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## 14 Reference Information

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### 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 supplies Power to LCD panel lamp. This device generates 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 changes the number of frames displayed on screen per second.

TFT-LCD panel requires 60 frames per second.

This technology is needed to convert input image to 60 frames per second regardless input frame quantity.

#### **-Image Scaler**

Technology that converts an input resolution to another 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)**

Customers can easily control the screen settings using the OSD.

#### **-FINE**

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

#### **-COARSE**

This adjustment adjusts the display by tuning Video clock 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.

#### **-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 enables Plug and Play between PC and Monitor.

#### **-EDID**

Extended Display Identification Data PC can recognize monitor information such as Product data, Product name,Display mode,Serial number and Signal source, etc Data is recognised via DDC Line linking 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).

## 14-2 Pin Assignments

| Pin No. | Sync Type | 15-Pin D-Sub Signal Cable Connector |                       |                       |
|---------|-----------|-------------------------------------|-----------------------|-----------------------|
|         |           | Separate                            | Composite             | Sync-on-green         |
| 1       |           | Red                                 | Red                   | Red                   |
| 2       |           | Green                               | Green                 | Green + H/V Sync.     |
| 3       |           | Blue                                | Blue                  | Blue                  |
| 4       |           | GND                                 | GND                   | GND                   |
| 5       |           | DDC Return (GND)                    | DDC Return (GND)      | DDC Return (GND)      |
| 6       |           | GND-R                               | GND-R                 | GND-R                 |
| 7       |           | GND-G                               | GND-G                 | GND-G                 |
| 8       |           | GND-B                               | GND-B                 | GND-B                 |
| 9       |           | DDC Power Input (+5V)               | DDC Power Input (+5V) | DDC Power Input (+5V) |
| 10      |           | Self Raster                         | Self Raster           | Self Raster           |
| 11      |           | GND                                 | GND                   | GND                   |
| 12      |           | Bi-Dr Data (SDA)                    | Bi-Dr Data (SDA)      | Bi-Dr Data (SDA)      |
| 13      |           | H-Sync.                             | H/V-Sync.             | Not Used              |
| 14      |           | V-Sync.                             | Not Used              | Not Used              |
| 15      |           | DDC Clock (SCL)                     | DDC Clock (SCL)       | DDC Clock (SCL)       |

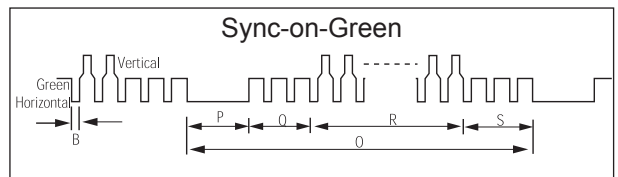
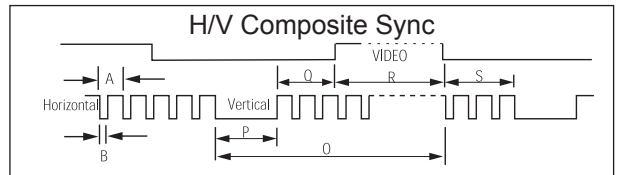
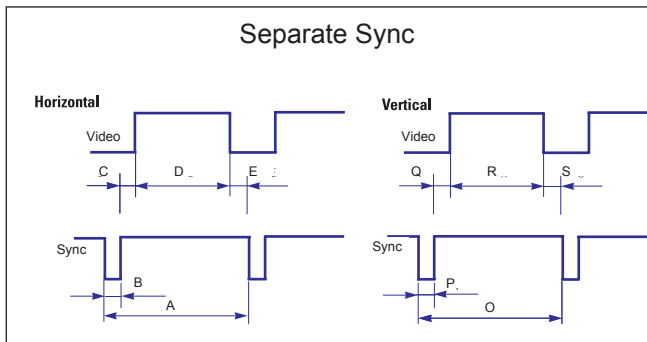
| Pin No. | Sync Type | 24P DVI-D       |    |               |
|---------|-----------|-----------------|----|---------------|
|         |           |                 |    |               |
| 1       |           | Rx2-            | 13 | No Connection |
| 2       |           | Rx2+            | 14 | +5V_M         |
| 3       |           | GND             | 15 | Self Raster   |
| 4       |           | No Connection   | 16 | +5V_M         |
| 5       |           | No Connection   | 17 | Rx0-          |
| 6       |           | DDC Clock (SCL) | 18 | Rx0+          |
| 7       |           | DDC Data (SDA)  | 19 | NC            |
| 8       |           | NC              | 20 | No Connection |
| 9       |           | Rx1-            | 21 | No Connection |
| 10      |           | Rx1+            | 22 | NC            |
| 11      |           | NC              | 23 | RxC+          |
| 12      |           | No Connection   | 24 | RxC-          |

