

DLC Display Co., Limited

德爾西顯示器有限公司



MODEL No:DLC0800BIG-2

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Record of Revision

Date	Revision No.	Summary
2010-12-08	1.0	Rev 1.0 was issued

1. Scope

This data sheet is to introduce the specification of DLC0800BIG active matrix TFT module. It is composed of a color TFT-LCD panel, driver ICs, FPC and a backlight unit. The 8.0" display area contains 800(RGB) x 600 pixels.

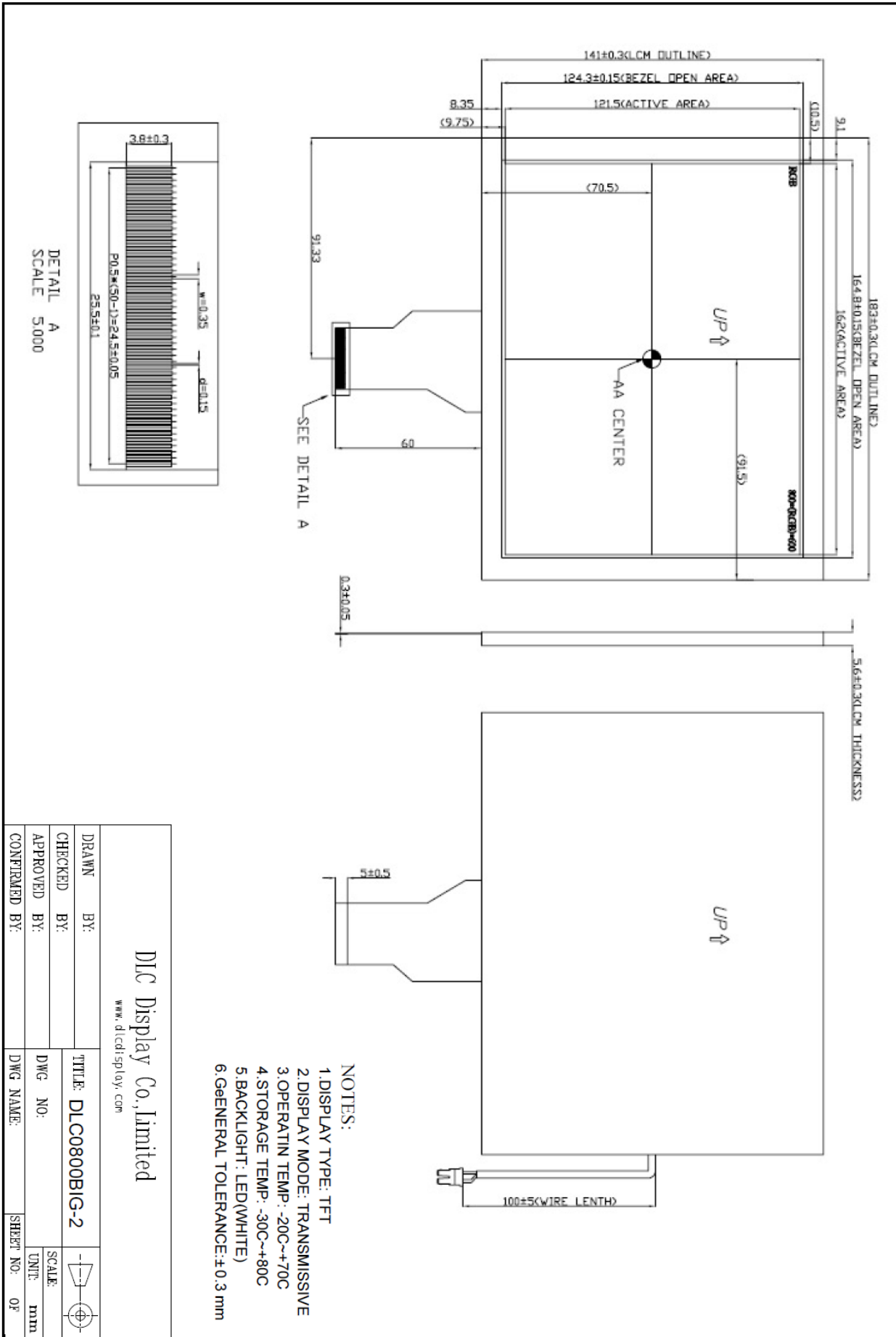
2. Application

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

3. General Information

Item	Contents	Unit
Size	8.0	inch
Resolution	800(RGB) x 600	/
Technology type	a-si TFT	/
Interface	RGB 24 bits with TCON	
Pixel pitch	0.2025x0.2025	mm
Pixel Configuration	R.G.B. Vertical Stripe	
Outline Dimension (W x H x D)	183.0x 141.0x5.6	mm
Active Area	162.0 x 121.5	mm
Display Mode	Transmissive, Normally white	/
Gray Scale Inversion Direction	6 o'clock	
Backlight Type	27 LEDs	/

