# YB-TG1024600S11A-C-A0

## 7,0" | 1240*600 pixels | 600cd/m² | CTP



## PRODUCTCARD

# IHR VORTEIL - UNSERE STÄRKEN

- Asiatischer Premium Hersteller (seit 1988) unter Berücksichtigung von ISO 9001, ISO 14001, IATF16949 und AEO Certificate.

- Qualitätssystem IECQ QC 080000 und ANSI/ESD S20.0.-2021

- **Individualisierung** nach Kundenwunsch (Custom Size, Custom Print, Curved, Edge-Less, Edge-Round, etc.), bzw. Anpassung von Formfaktor, Konnektivität und Leistung möglich.

- **TFT** (Thin-Film Transistor-Display) und **CTP** (Capacitive Touch Panel)
  **LCM** (Liquid Crystal Modul)
  **LCD** (Liquid Crystal Display)

- Industrie und Automotiv - Varianten

- Lange Produktverfügbarkeit

- **Standard** TFT + CTP Displays in den Größen von 1,33" bis 15,6".

- Kundenspezifisch ab 1,33" bis 15,6"

- Kurze Lieferkette für Standard Displays - prompt verfügbar mittels Lager innerhalb Europas.

- Kundenreferenzen: ABB, Bayer & Bayer, brother, DeLonghi, Fisher&Paykei, Honeywell, HP, Philips, LG, Siemens, T-Mobile, etc..

- Design-In, Vertrieb und Abnahme durch das Ingenieurbüro **GLASER Engineering**

**YB** 億都集團
**YEEBO GROUP**

# SPECIFICATION
# FOR
# LCD MODULE
## MODULE NO: YB-TG1024600S11A-C-A0

## Doc.Version:02

Customer Approval:

| □ Accept | □ Reject |
|---|---|
|  |  |

| YEEBO | NAME | SIGNATURE | DATE |
|---|---|---|---|
| Prepare | Mechanical Engineer | 王周雄 | 2020-08-14 |
| Check | Electronic Engineer |  |  |
| Verify |  |  |  |
| Approval |  |  |  |

□ APPROVAL FOR SPECIFICATIONS ONLY

■ APPROVAL FOR SPECIFICATIONS AND SAMPLE

WIMRD005-02-D

# 1. Revision History

| Sample Version | DOC. Version | DATE | DESCRIPTION | | CHANGED BY |
|---|---|---|---|---|---|
| A0 | 00 | 2020-06-05 | SPEC ONLY | First issue | W.Z.X |
| A0 | 01 | 2020-07-21 | SPEC ONLY | Update brightness, number of lights | W.Z.X |
| A0 | 02 | 2020-08-14 | FULL SPEC | First sample | W.Z.X |
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## 2. Table of Contents:

## 3. Module Numbering System:

**YB- TG 1204600 S 11 A -C – A0**

Sample Version: A0~AX

T: With Touch panel
C: With Capacitive touch panel
N: Without Touch panel

Version: A~Z

Serial No: 01~99

S: STD Product
C: Customer Made

Display Function:
Segment Number of Segment
Characters Lines of Character
Column and Row of Graphic
Length * Width of Other

LCM Display Type
C: Character Type；
G: Graphic Type；
S: Segment Type

LCD Model: **C**: CSTN; **T**: TFT; **L**: LTPS; **O**: OLED; **P**: PLED; **S**: B/W STN; **Y:** Yeetek TFT; **N**: Others;

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# 4. General Specification:

| ITEM | CONTENTS |
|---|---|
| Module Size | 187.95(W) * 119.66(H) * 4.75(T) mm |
| Display Size(Diagonal) | 7inch |
| Display Format | 1024(RGB)* 600 Pixels |
| Pixel Pitch | 0.1506 (H)mm*0.1432(V) mm |
| LCD Type | TFT(16.7M)/ Transmissive/Normal Black |
| Active Area | 154.21(W)*85.92(H)mm |
| View Angle | Free |
| Drive IC | EK79001HN3 & EK73215BCGA |
| CTP IC | ILI2117A |
| Weight(g) | $\approx$192. 84g |
| Fireware | 8819_130k_v1.6.bin |
| Test Configuration | autoSettings.ini |

# 5. LCM drawing:

由 AUTODESK 教育產品製造

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# 6. Electrical Characteristics

## 6-1 Absolute Maximum Ratings

### 6-1-1 TFT Absolute Maximum Ratings　　　(Ta=25℃ VSS=0V)

| Item | Symbol | Min. | Type | Max. | Unit | Remark |
|---|---|---|---|---|---|---|
| Power Supply voltage | VDD | -0.5 | - | 5.0 | Volt | |
| | AVDD | -0.5 | - | 15.0 | Volt | |
| Operating Temperature | Topr | -20 | - | +70 | ℃ | |
| Storage Temperature | Tstg | -30 | - | +80 | ℃ | |

Note1: Absolute maximum rating is the limit value beyond which the IC maybe broken.

## 6-2 Operating Conditions

### 6-2-1 TFT Operating Conditions　　　(Ta=25℃ )

| Item | Symbol | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Power Supply voltage | VDD | - | 2.3 | 3.3 | 3.6 | Volt |
| | AVDD | - | 9.4 | 9.6 | 9.8 | Volt |
| | VGH | - | 16 | 18 | 20 | Volt |
| | VGL | - | -7 | -6 | -5 | Volt |
| Input Voltage | VCOM | | - | 3.2 | 4 | Volt |
| Power Supply Current for Driver | IVDD | DVDD=3.3V | - | 22.61 | 33.92 | mA |
| | IAVDD | AVDD=9.6V | - | 16.46 | 24.69 | mA |

### 6-2-2 TP Operating Conditions　　　(Ta=25℃ )

**Table 5-2: Power Supply**

| Item | Symbol | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|
| System power supply voltage | VDD | 2.8 | | 3.3 | V |
| Ambient operating temperature | $T_A$ | -40 | | 85 | ℃ |
| Junction Temperature | $T_J$ | | | 125 | ℃ |

**Table 5-3: DC Characteristics** $(T_{opr} = 25℃)$

| Item | Symbol | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|
| Input Voltage, High 1 | $(V_{IH1})$[1] | 1 | | | V |
| Input Voltage, High 2 | $(V_{IH2})$[2] | 1.3 | | | V |
| Input Voltage, Low | $(V_{IL})$ | | | 0.5 | V |
| Output Voltage, High 1 | $(V_{OH1})$[3] | | See Note3 | | V |
| Output Voltage, High 2 | $(V_{OH2})$[4] | $V_{VDD} - 0.1$ | | | V |
| Output Voltage, Low | $(V_{OL})$ | | | 0.1 | V |

Specifications are subjected to change without notice.

Notes:
1. $V_{IH1}$ includes pins CHIP_EN, SDA, SCL, INT
2. $V_{IH2}$ includes pin EXT_CLK
3. $V_{OH1}$ is for INT output voltage level which is programmable by registers. Typical values are 1.2V/1.5V/1.8V/$V_{VDD}$.
4. $V_{OH2}$ refers to other digital pins.

## 6-3 Timing Characteristics

### 6-3-1 TP    I²C interface
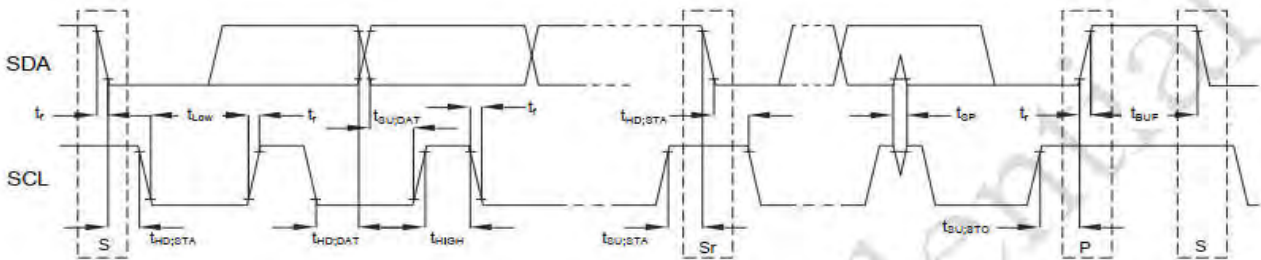


| Symbol | Parameter | 100KHz | | | 400KHz | | |
|---|---|---|---|---|---|---|---|
| | | Min | Max | Unit | Min | Max | Unit |
| $f_{SCL}$ | SCL clock frequency | 0 | 100 | kHz | 0 | 400 | KHz |
| $t_{HD;STA}$ | Hold time (repeated) START condition. After this period, the first clock pulse is generated | 4.0 | – | µs | 0.6 | – | µs |
| $t_{LOW}$ | LOW period of the SCL clock | 4.7 | – | µs | 1.3 | – | µs |
| $t_{HIGH}$ | HIGH period of the SCL clock | 4.0 | – | µs | 0.6 | – | µs |
| $t_{SU;STA}$ | Set-up time for a repeated START condition | 4.7 | – | µs | 0.6 | – | µs |
| $t_{HD;DAT}$ | Data hold time | 0 | 3.45 | µs | 0 | 0.9 | µs |
| $t_{SU;DAT}$ | Data set-up time | 250 | – | ns | 100 | – | ns |
| $t_r$ | Rise time of both SDA and SCL signals | – | 1000 | ns | – | 300 | ns |
| $t_f$ | Fall time of both SDA and SCL signals | – | 300 | ns | – | 300 | ns |
| $t_{SU;STO}$ | Set-up time for STOP condition | 4.0 | – | µs | 0.6 | – | µs |
| $t_{BUF}$ | Bus free time between a STOP and START condition | 4.7 | – | µs | 1.3 | – | µs |

