



ASI-T-600MA3FN/D

Item	Contents	Unit
Size	6.0	inch
Resolution	800(RGB) x 480	/
Technology type	a-si TFT	/
Interface	RGB 24 bits with TCON	
Color depth	16M	
Pixel pitch	0.1665x0.1538	mm
Pixel Configuration	R.G.B. Vertical Stripe	
Outline Dimension (W x H x D)	145.50x 87.80x3.05	mm
Active Area	133.20 x 73.80	mm
Display Mode	Transmissive, Normally White	/
Backlight Type	LED	/



Record of Revision

Date	Revision No.	Summary
2011-03-14	1.0	Rev 1.0 was issued



1. Scope

This data sheet is to introduce the specification of ASI-T-600MA3FN/D active matrix TFT module. It is composed of a color TFT-LCD panel, driver ICs, FPC and a backlight unit. The 6.0" display area contains 800(RGB) x 480 pixels.

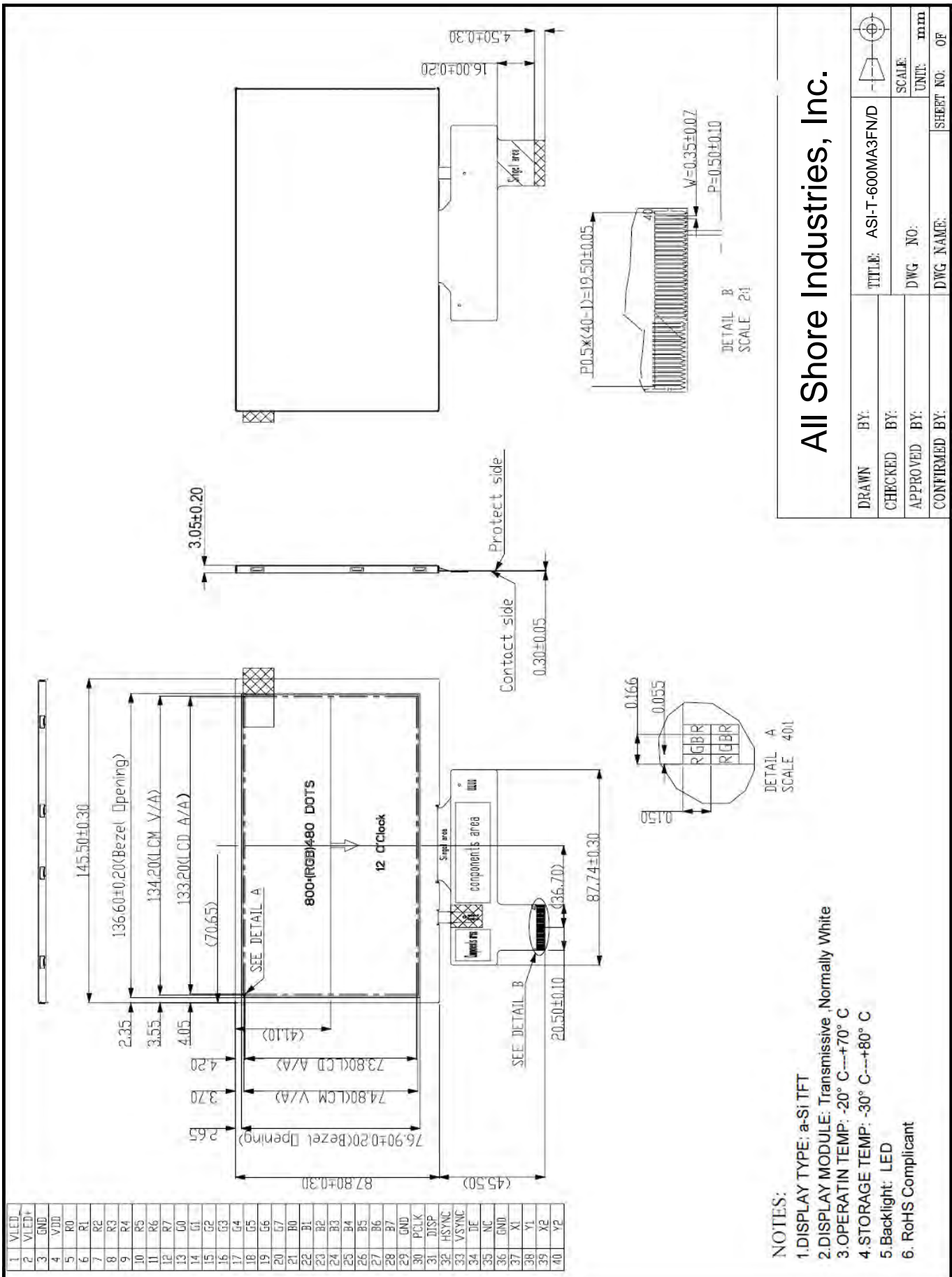
2. Application

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

3. General Information

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4. Outline Drawing



All Shore Industries, Inc.

