

DLC Display Co., Limited

德爾西顯示器有限公司



MODEL No: DLC1230ABL

TEL: 86-755-86029824

FAX: 86-755-86029827

E-MAIL: sales@dlcdisplay.com

WEB: www.dlcdisplay.com



Record of Revision

Date	Revision No.	Summary
2016-11-02	1.0	Rev 1.0 was issued

1. Scope

This data sheet is to introduce the specification of DLC1230ABL active matrix TFT module. It is composed of a color TFT-LCD panel, driver ICs, FPC and a backlight unit. The 12.3" display area contains 1920(RGB) x 720 pixels.

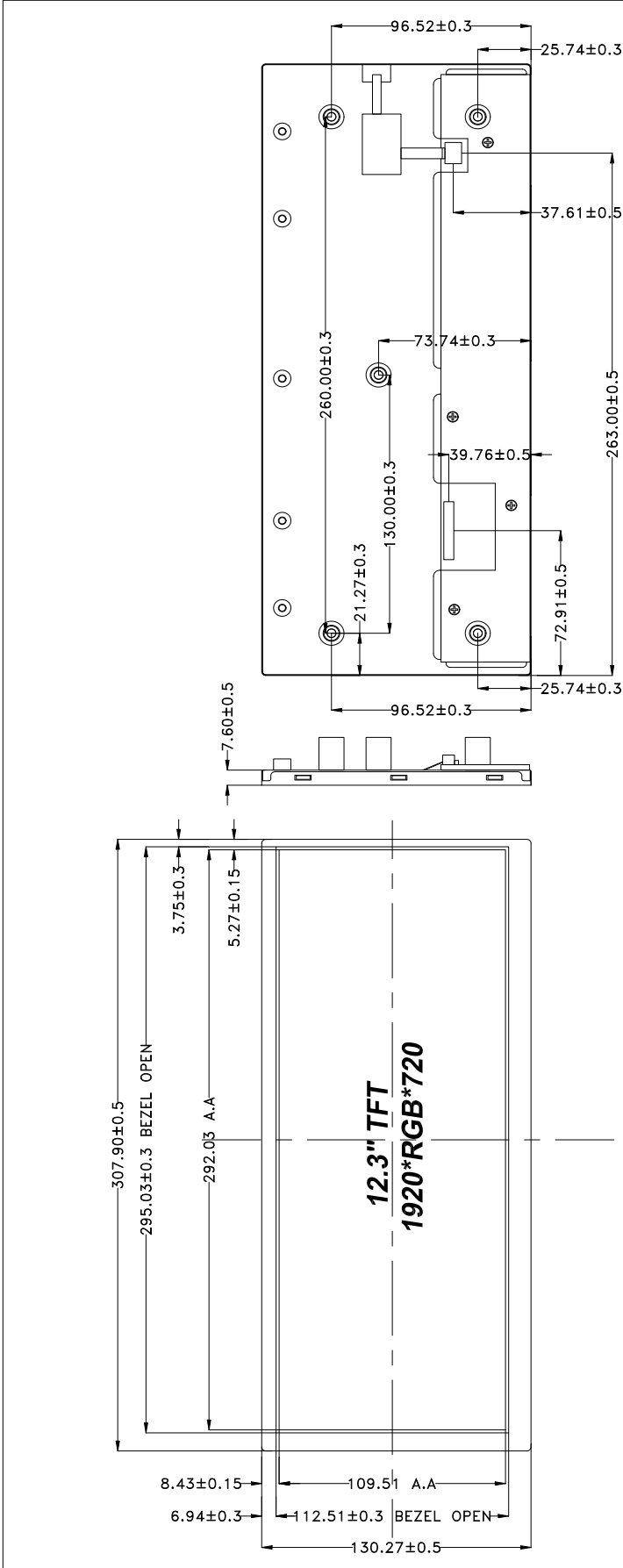
2. Application

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

3. General Information

Item	Contents	Unit
Size	12.3	inch
Resolution	1920(RGB) x 720	/
Interface	LVDS	/
Technology type	a-Si TFT	/
Pixel pitch	152.1(H) x 152.1(V)	mm
Pixel Configuration	RGB stripe	
Outline Dimension (W x H x D)	130.27 x 307.9 x 12.1	mm
Active Area (H x V)	292.032 x 109.512	mm
Display Mode	Transmissive ,Normally Black	/
Viewing Direction (Human Eye)	Free viewing direction	
Backlight Type	LED	/
Driver IC	Source:HX8298-A / Gate: HX8695-E	
Weight	520+/-50	g

