
14 Reference Information

14-1 Technical Terms

- TFT-LCD

(Thin film Transistor Liquid Crystal Display)

ADC(Analog to Digital Converter)

This is a circuit that converts from analog signal to digital signals.

- PLL(Phase Locked Loop)

During progressing ADC, Device makes clock synchronizing HSYNC with Video clock

- Inverter

Device that supply Power to LCD panel lamp. this device generate about 1,500~2,000V.

- AC Adapter

Device that converts AC(90V~240V) to DC(+12V or 14V)

- SMPS(Switching Mode Power Supply)

Switching Mode Power supply. This design technology is used to step up/down the input power by switching on/off

- FRC(Frame Rate Controller)

Technology that change image frame quantity displayed on screen for one second.

Actually TFT-LCD panel require 60 pcs of frame for one second.

so, this technology is needed to convert input image to 60 pcs regardless input frame quantity.

- Image Scaler

Technology that convert various input resolution to other resolution.(ex. 640* 480 to 1024*768)

- Auto Configuration(Auto adjustment)

This is an algorithm to adjust monitor to optimum condition by pushing one key.

- OSD(On Screen Display)

On screen display. customer can control the screen easily with this.

- Image Lock

This means "Fineness adjustment" in LCD Monitor, the features are "Fine" and "Coarse"

- FINE

"Fine" adjustment is used to adjust visibility by control phase difference.

- COARSE

This is a adjustment by tuning with Video colck and PLL clock.

- DVI (Digital Visual Interface)

This provides a high speed digital connection for visual data types that is display technology independent. this interface is primarily focused at providing a connection between a computer and its display device.

- L.V.D.S.(Low Voltage Differential Signaling)

a kind of transmission method for Digital.It can be used from Main PBA to Panel.

- DVI (Digital Visual Interface)

This provides a high speed digital connection for visual data types that is display technology independent. this interface is primarily focused at providing a connection between a computer and its display device.

- T.M.D.S

(Transition minimized Differential Signaling)

a kind of transmission method for Digital.

It can be used from Video card to Main PBA.

- DDC(Display data channel)

It is a communication method between Host Computer and related equipment.

It can make it Plug and Play between PC and Monitor.

- EDID

Extended Display Identification Data PC can recognize the monitor information as Product data, Product name, Display mode, Serial number and Signal source, etc through DDC Line communicating with PC and Monitor.

- Dot Pitch

The image on a monitor is composed of red, green and blue dots. The closer the dots, the higher the resolution. The distance between two dots of the same color is called the 'Dot Pitch'. Unit: mm

- Vertical Frequency

The screen must be redrawn several times per second in order to create and display an image for the user. The frequency of this repetition per second is called Vertical Frequency or Refresh Rate.

Unit: Hz

Example: If the same light repeats itself 60 times per second, this is regarded as 60 Hz.

- Horizontal Frequency

The time to scan one line connecting the right edge to the left edge of the screen horizontally is called Horizontal Cycle. The inverse number of the Horizontal Cycle is called Horizontal Frequency.

Unit: kHz

- Interlace and Non-Interlace Methods

Showing the horizontal lines of the screen from the top to the bottom in order is called the Non-Interlace method while showing odd lines and then even lines in turn is called the Interlace method.

The Non-Interlace method is used for the majority of monitors to ensure a clear image. The Interlace method is the same as that used in TVs.

- Plug & Play

This is a function that provides the best quality screen for the user by allowing the computer and the monitor to exchange information automatically.

This monitor follows the international standard VESA DDC for the Plug & Play function.

- Resolution

The number of horizontal and vertical dots used to compose the screen image is called 'resolution'.

This number shows the accuracy of the display.

High resolution is good for performing multiple tasks as more image information can be shown on the screen.

Example: If the resolution is 1280 x 1024, this means the screen is composed of 1280 horizontal dots (horizontal resolution) and 1024 vertical lines (vertical resolution).

- BTSC

Broadcast Television System Committee

The stereo broadcasting system that is used in most of the countries that have adopted the NTSC system, including the United States, Canada, Chile, Venezuela and Taiwan. It also refers to the organization that has been organized to promote its development and management.

- EIAJ

Electronic Industries Association of Japan.

- RF Cable

A round signal cable generally used for TV antennas.

- Satellite Broadcasting

Broadcasting service provided via satellite. Enables high picture quality and clear sound throughout the country regardless of the location of the viewer.

- Sound Balance

Balances the levels of the sound coming from each speaker in televisions with two speakers.

- Cable TV

Whereas the terrestrial broadcasting is delivered via frequency signals through the air, cable broadcasting is transmitted via a cable network. In order to view cable TV, one must purchase a cable receiver and hook it up to the cable network.

- CATV

"CATV" refers to the broadcasting service offered at hotels, schools and other buildings through their own broadcasting system, apart from VHF or UHF broadcasting by terrestrial broadcasters. The CATV programs may include movies, entertainment and educational programs. (Different from cable TV.)

CATV can be viewed only within the area in which the CATV service is offered.

- S-Video

Short for "Super Video." S-Video allows up to 800 lines of horizontal resolution, enabling high-quality video.

- VHF/UHF

VHF indicates TV channels 2 to 13, and UHF indicates channels 14 through 69.

- Channel Fine Tuning

This feature allows the viewer to fine-tune the TV channel to obtain the best viewing conditions. The Samsung LCD TV has both automatic and manual channel fine-tuning features to enable the viewer to adjust their desired settings.

- External Device Input

External device input refers to video input from such external video devices as VCRs, camcorders and DVD players, separate from a TV broadcast.

