ALL SHORE INDUSTRIES

ASI-T-1010JB5LN/D

Item	Contents	Unit
Size	10.1	inch
Resolution	1024(RGB) x 600	/
Interface	LVDS	/
Technology type	IPS	/
Pixel pitch	0.2175 x 0.2088	mm
Pixel Configuration	RGB stripes	
Outline Dimension (W x H x D)	235.00 x 143.00 x 5.00	mm
Active Area	222.72 x 125.28	mm
Display Mode	Transmissive	/
Viewing Direction	ALL	
Backlight Type	LED	/

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Record of Revision

Date	Revision No.	Summary
2020-06-01	1.0	Rev 1.0 was issued

1. Scope

This data sheet is to introduce the specification of ASI-T-1010JB5LN/D active matrix TFT module. It is composed of a color TFT-LCD panel, driver IC, FPC and a backlight unit. The 10.1″ display area contains 1024(RGB) x 600 pixels.

2. Application

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

3. General Information

Item	Contents	Unit
Size	10.1	inch
Resolution	1024(RGB) x 600	/
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Backlight Type	LED	/

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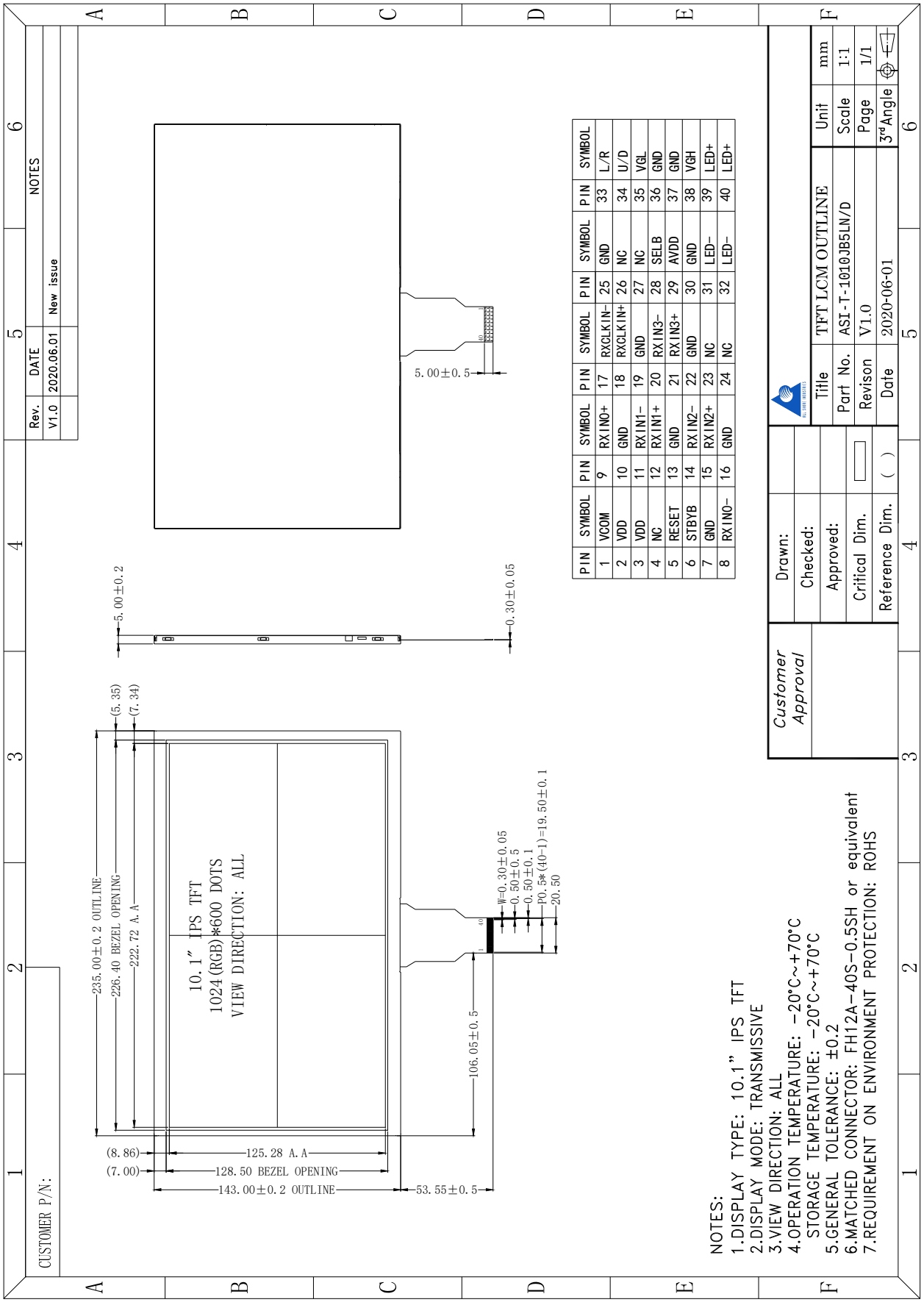
4. Outline Drawing



5. Interface signals

5.1.Interface Signal for Display

The recommended connector model is FH12A-40S-0.5SH manufactured by Hirose.