4. Outline Drawing



- NOTES:
- 1.DISPLAY TYPE: a-si TFT
 - 2.DISPLAY MODULE :Transmissive,Normally Black
 - 3.OPERATING TEMP: -30°C ~ 85°C
 - 4.STORAGE TEMP: -40°C ~ 90°C
 - 5.RoHS Complicant

1	GND	16	GND	31	GND
2	RxOIN0-	17	RxEIN0-	32	VDD
3	RxOIN0+	18	RxEIN0+	33	VDD
4	GND	19	GND	34	GND
5	RxOIN1-	20	RxEIN1-	35	RESET
6	RxOIN1+	21	RxEIN1+	36	THER-
7	GND	22	GND	37	LEDK
8	RxOIN2-	23	RxEIN2-	38	LEDK
9	RxOIN2+	24	RxEIN2+	39	LEDA
10	GND	25	GND	40	LEDA
11	RxOCLK-	26	RxECLK-	41	THER+
12	RxOCLK+	27	RxECLK+		
13	GND	28	GND		
14	RxOIN3-	29	RxEIN3-		
15	RxOIN3+	30	RxEIN3+		

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DRAWN BY:	TITLE: DLC1230ABL	SCALE:
CHECKED BY:	DWG NO:	UNIT: mm
APPROVED BY:	DWG NAME:	SHEET NO: OF
CONFIRMED BY:		

5. Interface signals

The Recommended connector is JAE FI-RE41S-HF

No	Symbol	Description	Remark
1	GND	Ground	
2	RxOIN0-	LVDS Receiver Signal(-)	
3	RxOIN0+	LVDS Receiver Signal(+)	
4	GND	Ground	
5	RxOIN1-	LVDS Receiver Signal(-)	
6	RxOIN1+	LVDS Receiver Signal(+)	
7	GND	Ground	
8	RxOIN2-	LVDS Receiver Signal(-)	
9	RxOIN2+	LVDS Receiver Signal(+)	
10	GND	Ground	
11	RxOCLK-	LVDS Receiver Signal(-)	
12	RxOCLK+	LVDS Receiver Signal(+)	
13	GND	Ground	
14	RxOIN3-	LVDS Receiver Signal(-)	
15	RxOIN3+	LVDS Receiver Signal(+)	
16	GND	Ground	
17	RxEIN0-	LVDS Receiver Signal(-)	
18	RxEIN0+	LVDS Receiver Signal(+)	
19	GND	Ground	
20	RxEIN1-	LVDS Receiver Signal(-)	
21	RxEIN1+	LVDS Receiver Signal(+)	
22	GND	Ground	
23	RxEIN2-	LVDS Receiver Signal(-)	
24	RxEIN2+	LVDS Receiver Signal(+)	
25	GND	Ground	
26	RxECLK-	LVDS Receiver Signal(-)	
27	RxECLK+	LVDS Receiver Signal(+)	
28	GND	Ground	
29	RxEIN3-	LVDS Receiver Signal(-)	
30	RxEIN3+	LVDS Receiver Signal(+)	
31	GND	Ground	
32	VDD	Power Supply	+3.3V
33	VDD	Power Supply	+3.3V
34	GND	Ground	
35	RESET	Reset Signal	
36	THER-	Thermistor Sensor	
37	LEDA	Ground of LED	
38	LEDK	Ground of LED	
39	LEDA	Power Supply of LED	
40	LEDA	Power Supply of LED	
41	THER+	Thermistor Sensor	

The LED Electrical Interface Connection

The Recommended connector is FH52-10S-0.5SH (HRS)

No	Symbol	Description	Remark
1	K1-	Feedback Current of Channel 1	
2	K2-	Feedback Current of Channel 2	
3	K3-	Feedback Current of Channel 3	
4	K4-	Feedback Current of Channel 4	
5	NC	Dummy Pin	
6	A	Power supply for Backlight	
7	A	Power supply for Backlight	
8	NC	Dummy Pin	
9	THER+	Thermistor Sensor	
10	THER-	Thermistor Sensor	

