# DATA IMAGE  CORPORATION

## TFT Module Specification

### ITEM NO.:  FG050722DSSWDGL2

### Table of Contents

| Customer Companies | R&D Dept. | Q.C. Dept. | Eng. Dept. | Prod. Dept. |
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| Approved by | Version: | Issued Date: | Sheet Code: | Total Pages: |
|  | B | 27/NOV/14' |  | 23 |

## 2. RECORD OF REVISION

| Rev | Date | Item | Page | Comment |
|-----|------|------|------|---------|
| 1 | 25/OCT/12' | | | Initial preliminary |
| A | 1/JUL/13' | 6<br>10<br>11.1.5<br>11.2<br>14 | 3<br>12<br>15<br>16<br>22 | 1. Add ILED data.<br>2. Add CR data.<br>3. Add Remark.<br>4. Add Inspection condition.<br>5. Modify Outline Drawing from Rev.1 to A.<br>6. Release Rev: A for production. |
| B | 27/NOV/14' | 3 | 3 | Modify LED Dice life time. |
| | | | | |

### 3. APPLICATION

Digital equipments which need color display, such as P.O.S, medical equipments and industrial equipments.

### 4. GENERAL SPECIFICATIONS

| Parameter | Specifications | Unit |
|---|---|---|
| Display resolution | (640X R.G.B) (W) x480(H) | dot |
| Active area | 115.2(W) x 86.4(H) | mm |
| Screen size | 5.7(Diagonal) | inch |
| Dot pitch | 0.06(W) x 0.18(H) | mm |
| Color configuration | R.G.B. Stripe | |
| Overall dimension | 127 (W) x 98.43(H) x 8.9Max.(T) | mm |
| Weight | 110 | g |
| Surface treatment | Clear | |
| View Angle direction(Gray inversion) | 12 o'clock | |
| Our components and processes are compliant to RoHS standard | | |

### 5. ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | MIN. | MAX. | Unit | Remark |
|---|---|---|---|---|---|
| Power supply voltage | Vcc | -0.3 | 5.0 | V | |
| Logic input voltage | VI | -0.3 | $V_{CC}$+0.3 | V | |
| Operating temperature | Top | -20 | +70 | °C | Ambient temperature |
| Storage temperature | Tst | -30 | +80 | °C | Ambient temperature |

### 6. ELECTRICAL CHARACTERISTICS

GND=0V,DCLK=25MHz,Ta=25°C

| Parameter | Symbol | MIN. | Typ. | MAX. | Unit | Remark |
|---|---|---|---|---|---|---|
| Power Supply voltage for LCD | $V_{CC}$ | +3.0 | +3.3 | +3.6 | V | |
| Power Supply Current for LCD | $I_{CC}$ | | 123 | 150 | mA | $V_{CC}$ =3.3V |
| Power Supply voltage for LED | $V_{LED}$ | 4.5 | 5 | 5.5 | V | |
| Power Supply Current for LED | $I_{LED}$ | -- | 333 | 400 | mA | $V_{LED}$ =5.0V |
| Ripple voltage | $V_{RF}$ | - | - | 100 | $mV_{P-P}$ | |
| "H" level logical input voltage | $V_{IH}$ | 0.7Vcc | -- | Vcc | V | |
| "L" level logical input voltage | $V_{IL}$ | 0 | -- | 0.3Vcc | V | |
| ADJ frequency | | 19K | 20K | 21K | Hz | |
| ADJ input voltage | VIH | 3.0 | - | 3.3 | V | |
| | VIL | 0 | - | 0.3 | V | |
| LED Dice life time | | -- | 50,000 | -- | Hr | Note 1 |

Note 1: The "LED dice life time" is defined as the brightness decrease to 50% original brightness that the ambient temperature is 22°C and LED dice current=20mA.

## 7. BLOCK DIAGRAM

```
┌──────────────────────────────────────────────────────────────┐
│  ┌──────────────────────────────────────┐    ┌────────────┐   │
│  │                                        │    │            │   │
│  │        640(R,G,B)x480 Pixel            │    │   Gate     │   │
│  │                                        │    │  Driver    │   │
│  └──────────────────────────────────────┘    │            │   │
│  ┌──────────────────────┐  ┌──────────────┐   │            │   │
│  │   Source Driver      │  │   Source     │   │            │   │
│  │  Timing Control      │  │   Driver     │   │            │   │
│  └──────────────────────┘  └──────────────┘   └────────────┘   │
└──────────────────────────────────────────────────────────────┘

┌──────────────────────────────────────────────────────────────┐
│  ┌──────────────┐    ┌──────────────┐    ┌──────────────┐      │
│  │    LED       │    │    DC/DC     │    │    LVDS      │      │
│  │   Driver     │    │  Converter   │    │   Receiver   │      │
│  └──────────────┘    └──────────────┘    └──────────────┘      │
└──────────────────────────────────────────────────────────────┘
```

GND
RxIN0(+/-)
RxIN2(+/-)
VCC
RxIN1(+/-)
ADJ
VLED
CKIN(+/-)
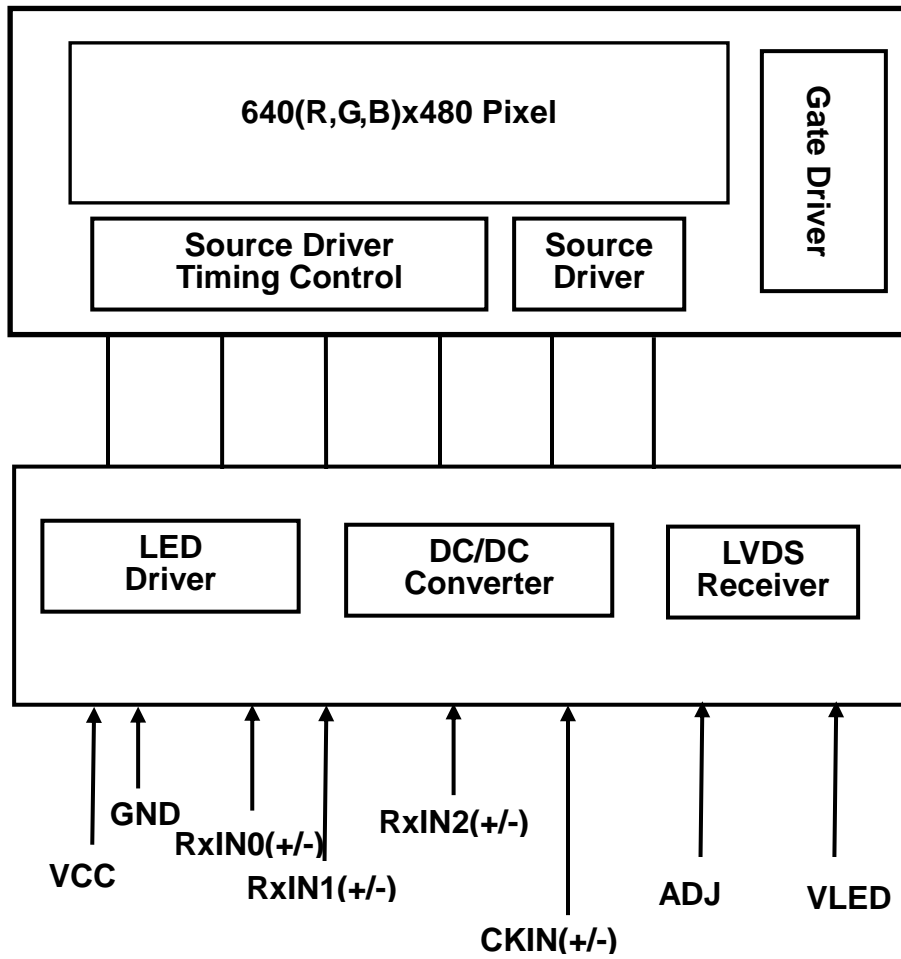
## 8. PIN CONNECTIONS