### 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.

Table 14-1 Timing Chart

| Mode<br>Timing    | IBM                         |                             | VESA                 |                      |                      |                        |                        |                         |                         |
|-------------------|-----------------------------|-----------------------------|----------------------|----------------------|----------------------|------------------------|------------------------|-------------------------|-------------------------|
|                   | VGA2/<br>70 Hz<br>720 x 400 | VGA3/<br>60 Hz<br>640 x 480 | 640/75 Hz<br>640x480 | 800/60 Hz<br>800x600 | 800/75 Hz<br>800x600 | 1024/60 Hz<br>1024x768 | 1024/75 Hz<br>1024x768 | 1280/60 Hz<br>1280x1024 | 1280/75 Hz<br>1280x1024 |
| fH (kHz)          | 31.469                      | 31.469                      | 37.500               | 37.879               | 46.875               | 48.363                 | 60.023                 | 63.981                  | 79.975                  |
| A $\mu$ sec       | 31.777                      | 31.778                      | 26.667               | 26.400               | 21.333               | 20.677                 | 16.660                 | 11.852                  | 12.504                  |
| B $\mu$ sec       | 3.813                       | 3.813                       | 2.032                | 3.200                | 1.616                | 2.092                  | 1.219                  | 1.037                   | 1.067                   |
| C $\mu$ sec       | 1.589                       | 1.589                       | 3.810                | 2.200                | 3.232                | 2.462                  | 2.235                  | 2.296                   | 1.837                   |
| D $\mu$ sec       | 26.058                      | 26.058                      | 20.317               | 20.000               | 16.162               | 15.754                 | 13.003                 | 9.259                   | 9.481                   |
| E $\mu$ sec       | 0.318                       | 0.318                       | 0.508                | 0.000                | 0.323                | 0.369                  | 0.203                  | 0.000                   | 0.119                   |
| fV (Hz)           | 70.087                      | 59.940                      | 75.000               | 60.317               | 75.000               | 60.004                 | 75.029                 | 60.020                  | 75.025                  |
| O msec            | 14.268                      | 16.683                      | 13.333               | 16.579               | 13.333               | 16.666                 | 13.328                 | 16.005                  | 13.329                  |
| P msec            | 0.064                       | 0.064                       | 0.080                | 0.106                | 0.064                | 0.124                  | 0.050                  | 0.047                   | 0.038                   |
| Q msec            | 0.858                       | 0.794                       | 0.427                | 0.607                | 0.448                | 0.600                  | 0.466                  | 0.594                   | 0.475                   |
| R msec            | 13.155                      | 15.761                      | 12.800               | 15.840               | 12.800               | 15.880                 | 12.795                 | 15.630                  | 12.804                  |
| S msec            | 0.191                       | 0.064                       | 0.027                | 0.0261               | 0.021                | 0.062                  | 0.017                  | 0.016                   | 0.013                   |
| Clock Freq. (MHz) | 28.322                      | 26.175                      | 31.500               | 40.000               | 49.500               | 75.000                 | 78.750                 | 108.000                 | 135.000                 |
| Polarity H.Sync   | Negative                    | Negative                    | Negative             | Positive             | Positive             | Negative               | Positive               | Positive                | Positive                |
| V.Sync            | Positive                    | Negative                    | Negative             | Positive             | Positive             | Negative               | Positive               | Positive                | Positive                |
| Remark            | Separate                    | Separate                    | Separate             | Separate             | Separate             | Separate               | Separate               | Separate                | Separate                |



|  |                             |
|--|-----------------------------|
| <p>A : Line time total    B : Horizontal sync width<br/>                 P : Vertical sync width</p> | <p>O : Frame time total</p> |
| <p>C : Back porch        D : Active time<br/>                 R : Active time</p>                    | <p>Q : Back porch</p>       |

## 14-4 Preset Timing Modes

-If the signal transferred from the computer is the same as the following Preset Timing Modes, the screen will be adjusted automatically. However, if the signal differs, the screen may go blank while the power LED is on. Refer to the video card manual and adjust the screen as follows.

