



ASI-T-700MA5AN/D

Item	Contents	Unit
Size	7.0	inch
Resolution	800(RGB) x 480	/
Interface	RGB	/
Technology type	a-Si TFT	/
Pixel Configuration	R.G.B. Vertical Stripe	
Outline Dimension (W x H x D)	164.9 x 100.0 x 5.7	mm
Active Area	154.08 x 85.92	mm
Display Mode	Transmissive, Normally white	/
Backlight Type	LED	/
Driver IC	HX8264D+HX8664B	/
Weight	155	g

1. Scope

This data sheet is to introduce the specification of ASI-T-700MA5AN/D active matrix TFT module. It is composed of a color TFT-LCD panel, driver ICs, FPC and backlight . The 7.0" display area contains 800(RGB) x 480 pixels.

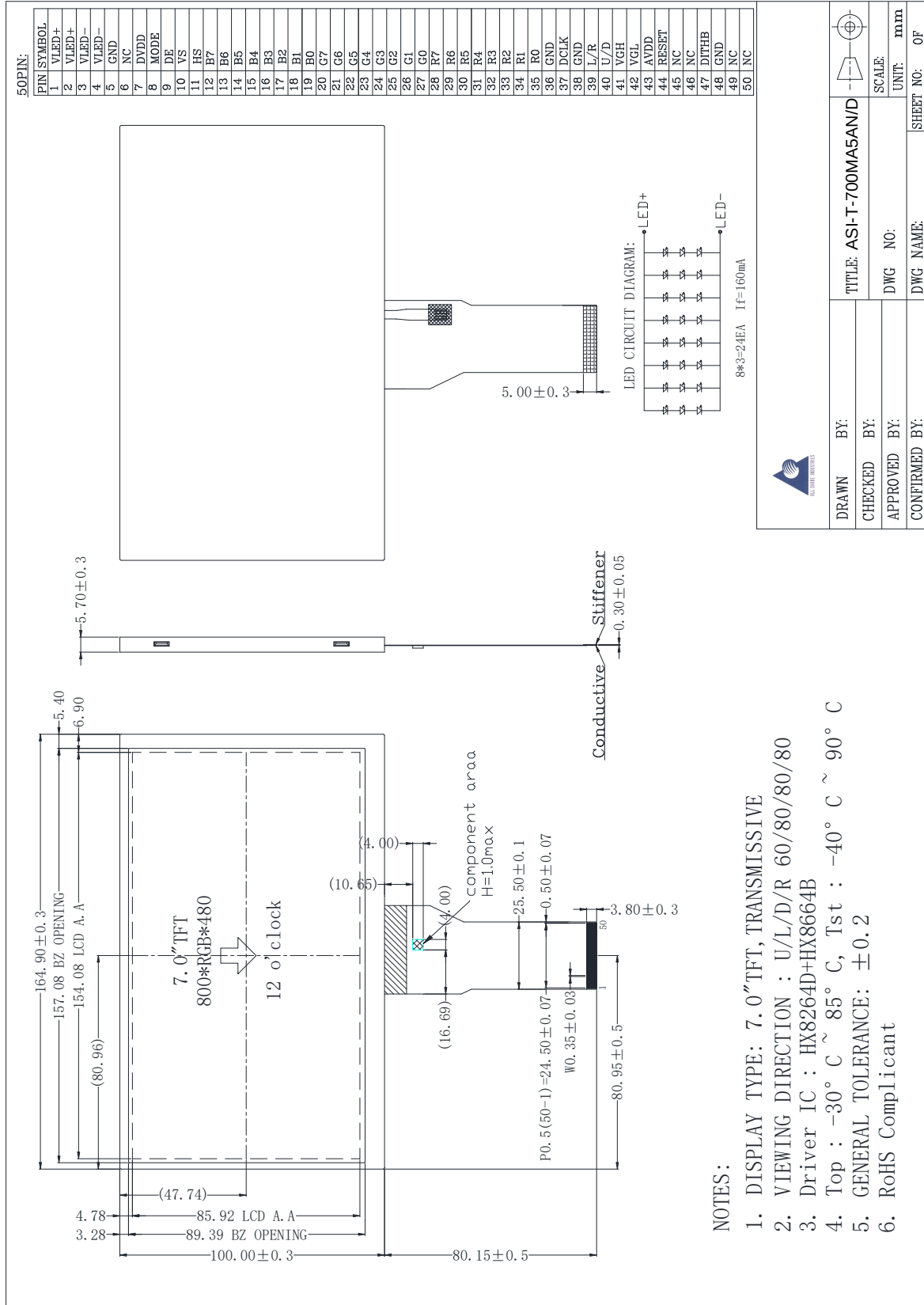
2. Application

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

3. General Information

Item	Contents	Unit
Size	7.0	inch
Resolution	800(RGB) x 480	/
Interface	RGB	/
Technology type	a-Si TFT	/
Pixel Configuration	R.G.B. Vertical Stripe	
Outline Dimension (W x H x D)	164.9 x 100.0 x 5.7	mm
Active Area	154.08 x 85.92	mm
Display Mode	Transmissive, Normally white	/
Backlight Type	LED	/
Driver IC	HX8264D+HX8664B	/
Weight	155	g

4. Outline Drawing



5. Interface signals

Pin No	Symbol	Function
1	VLED+	Led anode
2	VLED+	Led anode
3	VLED-	Led cathode
4	VLED-	Led cathode
5	GND	Ground
6	NC	No connection
7	DVDD	Digital power supply
8	MODE	DE/SYNC mode select. H:DE mode, L:SYNC mode
9	DE	Data enable signal, active high to enable data,if not used,please pull low
10	VS	Vertical sync input, negative polarity,if not used,please pull High
11	HS	Horizontal sync input, negative polarity,if not used,please pull High
12-19	B7-B0	Blue data
20-27	G7-G0	Green data
