

DLC Display Co., Limited

德爾西顯示器有限公司



MODEL No: DLC0800FIK-T-3

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Record of Revision

Date	Revision No.	Summary
2015-11-14	1.0	Rev 1.0 was issued
2017-03-23	1.1	Revise the thickness of the display module

1. Scope

This data sheet is to introduce the specification of DLC0800FIK-T-3 active matrix TFT module. It is composed of a color TFT-LCD panel, driver ICs, FPC,CTP and a backlight unit. The 8.0” display area contains 1024x3(RGB)x768 pixels.

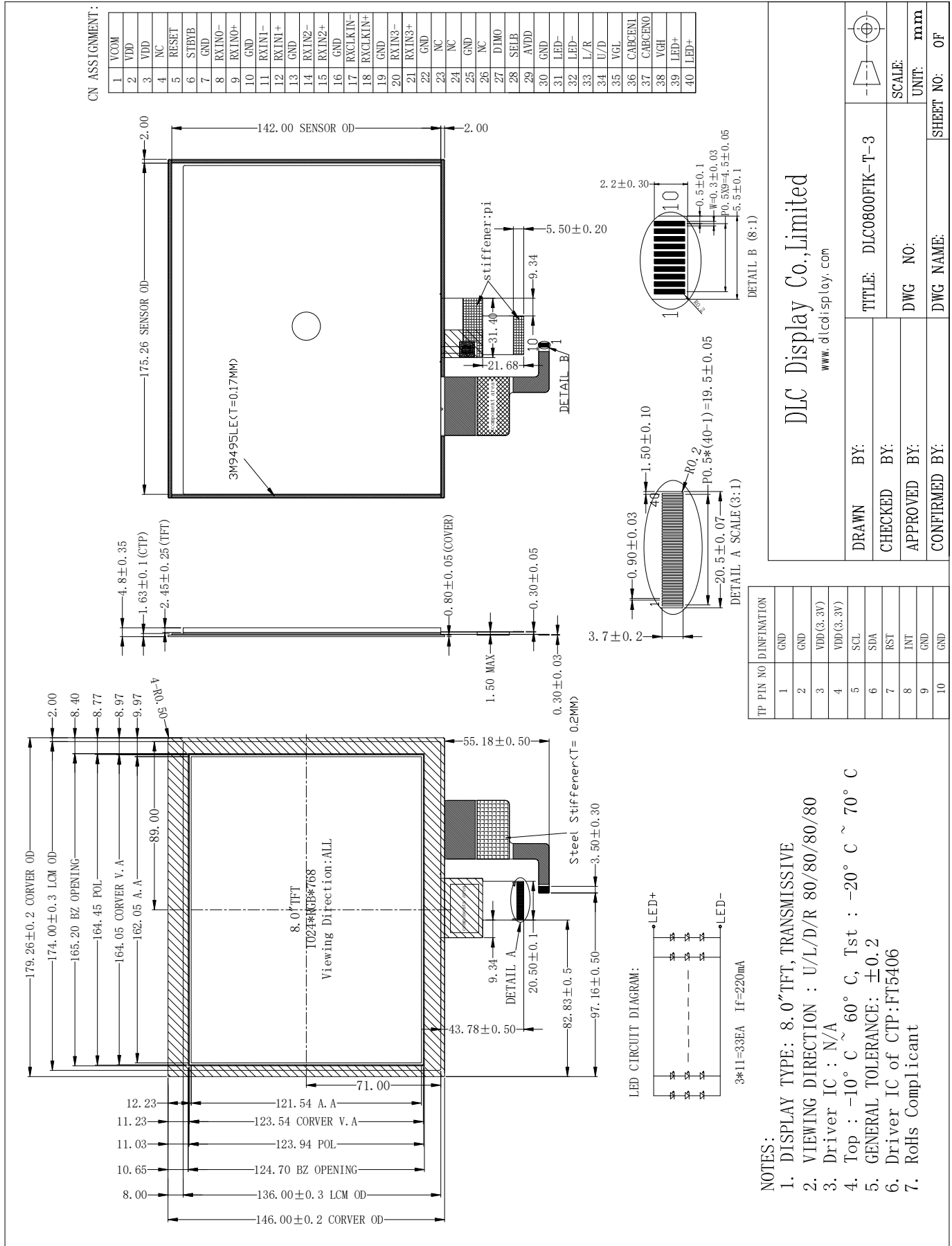
2. Application

Digital equipments which need color display, mobile equipment, monitor.

3. General Information

Item	Contents	Unit
Size	8.0	inch
Resolution	1024x3(RGB)x768	/
Interface	LVDS	/
Technology type	IPS TFT	/
Pixel pitch	0.05275x0.15825	mm
Pixel Configuration	RGB stripes	
Outline Dimension (W x H x D)	179.26x146.00x4.8	mm
Active Area	162.05 x 121.54	mm
Display Mode	Transmissive, Normally Black ,	/
Backlight Type	LED	/
Driver IC of CTP	FT5406	
Weight	TBD	g

4. Outline Drawing



5. Interface signals

Pin No.	Symbol	I/O	Function	Remark
1	VCOM	P	Common Voltage	
2	VDD	P	Power Voltage for digital circuit	
3	VDD	P	Power Voltage for digital circuit	
4	NC	---	No connection	
5	RESET	I	Global reset pin	
6	STBYB	I	Standby mode, Normally pulled high STBYB = "1", normal operation STBYB = "0", timing controller, source driver will turn off, all output are High-Z	
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	DIMO	O	Backlight CABAC controller signal output	
28	SELB	I	6bit/8bit mode select	Note 1
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	Note 3
34	U/D	I	Vertical inversion	Note 3
35	VGL	P	Gate OFF Voltage	
36	CABCEN1	I	CABC H/W enable	Note 2
37	CABCEN0	I	CABC H/W enable	Note 2

38	VGH	P	Gate ON Voltage	
39	LED+	P	LED Anode	
40	LED+	P	LED Anode	

I: input, O: output, P: Power

Note1: If LVDS input data is 6 bits, SELB must be set to High;
If LVDS input data is 8 bits, SELB must be set to Low.