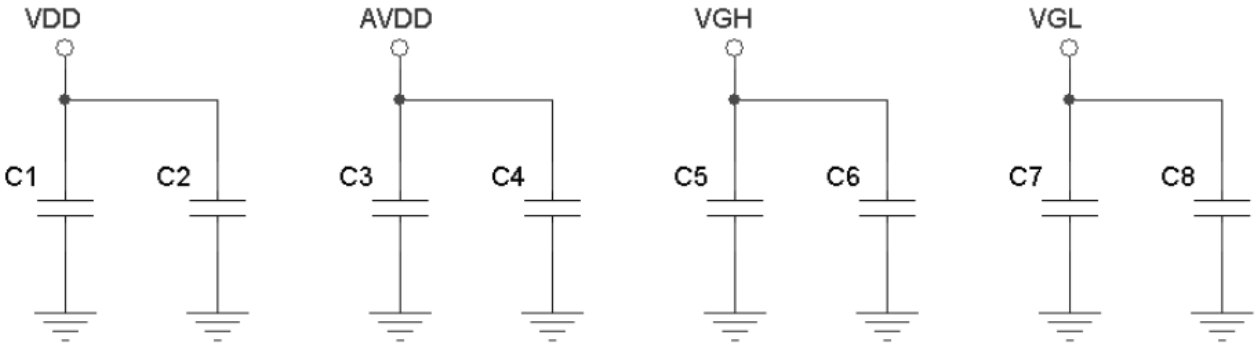
Pin No.	Symbol	I/O	Function	Remark
1	VCOM	P	Common Voltage	
2	VDD	P	Digital Power	
3	VDD	P	Digital Power	
4	NC	-	No connection	
5	RESET	I	Global reset pin. Active low to enter reset state. Suggest to connecting with an RC reset circuit for stability. Normally pull high. (R=100KΩ, C=1μF)	
6	STBYB	I	Standby mode, normally pull high. STBYB="1", normal operation STBYB="0", timing control, source driver will turn off, all output are high-Z.	
7	GND	P	Ground	
8	RXIN0-	I	Negative LVDS Differential Data Inputs	
9	RXIN0+	I	Positive LVDS Differential Data Inputs	
10	GND	P	Ground	
11	RXIN1-	I	Negative LVDS Differential Data Inputs	
12	RXIN1+	I	Positive LVDS Differential Data Inputs	
13	GND	P	Ground	
14	RXIN2-	I	Negative LVDS Differential Data Inputs	
15	RXIN2+	I	Positive LVDS Differential Data Inputs	
16	GND	P	Ground	
17	RXCLKIN-	I	Negative LVDS Differential Clock Inputs	
18	RXCLKIN+	I	Positive LVDS Differential Clock Inputs	
19	GND	P	Ground	
20	RXIN3-	I	Negative LVDS Differential Clock Inputs	
21	RXIN3+	I	Positive LVDS Differential Clock Inputs	
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	SELB	I	6bit/8bit mode select H: 6bit / L: 8bit	
29	AVDD	P	Power for Analog Circuit	
30	GND	P	Ground	
31	LED-	P	LED Cathode	
32	LED-	P	LED Cathode	
33	L/R	I	Horizontal inversion	
34	U/D	I	Vertical inversion	
35	VGL	P	Negative power for TFT	
36	GND	P	Ground	
37	GND	P	Ground	
38	VGH	P	Positive power for TFT	
39	LED+	P	LED Anode	
40	LED+	P	LED Anode	

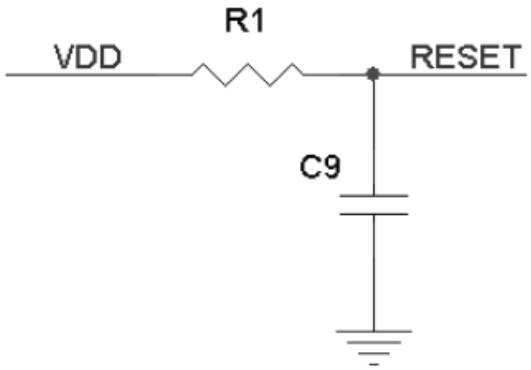
I: input, O: output, P: Power

5.2 Advice Circuit for Customer System

5.2.1 Power PIN: AVDD/VDD/VGH/VGL

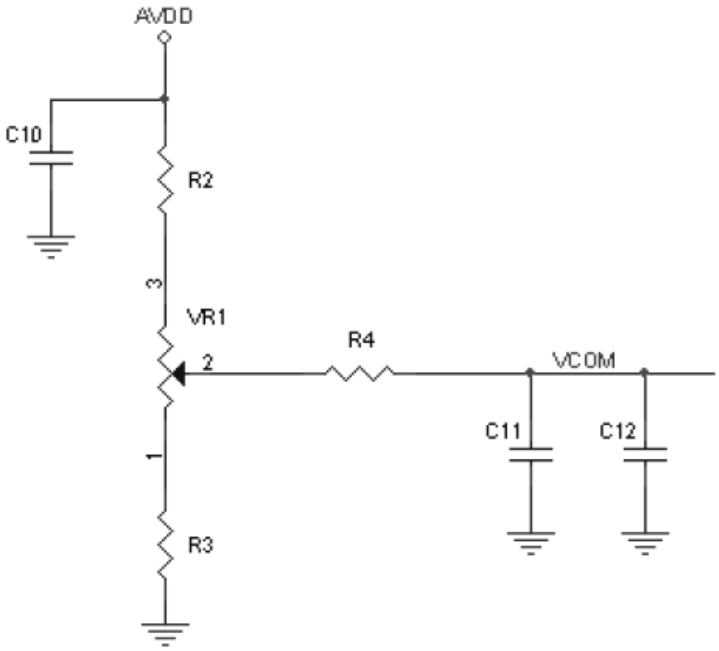


5.2.2 Control PIN: RESET

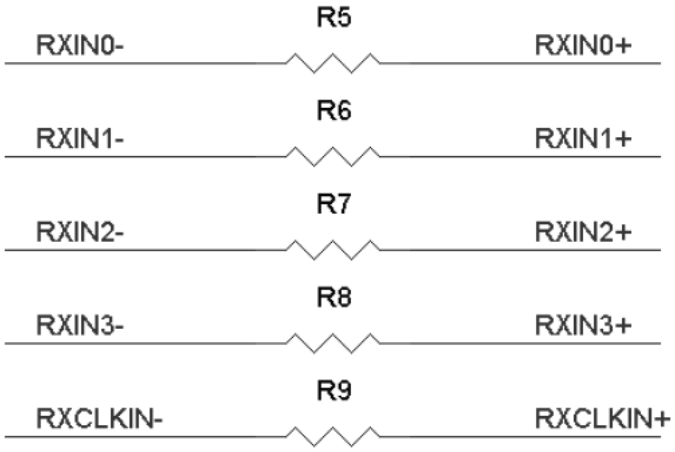


5.2.3 VCOM

Typical VCOM is only a reference value, it must be optimized according to each LCM. Be sure to use VR;



