



|                   |                       |
|-------------------|-----------------------|
| <b>Module</b>     | 15 Inch Color TFT-LCD |
| <b>Model Name</b> | G150XAN01.0           |

General Display Business Unit /  
AU Optronics corporation

## Contents

|                                                                 |           |
|-----------------------------------------------------------------|-----------|
| <b>1. Operating Precautions .....</b>                           | <b>4</b>  |
| <b>2. General Description .....</b>                             | <b>5</b>  |
| 2.1 Display Characteristics .....                               | 5         |
| 2.2 Optical Characteristics .....                               | 6         |
| <b>3. Functional Block Diagram .....</b>                        | <b>9</b>  |
| <b>4. Absolute Maximum Ratings .....</b>                        | <b>10</b> |
| 4.1 Absolute Ratings of TFT LCD Module .....                    | 10        |
| 4.2 Absolute Ratings of Environment .....                       | 10        |
| 5.1 TFT LCD Module .....                                        | 11        |
| 5.2 Backlight Unit .....                                        | 13        |
| <b>6. Signal Characteristic .....</b>                           | <b>14</b> |
| 6.1 Pixel Format Image .....                                    | 14        |
| 6.2 Scanning Direction .....                                    | 14        |
| 6.3 Signal Description .....                                    | 15        |
| 6.4 The Input Data Format .....                                 | 16        |
| 6.5 Interface Timing .....                                      | 17        |
| 6.6 Power ON/OFF Sequence .....                                 | 18        |
| <b>7. Connector &amp; Pin Assignment .....</b>                  | <b>19</b> |
| 7.1 TFT LCD Module: LVDS Connector .....                        | 19        |
| 7.2 LED Backlight Unit: LED Driver Connector .....              | 20        |
| 7.2 LED Backlight Unit: LED Driver Connector .....              | 21        |
| 7.3 LED Driver Connector Pin Assignment .....                   | 21        |
| <b>8. Reliability Test Criteria .....</b>                       | <b>22</b> |
| <b>9. Mechanical Characteristics .....</b>                      | <b>23</b> |
| 9.1 LCM Outline Dimension (Front View) .....                    | 23        |
| 9.2 CM Outline Dimension (Rear View) .....                      | 24        |
| <b>10. Label and Packaging .....</b>                            | <b>25</b> |
| 10.1 Shipping Label (on the rear side of TFT-LCD display) ..... | 25        |
| 10.2 Carton Package .....                                       | 25        |
| 10.3 Palletizing .....                                          | 26        |
| <b>11 Safety .....</b>                                          | <b>27</b> |
| 11.1 Sharp Edge Requirements .....                              | 27        |
| 11.2 Materials .....                                            | 27        |
| 11.3 Capacitors .....                                           | 27        |
| 11.4 National Test Lab Requirement .....                        | 27        |

# Record of Revision

| Version and Date | Page             | Old description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | New Description                                                              |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------|--------|-------|-------------------|--------------------|-------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------|-------|-------|---------|--------------|------------------|--------|----------------|-----|-----|-----|-------------------|--------|-----------------|-----|-----|-----|----------|-----------------|----|----|-----|--------------|--------------------|--------|----------------|------|------|------|--------------------|--------|-----------------|------|------|------|----------|-----------------|-----|-----|------|------------|--|---|----|--|----|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------|--------|------|------|------|------|--------------|-----------------|-----------------------|----|----|----|-----|--------------|------------------|--------|----------------|-----|-----|-----|-------------------|--------|-----------------|-----|-----|-----|----------|-----------------|----|----|----|--------------|--------------------|--------|----------------|------|------|------|--------------------|--------|-----------------|------|------|------|----------|-----------------|-----|-----|-----|------------|--|---|----|----|----|----|
| 0.0 2017/12/15   | All              | First Edition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                              |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| 0.1 2018/06/20   | 17               | <div>6.5.1 Timing Characteristics</div> <table><tr><th>Signal</th><th>Parameter</th><th>Symbol</th><th>Min.</th><th>Typ.</th><th>Max.</th><th>Unit</th></tr><tr><td>Clock Timing</td><td>Clock frequency</td><td>1/ T<sub>clock</sub></td><td>50</td><td>65</td><td>81</td><td>MHz</td></tr><tr><td rowspan="4">Vsync Timing</td><td rowspan="3">Vertical Section</td><td>Period</td><td>T<sub>V</sub></td><td>783</td><td>806</td><td>968</td><td rowspan="3">T<sub>Line</sub></td></tr><tr><td>Active</td><td>T<sub>VD</sub></td><td>768</td><td>768</td><td>768</td></tr><tr><td>Blanking</td><td>T<sub>VB</sub></td><td>15</td><td>38</td><td>200</td></tr><tr><td rowspan="3">Hsync Timing</td><td rowspan="3">Horizontal Section</td><td>Period</td><td>T<sub>H</sub></td><td>1224</td><td>1344</td><td>2024</td><td rowspan="3">T<sub>clock</sub></td></tr><tr><td>Active</td><td>T<sub>HD</sub></td><td>1024</td><td>1024</td><td>1024</td></tr><tr><td>Blanking</td><td>T<sub>HB</sub></td><td>200</td><td>320</td><td>1000</td></tr><tr><td colspan="2">Frame Rate</td><td>F</td><td colspan="2">60</td><td colspan="2">Hz</td></tr></table> | Signal                                                                       | Parameter      | Symbol | Min.  | Typ.              | Max.               | Unit  | Clock Timing | Clock frequency                                                                                                                                                                              | 1/ T <sub>clock</sub> | 50    | 65    | 81    | MHz     | Vsync Timing | Vertical Section | Period | T <sub>V</sub> | 783 | 806 | 968 | T <sub>Line</sub> | Active | T <sub>VD</sub> | 768 | 768 | 768 | Blanking | T <sub>VB</sub> | 15 | 38 | 200 | Hsync Timing | Horizontal Section | Period | T <sub>H</sub> | 1224 | 1344 | 2024 | T <sub>clock</sub> | Active | T <sub>HD</sub> | 1024 | 1024 | 1024 | Blanking | T <sub>HB</sub> | 200 | 320 | 1000 | Frame Rate |  | F | 60 |  | Hz |  | <div>6.5.1 Timing Characteristics</div> <table><tr><th>Signal</th><th>Parameter</th><th>Symbol</th><th>Min.</th><th>Typ.</th><th>Max.</th><th>Unit</th></tr><tr><td>Clock Timing</td><td>Clock frequency</td><td>1/ T<sub>clock</sub></td><td>63</td><td>65</td><td>67</td><td>MHz</td></tr><tr><td rowspan="4">Vsync Timing</td><td rowspan="3">Vertical Section</td><td>Period</td><td>T<sub>V</sub></td><td>804</td><td>806</td><td>808</td><td rowspan="3">T<sub>Line</sub></td></tr><tr><td>Active</td><td>T<sub>VD</sub></td><td>768</td><td>768</td><td>768</td></tr><tr><td>Blanking</td><td>T<sub>VB</sub></td><td>36</td><td>38</td><td>40</td></tr><tr><td rowspan="4">Hsync Timing</td><td rowspan="3">Horizontal Section</td><td>Period</td><td>T<sub>H</sub></td><td>1328</td><td>1344</td><td>1360</td><td rowspan="3">T<sub>clock</sub></td></tr><tr><td>Active</td><td>T<sub>HD</sub></td><td>1024</td><td>1024</td><td>1024</td></tr><tr><td>Blanking</td><td>T<sub>HB</sub></td><td>304</td><td>320</td><td>336</td></tr><tr><td colspan="2">Frame Rate</td><td>F</td><td>59</td><td>60</td><td>61</td><td>Hz</td></tr></table> | Signal | Parameter | Symbol | Min. | Typ. | Max. | Unit | Clock Timing | Clock frequency | 1/ T <sub>clock</sub> | 63 | 65 | 67 | MHz | Vsync Timing | Vertical Section | Period | T <sub>V</sub> | 804 | 806 | 808 | T <sub>Line</sub> | Active | T <sub>VD</sub> | 768 | 768 | 768 | Blanking | T <sub>VB</sub> | 36 | 38 | 40 | Hsync Timing | Horizontal Section | Period | T <sub>H</sub> | 1328 | 1344 | 1360 | T <sub>clock</sub> | Active | T <sub>HD</sub> | 1024 | 1024 | 1024 | Blanking | T <sub>HB</sub> | 304 | 320 | 336 | Frame Rate |  | F | 59 | 60 | 61 | Hz |
| Signal           | Parameter        | Symbol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Min.                                                                         | Typ.           | Max.   | Unit  |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| Clock Timing     | Clock frequency  | 1/ T <sub>clock</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 50                                                                           | 65             | 81     | MHz   |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| Vsync Timing     | Vertical Section | Period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | T <sub>V</sub>                                                               | 783            | 806    | 968   | T <sub>Line</sub> |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|                  |                  | Active                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | T <sub>VD</sub>                                                              | 768            | 768    | 768   |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|                  |                  | Blanking                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | T <sub>VB</sub>                                                              | 15             | 38     | 200   |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|                  | Hsync Timing     | Horizontal Section                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Period                                                                       | T <sub>H</sub> | 1224   | 1344  | 2024              | T <sub>clock</sub> |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| Active           |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | T <sub>HD</sub>                                                              | 1024           | 1024   | 1024  |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| Blanking         |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | T <sub>HB</sub>                                                              | 200            | 320    | 1000  |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| Frame Rate       |                  | F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 60                                                                           |                | Hz     |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| Signal           | Parameter        | Symbol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Min.                                                                         | Typ.           | Max.   | Unit  |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| Clock Timing     | Clock frequency  | 1/ T <sub>clock</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 63                                                                           | 65             | 67     | MHz   |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| Vsync Timing     | Vertical Section | Period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | T <sub>V</sub>                                                               | 804            | 806    | 808   | T <sub>Line</sub> |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|                  |                  | Active                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | T <sub>VD</sub>                                                              | 768            | 768    | 768   |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|                  |                  | Blanking                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | T <sub>VB</sub>                                                              | 36             | 38     | 40    |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|                  | Hsync Timing     | Horizontal Section                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Period                                                                       | T <sub>H</sub> | 1328   | 1344  | 1360              | T <sub>clock</sub> |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| Active           |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | T <sub>HD</sub>                                                              | 1024           | 1024   | 1024  |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| Blanking         |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | T <sub>HB</sub>                                                              | 304            | 320    | 336   |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| Frame Rate       |                  | F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 59                                                                           | 60             | 61     | Hz    |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|                  | 25               | 10.2 Carton Package<br>NA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 10.2 Carton Package<br>Update Packing Spec & drawing.                        |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|                  | 26               | 10.3 Palletizing<br>NA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 10.3 Palletizing<br>Update Palletizing Spec & drawing.                       |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| 0.2 2018/09/04   | 5                | 2.2 Optical Characteristics<br>White Luminance 280(Min), 350(Typ)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2.2 Optical Characteristics<br>White Luminance 320(Min), 400(Typ)            |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| 0.3 2018/12/11   | 6                | <div>2.2 Optical Characteristics</div> <table><tr><td>White x</td><td>0.263</td><td>0.313</td><td>0.363</td></tr><tr><td>White y</td><td>0.279</td><td>0.329</td><td>0.379</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | White x                                                                      | 0.263          | 0.313  | 0.363 | White y           | 0.279              | 0.329 | 0.379        | <div>2.2 Optical Characteristics</div> <table><tr><td>White x</td><td>0.253</td><td>0.303</td><td>0.353</td></tr><tr><td>White y</td><td>0.269</td><td>0.319</td><td>0.369</td></tr></table> | White x               | 0.253 | 0.303 | 0.353 | White y | 0.269        | 0.319            | 0.369  |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| White x          | 0.263            | 0.313                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.363                                                                        |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| White y          | 0.279            | 0.329                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.379                                                                        |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| White x          | 0.253            | 0.303                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.353                                                                        |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
| White y          | 0.269            | 0.319                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.369                                                                        |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|                  | 24               | 9.2 LCM Outline Dimension (Rear View)<br>BLU CN : 45.9mm<br>LVDS CN : 46.1mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 9.2 LCM Outline Dimension (Rear View)<br>BLU CN : 41.4mm<br>LVDS CN : 41.6mm |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|                  |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                              |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|                  |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                              |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|                  |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                              |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|                  |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                              |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|                  |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                              |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |
|                  |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                              |                |        |       |                   |                    |       |              |                                                                                                                                                                                              |                       |       |       |       |         |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |     |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |      |            |  |   |    |  |    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |        |      |      |      |      |              |                 |                       |    |    |    |     |              |                  |        |                |     |     |     |                   |        |                 |     |     |     |          |                 |    |    |    |              |                    |        |                |      |      |      |                    |        |                 |      |      |      |          |                 |     |     |     |            |  |   |    |    |    |    |