14-2 Pin Assignments

14-2-1 DVI-D

| Pin No. | Sync Type | 24P DVI-D | |
|---------|-----------|-----------|------------------------------|
| 1 | Rx2- | 13 | NC |
| 2 | Rx2+ | 14 | DDC Input power (+5V) |
| 3 | GND | 15 | IDENT-DVI |
| 4 | NC | 16 | Output Signal (HDCP Control) |
| 5 | NC | 17 | Rx0- |
| 6 | DDC - SCL | 18 | Rx0+ |
| 7 | DDC - SDA | 19 | GND |
| 8 | NC | 20 | NC |
| 9 | Rx1- | 21 | NC |
| 10 | Rx1+ | 22 | GND |
| 11 | GND | 23 | RxC+ |
| 12 | NC | 24 | RxC- |

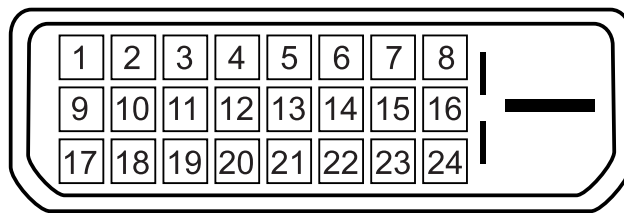


Figure 1.

14-2-2 Component

| | |
|-----------|---------|
| RCA Green | Y |
| | GND |
| RCA Blue | Pb (Cb) |
| | GND |
| RCA Red | Pr (Cr) |
| | GND |
| RCA White | Audio L |
| | GND |
| RCA Red | Audio R |
| | GND |

14-2-4 A/V

| | |
|------------|---------|
| RCA Yellow | CVBS |
| RCA White | Audio L |
| | GND |
| RCA Red | Audio R |
| | GND |

14-2-3 S-Video

| | |
|-----|----------|
| Pin | Separate |
| 1 | GND |
| 2 | Y |
| 3 | C |
| 4 | GND |
| 5 | GND |

14-2-5 D-SUB

| | |
|-----|----------------------|
| Pin | Separate |
| 1 | Red |
| 2 | Green |
| 3 | Blue |
| 4 | GND |
| 5 | GND |
| 6 | GND Red |
| 7 | GND Green |
| 8 | GND Blue |
| 9 | DDC Input power(+5V) |
| 10 | IDENT PC |
| 11 | GND |
| 12 | DDC Data(SDA) |
| 13 | H SYNC |
| 14 | V SYNC |
| 15 | DDC Clock(SCL) |

14-2-6 PC Display mode

Both screen position and size will vary depending on the type of PC monitor and its resolution.

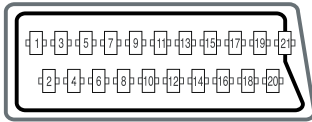
The resolutions in the table are recommended. (All resolutions between the supported limits are supported)

| Mode | Resolution | Horizontal Frequency (kHz) | Vertical Frequency (Hz) | Pixel Clock Frequency (MHz) | Sync Polarity (H/V) |
|------|------------|----------------------------|-------------------------|-----------------------------|---------------------|
| IBM | 640 x 480 | 31.469 | 59.940 | 25.175 | - / - |
| | 720 x 400 | 31.469 | 70.087 | 28.322 | - / + |
| VESA | 640 x 480 | 37.861 | 72.809 | 31.500 | - / - |
| | 640 x 480 | 37.500 | 75.000 | 31.500 | - / - |
| | 800 x 600 | 37.879 | 60.317 | 40.000 | + / + |
| | 800 x 600 | 48.077 | 72.188 | 50.000 | + / + |
| | 800 x 600 | 46.875 | 75.000 | 49.500 | + / + |
| | 1024 x 768 | 48.364 | 60.000 | 65.000 | - / - |
| | 1024 x 768 | 56.476 | 70.069 | 75.000 | - / - |
| | 1024 x 768 | 60.023 | 75.029 | 78.750 | + / + |
| | 1360 x 768 | 47.712 | 60.015 | 85.800 | + / + |

- The interlace mode is not supported.
- The set might operate abnormally if a non-standard video format is selected.
- DVI dose not support PC function.

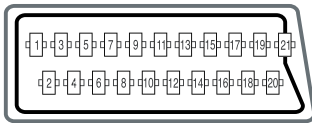
14 Reference Information

14-2-7 Scart 1



| Pin | Signal | Pin | Signal |
|-----|-----------------------|-----|--------------------------------------|
| 1 | Audio output R | 12 | NC |
| 2 | Audio input R | 13 | Video GND (RGB red) |
| 3 | Audio output L | 14 | GND |
| 4 | Audio common GND | 15 | RGB red input |
| 5 | Video GND (RGB blue) | 16 | Fast Blanking signal (RGB switching) |
| 6 | Audio input L | 17 | Video output GND |
| 7 | RGB blue input | 18 | Video input GND |
| 8 | Switching voltage | 19 | Video output (CVBS out) |
| 9 | Video GND (RGB green) | 20 | Video input (CVBS in) |
| 10 | NC | 21 | Common GND |
| 11 | RGB green input | | |

14-2-8 Scart 2



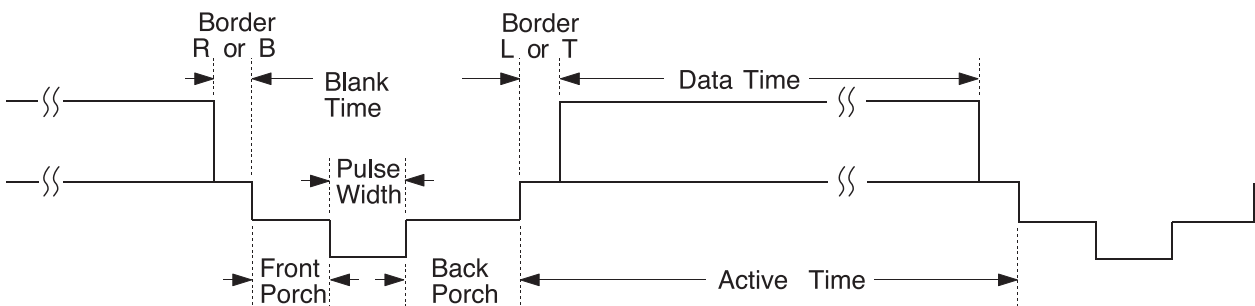
| Pin | Signal | Pin | Signal |
|-----|-----------------------|-----|-------------------------|
| 1 | Audio output R | 12 | NC |
| 2 | Audio input R | 13 | Video GND (RGB red) |
| 3 | Audio output L | 14 | GND |
| 4 | Audio common GND | 15 | RGB red input |
| 5 | Video GND (RGB blue) | 16 | NC |
| 6 | Audio input L | 17 | Video output GND |
| 7 | RGB blue input | 18 | Video input GND |
| 8 | Switching voltage | 19 | Video output (CVBS out) |
| 9 | Video GND (RGB green) | 20 | Video input (CVBS in) |
| 10 | NC | 21 | Common GND |
| 11 | RGB green input | | |

14-3 Timing Chart

This section of the service manual describes the timing that the computer industry recognizes as standard for computer-generated video signals.