4. Outline Drawing



5. Interface signals

CN1 of FPC

No	Symbol	I/O	Description	Remarks
1	NC	-	No connection	
2	NC	-	No connection	
3	NC	-	No connection	
4	NC	-	No connection	
5	GND	P	Power ground	
6	V _{COM}	I	Common voltage	
7	V _{CC}	P	Power for Digital circuit	
8	MODE	I	DE/SYNC mode select	NOTE 1
9	DE	I	Data Input Enable	
10	VS	I	Vertical Sync Input	
11	HS	I	Horizontal Sync Input	
12	B7	I	Blue data(MSB)	
13	B6	I	Blue data	
14	B5	I	Blue data	
15	B4	I	Blue data	
16	B3	I	Blue data	
17	B2	I	Blue data	
18	B1	I	Blue data	
19	B0	I	Blue data(LSB)	
20	G7	I	Green data (MSB)	
21	G6	I	Green data	
22	G5	I	Green data	
23	G4	I	Green data	
24	G3	I	Green data	
25	G2	I	Green data	
26	G1	I	Green data	
27	G0	I	Green data (LSB)	
28	R7	I	Red data (MSB)	
29	R6	I	Red data	
30	R5	I	Red data	
31	R4	I	Red data	
32	R3	I	Red data	
33	R2	I	Red data	
34	R1	I	Red data	
35	R0	I	Red data (LSB)	
36	GND	P	Power ground	
37	DCLK	I	Sample clock	
38	GND	P	Power ground	
39	L/R	I	Right/ left selection	NOTE2
40	U/D	I	Up/down selection	NOTE2
41	V _{GH}	P	Gate ON voltage	
42	V _{GL}	P	Gate OFF voltage	
43	AV _{DD}	P	Power for Analog circuit	
44	RESET	I	Global reset pin.	
45	NC	-	No connection	

46	V _{COM}	I	Common voltage	
47	DITHB	I	Dithering function	NOTE2
48	GND	P	Power ground	
49	NC	-	No connection	
50	NC	-	No connection	

Recommend connector: HIROSE"FH12A-50S-0.5H"

CN 2 of LED BLU connector

No	Symbol	I/O	Description	Remarks
1	LED+	P	LED Anode	Red cable
2	LED-	P	LED Cathode	White cable

Recommend connector: BHSR-02VS-1

Note :

1) U/D and L/R control Function V_{cc}=1,GND=0

L/R	U/D	Function
1	0	Up to down, left to right
0	1	Down to up, right to left
0	0	Up to down, right to left
1	1	Down to up, left to right

2) Dithering function enable control. Normally pull high.

DITHB="1",Disable internal dithering function. For 18bit RGB interface, connect two LSB bits of all the R/G/B data buses to GND.

DITHB="0",Enable internal dithering function, For TTL 24bit parallel RGB image data input.

6. Absolute maximum Ratings

6.1. Electrical Absolute max. ratings

Parameter	Symbol	MIN	MAX	Unit	Remark
Power Supply Voltage	V _{CC}	-0.5	5.0	V	
	A _{VDD}	-0.5	13.5	V	
	V _{GH}	-0.3	42.0	V	
	V _{GL}	V _{GH} -42	0.3	V	

6.2. Environment Conditions

Item	Symbol	MIN	MAX	Unit	Remark
Operating Temperature	T _{OPR}	-20	70	°C	
Storage Temperature	T _{STG}	-30	80	°C	

6.3. LED Backlight Absolute max. ratings

Item	Symbol	MIN	MAX	Unit	Remark
LED Forward Current	I _{LED}	--	25	mA	For each LED

7. Electrical Specifications

7.1 Electrical characteristics

GND=0V, Ta=25°C

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Digital Supply Voltage	VCC		3.3		V	
Logic Supply Voltage	DVDD		3.3		V	
Analog Supply Voltage	AVDD		12.5		V	
Gate On Voltage	VGH		22.0		V	
Gate Off Voltage	VGL		-7.0		V	
Common Electrode Driving Signal	VCOM	3.5	TBD	4.5	V	
Input Signal Voltage	VIL	0	--	0.3 DVDD	V	Note
	VIH	0.7 DVDD	--	DVDD	V	
Output Signal Voltage	VOL	-	--	GND+0.4	V	
	VOH	DVDD-0.4	--	-	V	
Gate On Current	IGH	-	TBD	-	mA	V _{GH} =22.0V
Gate Off Current	IGL	-	TBD	-	mA	V _{GL} = -7.0V
Digital Supply Current	I _{CC}	-	TBD	-	mA	V _{CC} =3.3V
Analog Supply Current	I _{AVDD}	-	TBD	-	mA	A _{VDD} =12.5V