## 1. Operating 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) Since CMOS LSI is used in this module, take care of static electricity and insure human earth when handling.
- 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 Reflector edge. Instead, press at the far ends of the LED Reflector 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 (IEC60950-1 or UL60950-1), or be applied exemption.
- 13) Severe temperature condition may result in different luminance, response time.
- 14) Continuous operating TFT-LCD Module under high temperature environment may accelerate LED light bar exhaustion and reduce luminance dramatically.
- 15) The data on this specification sheet is applicable when TFT-LCD module is placed in landscape position.
- 16) Continuous displaying fixed pattern may induce image sticking. It's recommended to use screen saver or moving content periodically if fixed pattern is displayed on the screen.

## 2. General Description

G150XAN01.0 is a Color Active Matrix Liquid Crystal Display composed of a TFT-LCD display, a driver circuit, and a backlight system. The screen format is intended to support XGA (1024(H) x 768(V)) screen and 16.2M (RGB 6+2FRC) colors. All input signals are LVDS interface compatible.

G150XAN01.0 is designed for industrial display applications.

### 2.1 Display Characteristics

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

| Items                                                     | Unit         | Specifications                                   |
|-----------------------------------------------------------|--------------|--------------------------------------------------|
| Screen Diagonal                                           | [inch]       | 15                                               |
| Active Area                                               | [mm]         | 304.128(H) x 228.096(V)                          |
| Pixels H x V                                              |              | 1024x3(RGB) x 768                                |
| Pixel Pitch                                               | [mm]         | 0.297 x 0.297                                    |
| Pixel Arrangement                                         |              | R.G.B. Vertical Stripe                           |
| Display Mode                                              |              | AHVA                                             |
| Nominal Input Voltage VDD                                 | [Volt]       | 3.3 typ.                                         |
| Typical Power Consumption                                 | [Watt]       | 7.5 W                                            |
| Weight                                                    | [Grams]      | 920g (max.)                                      |
| Physical Size                                             | [mm]         | 326.5(H) x 253.5(V) x 9.0 (D)                    |
| Electrical Interface                                      |              | LVDS                                             |
| Surface Treatment                                         |              | Anti-glare, Hardness 3H                          |
| Support Color                                             |              | 16.2M colors                                     |
| Temperature Range<br>Operating<br>Storage (Non-Operating) | [°C]<br>[°C] | -20 to +70 (+70 °C as panel surface temperature) |
| RoHS Compliance                                           |              | RoHS Compliance                                  |
| Light Bar Unit                                            |              | LED, Non-Replaceable                             |

## 2.2 Optical Characteristics

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

| Item                                        | Unit                 | Conditions                           | Min.  | Typ.  | Max.  | Note    |
|---------------------------------------------|----------------------|--------------------------------------|-------|-------|-------|---------|
| White Luminance                             | [cd/m <sup>2</sup> ] |                                      | 320   | 400   | -     | 1       |
| Uniformity                                  | %                    | 9 Points                             | 75    | 80    | -     | 1, 2, 3 |
| Contrast Ratio                              |                      |                                      | 800   | 1000  | -     | 4       |
| Cross talk                                  | %                    |                                      | -     | --    | 1.5   | 5       |
| Response Time                               | [msec]               | Rising                               | -     |       |       | 6       |
|                                             | [msec]               | Falling                              | -     |       |       |         |
|                                             | [msec]               | Raising + Falling                    | -     | 25    | 30    |         |
| Viewing Angle                               | [degree]             | Horizontal (Right)<br>CR = 10 (Left) | 80    | 89    | -     | 7       |
|                                             | [degree]             |                                      | 80    | 89    | -     |         |
|                                             | [degree]             | Vertical (Upper)<br>CR = 10 (Lower)  | 80    | 89    | -     |         |
|                                             | [degree]             |                                      | 80    | 89    | -     |         |
| Color / Chromaticity Coordinates (CIE 1931) |                      | Red x                                | 0.569 | 0.619 | 0.669 |         |
|                                             |                      | Red y                                | 0.302 | 0.352 | 0.402 |         |
|                                             |                      | Green x                              | 0.279 | 0.329 | 0.379 |         |
|                                             |                      | Green y                              | 0.559 | 0.609 | 0.659 |         |
|                                             |                      | Blue x                               | 0.100 | 0.150 | 0.200 |         |
|                                             |                      | Blue y                               | 0.068 | 0.118 | 0.168 |         |
|                                             |                      | White x                              | 0.253 | 0.303 | 0.353 |         |
|                                             |                      | White y                              | 0.269 | 0.319 | 0.369 |         |
| Color Gamut                                 | %                    |                                      |       | 60    | -     |         |

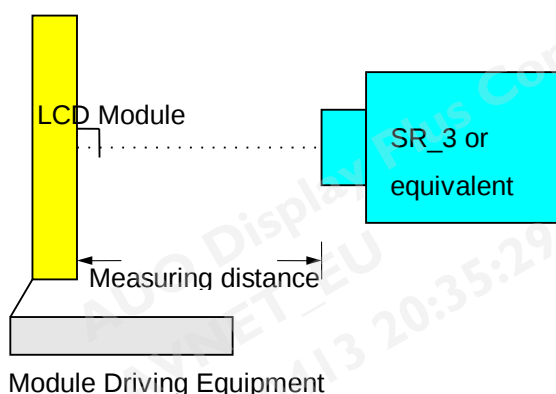
Note 1: Measurement method

Equipment Pattern Generator, Power Supply, Digital Voltmeter, Luminance meter (SR\_3 or equivalent)

