ASI-T-700SA4LN/D

Item	Contents	Unit
Size	7.0	inch
Resolution	1280 (RGB) x 800	/
Interface	LVDS	/
Technology type	a-si TFT	/
Pixel pitch	0.117 x 0.117	mm
Pixel Configuration	R.G.B. Vertical Stripe	
Outline Dimension (W x H x D)	161.0 x 107.0 x 3.35	mm
Active Area(W x H)	149.76 x 93.60	mm
Display Mode	Transmissive with Normally Black	/
Backlight Type	LED	/

Record of Revision

Date	Revision No.	Summary
2016-01-14	1.0	Rev 1.0 was issued

1. Scope

This data sheet is to introduce the specification of ASI-T-700SA4LN/D active matrix TFT module. It is composed of a color TFT-LCD panel, driver ICs, FPC and a backlight unit. The 7.0″ display area contains 1280(RGB) x 800 pixels.
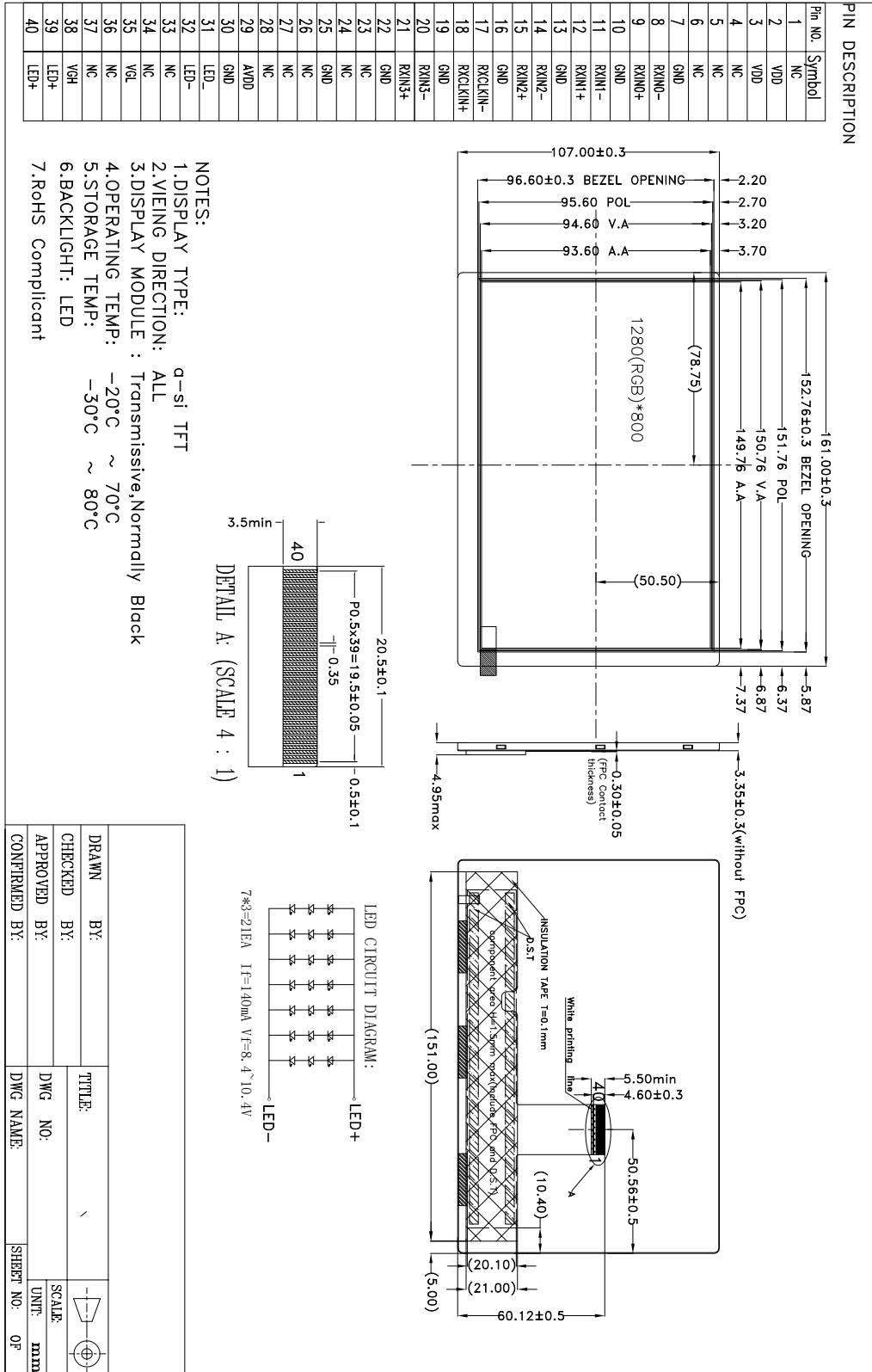
2. Application

Digital equipments which need color display, mobile navigator/video systems.