Note: R0~R7,G0~G7,B0~B7,DE,DCLK,HSD,VSD,MODE,RSTB,STBYB,SHLR,UPDN,VCOM,DITH,V1~V10

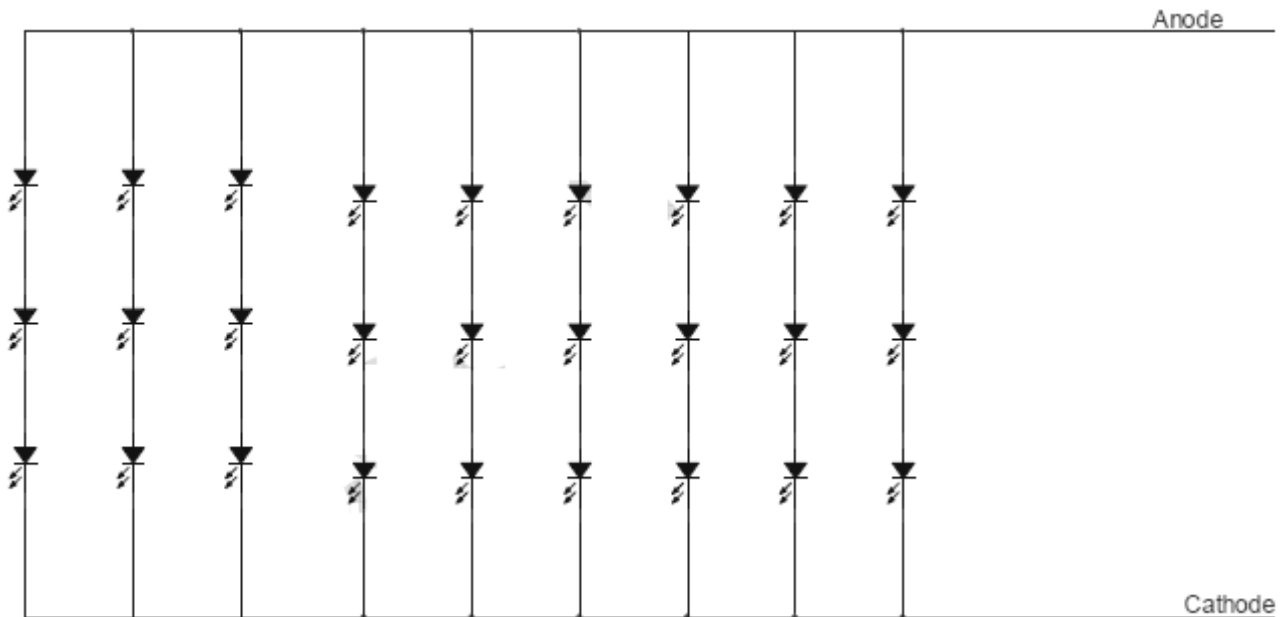
7.2 LED Backlight

Ta=25°C

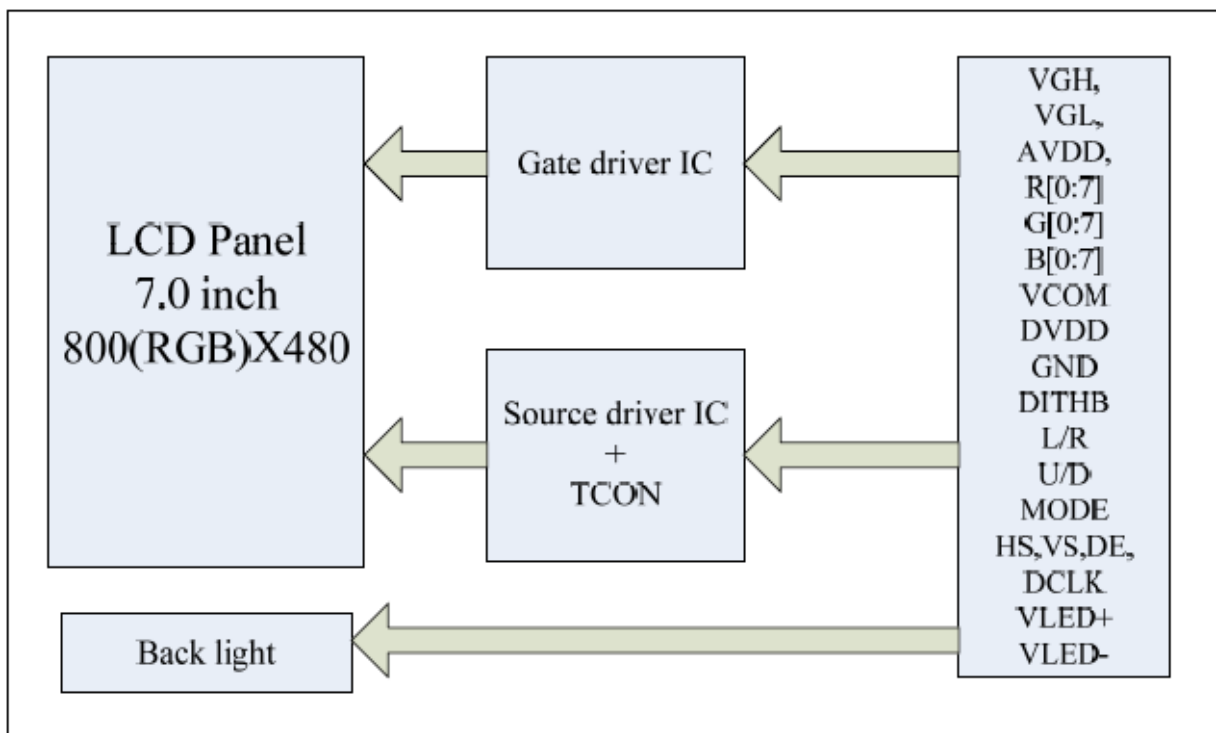
Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	IF	-	20	25	mA	27 LEDs (3 LED Serial, 9 LED Parallel)
Forward Voltage	VF	-	9.6	-	V	
Power Consumption	--	1.728	-	-	W	

