深圳秦唐盛世科技有限公司

PRODUCT SPECIFICATIONS

For Customer:____________________ □ : APPROVAL FOR SPECIFICATION

Customer Model No._______________ □ : APPROVAL FOR SAMPLE

Module No.: QTM101TFT-001 Date :2019.02.19

Version :0

For Customer's Acceptance:

Approved By	Comment

PREPARED	CHECKED	VERIFIED BY QA DEPT	VERIFIED BY R&D DEPT

Revision Record

Rev	Date	Sub-Model	Description of change
A	**2019.02.19**		**Preliminary Product Specification was first issued.**

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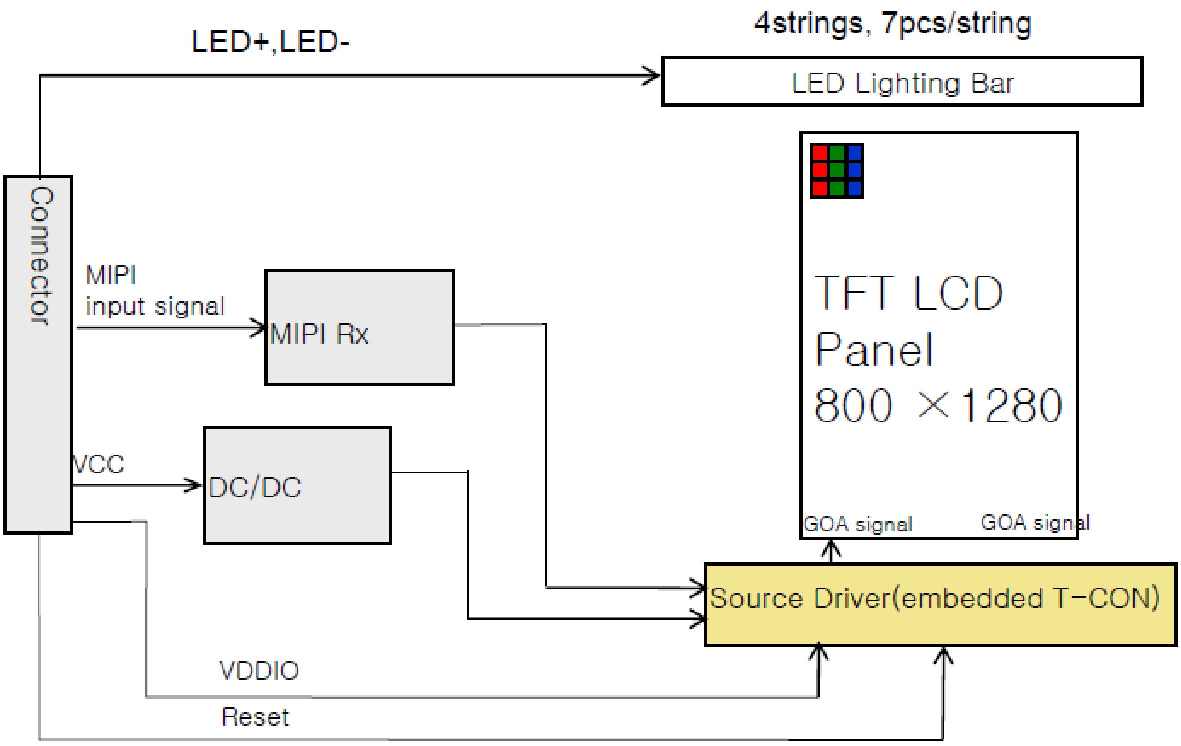
1. General description

TV101WXU-N10-49P0 is a color active matrix TFT LCD product using amorphous silicon TFT's (Thin Film Transistors) as an active switching devices. This module has a 10.1 inch diagonally measured active area with WXGA resolutions (800 horizontal by 1280 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots By applying 8 bit digital data, 800×RGB (3) ×1280, 16.7M-color images are displayed on the 10.1" diagonal screen


4strings, 7pcs/string
LED+,LED-
LED Lighting Bar
Connector
MIPI
input signal
MIPI Rx
TFT LCD
Panel
800 ×1280
VCC
DC/DC
GOA signal
GOA signal
Source Driver(embedded T-CON)
VDDIO
Reset