5.2.4 LVDS Signal: LVDS terminal resistor



5.2.5 Suggestion BOM

Location	Description
C1, C11	10uF, X5R, 10V
C2, C12	100nF, X5R, 10V
C3, C7	10uF, X5R, 25V
C4, C8	100nF, X5R, 25V
C5	10uF, X5R, 50V
C6	100nF, X5R, 50V
C9	1uF, X5R, 10V
C10	1uF, X5R, 25V
R1	10Kohm, 1%
R2	12Kohm, 1%
R3	10Kohm, 1%
R4	0ohm, 1%
VR1	10Kohm, 1%
R5, R6,R7, R8, R9	100ohm, 1%

6. Absolute maximum Ratings

6.1. Electrical Absolute max. ratings

Parameter	Symbol	MIN	MAX	Unit	Remark
Power Voltage	VDD	-0.3	3.6	V	
	AVDD	-0.3	15	V	
	VGH	-0.3	30	V	
	VGL	-15	0.3	V	

6.2. Environment Conditions

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

7. Electrical Specifications

7.1 Electrical characteristics

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power voltage	VDD	3.0	3.3	3.6	V	Note 2
	AVDD	12.0	12.2	12.4	V	
	VGH	20	22	24	V	
	VGL	-11	-10	-9	V	
Input signal voltage	VCOM	4.39	5.39	6.39	V	
Input logic high voltage	VIH	0.7*VDD	-	VDD	V	Note 1
Input logic low voltage	VIL	VSS	-	0.3*VDD	V	

Note 1: Including signal: U/D、L/R、RESET、STBYB、SELB、CABCEN0、CABCEN1.

7.2 Backlight Driving Conditions

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED Backlight	VL	9.0	(9.6)	10.5	V	Note 1
Current for LED Backlight	IL	-	300	-	mA	
LED life time	-	-	30000	-	Hrs	Note 2

Note 1: The LED Supply Voltage is defined by the number of LED at Ta=25℃ and IL=300mA.

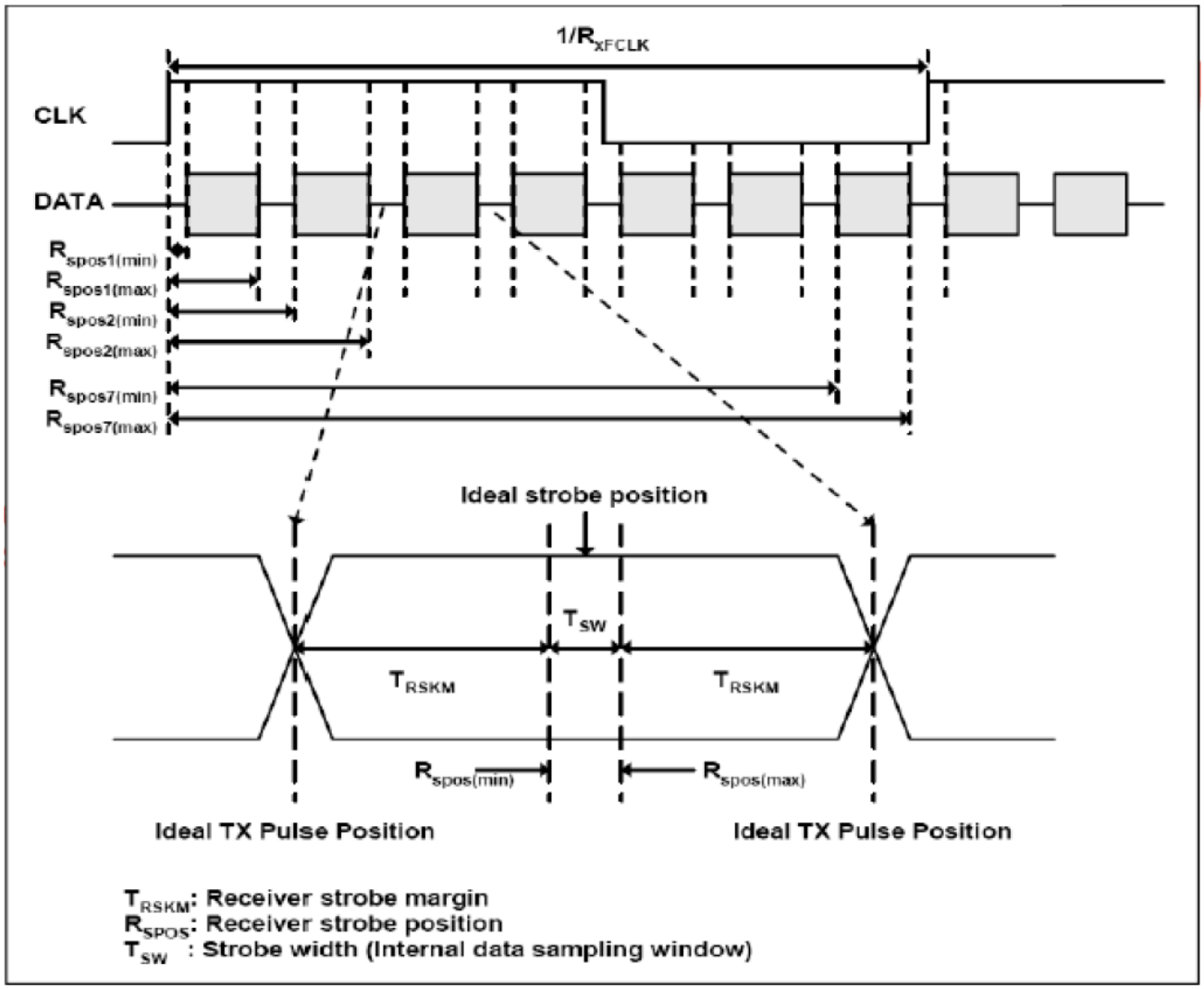
Note 2: The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25℃ and IL=300mA. The LED lifetime could be decreased if operating IL is large than 300mA.