| Pin No | Symbol | Function | Remark |
|---|---|---|---|
| 1 | VCC | power supply for Digital Circuit | |
| 2 | VCC | power supply for Digital Circuit | |
| 3 | GND | Ground | |
| 4 | GND | Ground | |
| 5 | RxIN0- | Differential Data Input ,CH0(Negative) | |
| 6 | RxIN0+ | Differential Data Input ,CH0(Positive) | |
| 7 | GND | Ground | |
| 8 | RxIN1- | Differential Data Input ,CH1(Negative) | |
| 9 | RxIN1+ | Differential Data Input ,CH1(Positive) | |
| 10 | GND | Ground | |
| 11 | RxIN2- | Differential Data Input ,CH2(Negative) | |
| 12 | RxIN2+ | Differential Data Input ,CH2(Positive) | |
| 13 | GND | Ground | |
| 14 | CKIN- | Differential Clock Input (Negative) | |
| 15 | CKIN+ | Differential Clock Input (Positive) | |
| 16 | GND | Ground | |
| 17 | VLED | Power Supply for LED Driver Circuit | |
| 18 | VLED | Power Supply for LED Driver Circuit | |
| 19 | GND | Ground | |
| 20 | ADJ | Brightness control for LED B/L | |

Remarks：
1) ADJ is brightness control Pin. The larger of the pulse duty is, the higher of the brightness.
2) ADJ signal is 0~3.3V.Operation frequency is 20KHz
3) GND PIN must be grounding, can not be floating.
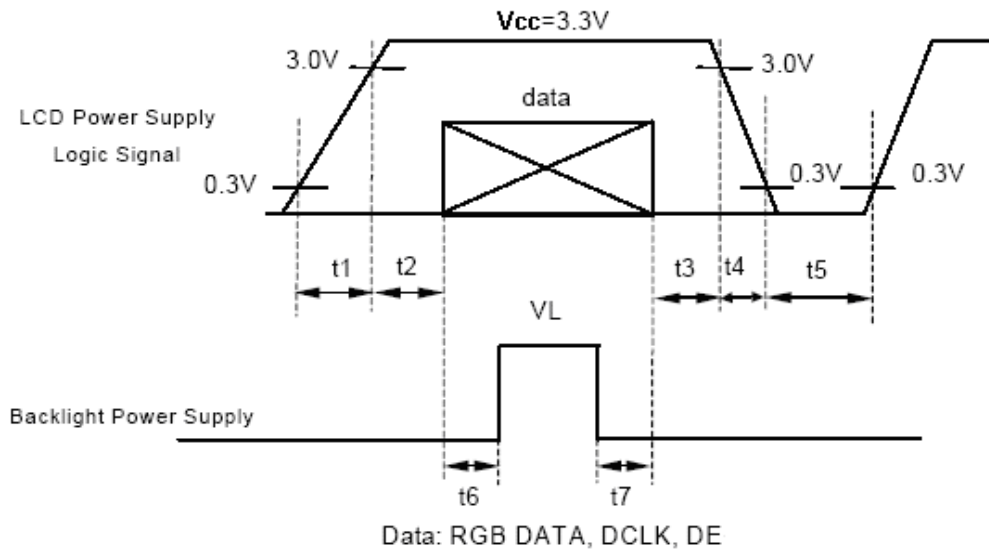
**8.1 Power Signal Sequence**

Remarks:

*1) Power Signal sequence:

t1 ≤10ms : 1 sec≤ t5

50ms≤ t2 : 200ms ≤t6

0<t3 ≤50ms: 200ms≤ t7

0<t4 ≤10ms



Data: RGB DATA, DCLK, DE

*2) VCC-dip condition:

(1) 2.7 V ≤VCC <3.0V,td ≤ 10 ms

(2) VCC＞3.0V,VCC-dip condition should be the same with VCC-turn-on condition。
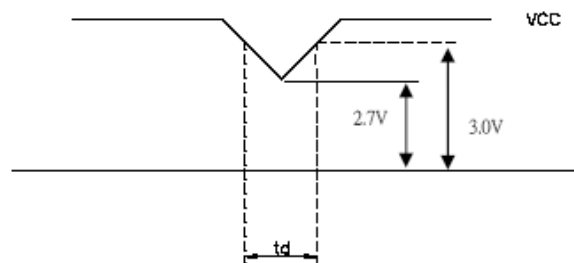
## 9. INTERFACE SPECIFICATIONS

### 9.1 DE mode Input signal characteristics

| Signal | Parameter | Symbol | MIN. | TYP. | MAX. | Unit | Remarks |
|--------|-----------|--------|------|------|------|------|---------|
| DCLK | Period | $t_{CLK}$ | 33 | 40 | 43 | ns | |
| | Frequency | $f_{CLK}$ | 23 | 25 | 30 | MHz | |
| | Low Level Width | $t_{WCL}$ | 6 | - | - | ns | |
| | High Level Width | $t_{WCH}$ | 6 | - | - | ns | |
| | Rise, Fall Time | $t_{CLKr}, t_{CLKf}$ | - | - | 3 | ns | |
| | Duty [(1)] | - | 0.45 | 0.50 | 0.55 | - | |
| DE (Data Enable) | Setup Time | $t_{DES}$ | 5 | - | - | ns | |
| | Hold Time | $t_{DEH}$ | 10 | - | - | ns | |
| | Rise, Fall Time | $t_{DEr}, t_{DEf}$ | - | - | 16 | ns | |
| | Horizontal Period | $t_{HP}$ | 750 | 800 | 900 | $t_{CLK}$ | |
| | Horizontal Valid | $t_{HV}$ | 640 | 640 | 640 | $t_{CLK}$ | |
| | Horizontal Blank | $t_{HBK}$ | 110 | 160 | 260 | $t_{CLK}$ | |
| | Vertical Period | $t_{VP}$ | 515 | 525 | 560 | $t_{HP}$ | |
| | Vertical Valid | $t_{W}$ | 480 | 480 | 480 | $t_{HP}$ | |
| | Vertical Blank | $t_{VBK}$ | 35 | 45 | 80 | $t_{HP}$ | |
| | Vertical Frequency | $f_{v}$ | 55 | 60 | 65 | Hz | |
| Data R,G,B | Setup Time | $t_{DS}$ | 5 | - | - | ns | |
| | Hold Time | $t_{DH}$ | 10 | - | - | ns | |
| | Rise, Fall Time | $t_{Dr}, t_{Df}$ | - | - | 3 | ns | |

Note: (1) $t_{CLKL} / t_{CLK}$.