1.2 Features

- High Transmittance: 6.1%
- 0.5 t Array Glass*0.5t CF Glass

1.3 Application

- Tablet & Application Mini-PC

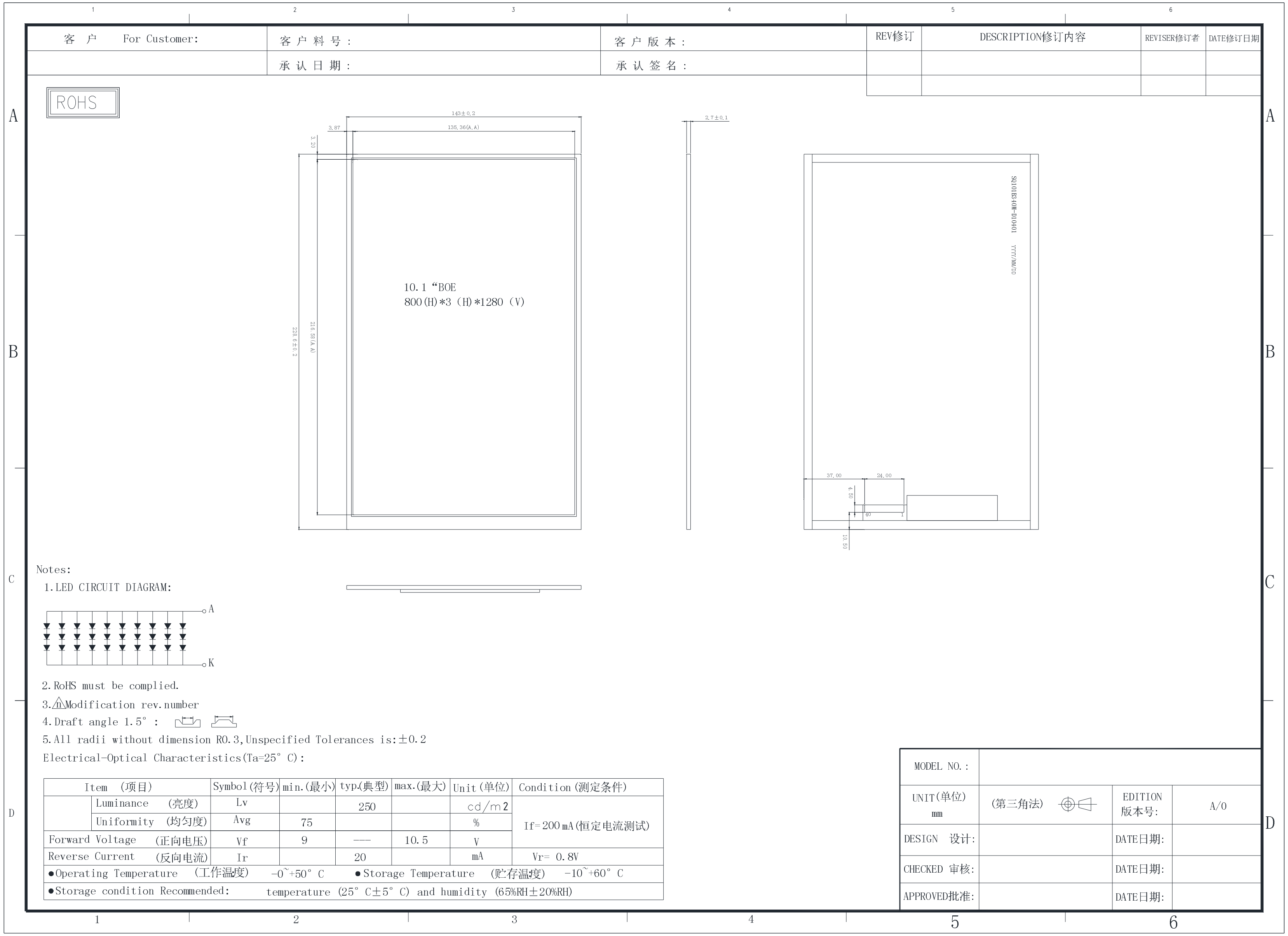
1.4 General Specification

< Table 1. General Specifications >

Parameter	Specification	Unit	Remarks
Number of pixels	800(H)×1280(V)	pixels	
Pixel pitch	0.1692(H)×0.1692(V)	mm	
Active area	135.36(H)x216.576(V)	mm	
CF size	139.76(H)×222.1(V)	mm	
Panel size	139.76(H)×225.8(V)	mm	
Pixel arrangement	Pixels RGB stripe arrangement		
Display colors	16.7M	colors	
Color gamut (BLU)	60(Typ.)	%	
Display mode	Normally Black		
View angle	80/80/80/80	°	
Q-Panel size	Q1: 718.8(H)×687.4(V)/ Q2: 566.04(H)×687.4(V)	mm	
Weight (Single)	35.6 (Typ.)	g	
Weight (Q-Panel)	Q1: 965.4 (Typ.)/Q2: 1152.9(Typ.)	g	
Response time	30 (Typ.)	ms	
推荐Source IC	NT35521S(mipi接口)		