3. General Information

Item	Contents	Unit
Size	7.0	inch
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Backlight Type	LED	/

4. Outline Drawing

PIN DESCRIPTION

Pin NO.	Symbol
1	NC
2	VDD
3	VDD
4	NC
5	NC
6	NC
7	GND
8	RXIN0−
9	RXIN0+
10	GND
11	RXIN1−
12	RXIN1+
13	GND
14	RXIN2−
15	RXIN2+
16	GND
17	RXCLKIN−
18	RXCLKIN+
19	GND
20	RXIN3−
21	RXIN3+
22	GND
23	NC
24	NC
25	GND
26	NC
27	NC
28	NC
29	AVDD
30	GND
31	GND
32	LED−
33	LED−
34	NC
35	VGL
36	NC
37	NC
38	VGH
39	LED+
40	LED+

NOTES:
1.DISPLAY TYPE: a−si TFT
2.VIEING DIRECTION: ALL
3.DISPLAY MODULE : Transmissive,Normally Black
4.OPERATING TEMP: −20°C ~ 70°C
5.STORAGE TEMP: −30°C ~ 80°C
6.BACKLIGHT: LED
7.RoHS Compliant

DETAIL A: (SCALE 4 : 1)

3.5min
40
P0.5x39=19.5±0.05
0.35
20.5±0.1
0.5±0.1
1

107.00±0.3
96.60±0.3 BEZEL OPENING
95.60 POL
94.60 V.A
93.60 A.A
2.20
2.70
3.20
3.70

161.00±0.3
152.76±0.3 BEZEL OPENING
151.76 POL
150.76 V.A
149.76 A.A
5.87
6.37
6.87
7.37

1280(RGB)*800

(78.75)
(50.50)

4.95max
0.30±0.05 (FPC Contact thickness)
3.35±0.3(without FPC)

LED CIRCUIT DIAGRAM:
7*3=21EA If=140mA Vf=8.4~10.4V
LED+
LED−

INSULATION TAPE T=0.1mm
0.5T
White printing line
component area 0.4±0.3mm max(include FPC and 0.5T)
5.50min
4.60±0.3
(151.00)
50.56±0.5
(10.40)
(20.10)
(21.00)
(5.00)
60.12±0.5

DRAWN	BY:		TITLE:	/
CHECKED	BY:			
APPROVED	BY:		DWG NO:	
CONFIRMED BY:			DWG NAME:	
			SCALE:	SHEET NO: OF
			UNIT: mm	

5. Interface signals

Pin No.	Symbol	I/O	Function	Remarks
1	NC	--	No connection	
2	VDD	P	Power Voltage for digital circuit	
3	VDD	P	Power Voltage for digital circuit	
4	NC	--	No connection	
5	NC	--	No connection	
6	NC	--	No connection	
7	GND	P	Ground	
8	RXIN0-	I	- LVDS differential data input	
9	RXIN0+	I	+LVDS differential data input	
10	GND	P	Ground	
11	RXIN1-	I	-LVDS differential data input	
12	RXIN1+	I	+LVDS differential data input	
13	GND	P	Ground	
14	RXIN2-	I	-LVDS differential data input	
15	RXIN2+	I	+LVDS differential data input	
16	GND	P	Ground	
17	RXCLKIN-	I	-LVDS differential clock input	
18	RXCLKIN+	I	+LVDS differential clock input	
19	GND	P	Ground	
20	RXIN3-	I	-LVDS differential data input	
21	RXIN3+	I	+LVDS differential data input	
22	GND	P	Ground	
23	NC	--	No connection	
24	NC	--	No connection	
25	GND	P	Ground	
26	NC	--	No connection	
27	NC	--	No connection	
28	NC	--	No connection	
29	AVDD	P	Power for Analog Circuit	
30	GND	P	Ground	
31.	LED-	P	LED Cathode	
32	LED-	P	LED Cathode	
33	NC	--	No connection	
34	NC	--	No connection	
35	VGL	P	Gate OFF Voltage	
36	NC	--	No connection	
37	NC	--	No connection	
38	VGH	P	Gate ON Voltage	
39	LED+	P	LED Anode	
40	LED+	P	LED Anode	

Note1: I/O definition: I---Input, O---Output, P--- Power/Ground
Connector type: Molex 54132-4062

6. Absolute maximum Ratings

6.1. Electrical Absolute max. ratings

GND=0V, Ta = 25℃

Parameter	Symbol	MIN	MAX	Unit	Remark
Power voltage	VDD	-0.5	5.0	V	
	AVDD	-0.5	14.85	V	
	VGH	-0.3	20.0	V	
	VGL	-20.0	0.3	V	

6.2. Environment Conditions

Item	Symbol	MIN	MAX	Unit	Remark
Operating Temperature	TOPR	-20	70	℃	
Storage Temperature	TSTG	-30	80	℃	

6.3. LED Backlight Absolute max. ratings

Item	Symbol	MIN	MAX	Unit	Remark
LED Forward Current	IL	--	25	mA	For each LED

7. Electrical Specifications

7.1 Electrical characteristics

GND=0V, Ta=25℃

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Digital Supply Voltage	VDD	3.0	3.3	3.6	V	
Analog Supply Voltage	AVDD	10.5	11	11.5	V	
Gate On Voltage	VGH	17.5	18.0	18.5	V	
Gate Off Voltage	VGL	-7.1	-6.8	-6.5	V	
Common Electrode Driving Signal	VCOM	3.45	3.55	3.65	V	With the VR Knob

7.2 LED Backlight

Ta=25℃

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Voltage	VLED	--	9.3	10.2	V	Note 1 Note 2 I_F=140mA
Forward Current	I_F	--	140	--	mA	
Backlight Power Consumption	WBL	--	1302	1428	mW	
Life Time		--	30,000	--	Hrs	

Note 1: I_F is defined for one channel LED. There are total three LED channels in back light unit.
　　　Under LCM operating, the stable forward current should be inputted.
Note 2: Optical performance should be evaluated at Ta=25℃ only.
Note 3: If LED is driven by high current, high ambient temperature & humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness.
　　　Typical operating life time is estimated data.
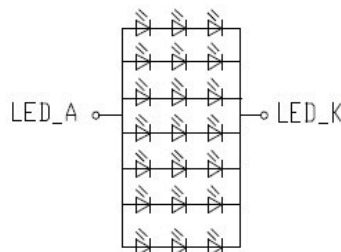
LED circuit
V_f=9.3V, I_f=140mA