6. Absolute maximum Ratings

6.1. Electrical Absolute max. ratings

Parameter	Symbol	Value	Unit	Remark
Power Supply Voltage	VCC	3.3	V	
Driver Supply Voltage	VDD	3.3	V	
Back light Power Supply Voltage	VLED	27.9	V	
Back light LED Current	ILED	320	mA	

6.2. Environment Conditions

Item	Symbol	MIN	MAX	Unit	Remark
Operating Temperature	TOPR	-30	85	°C	
Storage Temperature	TSTG	-40	90	°C	

7. Electrical Specifications

7.1 Electrical characteristics

GND=0V, Ta=25 °C

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Power Supply Voltage	VCC	3	3.3	3.6	V	Note1
Power Supply Current	IVCC	-		800	mA	
Analog Voltage	AVDD		6.27		V	
Low Level Input Voltage	VGL		-12		V	
High Level Input Voltage	VGH		18		V	
Common Electrode Voltage	VCOM		-1.25		V	Note2
Back-light Power Supply Voltage	VLED	24.3	27.9	30.6	v	
Back-light Power Supply Current	ILED	-	320	-	mA	
Power Consumption	PD		1.1		W	Note3
	PBL	7.8	8.9	9.8	W	
	Ptotal		10		W	

Note1: The supply voltage is measured and specified at the interface connector of LCM.

The current draw and power consumption specified is for 3.3V 60Hz at 25°C.

a) Typ : Window XP pattern

b) Max : Skip 2 dot 255 pattern

Note2: VCOM should be adjusted to make the flicker level be minimum.

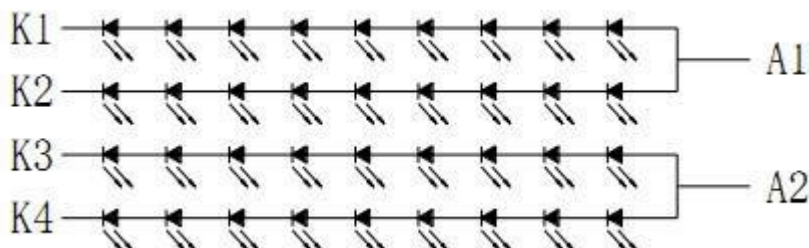
Note3: Frame rate=60HZ, Typ. Pattern: White pattern 25°C.

