() Preliminary Specification  
(V) Final Specification

<table>
<thead>
<tr>
<th>Module</th>
<th>17.3” FHD Color TFT-LCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Name</td>
<td>G173HW01 V0</td>
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<table>
<thead>
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<th>Date</th>
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Approved by

<table>
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<tr>
<th>Date</th>
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Checked & Approved by

| Vito Huang | 2011/5/30 |

Prepared by

<table>
<thead>
<tr>
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</table>

Vivian Huang 2011/5/30

Audio Video Business Group / AU Optronics corporation

Note: This Specification is subject to change without notice.
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<td>5</td>
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<td>Weight(g): TBD(Typ.)</td>
<td>Weight(g): 1080(Typ.)</td>
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<tr>
<td></td>
<td>6</td>
<td>Update Viewing Angle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Update Optical Response Time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Update Color / Chromaticity Coordinates</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Update White Luminance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>IDD (mA): 350(Typ), 600(Max)</td>
<td>IDD (mA): 1200(Typ), 1400(Max)</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>PDD (Watt): TBD(Typ), 2(Max)</td>
<td>PDD (Watt): 5(Typ), 6(Max)</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Update the diagram of Vin rising time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>$P_{VCC}$ (Watt): 11.88(Typ), 13.39(Max)</td>
<td>$P_{VCC}$ (Watt): 12(Typ), 15(Max)</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Update LED Forward Voltage</td>
<td></td>
</tr>
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<td></td>
<td>14</td>
<td>Update Note6 description</td>
<td></td>
</tr>
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<td>25</td>
<td>Update Shipping Label</td>
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<td></td>
<td>25</td>
<td>Update Packing Form</td>
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</tr>
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<td></td>
<td>28</td>
<td>Update Outline Drawing</td>
<td></td>
</tr>
</tbody>
</table>
1. Handling Precautions

1) Since front polarizer is easily damaged, please be cautious and not to scratch it.
2) Be sure to turn off power supply when inserting or disconnecting from input connector.
3) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
4) When the panel surface is soiled, wipe it with absorbent cotton or soft cloth.
5) Since the panel is made of glass, it may be broken or cracked if dropped or bumped on hard surface.
6) To avoid ESD (Electro Static Discharge) damage, be sure to ground yourself before handling TFT-LCD Module.
7) Do not open nor modify the module assembly.
8) Do not press the reflector sheet at the back of the module to any direction.
9) In case if a module has to be put back into the packing container slot after it was taken out from the container, do not press the center of the LED light bar edge. Instead, press at the far ends of the LED light bar edge softly. Otherwise the TFT Module may be damaged.
10) At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT Module.
11) TFT-LCD Module is not allowed to be twisted & bent even force is added on module in a very short time. Please design your display product well to avoid external force applying to module by end-user directly.
12) Small amount of materials without flammability grade are used in the TFT-LCD module. The TFT-LCD module should be supplied by power complied with requirements of Limited Power Source (IEC60950 or UL1950), or be applied exemption.
13) Severe temperature condition may result in different luminance, response time and lamp ignition voltage.
14) Continuous operating TFT-LCD display under low temperature environment may accelerate lamp exhaustion and reduce luminance dramatically.
15) The data on this specification sheet is applicable when LCD module is placed in landscape position.
16) Continuous displaying fixed pattern may induce image sticking. It’s recommended to use screen saver or shuffle content periodically if fixed pattern is displayed on the screen.
2. General Description

G173HW01 V0 is a Color Active Matrix Liquid Crystal Display composed of a TFT-LCD panel, a LED driver circuit, and a LED backlight system. The screen format is intended to support the FHD (1920(H) x 1080(V)) screen and 16.7M colors (RGB 6-bits + HiFRC data). All input signals are LVDS interface compatible. Inverter card of backlight is not included.

