Disea Electronics Co., LTD

An IATF16949 display manufacturing company.
Focus on Industrial &Auto LCD display customized service.
URL:www.diseaelec.com.
E-mail:mkt@diseaelec.com

PRODUCT SPECIFICATIONS

For Customer:_____   ☐ : APPROVAL FOR SPECIFICATION

Customer Model No. _____   ☐ : APPROVAL FOR SAMPLE

Module No.:   ZW-T070SWH-99CP   Date : 2021-08-11

Table of Contents

For Customer's Acceptance:

Approved By	Comment

PREPARED	CHECKED	VERIFIED BY QA DEPT	VERIFIED BY R&D DEPT
mma	John		Dmjiang

2. Revision Record

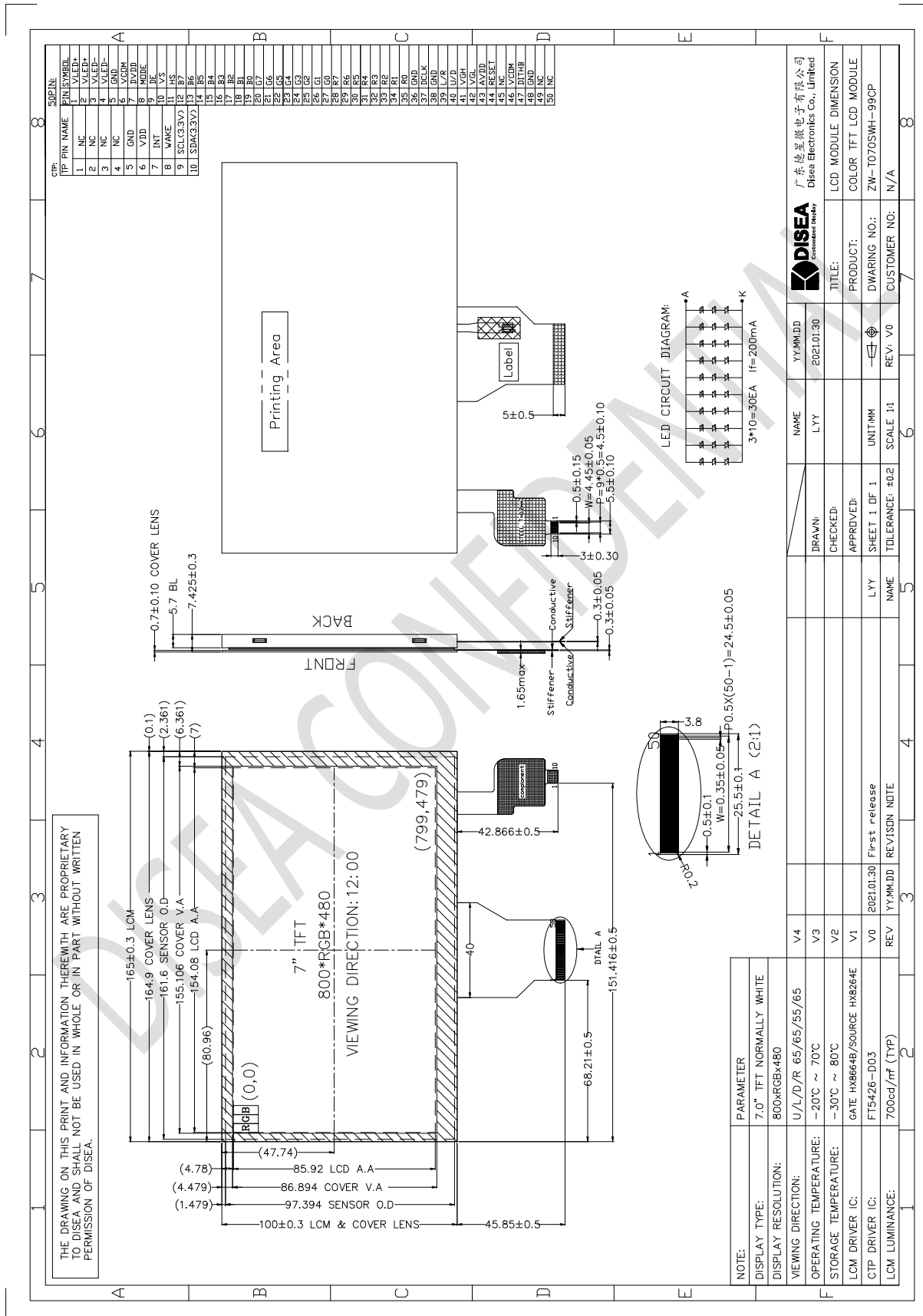| Date	Rev.No.	Page	Revision Items	Prepared
2021-08-11	**V0**		**First**	**mma**

3. General Specifications

ZW-T070SWH-99CP is a TFT-LCD module.It is composed of a TFT-LCD panel,driver IC,FPC,a back light unit.The 7.0″ display area contains 800x(RGB)x480 pixels and can display up to 16.7M colors.This product accords with RoHS environmental criterion.