7.3 BLOCK DIAGRAM
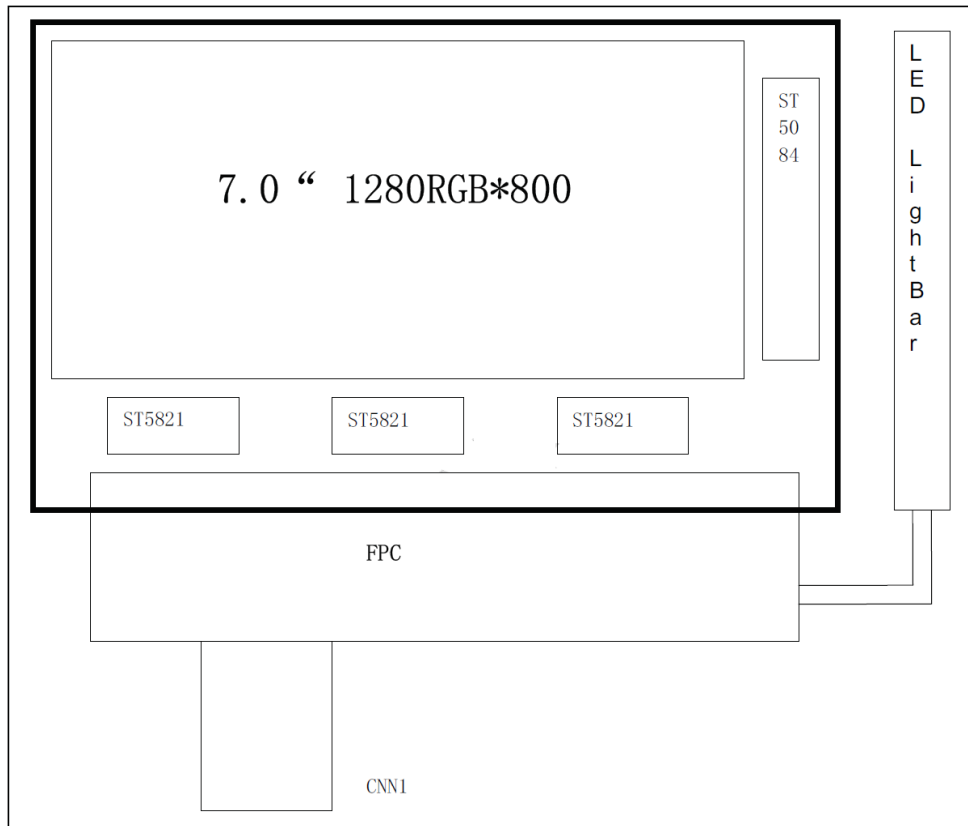
8. Command/AC Timing

8.1 AC Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Clock Frequency	R_{xFCLK}	20	--	80	MHz	
Input data skew margin	T_{RSKM}	500	--	--	ps	$|V_{IDI}|$= 400mV, R_{xVCM}=1.2V R_{xFCLK}=80MHz
Clock high time	T_{LVCH}	--	4/7	--	R_{xFCLK}	
Clock low time	T_{LVCL}	--	3/7	--	R_{xFCLK}	
PLL wake-up time	T_{enPLL}	--	--	150	us	
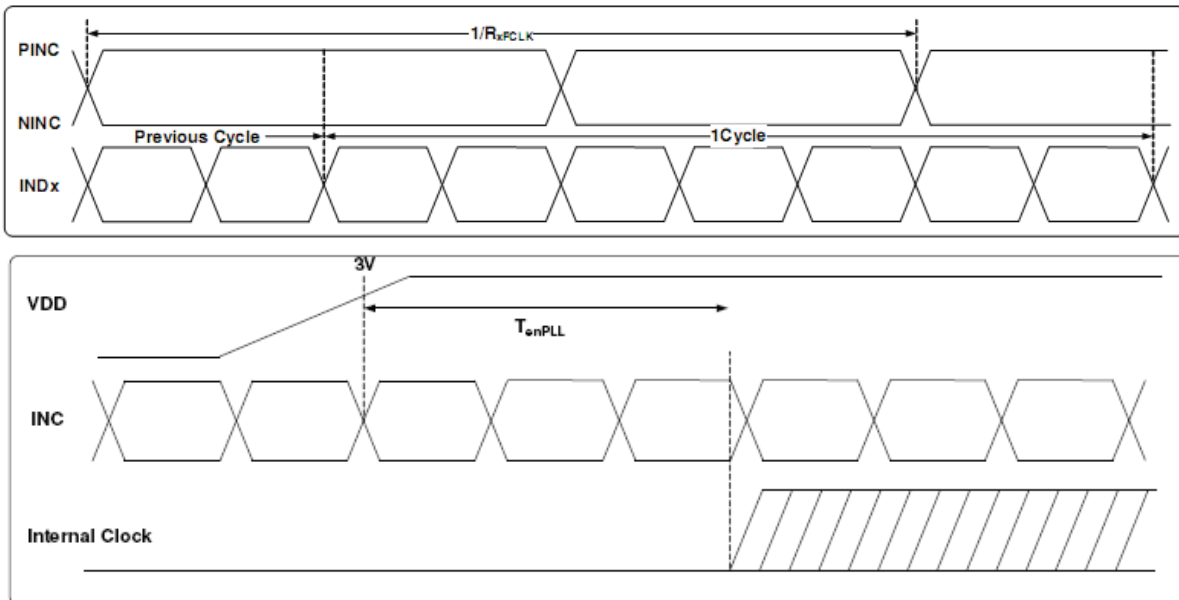
8.2 DC Electrical Characteristics