### 6-3-2 TFT Timing Characteristics

**LVDS DC characteristic**

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Condition |
|---|---|---|---|---|---|---|
| Differential input high threshold voltage | RxVTH | | | +0.1V | V | RxVCM=1.2V |
| Differential input low threshold voltage | RxVTL | -0.1 | | | V | |
| Input voltage range(single-end) | RxVIN | 0 | | 2.4 | V | |
| Differential input common mode voltage | RxVCM | $|V_{ID}|/2$ | | $2.4 - |V_{ID}|/2$ | V | |
| Differential input voltage | $|V_{ID}|$ | 0.2 | | 0.6 | V | |
| Differential input leakage current | RxVTH | -10 | | +10 | V | |
| LVDS Digital Operating Current | Iddlvsd | - | 40(TBD) | 50 | mA | Fclk=65Mhz, VDD=3.3V |
| LVDS Digital Standby Current | Istlvds | - | 10(TBD) | 50 | uA | Clock & all functions are stop |
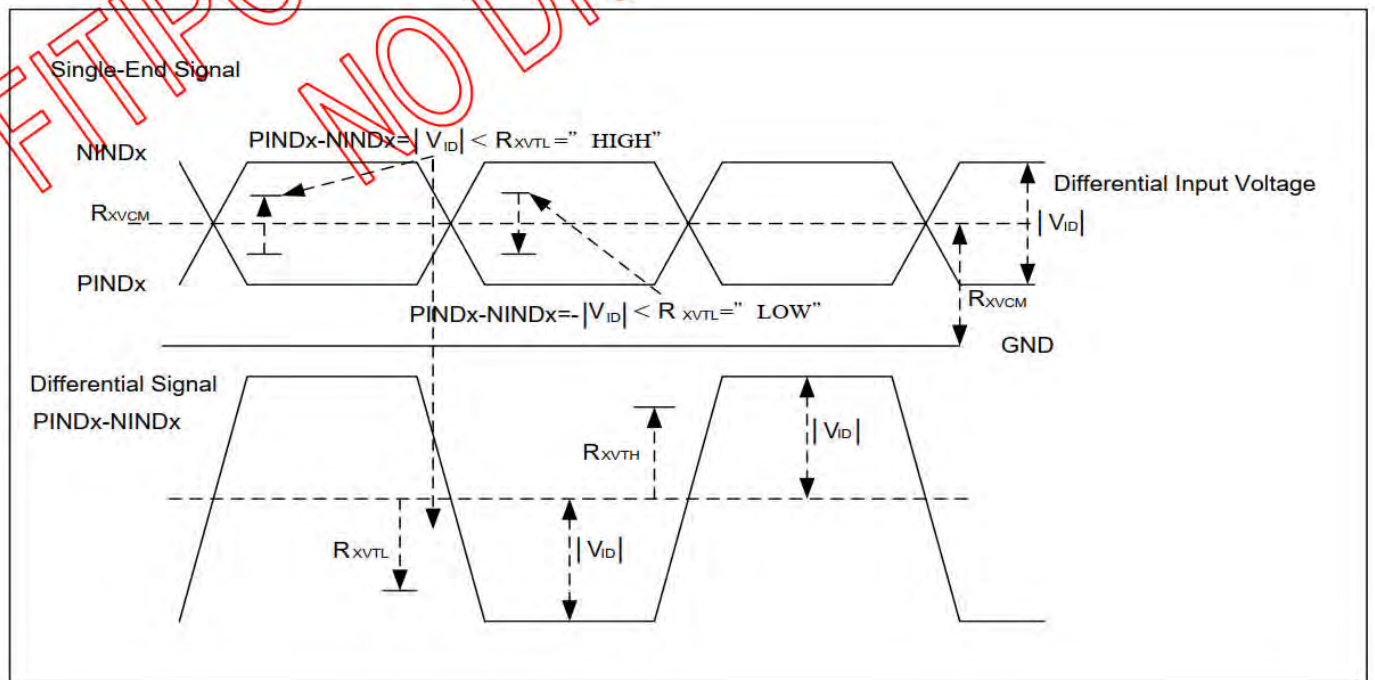
## 6-3-3 AC Electrical Characteristics

LVDS mode

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Clock Frequency | $R_{XFCLK}$ | | 20 | - | 71 | MHz |
| Input data skew margin | $T_{RSKM}$ | $|V_{ID}|$=400mV $R_{XVCM}$=1.2V $R_{XFCLK}$=71MHz | 500 | | | ps |
| Clock High Time | $T_{LVCH}$ | | | 4/(7* $R_{XFCLK}$) | | ns |
| | | | | | | ns |
| Clock Low Time | $T_{LVCL}$ | | | 3/(7* $R_{XFCLK}$) | | ns |
| PLL wake-up-time | $T_{enPLL}$ | | | | 150 | us |
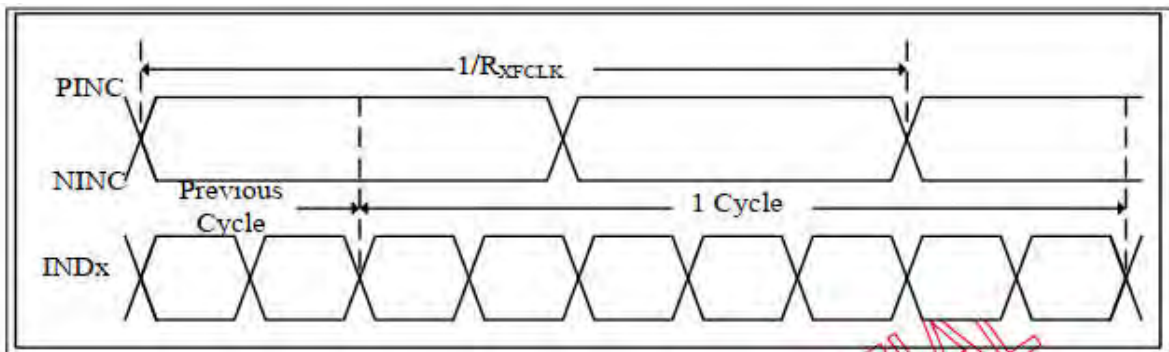