Note2: When CABC_EN="00", CABC OFF.

When CABC_EN="01", user interface image.

When CABC_EN="10", still picture.

When CABC_EN="11", moving image.

When CABC off, don't connect DIMO, else connect it to backlight.

Note3: When L/R="0", set right to left scan direction.

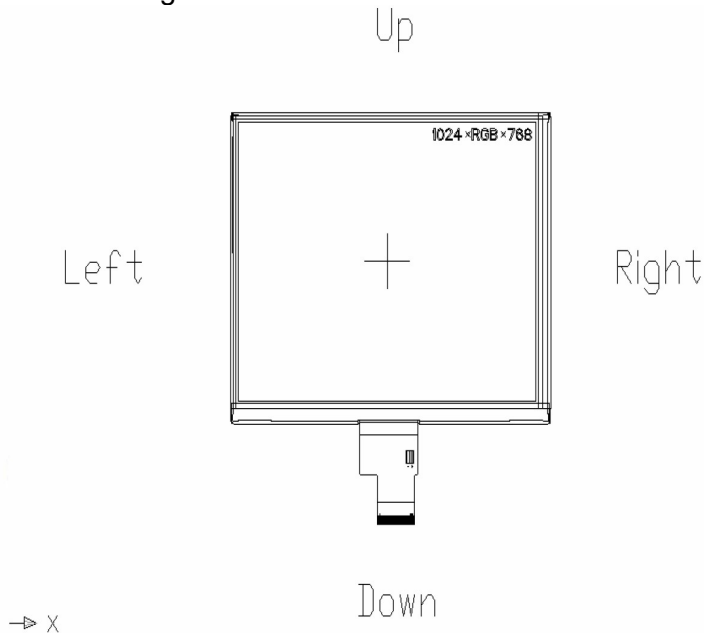
When L/R="1", set left to right scan direction.

When U/D="0", set top to bottom scan direction.

When U/D="1", set bottom to top scan direction.

Note4: Definition of scanning direction.

Refer to the figure as below:



TP signal interface

Pin	Symbol	Description
1	GND	Power ground
2	GND	Power ground
3	VDD(3.3V)	Touch screen supply voltage (3.3 V)
4	VDD(3.3V)	Touch screen supply voltage (3.3 V)
5	SCL	Clock for the data input
6	SDA	Data input
7	RST	Reset pin
8	INT	Interrupt output Pin
9	GND	Power ground
10	GND	Power ground

6. Absolute maximum Ratings

6.1. Electrical Absolute max. ratings

Parameter	Symbol	MIN	MAX	Unit	Remark
Power Voltage	VCC	-0.3	5.0	V	GND=0V TA=25°C
	AVDD	6.5	13.5	V	
	VGH	-0.3	40.0	V	
	VGL	-20.0	0.3	V	
	VGH-VGL	-	40.0	V	

6.2. Environment Conditions

Item	Symbol	MIN	MAX	Unit	Remark
Operating Temperature	TOPR	-10	60	°C	
Storage Temperature	TSTG	-20	70	°C	

6.3. LED Backlight Absolute max. ratings

Item	Symbol	MIN	MAX	Unit	Remark
LED Forward Current	IF	--	25	mA	Each LED
LED Reverse Voltage	VR	--	5	V	Each LED

7. Electrical Specifications

7.1 Electrical characteristics

GND=AVSS=0V, Note 1

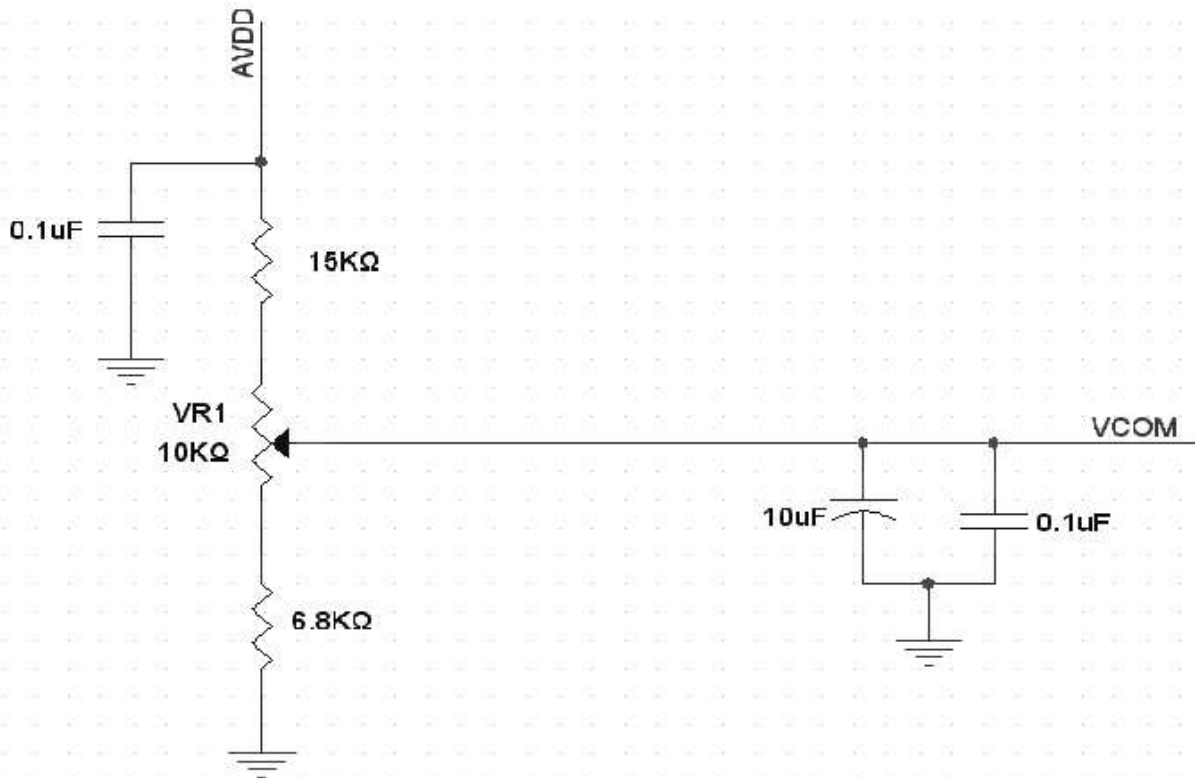
Item	Symbol	MIN	TYP	MAX	Unit	Remark
Power voltage	VCC	3.0	3.3	3.6	V	Note 2
	AVDD	9.8	10	10.2	V	
	VGH	18.6	18.9	19.2	V	
	VGL	-8.1	-7.8	-7.5	V	
Input signal voltage	VCOM	2.6	3.6	4.6	V	Note 3
Input Logic Voltage	VIL	0	--	0.3VCC	V	Note4
	VIH	0.7VCC	--	VCC	V	