VGH=18V, VGL=-7V, VDD=3.3V, GND=0V, Ta=25℃

Parameter	Symbol	Min	Typ	Max	Unit	Remark
Differential input high Threshold voltage	R_{XVTH}	--	--	+0.1	V	
Differential input Low Threshold voltage	R_{XVTL}	-0.1	--	--	V	
Input voltage range	R_{XVIN}	0	--	VDD-1.0	V	
Differential input common Mode voltage	R_{XVCM}	$|V_{ID}|/2$	--	$2.4-|V_{ID}|/2$	V	
Differential input voltage	$|V_{ID}|$	0.2	v	0.6	V	

1 Edgewater Plaza, Staten Island, NY 10305 * Tel. 718-720-0018 * Fax. 718-720-0225 * email: sales@allshore.com

Differential input leakage Current	RVXliz	-10	v	+10	uA	
LVDS Digital Operating Current	Iddlvds		(40)	(50)	mA	Fclk=65MHz, VDD=3.3V
LVDS Digital Stand-by Current	Istlvds		(10)	(50)	uA	Clock & all functions are stopped
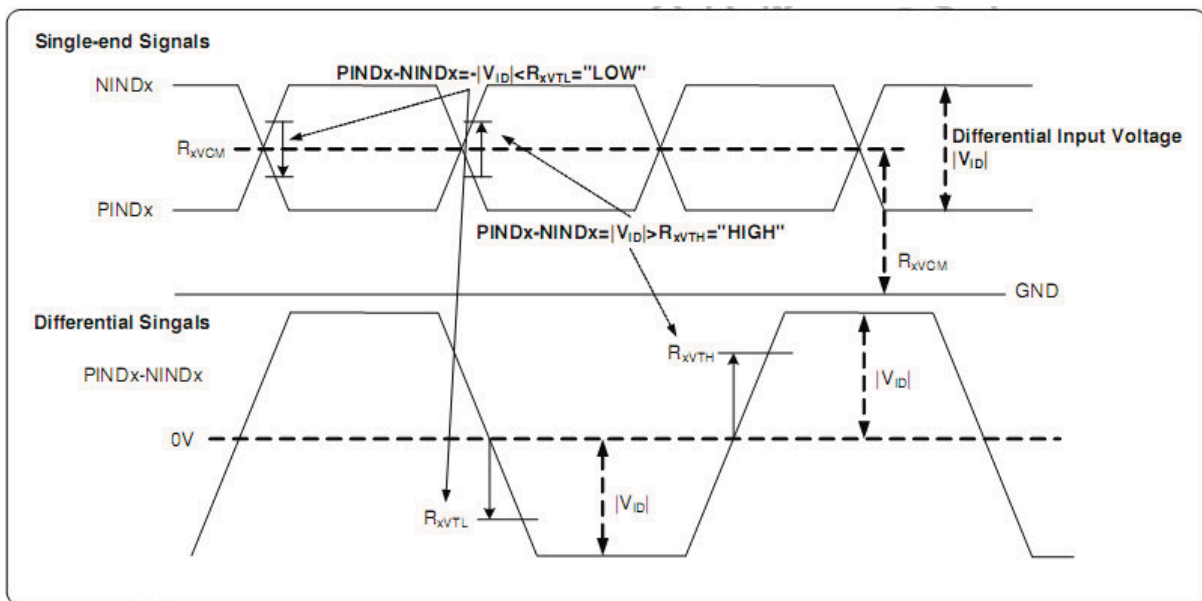
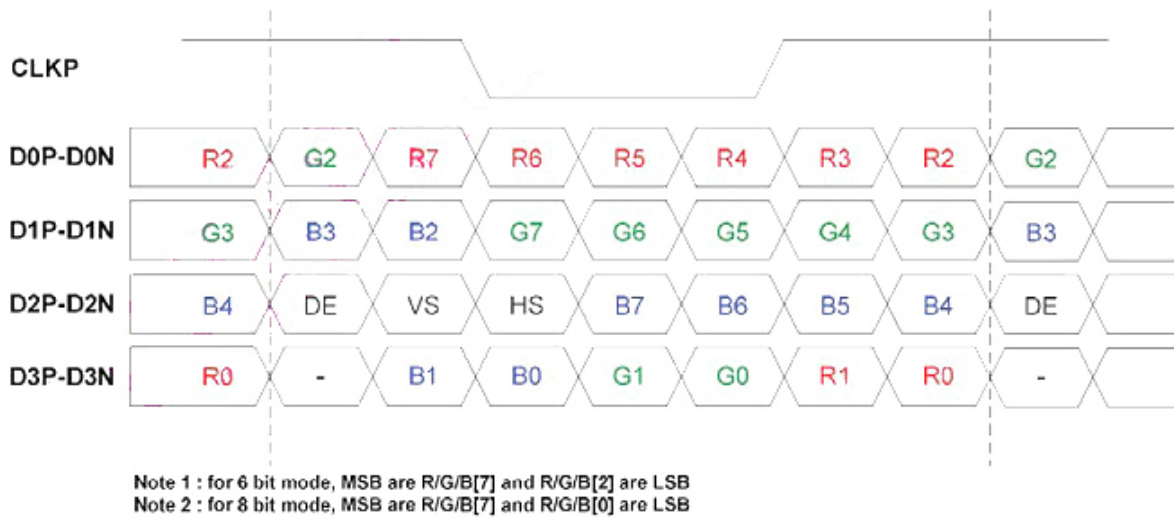## 8.3 Input timing