IC:天钰 9365AA

2. Outline Dimension


客 户 For Customer:
客 户 料 号 :
客 户 版 本 :
承 认 日 期 :
承 认 签 名 :
REV修订
DESCRIPTION修订内容
REVISER修订者
DATE修订日期
ROHS
143±0.2
135.36(A.A)
3.87
3.20
228.6±0.2
216.58(A.A)
10.1 "BOE
800(H)*3 (H)*1280 (V)
2.7±0.1
SQ101B340M-D10401 YYYY/MM/DD
37.00
24.00
4.50
10.50
40
1
A
K
MODEL NO.:
UNIT(单位)
mm
(第三角法)
EDITION
版本号:
A/0
DESIGN 设计:
CHECKED 审核:
APPROVED批准:
DATE日期:
DATE日期:
DATE日期:
1
2
3
4
5
6
A
B
C
D

Notes:

1. LED CIRCUIT DIAGRAM:

2. RoHS must be complied.

3. ⚠Modification rev.number

4. Draft angle 1.5° :

5. All radii without dimension R0.3, Unspecified Tolerances is: ±0.2

Electrical-Optical Characteristics(Ta=25° C):

Item (项目)		Symbol(符号)	min.(最小)	typ.(典型)	max.(最大)	Unit(单位)	Condition(测定条件)
	Luminance (亮度)	Lv		250		cd/m2	If=200mA(恒定电流测试)
	Uniformity (均匀度)	Avg	75			%	
Forward Voltage (正向电压)		Vf	9	---	10.5	V	
Reverse Current (反向电流)		Ir		20		mA	Vr= 0.8V
●Operating Temperature (工作温度) -0~+50° C ●Storage Temperature (贮存温度) -10~+60° C							
●Storage condition Recommended: temperature (25° C±5° C) and humidity (65%RH±20%RH)							

3.0 ELECTRICAL SPECIFICATIONS

3.1 Electrical Specifications

< Table 3. LCD Module Electrical Specifications >　　[Ta =25±2 ℃]

Parameter	Symbol	Value	Unit	Remarks
TFT Gate ON Voltage	VGH	15	V	
TFT Gate OFF Voltage	VGL	-11	V	
Analog Power Supply Voltage	AVDD/AVEE	5/-5	V	

4.0 OPTICAL SPECIFICATION

4.1 Overview

The test of Optical specifications shall be measured in a dark room (ambient luminance ≤ 1lux and temperature = 25±2℃) with the equipment of Luminance meter system (Goniometer system and TOPCON BM-5) and test unit shall be located at an approximate distance 50cm from the LCD surface at a viewing angle of θ and Φ equal to 0°. We refer to θØ=0 (=θ3) as the 3 o'clock direction (the "right"), θØ=90 (= θ12) as the 12 o'clock direction ("upward"), θØ=180 (= θ9) as the 9 o'clock direction ("left") and θØ=270(= θ6) as the 6 o'clock direction ("bottom"). While scanning θ and /or Ø, the center of the measuring spot on the Display surface shall stay fixed. The backlight should be operating for 30 minutes prior to measurement. VDD shall be 3.3±0.3V for LVDS interface or 1.8±0.09V for MIPI interface at 25°C.

4.2 Optical Specifications

<Table 5. Optical Specifications>

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle range	Horizontal	Θ_3	CR > 10	75	80	-	Deg.	Note 1
		Θ_9		75	80	-	Deg.	
	Vertical	Θ_{12}		75	80	-	Deg.	
		Θ_6		75	80	-	Deg.	
Color Gamut				55	60	-	%	@BLU
Luminance Contrast ratio		CR	Θ = 0°	800	1000			Note 2
Transmittance		T(%)	Θ = 0°		6.1		%	Base on BLU Note 3
White Chromaticity		x_W	Θ = 0°	0.274	0.304	0.334		Note 4
		y_W		0.29	0.32	0.35		
Reproduction of color (BLU)	Red	x_R	Θ = 0°	0.588	0.618	0.648		
		y_R		0.338	0.368	0.398		
	Green	x_G		0.295	0.325	0.355		
		y_G		0.573	0.603	0.633		
	Blue	x_B		0.128	0.158	0.188		
		y_B		0.066	0.096	0.126		
Response Time (Rising + Falling)		T_{RT}	Ta= 25° C Θ = 0°	-	30		ms	Note 5

Notes : 1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 1).

2. Contrast measurements shall be made at viewing angle of $\Theta= 0$ and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state . (see FIGURE 1) Luminance Contrast Ratio (CR) is defined mathematically.

$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

3. Transmittance is the Value with Polarizer

4. The color chromaticity coordinates specified in Table 5 shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.

5. The electro-optical response time measurements shall be made as FIGURE 3 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Tr, and 90% to 10% is Td.