14-3-1 LCD Panel Mode1 mode

| | |
|------------------|----------------|
| Timing No. | LTA400W2 |
| Originator | VESA |
| Mode Name | 1366/60Hz |
| Resolution (HxV) | 1366x768 |
| HORIZONTAL | |
| Frequency | 47.712kHz |
| Total time | 20.959 μ s |
| Active time | 15.906 μ s |
| Blank time | 5.053 μ s |
| Border(L / R) | 0.000 μ s |
| Data time | 15.906 μ s |
| Front porch | 0.749 μ s |
| Sync. width | 1.702 μ s |
| Back porch | 2.994 μ s |
| Sync. polarity | Positive |
| VERTICAL | |
| Frequency | 60.015Hz |
| Total time | 16.662 ms |
| Active time | 16.097 ms |
| Blank time | 0.566 ms |
| Border(T / B) | 0.000 ms |
| Data time | 16.097ms |
| Front porch | 0.063 ms |
| Sync. width | 0.105 ms |
| Back porch | 0.377ms |
| Sync polarity | Positive |
| Dot Clock | 85.500MHz |
| Sync. Type | Separate |
| Scan Type | N/I |



14-3-2 Supported Modes (1)

| Timing No. | 2 | 3 | 11 | 17 | 32 |
|------------------|----------------|----------------|----------------|----------------|----------------|
| Originator | IBM | IBM | VESA | VESA | MAC |
| Mode Name | VGA2 | VGA3 | 640/72Hz | 640/75Hz | 640/67Hz |
| Resolution (HxV) | 720x400 | 640x480 | 640x480 | 640x480 | 640x480 |
| HORIZONTAL | | | | | |
| Frequency | 31.469kHz | 31.469kHz | 37.861kHz | 37.500kHz | 35.000kHz |
| Total time | 31.777 μ s | 31.778 μ s | 26.413 μ s | 26.667 μ s | 28.571 μ s |
| Active time | 26.058 μ s | 26.058 μ s | 20.825 μ s | 20.317 μ s | 21.164 μ s |
| Blank time | 5.720 μ s | 5.720 μ s | 5.588 μ s | 6.350 μ s | 7.407 μ s |
| Border(L / R) | 0.318 μ s | 0.318 μ s | 0.254 μ s | 0.000 μ s | 0.000 μ s |
| Data time | 25.422 μ s | 25.422 μ s | 20.317 μ s | 20.317 μ s | 21.164 μ s |
| Front porch | 0.318 μ s | 0.318 μ s | 0.508 μ s | 0.508 μ s | 2.116 μ s |
| Sync. width | 3.813 μ s | 3.813 μ s | 1.270 μ s | 2.032 μ s | 2.116 μ s |
| Back porch | 1.589 μ s | 1.589 μ s | 3.810 μ s | 3.810 μ s | 3.175 μ s |
| Sync. polarity | Negative | Negative | Negative | Negative | Negative |
| VERTICAL | | | | | |
| Frequency | 70.087Hz | 59.940Hz | 72.809Hz | 75.000Hz | 66.667Hz |
| Total time | 14.268ms | 16.683ms | 13.735ms | 13.333ms | 15.000ms |
| Active time | 13.155ms | 15.761ms | 13.100ms | 12.800ms | 13.714ms |
| Blank time | 1.113ms | 0.922ms | 0.635ms | 0.533ms | 1.286ms |
| Border(T / B) | 0.222ms | 0.254ms | 0.211ms | 0.000ms | 0.000ms |
| Data time | 12.711ms | 15.253ms | 12.678ms | 12.800ms | 13.714ms |
| Front porch | 0.191ms | 0.064ms | 0.026ms | 0.027ms | 0.086ms |
| Sync. width | 0.064ms | 0.064ms | 0.079ms | 0.080ms | 0.086ms |
| Back porch | 0.858ms | 0.794ms | 0.528ms | 0.427ms | 1.114ms |
| Sync polarity | Positive | Negative | Negative | Negative | Negative |
| Dot Clock | 28.322MHz | 25.175MHz | 31.500MHz | 31.500MHz | 30.240MHz |
| Sync. Type | Separate | Separate | Separate | Separate | Separate |
| Scan Type | N/I | N/I | N/I | N/I | N/I |

14-3-3 Supported Modes (2)

| Timing No. | 13 | 14 | 18 |
|-------------------|----------------|----------------|----------------|
| Originator | VESA | VESA | VESA |
| Mode Name | 800/60Hz | 800/72Hz | 800/75Hz |
| Resolution (HxV) | 800x600 | 800x600 | 800x600 |
| HORIZONTAL | | | |
| Frequency | 37.879kHz | 48.077kHz | 46.875kHz |
| Total time | 26.400 μ s | 20.800 μ s | 21.333 μ s |
| Active time | 20.000 μ s | 16.000 μ s | 16.162 μ s |
| Blank time | 6.400 μ s | 4.800 μ s | 5.171 μ s |
| Border(L / R) | 0.000 μ s | 0.000 μ s | 0.000 μ s |
| Data time | 20.000 μ s | 16.000 μ s | 16.162 μ s |
| Front porch | 1.000 μ s | 1.120 μ s | 0.323 μ s |
| Sync. width | 3.200 μ s | 2.400 μ s | 1.616 μ s |
| Back porch | 2.200 μ s | 1.280 μ s | 3.232 μ s |
| Sync. polarity | Positive | Positive | Positive |
| VERTICAL | | | |
| Frequency | 60.317Hz | 72.188Hz | 75.000Hz |
| Total time | 16.579ms | 13.853ms | 13.333ms |
| Active time | 15.840ms | 12.480ms | 12.800ms |
| Blank time | 0.739ms | 1.373ms | 0.533ms |
| Border(T / B) | 0.000ms | 0.000ms | 0.000ms |
| Data time | 15.840ms | 12.480ms | 12.800ms |
| Front porch | 0.026ms | 0.770ms | 0.021ms |
| Sync. width | 0.106ms | 0.125ms | 0.064ms |
| Back porch | 0.607ms | 0.478ms | 0.448ms |
| Sync polarity | Positive | Positive | Positive |
| Dot Clock | 40.000MHz | 50.000MHz | 49.500MHz |
| Sync. Type | Separate | Separate | Separate |
| Scan Type | N/I | N/I | N/I |