**9.1.1 DE mode timing waveform**
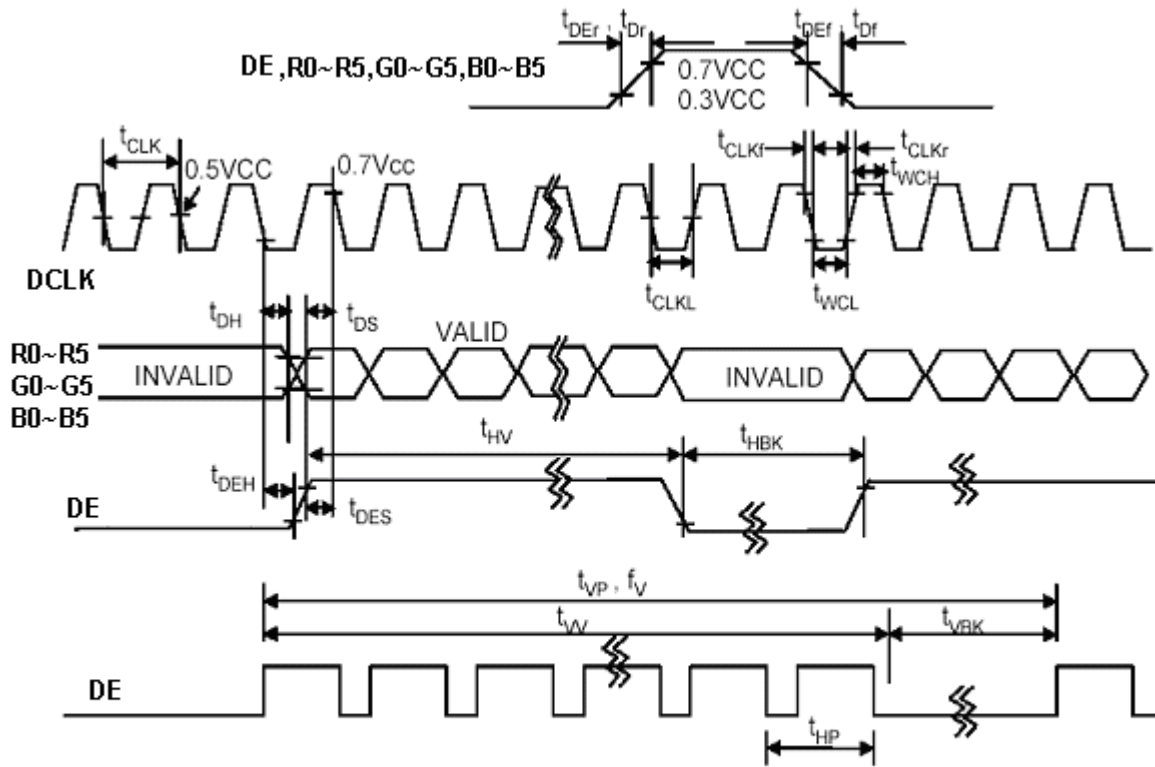
### 9.2 SYNC mode Input signal characteristics

| Parameter | Symbol | MIN. | TYP. | MAX. | Unit | Remarks |
|---|---|---|---|---|---|---|
| Clock Period | $t_{CLK}$ | 33 | 40 | 43 | ns | |
| Clock Frequency | $f_{CLK}$ | 23 | 25 | 30 | MHz | |
| Clock Low Level Width | $t_{WCL}$ | 6 | - | - | ns | |
| Clock High Level Width | $t_{WCH}$ | 6 | - | - | ns | |
| Clock Rise, Fall Time | $t_{CLKr},t_{CLKf}$ | - | - | 3 | ns | |
| HSYNC Period | $t_{HP}$ | 750 | 800 | 900 | $t_{CLK}$ | |
| HSYNC Pulse Width | $t_{HW}$ | 5 | 30 | - | $t_{CLK}$ | |
| HSYNC Front Porch | $t_{HFP}$ | 1 | 16 | 116 | $t_{CLK}$ | |
| HSYNC Back Porch | $t_{HBP}$ | 1 | 114 | 139 | $t_{CLK}$ | |
| HSYNC Width + Back Porch | $t_{HW}+t_{HBP}$ | 144 | 144 | 144 | $t_{CLK}$ | |
| Horizontal Blank | $t_{HBK}$ | 1 | 160 | 260 | $t_{CLK}$ | |
| Horizontal Valid | $t_{HV}$ | 640 | 640 | 640 | $t_{CLK}$ | |
| VSYNC Period | $t_{VP}$ | 515 | 525 | 560 | $t_{HP}$ | |
| VSYNC Pulse Width | $t_{VW}$ | 1 | 3 | 5 | $t_{HP}$ | |
| VSYNC Front Porch | $t_{VFP}$ | 1 | 10 | 45 | $t_{HP}$ | |
| VSYNC Back Porch | $t_{VBP}$ | 30 | 32 | 34 | $t_{HP}$ | |
| VSYNC Width + Back Porch | $t_{VW}+t_{VBP}$ | 35 | 35 | 35 | $t_{CLK}$ | |
| Vertical Blank | $t_{VBK}$ | 35 | 45 | 80 | $t_{HP}$ | |
| Vaild data Width | $t_{W}$ | 480 | 480 | 480 | $t_{HP}$ | |
| Data Setup Time | $t_{DS}$ | 5 | - | - | ns | |
| Data Hold Time | $t_{DH}$ | 10 | - | - | ns | |