28-35	R7-R0	Red data
36	GND	Ground
37	DCLK	Clock for input data
38	GND	Ground
39	L/R	Source left or right sequence control
40	U/D	Gate up or down scan control
41	VGH	Positive power of TFT
42	VGL	Negative power of TFT
43	AVDD	Analog power supply
44	RESET	Global reset pin
45	NC	No connection
46	NC	No connection
47	DITHB	Dithering setting. H: 6bit resolution, L: 8bit resolution
48	GND	Ground
49	NC	No connection
50	NC	No connection

Matching Connection Type: FH12A-50S-0.5H

Note :

U/D R/L Function Description

Scan control input		Scanning direction
U/D	L/R	
GND	DVDD	Up to down, left to right
DVDD	GND	Down to up, right to left
GND	GND	Up to down, right to left
DVDD	DVDD	Down to up, left to right

6. Absolute maximum Ratings

6.1. Electrical Absolute max. ratings

Parameter	Symbol	MIN	MAX	Unit	Remark
Power Voltage	DVDD	-0.50	3.95	V	
	AVDD	-0.50	14.95	V	
	VGH	-0.30	42.00	V	
	VGL	-20.00	-0.30	V	
	VGH-VGL	-0.30	40.00	V	

Notes:

1. If the module is above these absolute maximum ratings. It may become permanently damaged. Using the module within the following electrical characteristic conditions are also exceeded, the module will malfunction and cause poor reliability.

6.2. Environment Conditions

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

Note:

1. The response time will become lower when operated at low temperature.
2. Background color changes slightly depending on ambient temperature.
The phenomenon is reversible.
3. $T_a \leq 40^\circ\text{C}$: 85%RH MAX.

$T_a > 40^\circ\text{C}$: Absolute humidity must be lower than the humidity of 85%RH at 40°C .