LVDS timing(1)
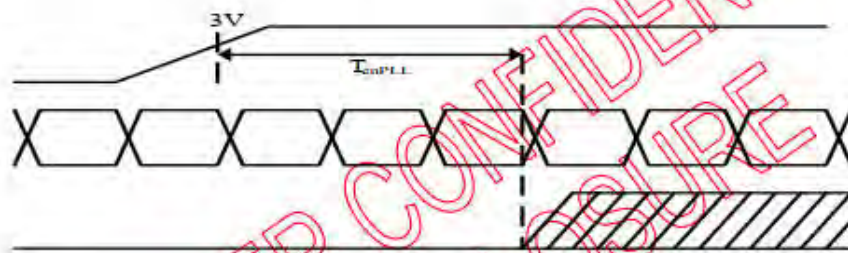


LVDS timing(2)
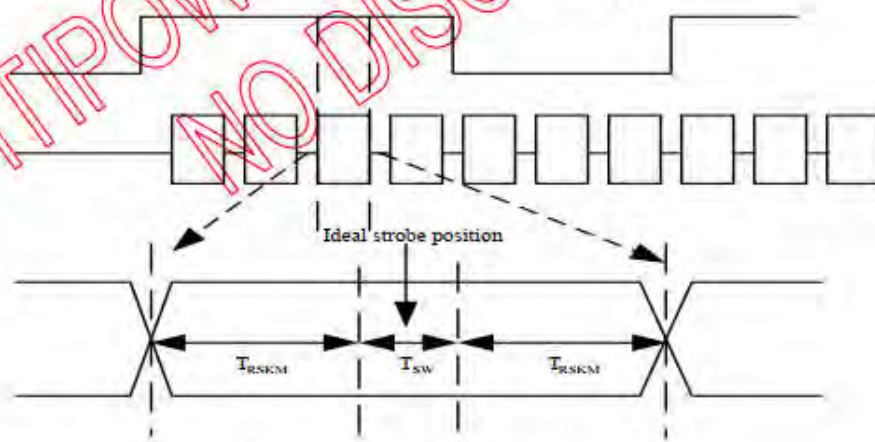


$T_{SW}$ :Receiver strobe position
$T_{RSKM}$ :Receiver strobe margin

Module P/N: YB-TG1024600S11A-C-A0
9

Doc.Version:02

## 6-3-4 Data Input Format for LVDS

### 6-bit LVDS input(HSD="H")

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| PCLK | | | | | | | | | |
| NCLK | | | | | | | | | |
| IND0 | R0 | G0 | R5 | R4 | R3 | R2 | R1 | R0 | G0 |
| IND1 | G1 | B1 | B0 | G5 | G4 | G3 | G2 | G1 | B1 |
| IND2 | B2 | DE | VS | HS | B5 | B4 | B3 | B2 | DE |
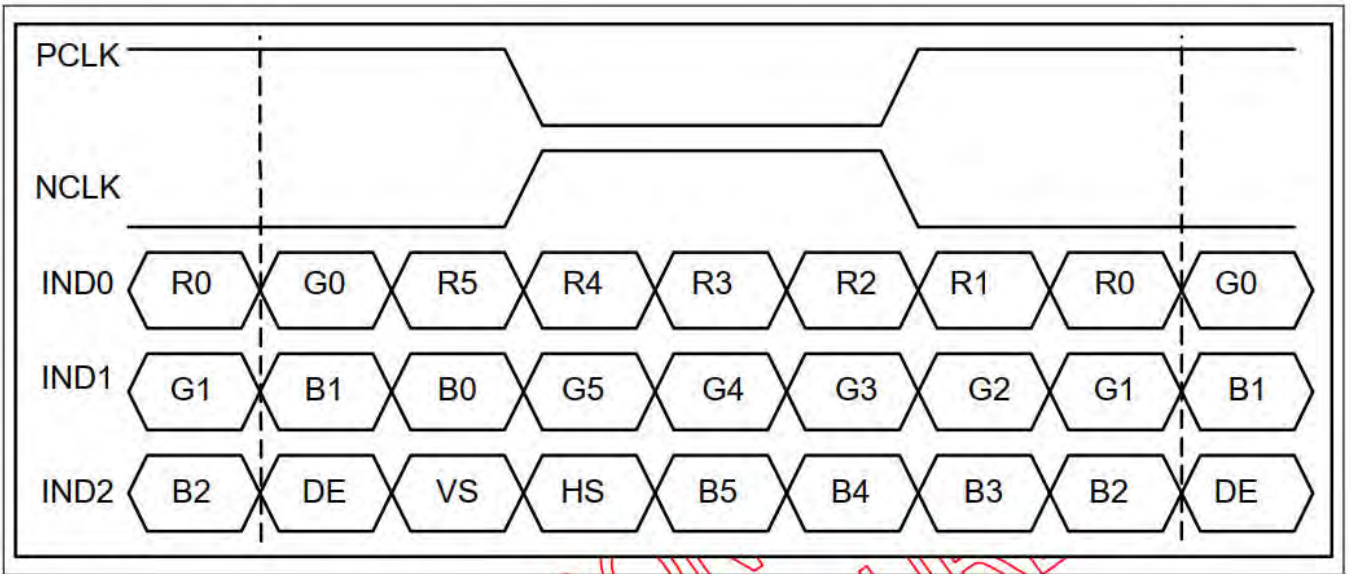
6-bit LVDS Input Timing chart

### 8-bit LVDS input(HSD="L")

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| PCLK | | | | | | | | | |
| NCLK | | | | | | | | | |
| IND0 | R0 | G0 | R5 | R4 | R3 | R2 | R1 | R0 | G0 |
| IND1 | G1 | B1 | B0 | G5 | G4 | G3 | G2 | G1 | B1 |
| IND2 | B2 | DE | VS | HS | B5 | B4 | B3 | B2 | DE |
| IND3 | R6 | - | B7 | B6 | G7 | G6 | R7 | R6 | - |
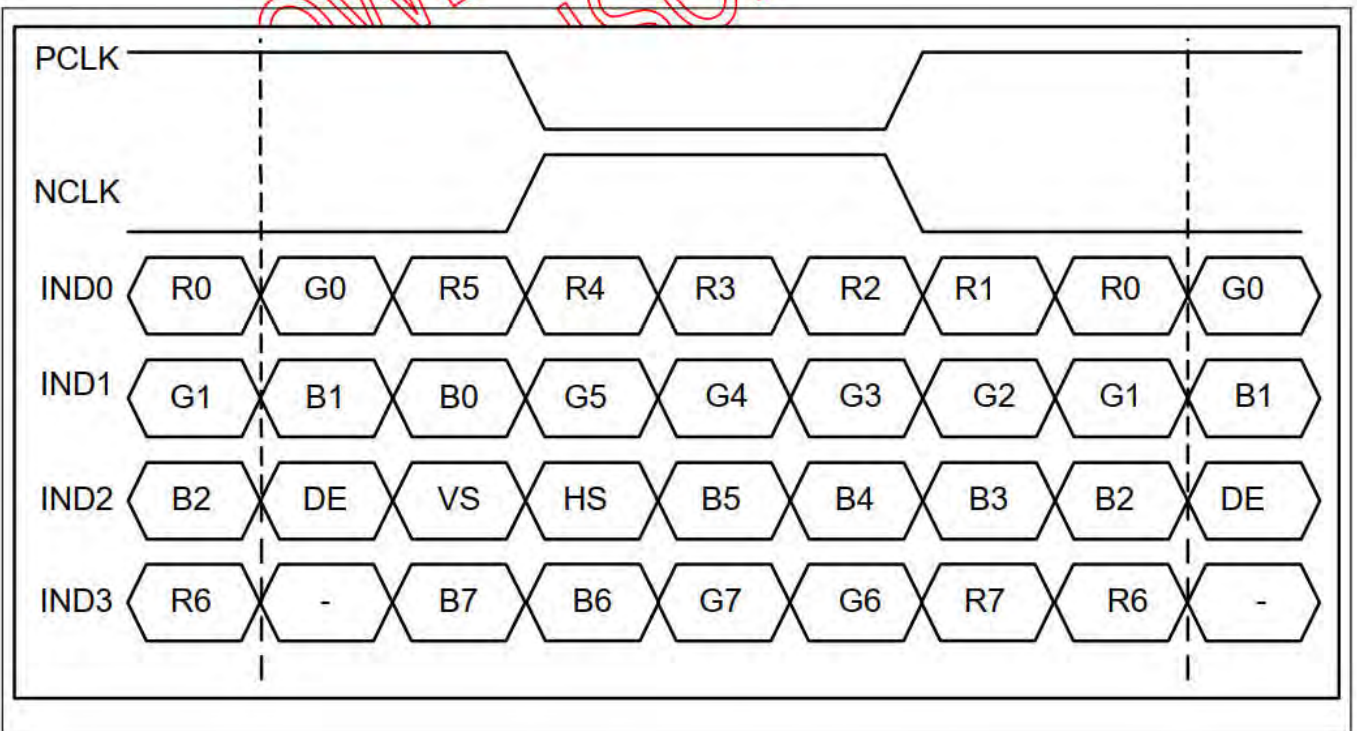
8-bit LVDS Input Timing chart

### 6-3-5 Power On/Off Sequence

In order to prevent IC from power on reset fail, the rising time (TPOR) of the digital power supply VDD should be maintained within the given specifications. Refer to "AC Characteristics" for more detail on timing