Note: (1) tHBK = tHFP + tHW + tHBP

### 9.2.1 SYNC mode timing waveform
#### 9.2.1.1 Input vertical timing
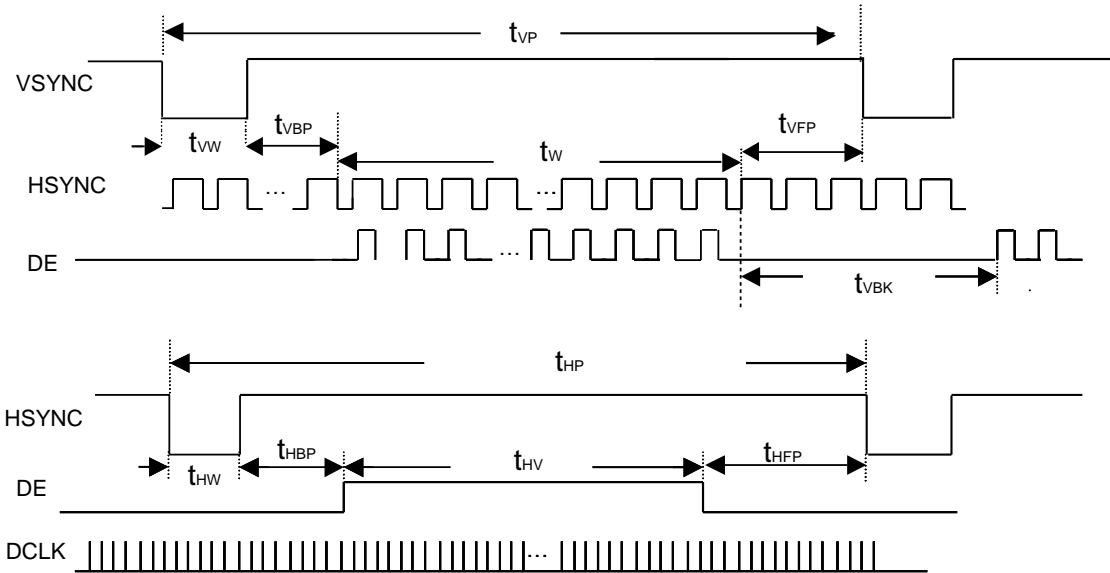


#### 9.2.1.2 Input horizontal timing
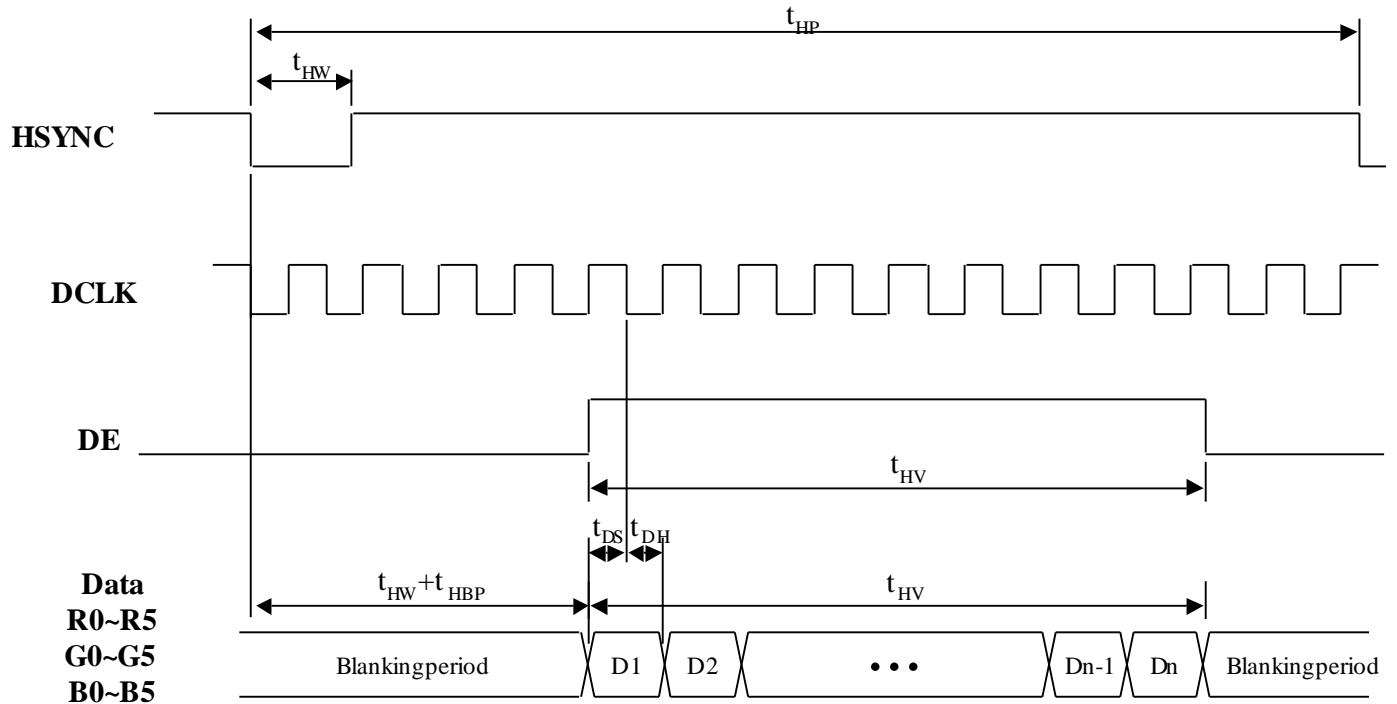
## 9.3 Color Data Assignment

| COLOR | INPUT | R DATA | | | | | | G DATA | | | | | | B DATA | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DATA | R5 | R4 | R3 | R2 | R1 | R0 | G5 | G4 | G3 | G2 | G1 | G0 | B5 | B4 | B3 | B2 | B1 | B0 |
| | | MSB | | | | | LSB | MSB | | | | | LSB | MSB | | | | | LSB |
| BASIC COLOR | BLACK | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | RED(63) | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | GREEN(63) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | BLUE(63) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| | CYAN | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | MAGENTA | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| | YELLOW | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | WHITE | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| RED | RED(0) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | RED(1) | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | RED(2) | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | RED(62) | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | RED(63) | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GREEN | GREEN(0) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | GREEN(1) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | GREEN(2) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | GREEN(62) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | GREEN(63) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| BLUE | BLUE(0) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | BLUE(1) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | BLUE(2) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | BLUE(62) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 |
| | BLUE(63) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |

Remarks:(1) Definition of Gray Scale

color(n):n is series of Gray Scale

The more n value is, the bright Gray Scale.

(2)Data:1-High,0-Low

### Correspondence between Data and Display Position

| | S0001 | S0002 | S0003 | S0004 | S0005 | S0006 | S0007 | S0008 | - - - - - - - - - - - - - - - - - - | S1919 | S1920 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C001 | R001 | G001 | B001 | R002 | G002 | B002 | R003 | G003 | | G640 | B640 |
| ⋮ | | | | | | | | | | | |
| C480 | R001 | G001 | B001 | R002 | G002 | B002 | R003 | G003 | | G640 | B640 |

## 10. OPTICAL CHARACTERISTIC

**Specification:**

| Parameter | | Symbol | Condition | MIN. | TYP. | MAX. | Unit | Remarks |
|---|---|---|---|---|---|---|---|---|
| Viewing Angle | Horizontal | $\theta_x+$ | Center CR$\geq$10 | 60 | 70 | -- | deg | Note 1,4 |
| | | $\theta_x-$ | | 60 | 70 | -- | | |
| | Vertical | $\theta_Y+$ | | 50 | 60 | -- | | |
| | | $\theta_Y-$ | | 30 | 40 | -- | | |
| Contrast Ratio | | CR | at optimized viewing angle | 200 | 300 | | | Note 1,3 |
| Response time | Rise | Tr | Center | - | 15 | | ms | Note 1,6 |
| | Fall | Tf | $\theta x=\theta y =0°$ | - | 35 | | ms | |
| Uniformity | | B-uni | $\theta x=\theta y =0°$ | 70 | 80 | -- | % | Note1,5 |
| Brightness | | L | $\theta x=\theta y =0°$ ADJ=3.3V | 720 | 900 | -- | cd/$\mathrm{m}^2$ | Note 1,2 |
| Chromaticity | | $x_W$ | Center $\theta x=\theta y =0°$ | 0.259 | 0.309 | 0.359 | | Note 1,7 |
| | | $y_W$ | | 0.270 | 0.320 | 0.370 | | |
| | | $x_R$ | | 0.565 | 0.615 | 0.665 | | |
| | | $y_R$ | | 0.310 | 0.360 | 0.410 | | |
| | | $x_G$ | | 0.295 | 0.345 | 0.395 | | |
| | | $y_G$ | | 0.490 | 0.540 | 0.590 | | |
| | | $x_B$ | | 0.098 | 0.148 | 0.198 | | |
| | | $y_B$ | | 0.056 | 0.106 | 0.156 | | |
| Image sticking | | tis | 2 hours | | | 2 | Sec | Note 8 |

The following optical specifications shall be measured in a darkroom or equivalent state(ambient luminance $\leq$1 lux, and at room temperature). The operation temperature is 25°C$\pm$2°C. The measurement method is shown in Note1.