Table 1. Preset Timing

| Display Mode      | Horizontal Frequency (kHz) | Vertical Frequency (Hz) | Pixel Clock (MHz) | Sync Polarity (H/V) |
|-------------------|----------------------------|-------------------------|-------------------|---------------------|
| MAC, 640 x 480    | 35.000                     | 66.667                  | 30.240            | -/-                 |
| MAC, 832 x 624    | 49.726                     | 74.551                  | 57.284            | -/-                 |
| MAC, 1152 x 870   | 68.681                     | 75.062                  | 100.000           | -/-                 |
| IBM, 640 x 350    | 31.469                     | 70.086                  | 25.175            | +/-                 |
| IBM, 640 x 480    | 31.469                     | 59.940                  | 25.175            | -/-                 |
| IBM, 720 x 400    | 31.469                     | 70.087                  | 28.322            | -/+                 |
| VESA, 640 x 480   | 37.500                     | 75.000                  | 31.500            | -/-                 |
| VESA, 640 x 480   | 37.861                     | 72.809                  | 31.500            | -/-                 |
| VESA, 800 x 600   | 35.156                     | 56.250                  | 36.000            | +, -/+, -           |
| VESA, 800 x 600   | 37.879                     | 60.317                  | 40.000            | +/+                 |
| VESA, 800 x 600   | 46.875                     | 75.000                  | 49.500            | +/+                 |
| VESA, 800 x 600   | 48.077                     | 72.188                  | 50.000            | +/+                 |
| VESA, 1024 x 768  | 48.363                     | 60.004                  | 65.000            | -/-                 |
| VESA, 1024 x 768  | 56.476                     | 70.069                  | 75.000            | -/-                 |
| VESA, 1024 x 768  | 60.023                     | 75.029                  | 78.750            | +/+                 |
| VESA, 1152 x 864  | 67.500                     | 75.000                  | 108.00            | +/+                 |
| VESA 1280 x 960   | 60.000                     | 60.000                  | 108.00            | +/+                 |
| VESA, 1280 x 1024 | 63.981                     | 60.020                  | 108.00            | +/+                 |
| VESA, 1280 x 1024 | 79.976                     | 75.025                  | 135.00            | +/+                 |

### Horizontal Frequency

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

### Vertical Frequency

Like a fluorescent lamp, the screen has to repeat the same image many times per second to display an image to the user. The frequency of this repetition is called Vertical Frequency or Refresh Rate. Unit: Hz

## 14-5 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 mechanicalCompatible                        |
| 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" PVAmode                              |
| 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"                  |
| 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"                                       |

| Maker | VENDOR P/N   | PANEL_CODE  | PANEL_ABB | STICKER_CODE | Remarks   |
|-------|--------------|-------------|-----------|--------------|---|
| 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   | 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                                      |
| 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                                     |
| 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                                   |

14 Reference Information

| Maker    | VENDOR P/N       | PANEL_CODE  | PANEL_ABB | STICKER_CODE | Remarks   |
|----------|------------------|-------------|-----------|--------------|---|
| 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                          |
| 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 |
| 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                        |
| SHARP    | LQ181E1DG11(A)   | BN07-10001C | PA        |              | -   |
| SHARP    | LQ150X1LW71      | BN07-00067A | PB        |              | SHARP 15" PVA PANEL                                       |
| 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        |              | -   |



| Maker     | VENDOR P/N  | PANEL_CODE  | PANEL_ABB | STICKER_CODE | Remarks  |
|-----------|-------------|-------------|-----------|--------------|--|
| 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(BM) PJT 17"" HYDIS PANEL Derivation"  |
| HYUNDAI   | HT17E13-100 | BN07-00167B | DTZ       |              | "PINEHURST-2(BM) Hydis 17"" ZPD code Derivation"   |
| ACER      | L170E3      | BN07-00044A | AA        |              | TN(ADT)  |
| ACER      | M170EN05    | BN07-00076A | AB        |              | AU 17" Panel (Narrow & slim design)                |
| 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 developm                        |
| (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          |
| 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)                       |

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