Note1: The LED driving condition is defined for each LED module (3 LED Serial, 9 LED Parallel).For each LED: $I_F (1/9) = 20mA$, $V_F (1/3) = 3.2V$.

note2:



7.3 Block diagram



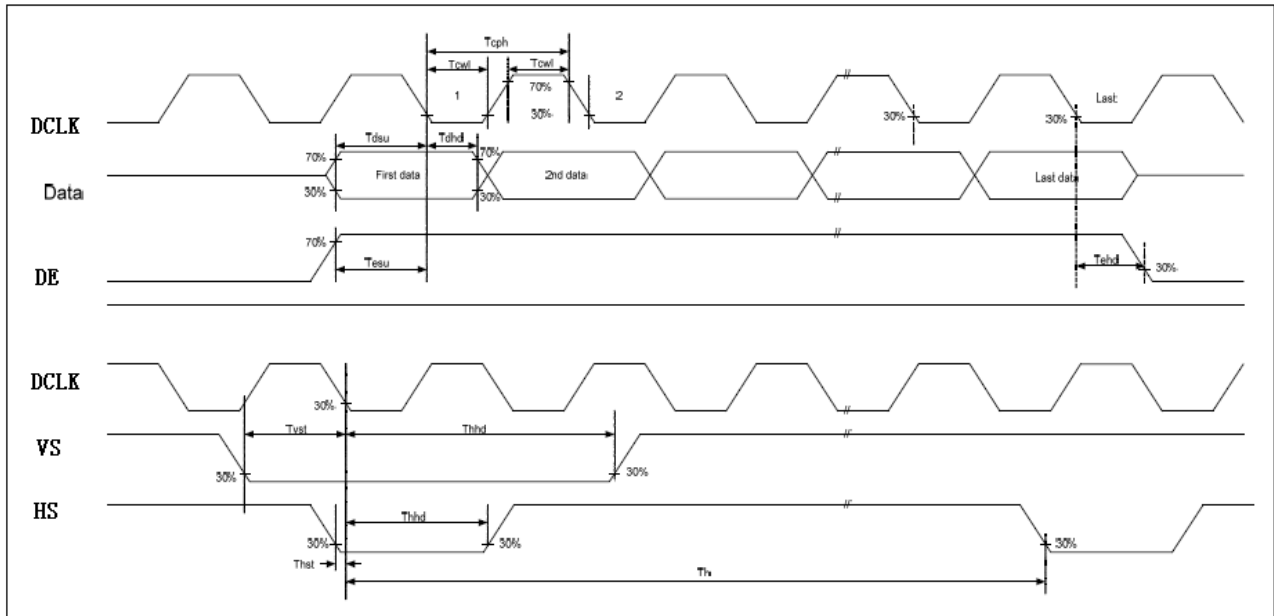
8. Command/AC Timing

8.1 TFT-LCD Input Timing

VCC=3.3V, AVDD=12.5V, AGND=GND=0V, Ta=25°C

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Conditions
DCLK Frequency	Fclk	-	40	50	MHz	
DCLK Cycle Time	Tcph	-	25	20	ns	
DCLK Pulse Width	Tcw	40%	50%	60%	Tcph	
VSD Setup Time	Tvst	8	-	-	ns	
VSD Hold Time	Tvhd	8	-	-	ns	
HSD Setup Time	Thst	8	-	-	ns	
HSD Hold Time	Thhd	8	-	-	ns	
Data Setup Time	Tdsu	8	-	-	ns	Data to DCLK
Data Hold Time	Tdhd	8	-	-	ns	Data to DCLK
DE Setup Time	Tesu	8	-	-	ns	
DE Hold Time	Tehd	8	-	-	ns	