Note1: The method of optical measurement:
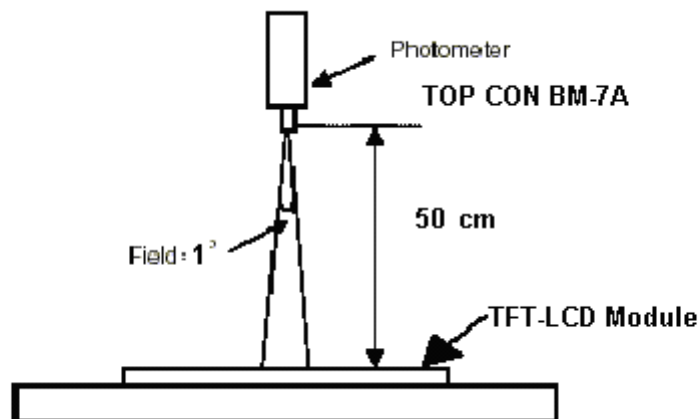
Note2: Measured at the center area of the panel and at the viewing angle of the $\theta x = \theta y = 0°$

Note3: Definition of Contrast Ratio (CR):

$$CR = \frac{\text{Luminance with all pixels in white state}}{\text{Luminance with all pixels in Black state}}$$

Note4: Definition of Viewing Angle
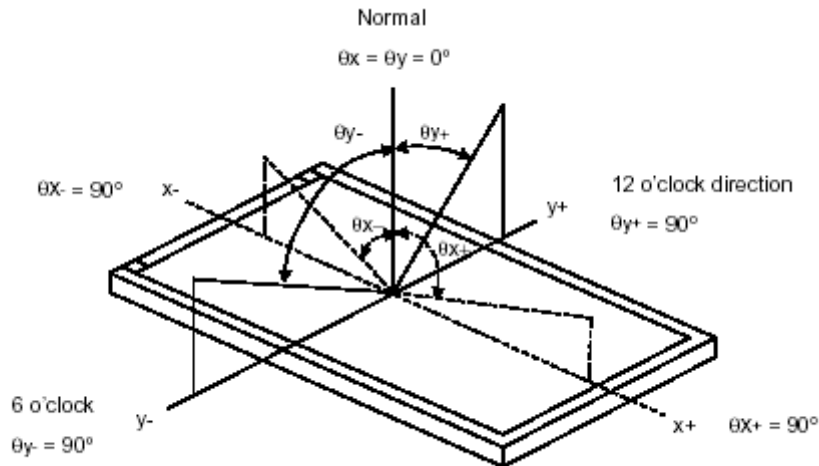


Note 5: Definition of Brightness Uniformity (B-uni):
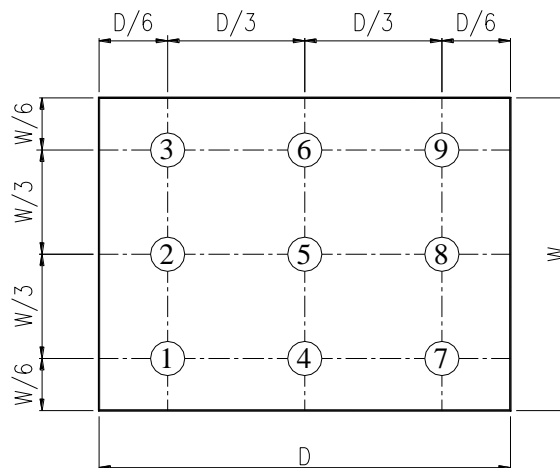


$$\text{B-uni} = \frac{\text{Minimum luminance of 9 points}}{\text{Maximum luminance of 9points}} \quad \text{(Note 5)}.$$

Note6: Definition of Response Time:

The Response Time is set initially by defining the "Rising Time (Tr)" and the "Falling Time (Tf)" respectively. Tr and Tf are defined as following figure.
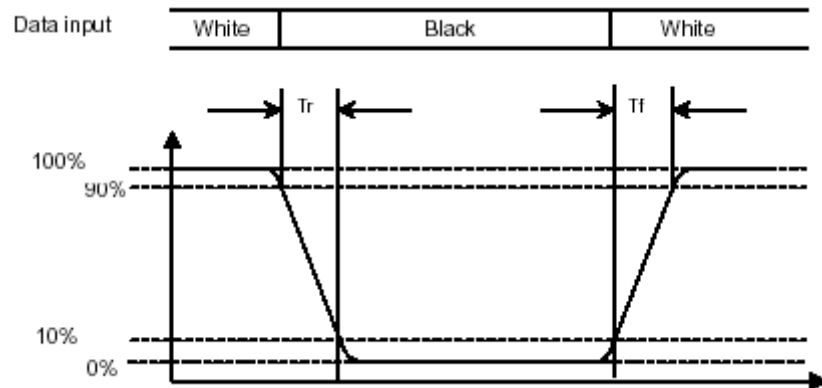


Note 7: Definition of Chromaticity:

The color coordinates $(x_W,y_W),(x_R,y_R),(x_G,y_G),$ and $(x_B,y_B)$ are obtained with all pixels in the viewing field at white, red, green, and blue states, respectively.

Note 8: Definition of Image sticking (tis):

Continuously display the test pattern shown in the figure below for 2 hours. Then display a completely white screen. The previous image shall not persist more than 2 sec at 25 °C

**Image sticking pattern**
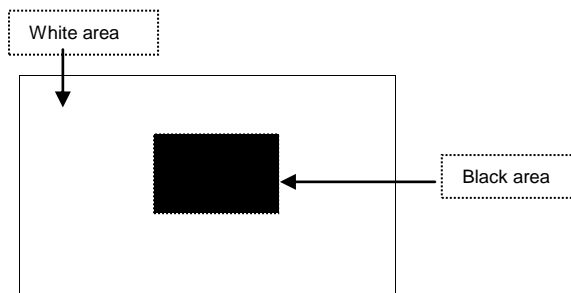
## 11. QUALITY ASSURANCE

### 11.1 Test Condition

#### 11.1.1 Temperature and Humidity(Ambient Temperature)
Temperature : $25 \pm 5°C$
Humidity : $65 \pm 5\%$

#### 11.1.2 Operation
Unless specified otherwise, test will be conducted under function state.

#### 11.1.3 Container
Unless specified otherwise, vibration test will be conducted to the product itself without putting it in a container.

#### 11.1.4 Test Frequency
In case of related to deterioration such as shock test.　It will be conducted only once.

#### 11.1.5 Test Method

| No. | Reliability Test Item & Level | Test Level | Remark |
|---|---|---|---|
| 1 | High Temperature Storage Test | T=80°C,240hrs | IEC68-2-2 |
| 2 | Low Temperature Storage Test | T=-30°C,240hrs | IEC68-2-1 |
| 3 | High Temperature Operation Test | T=70°C,240hrs | IEC68-2-2 |
| 4 | Low Temperature Operation Test | T=-20°C,240hrs | IEC68-2-1 |
| 5 | High Temperature and High Humidity Operation Test | T=60°C,90% RH,240hrs | IEC68-2-3 |
| 6 | Thermal Cycling Test (No operation) | -30°C → +25°C → +80°C,200 Cycles　30 min　5min　30 min | IEC68-2-14 |
| 7 | Vibration Test (No operation) | Frequency:0 ~ 55 Hz Amplitude:1.5 mm　Sweep Time:11min　Test Period:6 Cycles for each Direction of X,Y,Z | IEC68-2-6 |
| 8 | Electrostatic Discharge Test (No operation) | 150pF,330Ω　Air:± 12KV;Contact: ±6KV　10 times/point;4 points/panel face | IEC-61000-4-2 |