Note 1: Be sure to apply VCC and VGL to the LCD first, and then apply VGH.

Note 2: VDD setting should match the signals output voltage (refer to Note 3) of customer's system board.

Note 3 Typical VCOM is only a reference value. It must be optimized according to each LCM. Please use VR and base on below application circuit.

Note 4: RESET, STBYB, SELB, L/R, U/D, CABCE0, CABCE1.



7.2 Current Consumption

GND=AVSS=0V

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Power voltage	ICC	--	35	60	mA	VCC=3.3V
	I _{AVDD}	--	25	40	mA	AVDD=10.0V
	I _{GH}	--	0.65	1.0	mA	V _{GH} =18.9V
	I _{GL}	--	0.65	1.0	mA	V _{GL} =-7.8V

7.3 LED Backlight

Ta=25°C

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	I _F	-	220	-	mA	Note 1
Forward Voltage	V _F	8.4	9.3	10.2	V	
LED life time	-	-	30,000	-	Hrs	

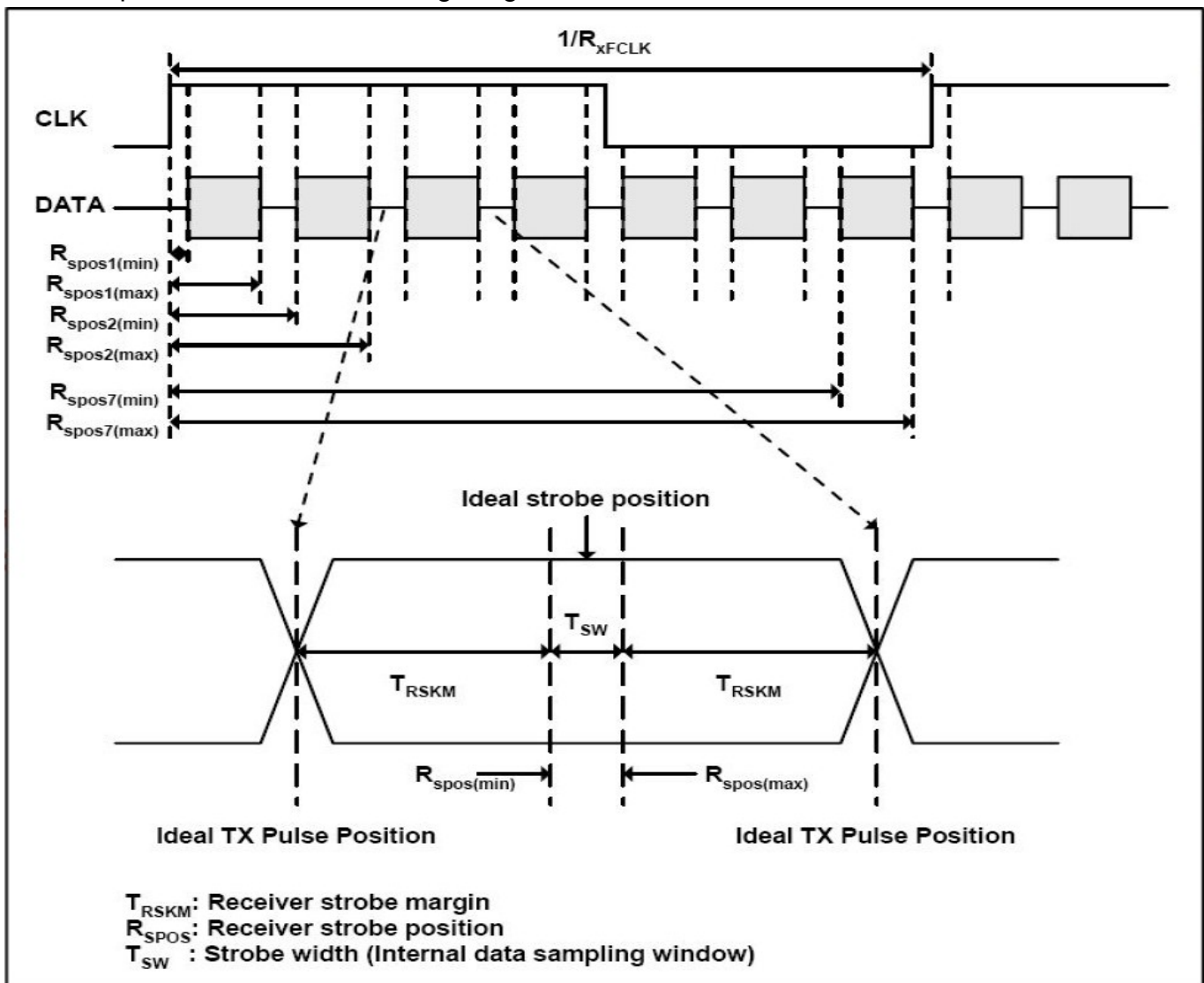
 Note 1: The LED Supply Voltage is defined by the number of LED at Ta=25°C and I_L =220mA.