2.1 Display Characteristics

The following items are characteristics summary on the table under 25 °C condition:

<table>
<thead>
<tr>
<th>Items</th>
<th>Unit</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screen Diagonal</td>
<td>[mm]</td>
<td>17.3W (17.25)</td>
</tr>
<tr>
<td>Active Area</td>
<td>[mm]</td>
<td>381.888 (H) x 214.812 (V)</td>
</tr>
<tr>
<td>Pixels H x V</td>
<td></td>
<td>1920(x3) x 1080</td>
</tr>
<tr>
<td>Pixel Pitch</td>
<td>[mm]</td>
<td>0.1989 (per one triad) x 0.1989</td>
</tr>
<tr>
<td>Pixel Arrangement</td>
<td></td>
<td>R.G.B. Vertical Stripe</td>
</tr>
<tr>
<td>Display Mode</td>
<td></td>
<td>Normally White</td>
</tr>
<tr>
<td>White Luminance</td>
<td>[cd/m²]</td>
<td>400 (Typ.)</td>
</tr>
<tr>
<td>Contrast Ratio</td>
<td></td>
<td>600 : 1 (Typ)</td>
</tr>
<tr>
<td>Optical Response Time</td>
<td>[msec]</td>
<td>40 (Typ, on/off)</td>
</tr>
<tr>
<td>Nominal Input Voltage VDD</td>
<td>[Volt]</td>
<td>3.3 V</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>[Watt]</td>
<td>17 (Typ)</td>
</tr>
<tr>
<td>Weight</td>
<td>[Grams]</td>
<td>1080 (Typ)</td>
</tr>
<tr>
<td>Physical Size (H x V x D)</td>
<td>[mm]</td>
<td>403 (H) x 240 (V) x 12.5 (D) (Typ)</td>
</tr>
<tr>
<td>Electrical Interface</td>
<td></td>
<td>Dual channel LVDS</td>
</tr>
<tr>
<td>Surface Treatment</td>
<td></td>
<td>Hard-coating (3H), Glare treatment</td>
</tr>
<tr>
<td>Support Color</td>
<td></td>
<td>16.7M colors (RGB 6-bit data + HiFRC data)</td>
</tr>
<tr>
<td>Temperature Range (Ta)</td>
<td>[°C]</td>
<td>0 to +70</td>
</tr>
<tr>
<td>Operating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage (Non-Operating)</td>
<td>[°C]</td>
<td>-20 to +70</td>
</tr>
<tr>
<td>RoHS Compliance</td>
<td></td>
<td>RoHS Compliance</td>
</tr>
</tbody>
</table>

document version 1.0
2.2 Optical Characteristics

The optical characteristics are measured under stable conditions at 25°C (Room Temperature):

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Viewing Angle</strong></td>
<td>[degree]</td>
<td>Horizontal (Right) CR = 10</td>
<td>70</td>
<td>80</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (Left) CR = 10</td>
<td>70</td>
<td>80</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (Up) CR = 10</td>
<td>50</td>
<td>60</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (Down) CR = 10</td>
<td>70</td>
<td>80</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Luminance Uniformity</strong></td>
<td>[%]</td>
<td>13 Points</td>
<td>75</td>
<td>80</td>
<td>-</td>
<td>2, 3</td>
</tr>
<tr>
<td><strong>Optical Response Time</strong></td>
<td>[msec]</td>
<td>Rising</td>
<td>-</td>
<td>37</td>
<td>50</td>
<td>4, 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Falling</td>
<td>-</td>
<td>3</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rising + Falling</td>
<td>-</td>
<td>40</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td><strong>Color / Chromaticity</strong></td>
<td></td>
<td>Red x</td>
<td>0.590</td>
<td>0.640</td>
<td>0.690</td>
<td>4</td>
</tr>
<tr>
<td>Coordinates (CIE 1931)</td>
<td></td>
<td>Red y</td>
<td>0.296</td>
<td>0.346</td>
<td>0.396</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green x</td>
<td>0.264</td>
<td>0.314</td>
<td>0.364</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green y</td>
<td>0.574</td>
<td>0.624</td>
<td>0.674</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blue x</td>
<td>0.100</td>
<td>0.150</td>
<td>0.200</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blue y</td>
<td>0.004</td>
<td>0.054</td>
<td>0.104</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>White x</td>
<td>0.255</td>
<td>0.305</td>
<td>0.355</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>White y</td>
<td>0.268</td>
<td>0.318</td>
<td>0.368</td>
<td></td>
</tr>
<tr>
<td><strong>White Luminance</strong></td>
<td>[cd/m²]</td>
<td>(At LED=100mA)</td>
<td>320</td>
<td>400</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td><strong>Contrast Ratio</strong></td>
<td>%</td>
<td></td>
<td>500</td>
<td>600</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td><strong>NTSC</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>72</td>
<td></td>
</tr>
</tbody>
</table>

