| 标准文本 | 产品规格书 | 型号 | S92048-AAA | | |
|---|---|---|---|---|---|

**1. 概述**

1-1范围:

1-2 产品:

LCD 模块 (LCM)

1-3 型号:

S92048-AAA

**2. 产品特征**

(1) 显示类型：5.0" a-Si TFT; 800RGB*480dots; 12 O'clock; transmissive; normally white;

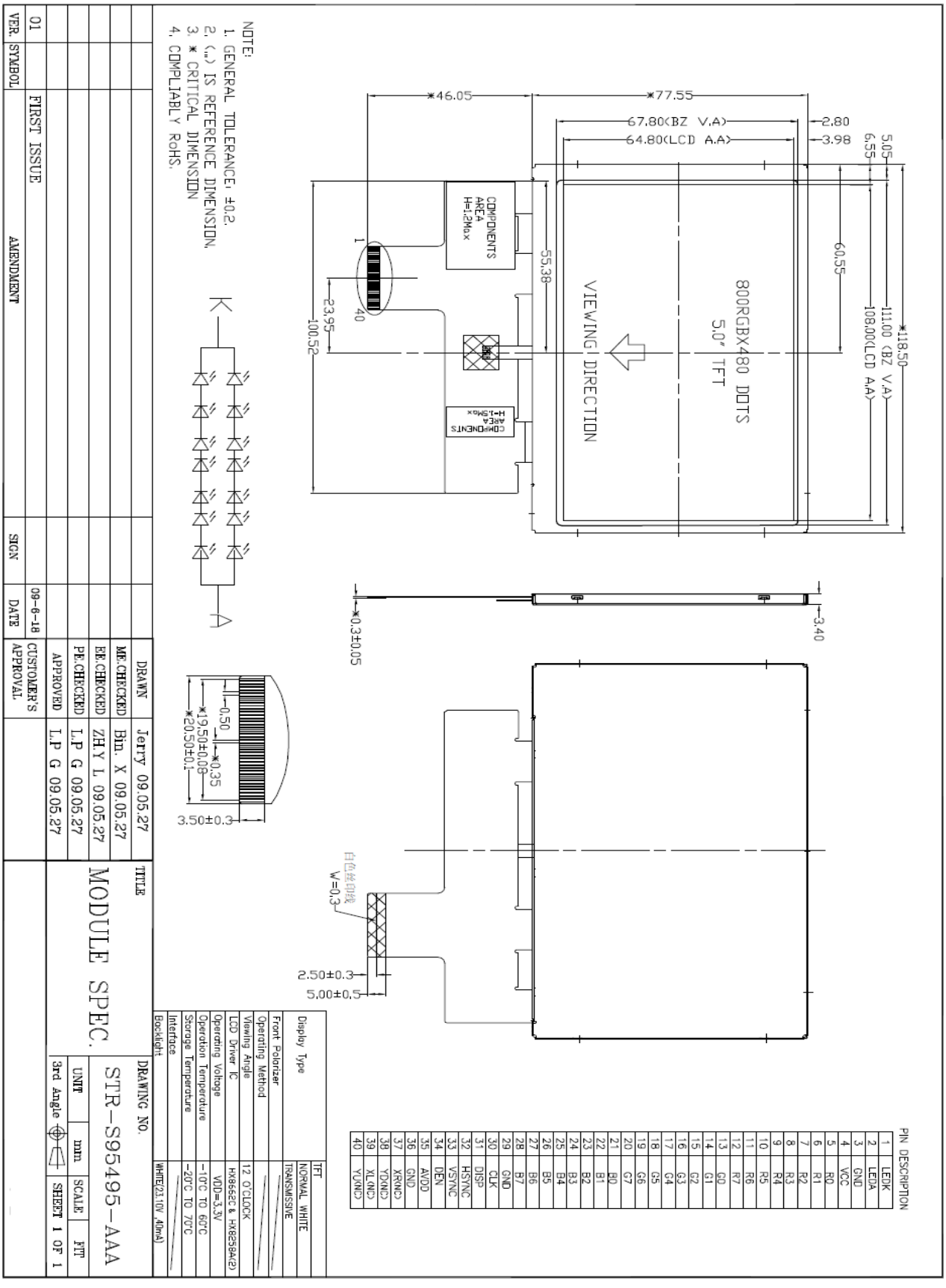
(2) 控制器：HX8258-A+HX8662-C

(3) 背光类型：白色背光

**3. 机械规格**

| 项目 | 规格 | 单位 |
|---|---|---|
| 外形尺寸 | 120.7(W) x75.80(H) x3.40(T) | mm |
| 有效显示区域 | 108.00 (W) x64.80(H) | mm |
| 分辨率 | 800(RGB) x480 Dots | Dots |
| 像素点间距 | 0.045 X 0.135 | mm |
| 结构类型 | COG+FPC+BL | --- |
| 背光类型 | WHITE | — |
| 重量 | TBD | g |