Power On/Off timing chart
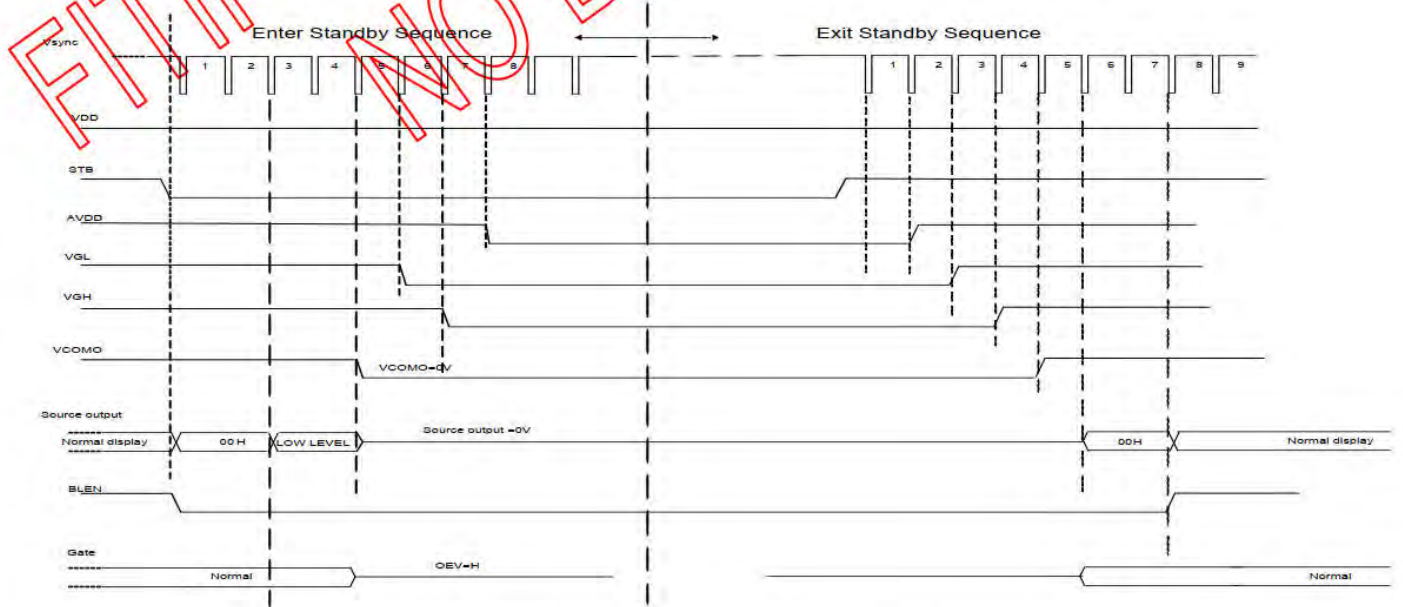


Enter and Exit Standby Mode timing chart

**6-3-6 Output Timing Table**

Output Timing Table

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Condition |
|-----------|--------|------|------|------|------|-----------|
| DCLK frequency | Fclk | - | 65 | 71 | MHz | VDD =2.3~3.6V |
| DCLK cycle time | Tclk | 14.1 | 15.4 | | ns | |
| DCLK pulse duty | Tcwh | 40 | 50 | 60 | % | Tclk |
| Time from HSD to Source Output | Thso | - | 64 | - | DCLK | |
| Time from HSD to LD | Thld | - | 64 | - | DCLK | |
| Time from HSD to STV | Thstv | - | 2 | - | DCLK | |
| Time from HSD to CKV | Thckv | - | 20 | - | DCLK | |
| Time from HSD to OEV | Thoev | - | 4 | - | DCLK | |
| LD pulse width | Twld | - | 10 | - | DCLK | |
| CKV pulse width | Twckv | - | 66 | - | DCLK | |
| OEV pulse width | Twoev | - | 74 | - | DCLK | |
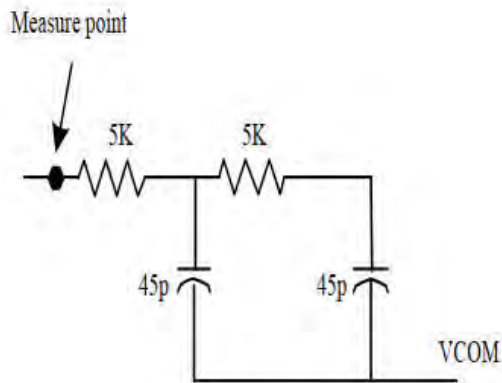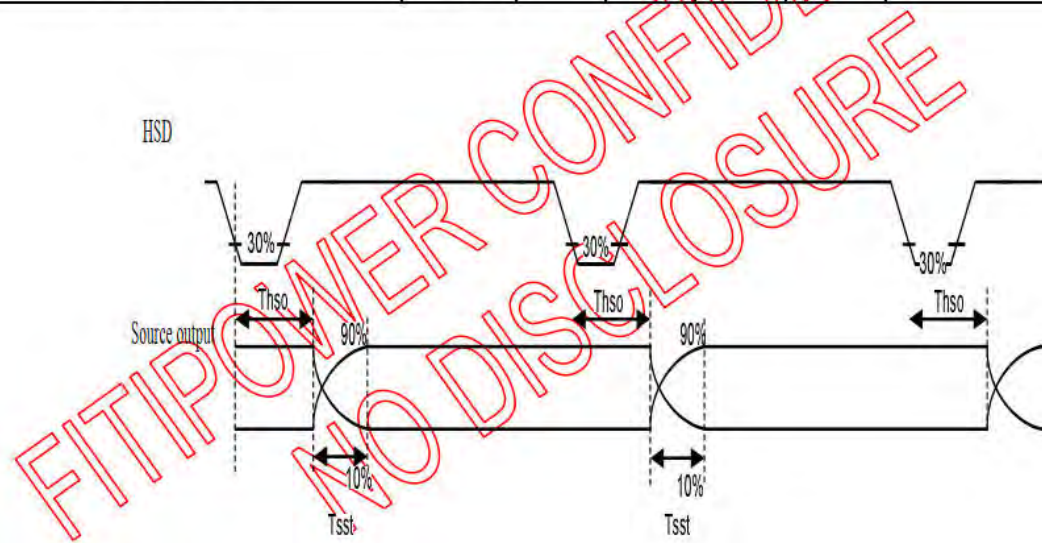


Source Output Timing

# 7. Optical Characteristics:

| Item | | Symbol | Conditions | Specifications | | | Unit | Note |
|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | | |
| Transmittance (With PL) | | T(%) | - | 4.8 | 5.0 | - | - | - |
| Contrast Ratio | | CR | Θ=0 Normal Viewing Angle | 500 | 800 | - | - | (1) (2) |
| Response Time | | TR+TF | - | - | 25 | 40 | ms | (1) (3) |
| Viewing angle | Hor | Θx+ | CR≧10 | - | 85 | - | deg. | - |
| | | Θx- | | - | 85 | - | | |
| | Ver | Θy+ | | - | 85 | - | | |
| | | Θy- | | - | 85 | - | | |

Measuring Condition
1. Measuring surrounding: dark room
2. Ambient temperature: 25±2℃
3. 30 min. Warm-up time.

Color of CIE Coordinate:

| Item | | Symbol | Condition | Min. | Typ. | Max. |
|---|---|---|---|---|---|---|
| Chromaticity Coordinates (Transmissive) | Red | x | $\theta = \phi = 0°$ LED Backlight | 0.556 | 0.606 | 0.656 |
| | | y | | 0.293 | 0.343 | 0.393 |
| | Green | x | | 0.295 | 0.345 | 0.395 |
| | | y | | 0.526 | 0.576 | 0.626 |
| | Blue | x | | 0.100 | 0.150 | 0.200 |
| | | y | | 0.058 | 0.108 | 0.158 |
| | White | x | | 0.273 | 0.323 | 0.373 |
| | | y | | 0.302 | 0.352 | 0.402 |