8. Command/AC Timing

8.1 AC Electrical Characteristics

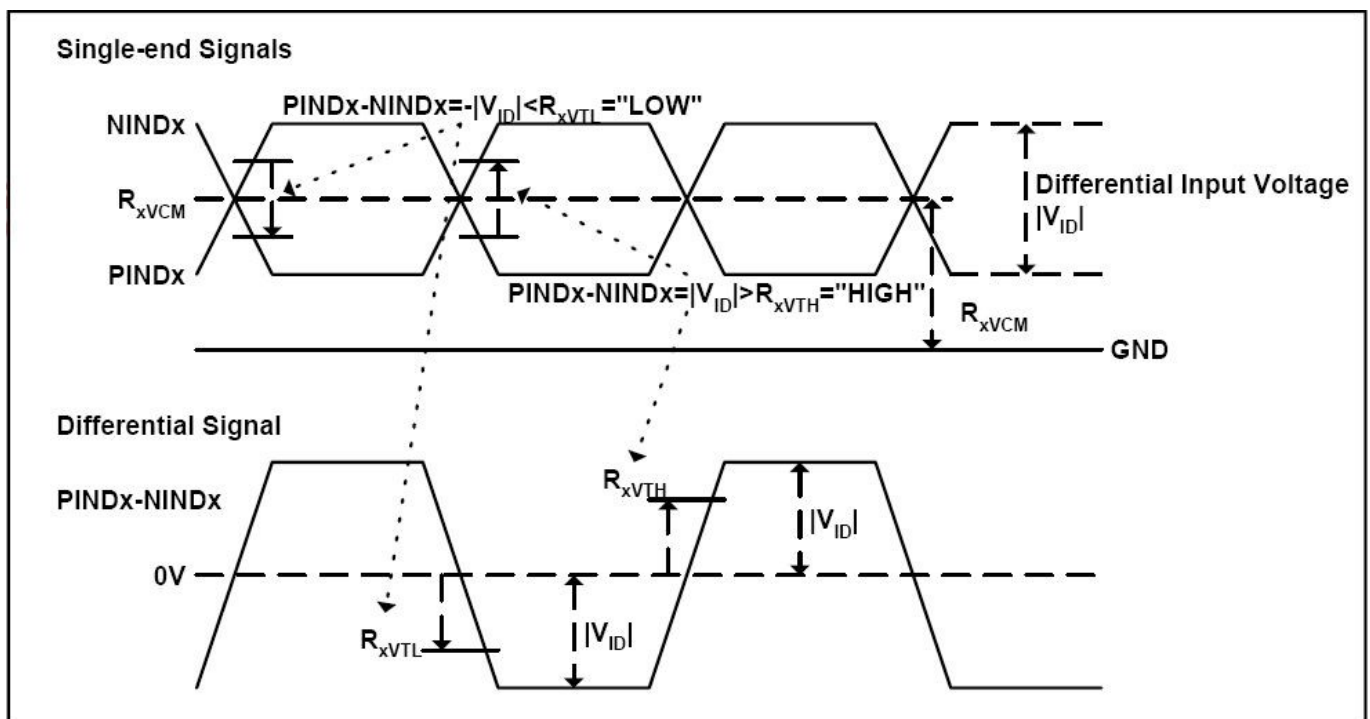
Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Clock frequency	RxFCLK	20	-	71	MHz	
Input data skew margin	TRSKM	500	-	-	ps	
Clock high time	TLVCH	-	$4/(7 * RxFCLK)$	-	ns	
Clock low time	TLVCL	-	$3/(7 * RxFCLK)$	-	ns	