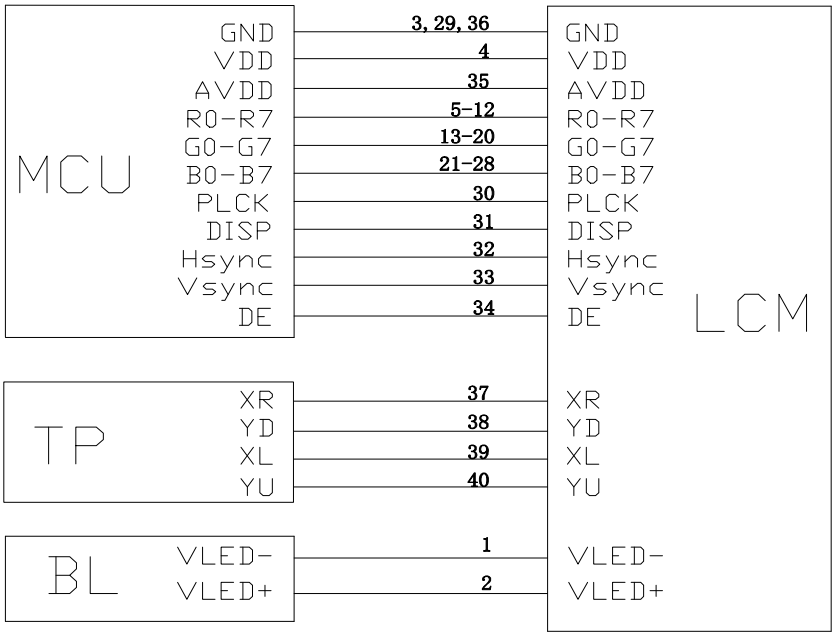
**4. 外形尺寸**


NOTE:
1. GENERAL TOLERANCE: ±0.2.
2. (,,) IS REFERENCE DIMENSION.
3. * CRITICAL DIMENSION.
4. COMPLIABLY RoHS.
VER. SYMBOL AMENDMENT SIGN DATE
01 FIRST ISSUE 09-6-18
DRAWN Jerry 09.05.27
ME.CHECKED Bin. X 09.05.27
EE.CHECKED ZH.Y L 09.05.27
PE.CHECKED L.P G 09.05.27
APPROVED L.P G 09.05.27
CUSTOMER'S APPROVAL
TITLE
MODULE SPEC.
DRAWING NO.
STR-S95495-AAA
UNIT mm
SCALE FIT
SHEET 1 OF 1
3rd Angle
*46.05
*77.55
67.80(BZ V.A)
64.80(LCD A.A)
2.80
3.98
5.05
6.55
*118.50
111.00 (BZ V.A)
108.00(LCD A.A)
60.55
55.38
23.95
100.52
40
1
800RGBX480 DOTS
5.0" TFT
VIEWING DIRECTION
COMPONENTS AREA H=1.2Max
COMPONENTS AREA H=1.5Max
*0.3±0.05
3.40
0.50
*0.35
*19.50±0.08
*20.50±0.1
3.50±0.3
白色丝印线 W=0.3
2.50±0.3
5.00±0.5
Display Type TFT
Front Polarizer NORMAL WHITE
Operating Method TRANSMISSIVE
Viewing Angle 12 O'CLOCK
LCD Driver IC HX8556C & HX8259A(2)
Operating Voltage VDD=3.3V
Operation Temperature -10°C TO 60°C
Storage Temperature -20°C TO 70°C
Interface
Backlight WHITE(23.1V ,40mA)
PIN DESCRIPTION
1 LEDK
2 LEDA
3 GND
4 VCC
5 R0
6 R1
7 R2
8 R3
9 R4
10 R5
11 R6
12 R7
13 G0
14 G1
15 G2
16 G3
17 G4
18 G5
19 G6
20 G7
21 B0
22 B1
23 B2
24 B3
25 B4
26 B5
27 B6
28 B7
29 GND
30 CLK
31 DISP
32 HSYNC
33 VSYNC
34 DEN
35 AVDD
36 GND
37 XRNC
38 YDNC
39 XLNC
40 YUNC