7. Electrical Specifications

7.1 Recommended Operating Condition

Parameter		Symbol	Min	Typ	Max	Unit	Note
Digital supply Voltage		DVDD	3.0	3.3	3.6	V	
Analog supply Voltage		AVDD	10.3	10.4	10.5	V	
Gate on voltage		VGH	14.4	16.0	17.6	V	
Gate off voltage		VGL	-7.7	-7.0	-6.3	V	
Input Signal Voltage	Low Level	V _{IL}	0	-	0.3*DVDD	V	R0~R7,G0~G7, B0~B7,DE,DCLK, HS,VS,MODE, RESET,L/R,U/D, DITHB
	High Level	V _{IH}	0.7*DVDD	-	DVDD	V	

7.2 Panel Power Consumption

Parameter	Symbol	Min	Typ	Max	Unit	Note
Digital Supply Current	I _{DVDD}	-	8	15	mA	DVDD=3.3V
Analog Supply Current	I _{AVDD}	-	20	30	mA	AVDD=10.4V
Gate On Current	I _{VGH}	-	0.2	0.5	mA	VGH=16V
Gate Off Current	I _{VGL}	-	0.2	0.5	mA	VGL=-7V
Power Consumption		-	250	400	mW	

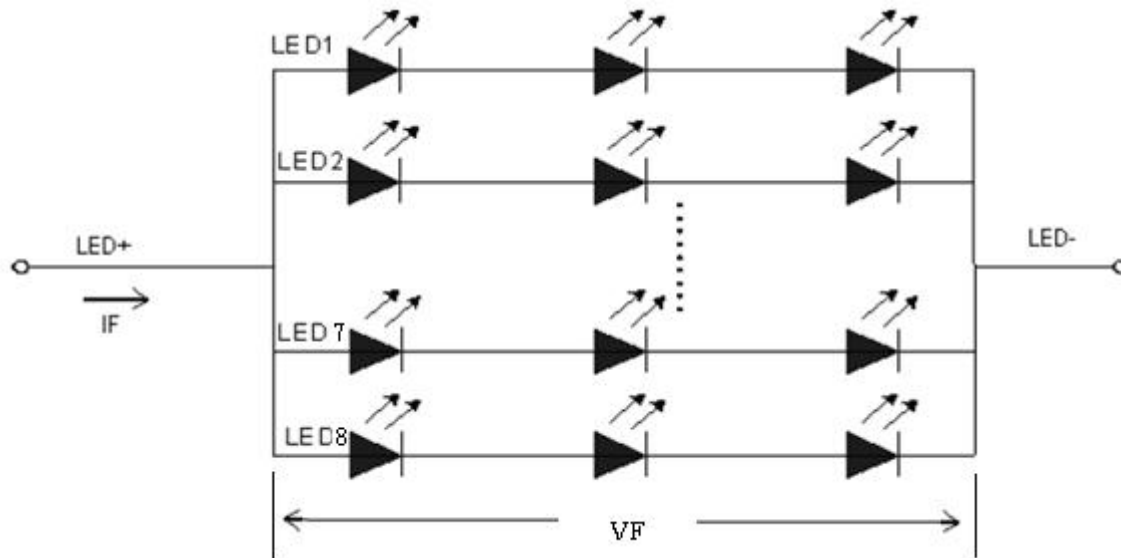
7.3 Backlight Unit Driving Condition

Parameter	Symbol	Min	Typ	Max	Unit	Note
Forward Current	I _F	-	160	200	mA	
Forward Current Voltage	V _F	-	9.6	10.8	V	
Backlight Power Consumption	W _{BL}	-	1536	2160	mW	
Operating Life Time	-	-	50000	-	Hrs	

Note1: The LED driving condition is defined for each module (3 LED Serial, 8 LED Parallel).

Note2: When LCM is operated, the stable forward current should be inputted. And forward voltage is for reference only.