Optical Equipment: BM-5A, BM-7, PR880, or equivalent
Note 1: Definition of viewing angle
Viewing angle is the measurement of contrast ratio $\geq 10$, or $\geq 5$, at the screen center, over a 180° horizontal and 180° vertical range (off-normal viewing angles). The 180° viewing angle range is broken down as follows; 90° ($\phi$) horizontal left and right and 90° ($\theta$) vertical, high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated about its center to develop the desired measurement viewing angle.

![Diagram of viewing angle](image)

Note 2: 13 points position

![Diagram of 13 points position](image)
Note 3:

\[
\delta_{W13} = \frac{\text{Minimum Luminance of 13 points}}{\text{Maximum Luminance of 13 points}}
\]

Note 4: Measurement method

The LCD module should be stabilized at given temperature for 30 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a stable, windless and dark room.
Note 5: Definition of response time:

The output signals of photo detector are measured when the input signals are changed from “Full Black” to “Full White” (rising time), and from “Full White” to “Full Black” (falling time), respectively. The response time is interval between the 10% and 90% of amplitudes. Please refer to the figure as below.
3. Functional Block Diagram

The following diagram shows the functional block of the 17.3 inches Color TFT-LCD Module:
4. Absolute Maximum Ratings

Absolute maximum ratings of the module are as following:

4.1 Absolute Ratings of TFT LCD Module

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logic/LCD Drive Voltage</td>
<td>Vin</td>
<td>-0.3</td>
<td>+3.6</td>
<td>Volt</td>
</tr>
</tbody>
</table>

4.2 Absolute Ratings of Environment

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>TOP</td>
<td>0</td>
<td>+70</td>
<td>°C</td>
</tr>
<tr>
<td>Operation Humidity</td>
<td>HOP</td>
<td>5</td>
<td>95</td>
<td>%RH</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>TST</td>
<td>-20</td>
<td>+70</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Humidity</td>
<td>HST</td>
<td>5</td>
<td>95</td>
<td>%RH</td>
</tr>
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</table>

Note: Maximum Wet-Bulb should be 39°C and no condensation.
5. Electrical characteristics

5.1 TFT LCD Module

5.1.1 Power Specification

Input power specifications are as follows:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
<th>Condition</th>
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</thead>
<tbody>
<tr>
<td>VDD</td>
<td>Logic/LCD Drive Voltage</td>
<td>3.0</td>
<td>3.3</td>
<td>3.6</td>
<td>Volt</td>
<td>± 10%</td>
</tr>
<tr>
<td>IDD</td>
<td>Input Current</td>
<td>-</td>
<td>1200</td>
<td>1400</td>
<td>mA</td>
<td>VDD= 5.0V, All Black Pattern At 75Hz, +30%</td>
</tr>
<tr>
<td>PDD</td>
<td>VDD Power</td>
<td>-</td>
<td>5</td>
<td>6</td>
<td>Watt</td>
<td>VDD= 5.0V, All Black Pattern Note 1</td>
</tr>
<tr>
<td>IRush</td>
<td>Inrush Current</td>
<td>-</td>
<td>-</td>
<td>2000</td>
<td>A</td>
<td>Note 2</td>
</tr>
<tr>
<td>VDDrp</td>
<td>Allowable Logic/LCD Drive Ripple Voltage</td>
<td>-</td>
<td>-</td>
<td>100</td>
<td>mV p-p</td>
<td>VDD= 3.3V, All Black Pattern At 75Hz</td>
</tr>
</tbody>
</table>