1280x800 (RES[3:0] = 0010)

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
CLK frequency	t_{CLK}	62.6	68.2	78.1	Mhz	
Horizontal blanking time	t_{HBT}	20	69	164	t_{CLK}	$t_{HBP} + t_{HFP}$
Horizontal back porch	t_{HBP}	5	5	164- t_{HFP}	t_{CLK}	
Horizontal display area	t_{HD}	1280	1280	1280	t_{CLK}	
Horizontal front porch	t_{HFP}	15	64	159	t_{CLK}	
Horizontal period	t_H	1300	1349	1444	t_{CLK}	
Horizontal pulse width	t_{HPW}	1	1	256	t_{CLK}	
Vertical blanking time	t_{VBT}	5	42	101	t_H	$t_{VBP} + t_{VFP}$
Vertical back porch	t_{VBP}	2	2	101- t_{VFP}	t_H	
Vertical display area	t_{VD}	800	800	800	t_H	
Vertical front porch	t_{VFP}	3	40	99	t_H	
Vertical period	t_V	803	842	901	t_H	
Vertical pulse width	t_{VPW}	1	1	128	t_H	

8.4 Data Input Format

VESA data mapping

CLKP									
D0P-D0N	R0	G0	R5	R4	R3	R2	R1	R0	G0
D1P-D1N	G1	B1	B0	G5	G4	G3	G2	G1	B1
D2P-D2N	B2	DE	VS	HS	B5	B4	B3	B2	DE
D3P-D3N	R6	-	B7	B6	G7	G6	R7	R6	-

Note 1 : for 6 bit mode, MSB are R/G/B[5] and R/G/B[0] are LSB
Note 2 : for 8 bit mode, MSB are R/G/B[7] and R/G/B[0] are LSB

JEIDA data mapping

CLKP									
D0P-D0N	R2	G2	R7	R6	R5	R4	R3	R2	G2
D1P-D1N	G3	B3	B2	G7	G6	G5	G4	G3	B3
D2P-D2N	B4	DE	VS	HS	B7	B6	B5	B4	DE
D3P-D3N	R0	-	B1	B0	G1	G0	R1	R0	-

Note 1 : for 6 bit mode, MSB are R/G/B[7] and R/G/B[2] are LSB
Note 2 : for 8 bit mode, MSB are R/G/B[7] and R/G/B[0] are LSB

8.5 Power On/Off Timing

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

Power On:

Power Off

VDD		
VS (input)		
DE (input)		
RSTB (input)		
STBYB (input)	Power off	
VDDA, RVDDA (output)		
VGL (output)		
VGH (output)		
VCOM (output)		
Source output	Normal	POFF
Gate output	Normal	
XON (output)		
DIMO (LED backlight)		
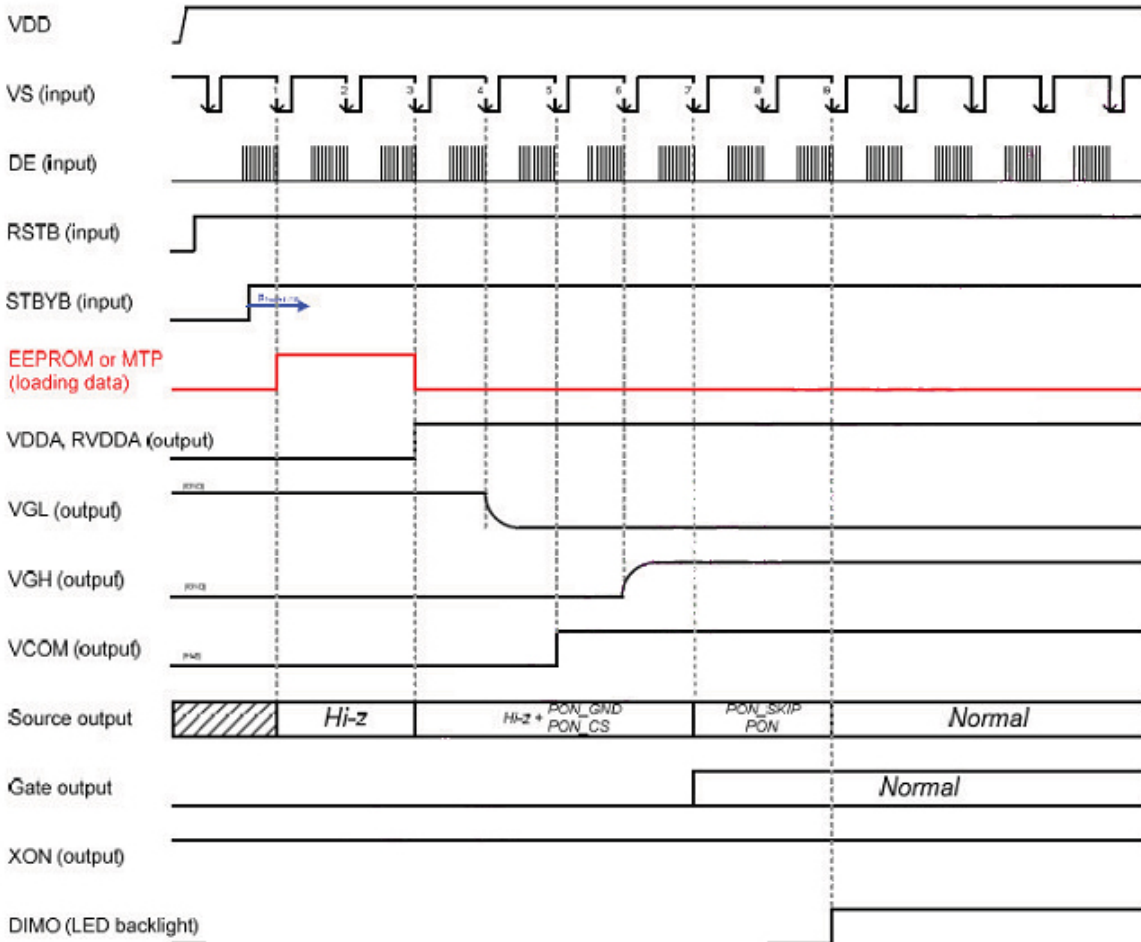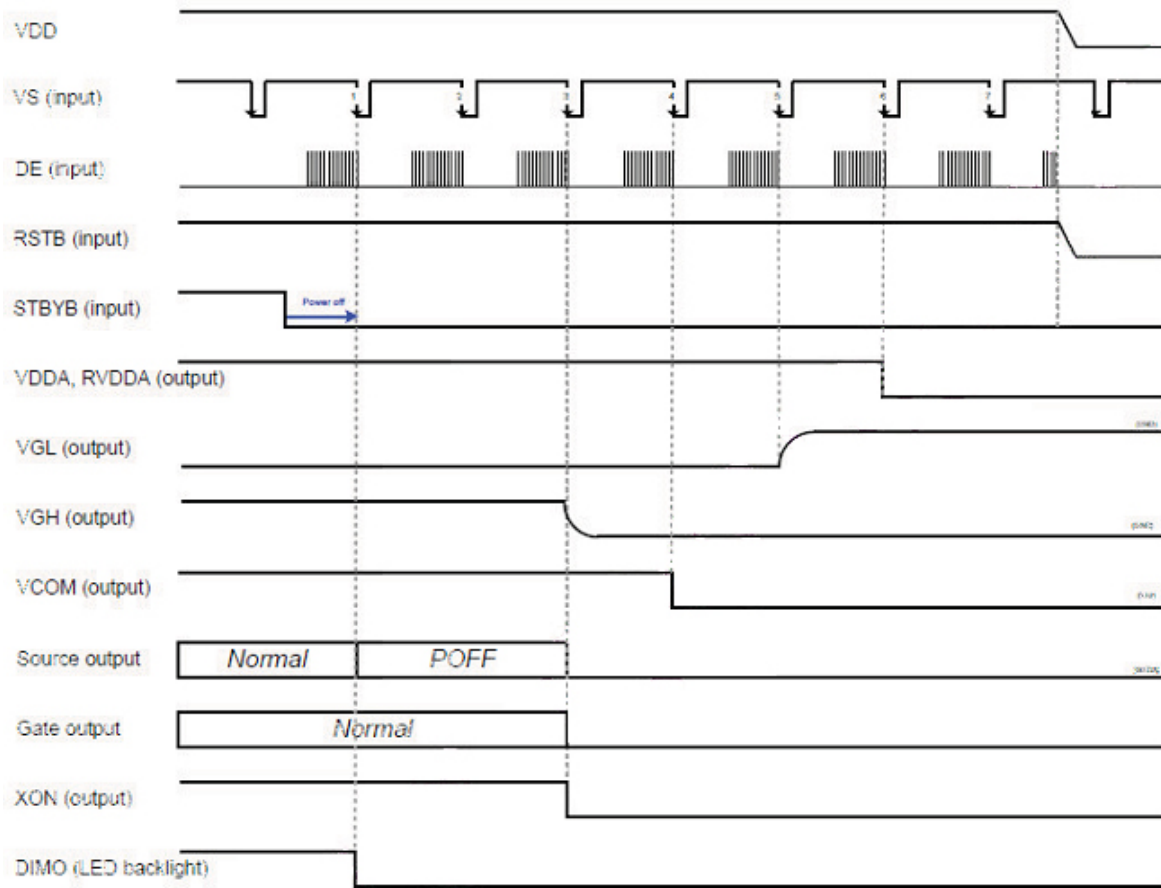
9. Optical Specification

Ta=25℃

Item		Symbol	Condition	Min	Typ.	Max.	Unit	Remark
Contrast Ratio		CR	θ=0°	600	800	-		Note1 Note2
Response Time		Ton/ Toff	25℃	-	35	40	ms	Note1 Note3
View Angles		ΘT	CR≧10	80	88	-	Degree	Note 4
		ΘB		80	88	-		
		ΘL		80	88	-		
		θR		80	88	-		
Chromaticity	White	x	Brightness is on	0.256	0.306	0.356		Note5, Note1
		y		0.279	0.329	0.379		
	Red	x		0.520	0.570	0.620		
		y		0.280	0.330	0.380		
	Green	x		0.300	0.350	0.400		
		y		0.542	0.592	0.642		
	Blue	x		0.105	0.155	0.205		
		y		0.051	0.101	0.151		
NTSC		S		45	50		%	Note5
Luminance		L		320	400	-	cd/m^2	Note1 Note6
Uniformity		U		70	75	-	%	Note1 Note7

Test condition: I$_F$= 20mA(one channel), the ambient temperature is 25℃.
The test systems refer to Note 1 and Note 2.

Note 1: Definition of optical measurement system.