## 11.2 Inspection condition

11.2.1 Inspection conditions

11.2.1.1　Inspection Distance : 35 ± 5 cm

11.2.1.2　View Angle : Inspection under test condition : ±5°
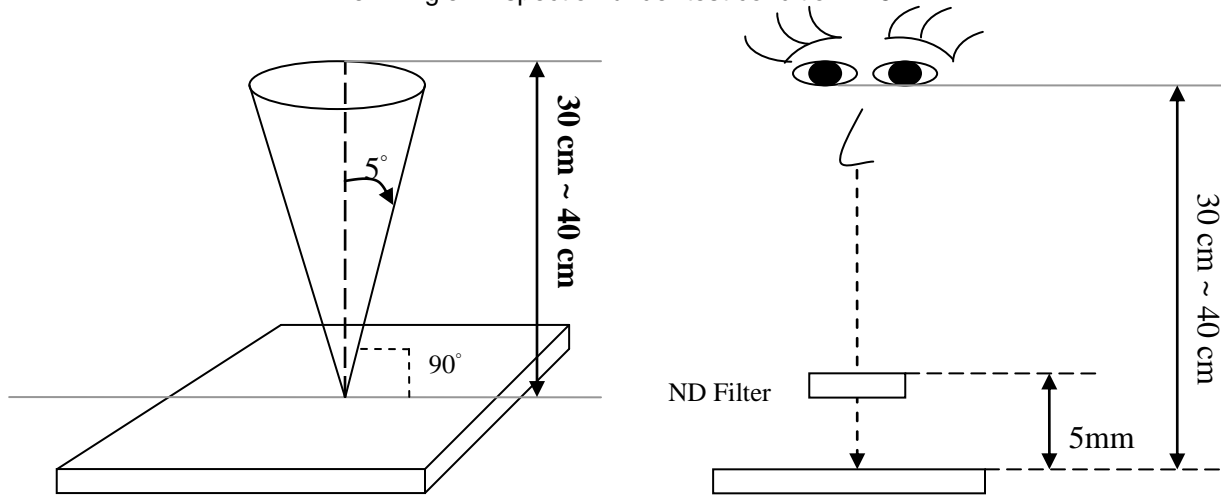


11.2.2 Environment conditions：

| Ambient Temperature : | | 25±5℃ |
|---|---|---|
| Ambient Humidity : | | 65±5% |
| Ambient Illumination | Cosmetic Inspection | 300 ~600 lux |
| | Functional Inspection | 300 ~ 500 lux |

11.2.3 Definition of applicable Zones

## 11.2.4 Inspection Parameters

| No. | Parameter | Criteria |
|---|---|---|
| 1 | Operating | Display function: No Display malfunction (Major) |

Detailed criteria for No. 1 (Operating):

Display function: No Display malfunction (Major)

Contrast ratio (Black, White):
 Does not meet specified range in the spec. (Major) (Note:3)

Line Defect: No obvious Vertical and Horizontal line defect in bright, dark and colored. (Major) (Note:1)

Point Defect : Active area ≤ 5 dots (Minor) (Note:1)

| Item | Acceptable number Active Area | Total |
|---|---|---|
| Bright | 2 | 5 |
| Dark | 4 | |

Non-uniformity: Visible through 5%ND filter. (Minor)

Foreign material in Black or White spots shape (W>1/4L)

| Zone \ Dimension | Acceptable number | Class Of Defects | AQL Level |
|---|---|---|---|
| D> 0.5 | 0 | Minor | 1.5 |
| 0.3 < D ≤ 0.5 | 5 | | |
| D ≤ 0.3 | * | | |

D = (Long + Short) / 2     ∗ : Disregard

Foreign Material in Line or spiral shape (W≤1/4L) (Note: 4)

| L (mm) | W(mm) Zone | Acceptable number | Class Of Defects | AQL Level |
|---|---|---|---|---|
| L >5 | W>0.1 | 0 | Minor | 1.5 |
| 0.5 < L ≤ 5 | 0.03 < W≤0.1 | 5 | | |
| L ≤0.5 | W≤0.03 | * | | |

L : Length     W : Width     ∗ : Disregard

| No. | Parameter | Criteria |
|---|---|---|
| 2 | External Inspection (non-operating) | Dimension: Outline (Major) |

Detailed criteria for No. 2 (External Inspection (non-operating)):

Dimension: Outline (Major)

Bezel appearance: uneven (Minor)

Scratch on the polarize: (Note:2)

| L (mm) | W(mm) Zone | Acceptable number | Class Of Defects | AQL Level |
|---|---|---|---|---|
| -- | W>0.1 | 0 | Minor | 1.5 |
| L ≤ 3 | W≤0.1 | 3 | | |

L : Length     W : Width     ∗ : Disregard

Dent or bubble on the polarize (Note:2)

| Zone \ Dimension | Acceptable number | Class Of Defects | AQL Level |
|---|---|---|---|
| D≤0.3 | * | Minor | 1.5 |
| D≤0.5 | 3 | | |

D = (Long + Short) / 2          ∗ : Disregard

| Class of defects | **Major** | AQL 0.65% | **Definition**<br>It is a defect that is likely to result in failure or to reduce materially the usability of the product for the intended function. |
|---|---|---|---|
| | **Minor** | AQL 1.5% | It is a defect that will not result in functioning problem with deviation classified. |

Note:1.(a)Bright point defect is defined as point defect of R,G,B with area >1/2 dot respectively
    (b)Dark point defect is defined as visible in full white pattern.
    (c)Definition of distribution of point defect is as follows:
       -minumum separation between dark point defects should be larger than 5mm.
       -minumum separation between bright point defects should be larger than 5mm.
    (d)Definition of joined bright point defect and joined dark point defect are as follows:
       -Three or more joined bright point defects must be nil.
       -Three joined dark point defects must be nil.
      -Coupling of one dark and one bright point in junction is counted as one dark and bright spot
       with 1 pair maxmum.
       -Two Joined dark point is counted as two dark point with 2 pair maxmum.
    (e) )Line defect is defined as visible by using 5% ND filter.
Note:2 The external inspection should be conducted at the distance 35± 5cm between the eyes of inspctor
    and the panel .
Note:3 Luminance measurement for contrast ratio is at the distance 50± 5cm between the detective head
    and the panel with ambient illuminance less than 1 lux. Contrast ratio is obtained at optimum view
    angle.
Note:4 W-Width in mm , L-length of Max.(L1,L2) in mm.
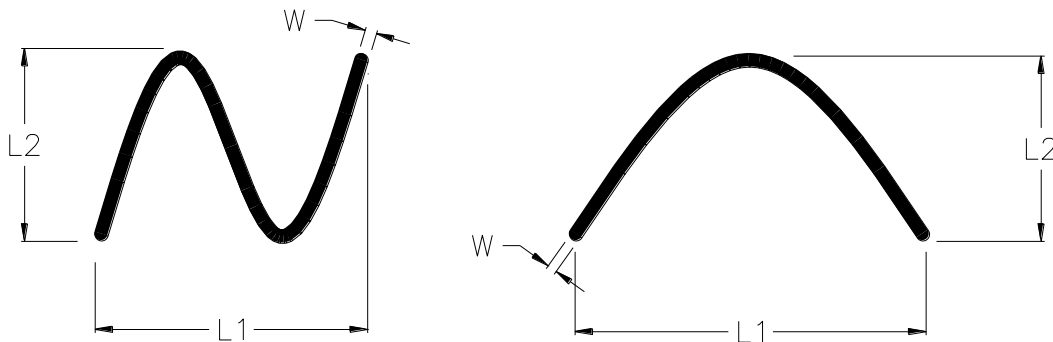


### 11.3 Sampling Condition

Unless otherwise agree in written, the sampling inspection shall be
applied to the incoming inspection of customer.
Lot size: Quantity of shipment lot per model.
Sampling type: normal inspection, single sampling
Sampling table: MIL-STD-105E
Inspection level: Level II