DRAWN BY:	TITLE: ASI-T-600MA3FN/D	SCALE:	mm
CHECKED BY:	DWG. NO.:	UNIT:	mm
APPROVED BY:	DWG. NAME:	SHEET NO.:	OF
CONFIRMED BY:			

- NOTES:
- 1.DISPLAY TYPE: a-Si TFT
 - 2.DISPLAY MODULE: Transmissive ,Normally White
 - 3.OPERATING TEMP: -20° C---+70° C
 - 4.STORAGE TEMP: -30° C---+80° C
 - 5.Backlight: LED
 6. RoHS Compliant

5. Interface signals

No	Symbol	Remarks	Description	Remarks
1	VLED-	P	LED light cathode	
2	VLED+	P	LED light anode	
3	GND	P	Ground	
4	VDD	P	Power Supply(3.3V)	
5	R0	I	Red data	
6	R1	I	Red data	
7	R2	I	Red data	
8	R3	I	Red data	
9	R4	I	Red data	
10	R5	I	Red data	
11	R6	I	Red data	
12	R7	I	Red data	
13	G0	I	Green data	
14	G1	I	Green data	
15	G2	I	Green data	
16	G3	I	Green data	
17	G4	I	Green data	
18	G5	I	Green data	
19	G6	I	Green data	
20	G7	I	Green data	
21	B0	I	Blue data	
22	B1	I	Blue data	
23	B2	I	Blue data	
24	B3	I	Blue data	
25	B4	I	Blue data	
26	B5	I	Blue data	
27	B6	I	Blue data	
28	B7	I	Blue data	
29	GND	I	Ground	
30	PCLK	I	Clock signal	
31	DISP	I	Display on/off	
32	HSYNC	I	Horizontal Synchronize signal	
33	VSYNC	I	Vertical Synchronize signal	
34	DE	I	Enable signal	
35	NC	-	Ground	
36	GND	P	Power Ground(0V)	
37	X1	O	Touch Panel Right side	
38	Y1	O	Touch Panel Bottom side	
39	X2	O	Touch Panel Left side	
40	Y2	O	Touch Panel Top side	



6. Absolute maximum Ratings

6.1. Electrical Absolute max. ratings

Parameter	Symbol	MIN	MAX	Unit	Remark
Power Voltage	VDD	-0.5	5.0	V	

6.2 Environment Conditions

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

6.3 LED back-light Unit Absolute max. ratings

Item	Symbol	MIN	MAX	Unit	Remark
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
Logic Supply Voltage	VDD	2.7	3.3	3.6	V	
Input Signal Voltage	VIL	0	-	0.3*VDD	V	Note
	VIH	0.7*VDD	-	VDD	V	
Output Signal Voltage	VOL	0	-	0.3*VDD		X1,X2,Y1,Y2
	VOH	0.7*VDD	-	VDD		
Power Consumption	Black mode(60Hz)	-	900	-	mW	
	Standby mode	-	517	-	uW	

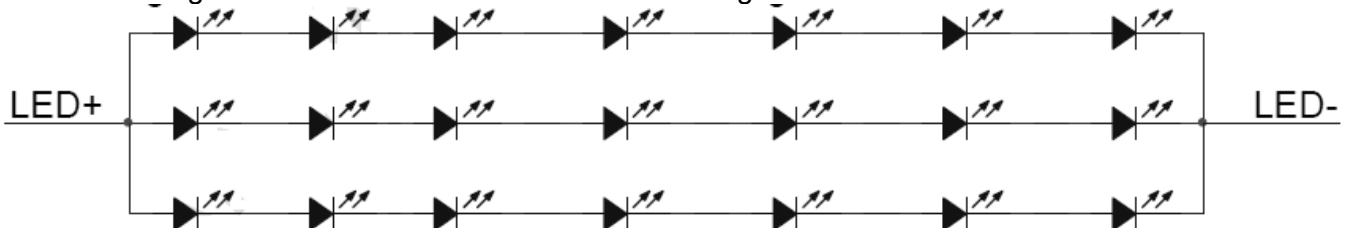
Note: R0~R7,G0~G7,B0~B7, HSYNC, VSYNC, PCLK, DE, DISP