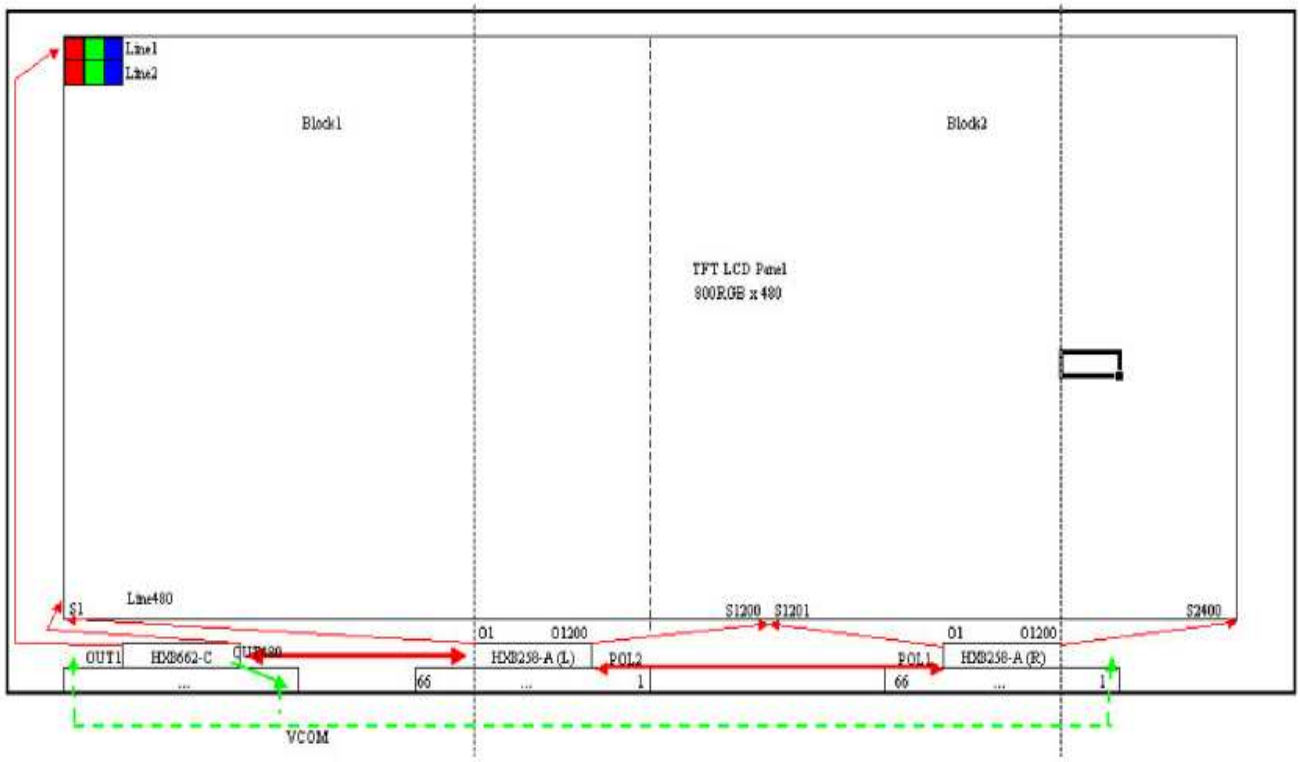
5. 接口定义

| PIN NO. | FUNCTION DESCRIPTIONS | SYMBOL |
|---|---|---|
| 1 | Backlight Cathode | LEDK |
| 2 | Backlight Anode | LEDA |
| 3 | GROUND | GND |
| 4 | +3.3V digital power source | VCC |
| 5 | Red data signal(LSB) | R0 |
| 6 | Red data signal | R1 |
| 7 | Red data signal | R2 |
| 8 | Red data signal | R3 |
| 9 | Red data signal | R4 |
| 10 | Red data signal | R5 |
| 11 | Red data signal | R6 |
| 12 | Red data signal(MSB) | R7 |
| 13 | Green data signal(LSB) | G0 |
| 14 | Green data signal | G1 |
| 15 | Green data signal | G2 |
| 16 | Green data signal | G3 |
| 17 | Green data signal | G4 |
| 18 | Green data signal | G5 |
| 19 | Green data signal | G6 |
| 20 | Green data signal(MSB) | G7 |
| 21 | Blue data signal(LSB) | B0 |
| 22 | Blue data signal | B1 |
| 23 | Blue data signal | B2 |
| 24 | Blue data signal | B3 |
| 25 | Blue data signal | B4 |
| 26 | Blue data signal | B5 |
| 27 | Blue data signal | B6 |
| 28 | Blue data signal(MSB) | B7 |
| 29 | GROUND | GND |
| 30 | Clock signal to sample each data | CLK |
| 31 | Display on/off signal (this pin is pulled high in internally) | DISP |
| 32 | Horizontal synchronizing signal | HSYNC |
| 33 | Vertical synchronizing signal | VSYNC |
| 34 | Input data enable control. Internally pulled low. | DEN |
| 35 | NC | |
| 36 | GROUND | GND |
| 37 | TOUCH PANEL INTERFACE FOR XR | XR |
| 38 | TOUCH PANEL INTERFACE FOR YD | YD |
| 39 | TOUCH PANEL INTERFACE FOR XL | XL |
| 40 | TOUCH PANEL INTERFACE FOR YU | YU |

**6. 应用电路**


MCU
GND
VDD
AVDD
R0-R7
G0-G7
B0-B7
PLCK
DISP
Hsync
Vsync
DE
3, 29, 36
4
35
5-12
13-20
21-28
30
31
32
33
34
GND
VDD
AVDD
R0-R7
G0-G7
B0-B7
PLCK
DISP
Hsync
Vsync
DE
LCM
TP
XR
YD
XL
YU
37
38
39
40
XR
YD
XL
YU
BL
VLED-
VLED+
1
2
VLED-
VLED+