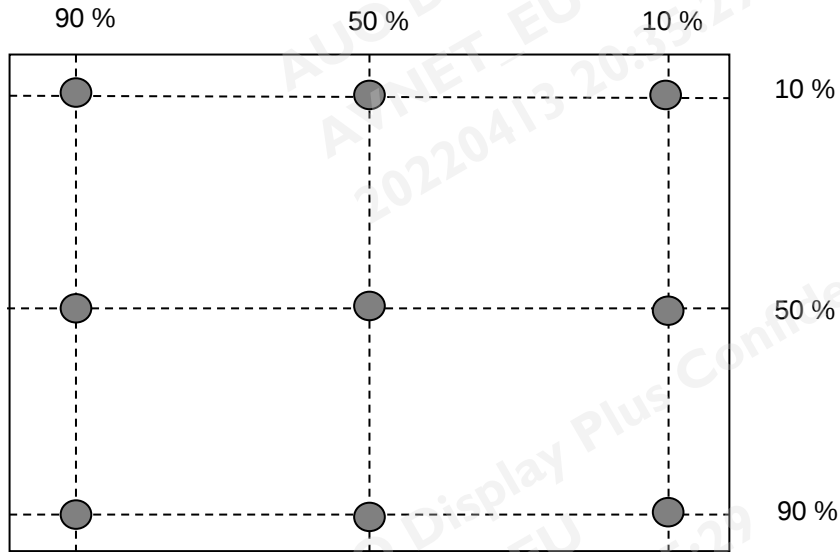
Aperture 1° with 50cm viewing distance

Test Point Center

Environment < 1 lux



Note 2: Definition of 9 points position (Display active area: 304.128(H) x 228.096(V))



Note 3: The luminance uniformity of 9 points is defined by dividing the minimum luminance values by the maximum test point luminance

$$\delta_{w9} = \frac{\text{Minimum Brightness of nine points}}{\text{Maximum Brightness of nine points}}$$

Note 4 : Definition of contrast ratio (CR):

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "White" state}}{\text{Brightness on the "Black" state}}$$

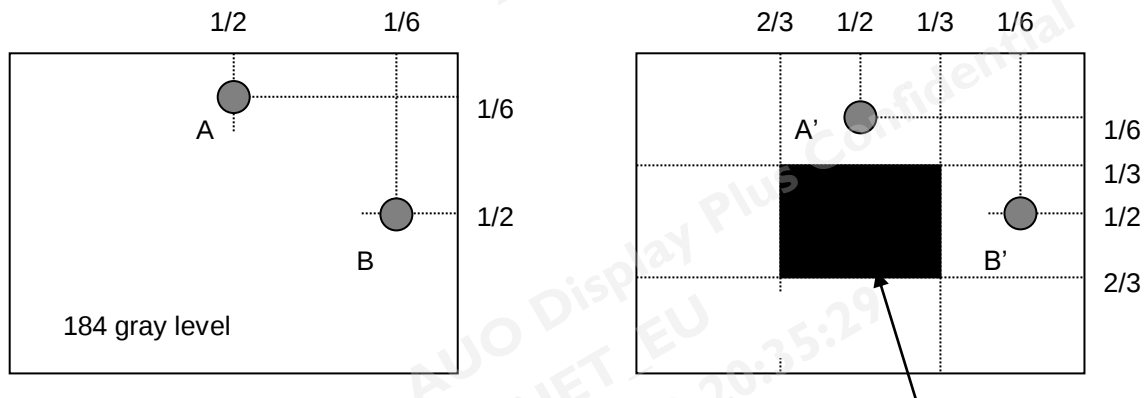
Note 5 : Definition of cross talk (CT)

$$CT = |YB - YA| / YA \times 100 (\%)$$

Where

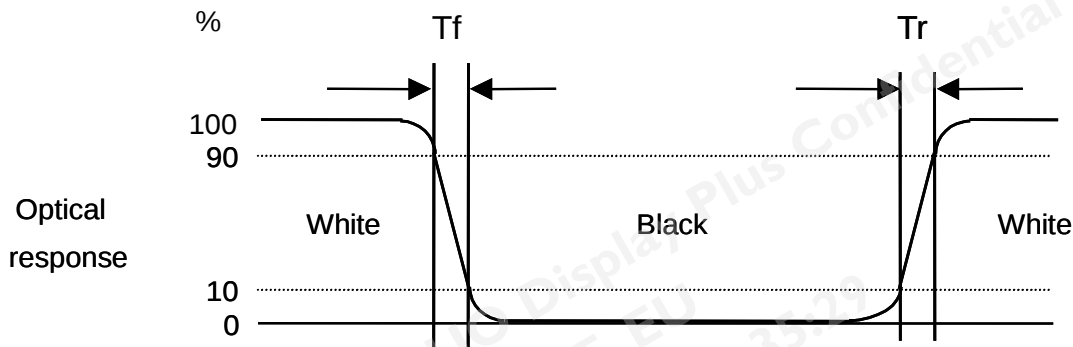
YA = Luminance of measured location without gray level 0 pattern (cd/m<sup>2</sup>)

YB = Luminance of measured location with gray level 0 pattern (cd/m<sup>2</sup>)



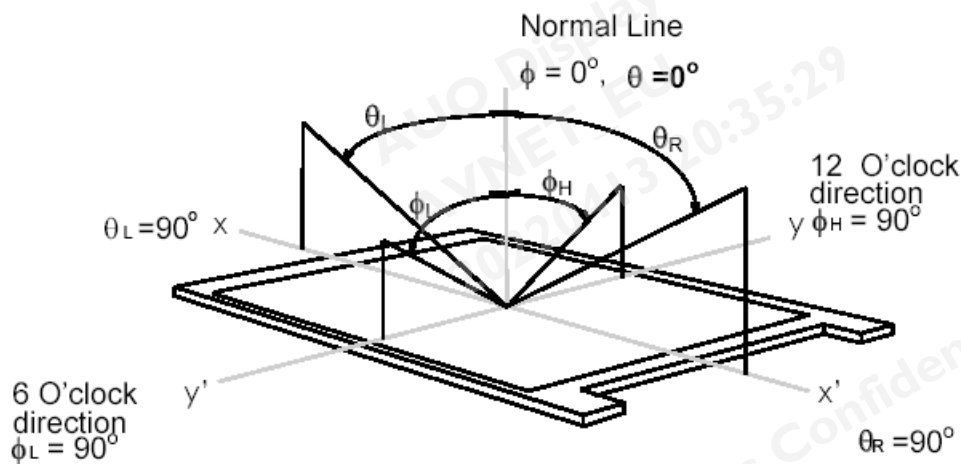
## Note 6: Definition of response time:

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



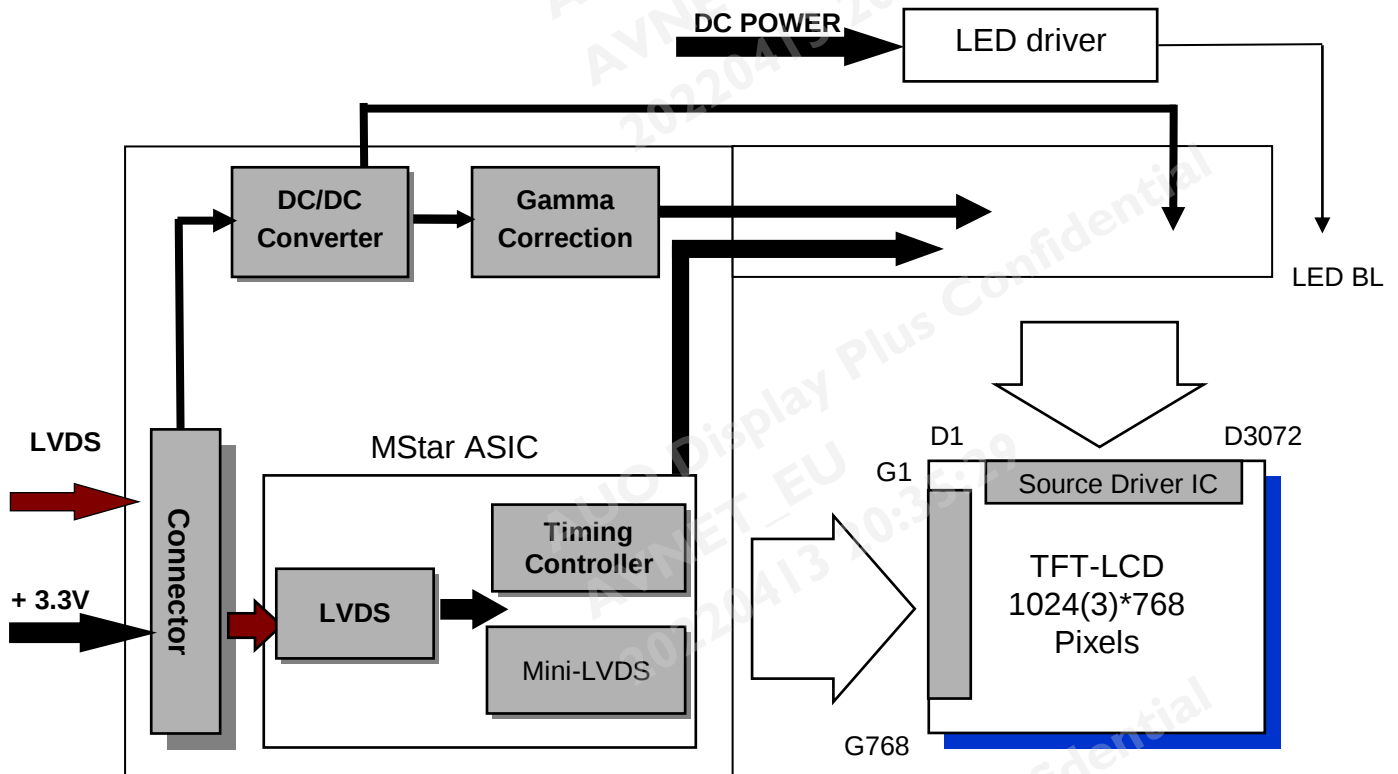
## Note 7: Definition of viewing angle

Viewing angle is the measurement of contrast ratio  $\geq 10$ , at the screen center, over a  $180^\circ$  horizontal and  $180^\circ$  vertical range (off-normal viewing angles). The  $180^\circ$  viewing angle range is broken down as below:  $90^\circ$  ( $\theta$ ) horizontal left and right, and  $90^\circ$  ( $\phi$ ) vertical high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated to its center to develop the desired measurement viewing angle.