Input Clock and Data timing Diagram:



8.2 Recommended Timing Setting Of TCON

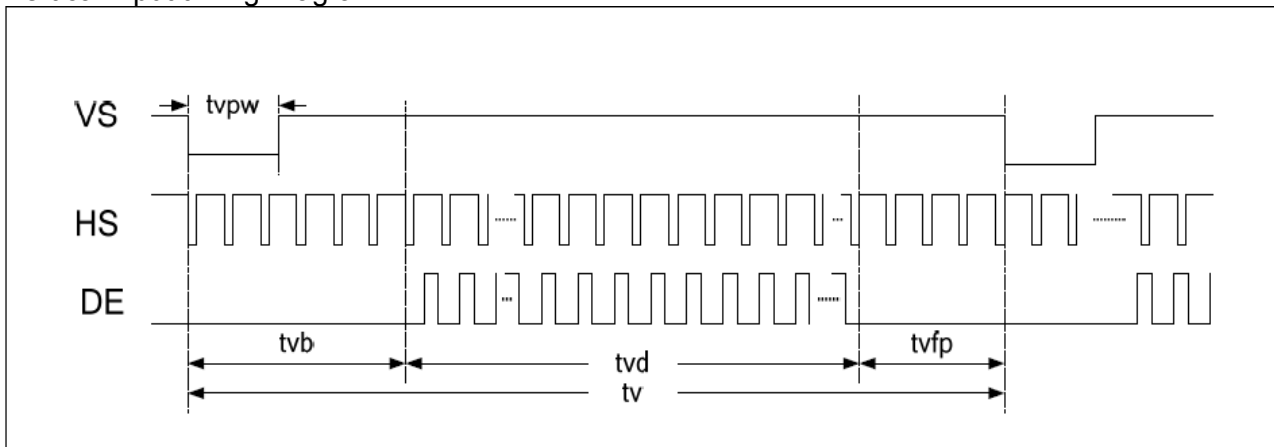
TCON (Embedded In Source IC) Input Timing (DCLK, HSD, VSD, DE)

VCC=3.3V, AVDD=12.5V, AGND=GND=0V, Ta=25°C

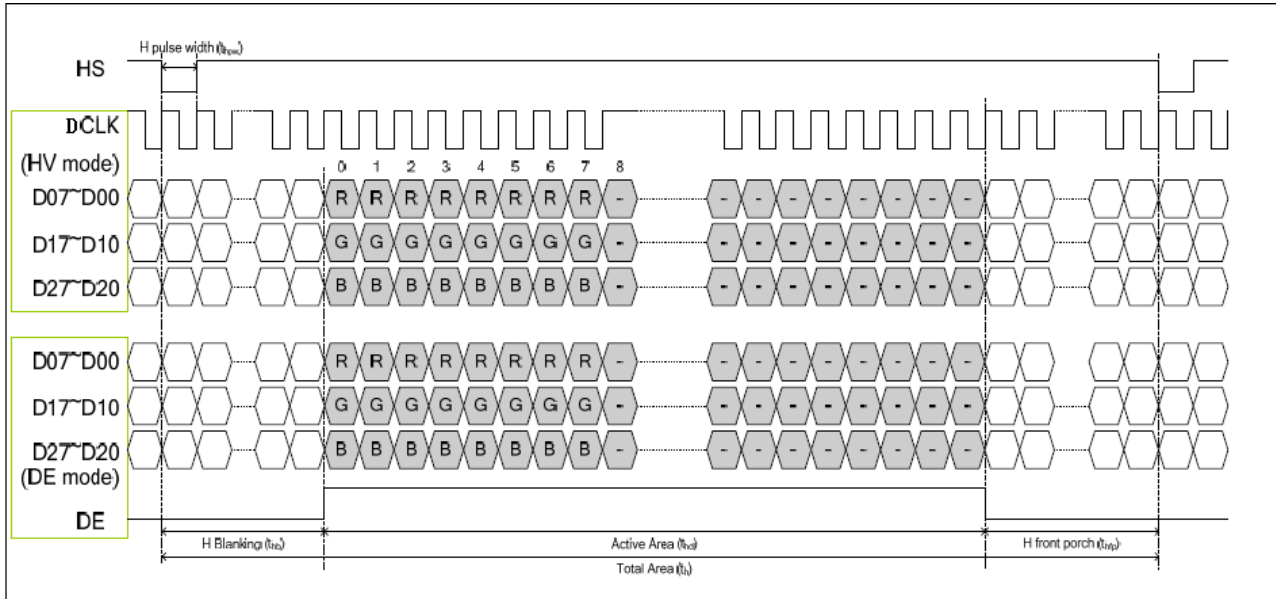
Parameter	Symbol	Min	Typ	Max	Unit
DCLK	Fclk	-	40	50	MHZ
	tclk	20	25	-	ns
HSD	th	-	1000	-	tclk
	thd	-	800	-	tclk
	thpw	1	48	-	tclk
	thb	-	88	-	tclk
	thfp	-	112	-	tclk
VSD	tv	-	660	-	th
	tvd	-	600	-	th
	tvpw	-	3	-	th
	tvb	-	39	-	th
	tvfp	-	21	-	th