14-3-4 Supported Modes (3)

| Timing No. | 15 | 16 | 19 | |
|-------------------|----------------|----------------|----------------|----------------|
| Originator | VESA | VESA | VESA | VESA |
| Mode Name | 1024/60Hz | 1024/70Hz | 1024/75Hz | 1360/60Hz |
| Resolution (HxV) | 1024x768 | 1024x768 | 1024x768 | 1360x768 |
| HORIZONTAL | | | | |
| Frequency | 48.363kHz | 56.476kHz | 60.023kHz | 47.712kHz |
| Total time | 20.677 μ s | 17.707 μ s | 16.660 μ s | 20.959 μ s |
| Activetime | 15.754 μ s | 13.653 μ s | 13.003 μ s | 15.906 μ s |
| Blank time | 4.923 μ s | 4.053 μ s | 3.777 μ s | 5.053 μ s |
| Border(L / R) | 0.000 μ s | 0.000 μ s | 0.000 μ s | 0.000 μ s |
| Data time | 15.754 μ s | 13.653 μ s | 13.003 μ s | 15.906 μ s |
| Front porch | 0.369 μ s | 0.320 μ s | 0.323 μ s | 0.749 μ s |
| Sync. width | 2.092 μ s | 1.813 μ s | 1.219 μ s | 1.702 μ s |
| Back porch | 2.462 μ s | 1.920 μ s | 2.235 μ s | 2.994 μ s |
| Sync. polarity | Negative | Negative | Positive | Positive |
| VERTICAL | | | | |
| Frequency | 60.004Hz | 70.069Hz | 75.029Hz | 60.015Hz |
| Total time | 16.666ms | 14.272ms | 13.328ms | 16.662ms |
| Active time | 15.880ms | 13.599ms | 12.795ms | 16.097ms |
| Blank time | 0.786ms | 0.672ms | 0.533ms | 0.566ms |
| Border(T / B) | 0.000ms | 0.000ms | 0.000ms | 0.000ms |
| Data time | 15.880ms | 13.599ms | 12.795ms | 16.097ms |
| Front porch | 0.062ms | 0.053ms | 0.017ms | 0.063ms |
| Sync. width | 0.124ms | 0.106ms | 0.050ms | 0.105ms |
| Back porch | 0.600ms | 0.513ms | 0.466ms | 0.377ms |
| Sync polarity | Negative | Negative | Positive | Positive |
| Dot Clock | 65.000MHz | 75.000MHz | 78.750MHz | 85.500MHz |
| Sync. Type | Separate | Separate | Separate | Separate |
| Scan Type | N/I | N/I | N/I | N/I |

14-4 Panel Description

| Maker | VENDOR P/N | PANEL_CODE | PANEL_ABB | STICKER_CODE | Remarks |
|-------|-------------------|-------------|-----------|--------------|---|
| SEC | LT140X1-002 | BN07-00004A | SA | BN68-00239H | - |
| SEC | LT150XS-L01 | BN07-00009A | SB | | - |
| SEC | LT150XS-L01-B | BN07-00022A | SC | | - |
| SEC | LTM150XS-L02 | BN07-00005A | SD | | - |
| SEC | LT181E2-132 | BN07-00001A | SE | | - |
| SEC | LT150XS-T01 | BN07-00010A | SF | | - |
| SEC | LTM181E3-132 | BN07-00019A | SG | | - |
| SEC | LT170E2-131 | BN07-10001D | SH | | - |
| SEC | LT181E2-131 | BN07-10001E | SJ | | - |
| SEC | LTM170E4-L01 | BN07-00018A | SK | | - |
| SEC | LTM240W1-L01 | BN07-00015A | SL | | - |
| SEC | LTM213U3-L01 | BN07-00016A | SM | | - |
| SEC | LTM150XH-L01 | BN07-00026A | SN | | - |
| SEC | LTM150XH-L03 | BN07-00027A | SP | | - |
| SEC | LTM150XS-L01 | BN07-00032A | SQ | | DELL(ZPD) |
| SEC | LTM181E4-L01 | BN07-00034A | SR | | PVA |
| SEC | LTM170EH-L01 | BN07-00036A | SS | | TN |
| SEC | LTM170E5-L01 | BN07-00037A | SU | | PVA |
| SEC | LTM150XH-L11 | BN07-00041A | SV | | - |
| SEC | LTM213U4-L01 | BN07-00039A | SW | | PVA |
| SEC | LTM150XH-L01(ZPD) | BN07-00045A | SX | | ZPD |
| SEC | LTM150XH-L04 | BN07-00046A | SY | | New panel with high brightness |
| SEC | LTM170W1-L01 | BN07-00047A | SZ | | Panel for TV |
| SEC | LTM150XH-L06 | BN07-00053A | EA | | Panel for TV/ High luminance for 450cd _ SONY&EOS Team Panel for TV |
| SEC | LTM153W1-L01 | BN07-00054A | EB | | Use NIKE MODEL |
| SEC | LTM170EH-L05 | BN07-00055A | EC | | Panel EOS proj. for high brightness of 17" EH-L05 |
| SEC | LTM170E5-L03 | BN07-00056A | ED | | Dell 1702FP pro. E4. EH mechanical Compatible |
| SEC | LTM190E1-L01 | BN07-00057A | EE | | DELL 1900 FP |
| SEC | LTM181E5-L01 | BN07-00061A | EF | | 18" narrow bezel GH18PS |
| SEC | LTM150XP-L01 | BN07-00065A | EG | | AMLCD PVA PANEL |
| SEC | LTM240W1-L02 | BN07-00062A | EH | | Panel for 15" Wide TV |
| SEC | LTM170EU-L01 | BN07-00071A | EJ | | Slim design, TN |
| SEC | LTM170E5-L04 | BN07-00072A | EK | | E5-L04 6 bits FRC... for IBM |
| SEC | LTA220W1-L01 | BN07-00074A | EL | | Panel for 22" TV |
| SEC | LTM170E6-L02 | BN07-00075A | EM | | AMLCD Narrow & slim design 17" PVA mode |
| SEC | LTM170W1-L01 | BN07-00082A | EN | | LTM170W1-L01 ZPD panel |
| SEC | LTM170EH-L01 | BN07-00080A | EP | | LTM170EH-L01 ZPD panel |
| SEC | LTM170E5-L01 | BN07-00081A | EQ | | LTM170E5-L01 ZPD panel |
| SEC | LTM170EH-L05 | BN07-00083A | ER | | LTM170EH-L05 ZPD panel |
| SEC | LTM170E5-L03 | BN07-00084A | ES | | LTM170E5-L03 ZPD panel |
| SEC | LTM170EU-L01 | BN07-00085A | ET | | LTM170EU-L01 ZPD panel |
| SEC | LTM170E5-L04 | BN07-00086A | EU | | LTM170E5-L04 ZPD panel |
| SEC | LTM170E6-L02 | BN07-00087A | EV | | LTM170E6-L02 ZPD panel |
| SEC | LTM150XH-L06 | BN07-00091A | EW | | Color coordinates change for LCD TV |
| SEC | LTM153W1-L01 | BN07-00092A | EX | | AMLCD WIDE 15",9/10 |
| SEC | LTM170W1-L01 | BN07-00100A | EY | | Color Coordinates change code management |
| SEC | LTM170EH-L05 | BN07-00097A | EZ | | LTM170E5-L05 Color Coordinates Change Panel Code |