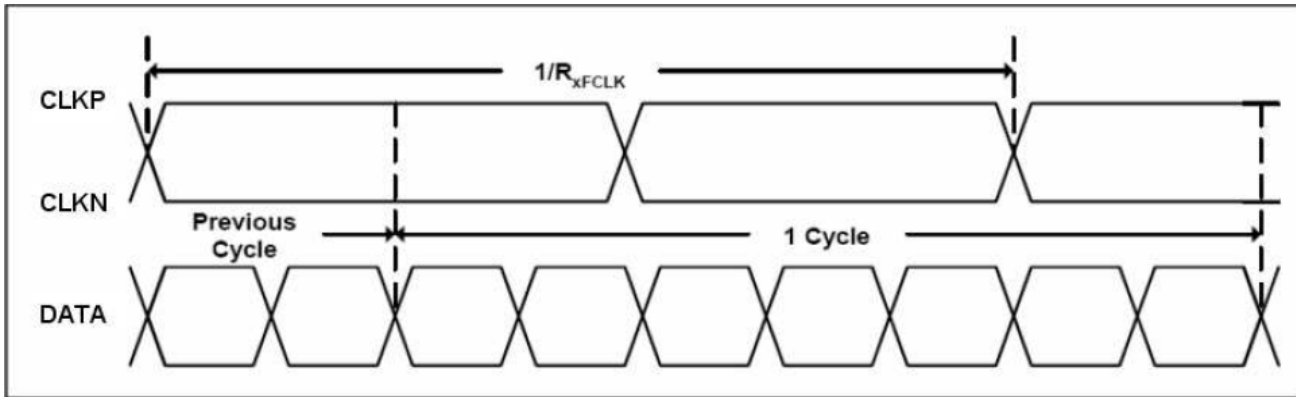
8. Command/AC Timing

8.1 AC Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Clock Frequency	RxFCLK	26.2	51.2	71	MHz	
Input data skew margin	TRSKM	500	500	1/(2* RxFCLK)	ps	Typical value for 1024*600 resolution
Clock high time	TLVCH	4/(7* RxFCLK)			ns	| VID| =400mv RxVCM=1.2V RxFCLK=71MHz VDD_LVDS=3.3V
Clock low time	TLVCL	3/(7* RxFCLK)			ns	
VSD setup time	TenPLL	0<TenPLL<150			us	

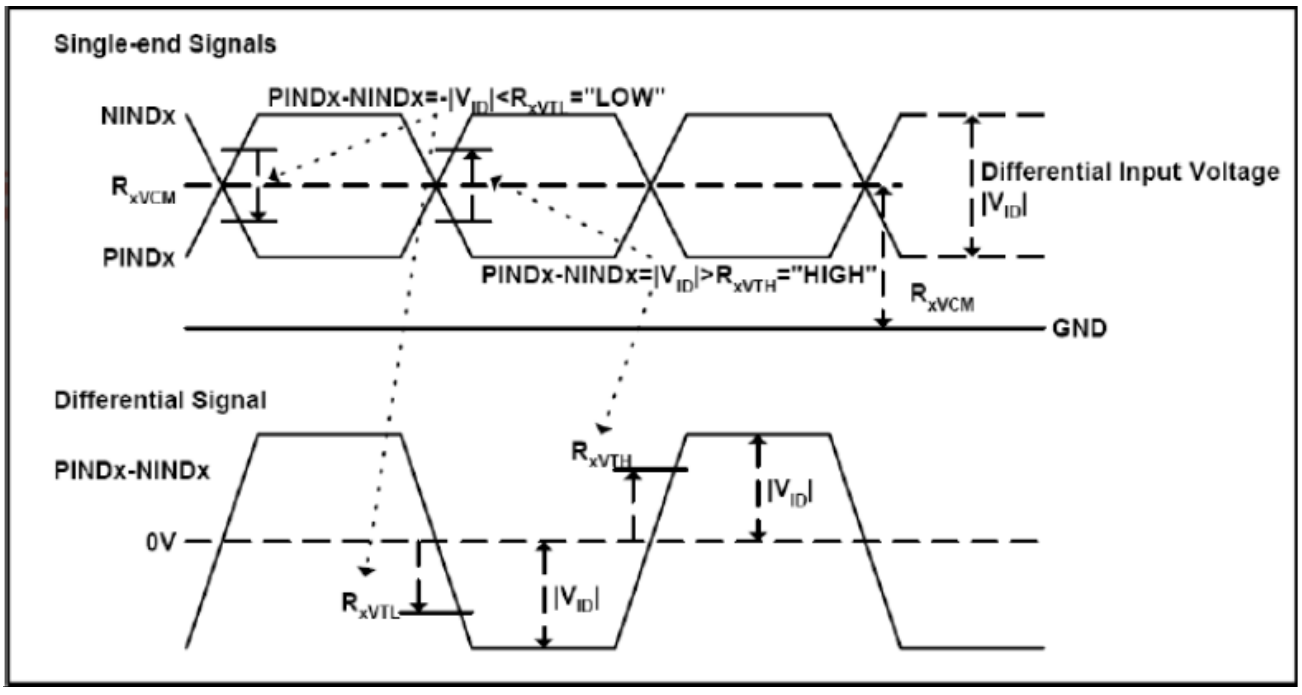
8.2 Input Clock and Data Timing Diagram





8.3 Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Differential input high threshold voltage	RxVTH	0.1	0.2	|VID|	V	RxVCM=1.2V
Differential input low threshold voltage	RxVTL	-|VID|	-0.2	-0.1	V	
Input voltage range (singled-end)	RxVIN	0	1.2±0.4	2.4	V	
Differential input common mode voltage	RxVCM	|VID|/2	1.2	2.1-|VID|/2	V	
Differential input voltage	|VID|	0.2	0.4	0.6	V	
Differential input leakage current	RVxliz	-10	0	+10	uA	
LVDS digital operating current	Iddlvds	8	22	30	mA	Fclk=65MHz, VDD=3.3V
LVDS digital standby current	Istlvds	0	200	300	uA	Clock & all functions are stopped
LVDS differential impendence	zdiff	90	100	110	ohm	RXINx+/- RXINCLK+/-