Note3: Optical performance should be evaluated at $T_a=25^{\circ}\text{C}$ When LED is driven at high current, high ambient temperature & humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

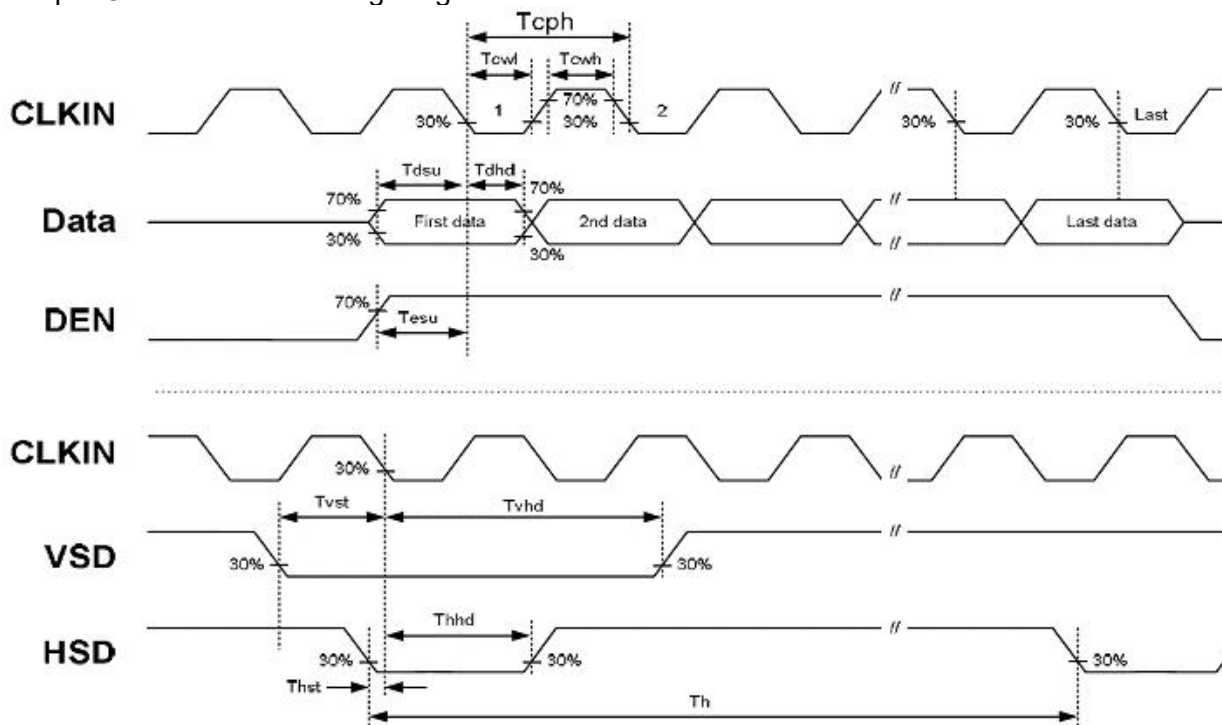


8. Timing Chart

8.1 Input Timing

Parameter	Symbol	Min	TYP	Max	Unit
DCLK frequency	F_{CLK}	28	30	40	MHz
DCLK cycle time	T_{CPH}	25	33.3	36	ns
DCLK pulse width	T_{CW}	40%	50%	60%	T_{cph}
VS setup time	T_{vs}	8	-	-	ns
VS hold time	T_{vhd}	8	-	-	ns
HS setup time	T_{hst}	8	-	-	ns
HS hold time	T_{hhd}	8	-	-	ns
Data setup time	T_{dsu}	8	-	-	ns
Data hold time	T_{dhd}	8	-	-	ns
DE setup time	T_{esu}	8	-	-	ns
DE hold time	T_{ehd}	8	-	-	ns

Input Clock and Data timing Diagram:



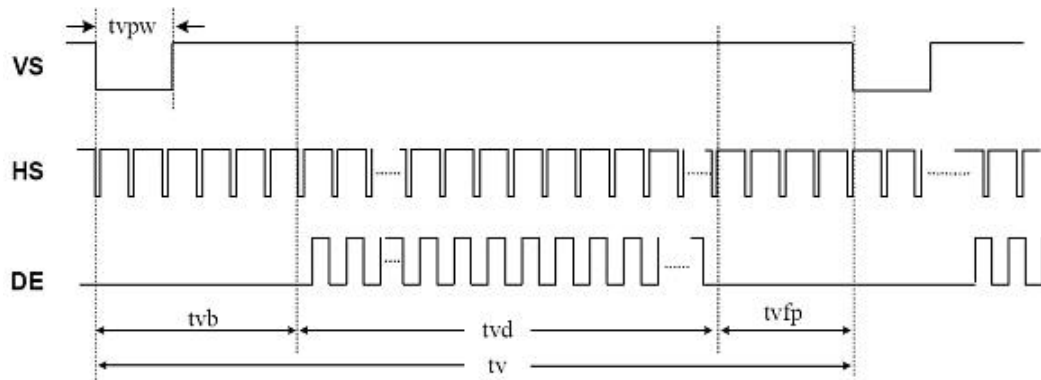
8.2 Recommended Timing Setting Of TCON

TCON (Embedded In Source IC) Input Timing (DCLK, HS, VS, DE)

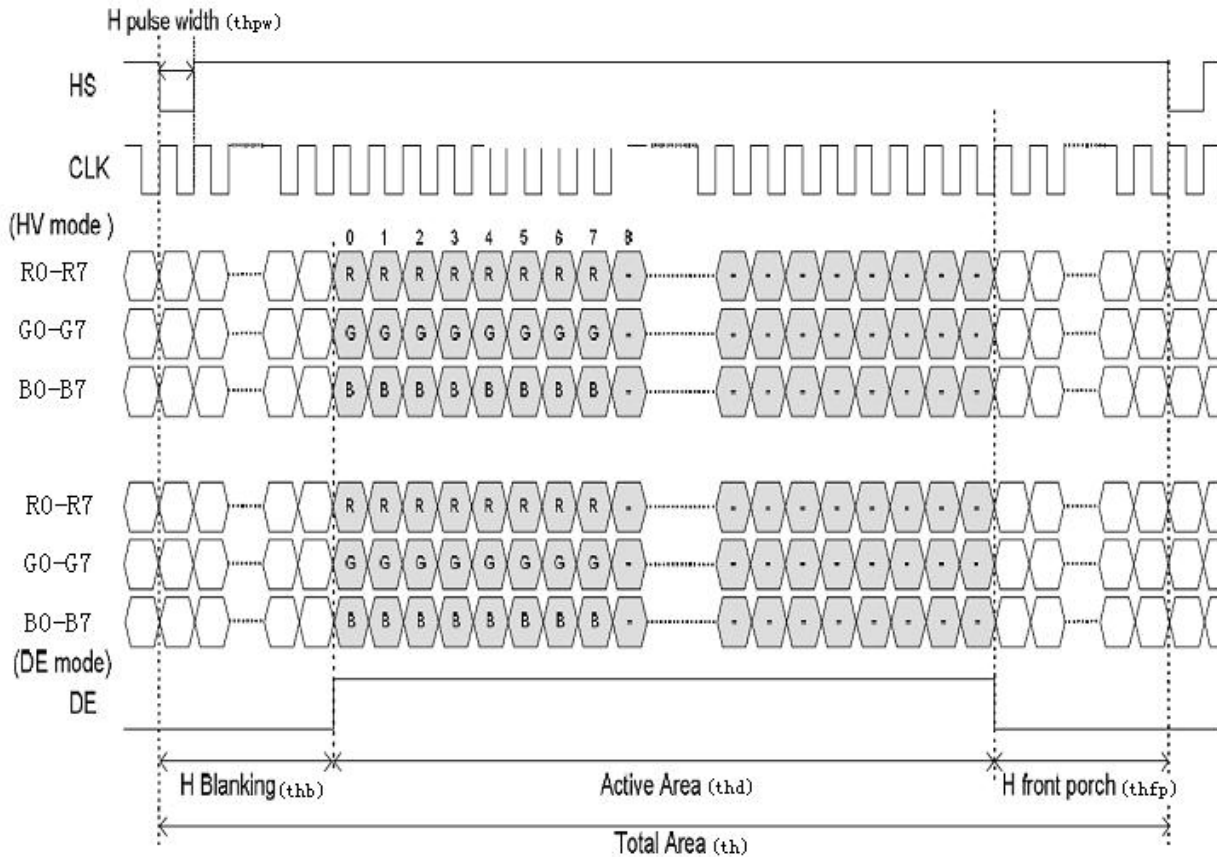
Parameter	Symbol	Min	TYP	Max	Unit
DCLK	F _{CLK}	28	30	40	MHz
	t _{clk}	25	33.3	36	ns
HSD	t _h	862	1056	1200	t _{clk}
	t _{hd}	800	800	800	t _{clk}
	t _{hpw}	1	-	40	t _{clk}
	t _{hb}	46	46	46	t _{clk}
	t _{hfp}	16	210	354	t _{clk}
VSD	t _v	510	525	650	t _h
	t _{vd}	480	480	480	t _h
	t _{vpw}	1	3	20	t _h
	t _{vb}	23	23	23	t _h
	t _{vfp}	7	22	47	t _h