## 12. LCM PRODUCT LABEL DEFINE

**Product Label style:**

35mm

Bar Code →

A A 6 0 0 1 4 2 1 0 2 6 - 0 0 1 3

Product Name →

F G 0 5 0 7 2 2 D S S W D G L 2

10mm
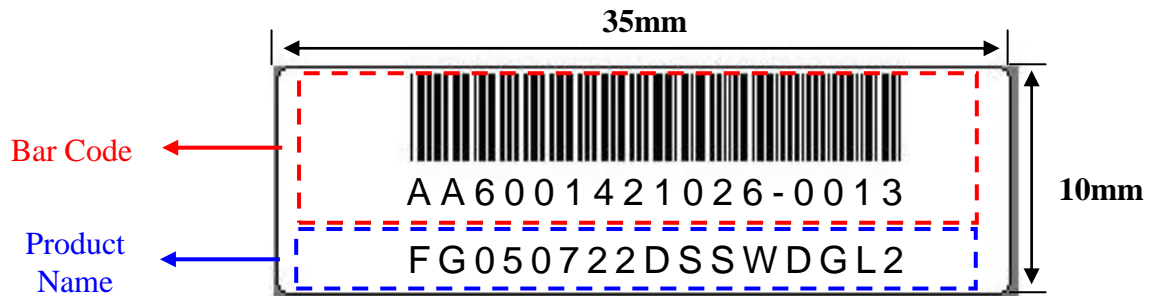
**Barcode Define:**

## A A 6 0014 2 10 26-0013

Serial number of the products
Serial number starts from 0000
Every work order is 10K at most

Week of production

Year of production

Storage area

Serial number of work order
Serial number starts from 0000 each month

Month of work order

Year of work order

The first 3 numbers of work order

**Product Name Define:**

**FG 050722 D S S W D G L2**

VERSION: L2

RoHS

**View direction & Temp. Range**

A－Bottom view 6H & Normal temp.

B－Bottom view 6H & Wide temp.

C–Top View & Normal temp

**D–Top View & Wide temp.**

J–Bottom view 6H & Super Wide temp.

**Backlight Color**

**W –White** Y – Yellow Green

G - green

**Backlight**

C–CCFL B/L

**S- LED B/L**

**LCD Polarize type**

N–Negative **S –Super wide view or Excellent W.V**

M–transmissive F– transflective

**LCD type**

A –TFT analog

**D –TFT digital**

**Series code**

**0507**22–, **5.7 inch**

**Model type**

**FG–Standard TFT Module**

FX–Custom TFT Module

## 13. PRECAUTION IN USE LCM

1. ASSEMBLY PRECAUTIONS
   (1) You must mount a module using holes arranged in four corners or four sides.
   (2) You should consider the mounting structure so that uneven force (ex. Twisted stress) is not applied to the module. And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the module.
   (3) Do not touch, push or rub the exposed polarizers with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment.
   (4) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.
   (5) Do not open the case because inside circuits do not have sufficient strength.
   (6) Please do not take a LCD module to pieces and reconstruct it.Resolving and reconstructing modules may cause them not to work well.
   (7) Please do not touch metal frames with bare hands and soiled gloves. A color change of the metal frames can happen during a long preservation of soiled LCD modules.
   (8) Please pay attention to handling lead wire of backlight so that it is not tugged in connecting with inverter.

2. OPERATING PRECAUTIONS
   (1) Please be sure to turn off the power supply before connecting and disconnecting signal input cable.
   (2) Please do not change variable resistance settings in LCD module. They are adjusted to the most suitable value. If they are changed, it might happen LCD does not satisfy the characteristics specification
   (3) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
   (4) When fixed patterns are displayed for a long time, remnant image is likely to occur.
   (5) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers.Grounding and shielding methods may be important to minimize the interference.
   (6) Please consider that LCD backlight takes longer time to become stable of radiation characteristics in low temperature than in room temperature.

3. ELECTROSTATIC DISCHARGE CONTROL
   (1) The operator should be grounded whenever he/she comes into contact with the module. Never touch any of the conductive parts such the copper leads on the PCB and the interface terminals with any parts of the human body.
   (2) The modules should be kept in antistatic bags or other containers resistant to static for storage.
   (3) Only properly grounded soldering irons should be used.
   (4) If an electric screwdriver is used, it should be well grounded and shielded from commutator sparks.
   (5) The normal static prevention measures should be observed for work clothes and working benches; for the latter conductive (rubber) mat is recommended
   (6) Since dry air is inductive to statics, a relative humidity of 50-60% is recommended.
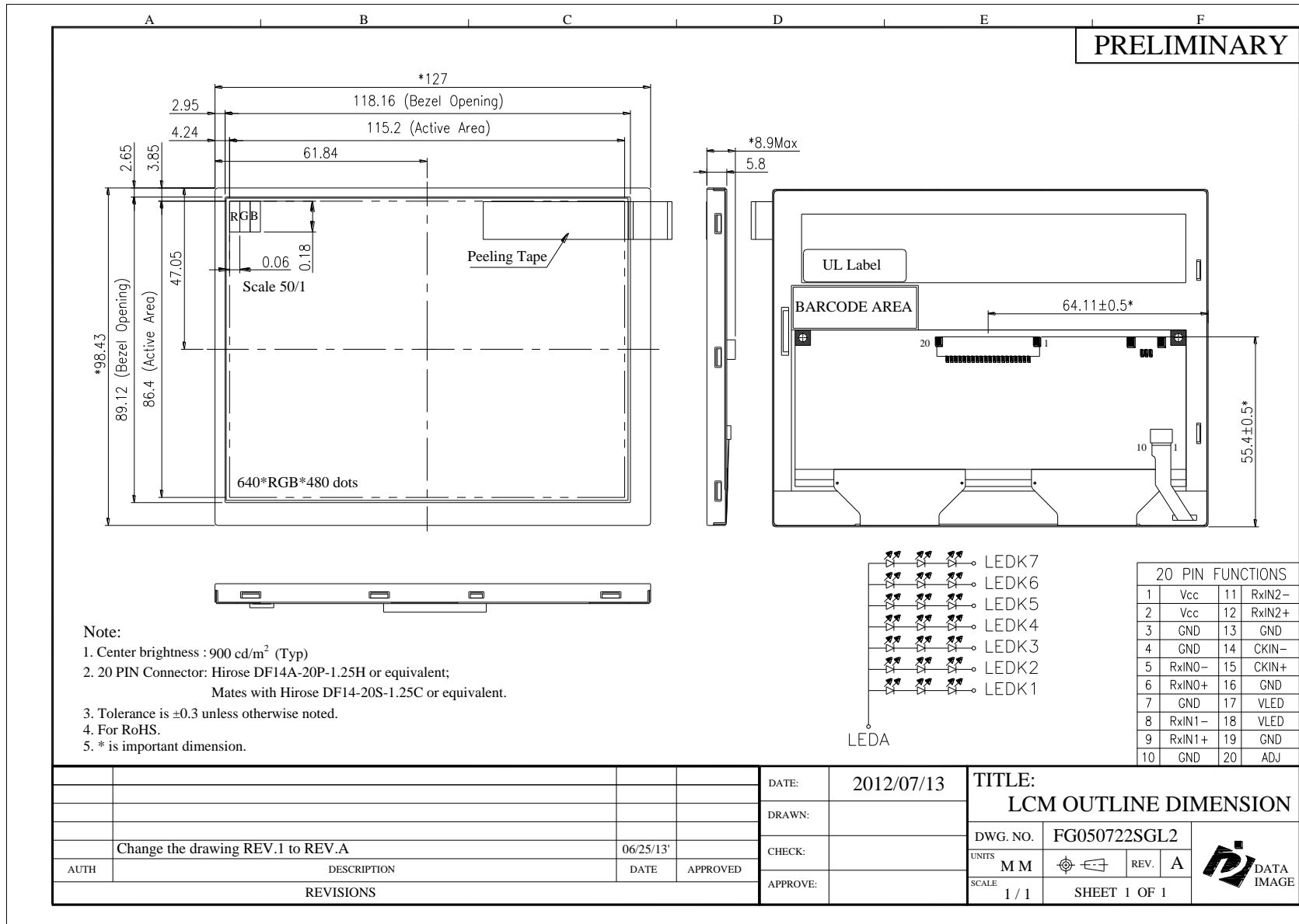
4. STORAGE PRECAUTIONS
   (1) When you store LCDs for a long time, it is recommended to keep the temperature between 0°C-40°C without the exposure of sunlight and to keep the humidity less than 90%RH.
   (2) Please do not leave the LCDs in the environment of high humidity and high temperature such as 60°C 90%RH
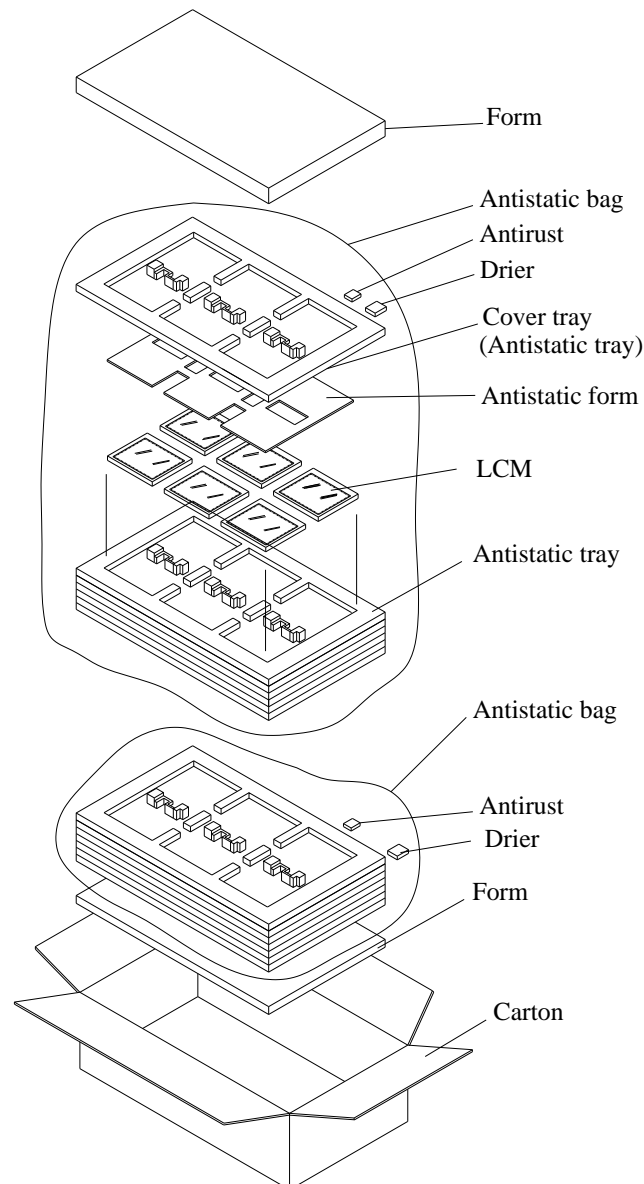   (3) Please do not leave the LCDs in the environment of low temperature; below -20°C.