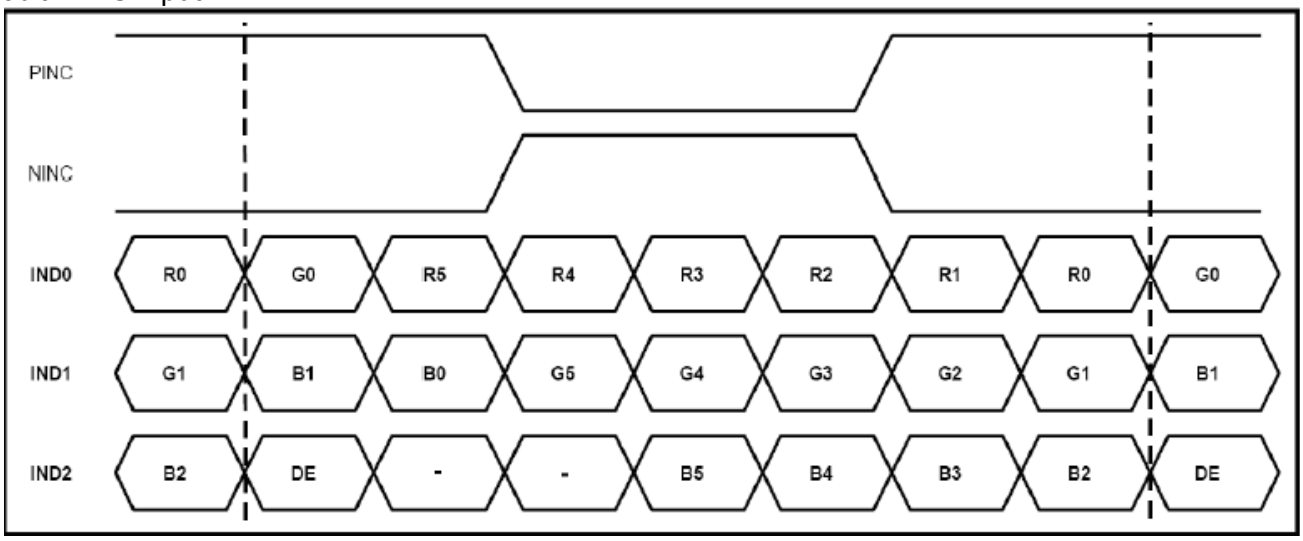


8.4 Timing Table

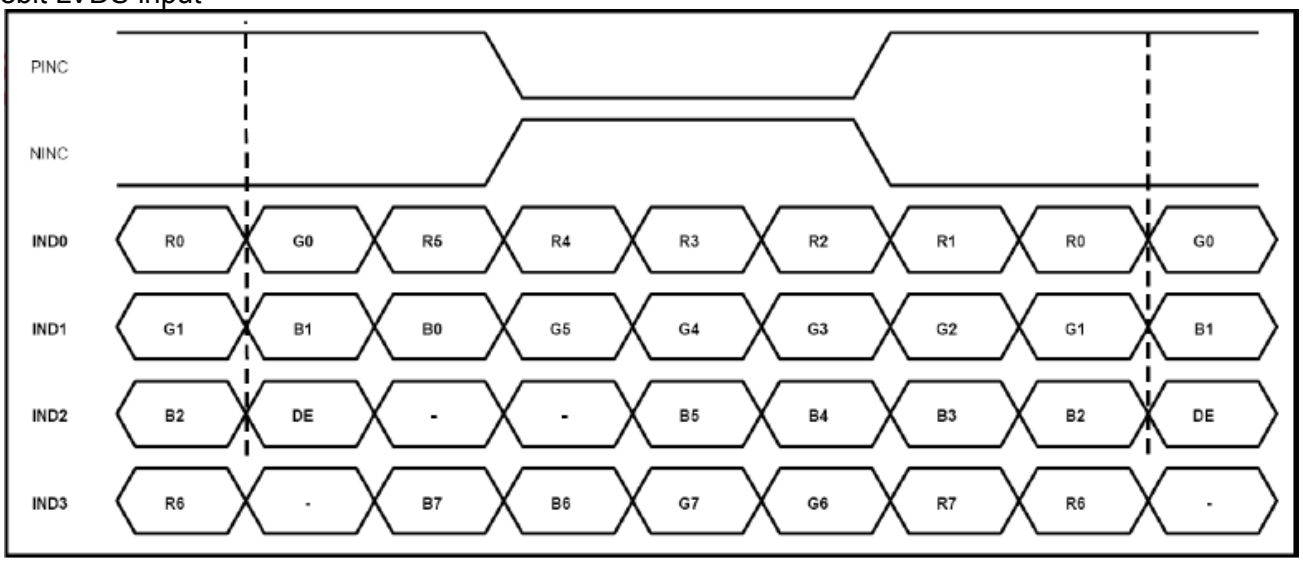
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Clock Frequency Frame rate=60Hz	fclk	42.5	51.2	67.2	MHz	
Horizontal display area	thd		1024		DCLK	
HSYNC period time	thpw	1164	1344	1400	DCLK	
HSYNC blanking	thb+thfp	140	320	376	DCLK	
Vertical display area	tvd		600		H	
VSYNC period time	tvpw	610	635	800	H	
VSYNC blanking	tvp+tvfp	10	35	200	H	