Temperature = 25℃($\pm$3℃)

LED back-light: ON, Environment brightness < 150 lx
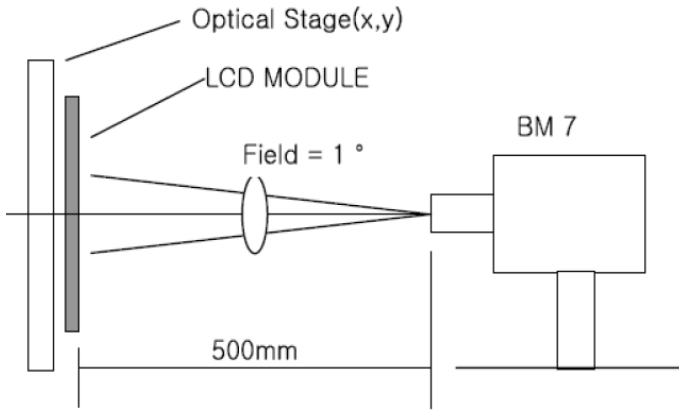
Note 2: Contrast ratio is defined as follow:

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

Note 3: Response time is defined as follow:

Response time is the time required for the display to transition from black to white (Rise Time, Tr) and from white to black(Decay Time, Tf).
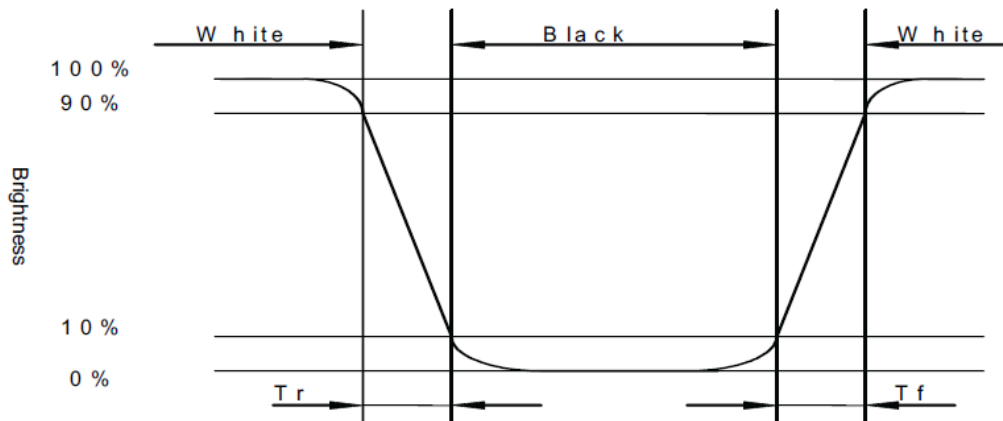
Note 4: Viewing angle range is defined as follow:

Viewing angle is measured at the center point of the LCD.
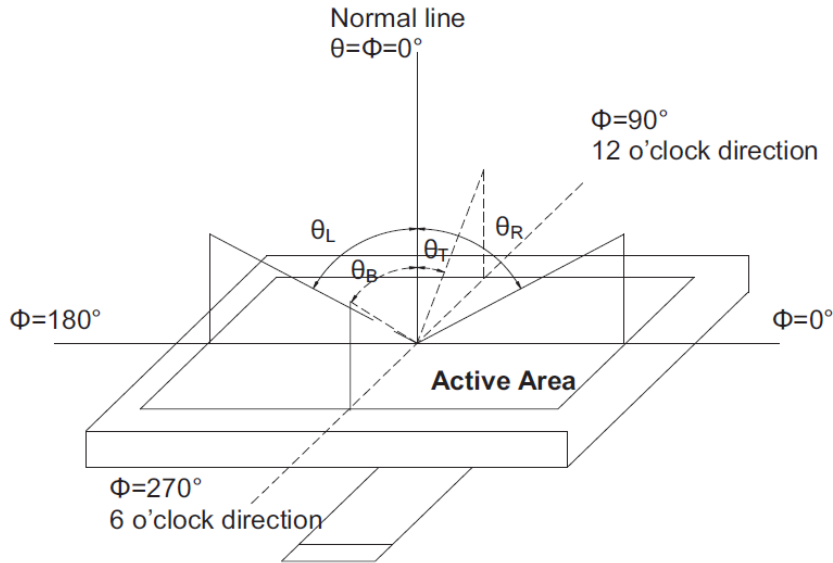
Note 5: Color chromaticity is defined as follow: (CIE1931)

Color coordinates measured at center point of LCD.

1931 CIE Chromaticity Diagram
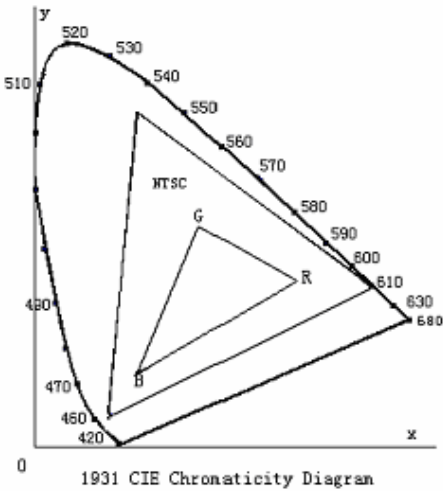
$$S = \frac{\text{area of RGB triangle}}{\text{area of NTSC triangle}} \times 100\%$$

Note 6: Luminance is defined as follow:

Luminance is defined as the brightness of all pixels "White" at the center of display area on optimum contrast.