Item	Contents	Unit	Note
LCD Type	TFT	-	
Display color	16.7M	-	1
Viewing Direction	12	O'Clock	
Gray scale inversion direction	6	O'Clock	
Operating temperature	-20~+70	℃	
Storage temperature	-30~+80	℃	
Module size	165.00×100.00×7.4	mm	2
Active Area(W×H)	154.08×85.92	mm	
Number of Dots	800×480	dots	
Controller	HX8264E+HX8664B	-	
CTP Driver	FT5426	-	
Power Supply Voltage	3.3	V	
Backlight	3S10P-LEDs (white)	pcs	
Weight	---	g	
Interface	RGB888	-	

Note 1:   Color tune is slightly changed by temperature and driving voltage.

Note 2:   Without FPC and Solder.

4. Outline Drawing

NOTE:
THE DRAWING ON THIS PRINT AND INFORMATION THEREWITH ARE PROPRIETARY TO DISEA AND SHALL NOT BE USED IN WHOLE OR IN PART WITHOUT WRITTEN PERMISSION OF DISEA.

PARAMETER		
DISPLAY TYPE:	7.0" TFT NORMALLY WHITE	
DISPLAY RESOLUTION:	800xRGBx480	
VIEWING DIRECTION:	U/L/D/R 65/65/55/65	
OPERATING TEMPERATURE:	−20℃ ~ 70℃	
STORAGE TEMPERATURE:	−30℃ ~ 80℃	
LCM DRIVER IC:	GATE HX8664B/SOURCE HX8264E	
CTP DRIVER IC:	FT5426−D03	
LCM LUMINANCE:	700cd/m² (TYP)	

7" TFT
800*RGB*480
VIEWING DIRECTION:12:00

RGB (0,0)
(799,479)

165±0.3 LCM
164.9 COVER LENS
161.6 SENSOR O.D
155.106 COVER V.A
154.08 LCD A.A
(80.96)

(0.1)
(2.361)
(6.361)
(7)

(4.78)
(4.479)
(1.479)
(47.74)
85.92 LCD A.A
86.894 COVER V.A
97.394 SENSOR O.D
100±0.3 LCM & COVER LENS
45.85±0.5

68.21±0.5
151.416±0.5
40
DTAIL A
42.866±0.5

0.7±0.10 COVER LENS
5.7 BL
7.425±0.3
BACK
FRONT
1.65max
Stiffener Conductive
Conductive Stiffener

0.5±0.15
W=4.45±0.05
9.5=4.5±0.10
5.5±0.10
3±0.30
0.3±0.05
0.3±0.05

Printing Area
Label
5±0.5

LED CIRCUIT DIAGRAM:
3*10=30EA If=200mA
A K

DETAIL A (2:1)
3.8
50
1
P0.5X(50−1)=24.5±0.05
25.5±0.1
0.35±0.05
0.5±0.1
W=0.35±0.1
R0.2

CTP:
TP PIN	PIN NAME
1	NC
2	NC
3	NC
4	GND
5	GND
6	VDD
7	INT
8	WAKE
9	SCLC(3.3V)
10	SDAC(3.3V)

50PIN:
PIN	SYMBOL
1	VLED+
2	VLED+
3	VLED−
4	VLED−
5	GND
6	VCOM
7	DVDD
8	MODE
9	DE
10	VS
11	HS
12	B7
13	B6
14	B5
15	B4
16	B3
17	B2
18	B1
19	B0
20	G7
21	G6
22	G5
23	G4
24	G3
25	G2
26	G1
27	G0
28	R7
29	R6
30	R5
31	R4
32	R3
33	R2
34	R1
35	R0
36	GND
37	DCLK
38	GND
39	L/R
40	U/D
41	VGH
42	VGL
43	AVDD
44	RESET
45	NC
46	VCOM
47	DITHB
48	GND
49	NC
50	NC

广东德星微电子有限公司
Disea Electronics Co., Limited

	NAME	DRAWN:	LYY	NAME	YY.MM.DD	2021.01.30
	CHECKED:					
	APPROVED:					

UNIT:MM
SCALE 1:1
SHEET 1 OF 1
TOLERANCE: ±0.2
REV: V0

TITLE: LCD MODULE DIMENSION
PRODUCT: COLOR TFT LCD MODULE
DWARING NO.: ZW−T070SWH−99CP
CUSTOMER NO: N/A

REV	YY.MM.DD	REVISION NOTE
V4		
V3		
V2		
V1		
V0	2021.01.30	First release

5. Absolute Maximum Ratings(Ta=25℃)

5.1 Electrical Absolute Maximum Ratings.(Vss=0V ,Ta=25℃)

Item	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage for LCD	DVDD	-0.5	5.0	V	1，2
	AVDD	-0.5	15.0		
	VGH	-0.3	42.0		
	VGL	-20	0.3		
Power Supply Voltage	VDD$_{CTP}$	2.7	3.6	V	1，2

Notes:

1. If the module is above these absolute maximum ratings. It may become permanently damaged. Using the module within the following electrical characteristic conditions are also exceeded, the module will malfunction and cause poor reliability.

