

Via SDA, the data about the information of the monitor, including the serial number, production codes, CRT type and applicable timings are stored in the EEPROM (24IC21). To avoid picture interference, the reading and writing processes are executed during vertical blanking which is informed by the vertical SYNC.

D. MICROCONTROLLER

GENERAL DESCRIPTION:

The Philips P87C380 u-processor is used to control the monitor. The preset data are stored in EEPROM ST24W16

HARDWARE DEFINITION:

a) KEY BOARD

There are five key pad at the front of monitor for the OSD control.

- OSD function key:

- Enter

Push it, to confirm the entrance or exit from the OSD window

- UP

To select the parameters which are chosen from OSD.

- DOWN

To select the parameters which are chosen from OSD.

- RIGHT

To adjust the parameter which are chosen from OSD to right side

- LEFT

To adjust the parameter which are chosen from OSD to left side

b) OSD WILL DISAPPEAR AND SAVE AUTOMATICALLY AFTER NON-OPERATION

c) SOFTWARE WILL CONTROL THE DPMA ACCORDING TO THE SYNC STATUS.

3. VIDEO PRESET MOSES

Pre-set Video Resolution and Sync Polarities

Resolution modes	H frequency	V frequency	H	V
1024 x 768	60.0K	75Hz (VESA/75)	+	+
1024 x 768	68.7K	85Hz (VESA/85)	+	+
1280 x 1024	80.0K	75Hz (VESA/75)	+	+
1280 x 1024	91.0K	85Hz (VESA/85)	+	+
1600 x 1200	93.0K	75Hz (VESA/75)	+	+
1600 x 1200	106.3K	85Hz (VESA/85)	+	+