Note 7: Luminance Uniformity is defined as follow:

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

$$\text{Uniformity(U)} = \frac{\text{Minimum Luminance(brightness) in 9 points}}{\text{Maximum Luminance(brightness) in 9 points}}$$
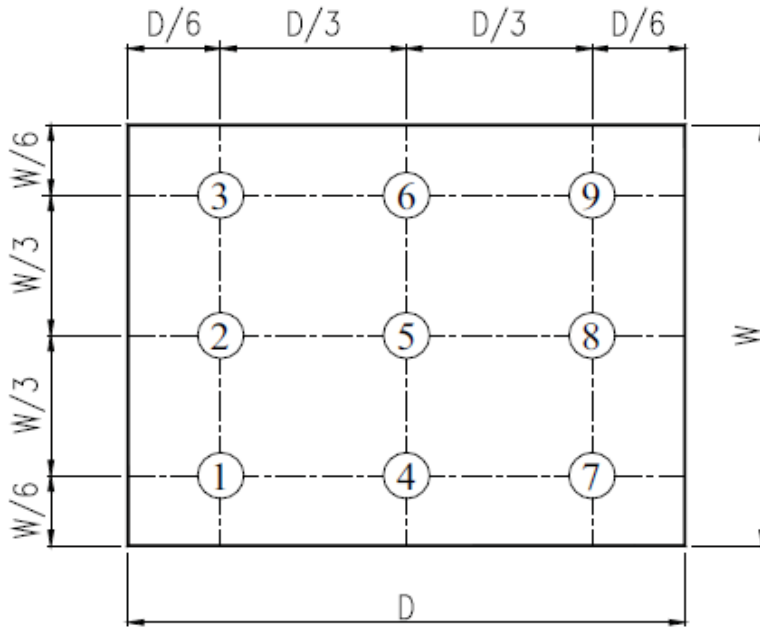
Fig. 2 Definition of uniformity

10. Environmental / Reliability Tests

No	Test Item	Condition	Judgment criteria
1	High Temp Operation	Ts=+70℃, 120hrs	Per table in below
2	Low Temp Operation	Ta=-20℃, 120hrs	Per table in below
3	High Temp Storage	Ta=+80℃, 120hrs	Per table in below
4	Low Temp Storage	Ta=-30℃, 120hrs	Per table in below
5	High Temp & High Humidity Storage	Ta=+40℃, 90% RH 120 hours	Per table in below (polarizer discoloration is excluded)
6	Thermal Shock (Non-operation)	-30℃ 30 min~+80℃ 30 min, Change time:5min, 10 Cycles	Per table in below
7	ESD (Operation)	C=150pF, R=330Ω，5points/panel Air:±8KV, 5times; Contact:±4KV, 5 times;	Per table in below
8	Vibration (Non-operation)	Frequency range:10~55Hz, Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X.Y.Z.	Per table in below
9	Shock (Non-operation)	60G 6ms, ±X,±Y,±Z 3times, for each direction	Per table in below
10	Package Drop Test	Height:80 cm, 1 corner, 3 edges, 6 surfaces	Per table in below

INSPECTION	CRITERION(after test)
Appearance	No Crack on the FPC, on the LCD Panel
Alignment of LCD Panel	No Bubbles in the LCD Panel No other Defects of Alignment in Active area
Electrical current	Within device specifications
Function / Display	No Broken Circuit, No Short Circuit or No Black line No Other Defects of Display

11. Precautions for Use of LCD Modules

11.1 Safety

The liquid crystal in the LCD is poisonous. Do not put it in your mouth. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and water.

11.2 Handling

A. The LCD and touch panel is made of plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.

B. Do not handle the product by holding the flexible pattern portion in order to assure the reliability

C. Transparency is an important factor for the touch panel. Please wear clear finger sacks, gloves and mask to protect the touch panel from finger print or stain and also hold the portion outside the view area when handling the touch panel.

D. Provide a space so that the panel does not come into contact with other components.

E. To protect the product from external force, put a covering lens (acrylic board or similar board) and keep an appropriate gap between them.

F. Transparent electrodes may be disconnected if the panel is used under environmental conditions where dew condensation occurs.

G. Property of semiconductor devices may be affected when they are exposed to light, possibly resulting in IC malfunctions.

H. To prevent such IC malfunctions, your design and mounting layout shall be done in the way that the IC is not exposed to light in actual use.

11.3 Static Electricity

A. Ground soldering iron tips, tools and testers when they are in operation.

B. Ground your body when handling the products.

C. Power on the LCD module before applying the voltage to the input terminals.

D. Do not apply voltage which exceeds the absolute maximum rating.

E. Store the products in an anti-electrostatic bag or container.

11.4 Storage

A. Store the products in a dark place at $+25°C \pm 10°C$ with low humidity (40% RH to 60% RH). Don't expose to sunlight or fluorescent light.

B. Storage in a clean environment, free from dust, active gas, and solvent.

11.5 Cleaning

A. Do not wipe the touch panel with dry cloth, as it may cause scratch.

B. Wipe off the stain on the product by using soft cloth moistened with ethanol. Do not allow ethanol to get in between the upper film and the bottom glass. It may cause peeling issue or defective operation. Do not use any organic solvent or detergent other than ethanol.

11.6 Cautions for installing and assembling

Bezel edge must be positioned in the area between the Active area and View area. The bezel may press the touch screen and cause activation if the edge touches the active area. A gap of approximately 0.5mm is needed between the bezel and the top electrode. It may cause unexpected activation if the gap is too narrow. There is a tolerance of 0.2 to 0.3mm for the outside dimensions of the touch panel and tail. A gap must be made to absorb the tolerance in the case and connector.