8.2 Input Clock and Data Timing Diagram



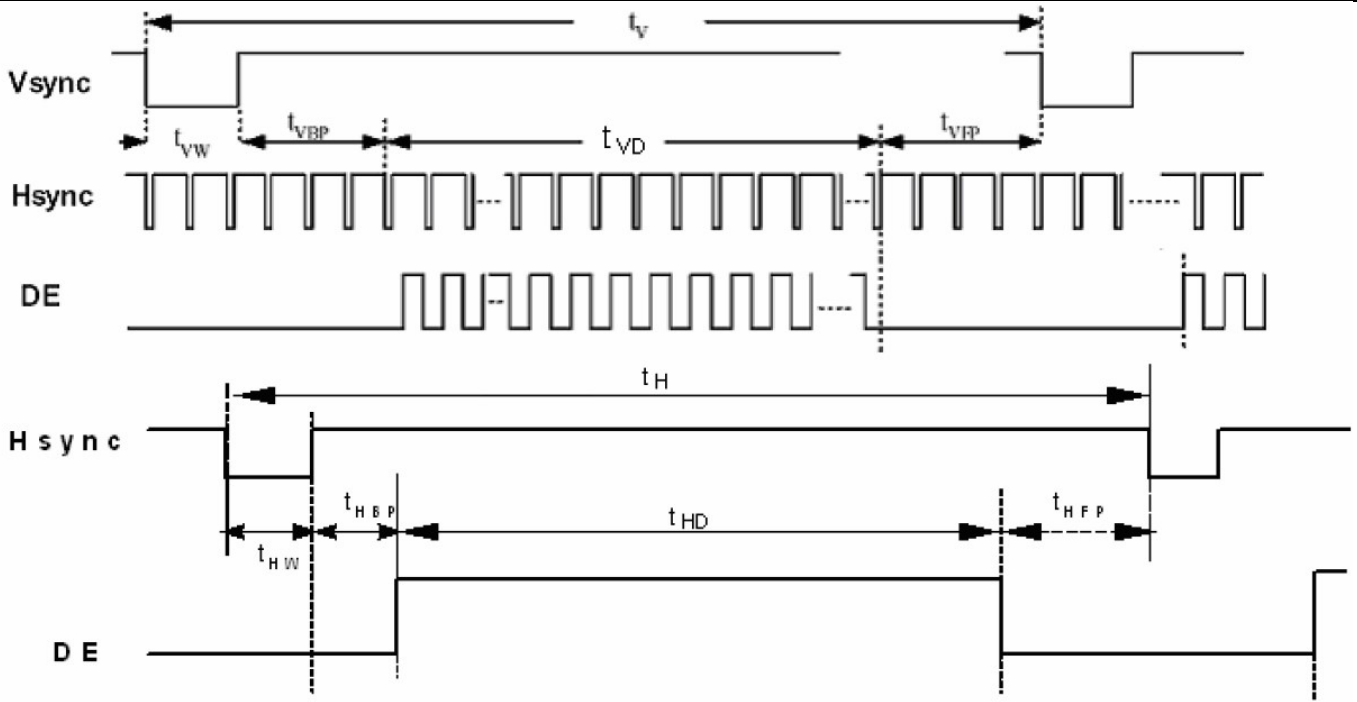
8.3 DC Electrical Characteristics

Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Differential input high Threshold voltage	RxVTH	-	-	0.1	V	RXVCM=1.2V
Differential input low Threshold voltage	RxVTL	-0.1	-	-	V	
Input voltage range (singled-end)	RxVIN	0	-	2.4	V	
Differential input common mode voltage	RxVCM	$ VID /2$	-	$2.4- VID /2$	V	
Differential voltage	$ VID $	0.2	-	0.6	V	
Differential input leakage current	RVxliz	-10	-	10	uA	



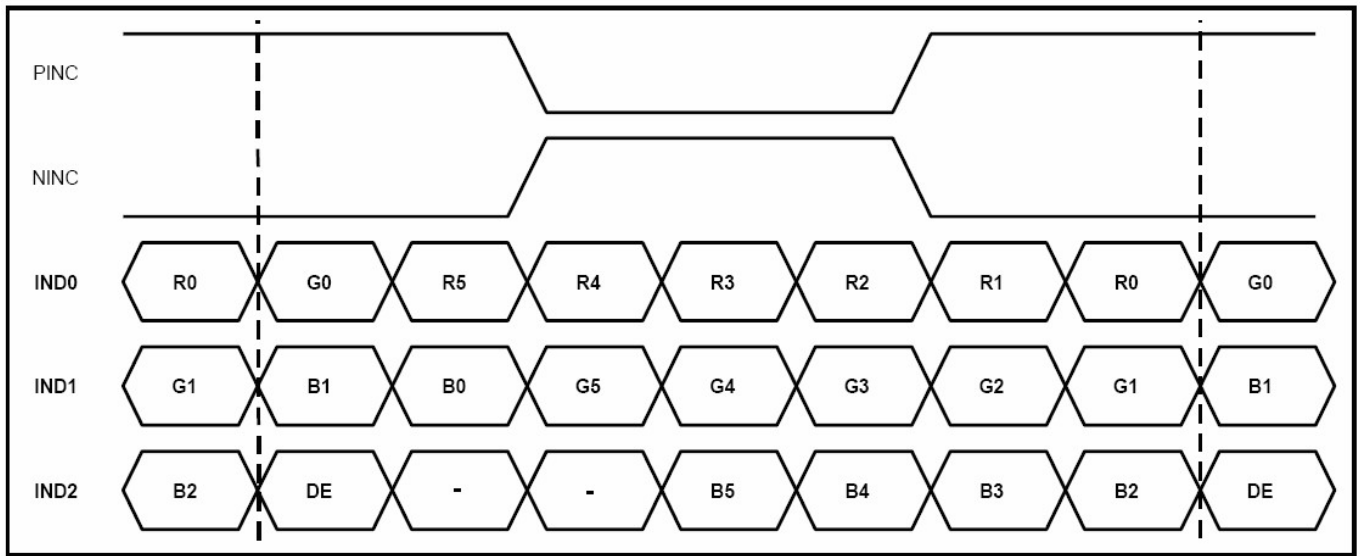
8.4 Timing

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Clock Frequency	fclk	52	65	71	MHz	Frame rate =TBD
Horizontal display area	thd	1024				
HS period time	th	1114	1344	1400	DCLK	
HS Blanking	thb+thfp	90	320	376	DCLK	
Vertical display area	tvd	768				
VS period time	tv	778	806	845	H	
VS Blanking	tvb+tvfp	10	38	77	H	