Note (1) Definition of Viewing Angle :
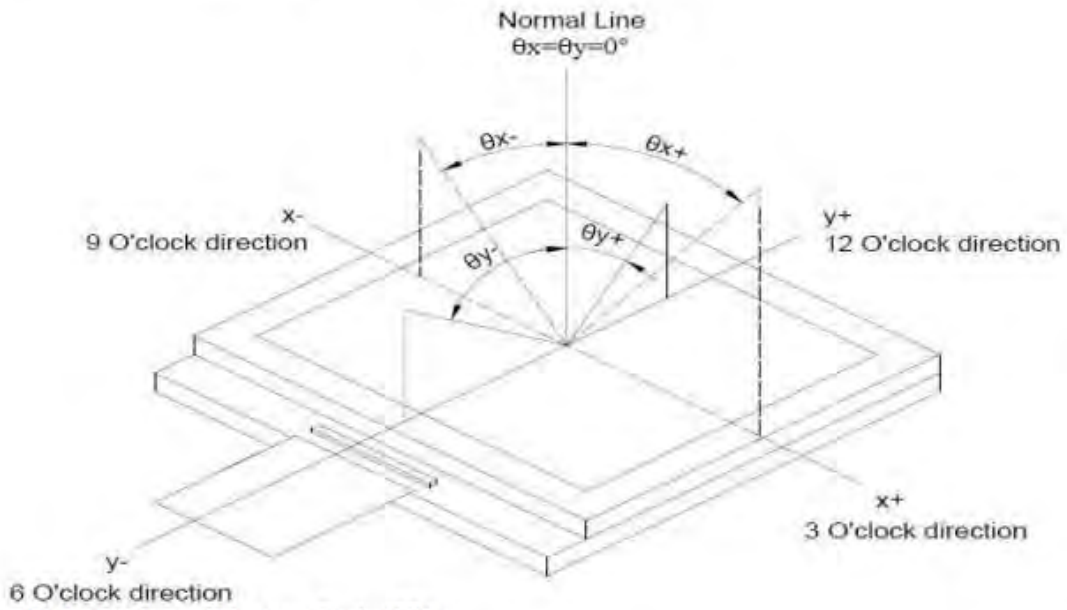


Note (2) Definition of Contrast Ratio(CR) :
　　　　　measured at the center point of panel

$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at "White" state}}{\text{Photo detector output when LCD is at "Black}}$$

Note (3) Definition of Response Time : Sum of TR and TF



Module P/N: YB-TG1024600S11A-C-A0　　　　　　　　　14

Doc.Version:02
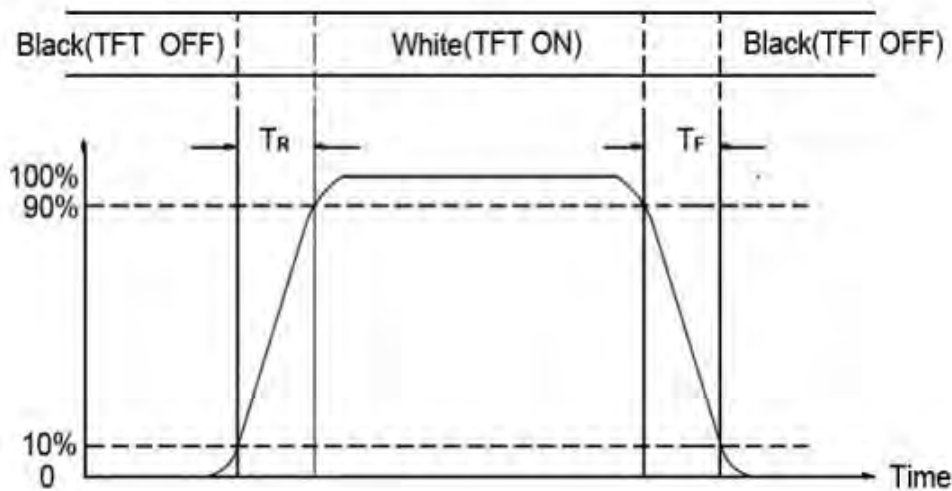
# 8. Interface Pin Assignment:

## 8-1 LCM FPC Interface

| No. | Symbol | Function |
|---|---|---|
| 1 | VCOM | Common Voltage |
| 2 | VDD | Power Voltage |
| 3 | VDD | Power Voltage |
| 4 | BIST | Normal Operation/BIST pattern select. Normally pull low<br>BIST = H : BIST(DCLK input is not needed)<br>BIST = L : Normal Operation |
| 5 | RESET | Global reset pin. Active Low to enter Reset State. Normally pull high. |
| 6 | STBYB | Standby mode & Normally pulled high.<br>STBYB = "1", normal operation<br>STBYB = "0", timing controller, source driver will turn off, all output are High-Z |
| 7 | GND | Power Ground |
| 8 | RXIN0- | -LVDS differential data input |
| 9 | RXIN0+ | +LVDS differential data input |
| 10 | GND | Power Ground |
| 11 | RXIN1- | -LVDS differential data input |
| 12 | RXIN1+ | +LVDS differential data input |
| 13 | GND | Power Ground |
| 14 | RXIN2- | -LVDS differential data input |
| 15 | RXIN2+ | +LVDS differential data input |
| 16 | GND | Power Ground |
| 17 | RXCLKIN- | -LVDS differential clock input |
| 18 | RXCLKIN+ | +LVDS differential clock input |
| 19 | GND | Power Ground |
| 20 | RXIN3- | -LVDS differential data input |
| 21 | RXIN3+ | +LVDS differential data input |
| 22 | GND | Power Ground |
| 23 | NC | No Connect |
| 24 | NC | No Connect |
| 25 | GND | Power Ground |
| 26 | NC | No Connect |
| 27 | DIMO | Backlight dimmer signal for external controller.<br>DIMO = "0", Turn off external backlight controller<br>DIMO = "1", Logical control signal to turn on external backlight controller |
| 28 | SELB | 6 bit/8 bit mode select                                        Note1 |

| 29 | AVDD | Power for Analog Circuit | |
|----|------|-------------------------|---|
| 30 | GND | Power Ground | |
| 31 | LED_K | LED Cathode | |
| 32 | LED_K | LED Cathode | |
| 33 | L/R | Horizontal inversion | Note2 |
| 34 | U/D | Vertical inversion | Note2 |
| 35 | VGL | Gate OFF Voltage | |
| 36 | VGH | Gate on Voltage | |
| 37 | LED_A | LED Anode | |
| 38 | LED_A | LED Anode | |
| 39 | GND | Power Ground | |
| 40 | VDD-CTP | Voltage for digital circuit | |
| 41 | INT-CTP | Indicate coordinate data ready | |
| 42 | SCL-CTP | I2C Serial Clock Power | |
| 43 | SDA-CTP | I2C Serial Data | |
| 44 | RESET-CTP | System reset signal input, active low | |
| 45 | GND-CTP | Power Ground | |

Note1: If LVDS input data is 6 bits ,SELB must be set to High;
    If LVDS input data is 8 bits ,SELB must be set to Low.
Note2: When L/R="0", set right to left scan direction.
    When L/R="1", set left to right scan direction.
    When U/D="0", set top to bottom scan direction.
    When U/D="1", set bottom to top scan direction.