2. DV$_{DD}$ >V$_{SS}$ must be maintained.

5.2 Environmental Absolute Maximum Ratings.

Item	Storage		Operating		Note
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature	-30℃	80℃	-20℃	70℃	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℃.

6. Electrical Specifications and Instruction Code

6.1 Electrical characteristics(Vss=0V ,Ta=25℃)

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Power supply		D_{VDD}	Ta=25℃	3.0	3.3	3.6	V
		VDD_{CTP}	Ta=25℃	2.8	-	3.3	
		AVDD	Ta=25℃	10.2	10.4	10.6	
		VGH	Ta=25℃	15.3	16	16.7	
		VGL	Ta=25℃	-7.7	-7.0	-6.3	
Input signal voltage		VCOM	Ta=25℃	2.8	3.8	4.8	V
Input voltage	'H'	V_{IH}	D_{VDD}=3.3V	$0.7V_{DVDD}$	-	V_{DVDD}	V
	'L'	V_{IL}	D_{VDD}=3.3V	0	-	$0.3V_{DVDD}$	V
Current Consumption		I_{DVDD1}	Normal mode	-	25	40	mA
		I_{DVDD2}	Sleep mode	-	0.05	0.1	mA
Clock Frequency		f_{CLK}	-	-	30	50	MHz

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

Item	Symbol	Condition	Min	Typ	Max	Unit	Note
Supply voltage	V_f	If=200mA	8.1	9.0	9.9	V	
Uniformity	△Bp	If=200mA	75	-	-	%	
Life Time	time	If=200mA	30K	-	-	hours	1
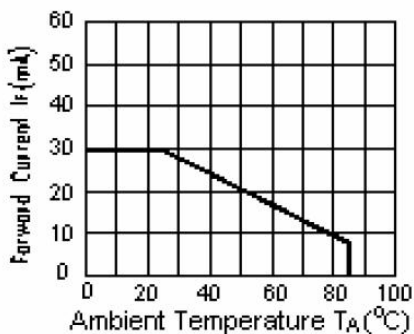
Note 1:   Brightness to be decreased to 50% of the initial value at ambient temperature TA=25℃

6.3 Interface signals

Pin No.	Symbol	I/O	Function
1-2	VLED+	P	LED back light(Anode)
3-4	VLED-	P	LED back light(Cathode)
5	GND	P	Ground.
6	VCOM	P	Common voltage
7	DVDD	P	Power supply
8	MODE	I	DE/YSNC mode select
9	DE	I	Data enable pin
10	VS	I	Frame sync signal
11	HS	I	Line sync signal
12-19	B7~B0	I	Blue data bus
20-27	G7~G0	I	Green data bus
28-35	R7~R0	I	Red data bus
36	GND	P	Ground.
37	DCLK	I	Data clock
38	GND	P	Ground.
39	L/R	I	Right/Left sequence control of source driver
40	U/D	I	Gate driver Up/Down scan control of gate driver
41	VGH	P	Gate on voltage
42	VGL	P	Gate off voltage
43	AVDD	P	power for analog circuit
44	RESET	I	Chip reset pin
45	NC	-	No connection.
46	VCOM	P	Common voltage
47	DITHB	I	Dithering function enable control.Normally pull high. DITHB=1, enable disable internal dithering function. DITHB =0,disable internal dithering function.
48	GND	P	Ground
49-50	NC	-	No connection.

CTP   interface

Pin No.	Symbol	I/O	Function
1-4	NC	-	No connection.
5	GND	P	Ground
6	VDD	P	Power supply
7	INT	-	External Interrupt to the IC of CTP
8	WAKE	I	Wake up signal
9	SCL(3.3V)	I	I2C CLOCK
10	SDA(3.3V)	I	I2C DATA

6.4 AC characteristics

Parameter	Symbol	Spec. Min.	Spec. Typ.	Max.	Unit
HS setup time	Thst	8	-	-	ns
HS hold time	Thhd	8	-	-	ns
VS setup time	Tvst	8	-	-	ns
VS hold time	Tvhd	8	-	-	ns
Data setup time	Tdsu	8	-	-	ns
Data hold time	Tdhd	8	-	-	ns
DE setup time	Tesu	8	-	-	ns
DE hold time	Tehd	8	-	-	ns
VDD Power On Slew rate	TPOR	-	-	20	ms
RSTB pulse width	TRst	10	-	-	µs
CLKIN cycle time	Tcph	20	-	-	ns
CLKIN pulse duty	Tcwh	40	50	60	%
Output stable time	Tsst	-	-	6	µs

- **Horizontal Timing**

Parameter	Symbol	Spec. Min.	Spec. Typ.	Max.	Unit
Horizontal Display Area	thd	-	800	-	DCLK
DCLK frequency	fclk	-	33.3	50	MHz
One Horizontal Line	th	862	1056	1200	DCLK
HS pulse width (Min.)	thpw		1		DCLK
HS pulse width (Typical.)	thpw		-		DCLK
HS pulse width (Max.)	thpw		40		DCLK
HS Back Porch (Blanking)	thb	46	46	46	DCLK
HS Front Porch	thfp	16	210	354	DCLK
DE mode Blanking	th-thd	45	256	400	DCLK