Note 1: The variance of VDD power consumption is ±30%.
Note 2: Measurement conditions:

Vin rising time

![Diagram of electronic circuit](image)
### 5.1.2 Signal Electrical Characteristics

Input signals shall be low or Hi-Z state when VDD is off.

Note: LVDS Signal Waveform.

#### Single-end Signal

- **Vp, Vn**:
  - $V_p, V_n = |VID| > VTH = \text{“High”}
  - $V_p, V_n = -|VID| < VTL = \text{“Low”}

#### Differential Signal

- **Vp, Vn**: $V_p, V_n = |VID| > VTH = \text{“High”}
  - $V_p, V_n = -|VID| < VTL = \text{“Low”}

---

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Item</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTH</td>
<td>Differential Input High Threshold</td>
<td>-</td>
<td>-</td>
<td>100</td>
<td>[mV]</td>
<td>VCM=1.2V</td>
</tr>
<tr>
<td>VTL</td>
<td>Differential Input Low Threshold</td>
<td>-100</td>
<td>-</td>
<td>-</td>
<td>[mV]</td>
<td>VCM=1.2V</td>
</tr>
<tr>
<td></td>
<td>VID</td>
<td>Input Differential Voltage</td>
<td>100</td>
<td>400</td>
<td>600</td>
<td>[mV]</td>
</tr>
<tr>
<td>VICM</td>
<td>Differential Input Common Mode Voltage</td>
<td>1.125</td>
<td>-</td>
<td>1.375</td>
<td>[V]</td>
<td>VTH/VTL=+-100mV</td>
</tr>
</tbody>
</table>
### 5.2 Backlight Unit

Following characteristics are measured under a stable condition using a inverter at 25°C. (Room Temperature):

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCC</td>
<td>Input Voltage</td>
<td>10.8</td>
<td>12</td>
<td>13.4</td>
<td>[Volt]</td>
<td></td>
</tr>
<tr>
<td>I(_{VCC})</td>
<td>Input Current</td>
<td>-</td>
<td>0.99</td>
<td>-</td>
<td>[A]</td>
<td>100% PWM Duty</td>
</tr>
<tr>
<td>P(_{VCC})</td>
<td>Power Consumption</td>
<td>-</td>
<td>12</td>
<td>15</td>
<td>[Watt]</td>
<td>100% PWM Duty</td>
</tr>
<tr>
<td>F(_{PWM})</td>
<td>Dimming Frequency</td>
<td>200</td>
<td>-</td>
<td>20K</td>
<td>[Hz]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Swing Voltage</td>
<td>3</td>
<td>3.3</td>
<td>5.5</td>
<td>[Volt]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dimming duty cycle</td>
<td>5</td>
<td>-</td>
<td>100</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>I(_F)</td>
<td>LED Forward Current</td>
<td>-</td>
<td>100</td>
<td>-</td>
<td>[mA]</td>
<td>Ta = 25°C</td>
</tr>
<tr>
<td>V(_F)</td>
<td>LED Forward Voltage</td>
<td>-</td>
<td>3.3</td>
<td>3.7</td>
<td>[Volt]</td>
<td>I(_F) = 100mA, Ta = 0°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>3.2</td>
<td>3.6</td>
<td>[Volt]</td>
<td>I(_F) = 100mA, Ta = 25°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>3.1</td>
<td>3.5</td>
<td>[Volt]</td>
<td>I(_F) = 100mA, Ta = 70°C</td>
</tr>
<tr>
<td>P(_{LED})</td>
<td>LED Power Consumption</td>
<td>-</td>
<td>10.24</td>
<td>11.52</td>
<td>[Watt]</td>
<td></td>
</tr>
<tr>
<td>LED Life Time</td>
<td></td>
<td>50,000</td>
<td>-</td>
<td>-</td>
<td>Hrs</td>
<td>I(_F) = 100mA, Ta = 25°C</td>
</tr>
</tbody>
</table>

Note 1: Ta means ambient temperature of TFT-LCD module.