Note: DE timing refer to HSD, VSD input timing.

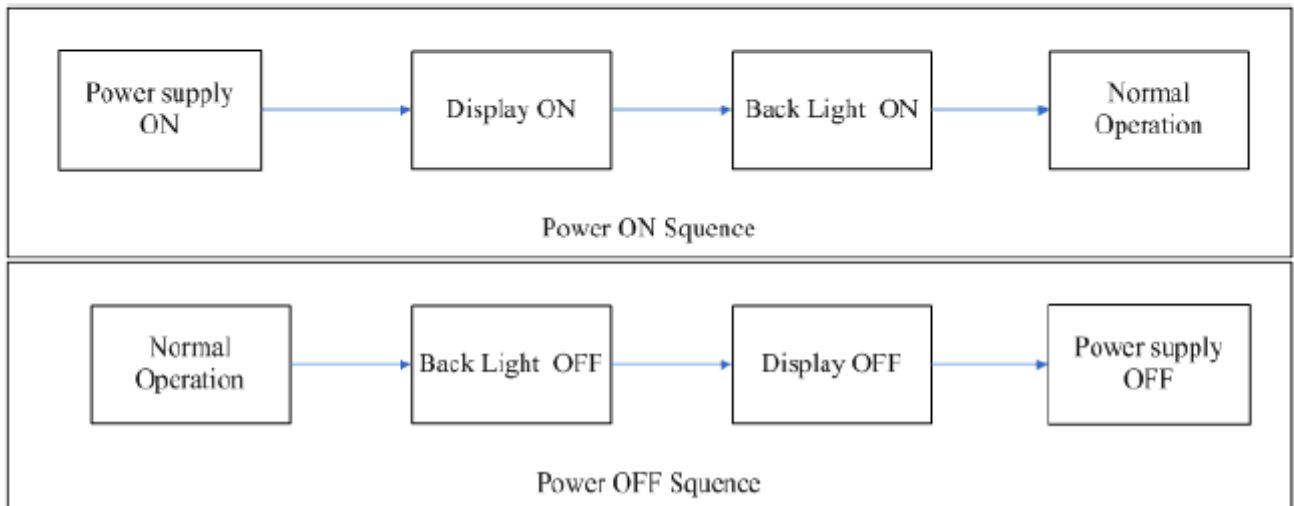
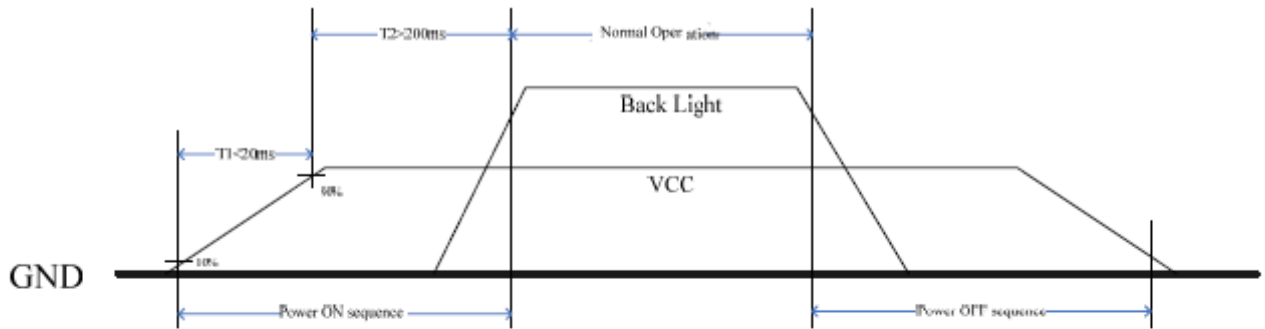
Vertical input timing Diagram:



Horizontal input timing Diagram:



8.3 power on/ off sequence



9. Optical Specification

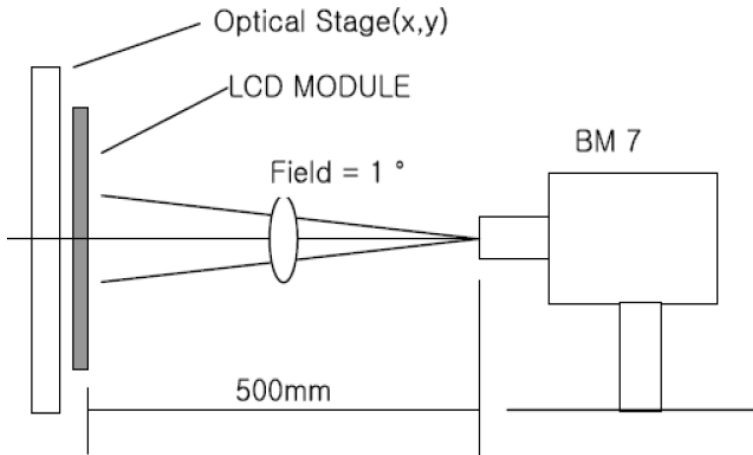
Ta=25°C

Item	Symbol	Condition	Min	Typ.	Max.	Unit	Remark
Contrast Ratio	CR	$\theta=0^\circ$	400	500	-		Note1 Note2
Response Time	Ton/ Toff	25°C	-	25	-	ms	Note1 Note3
View Angles	θT	$CR \geq 10$	40	50	-	Degree	Note 4
	θB		60	70	-		
	θL		60	70	-		
	θR		60	70	-		
Chromaticity	White	x	Brightness is on	Typ-0.05	0.310	Typ+0.05	Note5, Note1
		y			0.330		
	Red	x			TBD		
		y			TBD		
	Green	x			TBD		
		y			TBD		
	Blue	x			TBD		
		y			TBD		
Luminance	L		200	250	-	cd/m ²	Note1 Note6
NSTC	-	-	-	50	-	%	
Uniformity	U		-	75	-	%	Note1 Note7

Note 1: Definition of optical measurement system.

Temperature = 25°C(±3°C)

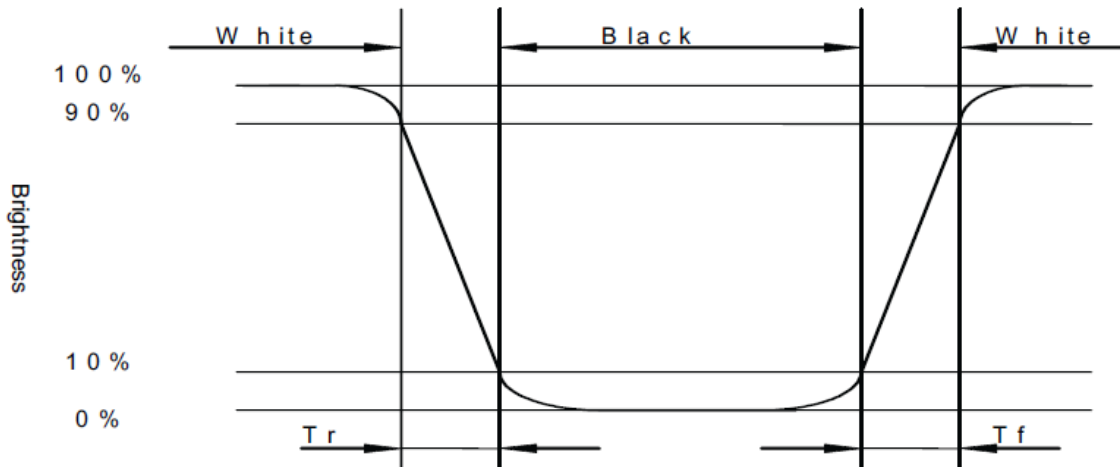
LED back-light: ON, Environment brightness < 150 lx



Note 2: Contrast ratio is defined as follow:

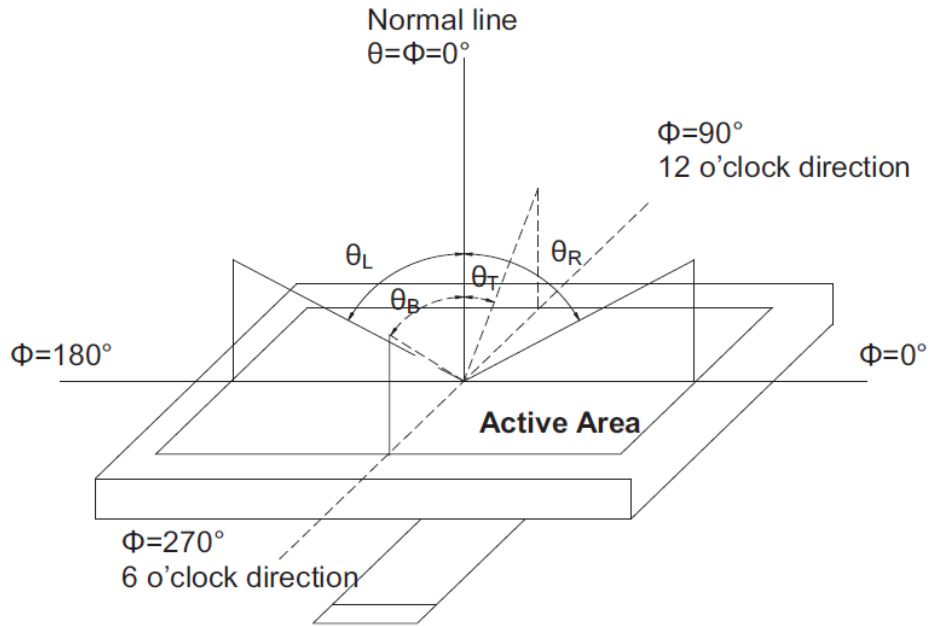
Note 3: Response time is defined as follow:

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).



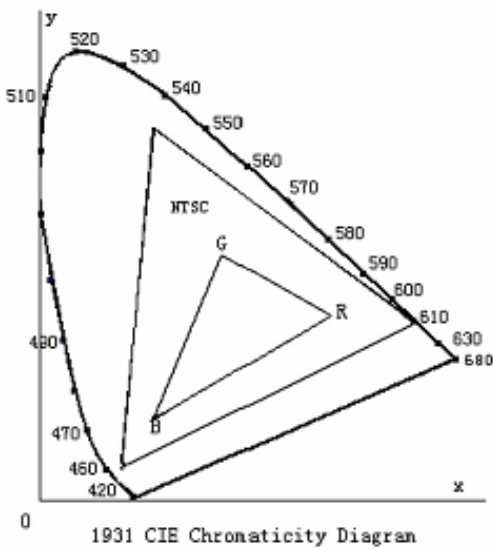
Note 4: Viewing angle range is defined as follow:

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.

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

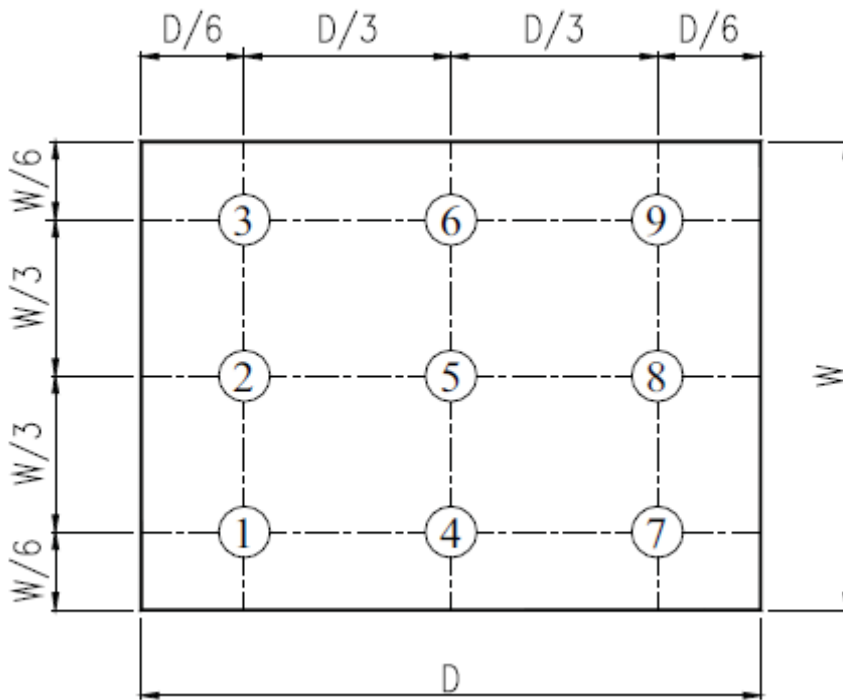


Fig. 2 Definition of uniformity

10. Environmental / Reliability Tests

No	Test Item	Condition	Judgment criteria
1	High Temp Operation	Ts=+70°C, 120hrs	Per table in below
2	Low Temp Operation	Ta=-20°C, 120hrs	Per table in below
3	High Temp Storage	Ta=+80°C, 120hrs	Per table in below
4	Low Temp Storage	Ta=-30°C, 120hrs	Per table in below
5	High Temp & High Humidity Storage	Ta=+40°C, 90% RH 120 hours	Per table in below (polarizer discoloration is excluded)
6	Thermal Shock (Non-operation)	-30°C 30 min~+80°C 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 $+25^{\circ}\text{C} \pm 10^{\circ}\text{C}$ 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.