- **Vertical Timing**

Parameter	Symbol	Spec. Min.	Spec. Typ.	Max.	Unit
Vertical Display Area	tvd		480		TH
VS period time	tv	510	525	650	TH
VS pulse width	tvpw	1	-	20	TH
VS Back Porch (Blanking)	tvb	23	23	23	TH
VS Front Porch	tvfp	7	22	147	TH
DE mode Blanking	tv-tvd	4	45	170	TH

parallel 24-bit RGB mode

Parameter	Symbol	Spec. Min.	Spec. Typ.	Max.	Unit	Conditions
CLKIN Frequency	Fclk	-	40	50	MHz	VDD = 3.0V ~ 3.6V
CLKIN Cycle Time	Tclk	20	25	-	ns	-
CLKIN Pulse Duty	Tcwh	40	50	60	%	Tclk
Time from HSD to Source Output	Thso	-	20	-	CLKIN	-
Time from HSD to LD	Thld	-	20	-	CLKIN	-
Time from HSD to STV	Thstv	-	2	-	CLKIN	-
Time from HSD to CKV	Thckv	-	20	-	CLKIN	-
Time from HSD to OEV	Thoev	-	4	-	CLKIN	-
LD Pulse Width	Twld	-	10	-	CLKIN	-
CKV Pulse Width	Twckv	-	66	-	CLKIN	-
OEV Pulse Width	Twoev	-	74	-	CLKIN	-

6.5 Data input format
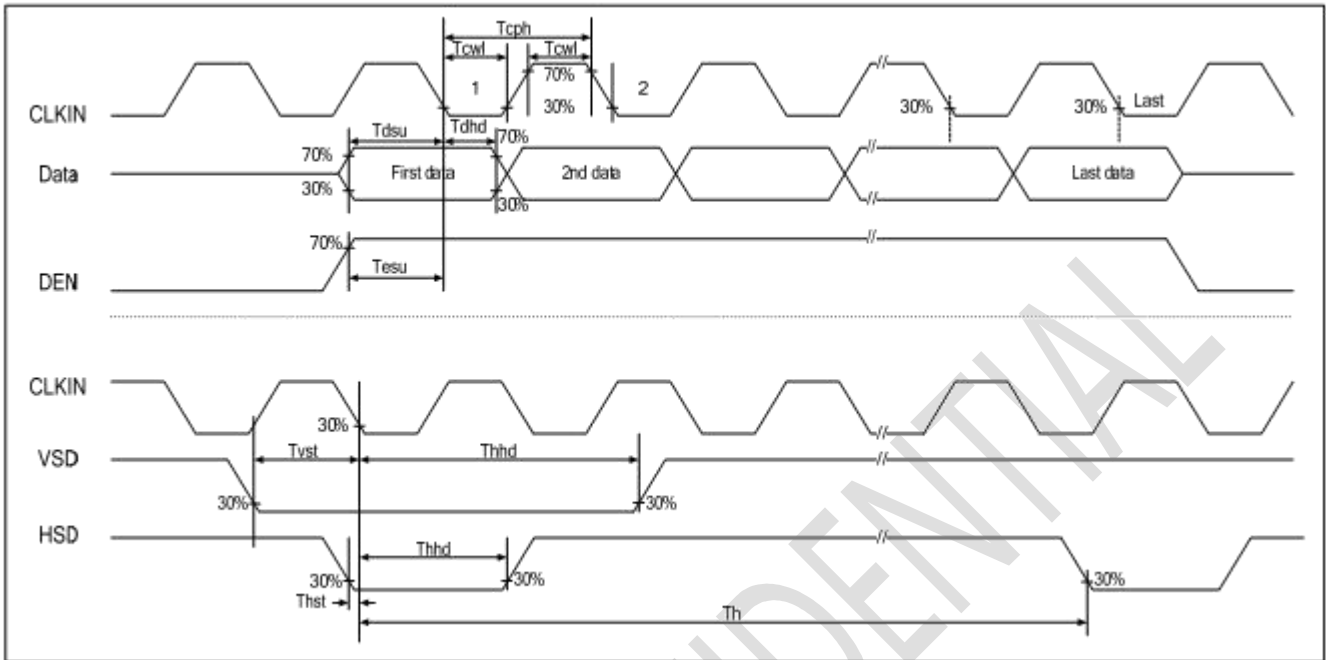
● **Horizontal timing**
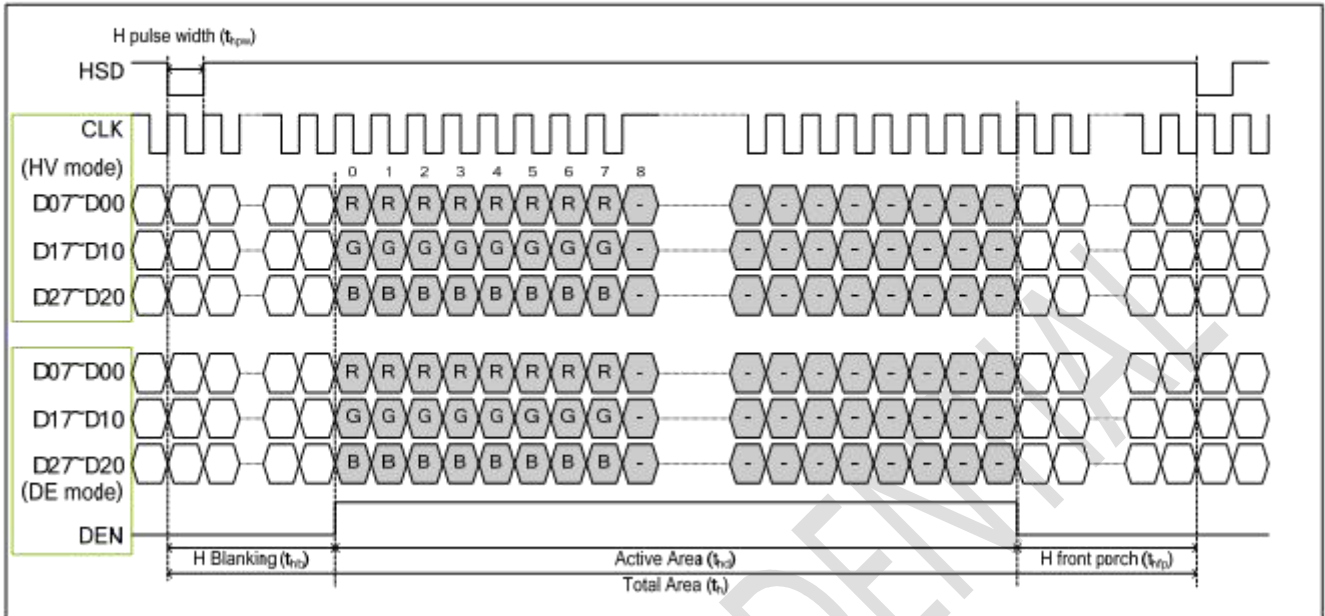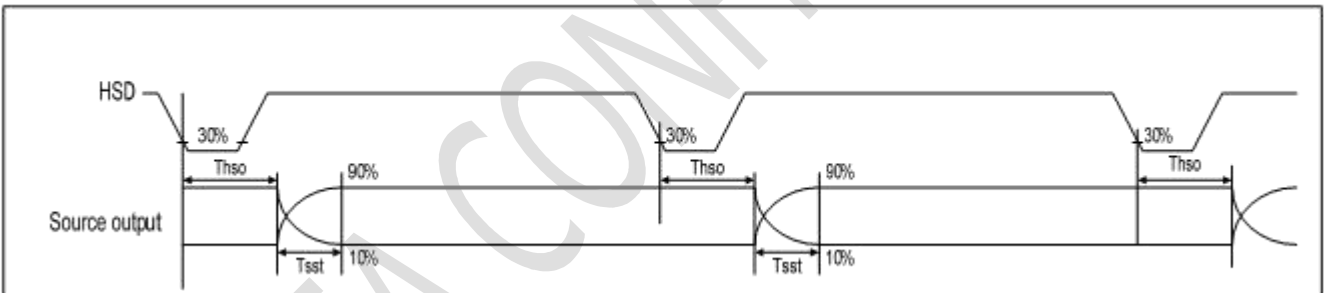