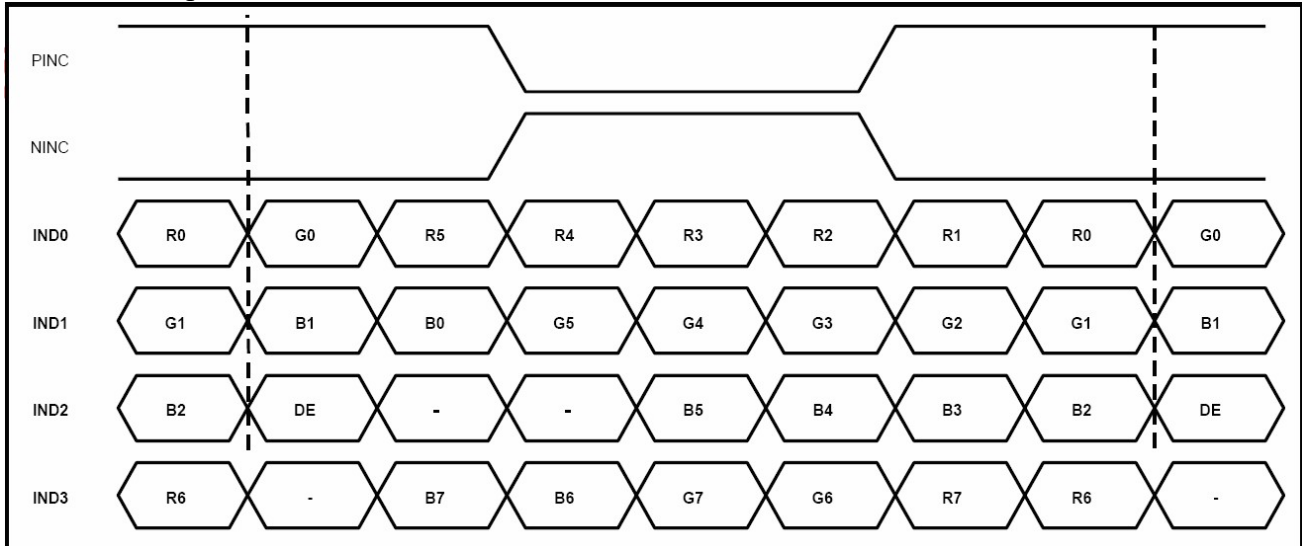


8.5 Data Input Format

6 bit LVDS input



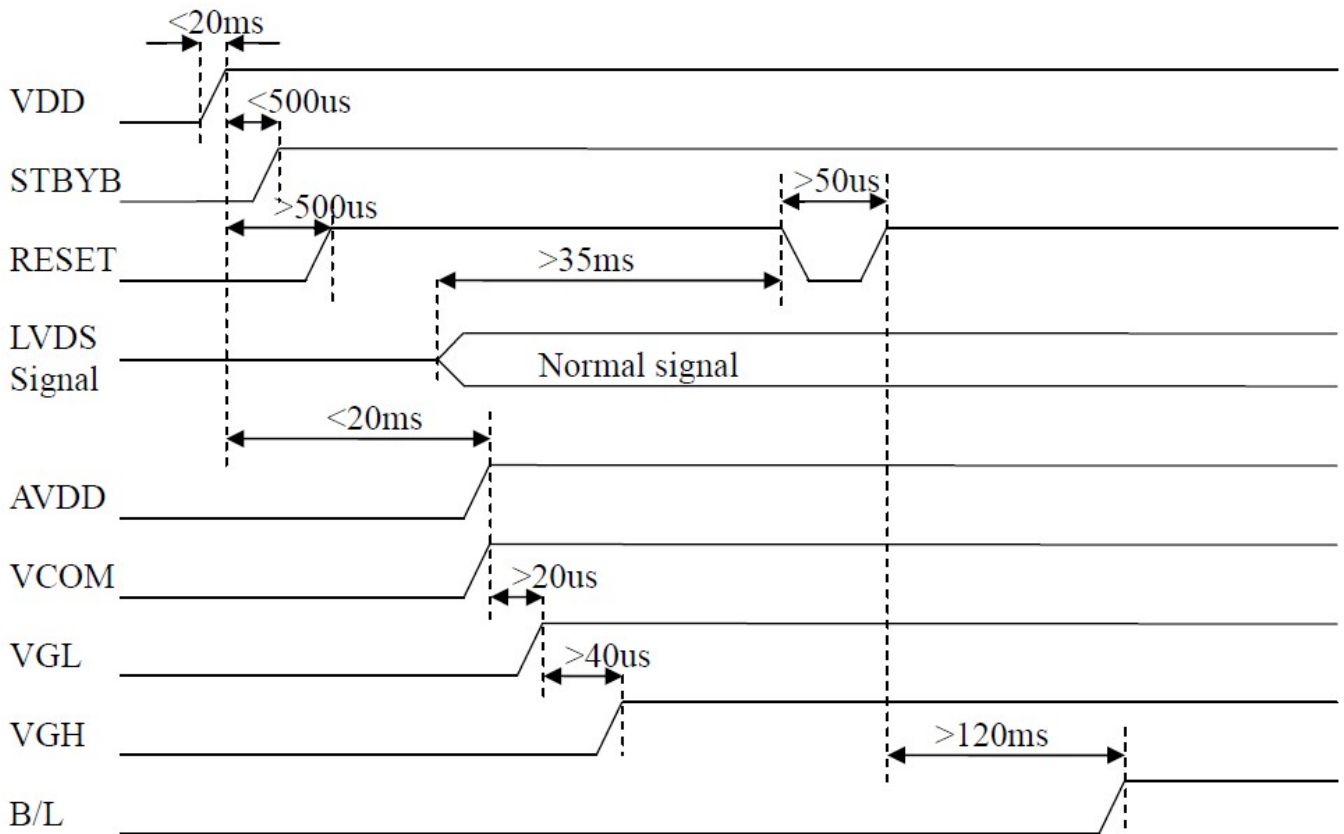
8 bit LVDS input



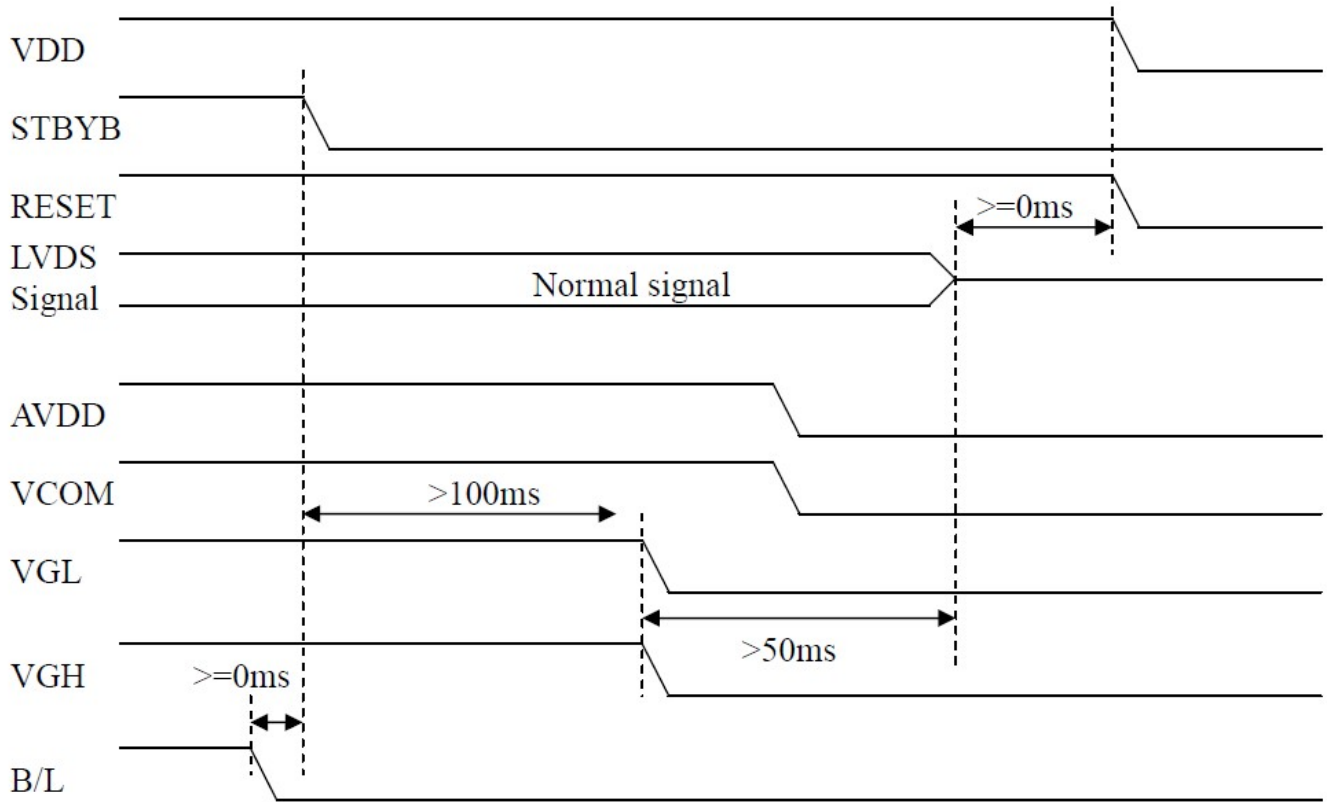
Note: Support DE timing mode only, SYNC mode not supported.

8.6 Power Sequence

Power on:



Power off:



9. Optical Specification

Ta=25°C

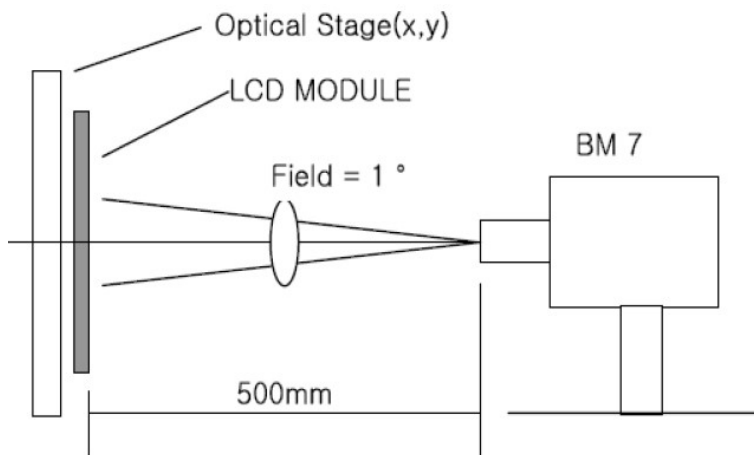
Item	Symbol	Condition	Min	Typ.	Max.	Unit	Remark
Contrast Ratio	CR	$\theta=0^\circ$	600	800	-		Note1 Note2
Response Time	Tr + Tf	25°C	-	25	50	ms	Note1 Note3
View Angles	θT	CR ≥ 10	-	80	-	Degree	Note 4