7.2 LED Backlight

Ta=25°C

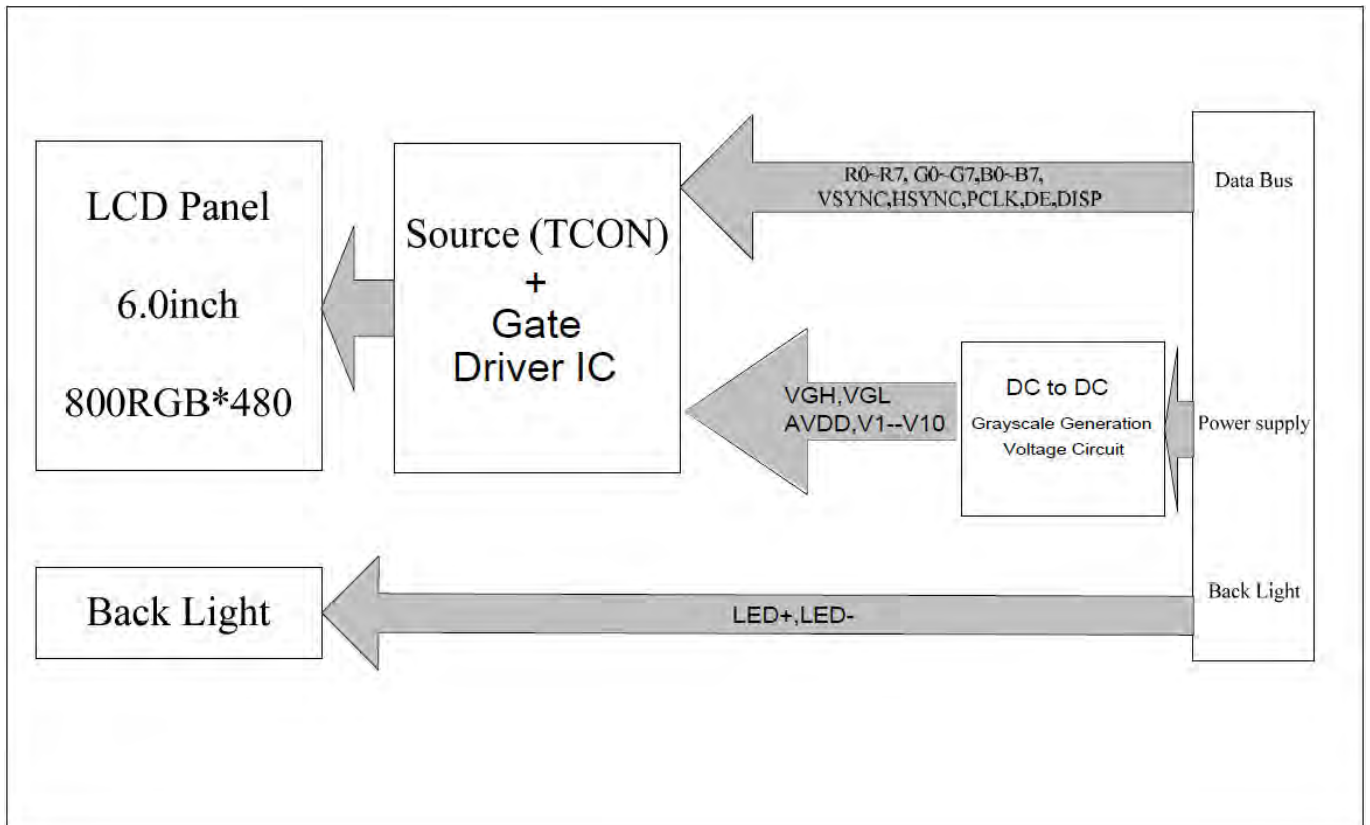
Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	If	-	60	75	mA	21 LEDs (7 LED Serial, 3 LED Parallel)
Forward Voltage	VF	-	22.4	-	V	
Backlight power	WBL		1344		mW	

Note1: The figure below shows the connection of backlight LED.