● **Vertical Timing**
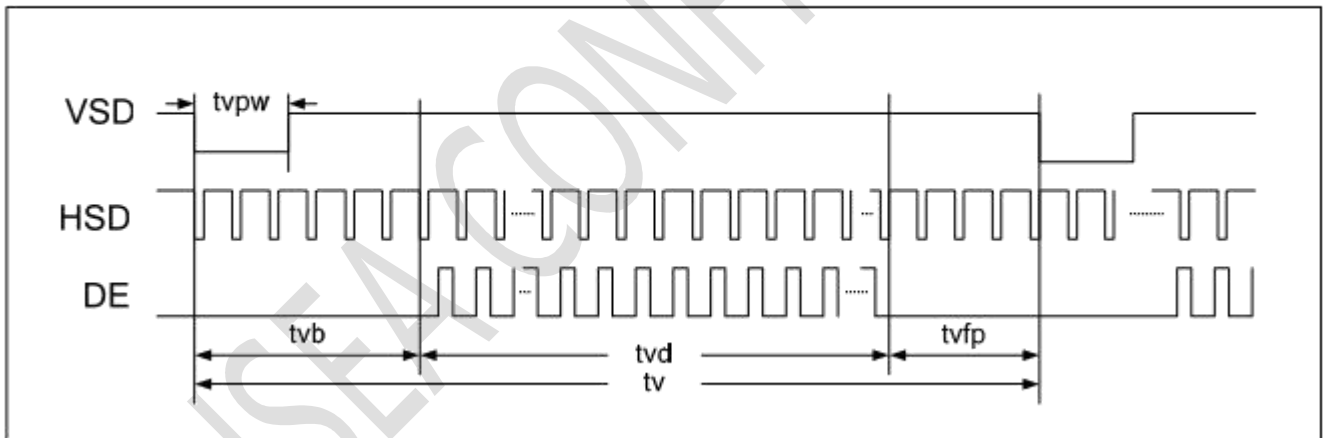
6.6 Timing diagram