5.0 APPENDIX

Figure 1. The Definition of Vth & Vsat

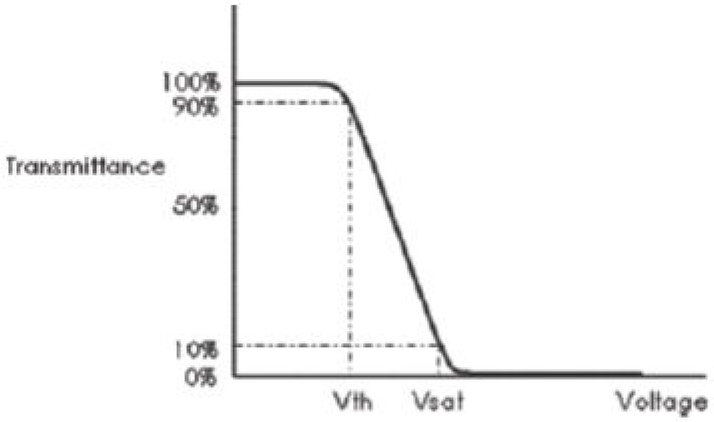


Figure 2. Measurement Set Up

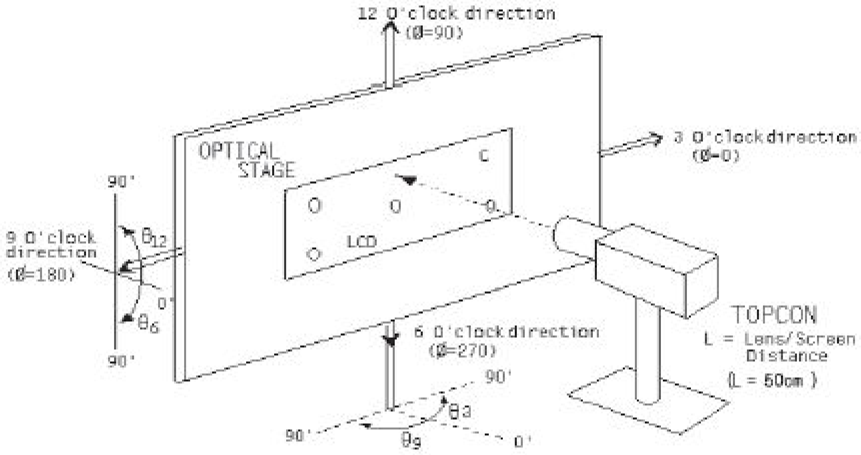

12 O'clock direction
(Ø=90)
OPTICAL
STAGE
3 O'clock direction
(Ø=0)
90'
9 O'clock
direction
(Ø=180)
θ12
0'
θ6
90'
LCD
6 O'clock direction
(Ø=270)
TOPCON
L = Lens/Screen
Distance
(L = 50cm)
90'
θ3
θ9
90'
0'