Note 2: Each LED : IF =20 mA, VF =22.4V

7.3 Block Diagram



8. Command/AC Timing

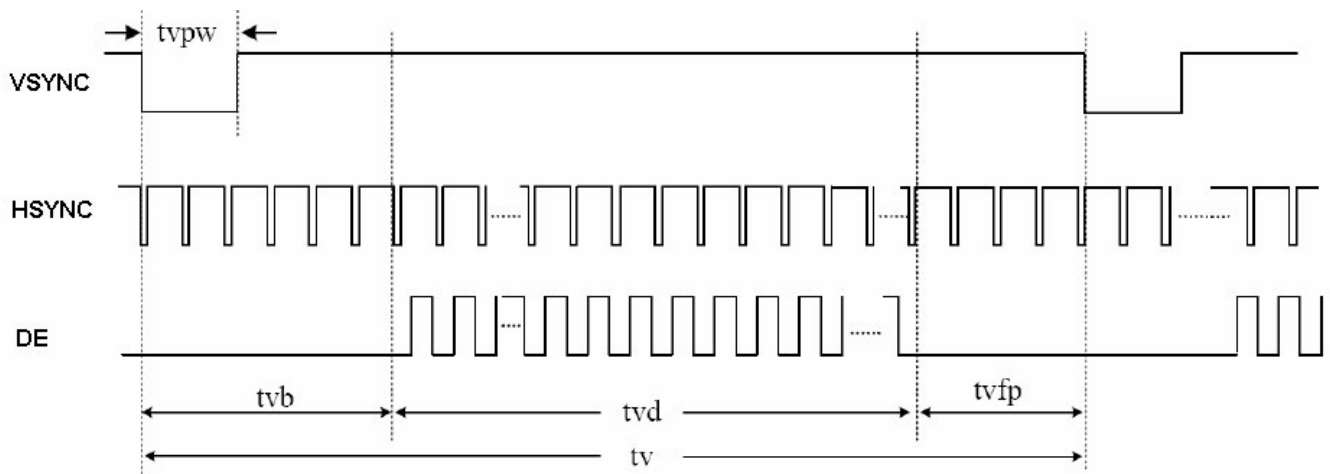
8.1 Data input timing

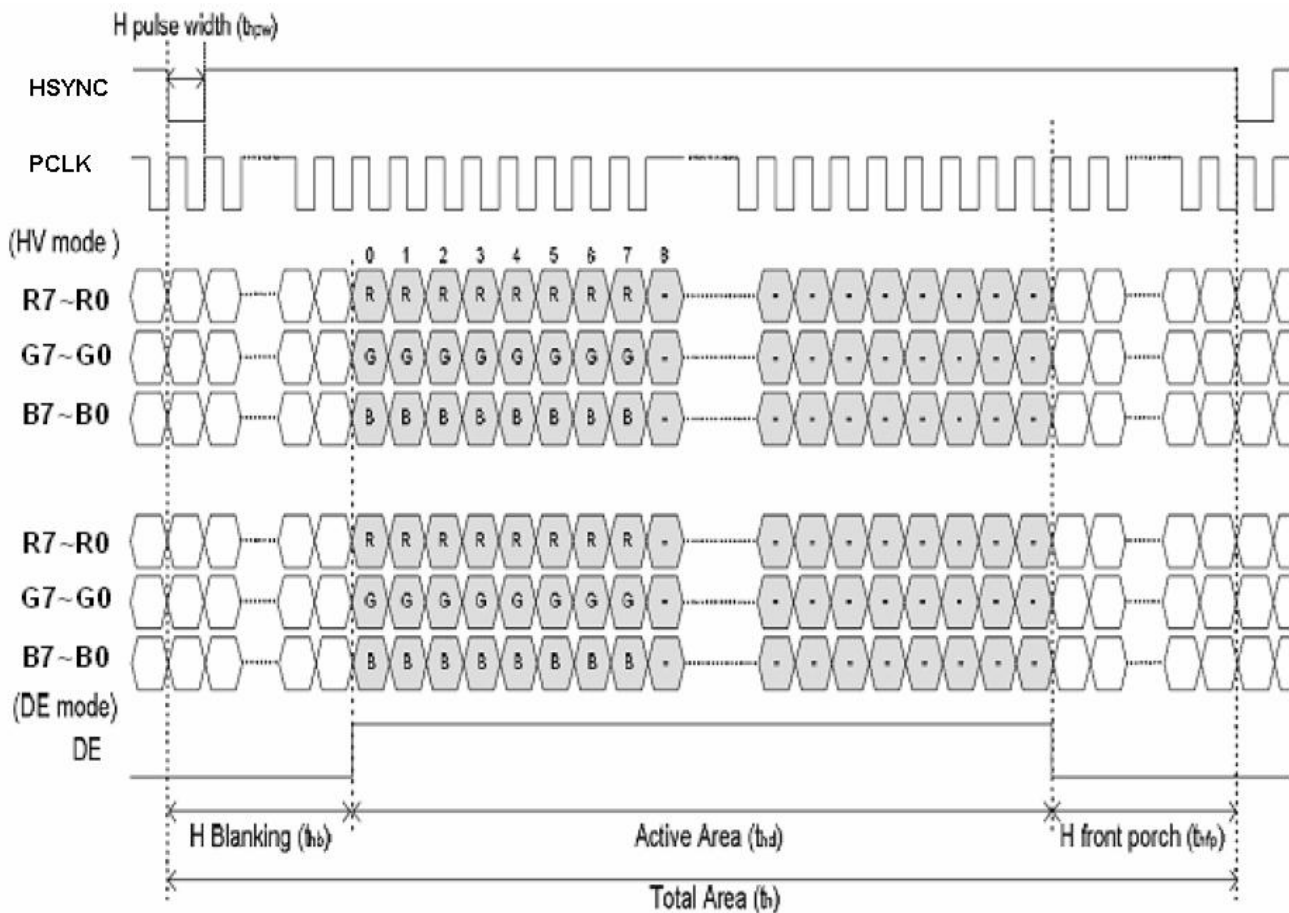
8.1.1 Horizontal input timing

Parameter	Symbol	Min	Typ	Max	Unit
Horizontal display area	thd	800			PCLK
PCLK frequency @ Frame rate =60HZ	fclk	-	30	40-	MHZ
1 Horizontal Line	th	928			PCLK