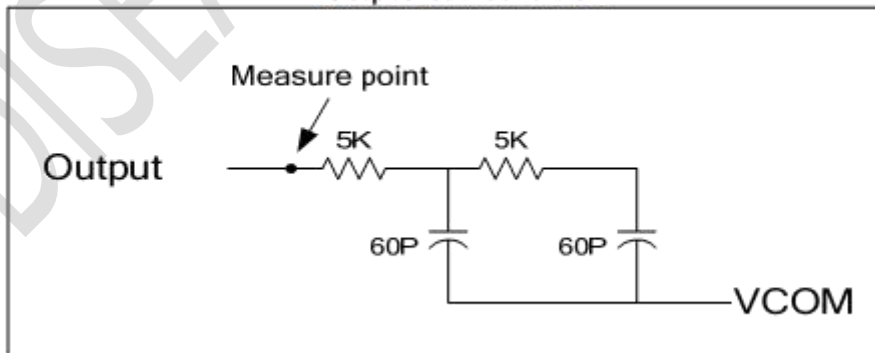### 6.6.1 clock input and data timing waveform

6.6.2 Source output timing waveform

Output load condition

7. Optical Characteristics

Item	Symbol		Condition	Min.	Typ.	Max.	Unit	Note
Brightness	Bp		θ=0° Φ=0°	-	700	-	Cd/m^2	1
Uniformity	⊿Bp			75	-	-	%	1,2
Viewing Angle	3:00		Cr≥10	-	65	-	Deg	3
	6:00			-	55	-		
	9:00			-	65	-		
	12:00			-	65	-		
Contrast Ratio	Cr		θ=0° Φ=0°	400	500	-	-	4
Response Time	T$_r$			-	10	20	ms	5
	T$_f$			-	15	30	ms	
Color of CIE Coordinate	W	x	θ=0° Φ=0°	Typ. -0.05	0.310	Typ. +0.05	-	1,6
		y			0.325		-	
	R	x			0.583		-	
		y			0.328		-	
	G	x			0.303		-	
		y			0.554		-	
	B	x			0.144		-	
		y			0.113		-	
NTSC Ratio	S			50	60	-	%	

Note：The parameter is slightly changed by temperature, driving voltage and materiel

Note 1: The data are measured after LEDs are turned on for 5 minutes. LCM displays full white.

The brightness is the average value of 9 measured spots. Measurement equipment BM-7

(Φ5mm)

Measuring condition:

- Measuring surroundings: Dark room.

- Measuring temperature: Ta=25℃.

- Adjust operating voltage to get optimum contrast at the center of the display.

Measured value at the center point of LCD panel after more than 5 minutes while backlight turning on.
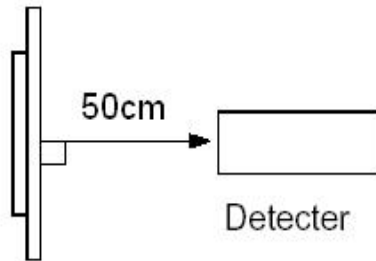
Note 2: The luminance uniformity is calculated by using following formula.
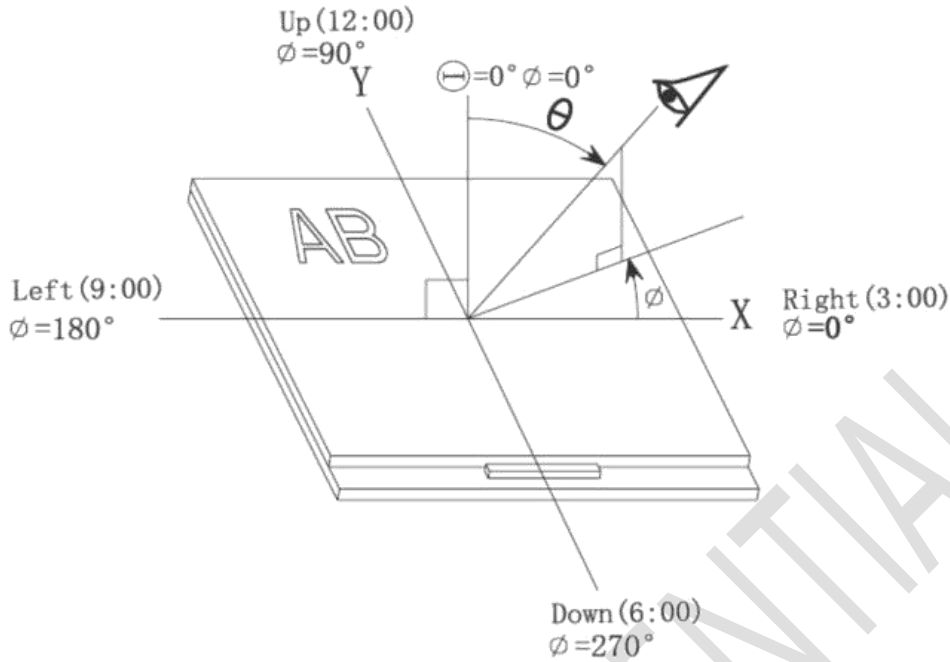
$\triangle Bp = Bp\ (Min.) / Bp\ (Max.) \times 100\ (\%)$