### 3. Functional Block Diagram

The following diagram shows the functional block of the 15 inch color TFT/LCD module:



MSB240420HD

Entery 3808K-F05N-12R

Mating Type: P240420

H208K-P05N-02B

## 4. Absolute Maximum Ratings

### 4.1 Absolute Ratings of TFT LCD Module

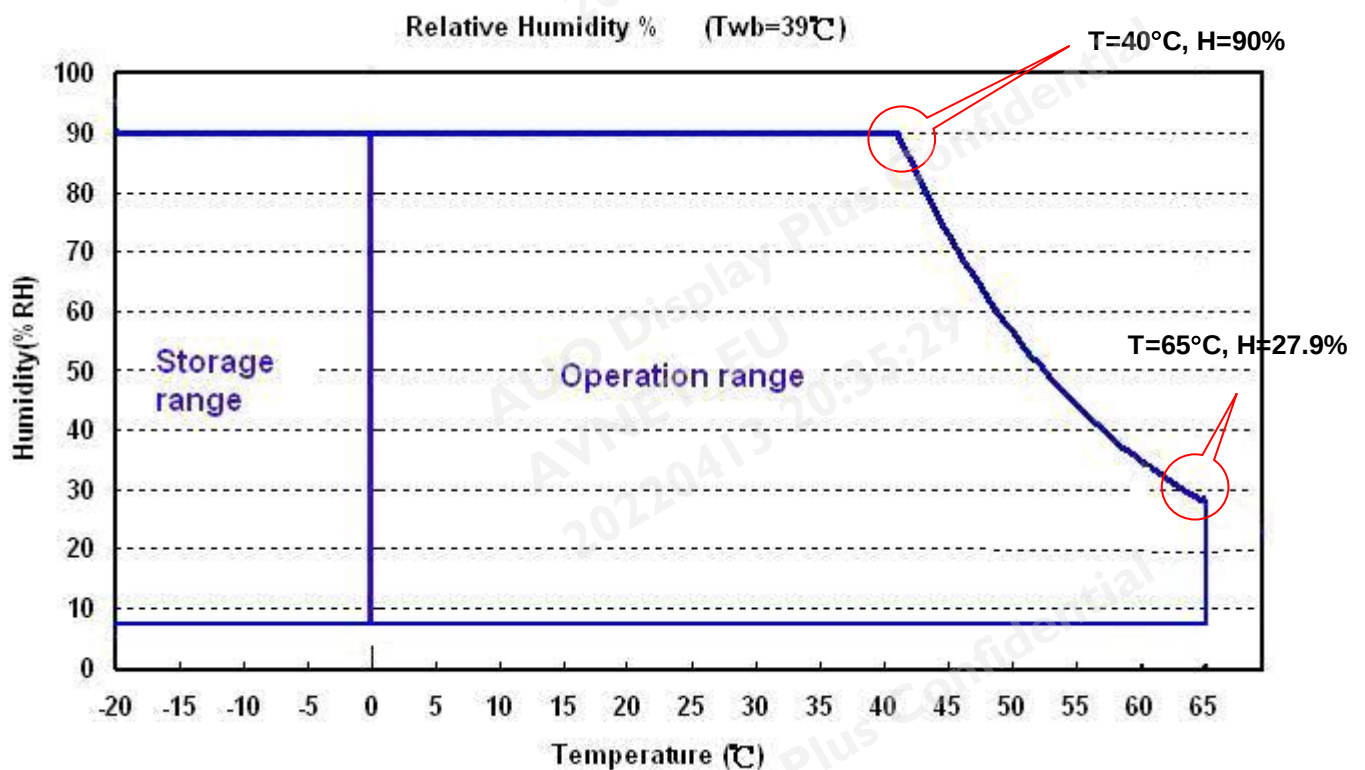
| Item            | Symbol | Min  | Max  | Unit   |
|-----------------|--------|------|------|--------|
| Logic/LCD Drive | Vin    | -0.3 | +3.6 | [Volt] |

### 4.2 Absolute Ratings of Environment

| Item                  | Symbol | Min | Max  | Unit  |
|-----------------------|--------|-----|------|-------|
| Operating Temperature | TOP    | -20 | +70* | [°C]  |
| Operation Humidity    | HOP    | 8   | 90   | [%RH] |
| Storage Temperature   | TST    | -20 | +70  | [°C]  |
| Storage Humidity      | HST    | 8   | 90   | [%RH] |

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

\* 70°C is panel surface temperature



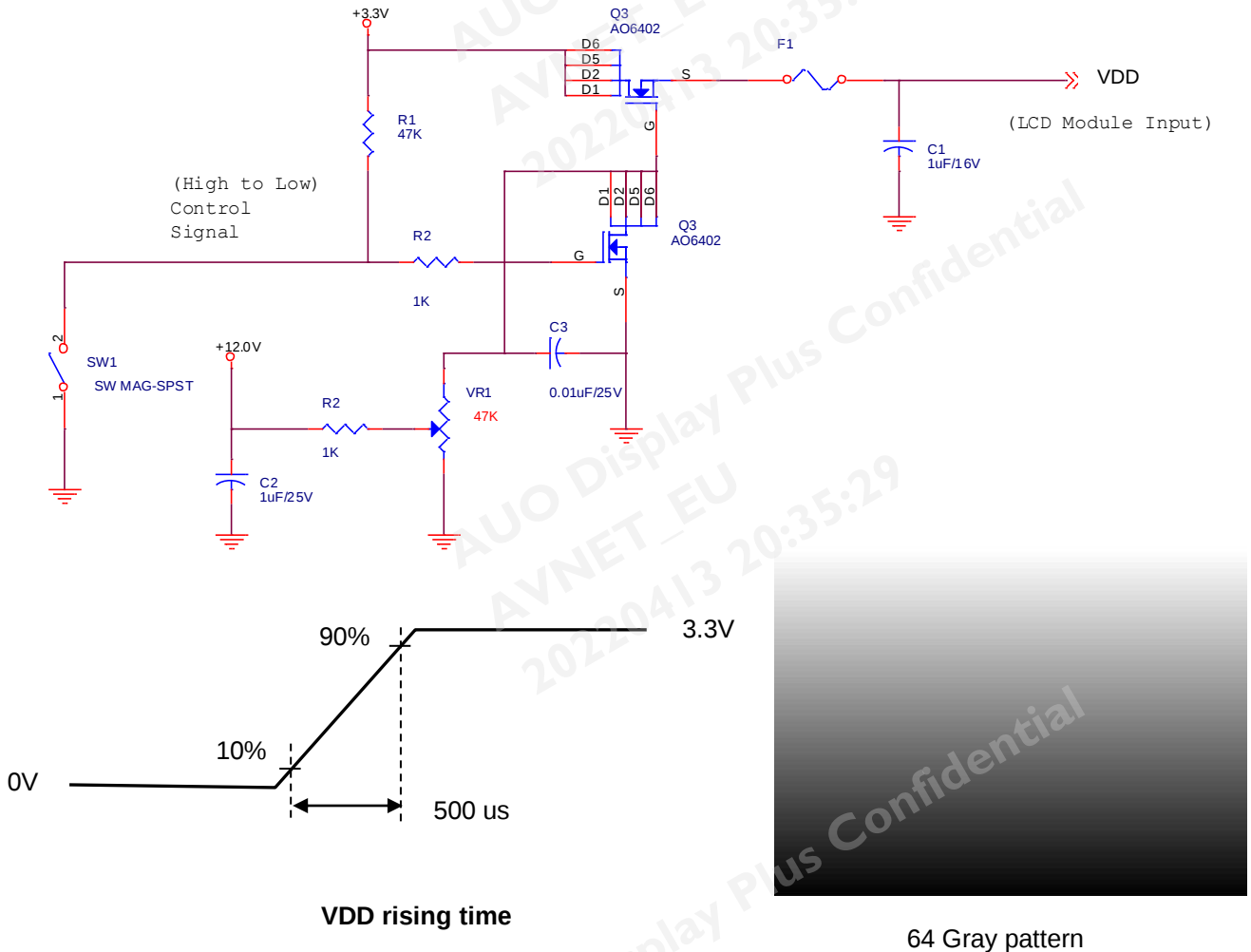
## 5. Electrical Characteristics

### 5.1 TFT LCD Module

#### 5.1.1 Power Specification

| Symbol | Parameter               | Min | Typ  | Max  | Units  | Remark                                   |
|--------|-------------------------|-----|------|------|--------|------------------------------------------|
| VDD    | Logic/LCD Drive Voltage | 3.0 | 3.3  | 3.6  | [Volt] | ±10%                                     |
| IDD    | VDD Current             | -   | 0.43 | 0.52 | [A]    | All White Pattern<br>(VDD=3.3V, at 60Hz) |
| Irush  | LCD Inrush Current      |     |      | 3    | [A]    | Note 1                                   |
| PDD    | VDD Power               | -   | 1.41 | 1.70 | [Watt] | All White Pattern<br>(VDD=3.3V, at 60Hz) |