Note 2: VCC, I\(_{VCC}\), P\(_{VCC}\) are defined for LED backlight. (100% duty of PWM dimming)

Note 3: I\(_F\), V\(_F\) are defined for one channel LED. There are four LED channel in back light unit.

Note 4: If G173HW01 V0 module is driven by high current or at high ambient temperature & humidity condition. The operating life will be reduced.

Note 5: Operating life means brightness goes down to 50% initial brightness. Minimum operating life time is estimated data.

Note 6: LED lifetime is definition: brightness is decreased to 50% of the initial value. LED lifetime is restricted under normal condition, ambient temperature = 25°C and LED operating I\(_F\) = 100mA.
6. Signal Characteristic

6.1 Pixel Format Image

Following figure shows the relationship of the input signals and LCD pixel format.
6.2 The Input Data Format

Note1: Normally, DE, VS, HS on EVEN channel are not used.
Note2: 8-bit in
6.3 Signal Description

The module using a pair of LVDS receiver SN75LVDS82 (Texas Instruments) or compatible. LVDS is a differential signal technology for LCD interface and high speed data transfer device. Transmitter shall be SN75LVDS83 (negative edge sampling) or compatible. The first LVDS port (RxOxxx) transmits odd pixels while the second LVDS port (RxExxx) transmits even pixels.

<table>
<thead>
<tr>
<th>PIN #</th>
<th>SIGNAL NAME</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RxOIN0-</td>
<td>Negative LVDS differential data input (Odd data)</td>
</tr>
<tr>
<td>2</td>
<td>RxOIN0+</td>
<td>Positive LVDS differential data input (Odd data)</td>
</tr>
<tr>
<td>3</td>
<td>RxOIN1-</td>
<td>Negative LVDS differential data input (Odd data)</td>
</tr>
<tr>
<td>4</td>
<td>RxOIN1+</td>
<td>Positive LVDS differential data input (Odd data)</td>
</tr>
<tr>
<td>5</td>
<td>RxOIN2-</td>
<td>Negative LVDS differential data input (Odd data, H-Sync, V-Sync, DSPTMG)</td>
</tr>
<tr>
<td>6</td>
<td>RxOIN2+</td>
<td>Positive LVDS differential data input (Odd data, H-Sync, V-Sync, DSPTMG)</td>
</tr>
<tr>
<td>7</td>
<td>VSS</td>
<td>Power Ground</td>
</tr>
<tr>
<td>8</td>
<td>RxOCLKIN-</td>
<td>Negative LVDS differential clock input (Odd clock)</td>
</tr>
<tr>
<td>9</td>
<td>RxOCLKIN+</td>
<td>Positive LVDS differential clock input (Odd clock)</td>
</tr>
<tr>
<td>10</td>
<td>RxOIN3-</td>
<td>Negative LVDS differential data input (Odd data)</td>
</tr>
<tr>
<td>11</td>
<td>RxOIN3+</td>
<td>Positive LVDS differential data input (Odd data)</td>
</tr>
<tr>
<td>12</td>
<td>RxEIN0-</td>
<td>Negative LVDS differential data input (Even data)</td>
</tr>
<tr>
<td>13</td>
<td>RxEIN0+</td>
<td>Positive LVDS differential data input (Even data)</td>
</tr>
<tr>
<td>14</td>
<td>VSS</td>
<td>Power Ground</td>
</tr>
<tr>
<td>15</td>
<td>RxEIN1-</td>
<td>Negative LVDS differential data input (Even data)</td>
</tr>
<tr>
<td>16</td>
<td>RxEIN1+</td>
<td>Positive LVDS differential data input (Even data)</td>
</tr>
<tr>
<td>17</td>
<td>VSS</td>
<td>Power Ground</td>
</tr>
<tr>
<td>18</td>
<td>RxEIN2-</td>
<td>Negative LVDS differential data input (Even data)</td>
</tr>
<tr>
<td>19</td>
<td>RxEIN2+</td>
<td>Positive LVDS differential data input (Even data)</td>
</tr>
<tr>
<td>20</td>
<td>RxECLKIN-</td>
<td>Negative LVDS differential clock input (Even clock)</td>
</tr>
<tr>
<td>21</td>
<td>RxECLKIN+</td>
<td>Positive LVDS differential clock input (Even clock)</td>
</tr>
<tr>
<td>22</td>
<td>RxEIN3-</td>
<td>Negative LVDS differential data input (Even data)</td>
</tr>
<tr>
<td>23</td>
<td>RxEIN3+</td>
<td>Positive LVDS differential data input (Even data)</td>
</tr>
<tr>
<td>24</td>
<td>VSS</td>
<td>Power Ground</td>
</tr>
<tr>
<td>25</td>
<td>VSS</td>
<td>Power Ground</td>
</tr>
<tr>
<td>26</td>
<td>VSS</td>
<td>Power Ground</td>
</tr>
<tr>
<td>27</td>
<td>VSS</td>
<td>Power Ground</td>
</tr>
<tr>
<td>28</td>
<td>VDD</td>
<td>+3.3V Power Supply</td>
</tr>
<tr>
<td>29</td>
<td>VDD</td>
<td>+3.3V Power Supply</td>
</tr>
<tr>
<td>30</td>
<td>VDD</td>
<td>+3.3V Power Supply</td>
</tr>
</tbody>
</table>
Note1: Start from left side