Figure 3. Response Time Testing

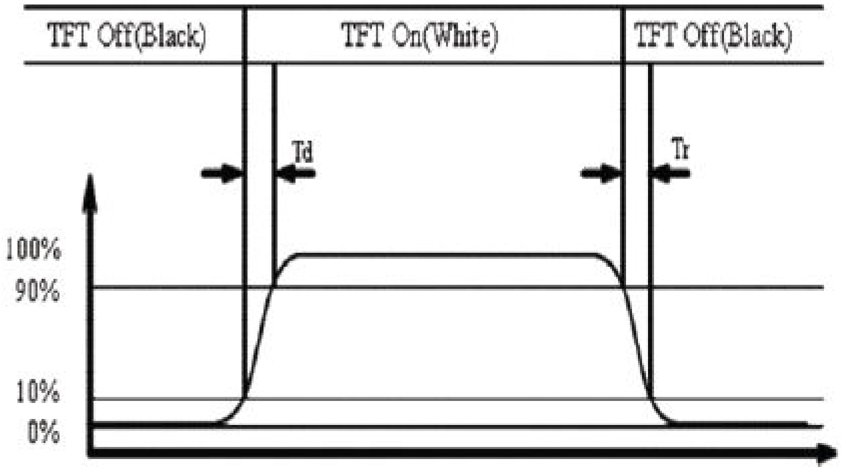
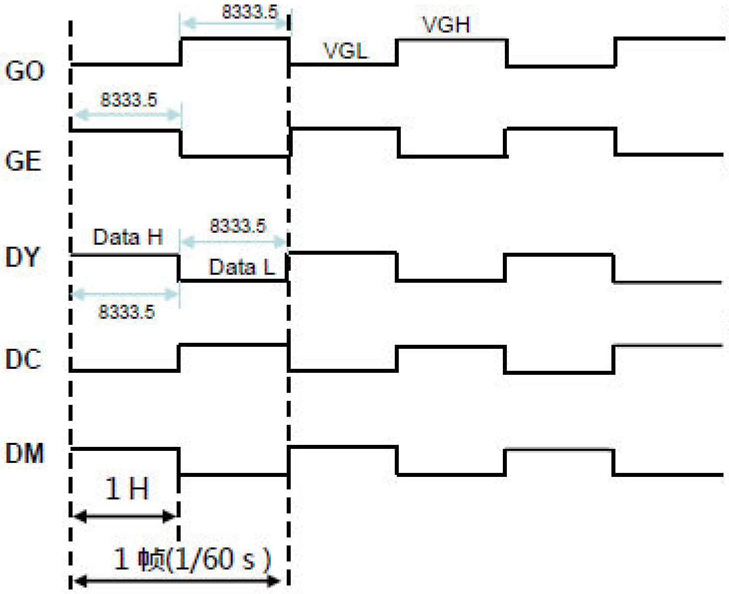
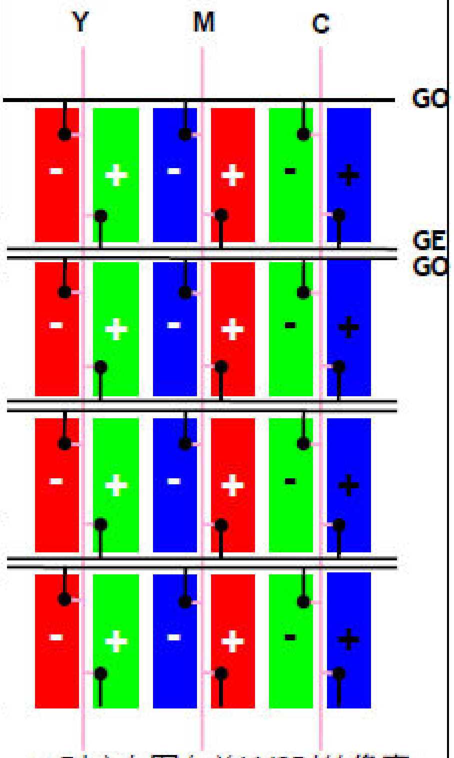

TFT Off(Black)
TFT On(White)
TFT Off(Black)
Td
Tr
100%
90%
10%
0%

Figure 6-2. TFT-LCD Panel Test 时序

CT Pad Name	V1 (V)	V2 (V)	Width (us)	Period (us)
GO	VGL(-11V)	VGH (15V)	8333.5	16667
GE	VGL(-11V)	VGH (15V)	8333.5	16667
GS	15V	15V	0	0
DS	15V	15V	0	0
VCOM	VCOM	VCOM	0	0
DM	Data H	Data L	8333.5	16667
DY	Data H	Data L	8333.5	16667
DC	Data H	Data L	8333.5	16667


8333.5
GO
VGL
VGH
8333.5
GE
Data H
8333.5
Data L
DY
8333.5
DC
DM
1 H
1 帧(1/60 s)

- 以上为检查某灰阶画面(DY, DC, DM 同时开启)的波形设置
- 为提升检出率电压可调整
- 比如VCOM=2.8 V, Data H=4.2 V, Data L=0 V



- 对应左图在前H/2时的像素开启情况(+ 表示有电压写入;
  - 表示电压同Vcom电压)

6.0 PIN Assignment

Pin No.	Symbol	I/O	Function	Remark
1	VCOM	P	Common Voltage(-0.7~~0 V), No connection	NC
2	VDDIN	P	Power supply for interface system except MIPI interface pin,VDDIN=3.3V	
3	VDDIN	P		
4	GND	P	GROUND	
5	RST	P	Device reset signal	
6	NC	/	No connection	
7	GND	P	GROUND	
8	MIPI_D0N	I	MIPI Negative data signal (-)	
9	MIPI_D0P	I	MIPI Positive data signal (+)	
10	GND	P	Ground	
11	MIPI_D1N	I	MIPI Negative data signal (-)	
12	MIPI_D1P	I	MIPI Positive data signal (+)	
13	GND	P	Ground	
14	MIPI_CKN	I	MIPI Negative clock signal (-)	
15	MIPI_CKP	I	MIPI Positive clock signal (+)	
16	GND	P	Ground	
17	MIPI_D2N	I	MIPI Negative data signal (-)	
18	MIPI_D2P	I	MIPI Positive data signal (+)	
19	GND	P	Ground	
20	MIPI_D3N	I	MIPI Negative data signal (-)	
21	MIPI_D3P	I	MIPI Positive data signal (+)	
22	GND	P	Ground	
23	NC	/	No connection	
24	NC	/	No connection	
25	GND	P	Ground	
26	NC	/	No connection	