**7. 功能框图**


Line1
Line2
Block1
Block2
TFT LCD Panel
800RGB x 480
Line480
S1
O1
O1200
S1200
S1201
O1
O1200
S2400
OUT1
HX8662-C
OUT480
HX8258-A (L)
POL2
POL1
HX8258-A (R)
66
1
66
1
VCOM

**8. 接口时序**

8.1 时序参数

- **Sync mode**

| PARAMETER | Symbol | Spec. | | | Unit |
|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | |
| CLK frequency | $F_{CPH}$ | - | 8.3 | - | MHz |
| CLK period | $T_{CPH}$ | - | 120.47 | - | ns |
| CLK pulse duty | $T_{CWH}$ | 40 | 50 | 60 | % |
| HS period | $T_H$ | - | 528 | - | $T_{CPH}$ |
| HS pulse width | $T_{WH}$ | 1 | 46 | - | $T_{CPH}$ |
| HS-first horizontal data time | $T_{HS}$ | STHD[7:0]-26 (i) (ii) | | | $T_{CPH}$ |
| HS Active Time | $T_{HA}$ | - | 400 | - | $T_{CPH}$ |
| VS period | $T_V$ | - | 262 | - | $T_H$ |
| VS pulse width | $T_{WV}$ | 1 | 2 | - | $T_H$ |
| VS-DEN time | $T_{VS}$ | STVD[6:0]-9 (iii) | | | $T_H$ |
| VS Active Time | $T_{VA}$ | - | 240 | - | $T_H$ |

- **DE mode**

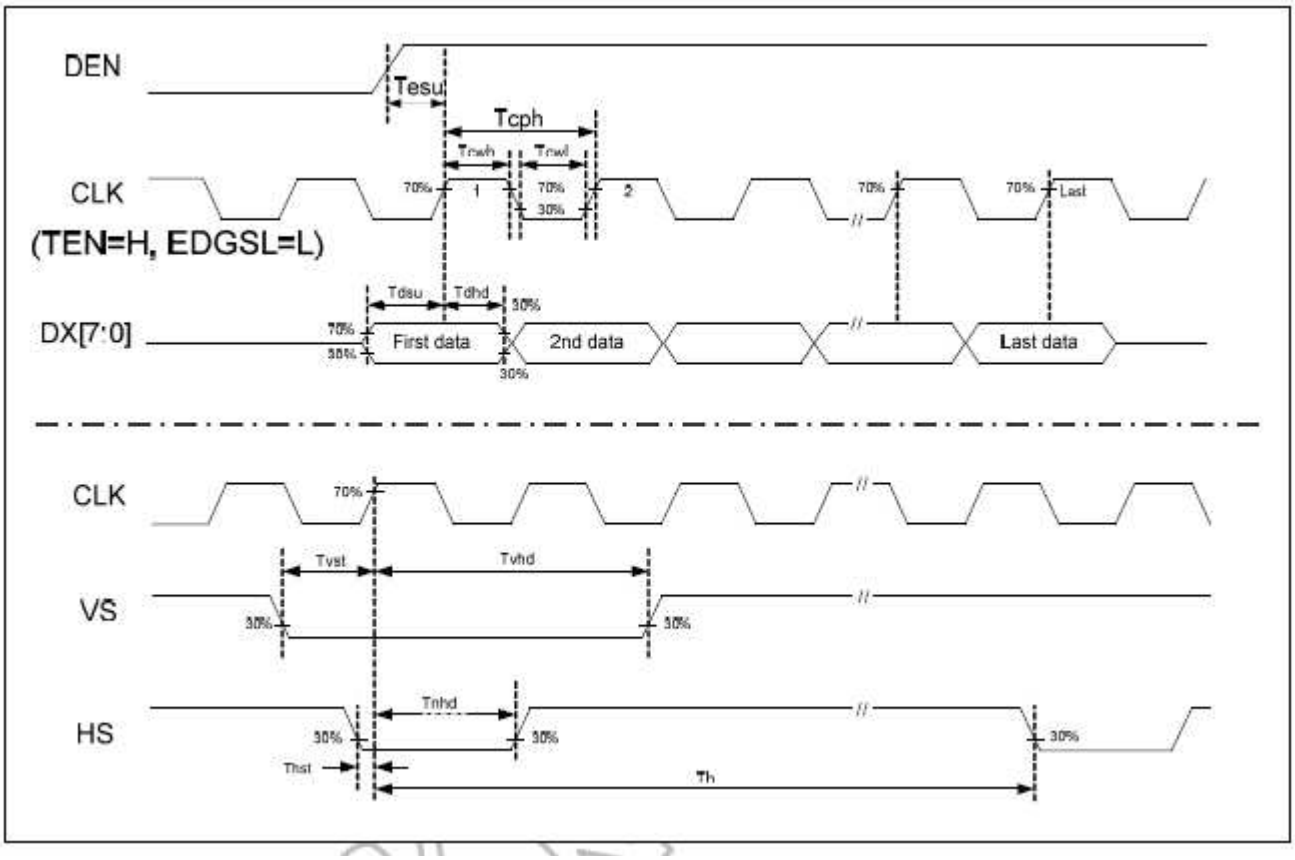
| PARAMETER | Symbol | Spec. | | | Unit |
|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | |
| CLK frequency | $F_{CPH}$ | - | 8.3 | - | MHz |
| CLK period | $T_{CPH}$ | - | 120.47 | - | ns |
| CLK pulse duty | $T_{CWH}$ | 40 | 50 | 60 | % |
| DE period | $T_{DEH}+T_{DEL}$ | 500 | 528 | 600 | $T_{CPH}$ |
| DE pulse width | $T_{DH}$ | - | 400 | - | $T_{CPH}$ |
| DE frame blanking | $T_{HS}$ | 10 | 22 | 110 | $T_{DEH}+T_{DEL}$ |
| DE frame width | $T_{EP}$ | - | 240 | - | $T_{DEH}+T_{DEL}$ |