Note2: Input signals of odd and even clock shall be the same timing.

Note3: Please follow PSWG.
6.4 Interface Timing

6.4.1 Timing Characteristics
Basically, interface timings should match the 1920x1080 / 60Hz manufacturing guide line timing.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame Rate</td>
<td>-</td>
<td>50</td>
<td>60</td>
<td>-</td>
<td>Hz</td>
</tr>
<tr>
<td>Clock frequency</td>
<td>1/ T_{Clock}</td>
<td>50</td>
<td>74.9</td>
<td>95</td>
<td>MHz</td>
</tr>
</tbody>
</table>

**Vertical Section**
- **Period**: T_V 1088 1130 1580 T_{Line}
- **Active**: T_{VP} 1080
- **Blanking**: T_{VB} 8 50 -

**Horizontal Section**
- **Period**: T_H 990 1050 - T_{Clock}
- **Active**: T_{HD} 960
- **Blanking**: T_{HB} 30 90 -

Note: DE mode only

6.4.2 Timing Diagram

---

Input Timing Definition (DE Mode)

<table>
<thead>
<tr>
<th>DOTCLK</th>
<th></th>
<th></th>
<th></th>
<th>Input Timing Definition (DE Mode)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Invalid Data</td>
<td>Pixel 1</td>
<td>Pixel 2</td>
<td>Pixel 3</td>
<td>Pixel N-1</td>
<td>Pixel N</td>
<td>Invalid Data</td>
</tr>
<tr>
<td>DE</td>
<td>T_{HB}</td>
<td></td>
<td></td>
<td>T_{HD}</td>
<td></td>
<td>T_{H}</td>
<td></td>
</tr>
<tr>
<td>DE</td>
<td>T_{VB}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T_{VB}</td>
</tr>
</tbody>
</table>
6.5 Power ON/OFF Sequence