HSYNC pulse width	thpw	1	48	-	PCLK
HSYNC blanking	thb	-	88	-	PCLK
HSYNC front porch	thfp	-	40	-	PCLK

8.1.2 Vertical input timing

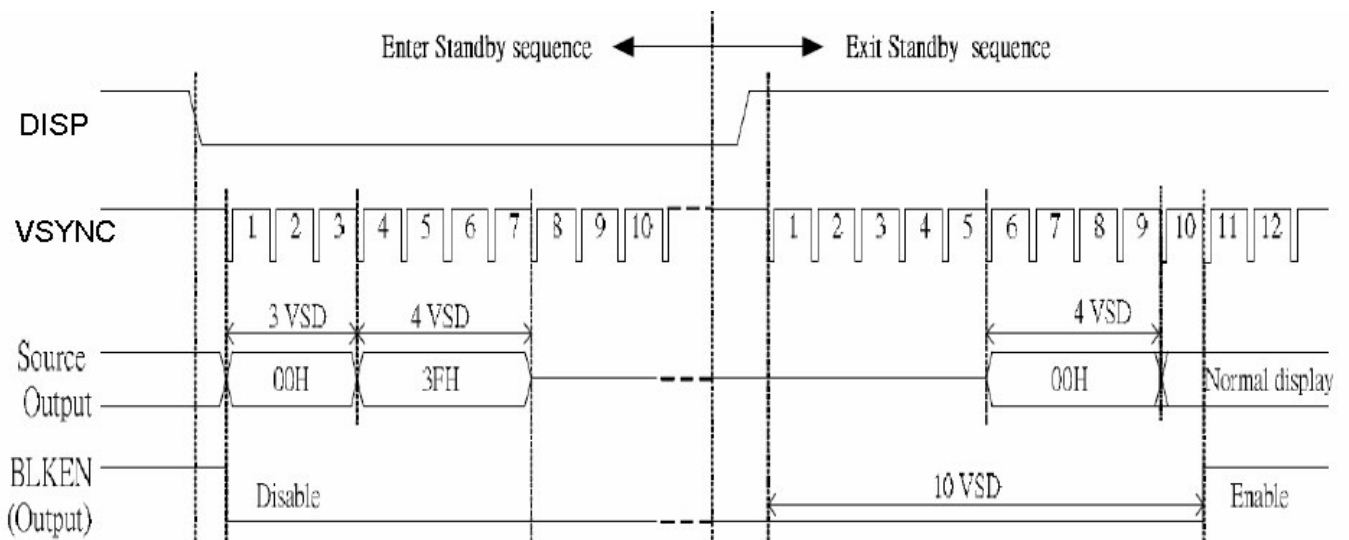
Parameter	Symbol	Min	Typ	Max	Unit
Vertical display area	tvd	-	480	-	H
VSYNC period time	tv	-	525		
VSYNC pulse width	tpw	-	3	-	H
VSYNC Blanking(tvb)	tvb	-	32	-	H
VSYNC Front porch (tvfp)	tvfp	-	13	-	H