Note 1: DE timing refer to HS, VS input timing.

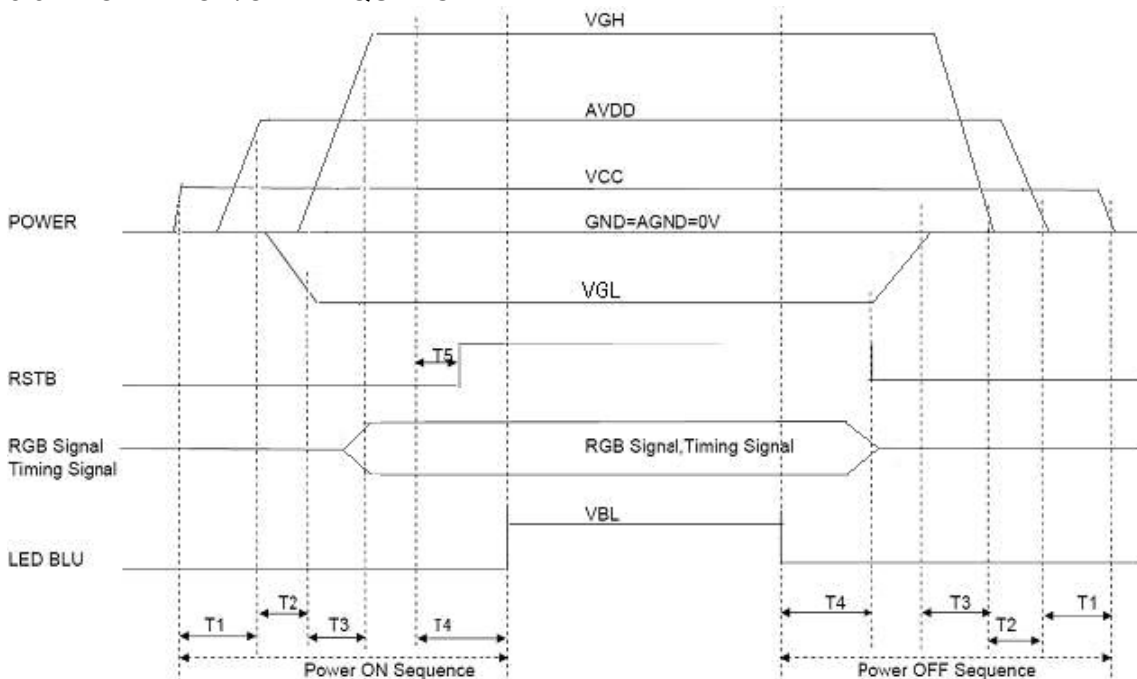
TCON Vertical Input Timing Diagram HV



TCON Horizontal Input Timing Diagram



8.3 POWER ON/OFF SEQUENCE



Note 1: $T1 \geq 20ms$, $T2 \geq 20ms$, $T3 \geq 5ms$, $T4 \geq 100ms$, $T5 \geq 5ms$.