14 Reference Information

| Maker | VENDOR P/N | PANEL_CODE | PANEL_ABB | STICKER_CODE | Remarks |
|-------|--------------|-------------|-----------|--------------|---|
| SEC | LTA400W1-L01 | BN07-00109A | S1 | | PANEL of AMLCD 40" TV |
| SEC | LTM153W1-L01 | BN07-00110A | S2 | | Color coordinates change 0.280/0.290, 10000k & ZPD Panel |
| SEC | LTM150XH-L06 | BN07-00111A | S3 | | Color coordinates change 0.280/0.290, 10000k & ZPD Panel |
| SEC | LTM170W1-L01 | BN07-00112A | S4 | | Color coordinates change 0.280/0.290, 10000k & ZPD Panel |
| SEC | LTM170EH-L05 | BN07-00113A | S5 | | Color coordinates change 0.280/0.290, 10000k & ZPD Panel |
| SEC | LTM220W1-L01 | BN07-00114A | S6 | | ZPD Panel for AMLCD 22" TV |
| SEC | LTM150XH-L06 | BN07-00117A | S7 | | ZPD Panel code |
| SEC | LTM153W1-L01 | BN07-00118A | S8 | | ZPD Panel code |
| SEC | LTM170WP-L01 | BN07-00119A | S9 | | PVA Panel for NIKE |
| SEC | LTM213U4-L01 | BN07-00039A | E1 | | 21.3" NARROW |
| SEC | LTA260W1-L01 | BN07-00121A | E2 | | VENUS |
| SEC | LTA220W1-L01 | BN07-00074B | E3 | | "Panel B-level panel code for 22" TV Panel " |
| SEC | LTA320W1-L01 | BN07-00108A | E4 | | "Panel for AMLCD 32" TV" |
| SEC | LTM213U4-L01 | BN07-00124A | E5 | | NARROW BEZEL 21 " PANEL |
| SEC | LTM170E6-L04 | BN07-00129A | E6 | | "HIGHLAND 17" LOW PANEL (Panel only for TCO03)" |
| SEC | LTM190E1-L01 | BN07-00088A | E7 | | LTM190E1-L01 ZPD panel |
| SEC | M150X4-L06 | BN07-00137A | E8 | | 15" Narrow & Slim panel |
| SEC | LTA170V1 | BN07-00139A | E9 | | "17" Panel for Muse 4:3 VGA TV" |
| SEC | LTM190E1-L02 | BN07-00128A | E10 | | "New Panel from AMLCDI, Specification : 6bit Driver IC" |
| SEC | LTM170EX-L01 | BN07-00143A | E11 | | "Development new Panel from AMLCD" |
| SEC | LTM170E8-L01 | BN07-00144A | E12 | | "Development new Panel from AMLCD" |
| SEC | LTM170E6-L04 | BN07-00129B | E13 | | "ZPD panel for AMLCD (Panel only for TCO03)" |
| SEC | LTA320W1-L02 | BN07-00108B | E14 | | "Creat B-level Panel code for AMLCD 32" TV" |
| SEC | LTM190E1-L03 | BN07-00151A | E15 | | "Development new 19" Panel form AMLCD (Panel only for TCO03)" |
| SEC | LTM240W1-L03 | BN07-00134A | E16 | | "AMLCD 24" panel development" |
| SEC | LTM190E1-L02 | BN07-00128B | E17 | | "New Panel from AMLCD, Specification : 6bit Driver IC(ZPD)" |
| SEC | LTM190E4-L01 | BN07-00145A | E18 | | "AMLCD 24" new panel development" |
| SEC | LTM170E8-L01 | BN07-00158A | E19 | | "ZPD code derivation" |
| SEC | LTM170EX-L01 | BN07-00159A | E20 | | "ZPD code derivation" |
| SEC | LTM190E1-L03 | BN07-00151B | E21 | | "Creat new panel code for AMLCD 19" (Panel only for TCO03)" |
| SEC | LTA460H1-L01 | BN07-00157A | E22 | | "creat panel code for AMLCD 46" TV " |
| SEC | LTM170EU-L11 | BN07-00160A | E23 | | "creat new panel code for AMLCD 17" (Panel only for TCO03)" |
| SEC | LTM240W1-L03 | BN07-00134B | E24 | | "24" panel ZPD code derivation" |
| SEC | LTM190E4-L01 | BN07-00145B | E25 | | "AMLCD 19" ZPD Panel code derivation" |
| SEC | LTM240W1-L03 | BN07-00134B | E26 | | "24" panel ZPD code derivation" |
| SEC | LTM150XO-L01 | BN07-00164A | E27 | | "AMLCD 15" XO-L01 new panel development" |
| SEC | LTM150XO-L01 | BN07-00164B | E28 | | "AMLCD 15" XO-L01 ZPD code derivation" |
| SEC | LTM170EU-L11 | BN07-00160B | E29 | | "AMLCD 17" NEW panel code derivation" |
| SEC | LTA320W2-L01 | BN07-00172A | SPZ | | AMLCD 32" NEW panel |
| SEC | LTM213U4-L01 | BN07-00124B | SPZ | | 21.3" Narrow PANEL ZPD Panel derivation |
| SEC | LTM170EU-L11 | BN07-00189A | STH | | AMLCD EU-L11 Pb free panel code derivation |
| SEC | LTM170EU-L11 | BN07-00189B | STZ | | AMLCD EU-L11 Pb free panel ZPD code derivation |
| SEC | LTM240W1-L04 | BN07-00188A | SPH | | 24" A-DCC new panel development |
| SEC | LTM240W1-L04 | BN07-00188B | SPZ | | 24" A-DCC panel ZPD code derivation |
| SEC | LTM190EX-L01 | BN07-00191A | STH | | AMLCD 19" TN new Panel |
| SEC | LTM190EX-L02 | BN07-00191B | STZ | | AMLCD 19" TN new Panel ZPD derivation |
| SEC | LTA230W1-L02 | BN07-00184A | SPZ | | AMLCD 23" 16:9 new Panel |