| PARAMETER | Symbol | Spec. | | | Unit |
|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | |
| OEV pulse width | $T_{OEV}$ | - | 43 | - | $T_{CPH}$ |
| CKV pulse width | $T_{CKV}$ | - | 39 | - | $T_{CPH}$ |
| DE(internal)-STV time | $T_1$ | - | 4 | - | $T_{CPH}$ |
| DE(internal)-CKV time | $T_2$ | - | 14 | - | $T_{CPH}$ |
| DE(internal)-OEV time | $T_3$ | - | 10 | - | $T_{CPH}$ |
| DE(internal)-POL time | $T_4$ | - | 45 | - | $T_{CPH}$ |
| STV pulse width | - | - | 1 | - | $T_H$ |

(i). $T_{HS}+T_{HA}<T_H$
(ii). $T_{HS}$ must be greater than 8 → STHD[7:0] must be greater than 34
(iii). $T_{VS}$ must be greater than 0 → STVD[6:0] must be greater than 9

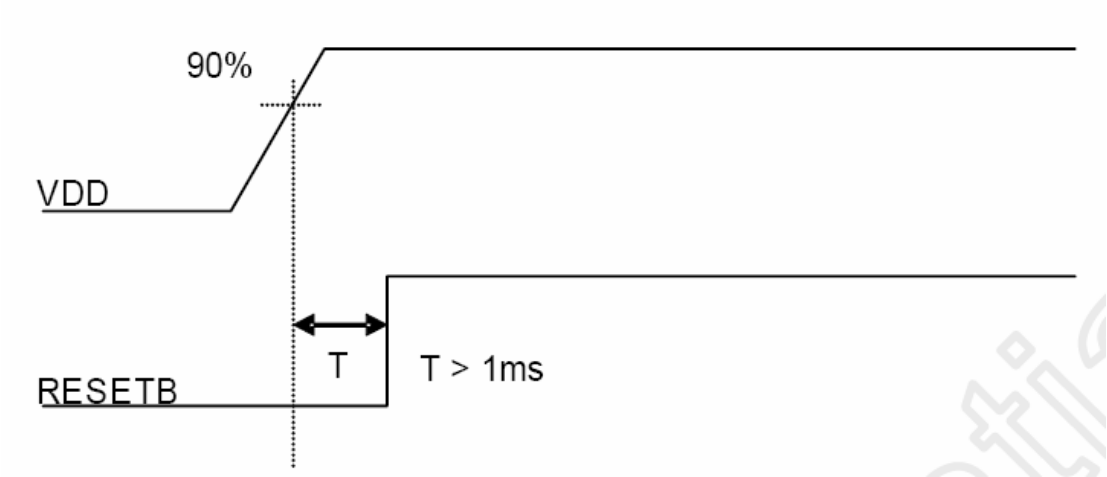
Hannstar confidential Do not copy

8.2 时序图


DEN
Tesu
Tcph
Tcwh
Tcwl
CLK
(TEN=H, EDGSL=L)
70%
1
70%
30%
2
70%
70%
Last
Tdsu
Tdhd
30%
DX[7:0]
70%
30%
First data
2nd data
Last data
30%
CLK
70%
Tvst
Tvhd
VS
30%
30%
Tnhd
HS
30%
30%
30%
Thst
Th

**9 复位时序**

复位操作由内部 RESETB 控制，RESETB 信号至少在 VDD 稳定 1ms 后置高。



**10.上电时序**

To prevent the device damage from latch up, the power ON/OFF sequence shown below must be followed.

Power ON: VCC, GND → VDDA, VSS → V1 to V10
Power OFF: V1 to V10 → VDDA, VSS → VCC, GND

## 5.8 Power ON Control

HX8258-A has a power ON sequence control function. When power is ON, blank data is outputted for 16-frames (default value) first, from the falling edge of the following VS signal. The blank data would be gray level 255 for normally white panel.
It can be defined in register R5 A_TIME[1:0].