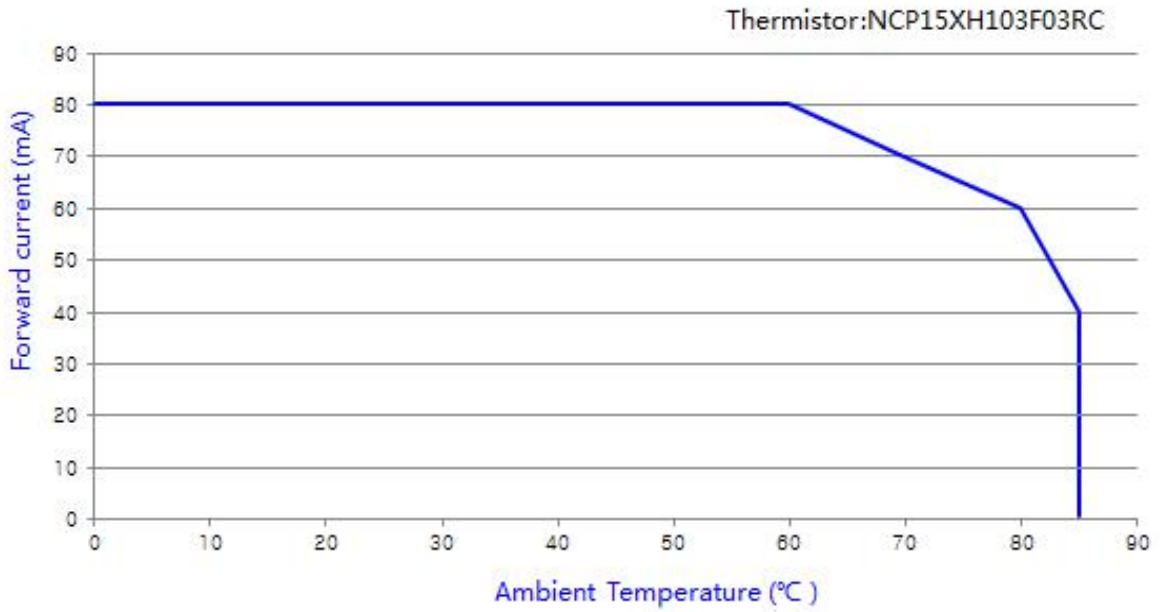
7.2 LED Backlight driving condition

Parameter	Symbol	Min	Typ	Max	Unit	Remark
LED Forward Voltage	VFLED	2.7	3.1	3.4	V	For each LED
LED Forward Current	IFLED		80		mA	-
LED Power Consumption	PLED	7.8	8.9	9.8	W	Note 1
LED Life time	Hrs	50,000				Note 2

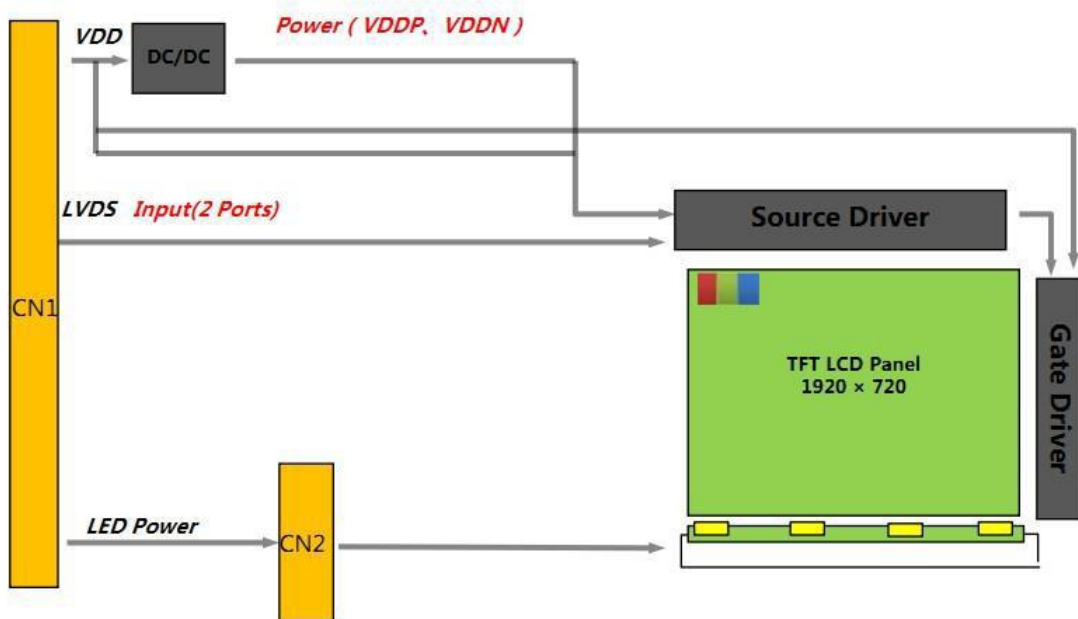
Note1: Calculator Value for reference $I_{LED} \times V_{LED} \times LED \text{ Quantity} = P_{LED}$.

Note2: The LED Life-time define as the estimated time to 50% degradation of initial luminous.