# 9.Block Diagram:

LCD PANNEL
1024(RGB) X 600 PIXELS

Back Light

Source + Gate Driver IC

CTP

CTP    IC

45 PIN TFT Interface
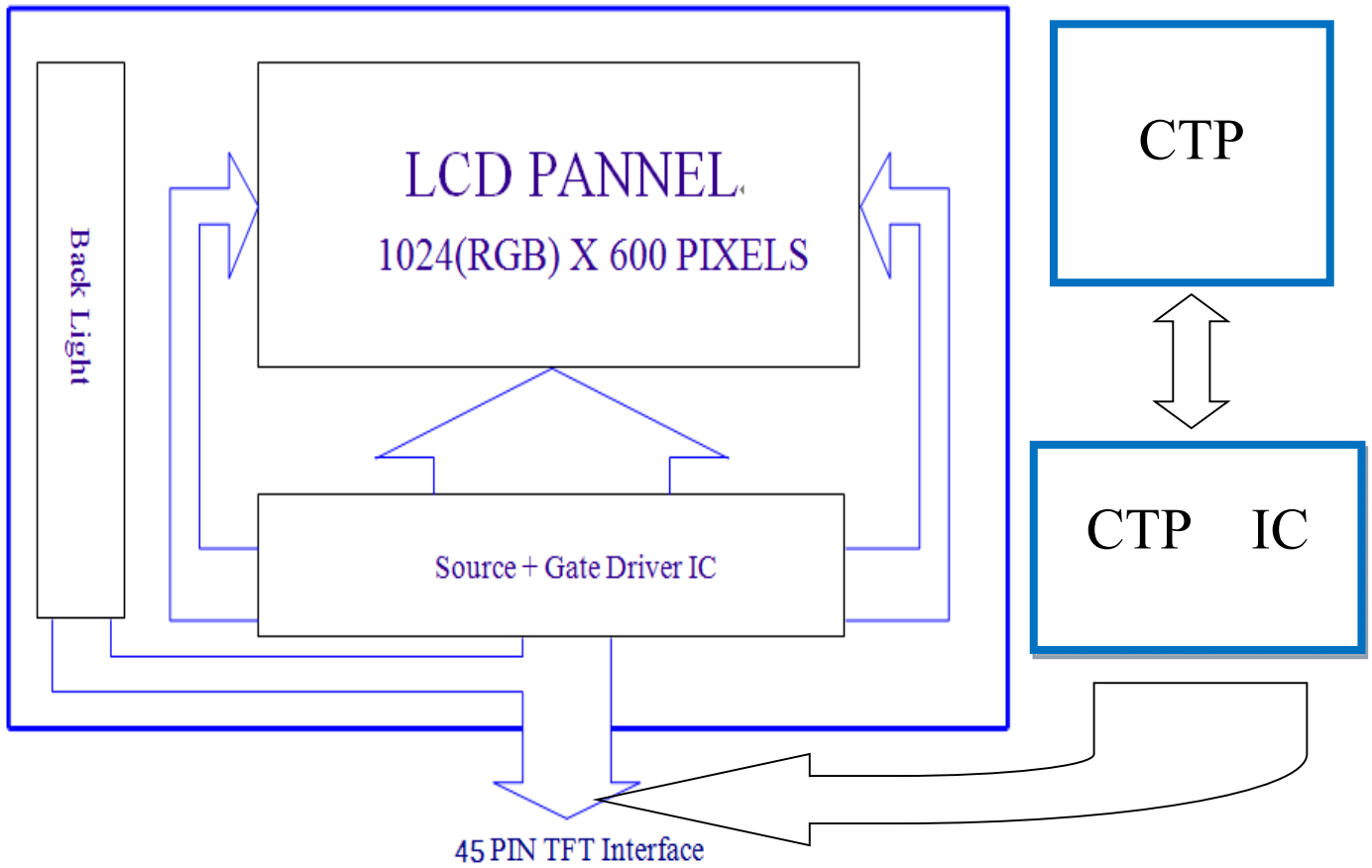
## 10. Backlight:

1. Standard Lamp Styles (Edge Lighting Type):

The LED chips are distributed over the edge light area of the illumination unit, which gives the less power consumption:

2. The Main Advantages of the LED Backlight are as following:
  2.1 The brightness of the backlight can simply be adjusted.
     By a resistor or a potentiometer.

### 3. Data About LED Backlight: (Ta=25℃)

| PARAMETER | Sym. | Min. | Typ. | Max. | Unit | Test Condition | Note |
|---|---|---|---|---|---|---|---|
| Supply Current | I | - | 160 | - | mA | -- | -- |
| Voltage of the Backlight | $V_{BL}$ | 10.8 | 12.4 | 14.0 | V | | -- |
| Luminous Intensity for LCM | IV | 510 | 600 | - | cd/m$^2$ | If=160mA | 2 |
| Uniformity for LCM | - | 70 | - | - | % | | 3 |
| LED Life Time | - | 20000 | - | - | Hr | | 4 |
| Color | | | | White | | | |

NOTE:
1. Backlight Only
2. Average Luminous Intensity of P1-P13
3. Uniformity = Min/Max * 100%
4. LED life time defined as follows: The final brightness is at 50% of original brightness

**Measured Method: (X*Y: Light Area)**          **Internal Circuit Diagram**
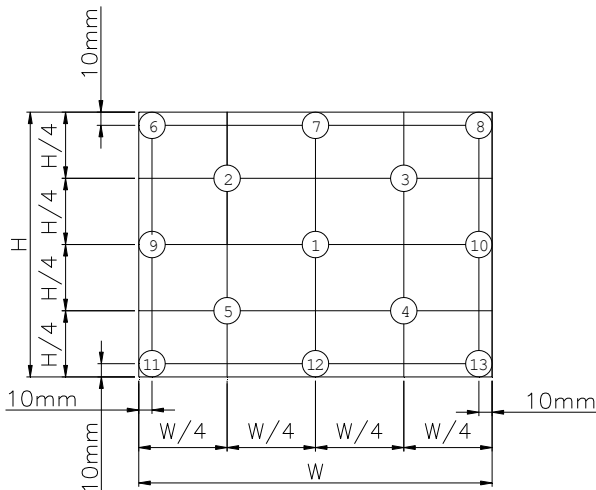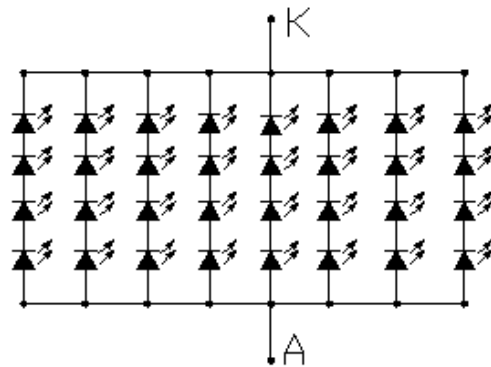


CIRCUIT DIAGRAM
B/L Electrical Circuit

**(Effective spatial Distribution)**
  Using aperture of 1°,distance 50cm.

## 11. Standard Specification for Reliability:

11–1. Standard Specifications for Reliability of LCD Module

| No | Item | Description |
|---|---|---|
| 01 | High temperature operation | The sample should be allowed to stand at 70℃ for 120 hours under driving condition and then returning it to normal temperature condition, and allowing it stand for 2 hours. |
| 02 | Low temperature operation | The sample should be allowed to stand at -20℃ for 120 hours under driving condition and then returning it to normal temperature condition, and allowing it stand for 2 hours. |
| 03 | High temperature storage | The sample should be allowed to stand at 80℃ for 240 hours under no-load condition, and then returning it to normal temperature condition, and allowing it stand for 2 hours. |
| 04 | Low temperature storage | The sample should be allowed to stand at -30℃ for 240 hours under no-load condition, then returning it to normal temperature condition, and allowing it stand for 2 hours. |
| 05 | Moisture storage | The sample should be allowed to stand at 60℃,90%RH MAX for 240　hours under no-load condition, then taking it out and drying it at normal temperature for 2 hours. |
| 06 | Thermal shock storage | The sample should be allowed to stand the following 10 cycles : -30℃ for 30 minutes → normal temperature for 5 minutes → +80℃ for 30 minutes → normal temperature for 5 minutes, as one cycle. |
| 07 | Packing vibration | Frequency range : 10Hz ~ 55Hz<br>Amplitude of vibration : 1.5mm　　　Sweep time: 12 min<br>X,Y,Z 2 hours for each direction. |
| 08 | Packing drop test | According to ISTA 1A 2001. |

*Sample size for each test item is 3~5pcs

11 - 2. Testing Conditions and Inspection Criteria

For the final test the testing sample must be stored at room temperature for 24 hours, after the tests listed in Table 11.2, Standard specifications for Reliability have been executed in order to ensure stability.

| No | Item | Test Model | In section Criteria |
|----|------|-----------|---------------------|
| 01 | Current Consumption | Refer To Specification | The current consumption should conform to the product specification. |
| 02 | Contrast | Refer To Specification | After the tests have been executed, the contrast must be larger than half of its initial value prior to the tests. |
| 03 | Appearance | Visual inspection | Defect free. |

11-3. MTBF

| | |
|---|---|
| MTBF | Functions, performance, appearance, etc. shall be free from remarkable deterioration within 50,000 hours under ordinary operating and storage conditions room temperature (25±5℃), normal humidity (50±10% RH), and in area not exposed to direct sun light. |

## 12. Specification of Quality Assurance:

12-1. Pupose

This standard for Quality Assurance should affirm the quality of LCD module products to supply to purchaser by YEEBO CORPORATION (Supplier).

12-2. Standard for Quality Test

a. Inspection:

Before delivering, the supplier should take the following tests, and affirm the quality of product.

b. Electro-Optical Characteristics:

According to the individual specification to test the product.

c. Test of Appearance Characteristics:

According to the individual specification to test the product.

d. Test of Reliability Characteristics:

According to the definition of reliability on the specification for testing products.

e. Delivery Test:

Before delivering, the supplier should take the delivery test.

(i) Test method: According to MIL-STD105E.General Inspection Level Ⅱ take a single time.

(ii) The defects classify of AQL as following:

Major defect: AQL = 0.65%

Minor defect: AQL = 2.5%

Total defects: AQL = 2.5%

12-3. Non- conforming Analysis & Deal With Manners

a. Non- conforming Analysis:

(i) Purchaser should supply the detail data of non- conforming sample and the non- conforming.

(ii) After accepting the detail data from purchaser, the analysis of non- conforming should be finished in two weeks.

(iii) If supplier can not finish analysis on time, must announce purchaser before 3 days.

b. Disposition of non- conforming:

(i) If find any product defect of supplier during assembly time, supplier must change the good product for every defect after recognition.

(ii) Both supplier and customer should analyze the reason and discuss the disposition of non- conforming when the reason of nonconforming is not sure.