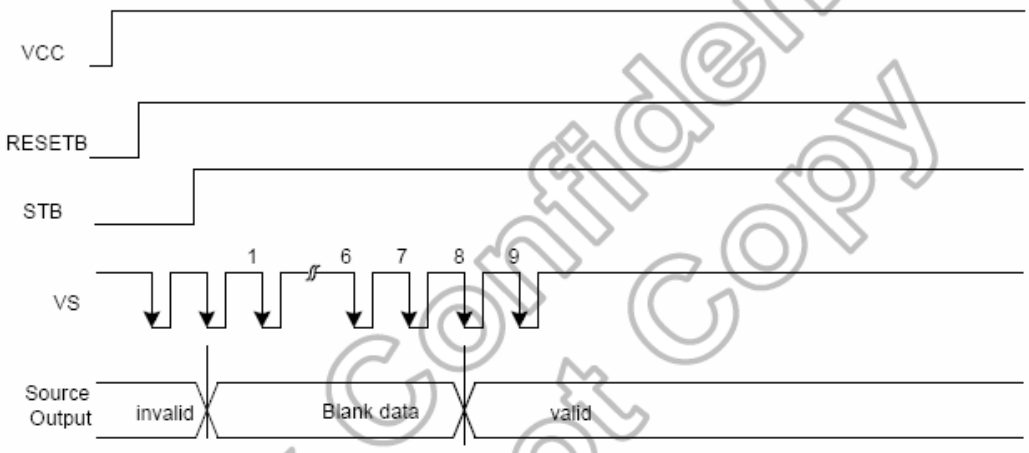



**Figure 5. 2 Power on control for Auto Mode**

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**11.极限技术参数**

## Absolute Maximum Rating (VSS=0V)

| Parameter | Symbol | Spec. | | | Unit |
|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | |
| Power supply voltage 1 | VDD | -0.3 | - | +7.0 | V |
| Power supply voltage 2 | VDC | -0.3 | - | +7.0 | V |
| Power supply voltage 3 | AVDD | -0.3 | - | +20 | V |
| Power supply voltage 4 | VGH-VGL | -0.3 | - | +42.0 | V |
| Input voltage | $V_{IN}$ | -0.5 | - | VDD+0.5 | V |
| Operation temperature | $T_{OPR}$ | -30 | - | +85 | ℃ |
| Storage temperature | $T_{STG}$ | -55 | - | +125 | ℃ |

**Note:** Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above.

## Recommended Operating Conditions (VSS=0V)

| Parameter | Symbol | Spec. | | | Unit |
|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | |
| Power supply voltage 1 | VDD | 2.3 | 2.5 | 3.6 | V |
| Power supply voltage 2 | VDC | 4.75 | 5.0 | 5.5 | V |
| Power supply voltage 3 | AVDD | 8 | 10 | 15 | V |
| Power supply voltage 4 | VGH-VGL | 28.5 | 30.0 | 33.0 | V |
| Input Voltage | $V_{IN}$ | 0 | - | VDD | V |
| Operation frequency | $F_{CPV}$ | - | - | 200 | KHz |
| Operation temperature | Ta | -30 | - | +80 | ℃ |

**14. 光电参数**

| Item | | Symbol | Conditions | Specifications Min. | Typ. | Max. | Unit | Note |
|---|---|---|---|---|---|---|---|---|
| Transmittance | | T% | Viewing normal angle $\theta_X = \theta_Y = 0°$ | | 5.5 | | % | All left side data are based on CMO's following condition –T6 NTSC: 50% LC:5091 Light : C light (Machine:BM5A) Normal Polarizer Without DBEF **"Simulation Data Reference Only"** |
| Contrast Ratio | | CR | | 150 | 250 | | -- | |
| Response Time | | $T_R$ | | | 15 | 30 | ms | |
| | | $T_F$ | | | 35 | 50 | ms | |
| Chromaticity | Red | $X_R$ | | 0.585 | 0.615 | 0.645 | | |
| | | $Y_R$ | | 0.314 | 0.344 | 0.374 | | |
| | Green | $X_G$ | | 0.277 | 0.307 | 0.337 | | |
| | | $Y_G$ | | 0.532 | 0.562 | 0.592 | | |
| | Blue | $X_B$ | | 0.103 | 0.133 | 0.163 | | |
| | | $Y_B$ | | 0.120 | 0.150 | 0.180 | | |
| | White | $X_W$ | | 0.279 | 0.309 | 0.339 | | |
| | | $Y_W$ | | 0.320 | 0.350 | 0.380 | | |
| Viewing Angle | Hor. | $\theta_{X+}$ | Center CR≥10 | | 45 | | deg. | |
| | | $\theta_{X-}$ | | | 45 | | | |
| | Ver. | $\theta_{Y+}$ | | | 15 | | | |
| | | $\theta_{Y-}$ | | | 35 | | | |