Note 1: Measurement condition:



### 5.1.2 Signal Electrical Characteristics

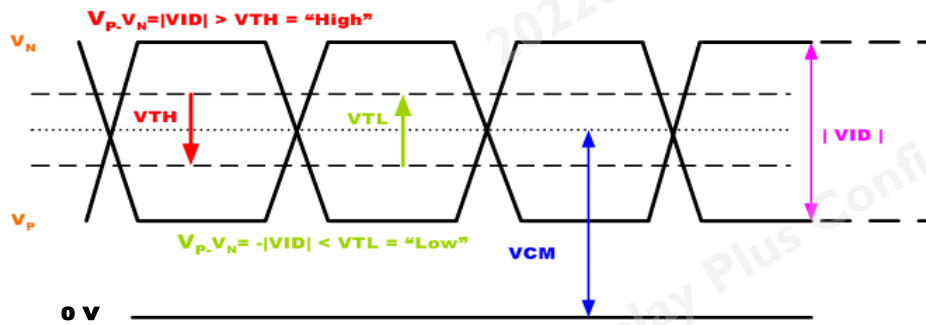
Input signals shall be low or Hi-Z state when VDD is off.

| Symbol    | Item                                   | Min. | Typ. | Max. | Unit | Remark                    |
|-----------|----------------------------------------|------|------|------|------|---------------------------|
| $V_{TH}$  | Differential Input High Threshold      | -    | -    | 100  | [mV] | $V_{CM}=1.2V$             |
| $V_{TL}$  | Differential Input Low Threshold       | -100 | -    | -    | [mV] | $V_{CM}=1.2V$             |
| $ VID $   | Input Differential Voltage             | 100  |      | 600  | [mV] |                           |
| $V_{ICM}$ | Differential Input Common Mode Voltage | 1.0  | 1.2  | 1.5  | [V]  | $V_{TH}/V_{TL}=\pm 100mV$ |

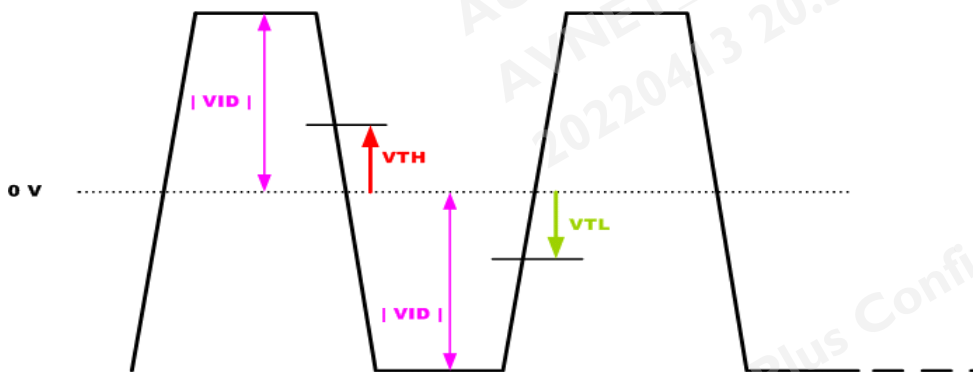
Note: LVDS Signal Waveform.

$V_P - V_N = |VID| > V_{TH} = \text{"High"}$   
 $V_P - V_N = -|VID| < V_{TL} = \text{"Low"}$

#### Single-end Signal



#### Differential Signal



## 5.2 Backlight Unit

### 5.2.1 Parameter guideline for LED

Following characteristics are measured under stable condition using a LED driving board at 25°C (Room Temperature).

| Symbol                  | Parameter             | Min.   | Typ. | Max. | Unit | Remark                |
|-------------------------|-----------------------|--------|------|------|------|-----------------------|
| V <sub>CC</sub>         | Input Voltage         | 10.8   | 12   | 13.2 | Volt |                       |
| I <sub>VCC</sub>        | Input Current         | -      | 0.49 | 0.54 | A    | 100% Dimming          |
| P <sub>LED</sub>        | Power Consumption     | -      | 5.9  | 6.48 | Watt | 100% Dimming          |
| I <sub>rush</sub>       | Inrush Current        |        |      | 2    | A    |                       |
| V <sub>LED on/off</sub> | On Control Voltage    | 2.5    | 3.3  | 5.5  | Volt |                       |
|                         | Off Control Voltage   |        |      | 0.5  | Volt |                       |
| F <sub>PWM</sub>        | PWM Dimming Frequency | 200    |      | 10k  | Hz   |                       |
|                         | High Voltage          | 2.5    | 3.3  | 5.5  | Volt |                       |
|                         | Low Voltage           |        |      | 0.5  | Volt |                       |
|                         | Dimming Duty Cycle    | 5      | -    | 100  | %    |                       |
| I <sub>F</sub>          | LED Forward Current   |        | 60   |      | mA   | T <sub>a</sub> = 25°C |
| Operating Life          |                       | 50,000 |      |      | Hrs  | T <sub>a</sub> = 25°C |

Note 1: T<sub>a</sub> means ambient temperature of TFT-LCD module.

Note 2: If G150XAN01.0 module is driven at high ambient temperature & humidity condition. The operating life will be reduced.

Note 3: Definition of life time: LED brightness becomes 50% of its original value. The minimum life time of LED unit is defined at the condition of I<sub>RLED</sub> = 60 mA and 25±2°C (Room temperature).

Following figure shows the relationship between input signal and LCD pixel format.

The following figures show the image seen from the front view. The arrow indicates the direction of scan.



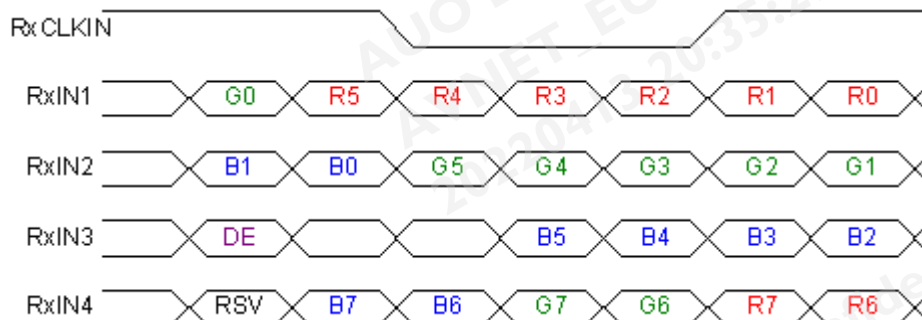
## 6.3 Signal Description

LVDS is a differential signal technology for LCD interface and high speed data transfer device.

| MSB240420E(STM) |        |                                                      |
|-----------------|--------|------------------------------------------------------|
| Pin No.         | Symbol | Description                                          |
| 1               | VDD    | Power Supply, 3.3V (typical)                         |
| 2               | VDD    | Power Supply, 3.3V (typical)                         |
| 3               | NC     | No Connect                                           |
| 4               | NC     | No Connect                                           |
| 5               | Rin1-  | - LVDS differential data input (R0-R5, G0)           |
| 6               | Rin1+  | + LVDS differential data input (R0-R5, G0)           |
| 7               | VSS    | Ground                                               |
| 8               | Rin2-  | - LVDS differential data input (G1-G5, B0-B1)        |
| 9               | Rin2+  | + LVDS differential data input (G1-G5, B0-B1)        |
| 10              | VSS    | Ground                                               |
| 11              | Rin3-  | - LVDS differential data input (B2-B5, HS, VS, DE)   |
| 12              | Rin3+  | + LVDS differential data input (B2-B5, HS, VS, DE)   |
| 13              | VSS    | Ground                                               |
| 14              | ClkIN- | - LVDS differential clock input                      |
| 15              | ClkIN+ | + LVDS differential clock input                      |
| 16              | GND    | Ground                                               |
| 17              | Rin4-  | - LVDS differential data input (R6-R7, G6-G7, B6-B7) |
| 18              | Rin4+  | + LVDS differential data input (R6-R7, G6-G7, B6-B7) |
| 19              | VSS    | Ground                                               |
| 20              | VSS    | Ground                                               |

Note 1: Input signals shall be in low status when VDD is off.