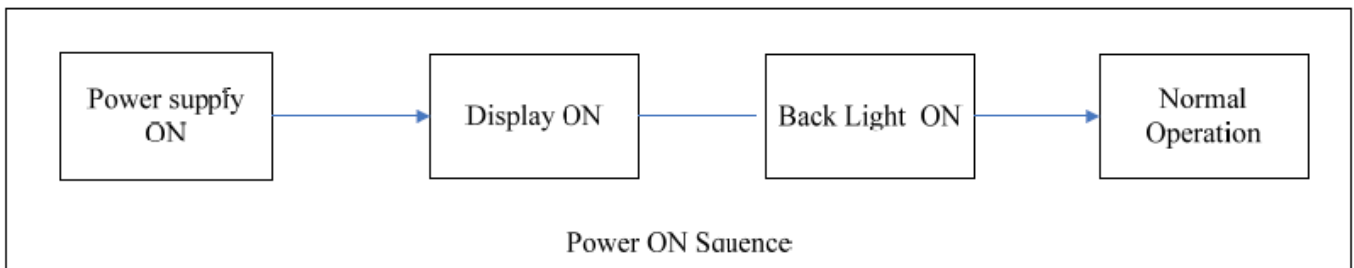
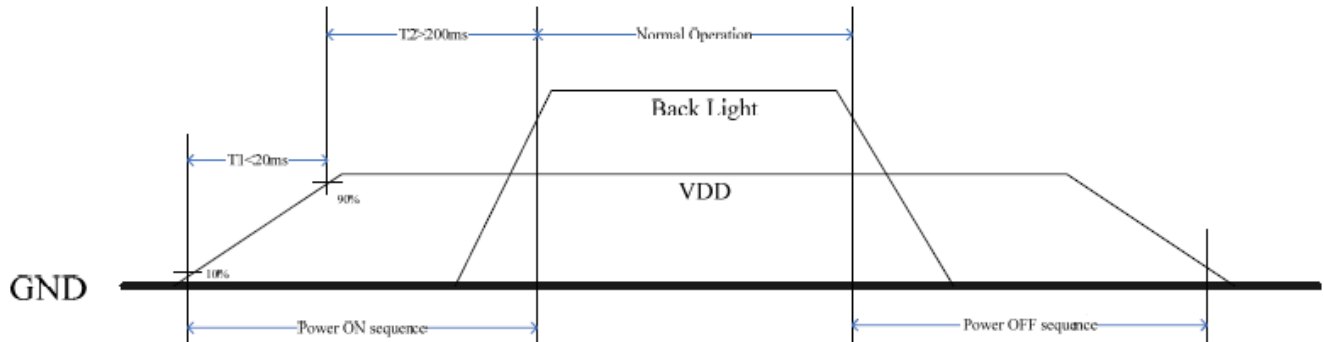
Horizontal input timing