Note (1) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63 / L0

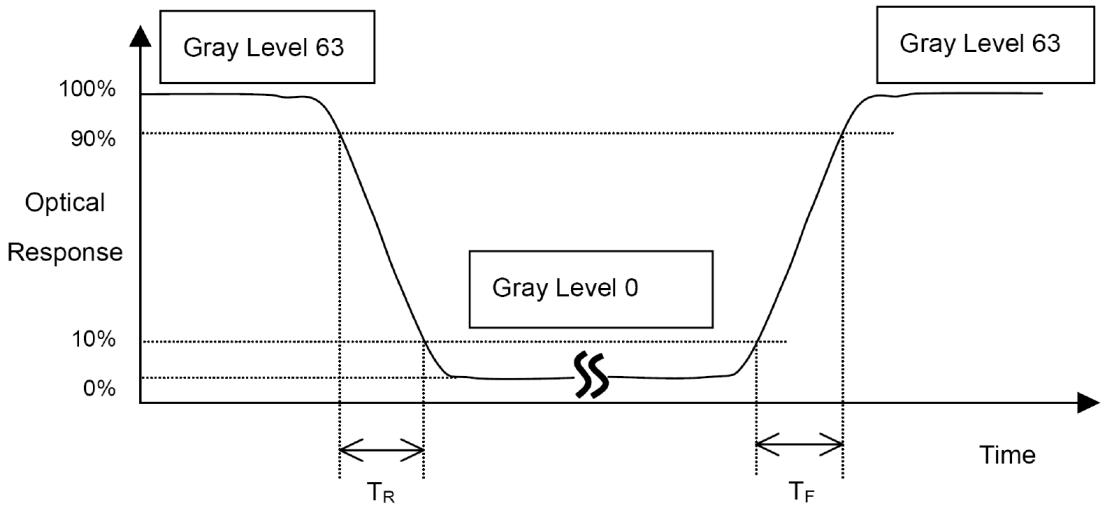
L63: Luminance of gray level 63

L0: Luminance of gray level 0

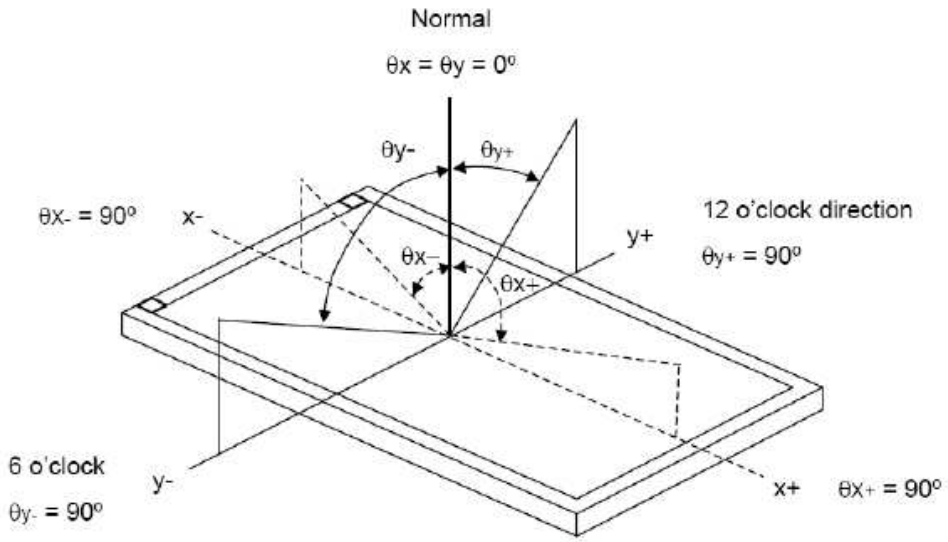
CR = CR (10)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (5).

Note (2) Definition of Response Time (TR, TF):