## 6.4 The Input Data Format



**Note1:** Please follow PSWG.

**Note2:** R/G/B data 7:MSB, R/G/B data 0:LSB

| Signal Name                                  | Description                                                                                                                  | Remark                                                                  |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| R7<br>R6<br>R5<br>R4<br>R3<br>R2<br>R1<br>R0 | Red Data 7<br>Red Data 6<br>Red Data 5<br>Red Data 4<br>Red Data 3<br>Red Data 2<br>Red Data 1<br>Red Data 0                 | Red-pixel Data<br><br>For 8Bits LVDS input<br>MSB: R7 ; LSB: R0         |
| G7<br>G6<br>G5<br>G4<br>G3<br>G2<br>G1<br>G0 | Green Data 7<br>Green Data 6<br>Green Data 5<br>Green Data 4<br>Green Data 3<br>Green Data 2<br>Green Data 1<br>Green Data 0 | Green-pixel Data<br><br>For 8Bits LVDS input<br>MSB: G7 ; LSB: G0       |
| B7<br>B6<br>B5<br>B4<br>B3<br>B2<br>B1<br>B0 | Blue Data 7<br>Blue Data 6<br>Blue Data 5<br>Blue Data 4<br>Blue Data 3<br>Blue Data 2<br>Blue Data 1<br>Blue Data 0         | Blue-pixel Data<br><br>For 8Bits LVDS input<br>MSB: B7 ; LSB: B0        |
| RxCLKIN                                      | LVDS Data Clock                                                                                                              |                                                                         |
| DE                                           | Data Enable Signal                                                                                                           | When the signal is high, the pixel data shall be valid to be displayed. |

Note: Output signals from any system shall be low or Hi-Z state when VDD is off.

## 6.5 Interface Timing

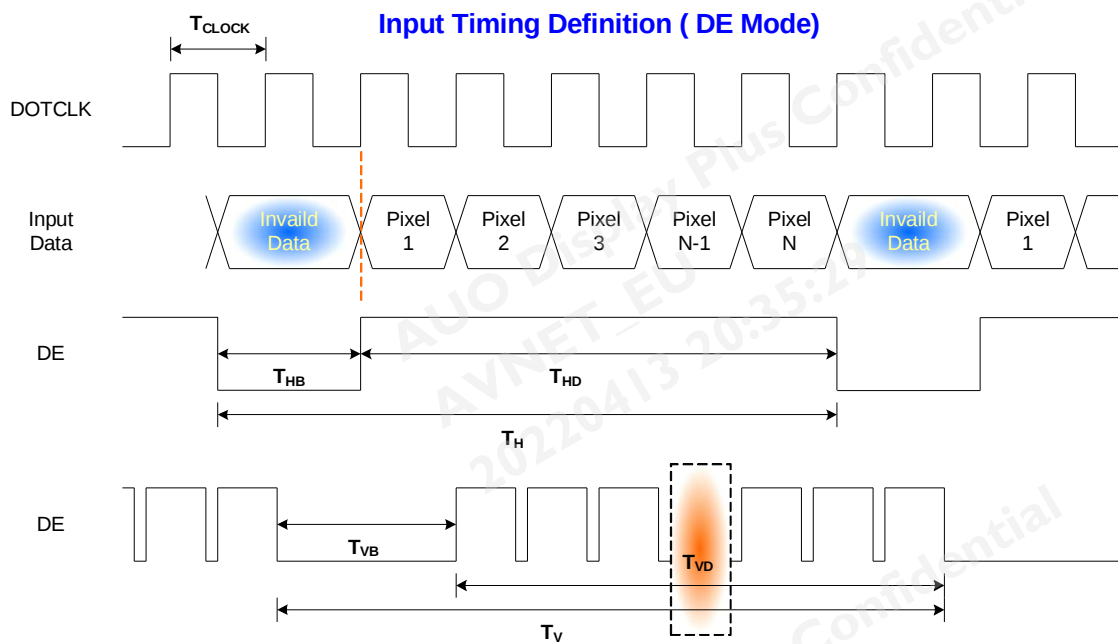
### 6.5.1 Timing Characteristics

| Signal       | Parameter             |          | Symbol                | Min. | Typ. | Max. | Unit               |
|--------------|-----------------------|----------|-----------------------|------|------|------|--------------------|
| Clock Timing | Clock frequency       |          | 1/ T <sub>Clock</sub> | 63   | 65   | 67   | MHz                |
| Vsync Timing | Vertical<br>Section   | Period   | T <sub>V</sub>        | 804  | 806  | 808  | T <sub>Line</sub>  |
|              |                       | Active   | T <sub>VD</sub>       | 768  | 768  | 768  |                    |
|              |                       | Blanking | T <sub>VB</sub>       | 36   | 38   | 40   |                    |
| Hsync Timing | Horizontal<br>Section | Period   | T <sub>H</sub>        | 1328 | 1344 | 1360 | T <sub>Clock</sub> |
|              |                       | Active   | T <sub>HD</sub>       | 1024 | 1024 | 1024 |                    |
|              |                       | Blanking | T <sub>HB</sub>       | 304  | 320  | 336  |                    |
| Frame Rate   |                       |          | F                     | 59   | 60   | 61   | Hz                 |

Note: Support DE mode only.

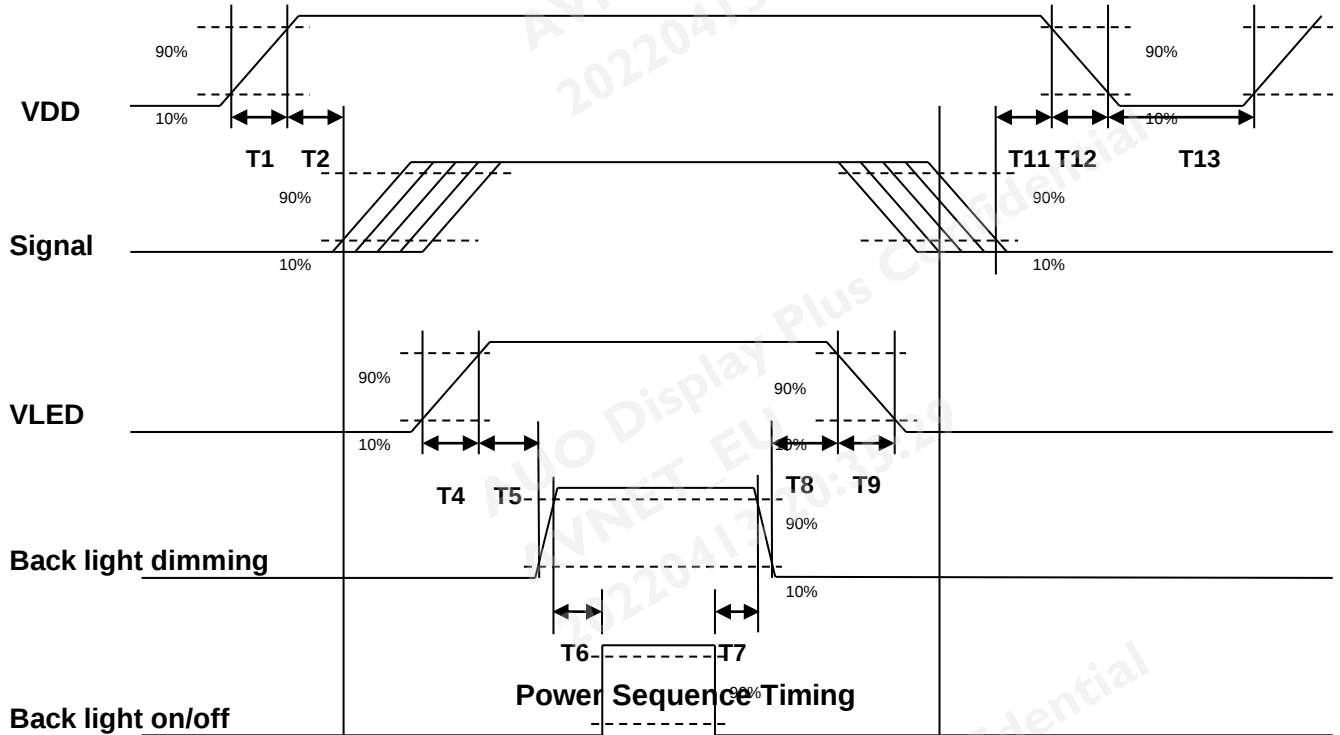
Note : Typical value refer to VESA STANDARD

### 6.5.2 Input Timing Diagram



## 6.6 Power ON/OFF Sequence

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



| Parameter | Value             |      |                    | Unit |
|-----------|-------------------|------|--------------------|------|
|           | Min. <sup>3</sup> | Typ. | Max. <sup>10</sup> |      |
| T1        | 0.5               | -    | 10                 | [ms] |
| T2        | 30                | 40   | 50                 | [ms] |
| T3        | 200               | -    | -                  | [ms] |
| T4        | 0.5               | -    | 10                 | [ms] |
| T5        | 10                | -    | -                  | [ms] |
| T6        | 10                | -    | -                  | [ms] |
| T7        | 0                 | -    | -                  | [ms] |
| T8        | 10                | -    | -                  | [ms] |
| T9        | -                 | -    | 200                | [ms] |
| T10       | 110               | -    | -                  | [ms] |
| T11       | 0                 | 16   | 50                 | [ms] |
| T12       | -                 | -    | 200                | [ms] |
| T13       | 1000              | -    | -                  | [ms] |

The above on/off sequence should be applied to avoid abnormal function in the display. Please make sure to turn off the power when you plug the cable into the input connector or pull the cable out of the connector.