9. Optical Specification

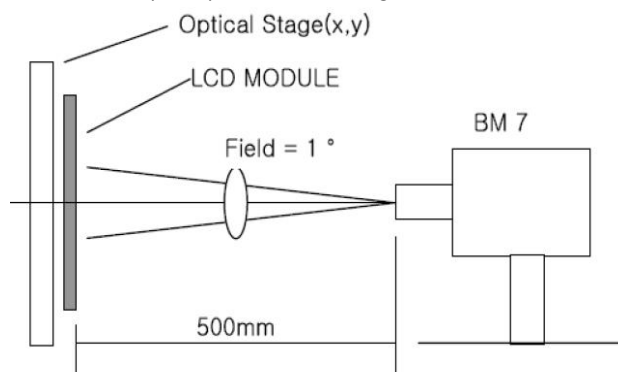
Ta=25°C

Item		Symbol	Condition	Min	Typ.	Max.	Unit	Remark
Contrast Ratio		CR	$\theta=0^{\circ}$	600	1000	-		Note1 Note2
Response Time		Tr	25℃	-	25	-	ms	Note1 Note3
		Tf						
View Angles		θT	$CR\geqslant 10$	50	60	-	Degree	Note 4
		θB		60	80	-		
		θL		60	80	-		
		θR		60	80	-		
Chromaticity	White	x	Brightness is on	TYP-0.05	0.315	TYP+0.05		Note5, Note1
		y			0.332			
	Red	x			0.597			
		y			0.356			
	Green	x			0.348			
		y			0.585			
	Blue	x			0.149			
		y			0.094			
NTSC				45	50	-	%	Note5
Luminance		L		450	500	-	cd/m ²	Note1 Note6
Uniformity		U		75	85	-	%	Note1 Note7

I_F=160 mA, V_F=9.6 V and the ambient temperature is 25±2°C.humidity is 65±7%

Note 1: Definition of optical measurement system.

Temperature = 25°C(±3°C); LED back-light: ON, Environment brightness < 150 lx

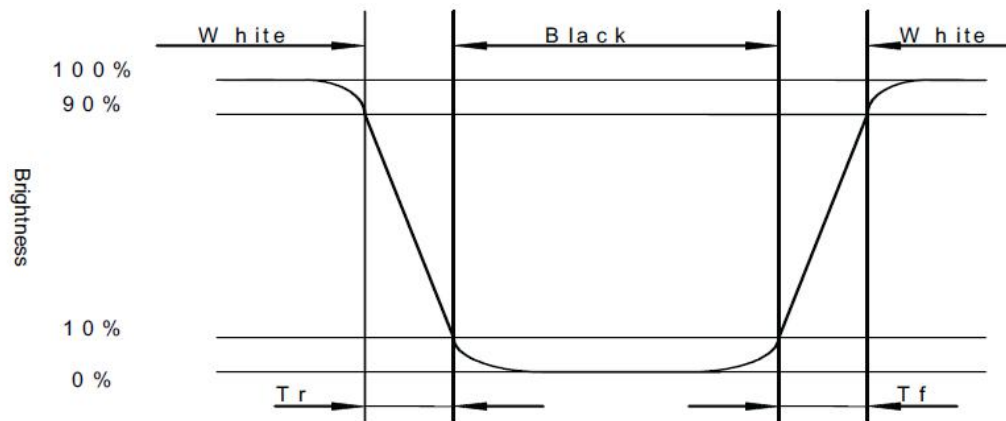


Note 2: Contrast ratio is defined as follow:

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

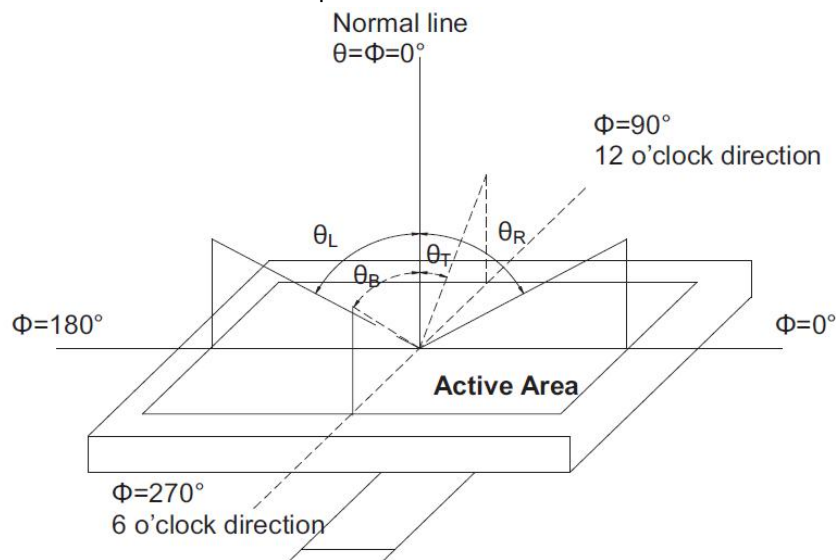
Note 3: Response time is defined as follow:

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: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

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.

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

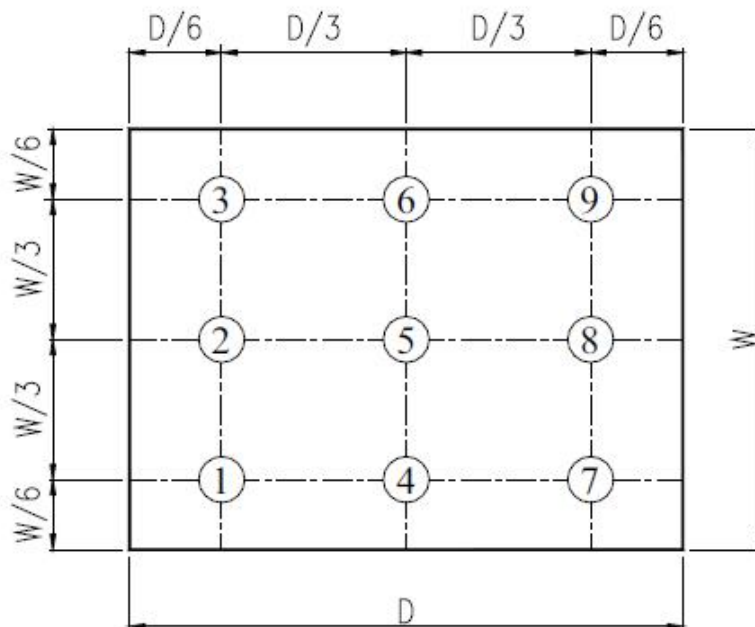


Fig. 2 Definition of uniformity

10. Environmental / Reliability Tests

No	Test Item	Condition	Judgment criteria
1	High Temp Operation	Ts=+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 30 min~+80°C 30 min, Change time:5min, 200 Cycles	Per table in below
7	ESD (Operation)	C=150pF,R=330Ω,5point/panel Air:±8Kv,5times; Contact:±4Kv,5times (Environment:15°C~35°C, 30%~60%.86Kpa~106Kpa)	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. (6 hours for total)	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:80cm, 1corner,3edges,6surfaces	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.