27	PWMO	O	PWM control signal for LED driver (CABC)	
28	NC	/	No connection	
29	VCL	O	Output voltage pin,use it to generate Vcom voltage by a VR circuit (output voltage -2.5V)	NC
30	GND	P	Ground	
31	LED-	P	LED cathode	
32	LED-	P	LED cathode	
33	NC	/	No connection	
34	NC	/	No connection	
35	AVEE	P	NC	
36	NC	/	No connection	
37	NC	/	No connection	
38	AVDD	P	NC	
39	LED+	P	LED anode	
40	LED+	P	LED anode	

7.0 ABSOLUTE MAXIMUM RATINGS

7.1Environment Absolute Rating

Item	Storage		Operating		Note
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature	-10℃	60℃	0℃	50℃	1,2
Humidity	-	-	-	-	3

1. The response time will become lower when operated at low temperature.

2. Background color changes slightly depending on ambient temperature.

   The phenomenon is reversible.

3. Ta<=40℃:85%RH MAX.

   Ta>=40℃:Absolute humidity must be lower than the humidity of 85%RH at 40℃.

7.2 ELECTRICAL SPECIFICATION

Item	Symbol	Specification			Unit
		Min.	Typ.	Max.	
TFT gate on voltage	VGH		16		V
TFT gate on voltage	VGL		-12		V
TFT common electrode voltage	Vcom(DC)		-0.7		V

Note: (1) Vcom must be adjusted to optimize display quality: cross-talk, contrast ratio and etc.

(2) VGH is TFT gate operating voltage

(3) VGL is TFT gate operating voltage

(4) Environmental condition: 25±5

(5) Reference waveform for panel light on is as below: (release after sample output)

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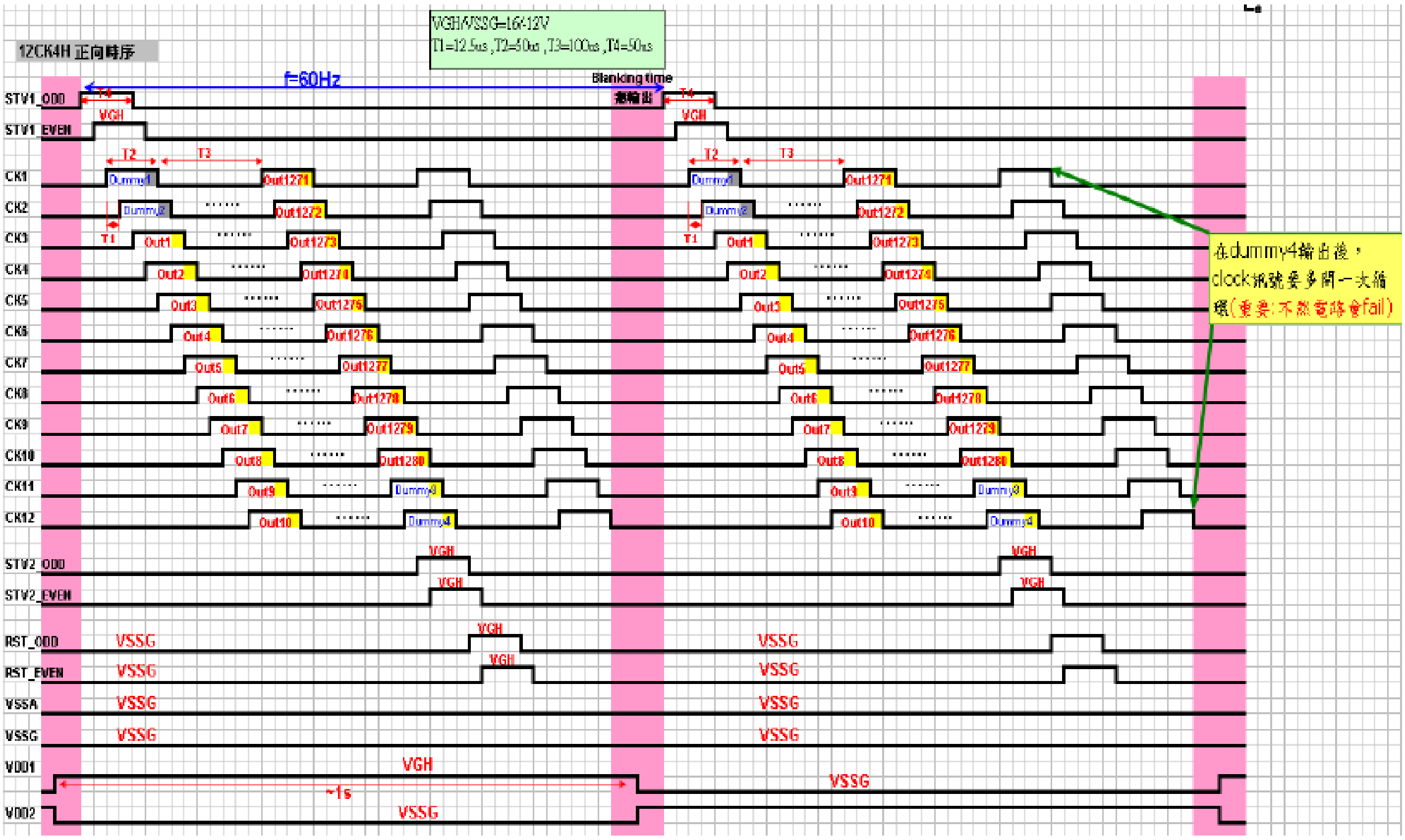
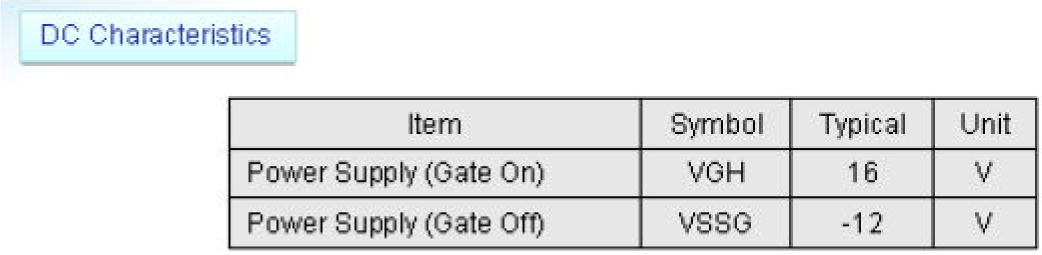
10.1"	Signle	Black	Gray25(10%)	Gray32(25%)	GRAY64(50%)	Gray128(75%)	White
DATA (DR/DG/DB)	Vsh(V)	0.3	1.08	1.211	1.721	2.433	4.8
	Vsl(V)	-0.3	-1.08	-1.211	-1.721	-2.433	-4.8