8.5 Data Input Format

6bit LVDS input

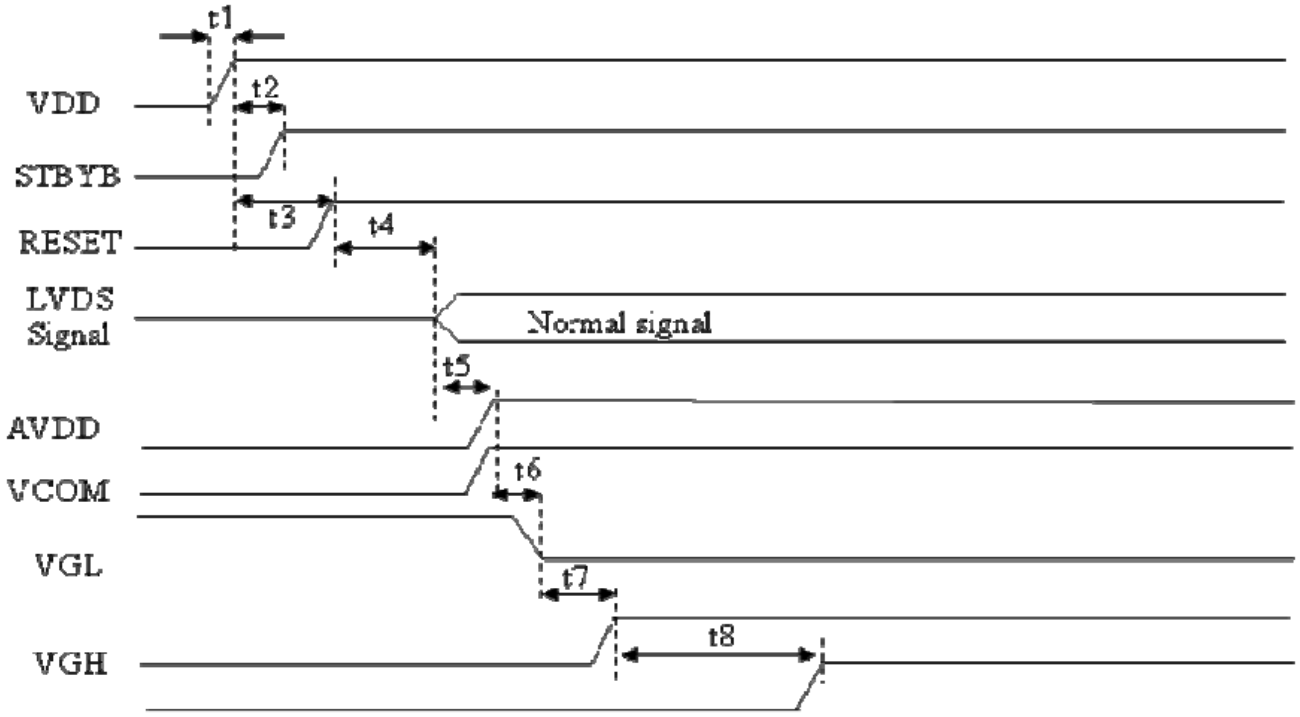


8bit LVDS input



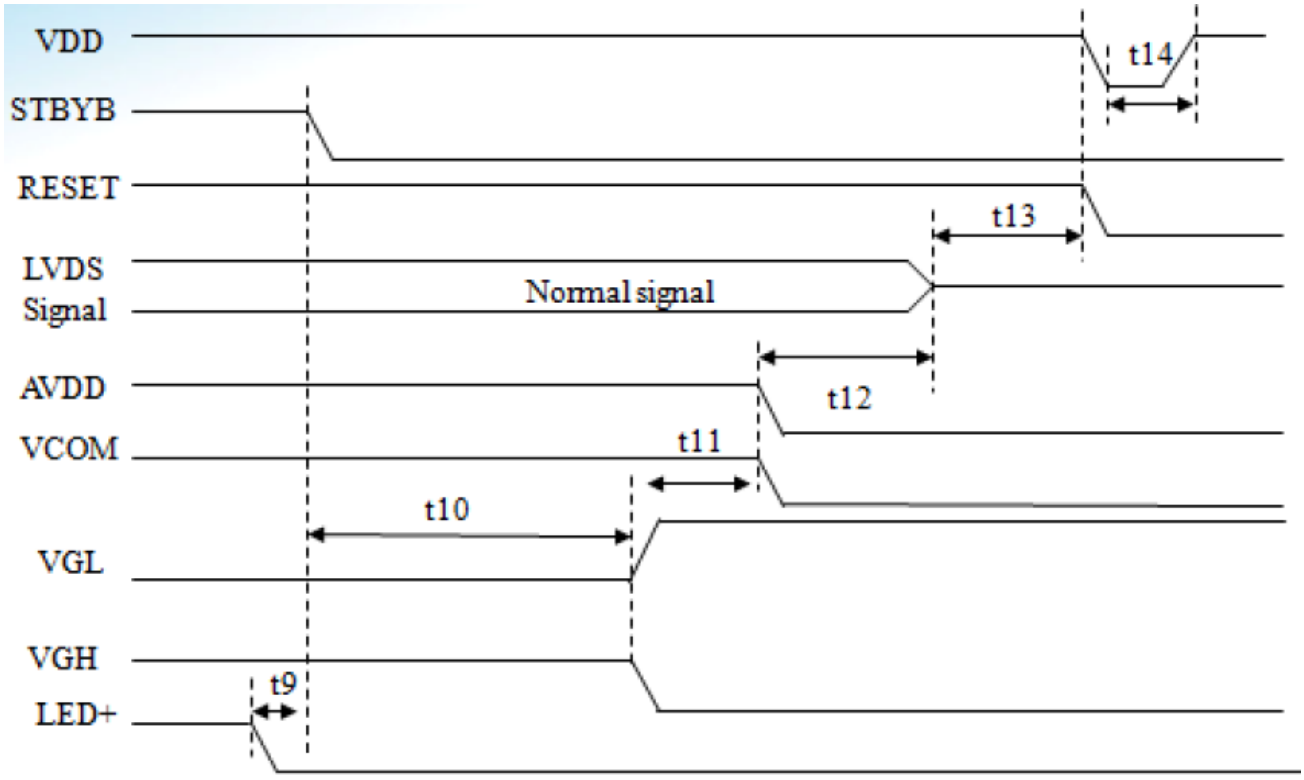
8.6 Power Sequence

8.6.1 Power on:



Symbol	SPEC			Unit
	Min.	Typ.	Max.	
t1	1	10	20	ms
t2	20	35	50	us
t3	1	10(RC Delay)	12	ms
t4	30	50	100	ms
t5	0.1	5	20	ms
t6	20	70	120	ms
t7	40	90	140	ms
t8	150	170	200	ms

8.6.2 Power off



Symbol	SPEC			Unit
	Min.	Typ.	Max.	
t9	0.1	1	10	ms
t10	120	150	200	ms
t11	50	100	200	ms
t12	1	10	20	ms
t13	0.1	10	100	ms
t14	500	-	-	ms

9 Optical Specification

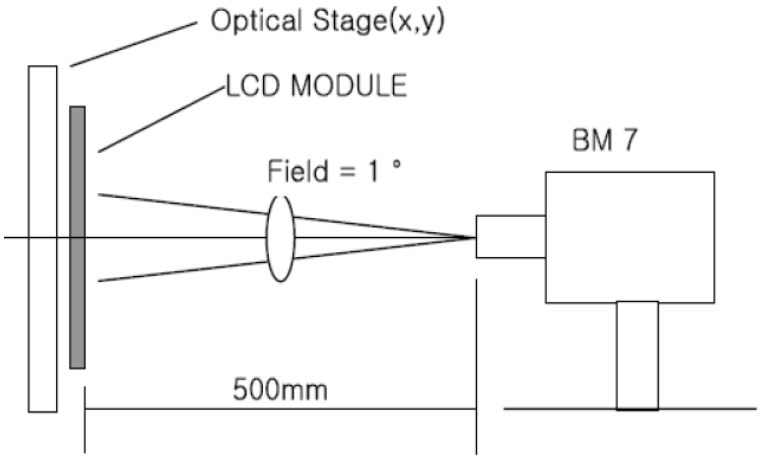
Ta=25℃

Item		Symbol	Condition	Min	Typ.	Max.	Unit	Remark