7.3 Block Diagram



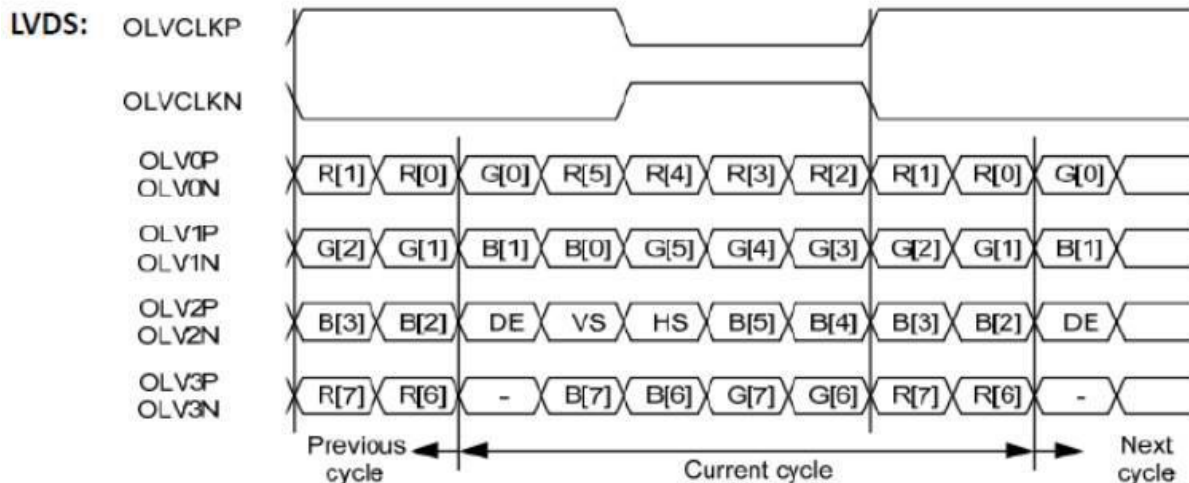
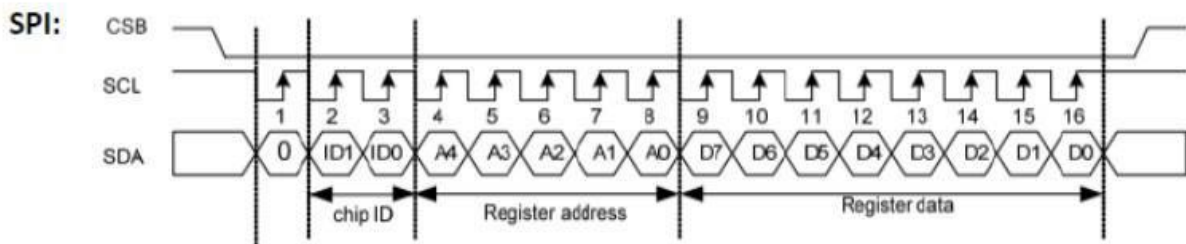
8. Signal Specifications

8.1 LVDS SIGNAL TIMING

The input signal timing specifications are shown as the following table and timing diagram.

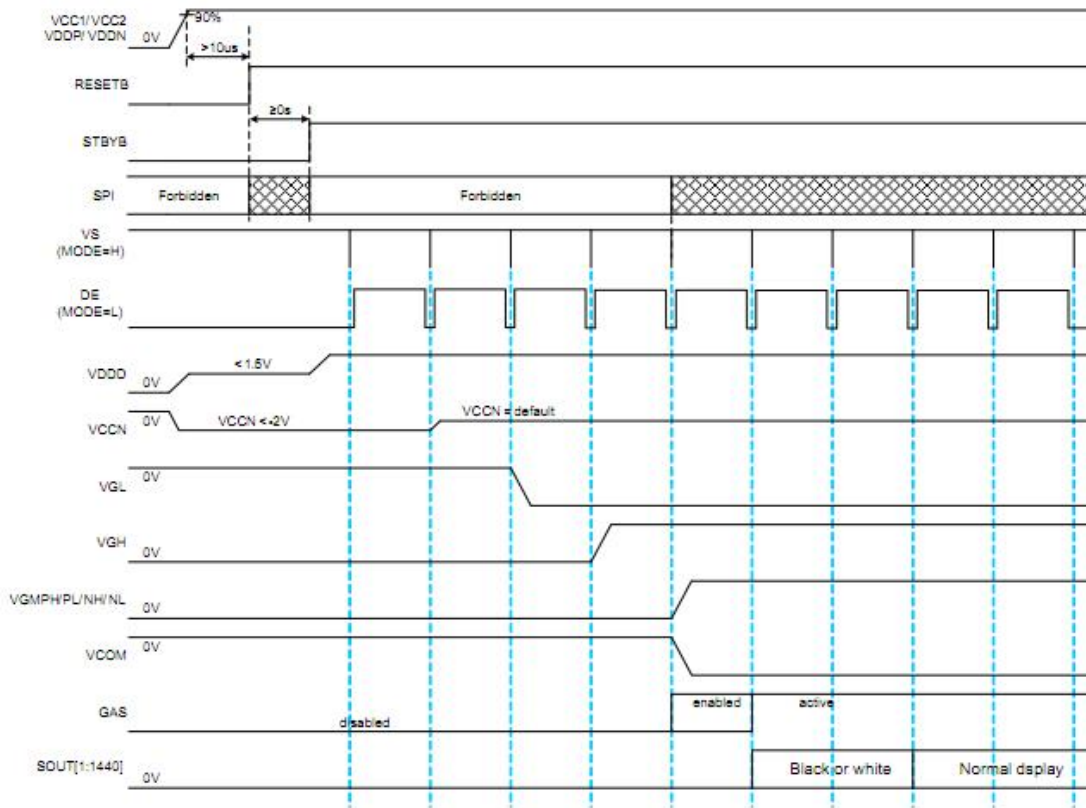
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Clock frequency	RxFCLK		44.1		MHz	
Horizontal Display Area	thd	960			DCLK	
HS Period	th	984	992	1005	DCLK	
HS Blanking	Thb+thfp		32		DCLK	
Vertical Display Area	tvd	720			TH	
VS Period	tv	730	741	753	TH	
VS Blanking	Tvbp+tvfp		21		TH	
Input data skew margin	TRSKM	400			ps	
Clock high time	TLVCH	2.45	3	4.55	ns	
Clock low time	TLVCL	2.45	4	4.55	ns	
PLL wake-up time	TenPLL			150	us	