12-4. Agreement items

Both sides should discuss together when the following problems happen.

a. There is any problem of standard of quality assurance, and both sides should think that must be modified.

b. There is any argument item which does not record in the standard of quality assurance.

c. Any other special problem.

12-5. Standard of The Product Appearance Test
      a. Manner of appearance test:
       (i) The test must be under 20W × 2 or 40W fluorescent light, and the distance of view must be at 30±5cm.
       (ii) When test the model of transmissive product must add the reflective plate.
       (iii)The test direction is base on around 10° of vertical line.
       (iiii)Temperature: 25±5℃     Humidity: 60±10%RH

eyes          eyes

10°      10°
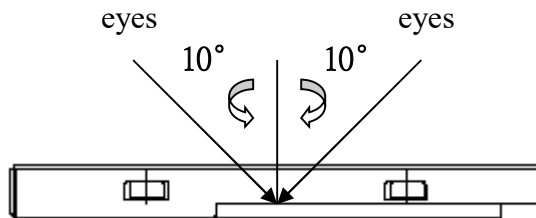
(iv) Definition of area:
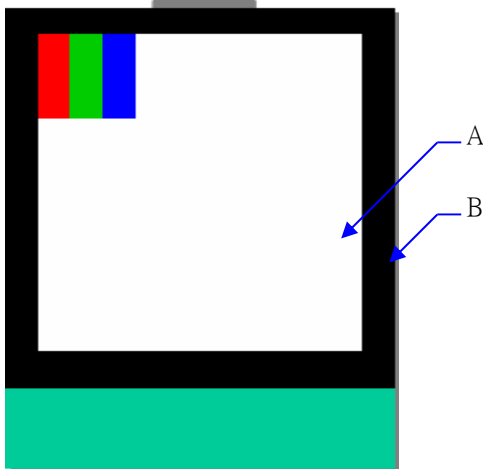


A. Area: Viewing area.
B. Area: Out of viewing area.
      (Outside viewing area)

b. Basic principle:
  (i) It will accord to the AQL when the standard can not be described.
  (ii) The sample of the lowest acceptable quality level must be discussed by both supplier and customer when any dispute happened.
  (iii) Must add new item on time when it is necessary.
  c. Standard of inspection: (Unit: mm)
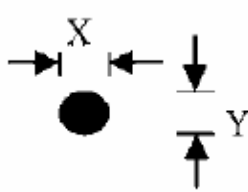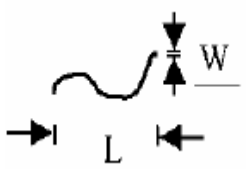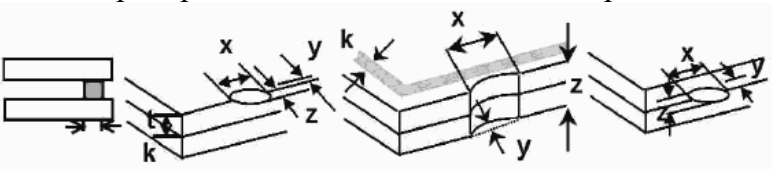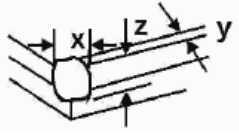
12-6. Inspection specification
Defect out of viewing area can be neglected.

| NO | Item | Criterion | AQL |
|---|---|---|---|
| 01 | Electrical Testing | 1.1 Missing vertical, horizontal segment, segment contrast defect.<br>1.2 Missing character, dot or icon.<br>1.3 Display malfunction.<br>1.4 No function or no display.<br>1.5 Current consumption exceeds product specifications.<br>1.6 LCD viewing angle defect.<br>1.7 Mixed product types.<br>1.8 Flicker | **0.65** |
| 02 | Black or White spots or Bright spots or Color spots on LCD (Display only) | 2.1 White and black or color spots on display $\leqq$ 0.25mm, no more than Five spots.<br>2.2 Densely spaced: No more than three spots within 3mm.<br><span style="color:red">2.3 Not visible through 5% ND filter</span> | **2.5** |
| 03 | LCD and Touch Panel black spots, white spots, contamination | 3.1 Round type: As following drawing<br>$\Phi = (X+Y) / 2$<br><br>* Densely spaced: No more than two spots within 3mm.<br><br>3.2 Line type: (As following drawing)<br><br>* Densely spaced: No more than two lines within 3mm. | **2.5** |

3.1 Round type table:

| Size(mm) | Acceptable Q'ty |
|---|---|
| ≤0.25 | ignored (No more than five spots within 5mm) |
| 0.25＜D≤0.5 | 3 |
| 0.5＜D≤0.8 | 2 |
| 0.8＜D≤1.5 | 1 |
| D＞1.5 | NG |

3.2 Line type table:

| Length(mm) | Width(mm) | Acceptable Q'ty |
|---|---|---|
| ≤0.05 | ≤6 | ignored (No more than five lines within 5mm) |
| 0.05＜W≤0.25 | ≤6 | 2 |
| W＞0.25 | | NG |

| NO | Item | Criterion | AQL |
|---|---|---|---|
| 04 | Polarizer | | 2.5 |

Module P/N: YB-TG1024600S11A-C-A0                                      23

Doc.Version:02

| | bubbles | If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction | | |
|---|---|---|---|---|

| Size Φ(mm) | Acceptable Q'ty | Area |
|---|---|---|
| Φ≦0.15 | Accept no dense | V.A |
| 0.15< Φ≦0.3 | 3 | V.A |
| 0.30< Φ≦0.5 | 1 | V.A |
| 0.50< Φ≦1 | 2 | Out of V.A |
| 1< Φ | 0 | - |

| 05 | Scratches | Follow NO.3 -2 Line Type. | |
|---|---|---|---|
| 06 | Mura | Not visible through 5% ND filter in 50% gray. | **2.5** |

| 07 | Chipped glass | Symbols:<br>x: Chip length    y: Chip width    z: Chip thickness<br>k: Seal width    t: Glass thickness    a: LCD side length<br>L: Electrode pad length<br>6.1 General glass chip:<br>6.1.1 Chip on panel surface and crack between panels: | 2.5 |
|---|---|---|---|



| z: Chip thickness | y: Chip width | x: Chip length |
|---|---|---|
| Z≦1/2t | Not over viewing area | x≦1/8a |
| 1/2t< z≦2t | Not exceed 1/3k | x≦1/8a |

⊙ Unit: mm

⊙ If there are 2 or more chips, x is the total length of each chip

6.1.2 Corner crack:



| z: Chip thickness | y: Chip width | x: Chip length |
|---|---|---|
| Z≦1/2t | Not over viewing area | x≦1/8a |
| 1/2t< z≦2t | Not exceed 1/3k | x≦1/8a |

⊙ Unit: mm

⊙ If there are 2 or more chips, x is the total length of each chip

| NO | Item | Criterion | AQL |
|---|---|---|---|

Module P/N: YB-TG1024600S11A-C-A0          24

| 08 | Glass crack | Symbols:<br>x: Chip length　　y: Chip width　　z: Chip thickness<br>k: Seal width　　　t: Glass thickness　a: LCD side length<br>L: Electrode pad length<br>7.2 Protrusion over terminal:<br>7.2.1 Chip on electrode pad:<br><br><br><br>
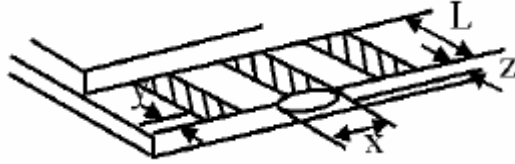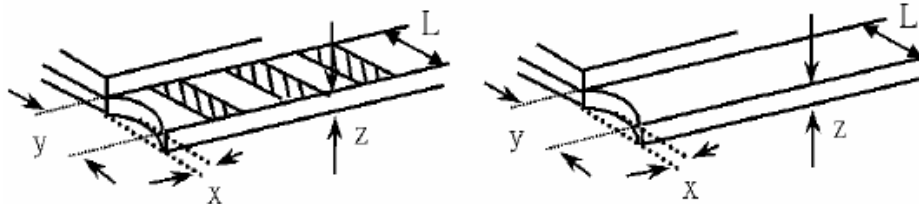
| y: Chip width | x: Chip length | z: Chip thickness |
|---|---|---|
| y≦0.5mm | x≦1/8a | 0< z≦t |

7.2.2

Non-conductive portion:



| y: Chip width | x: Chip length | z: Chip thickness |
|---|---|---|
| y≦L | x≦1/8a | 0< z≦t |

⊙ If there chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications.