| Maker | VENDOR P/N | PANEL_CODE | PANEL_ABB | STICKER_CODE | Remarks |
|----------|----------------|-------------|-----------|--------------|---|
| SEC | LTA260W2-L01 | BN07-00185A | SPZ | | AMLCD 26" 16:9 new Panel |
| SEC | LTM240M1-L01 | BN07-00195A | SPH | | 24" panel with high brightness development |
| SEC | LTA400W2-L01 | BN07-00186A | SPZ | | AMLCD 40" 16:9 new Panel |
| SEC | LTM150XO-L01 | BN07-00197A | STH | | AMLCD 15" XO-L01 Pb free panel code |
| SEC | LTM150XO-L01 | BN07-00197B | STZ | | AMLCD 15" XO-L01 Pb free panel ZPD code |
| SEC | LTM170EU-L21 | BN07-00202A | STZ | | AMLCD EU-L21 ZPD new code derivation |
| SEC | LTA460W2-L03 | BN07-00187A | SPZ | | BEETOVEN 46" ZPD new panel |
| SEC | LTM240M1-L01 | BN07-00195B | SPZ | | 24" igh brightness panel ZPD code derivation |
| SEC | M170EX-L21 | BN07-00206A | STZ | | AMLCD LTM170EX-L21 ZPD new code derivation |
| SEC | LTA460H3-L01 | BN07-00200A | SPZ | | AMLCD 46" LED BLU panel |
| SEC | LTM170EU-L15 | BN07-00214A | STZ | | AMLCD EU-L15 TV high brightness ZPD new code derivation |
| SEC | LTM170E8-L21 | BN07-00218A | SPZ | | AMLCD LTM170E8-L21 PVA ZPD new code derivation |
| SEC | LTM190EX-L21 | BN07-00222A | STZ | | DISPLAY LCD |
| SEC | LTM201U1-L01 | BN07-00190B | SPZ | | AMLCD 20.1" Normal panel ZPD code derivation |
| SEC | LTM190E4-L21 | BN07-00223A | SPZ | | HAYDN 17" PZD code PANEL derivation |
| SEC | LTA570H1-L01 | BN07-00196A | SPZ | | AMLCD 57" new panel development |
| SEC | LTM150XO-L21 | BN07-00229A | STZ | | AMLCD 15" XO-L21 8ms panel code |
| SEC | LTA260W2-L11 | BN07-00239A | SPZ | | AMLCD 26" 16:9 7Line new Panel |
| SEC | LTA400WS-LH1 | BN07-00245A | SPZ | | AMLCD 40" 16:9 SPVA 90% new Panel |
| SEC | LTM213U6-L01 | BN07-00231A | SPZ | | AMLCD 21.3" PVA new Panel Code |
| SEC | LTA320WS-LH2 | BN07-00244A | SPZ | | AMLCD 32" 16:9 SPVA 90% new Panel |
| SEC | LTA400WS-LH1 | BN07-00245A | SPZ | | AMLCD 40" 16:9 SPVA 90% new Panel |
| CPT | CLAA150XG09 | BN07-00141A | PA | | "CPT 15"" Monitor new panel development" |
| CPT | CLAA170EA02 | BN07-00148A | PB | | "17"" CPT NEW development panel" |
| CPT | CLAA170EA02 | BN07-00148B | PC | | "17"" CPT ZPD panel code derivation" |
| CPT | CLAA150XG09 | BN07-00141B | PTZ | | "CPT 15"" panel ZPD code derivation (GOYA-PJT)" |
| CPT | CLAA150XP01 | BN07-00173A | PTH | | CPT 15" PSWG code derivation |
| CPT | CLAA150XP01 | BN07-00173B | PTZ | | CPT 15" PSWG panel ZPD code |
| CPT | CLAA170EA07 | BN07-00174A | PTH | | "CPT 17"" PSWG panel code derivation |
| CPT | CLAA170EA07 | BN07-00174B | PTZ | | CPT 17"" PSWG type new Panel code"" |
| CPT | CLAA170EA07 | BN07-00174B | PTZ | | CPT 17" PSWG type new Panel code |
| CPT | CLAA170EA07Q | BN07-00220A | PTZ | | CPT 17" PSWG R/T 8msec code derivation |
| CPT | CLAA170EA07Q | BN07-00220B | PTH | | CPT 17" PSWG R/T 8msec HPD code derivation |
| CPT | CLAA150XP01F | BN07-00236A | PTZ | | CPT 15" PSWG panel ZPD & Lead free code derivation |
| TOSHIBA | LTM15C419(A) | BN07-00002A | TA | | - |
| TOSHIBA | LTM15C423(B) | BN07-00006A | TB | | - |
| TOSHIBA | LTM18C161 | BN07-00008A | TC | | - |
| TOSHIBA | LTM15C443 | BN07-00031A | TD | | - |
| TOSHIBA | LTM15C458 | BN07-00043A | TE | | - |
| TOSHIBA | LTM15C458S | BN07-00077A | TF | | "TSB 15"" high brightness Panel" |
| TOSHIBA | LTM15C458 | BN07-00078A | TG | | Toshiba ZPD panel |
| TOSHIBA | LTM15C458S | BN07-00099A | TH | | TSB LTM15C458S (ZPD) |
| HANNSTAR | HSD150MX41A(A) | BN07-00020A | NA | | "TTL type" |
| HANNSTAR | HSD150MX12 | BN07-00030A | NB | | "TTL type" |
| HANNSTAR | HSD170ME13 | BN07-00180A | NTH | | Hannstar 17" TN new panel development |
| HANNSTAR | HSD170ME13 | BN07-00180B | NTZ | | Hannstar 17" TN new panel development ZPD code derivation |
| HANNSTAR | HSD190ME12 | BN07-00210A | NTZ | | Hannstar 19" TN new panel development |