INPUT SIGNAL FORMAT

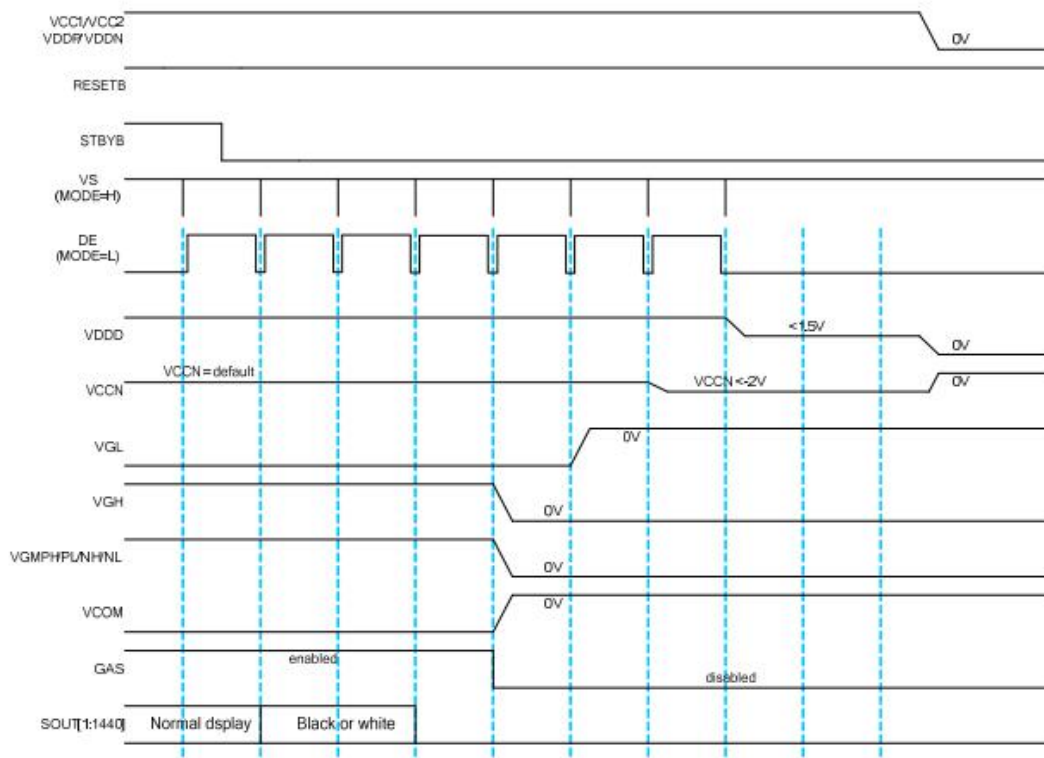


8.2 POWER ON/OFF SEQUENCE

Power On Sequence



Power Off Sequence



9. Optical Specification

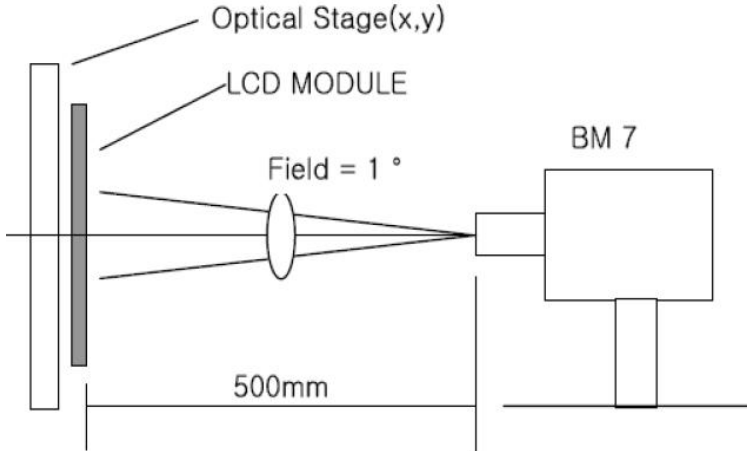
Ta=25°C

Item	Symbol	Condition	Min	Typ.	Max.	Unit	Remark		
Contrast Ratio	CR	$\theta=0^\circ$	800	1000	-		Note1 Note2		
Response Time	Tr	25°C	-	30	35	ms	Note1 Note3		
	Tf		-						
View Angles	ΘT	$CR \geq 10$	70	80	-	Degree	Note 4		
	ΘB		70	80	-				
	ΘL		70	80	-				
	ΘR		70	80	-				
Chromaticity	White	Brightness is on	Typ - 0.04	Typ +0.04			Note5, Note1		