Contrast Ratio		CR	θ=0°	600	800	-		Note1 Note2
Response Time		Tr	25℃	-	10	20	ms	Note1 Note3
		Tf		-	15	30		
View Angles		ΘT	CR≧10	75	80	-	Degree	Note 4
		ΘB		75	80	-		
		ΘL		75	80	-		
		ΘR		75	80	-		
Chromaticity	White	x	Brightness is on	0.31	0.36	0.41		Note5, Note1
		y		0.33	0.38	0.43		
Luminance		L		-	500	-	cd/m^2	Note1 Note6
Uniformity		U		75	80	-	%	Note1 Note7

Note 1: Definition of optical measurement system.

Temperature = 25℃(±3℃)

LED back-light: ON, Environment brightness < 150 lx

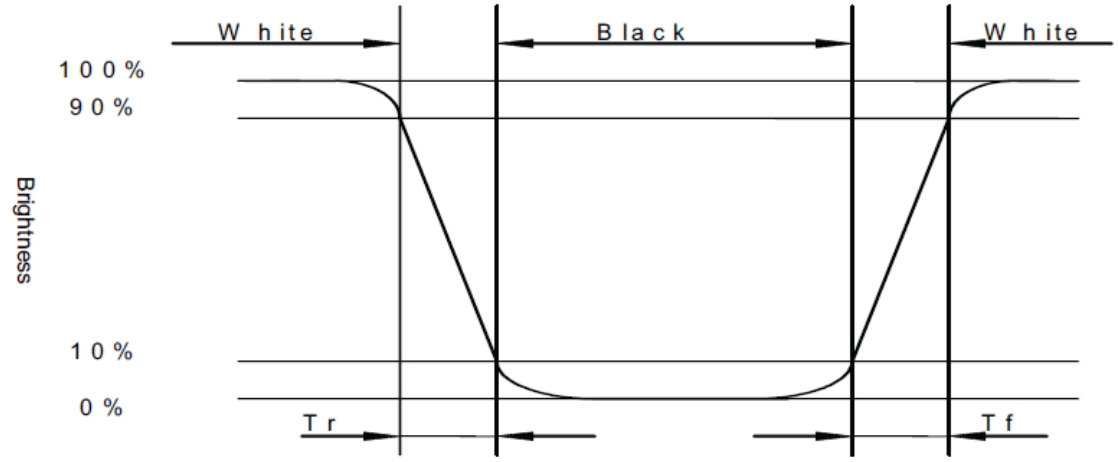


Note 2: Contrast ratio is defined as follow:

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

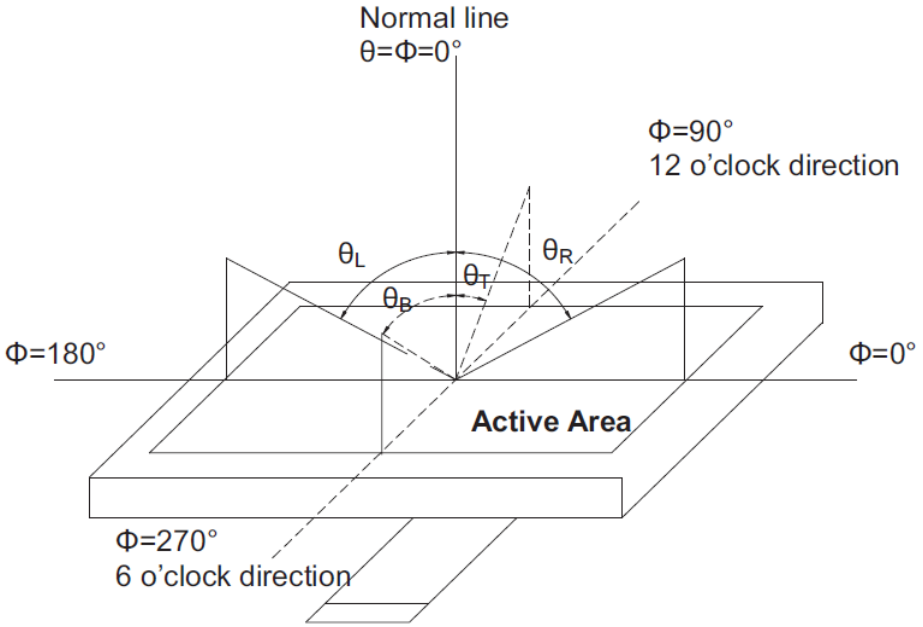
Note 3: Response time is defined as follow:

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).



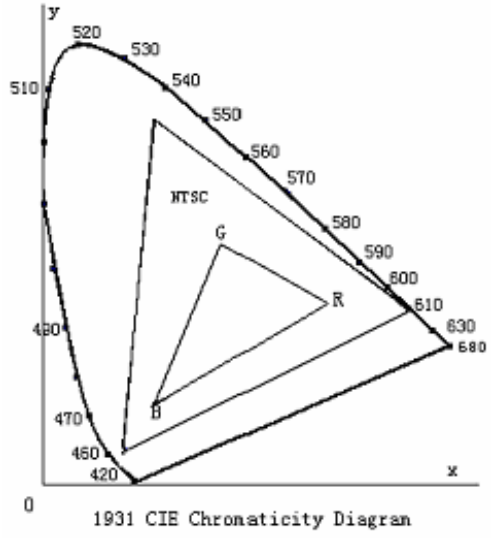
Note 4: Viewing angle range is defined as follow:

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.



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

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.

$$\text{Uniformity (U)} = \frac{\text{Minimum Luminance(brightness) in 9 points}}{\text{Maximum Luminance(brightness) in 9 points}}$$

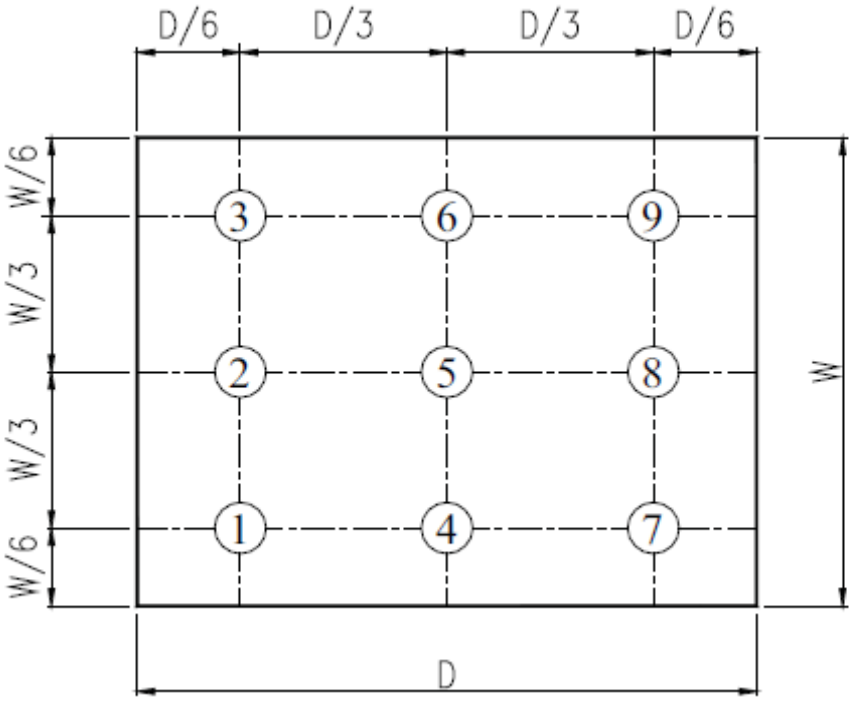


Fig. 2 Definition of uniformity

10 Environmental / Reliability Tests

No	Test Item	Condition	Judgment criteria
1	High Temp Operation	Ta=+70℃, 120hrs	Per table in below
2	Low Temp Operation	Ta=-20℃, 120hrs	Per table in below
3	High Temp Storage	Ta=+70℃, 120hrs	Per table in below
4	Low Temp Storage	Ta=-20℃, 120hrs	Per table in below
5	High Temp & High Humidity Storage	Ta=+60℃, 90% RH, 120 hours	Per table in below (polarizer discoloration is excluded)
6	Thermal Shock (Non-operation)	-20℃ 30 min~+70℃ 30 min, Change time:5min, 100 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.
F. Peel off the LCM protective film slowly since static electricity may be generated.

11.4Storage

A. Store the products in a dark place at +25℃±10℃ 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

A. 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.
B. In order to make the display assembly stable and firm, All Shore recommends to design some supporting at the display backside, especially for the display with tape-attached touch panel, such supporting is important andessential, or else, the display may drop-off from front after some period of time.
C. Do not display the fixed pattern for a long time because it may develop image sticking due to the LCD structure. If the screen is displayed with fixed pattern, use a screen saver.