14 Reference Information

| Maker | VENDOR P/N | PANEL_CODE | PANEL_ABB | STICKER_CODE | Remarks |
|----------|------------------|-------------|-----------|--------------|--|
| HANNSTAR | HSD150MX17-A | BN07-00226A | NTZ | | Hannstar 15" slim panel ZPD code derivation |
| TORISAN | TM150XG-22L03(A) | BN07-00021A | RA | | - |
| TORISAN | TM150XG-26L06 | BN07-00042A | RB | | - |
| TORISAN | TM181SX-76N01 | BN07-00048A | RC | | - |
| TORISAN | TM150XG-26L06 | BN07-00059A | RD | | 15" XGA TN MODE(ZPD) |
| TORISAN | TM290WX-71N31 | BN07-00063A | RE | | "RS24NS (TORISAN 29"" NEW PANEL)" |
| TORISAN | TM396WX-71N31 | BN07-00064A | RF | | "RS24NS (TORISAN 40"" NEW PANEL)" |
| TORISAN | TM150XG-26L09 | BN07-00073A | RG | | "Panel for 15"" TV" |
| TORISAN | TM150XG-26L10 | BN07-00089A | RH | | "L10(change except D/IC) ZPD" |
| TORISAN | TM150XG-26L10 | BN07-00090A | RJ | | L10 NORMAL |
| TORISAN | TM190SX-70N01 | BN07-00098A | RK | | Torisan 19" Panel |
| TORISAN | TM181SX-76N01 | BN07-00106A | RL | | ZPD Panel code |
| TORISAN | TM190SX-70N01 | BN07-00107A | RM | | ZPD Panel code |
| TORISAN | TM290WX-71N31 | BN07-00115A | RN | | "Color Coordinates change panel for TORISAN 29"" TV" |
| TORISAN | TM396WX-71N31 | BN07-00116A | RP,Q | | "Color Coordinates change panel for TORISAN 40"" TV" |
| TORISAN | TM220WX-71N31 | BN07-00125A | RR | | "Development TORISAN 22"" TV PANEL (ZPD)" |
| TORISAN | TM220WX-71N31 | BN07-00127A | RS | | "Development TORISAN 22"" TV PANEL (HPD)" |
| TORISAN | TM396WX-71N32A | BN07-00150A | RT | | 120V inverter Exclusive panel |
| TORISAN | TM190SX-70N02 | BN07-00154A | RMH | | Torisan 6bit panel code Derivation |
| TORISAN | TM190SX-70N02 | BN07-00154B | RMZ | | Torisan 6bit panel code Derivation |
| TORISAN | TM150XG-A01 | BN07-00162A | RTH | | Torisan 15" Narrow & Slim panel development |
| TORISAN | TM150XG-A01 | BN07-00162B | RTZ | | Torisan 15" N&S panel ZPD code Derivation |
| SHARP | LQ181E1DG11(A) | BN07-10001C | PA | | - |
| SHARP | LQ150X1LW71 | BN07-00067A | PB | | SHARP 15" PVA PANEL |
| SHARP | LQ370T3LZ41 | BN07-00216A | FAZ | | Rome2 |
| HITACHI | TX38D12VC0CAA(A) | BN07-00003A | HA | | - |
| HITACHI | TX43DVCOCAB | BN07-00060A | HB | | 17" SXGA PVA MODE |
| HITACHI | TX43D15VC0CAB | BN07-00101A | HC | | ZPD Panel |
| HITACHI | TX51D11VC0CAB | BN07-00122A | HD | | 20.1" NARROW |
| HITACHI | TX54D11VC0CAB | BN07-00123A | HE | | 21.3" NARROW |
| HITACHI | TX80D12VC0CAB | BN07-00169A | HIZ | | "Development new panel for Hitachi 32"" TV (ZPD)" |
| HITACHI | TX54D11VC0CAB | BN07-00123B | HIZ | | Hitachi 21.3"ZPD panel |
| IBM | ITSX94S | BN07-00017A | IA | | - |
| UNIPAC | UM170E0 | BN07-00028A | UA | | Loaded by cisdba |
| HYUNDAI | HT15X13 | BN07-00035A | DA | | - |
| HYUNDAI | HT17E11-200 | BN07-00049A | DB | | TN MODE |
| HYUNDAI | HT17E11-300 | BN07-00093A | DC | | HT17E11-300 ZPD panel |
| HYUNDAI | HT17E11-400 | BN07-00094A | DD | | HT17E11-400 normal panel |
| HYUNDAI | HT17E11-400 | BN07-00095A | DE | | HT17E11-400 ZPD panel code |
| HYUNDAI | HT17E12 | BN07-00096A | DF | | HT17E12 (Narrow & slim Design) |
| HYUNDAI | HT17E12 | BN07-00105A | DG | | ZPD Panel code |
| HYUNDAI | HT15X15-D00 | BN07-00146A | DH | | "Development for Ares 15"" Hydis TV" |
| HYUNDAI | HT15X15-D01 | BN07-00146B | DJ | | "Derivation panel HPD for Ares 15"" Hydis TV " |
| HYUNDAI | HT17E13-100 | BN07-00167A | DTH | | "PINEHURST-2(IBM) PJT 17"" HYDIS PANEL Derivation" |
| HYUNDAI | HT17E13-100 | BN07-00167B | DTZ | | "PINEHURST-2(IBM) Hydis 17"" ZPD code Derivation" |
| ACER | L170E3 | BN07-00044A | AA | | TN(ADT) |
| ACER | M170EN05 | BN07-00076A | AB | | AU 17" Panel (Narrow & slim design) |