VDD power and lamp on/off sequence is as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VDD is off.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>0.5</td>
<td>-</td>
</tr>
<tr>
<td>T2</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>T3</td>
<td>200</td>
<td>-</td>
</tr>
<tr>
<td>T4</td>
<td>0.5</td>
<td>-</td>
</tr>
<tr>
<td>T5</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>T6</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>T7</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>T8</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>T9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>T10</td>
<td>110</td>
<td>-</td>
</tr>
<tr>
<td>T11</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>T12</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>T13</td>
<td>500</td>
<td>-</td>
</tr>
</tbody>
</table>
7. Connector & Pin Assignment

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

7.1 TFT LCD Module

7.1.1 Connector

<table>
<thead>
<tr>
<th>Connector Name / Designation</th>
<th>Interface Connector / Interface card</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>HRS</td>
</tr>
<tr>
<td>Type Part Number</td>
<td>MDF76TW-30S-1H</td>
</tr>
<tr>
<td>Mating Type Part Number</td>
<td>MDF76-30P-1C</td>
</tr>
</tbody>
</table>

7.1.2 Pin Assignment

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Signal Name</th>
<th>Pin#</th>
<th>Signal Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RxOIN0-</td>
<td>2</td>
<td>RxOIN0+</td>
</tr>
<tr>
<td>3</td>
<td>RxOIN1-</td>
<td>4</td>
<td>RxOIN1+</td>
</tr>
<tr>
<td>5</td>
<td>RxOIN2-</td>
<td>6</td>
<td>RxOIN2+</td>
</tr>
<tr>
<td>7</td>
<td>VSS</td>
<td>8</td>
<td>RxOCLKIN-</td>
</tr>
<tr>
<td>9</td>
<td>RxOCLKIN+</td>
<td>10</td>
<td>RxOIN3-</td>
</tr>
<tr>
<td>11</td>
<td>RxOIN3+</td>
<td>12</td>
<td>RxEin0-</td>
</tr>
<tr>
<td>13</td>
<td>RxEin0+</td>
<td>14</td>
<td>VSS</td>
</tr>
<tr>
<td>15</td>
<td>RxEin1-</td>
<td>16</td>
<td>RxEin1+</td>
</tr>
<tr>
<td>17</td>
<td>VSS</td>
<td>18</td>
<td>RxEin2-</td>
</tr>
<tr>
<td>19</td>
<td>RxEin2+</td>
<td>20</td>
<td>RxECLKIN-</td>
</tr>
<tr>
<td>21</td>
<td>RxECLKIN+</td>
<td>22</td>
<td>RxEin3-</td>
</tr>
<tr>
<td>23</td>
<td>RxEin3+</td>
<td>24</td>
<td>VSS</td>
</tr>
<tr>
<td>25</td>
<td>VSS</td>
<td>26</td>
<td>VSS</td>
</tr>
<tr>
<td>27</td>
<td>VSS</td>
<td>28</td>
<td>VDD</td>
</tr>
<tr>
<td>29</td>
<td>VDD</td>
<td>30</td>
<td>VDD</td>
</tr>
</tbody>
</table>
7.2 Backlight Unit

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

7.2.1 Connector

<table>
<thead>
<tr>
<th>Connector Name / Designation</th>
<th>Lamp Connector / Backlight lamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>HRS</td>
</tr>
<tr>
<td>Type Part Number</td>
<td>DF14A-6P-1.25H</td>
</tr>
<tr>
<td>Mating Type Part Number</td>
<td>DF14-6S-1.25C</td>
</tr>
</tbody>
</table>

7.2.2 Pin Assignment

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin1</td>
<td>VLED</td>
<td>12V input</td>
</tr>
<tr>
<td>Pin2</td>
<td>VLED</td>
<td>12V input</td>
</tr>
<tr>
<td>Pin3</td>
<td>GND</td>
<td>GND</td>
</tr>
<tr>
<td>Pin4</td>
<td>GND</td>
<td>GND</td>
</tr>
<tr>
<td>Pin5</td>
<td>On/OFF</td>
<td>3.3-5V:ON, 0V:OFF</td>
</tr>
<tr>
<td>Pin6</td>
<td>Dimming</td>
<td>PWM</td>
</tr>
</tbody>
</table>
8. Reliability Test

Environment test conditions are listed as following table.