Bp (Max.) = Maximum brightness in 9 measured spots
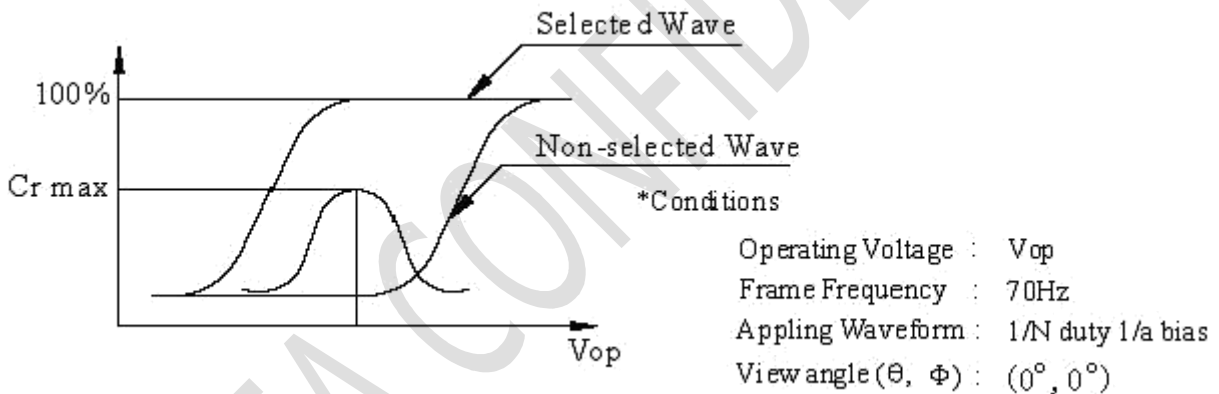
Bp (Min.) = Minimum brightness in 9 measured spots.

Active area
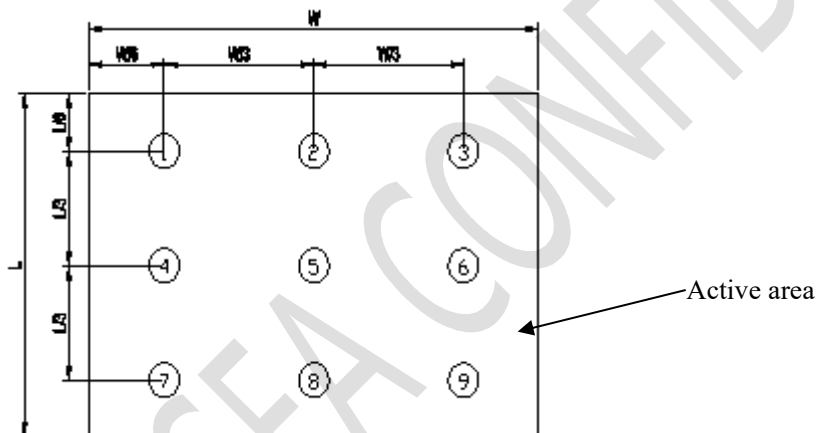
Note 3: The definition of viewing angle:
Refer to the graph below marked by θ and Φ

Note 4: Definition of contrast ratio.(Test LCD using DMS501)

*Conditions

Operating Voltage : Vop
Frame Frequency : 70Hz
Appling Waveform : 1/N duty 1/a bias
View angle (θ, Φ) : (0°, 0°)

$$Contrast\ ratio(Cr) = \frac{Brightness\ of\ selected\ dots}{Brightness\ of\ non-selected\ dots}$$

Note 5: Definition of Response time. (Test LCD using DMS501):

The response time is defined as the LCD optical switching time interval between"White" state and "Black"state. Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.
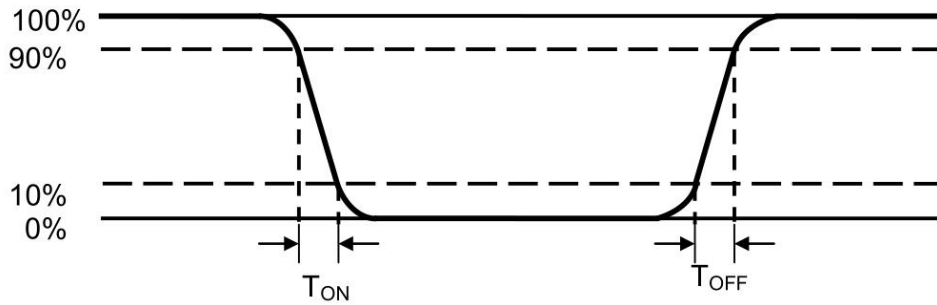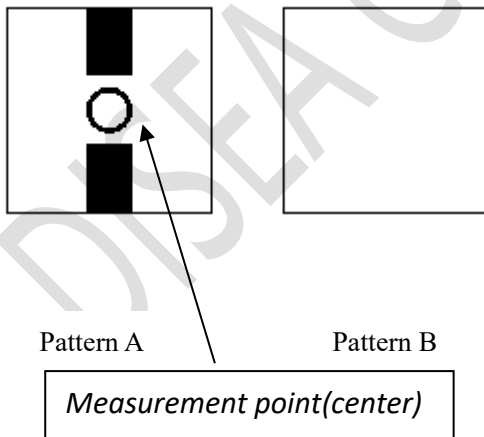
The definition of response time