| Maker | VENDOR P/N | PANEL_CODE | PANEL_ABB | STICKER_CODE | Remarks |
|--------|--------------|-------------|-----------|--------------|---|
| ACER | M170EN05 | BN07-00102A | AC | | ZPD Panel code |
| ACER | M190EN02 | BN07-00170A | AMH | | "AU Monitor 19"" new panel development (P19-1S)" |
| ACER | M190EN02 | BN07-00170B | AMZ | | "AU 19"" ZPD code derivation (ZPD)" |
| ACER | M170EN06 | BN07-00171A | ATH | | "AU Monitor 17"" New panel development " |
| ACER | T260XW01 | BN07-00163A | AMZ | | "AU 26"" new panel development (NF26EO)" |
| ACER | A201SN01 | BN07-00177A | ATZ | | "AU TV panel 20.1"" TN SVGA new panel development" |
| ACER | M170EN06 | BN07-00171B | ATZ | | AU Monitor 17" ZPD code derivation |
| ACER | T315XW01 | BN07-00194A | AMZ | | AU 32" new |
| ACER | M170EG01 | BN07-00192A | ATH | | AU TN PSWG type new Panel code |
| ACER | M170EG01 | BN07-00192B | ATZ | | AU TN PSWG type NEW panel code derivation |
| ACER | M190EN04 | BN07-00203A | ATH | | AU Monitor 19" ZPD new Panel code |
| ACER | T260XW02 | BN07-00208A | AMZ | | AUO 26" ZPD panel |
| ACER | M170EG01 V8 | BN07-00221A | ATZ | | AU TN PSWG type new Panel (8msec) ZPD code derivation |
| ACER | T260XW02 | BN07-00233A | AMZ | | AUO 26" Panel new (Cosmetic spec down grade) |
| ACER | T315XW01 | BN07-00234A | AMZ | | AUO 32" Grade new (Cosmetic spec down grade) |
| ACER | M190EN03 | BN07-00224A | AMZ | | AU Monitor 19" MVA new code derivation |
| ACER | T315XW01 | BN07-00237A | AMZ | | LCD TV VE project new |
| ACER | T315XW01 | BN07-00238A | AMZ | | LCD TV VE project new |
| ACER | M201UN02 V3 | BN07-00168A | AMZ | | |
| CHIMEI | M170E3-L01 | BN07-00050A | CA | | TN PANEL |
| CHIMEI | M150X3-L01 | BN07-00051A | CB | | COMPATIBLE |
| CHIMEI | M170E4-L01 | BN07-00052A | CC | | MVA PANEL |
| CHIMEI | M150X2-L01 | BN07-00066A | CD | | CHIMEI 15" PVA PANEL |
| CHIMEI | M150X3-L01 | BN07-00079A | CE | | Chimei ZPD panel |
| CHIMEI | M170E3-L01 | BN07-00103A | CF | | ZPD Panel code |
| CHIMEI | M170E4-L01 | BN07-00104A | CG | | ZPD Panel code |
| CHIMEI | V296W1-L01 | BN07-00120A | CH | | MVA |
| CHIMEI | M170E6-L02 | BN07-00126A | CJ | | HIGHLAND 17" LOW PANEL |
| CHIMEI | M190E2-L01 | BN07-00131A | CK | | GH19AS,BS CHIMEI PANEL |
| CHIMEI | M150X4-L06 | BN07-00137A | CL | | 15" Narrow & Slim panel |
| CHIMEI | M170E6-L01 | BN07-00133A | CM | | "2003-03-11 vendor change" |
| CHIMEI | M170E6-L01 | BN07-00133B | CN | | ZPD derivation panel |
| CHIMEI | V201V1-T01 | BN07-00135A | CP | | CHIMEI 20.1" panel development |
| CHIMEI | M170E6-L02 | BN07-00126B | CQ | | "HIGHLAND 17"" LOW PANEL ZPD derivation panel" |
| CHIMEI | M170E6-L05 | BN07-00152A | CR | | "CMO 17"" new panel development code" |
| CHIMEI | M170E6-L05 | BN07-00152B | CS | | "CMO 17"" ZPD panel code derivation" |
| CHIMEI | M150X4-L06 | BN07-00137B | CT | | Chimei 15" Narrow & Slim panel ZPD derivation |
| CHIMEI | M170E5-L05 | BN07-00165A | CTH | | CMO 17" new panel development code (GOYA2-PJT) |
| CHIMEI | M170E5-L05 | BN07-00165B | CTZ | | CMO 17" ZPD panel(GOYA2-PJT) |
| CHIMEI | V230W1-L02 | BN07-00209A | CMZ | | CMO 23" development |
| CHIMEI | V320B1-L01 | BN07-00207A | CMZ | | CMO 32" development |
| CHIMEI | V270W1-L01 | BN07-00136A | CMZ | | CHI MEI 27" panel development |
| NEC | SVA150XG04TB | BN07-00225A | BTZ | | SVA NEC 15" panel ZPD code |

Memo