VCOM	DC(V)	-0.7
VGG	DC(V)	-12
VSSA	DC(V)	-12
VSSG	DC(V)	-12
VDD1	AC(V)	16 ~ -12
VDD2	AC(V)	16 ~ -12
STV	AC(V)	16 ~ -12
CK#	AC(V)	16 ~ -12
RESET	AC(V)	16 ~ -12


12CK4H 正向時序
f=60Hz
Blanking time
無輸出
STV1_ODD
STV1_EVEN
T1
T2
T3
T4
VGH
CK1
CK2
CK3
CK4
CK5
CK6
CK7
CK8
CK9
CK10
CK11
CK12
Dummy1
Dummy2
Dummy3
Dummy4
Out1
Out2
Out3
Out4
Out5
Out6
Out7
Out8
Out9
Out10
Out1271
Out1272
Out1273
Out1274
Out1275
Out1276
Out1277
Out1278
Out1279
Out1280
STV2_ODD
STV2_EVEN
RST_ODD
RST_EVEN
VSSA
VSSG
VDD1
VDD2
VSSG
~1s

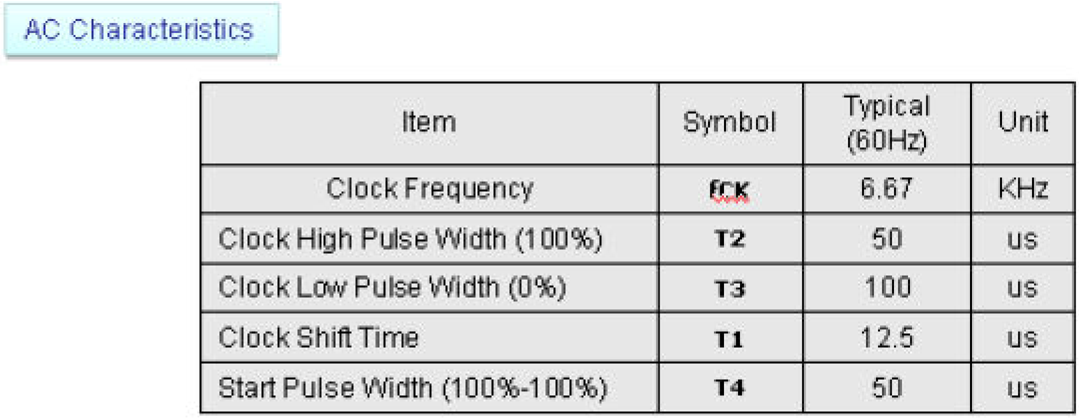
VGH/VSSG=16/-12V
T1=12.5us ,T2=50us ,T3=100us ,T4=50us