								x	0.310
	y							0.330	
	Red							x	0.640
								y	0.343
	Green							x	0.326
								y	0.627
	Blue							x	0.145
y		0.080							
Center Luminance of White	L		600	800	-	cd/m ²	Note1 Note6		
Uniformity	%	$\Theta=0^\circ$	75						
NTSC	%	$\Theta=0^\circ$	65	70					

Note 1: Definition of optical measurement system.

Temperature = 25°C(±3°C)

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

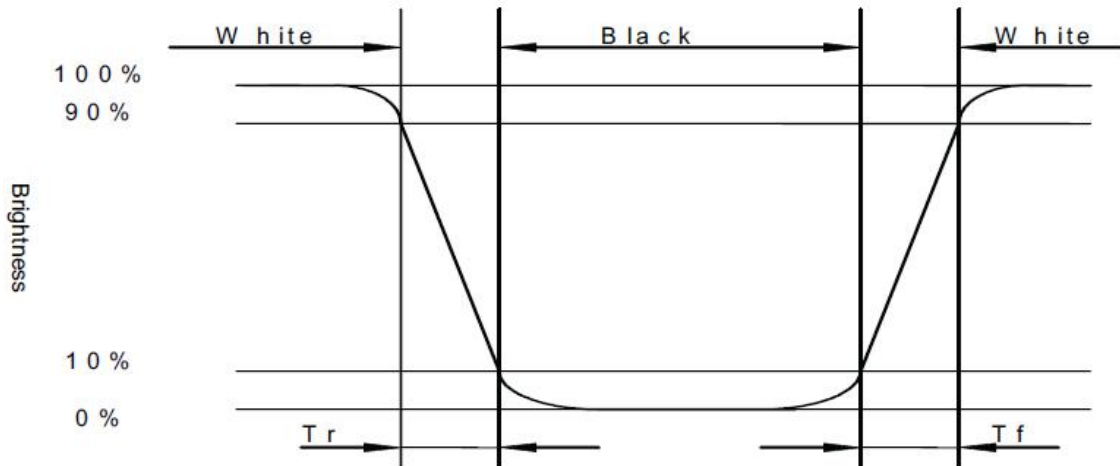


Note 2: Contrast ratio is defined as follow:

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

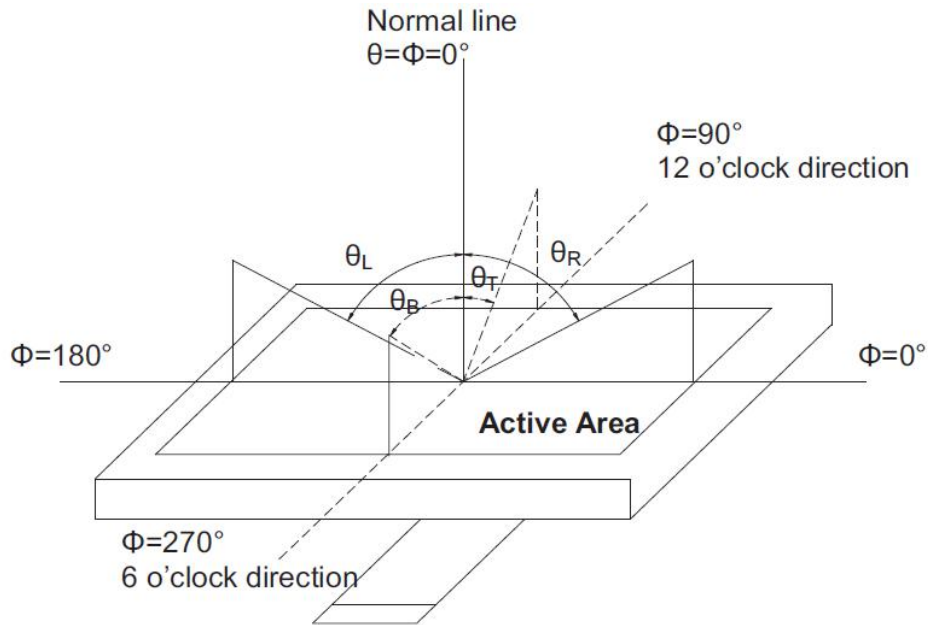
Note 3: Response time is defined as follow:

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



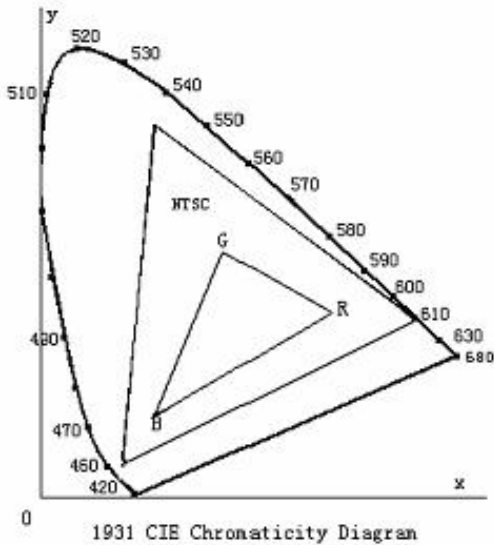
Note 4: Viewing angle range is defined as follow:

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: Definition of Luminance of White, Lc:

Measure the luminance of gray level 63 (255) at center point

10. Environmental / Reliability Tests

No	Test Item	Condition	Judgment criteria
1	High Temp Operation	Ts=+85°C, 240hrs	Per table in below
2	Low Temp Operation	Ta=-30°C, 240hrs	Per table in below
3	High Temp Storage	Ta=+90°C, 240hrs	Per table in below
4	Low Temp Storage	Ta=-40°C, 240hrs	Per table in below
5	High Temp & High Humidity Storage	Ta=+60°C, 90% RH 240 hours	Per table in below (polarizer discoloration is excluded)
6	Thermal Shock (Non-operation)	-30°C, 0.5hour ← → 85°C, 0.5hour; 1hour/cycle, 100cycles	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)	1.5G, 10 ~ 300 Hz, 10min/cycle, 3 cycles each X, Y, Z	Per table in below
9	Shock (Non-operation)	200G, 2ms, half sine wave, 1 time for ± X, ± Y, ± Z.	Per table in below
10	Package Drop Test	Height:60 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.