## 7. Connector & Pin Assignment

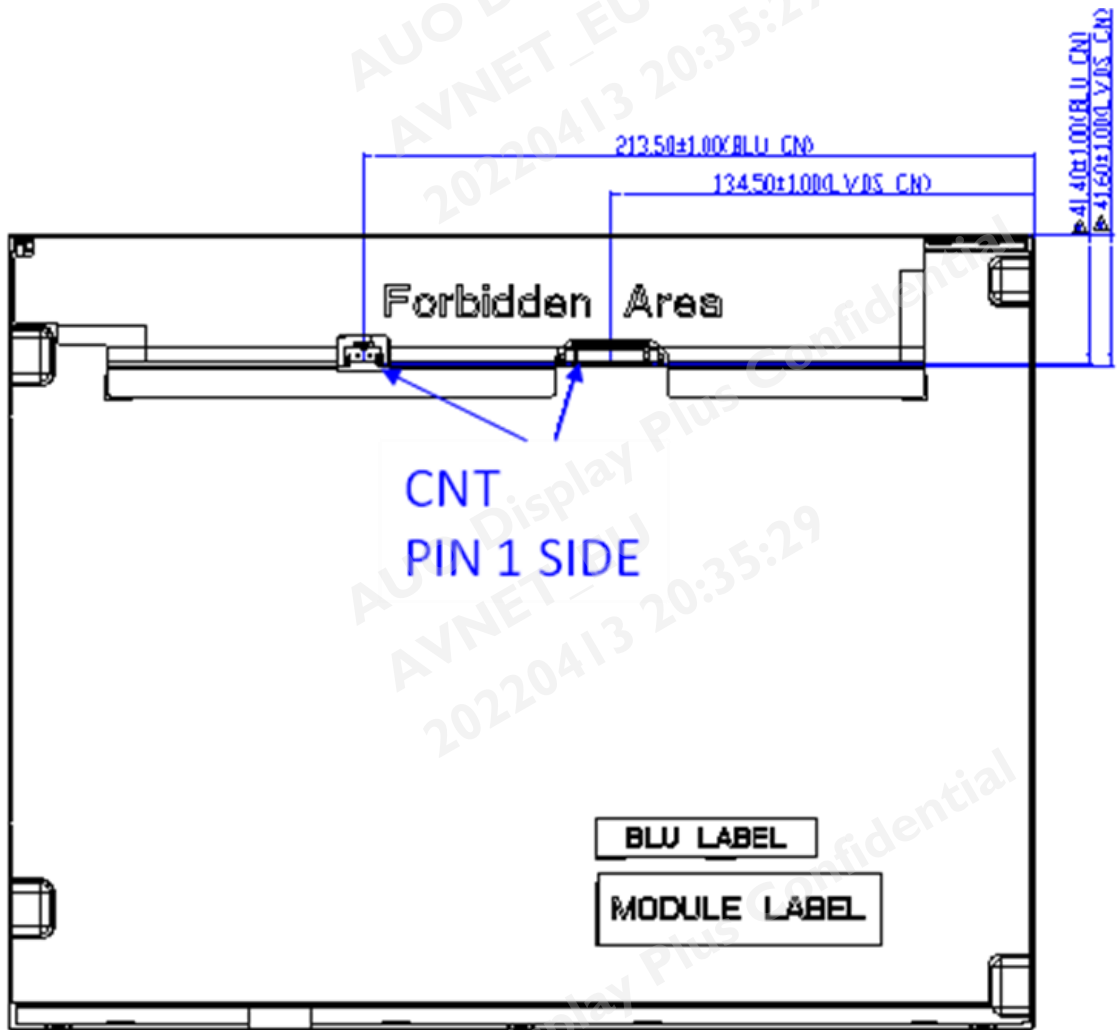
Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

### 7.1 TFT LCD Module: LVDS Connector

| Connector Name / Designation | Signal Connector          |
|------------------------------|---------------------------|
| Manufacturer                 | STM or compatible         |
| Connector Model Number       | MSB240420HD or compatible |
| Adaptable Plug               | P240420 or compatible     |

| Pin# | Signal Name | Pin# | Signal Name |
|------|-------------|------|-------------|
| 1    | VDD         | 2    | VDD         |
| 3    | NC          | 4    | NC          |
| 5    | Rin1-       | 6    | Rin1+       |
| 7    | VSS         | 8    | Rin2-       |
| 9    | Rin2+       | 10   | VSS         |
| 11   | Rin3-       | 12   | Rin3+       |
| 13   | VSS         | 14   | ClkIN-      |
| 15   | ClkIN+      | 16   | GND         |
| 17   | Rin4-       | 18   | Rin4+       |
| 19   | VSS         | 20   | VSS         |

## 7.1.1 Connector Illustration



## 7.2 LED Backlight Unit: LED Driver Connector

| Connector Name / Designation | LED Connector                |
|------------------------------|------------------------------|
| Manufacturer                 | Entery or compatible         |
| Connector Model Number       | 3808K-F05N-12R or compatible |
| Mating Model Number          | H208K-P05N-02B or compatible |

## 7.3 LED Driver Connector Pin Assignment

| Pin# | Symbol  | Signal Name |
|------|---------|-------------|
| 1    | Vcc     | 12V         |
| 2    | GND     | GND         |
| 3    | Enable  | VLED On/Off |
| 4    | Dimming | PWM Dimming |
| 5    | NC      | NC          |

## 8. Reliability Test Criteria

| Items                          | Required Condition                                                                                                                            | Note   |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Temperature Humidity Bias      | 50°C/80%,300 hours                                                                                                                            |        |
| High Temperature Operation     | 70°C,300 hours                                                                                                                                |        |
| Low Temperature Operation      | -20°C,300 hours                                                                                                                               |        |
| Hot Storage                    | 70°C,300 hours                                                                                                                                |        |
| Cold Storage                   | -20°C,300 hours                                                                                                                               |        |
| Thermal Shock Test             | -20°C/30 min ,60°C/30 min ,100cycles                                                                                                          |        |
| Shock Test (Non-Operating)     | 50G,20ms,Half-sine wave,( ±X, ±Y, ±Z)                                                                                                         |        |
| Vibration Test (Non-Operating) | 1.5G, (10~200Hz, P-P)<br>30 mins/axis (X, Y, Z)                                                                                               |        |
| On/off test                    | On/10 sec, Off/10 sec, 30,000 cycles                                                                                                          |        |
| ESD                            | Contact Discharge: ± 8KV, 150pF(330Ω ) 1sec, 8 points, 25 times/ point<br>Air Discharge: ± 15KV, 150pF(330Ω ) 1sec, 8 points, 25 times/ point | Note 1 |

Note1: According to EN61000-4-2, ESD class B: Some performance degradation allowed. No data lost  
Self-recoverable. No hardware failures.

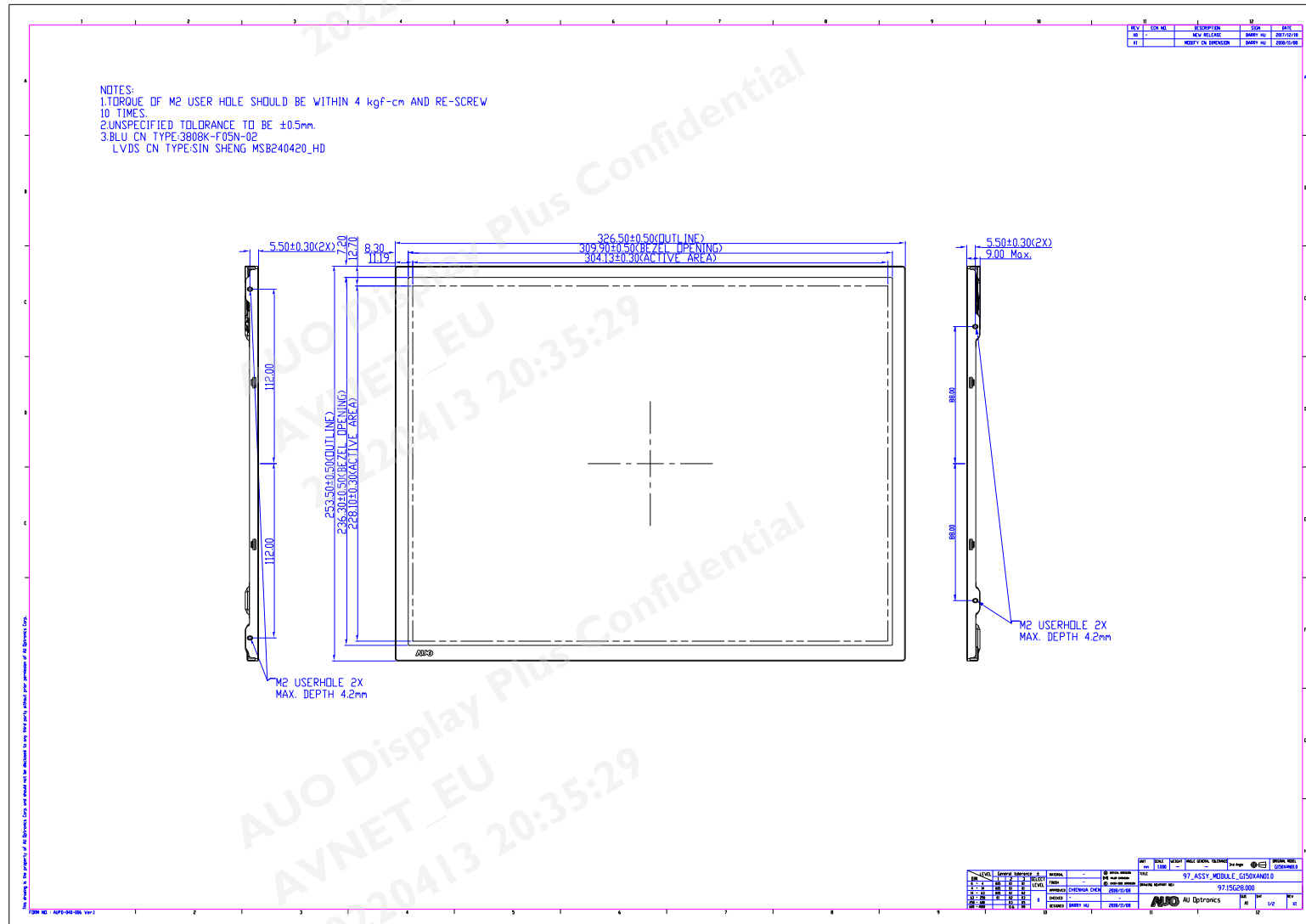
Note 2:

- Water condensation is not allowed for each test items.
- Each test is done by new TFT-LCD module. Don't use the same TFT-LCD module repeatedly for reliability test.
- The reliability test is performed only to examine the TFT-LCD module capability.
- To inspect TFT-LCD module after reliability test, please store it at room temperature and room humidity for 24 hours at least in advance.
- No function failure occurs. Mura shall be ignored after high temperature reliability test.



## 9. Mechanical Characteristics

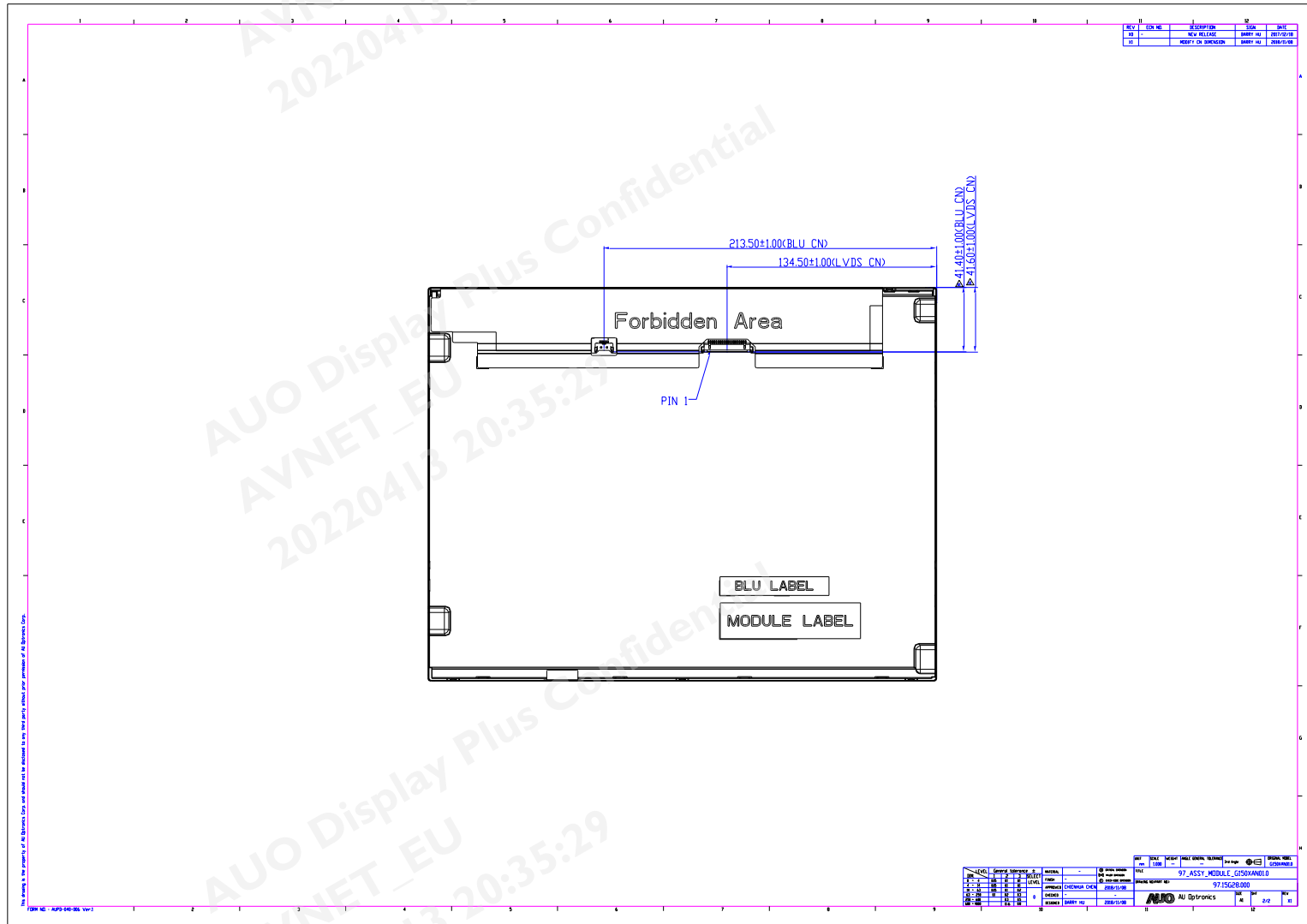
### 9.1 LCM Outline Dimension (Front View)





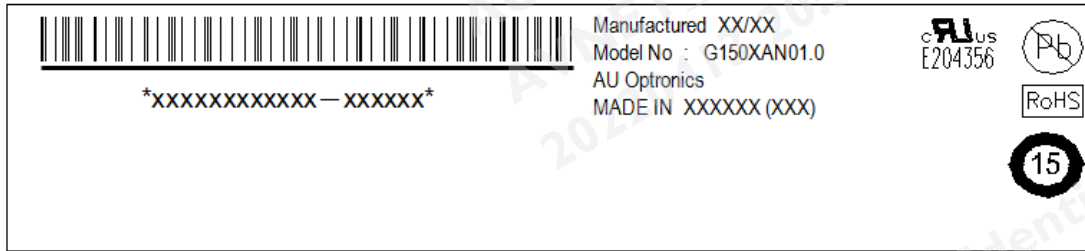
G150XAN01.0

## 9.2 LCM Outline Dimension (Rear View)



## 10. Label and Packaging

### 10.1 Shipping Label (on the rear side of TFT-LCD display)



### 10.2 Carton Package

Max capacity : 20 PCS TFT-LCD module per carton

Max weight: 20 kg per carton

Outside dimension of carton: 430mm(L)\* 370mm(W)\*350mm(H)

Pallet size : 1140 mm \* 890 mm \* 132mm



Protect film with 4 tape



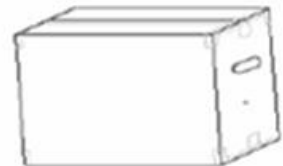
Put panel into ESD BAG



2 pcs Panel face to face , put 2 panel into 1 groove



Put Top Cushion into carton



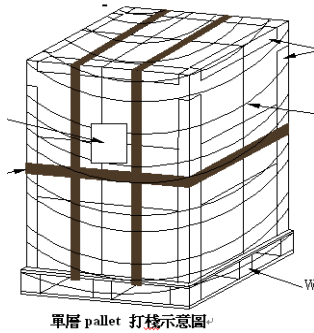
20pcs/Carton

### 10.3 Palletizing

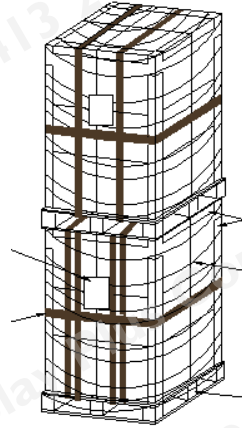
Module by air\_Max:  $(2 * 3) * 4$  layers , one pallet put 24 boxes , total 480pcs module

Module by sea\_Max:  $(2 * 3) * 4$  layers +  $(2 * 3) * 1$  layers , two pallet put 30 boxes , total 600pcs module

Module by sea\_HQ\_Max:  $(2 * 3) * 4$  layers+ $(2 * 3) * 2$  layers, two pallet put 36 boxes, total 720pcs module



By air : one pallet



By sea : two pallet

## 11 Safety

### 11.1 Sharp Edge Requirements

There will be no sharp edges or comers on the display assembly that could cause injury.

### 11.2 Materials

#### 11.2.1 Toxicity

There will be no carcinogenic materials used anywhere in the display module. If toxic materials are used, they will be reviewed and approved by the responsible AUO toxicologist.

#### 11.2.2 Flammability

All components including electrical components that do not meet the flammability grade UL94-V1 in the module will complete the flammability rating exception approval process.

The printed circuit board will be made from material rated 94-V1 or better. The actual UL flammability rating will be printed on the printed circuit board.

### 11.3 Capacitors

If any polarized capacitors are used in the display assembly, provisions will be made to keep them from being inserted backwards.

### 11.4 National Test Lab Requirement

The display module will satisfy all requirements for compliance to:

UL 60950-1, Second Edition

U.S.A. Information Technology Equipment