在dummy4輸出後，clock訊號要多開一次循環(重要:不然電路會fail)



DC Characteristics

Item	Symbol	Typical	Unit
Power Supply (Gate On)	VGH	16	V
Power Supply (Gate Off)	VSSG	-12	V



AC Characteristics

Item	Symbol	Typical (60Hz)	Unit
Clock Frequency	fCK	6.67	KHz
Clock High Pulse Width (100%)	T2	50	us
Clock Low Pulse Width (0%)	T3	100	us
Clock Shift Time	T1	12.5	us
Start Pulse Width (100%-100%)	T4	50	us

8. LED backlight specification(VSS=0V ,Ta=25℃)

Item		Symbol	Condition	Min	Typ	Max	Unit	Note
Supply voltage		-	-	-	9.6	-	V	1
Supply current		I_f	-	-	200	-	mA	2
Forward current	Normal	I_{pn}	3-chip series x 10	-	-	-	mA	
	Dimming	I_{pd}		-	-	-		

Note:

1: VLED=VLED(+)-VLED(-).

2:The current of LED is 20mA.
A LED drive in constant current mode is recommended.

3: LED power consumption is around 0.297W.

9.0 RELIABILITY SPECIFICATION

Test Item	Test Condition	Note
High Temperature Storage Test	Ta = 60ºC, 240 hours	(1) (4)
Low Temperature Storage Test	Ta= -20ºC, 240 hours	(1) (4)
High Temperature Operation Test	Ts= 50ºC, 240 hours	(2) (4)
Low Temperature Operation Test	Ta= -10ºC, 240 hours	(1) (4)
Operate at High Temperature & High Humidity	40ºC, RH 90%, 240hours	(4)

Note (1) Ta is the ambient temperature of samples.

Note (2) Ts is the temperature of panel's surface.

Note (3) In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation but don't guarantee all of the cosmetic specification.

Note (4) Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

10.0 GENERAL PRECAUTION

8.1 Use Restriction

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life threatening or otherwise catastrophic.

8.2 Disassembling or Modification

Do not disassemble or modify the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display. HannStar does not warrant the module, if customers disassemble or modify the module.

8.3 Breakage of LCD Panel

8.3.1.If LCD panel is broken and liquid crystal spills out, do not ingest or inhale liquid crystal, and do not contact liquid crystal with skin.

8.3.2. If liquid crystal contacts mouth or eyes, rinse out with water immediately.

8.3.3. If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.

8.3.4. Handle carefully with chips of glass that may cause injury, when the glass is broken.

8.4 Electric Shock

8.4.1. Disconnect power supply before handling LCD module.

8.4.2. Do not pull or fold the LED cable.

8.4.3. Do not touch the parts inside LCD modules and the fluorescent LED's connector or cables in order to prevent electric shock.

8.5 Absolute Maximum Ratings and Power Protection Circuit

8.5.1. Do not exceed the absolute maximum rating values, such as the supply voltage variation, input voltage variation, variation in parts' parameters, environmental temperature, etc., otherwise LCD module may be damaged. 9.5.2. Please do not leave LCD module in the environment of high humidity and high temperature for a long time. 11.5.3. It's recommended to employ protection circuit for power supply.

8.6 Operation

8.6.1 Do not touch, push or rub the polarizer with anything harder than HB pencil lead.

8.6.2 Use fingerstalls of soft gloves in order to keep clean display quality, when persons handle the LCD module for incoming inspection or assembly.

8.6.3 When the surface is dusty, please wipe gently with absorbent cotton or other soft material.

8.6.4 Wipe off saliva or water drops as soon as possible. If saliva or water drops contact with polarizer for a long time, they may causes deformation or color fading.

8.6.5 When cleaning the adhesives, please use absorbent cotton wetted with a little petroleum benzine or other adequate solvent.

8.7 Mechanism

Please mount LCD module by using mouting holes arranged in four corners tightly.

8.8 Static Electricity

8.8.1 Protection film must remove very slowly from the surface of LCD module to prevent from electrostatic occurrence.

8.8.2. Because LCD module use CMOS-IC on circuit board and TFT-LCD panel, it is very weak to electrostatic discharge. Please be careful with electrostatic discharge. Persons who handle the module should be grounded through adequate methods.

8.9 Strong Light Exposure

The module shall not be exposed under strong light such as direct sunlight. Otherwise, display characteristics may be changed.

8.10 Disposal

When disposing LCD module, obey the local environmental regulations.