<table>
<thead>
<tr>
<th>Items</th>
<th>Required Condition</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Humidity Bias (THB)</td>
<td>Ta= 50°C, 80%RH, 240hours</td>
<td></td>
</tr>
<tr>
<td>High Temperature Operation (HTO)</td>
<td>Ta= 70°C, 240hours</td>
<td></td>
</tr>
<tr>
<td>Low Temperature Operation (LTO)</td>
<td>Ta= 0°C, 240hours</td>
<td></td>
</tr>
<tr>
<td>High Temperature Storage (HTS)</td>
<td>Ta= 70°C, 240hours</td>
<td></td>
</tr>
<tr>
<td>Low Temperature Storage (LTS)</td>
<td>Ta= -20°C, 240hours</td>
<td></td>
</tr>
<tr>
<td>Vibration Test (Non-operation)</td>
<td>Acceleration: 1.5 G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wave: Random</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frequency: 10 - 200 - 10 Hz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sweep: 30 Minutes each Axis (X, Y, Z)</td>
<td></td>
</tr>
<tr>
<td>Shock Test (Non-operation)</td>
<td>Acceleration: 50 G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wave: Half-sine</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Active Time: 20 ms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Direction: ±X, ±Y, ±Z (one time for each Axis)</td>
<td></td>
</tr>
<tr>
<td>Drop Test</td>
<td>Height: 60 cm, package test</td>
<td></td>
</tr>
<tr>
<td>Thermal Shock Test (TST)</td>
<td>-20°C/30min, 60°C/30min, 50 cycles</td>
<td>1</td>
</tr>
<tr>
<td>ESD (Electro-Static Discharge)</td>
<td>Contact Discharge: ± 8KV, 150pF(330Ω) 1sec, 8 points, 25 times/ point.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Air Discharge: ± 15KV, 150pF(330Ω) 1sec 8 points, 25 times/ point.</td>
<td></td>
</tr>
</tbody>
</table>

Note 1: The TFT-LCD module will not sustain damage after being subjected to 100 cycles of rapid temperature change. A cycle of rapid temperature change consists of varying the temperature from -20°C to 60°C, and back again. Power is not applied during the test. After temperature cycling, the unit is placed in normal room ambient for at least 4 hours before power on.

Note 2: According to EN61000-4-2, ESD class B: Some performance degradation allowed. No data lost. Self-recoverable. No hardware failures.
9. Shipping Label

Manufactured Country (factory buildings)
1. CHINA (SJ)

Unit: mm
10. Packing Form

10.1 Packaging material

<table>
<thead>
<tr>
<th>FILM PROTECT</th>
<th>BAG ANTI-STATIC</th>
<th>TAPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAPE CREPED PAPER</td>
<td>PACKING CARTON</td>
<td>LABEL SPEC</td>
</tr>
<tr>
<td>LABEL CARTON.</td>
<td>CUSHION PACKING</td>
<td></td>
</tr>
</tbody>
</table>

10.2 External packaging material required

- Carton: 524mm*321mm*360mm, weight (carton + cushion): 1250g
- Pallet: 1140mm*980mm*140mm
- Stretch film: 500mm (W)*300M (L)
- Corner angle: L type fiber board
- PET band: 19mm (W)
- Label: 220mm*200mm

10.3 Palletizing sequence

<table>
<thead>
<tr>
<th></th>
<th>pcs / box</th>
<th>box / layer</th>
<th>layer / pallet</th>
<th>pcs / pallet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipping by air</td>
<td>10</td>
<td>2*3</td>
<td>3</td>
<td>180</td>
</tr>
<tr>
<td>Shipping by sea</td>
<td>10</td>
<td>2*3</td>
<td>3</td>
<td>180</td>
</tr>
</tbody>
</table>
10.4 Packing instruction