5. OTHERS
   (1) A strong incident light into LCD panel might cause display characteristics' changing inferior because of polarizer film, color filter, and other materials becoming inferior. Please do not expose LCD module direct sunlight Land strong UV rays
   (2) Please pay attention to a panel side of LCD module not to contact with other materials in preserving it alone.
   (3) For the packaging box, please pay attention to the followings:
   (4) Please do not pile them up more than 5 boxes. (They are not designed so.) And please do not turn over.
   (5) Please handle packaging box with care not to give them sudden shock and vibrations. And also please do not throw them up.
   (6) Packing box and inner case for LCDs are made of cardboard. So please pay attention not to get them wet. (Such like keeping them in high humidity or wet place can occur getting them wet.)

6. LIMITED WARRANTY
   Unless otherwise agreed between DATA IMAGE and customer, DATA IMAGE will replace or repair any of its LCD and LCM which is found to be defective electrically and visually when inspected in accordance with DATA IMAGE acceptance standards, for a period on one year from date of shipment. Confirmation of such date shall be based on freight documents. The warranty liability of DATA IMAGE is limited to repair and/or replacement on the terms set forth above. DATA IMAGE will not responsible for any subsequent or consequential events.

## 14. OUTLINE DRAWING

**PRELIMINARY**



*127
118.16 (Bezel Opening)
115.2 (Active Area)
2.95
4.24
61.84
2.65
3.85
47.05
*8.9Max
5.8
RGB
0.06
0.18
Peeling Tape
Scale 50/1
*98.43 (Bezel Opening)
89.12 (Active Area)
86.4 (Active Area)
640*RGB*480 dots
UL Label
BARCODE AREA
64.11±0.5*
20
1
55.4±0.5*
10
1

**Note:**
1. Center brightness : 900 cd/m$^2$ (Typ)
2. 20 PIN Connector: Hirose DF14A-20P-1.25H or equivalent;
Mates with Hirose DF14-20S-1.25C or equivalent.
3. Tolerance is ±0.3 unless otherwise noted.
4. For RoHS.
5. * is important dimension.

LEDK7
LEDK6
LEDK5
LEDK4
LEDK3
LEDK2
LEDK1
LEDA

| 20 PIN FUNCTIONS | | | |
|---|---|---|---|
| 1 | Vcc | 11 | RxIN2- |
| 2 | Vcc | 12 | RxIN2+ |
| 3 | GND | 13 | GND |
| 4 | GND | 14 | CKIN- |
| 5 | RxIN0- | 15 | CKIN+ |
| 6 | RxIN0+ | 16 | GND |
| 7 | GND | 17 | VLED |
| 8 | RxIN1- | 18 | VLED |
| 9 | RxIN1+ | 19 | GND |
| 10 | GND | 20 | ADJ |

| AUTH | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|
| | | | |
| | | | |
| | Change the drawing REV.1 to REV.A | 06/25/13' | |
| | REVISIONS | | |

DATE: 2012/07/13
DRAWN:
CHECK:
APPROVE:

TITLE: LCM OUTLINE DIMENSION
DWG. NO. FG050722SGL2
UNITS M M
REV. A
SCALE 1 / 1
SHEET 1 OF 1
DATA IMAGE

**DATA IMAGE**

## 15. PACKAGE INFORMATION

Form

Antistatic bag
Antirust
Drier
Cover tray
(Antistatic tray)
Antistatic form

LCM

Antistatic tray

Antistatic bag

Antirust
Drier

Form

Carton

Material

1 Carton + 2 Anti-static bag + 1 Form(35mm) + 1 Form(15mm)

+ 14 Anti-static tray + 2 Drier + 2 Antirust

Total pcs

1 Antistatic tray = 6 pcs

1 Anti-static bag = 6 Anti-static tray + cover tray = 6*6 +1*0 = 36 pcs

1 Carton = 2 Anti-static bag = 2*36 = 72 pcs

1 Carton = 72pcs

Carton size : 482L x 282W x 279H (mm)

Total Weight ≒ 11 kgw

## FG050722 TFT LCM PACKING