⊙ If the product will be heat sealed by the customer, the alignment mark must mot be damaged.
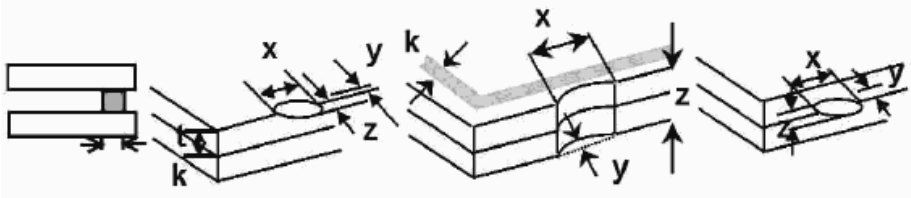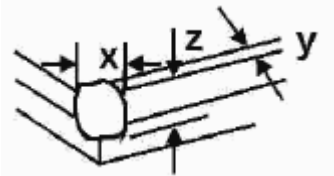
7.2.3 Substrate protuberance and internal crack
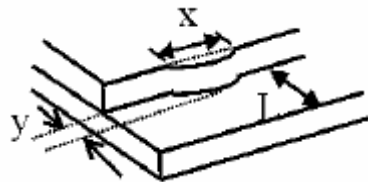


| y: width | x: length |
|---|---|
| y≦1/3L | X≦a |
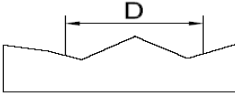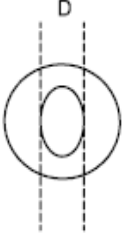
AQL: 2.5

| NO | Item | Criterion | AQL |
|---|---|---|---|

| 09 | Cracked glass | The LCD with extensive crack is not acceptable. | 2.5 |
|---|---|---|---|
| 10 | Backlight elements | 9.1 Illumination source flickers when lit.<br>9.2 Spots or scratches that appear when lit must be judged. Using LCD spot, lines and contamination standards.<br>9.3 Backlight doesn't light or color is wrong. | 2.5<br>2.5<br>0.65 |
| 11 | Bezel | Bezel must comply with product specifications. | 2.5 |
| 12 | PCB、COB | 11.1 COB seal may not have pinholes larger than 0.2mm or contamination.<br>11.2 COB seal surface may not have pinholes through to the IC.<br>11.3 The height of the COB should not exceed the height indicated in the assembly diagram.<br>11.4 There may not be more than 2mm of sealant outside the seal area on PCB. And there should be no more than three places.<br>11.5 Parts on PCB must be the same as on the production characteristic chart, There should be no wrong parts, missing parts or excess parts.<br>11.6 The jumper on the PCB should conform to the product characteristic chart. | 2.5<br>2.5<br>2.5<br>2.5<br>0.65<br>0.65 |
| 13 | FPC | 12.1 FPC terminal damage ≦ 1/2 FPC terminal width and can not affect the function , we judge accept.<br>12.2 FPC alignment hole damage ≦ 1/2 alignment area and can not affect the function , we judge accept. | 2.5<br>2.5 |
| 14 | Soldering | 13.1 No cold solder joints, missing solder connections, oxidation or icicle.<br>13.2 No short circuits in components on PCB or FPC. | 2.5<br>0.65 |

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**YEEBO GROUP**

| NO | Item | Criterion | AQL |
|---|---|---|---|
| 15 | Touch Panel Chipped glass | Symbols:<br>x: Chip length　　y: Chip width　　z: Chip thickness<br>k: Seal width　　　t: Touch Panel Total thickness　a: LCD side length<br>L: Electrode pad length<br>14.1 General glass chip:<br>14.1.1 Chip on panel surface and crack between panels:<br><br><br><br>(see table below)<br>⊙ Unit: mm<br>⊙ If there are 2 or more chips, x is the total length of each chip<br><br>14.1.2 Corner crack:<br><br><br><br>(see table below)<br>⊙ Unit: mm<br>⊙ If there are 2 or more chips, x is the total length of each chip | 2.5 |

Table for 14.1.1:

| z: Chip thickness | y: Chip width | x: Chip length |
|---|---|---|
| $Z \leqq t$ | $\leqq 1/2$ k and not over viewing area | $x \leqq 1/8a$ |

Table for 14.1.2:

| z: Chip thickness | y: Chip width | x: Chip length |
|---|---|---|
| $z \leqq t$ | $\leqq 1/2$ k and not over viewing area | $x \leqq 1/8a$ |

| NO | Item | Criterion | | AQL |
|---|---|---|---|---|
| 16 | Touch Panel(Fish | SIZE(mm) | Acceptable Q'ty | 2.5 |

Module P/N: YB-TG1024600S11A-C-A0

27

Doc.Version:02

| | | | | |
|---|---|---|---|---|
| eye、dent and bubble on film) | Φ≦0.2 | Accept no dense | | |
| | 0.2< D ≦0.4 | 5 | | |
| | 0.4< D ≦0.5 | 2 | | |
| | 0.5< D | 0 | | |

| 17 | Touch Panel Newton ring | Newton ring dimension ≦ 1/2 touch panel area and not affect font and line distortion(≦2.5%) , it is acceptable. | 2.5 |
|---|---|---|---|
| 18 | Touch Panel Linearity | Less than 2.5% is acceptable. | 2.5 |
| 19 | LCD Ripple | Touch the touch panel , can not see the LCD ripple.<br>Pen: R 1.0mm silicon rubber.<br>Operation Force: 80g | 2.5 |
| 20 | General appearance | 19.1 Pin type must match type in specification sheet.<br>19.2 LCD pin loose or missing pins.<br>19.3 Product packaging must the same as specified on packaging specification sheet.<br>19.4 Product dimension and structure must conform to product specification sheet. | 0.65<br>0.65<br>0.65<br>0.65 |

# 13. Handling Precaution:

13-1 Handling of LCM

- Don't give external shock.
- Don't apply excessive force on the surface.
- Liquid in LCD is hazardous substance. Must not lick and swallow. when the liquid is attach to your hand, skin, cloth etc. Wash it out thoroughly and immediately.
- Don't operate it above the absolute maximum rating.
- Don't disassemble the LCM.
- The operators should be grounded whenever he/she comes into contact with the module. Never touch any of the conductive parts such as the LSI pads,the copper leads on the PCB and the interface terminals with any parts of the human body.
- The modules should be kept in antistatic bags or other containers resistant to static for storage.
- The module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

13-2 Storage

- Store in an ambient temperature of $25\pm10℃$, and in a relative humidity of $50\pm10\%RH$. Don't expose to sunlight or fluorescent light.
- Storage in a clean environment, free from dust, active gas, and solvent.
- Store in anti-static electricity container.
- Store without any physical load.

13-3 Soldering

- Use only soldering irons with proper grounding and no leakage.
- Iron: No higher than $310\pm10℃$ and less than 3 sec during Hand soldering.
- Rewiring: no more than 2 times.

# 14. Warranty

This product has been manufactured to specifications as a part for use in your company's general electronic products. It is guaranteed to perform according to delivery specifications. For any other use apart from general electronic equipment, we will not take responsibility if the product is used in medical devices, nuclear power control equipment, aerospace equipment, fire and security systems, or any other applications in which there is a direct risk to human life and where extremely high levels of reliability are required. If the product is to be used in any of the above applications, we will need to enter into a separate product liability agreement.

1. We cannot accept responsibility for any defect arise after additional process of the product (including disassembly and reassembly), after product delivery.

2. We cannot accept responsibility for any defect, which may arise after the application of strong external force to the product.

3. We cannot accept responsibility for any defect, which may arise due to the application of static electricity after the product has passed your company's acceptance inspection procedures.

4. We can not accept responsibility for industrial property, which may arise through the use of your product , with exception to those issues relating directly to the structure or method of manufacturing of our product within one year from YEEBO shipment.

5. For Heatseal Product which required to heatseal by customer side, parts must be used within three months after delivery from factory.

6. For TAB Product which required to solder by customer side, parts must be used within three

months after delivery from factory.

7. The liability of YB is limited to repair or replacement on the terms set forth below. YB will not be responsible for any subsequent or consequential events or injury or damage to any personnel or user including third party personnel and/or user. Unless otherwise agreed in writing between YB and the customer, YB will only replace or repair any of its LCD which is found defective electrically or visually when inspected in accordance with YB GENERAL LCD INSPECTION STANDARD.

## 15. Guarantee:

Our products meet requirements of the environment.
YEEBO ROHS requirement is based on European Union Directive 2011/65/EU(ROHS) Requirements and Update.

# ANSPRECHPARTNER



Für Fragen stehe ich Ihnen gerne persönlich zur Verfügung,

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