	θB		-	80	-		
	θL		-	80	-		
	θR		-	80	-		
Chromaticity	White	Brightness is on	x	0.238	0.288	0.338	Note5, Note1
			y	0.276	0.326	0.376	
NTSC				50		%	
Luminance	L		250	300	-	cd/m ²	Note1 Note6
Uniformity	U		70	80	-	%	Note1 Note7

Test conditions: VCC=3.3V, IL=220mA (Backlight current), the ambient temperature is 25°C.

Note 1: Definition of optical measurement system.

Temperature = 25°C(±3°C)

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

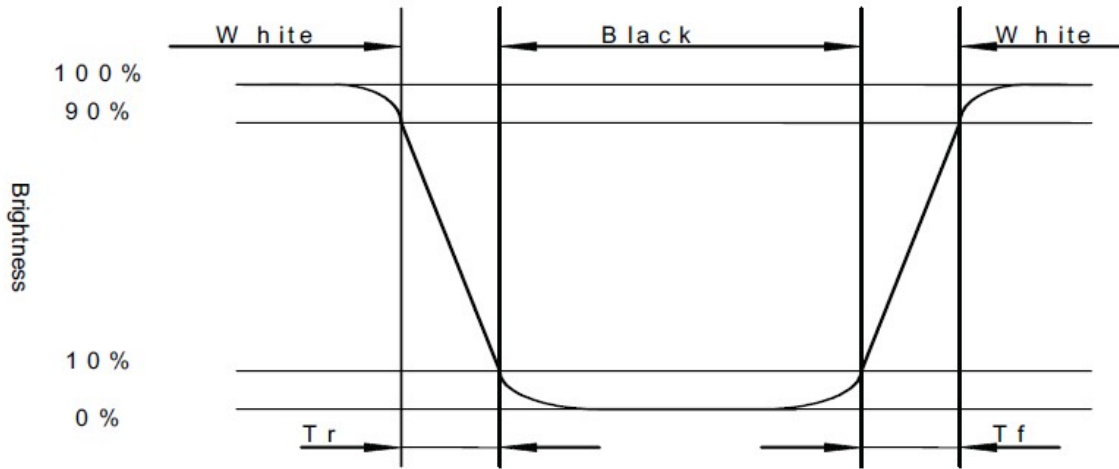


Note 2: Contrast ratio is defined as follow:

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

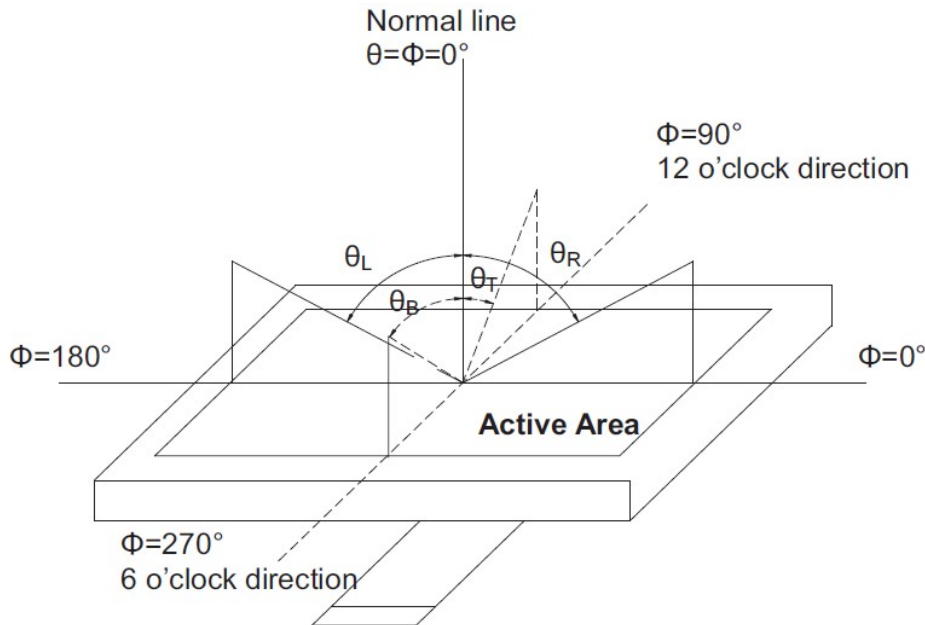
Note 3: Response time is defined as follow:

Response time is the time required for the display to transition from black to white (Rise Time, T_r) and from white to black (Decay Time, T_f).



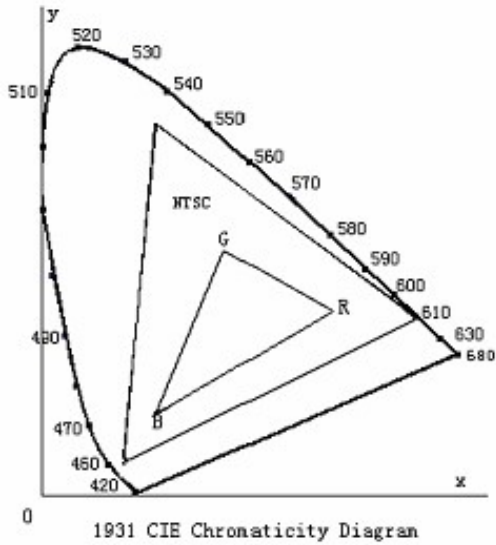
Note 4: Viewing angle range is defined as follow:

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.

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

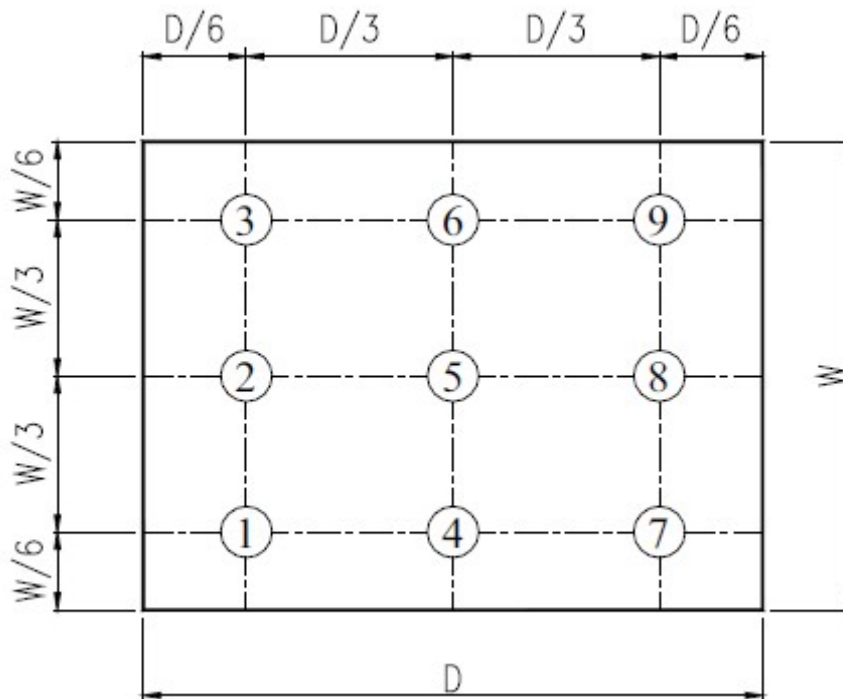


Fig. 2 Definition of uniformity

10. Environmental / Reliability Tests

No	Test Item	Condition	Judgment criteria
1	High Temp Operation	Ts=+60°C, 240hrs	Per table in below
2	Low Temp Operation	Ta=-10°C, 240hrs	Per table in below
3	High Temp Storage	Ta=+70°C, 240hrs	Per table in below
4	Low Temp Storage	Ta=-20°C, 240hrs	Per table in below
5	High Temp & High Humidity Storage	Ta=+40°C, 90% RH 240 hours	Per table in below (polarizer discoloration is excluded)
6	Thermal Shock (Non-operation)	-10°C 30 min~+60°C 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.

11.4 Storage

A. Store the products in a dark place at $+25^{\circ}\text{C} \pm 10^{\circ}\text{C}$ 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.