Note 6: Definition of Color of CIE Coordinate and NTSC Ratio.

1931 CIE Chromaticity Diagram

Color gamut:

$$S = \frac{\text{area of RGB triangle}}{\text{area of NTSC triangle}} \times 100\%$$
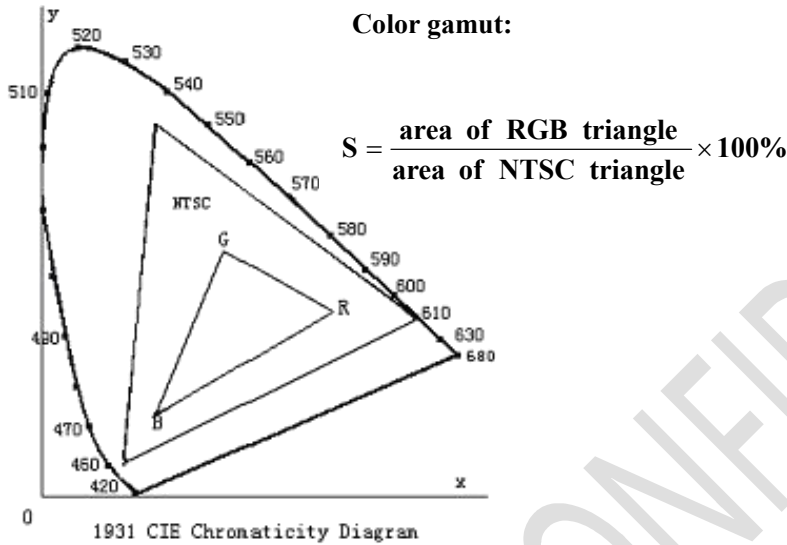
Note 7: Definition of cross talk.

Cross talk ratio(%)=|pattern A Brightness-pattern B Brightness|/pattern A Brightness*100

Pattern A   Pattern B

Measurement point(center)

Electric volume value=3F+/-3Hex

8. Reliability Test Items and Criteria

Test Item	Test condition	Remark
High Temperature Storage	Ta = 80℃ 96hrs	Note1,Note4
Low Temperature Storage	Ta = -30℃ 96hrs	Note1,Note4
High Temperature Operation	Ts = 70℃ 96hrs	Note2,Note4
Low Temperature Operation	Ta = -20℃ 96hrs	Note1,Note4
Operation at High Temperature/Humidity	+60℃, 90%RH 96hrs	Note4
Thermal Shock	-30℃/30 min ~ +80℃/30 min for a total 10 cycles, Start with cold temperature and end with high temperature.	Note4
Vibration Test	Frequency range:10~55Hz Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X. Y. Z. (6 hours for total)	
Mechanical Shock	100G 6ms,±X, ±Y, ±Z 3 times for each direction	
Package Vibration Test	Random Vibration : 0.015G*G/Hz from 5-200HZ, -6dB/Octave from 200-500HZ 2 hours for each direction of X. Y. Z. (6 hours for total)	
Package Drop Test	Height:60cm 1 corner, 3 edges, 6 surfaces	
Electro Static Discharge	±2KV, Human Body Mode, 100pF/1500Ω	

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

9. Precautions for Use of LCD Modules

9.1 Handling Precautions

9.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

9.1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

9.1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

9.1.4 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

9.1.5 If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

  — Isopropyl alcohol   — Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer.   Especially, do not use the following:

  — Water   — Ketone   — Aromatic solvents

9.1.6 Do not attempt to disassemble the LCD Module.

9.1.7 If the logic circuit power is off, do not apply the input signals.

9.1.8 To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

  a. Be sure to ground the body when handling the LCD Modules.

  b. Tools required for assembly, such as soldering irons, must be properly ground.

  c. To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

  d. The LCD 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.

9.2 Storage precautions

9.2.1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

9.2.2 The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:

Temperature :   0℃ ～ 40℃

Relatively humidity: ≤80%

9.2.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.

9.3 The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.

"Disea Electronics Co., Ltd. reserves the right to change this specification."

SZ office:
5F,#3 Building,TianFuAn Industrial park,LeZhuJiao,ZhouShi Road,XiXiang Town,BaoAn District,ShenZhen City,GuangDong Province,China

ZQ factory:
Building A1, No. 8, Science and Technology 1st Road, Zhaoqing New District, Dinghu District, Zhaoqing City, Guangdong Province, China.

- END