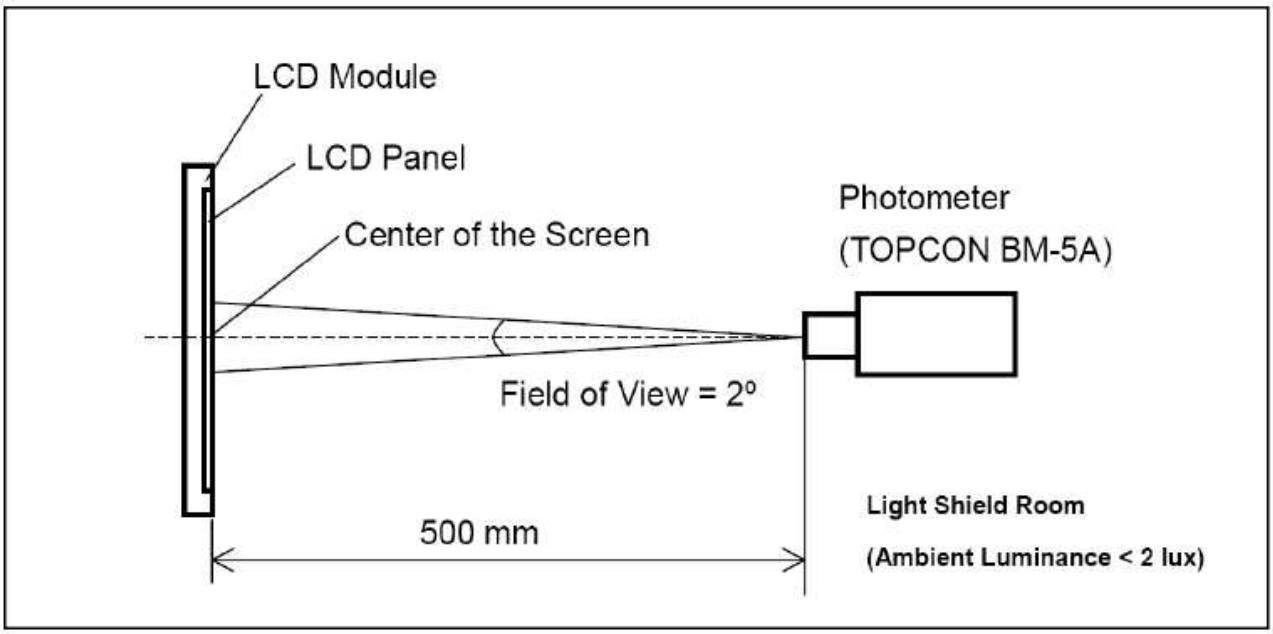
*Note(3) Definition of Viewing Angle



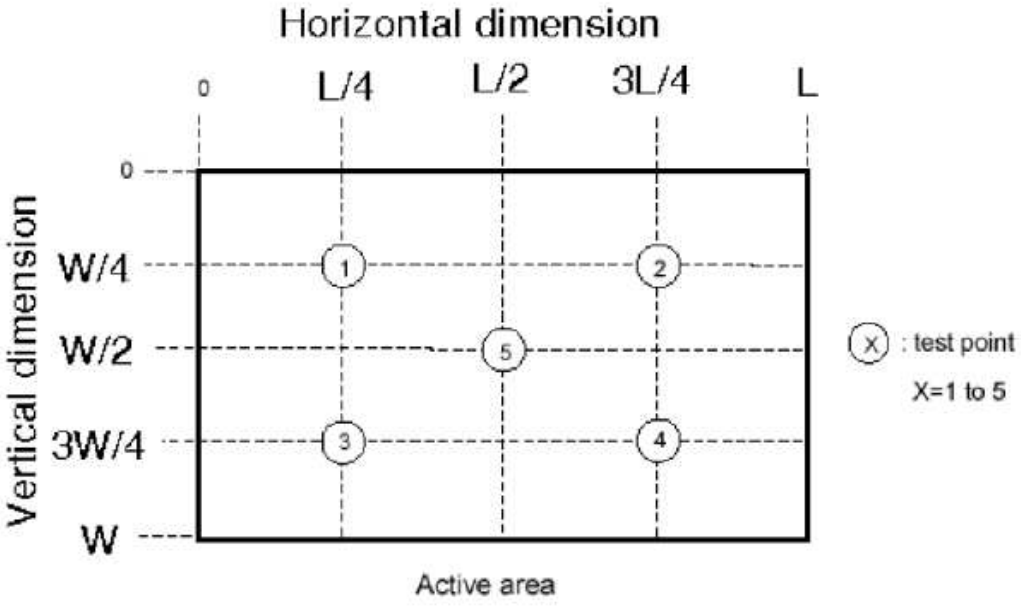

*** The above "Viewing Angle" is the measuring position with Largest Contrast Ratio; not for good image quality. View Direction for good image quality is 12 O'clock. Module maker can increase the "Viewing Angle" by applying Wide View Film.

*Note (4) Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



*Note (5)


Horizontal dimension
0
L/4
L/2
3L/4
L
Vertical dimension
0
W/4
W/2
3W/4
W
1
2
3
4
5
X : test point
X=1 to 5
Active area

**15.极限环境参数**

| 项目 | 符号 | 条件 | 标准 |
|---|---|---|---|
| 操作温度 | TOPR | -20℃～+70℃ | 外观无缺陷，功能正常 |
| 储存温度 | TSTG | -30℃～+80℃ | 外观无缺陷，功能正常 |
| 湿度 | — | See Note | 无缩合，凝聚现象 |

NOTE： 测试条件

（1） 温度和湿度：25±2 ℃， 60±5%RH（特殊条件除外）

（2） 操作状态： 样品在正常工作时测试

**16.可靠性测试**

| 项目 | 条件 | 标准 |
|---|---|---|
| 操作温度 | 高温 +70℃ 72 小时 | 外观无缺陷，功能正常 |
| | 低温 - 20℃ 72 小时 | |
| 储存温度 | 高温 +80℃ 120 小时 | 外观无缺陷，功能正常 |
| | 低温 - 30℃ 120 小时 | |
| 恒温恒湿 | 40℃ 90%RH 72HRS | 外观无缺陷，功能正常 |
| 振动 | 时间: 每个方向振动三十分钟 (X,Y,Z)<br>频率: 10～55Hz (1 min)<br>振幅: 1.5mm | 外观无缺陷，功能正常 |
| 冷热冲击 | -20℃(30mins) ←→+65℃(30mins) 10 cycles | 外观无缺陷，功能正常 |

NOTE: 以上测试后须在室温放置 2 小时检查样品