8.2 Enter and Exit Standby Mode Sequence

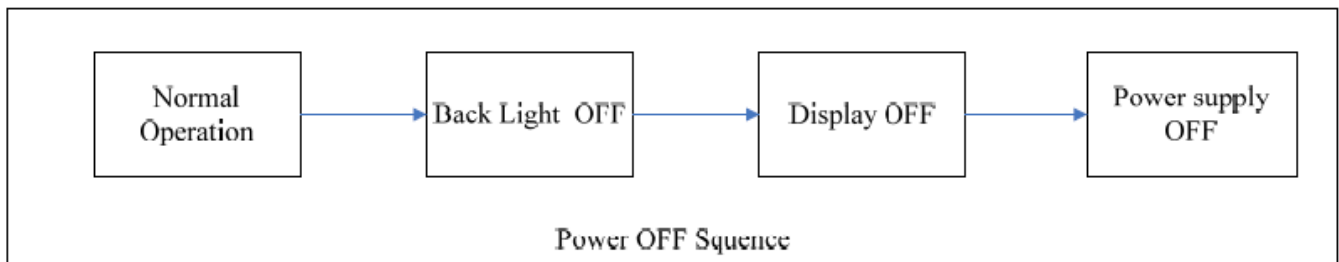


8.3 POWER ON/OFF SEQUENCE

8.3.1 POWER ON SEQUENCE



8.3.2 POWER OFF SEQUENCE



9 Optical Specification

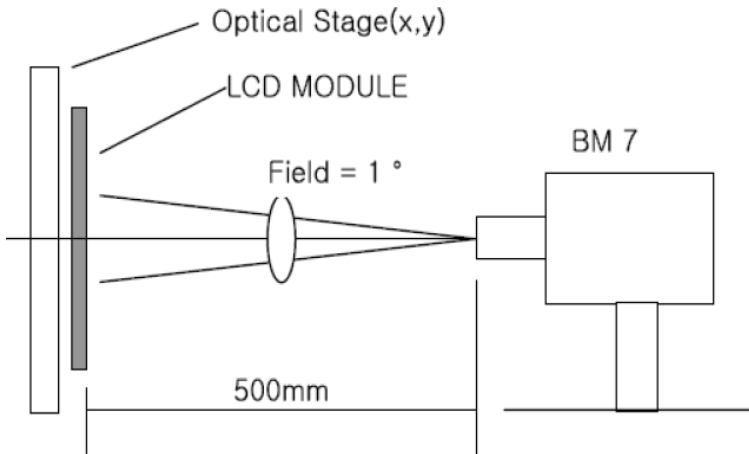
Item	Symbol	Condition	Min	Typ.	Max.	Unit	Remark
Contrast Ratio	CR	$\theta=0^\circ$	400	500	-		Note1 Note2
Response Time	Ton/ Toff	25°C	-	20	30	ms	Note1 Note3
View Angles	θT	$CR \geq 10$	50	60	-	Degree	Note 4
	θB		60	70	-		
	θL		60	70	-		
	θR		60	70	-		
Chromaticity	White	Brightness is on	x	0.235	0.285	0.335	Note5, Note1
			y	0.240	0.290	0.340	
	Red		x	0.510	0.560	0.610	
			y	0.265	0.315	0.365	
	Green		x	0.290	0.340	0.395	
			y	0.515	0.565	0.615	
	Blue		x	0.100	0.150	0.200	
			y	0.045	0.095	0.145	
NSTC	S		-	50		%	Note5
Luminance	L		320	350	-	cd/m ²	Note1 Note6
Uniformity	U		75	80	-	%	Note1 Note7

Test Conditions: $I_F=20mA$, $V_F=22.4V$, 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

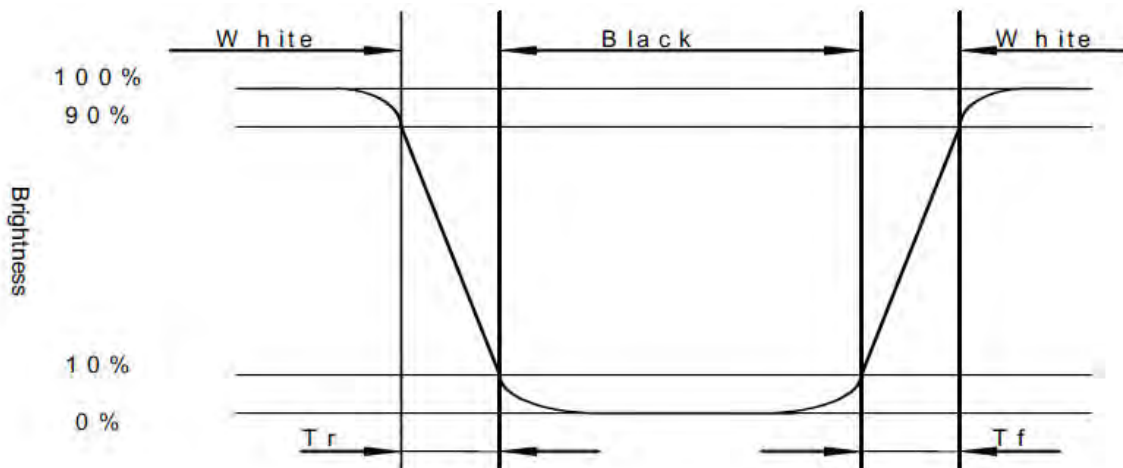


Note 2: Contrast ratio is defined as follow:

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

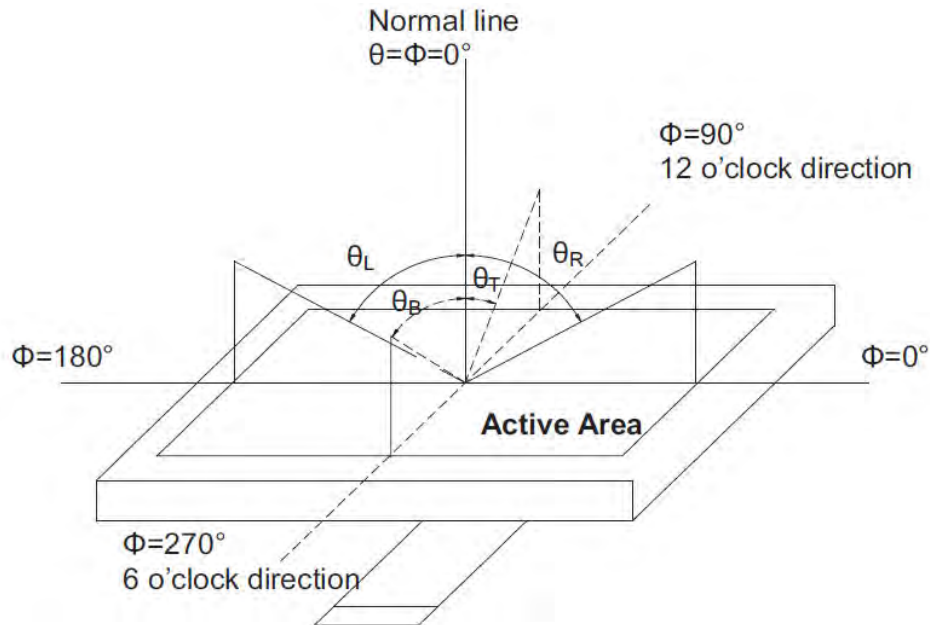
Note 3: Response time is defined as follow:

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



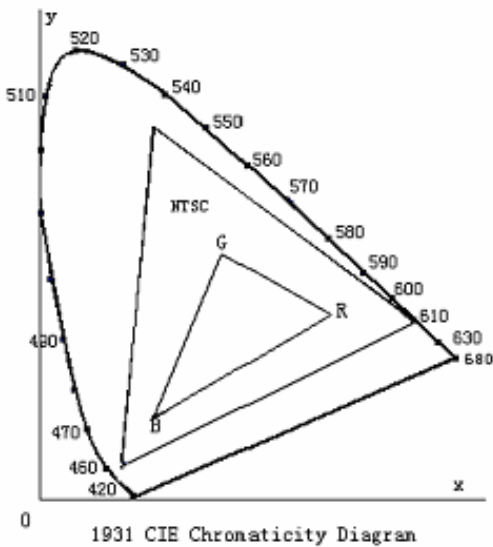
Note 4: Viewing angle range is defined as follow:

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:

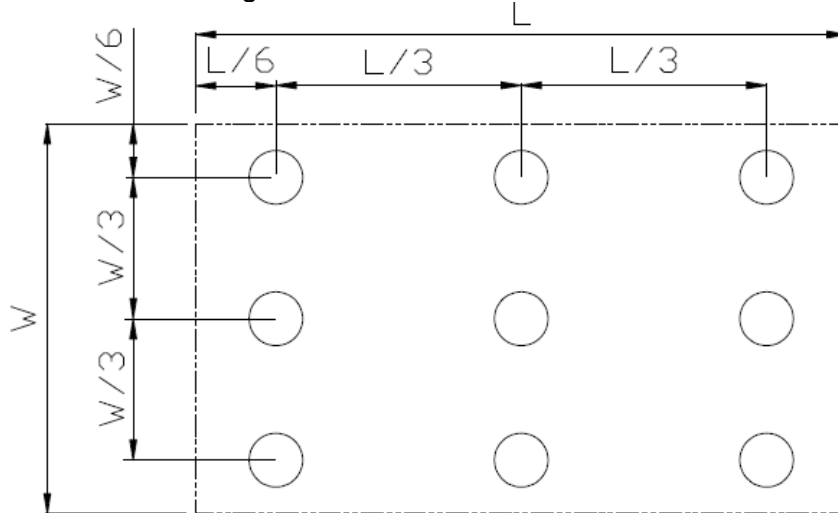
Luminance is defined as the brightness of all pixels “White” at the center of display area on optimum contrast

Note 7: Definition of Luminance Uniformity

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

Luminance Uniformity (U) = L_{min} / L_{max}

L-----Active area length W----- Active area width



10 Environmental / Reliability Tests

No	Test Item	Condition	Judgment criteria
1	High Temp Operation	Ts=+70°C, 500hrs	Per table in below
2	Low Temp Operation	Ta=-20°C, 500hrs	Per table in below
3	High Temp Storage	Ta=+80°C, 500hrs	Per table in below
4	Low Temp Storage	Ta=-30°C, 500hrs	Per table in below
5	High Temp & High Humidity Storage	Ta=+60°C, 90% RH 500 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.

