ALL SHORE INDUSTRIES

ASI-T-240DA7MUN/D

Item	Contents	Unit
Size	2.4	inch
Resolution	240(RGB) x 320	/
Interface	MCU	/
Technology type	a-Si TFT	/
Pixel pitch	0.153 x 0.153	mm
Pixel Configuration	R.G.B. Vertical Stripe	
Viewing Direction	6 o'clock	
Outline Dimension (W x H x D)	42.72 x 59.26 x 2.53	mm
Active Area	36.72 x 48.96	mm
Display Mode	Transmissive	/
Backlight Type	LED	/
Driver IC	ILI9341V	/

Record of Revision

Date	Revision No.	Summary
2022-11-15	1.0	Rev 1.0 was issued

1. Scope

This data sheet is to introduce the specification of ASI-T-240DA7MUN/D, active matrix TFT module. It is composed of a color TFT-LCD panel, driver IC, FPC and a backlight unit. The 2.4'' display area contains 240(RGB) x 320 pixels.

2. Application

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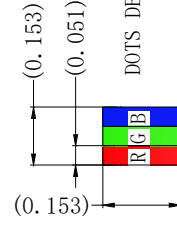
3. General Information

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4. Outline Drawing

NOTES

Rev.	DATE	
V1.0	2022.08.04	New issue
V1.1	2022.11.15	Change the BL & glass
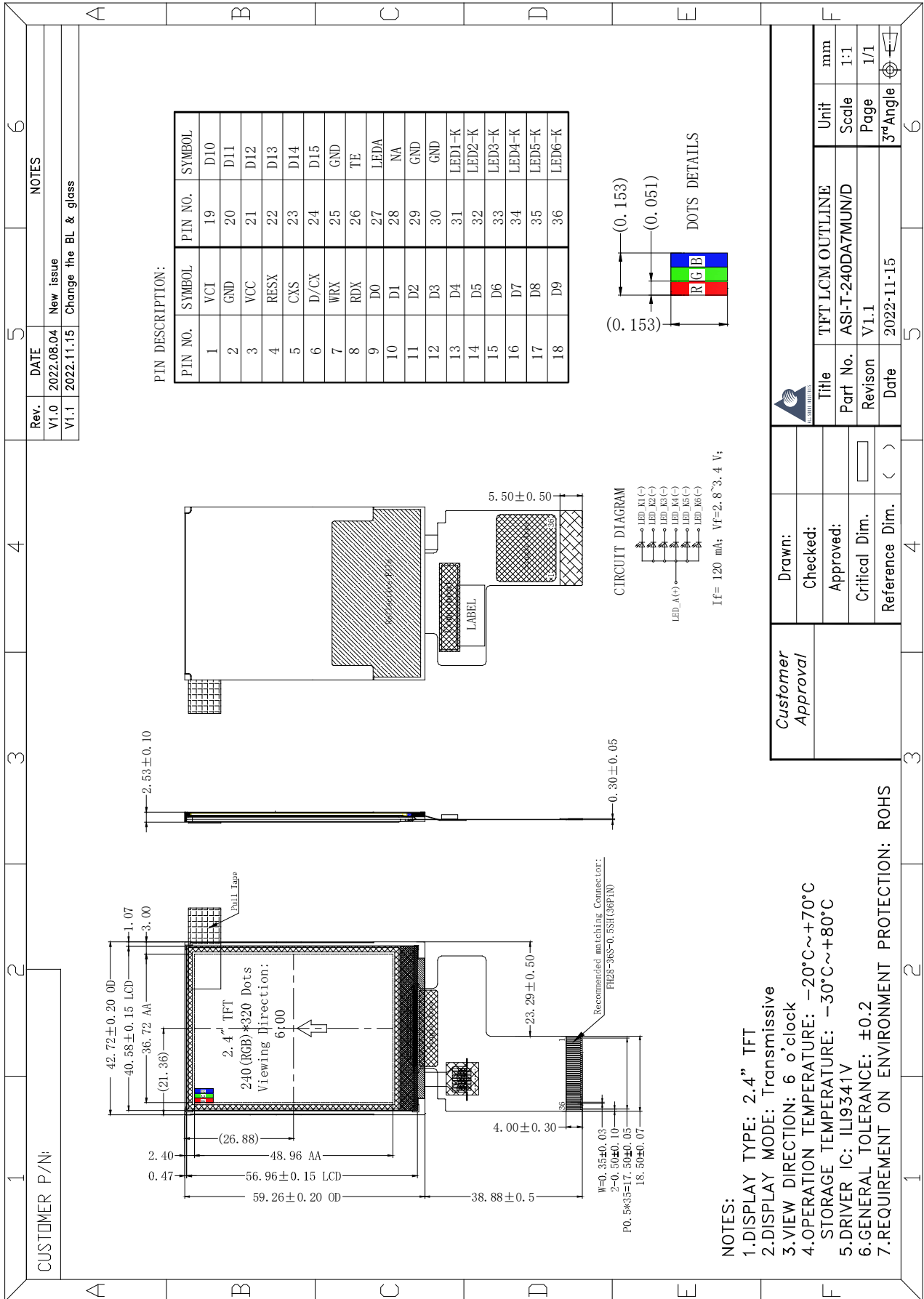
PIN DESCRIPTION:

PIN NO.	SYMBOL	PIN NO.	SYMBOL
1	VCI	19	D10
2	GND	20	D11
3	VCC	21	D12
4	RESX	22	D13
5	CXS	23	D14
6	D/CX	24	D15
7	WRX	25	GND
8	RDX	26	TE
9	D0	27	LEDA
10	D1	28	NA
11	D2	29	GND
12	D3	30	GND
13	D4	31	LED1-K
14	D5	32	LED2-K
15	D6	33	LED3-K
16	D7	34	LED4-K
17	D8	35	LED5-K
18	D9	36	LED6-K

DOTS DETAILS

(0.153)
(0.051)
(0.153)

R G B

CIRCUIT DIAGRAM

LED_K1(-) LED_K2(-) LED_K3(-) LED_K4(-) LED_K5(-) LED_K6(-)
LED_A(+)
If= 120 mA; Vf=2.8~3.4 V;

LABEL

5.50±0.50

2.53±0.10
0.30±0.05

Phil Tape

42.72±0.20 OD
40.58±0.15 LCD
36.72 AA
(21.36)
1.07
3.00

2.4" TFT
240(RGB)*320 Dots
Viewing Direction:
6:00

Recommended matching Connector:
FH28-36S-0.5SH(36PIN)

23.29±0.50

4.00±0.30

(26.88)
2.40
0.47
48.96 AA
56.96±0.15 LCD
59.26±0.20 OD

W=0.35±0.03
2-0.50±0.10
17.50±0.05
18.50±0.07
P0.5*35=17.50±0.05

38.88±0.5

NOTES:
1.DISPLAY TYPE: 2.4" TFT
2.DISPLAY MODE: Transmissive
3.VIEW DIRECTION: 6 o'clock
4.OPERATION TEMPERATURE: -20°C~+70°C
  STORAGE TEMPERATURE: -30°C~+80°C
5.DRIVER IC: ILI9341V
6.GENERAL TOLERANCE: ±0.2
7.REQUIREMENT ON ENVIRONMENT PROTECTION: ROHS

CUSTOMER P/N:

Customer Approval

Drawn:
Checked:
Approved:
Critical Dim.
Reference Dim.

Title	TFT LCM OUTLINE	Unit	mm
Part No.	ASI-T-240DA7MUN/D	Scale	1:1
Revison	V1.1	Page	1/1
Date	2022-11-15	3rd Angle	

5. Interface signals

No	Symbol	I/O	Description	Remarks
1	VCI	P	Power supply for logic circuit	
2	GND	P	Ground	
3	VCC	P	Power supply for analog	
4	RESX	I	This signal will reset the device and must be applied to properly initialize the chip. Signal is active low.	
5	CSX	I	Chip select input pin. ("low" enable)	
6	D/CX	I	This pin is used to select data or command	
7	WRX	I	Serves as a write signal and writes data at the rising edge.	
8	RDX	I	Serves as a read signal and reads data at the rising edge.	
9~24	DB0~DB15	I/O	Data bus pin	
25	GND	P	Ground	
26	TE	O	Tearing effect output pin to synchronize MPU to frame writing	
27	LEDA	P	LED backlight anode	
28	NA	-	No connection	
29~30	GND	P	Ground	
31	LED1-K	P	LED backlight cathode	
32	LED2-K	P	LED backlight cathode	
33	LED3-K	P	LED backlight cathode	
34	LED4-K	P	LED backlight cathode	
35	LED5-K	P	LED backlight cathode	
36	LED6-K	P	LED backlight cathode	

P ---- Power; I ---- Input; O ---- Output.

Note: Recommended matching connector: FH28-36S-0.5SH (36pin).

6. Absolute maximum Ratings

6.1. Electrical Absolute max. ratings

Parameter	Symbol	MIN	MAX	Unit	Remark
Power supply voltage	VCC	-0.3	4.6	V	
	IOVCC	-0.3	4.6	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.
2. VCC >VSS must be maintained.

6.2. Environment Conditions

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

7. Electrical Specifications

7.1 Electrical characteristics

GND=0V, Ta=25℃

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Power supply voltage	VCC	2.5	2.8	3.3	V	
	IOVCC	1.65	2.8	3.3	V	
Input Signal Voltage	VIL	VSSD	--	0.3*IOVCC	V	
	VIH	0.7*IOVCC	--	IOVCC	V	

7.2 LED Backlight

Ta=25℃

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	IF	--	120	--	mA	
Forward Voltage	VF	2.8	3.1	3.4	V	
LED life time		--	30,000	--	Hrs	

Note: "LED life time" is defined as the module brightness decrease to 50% original brightness at Ta=25℃ and IL=120mA. The "LED life time" could be decreased if operating IL is larger than 120mA.
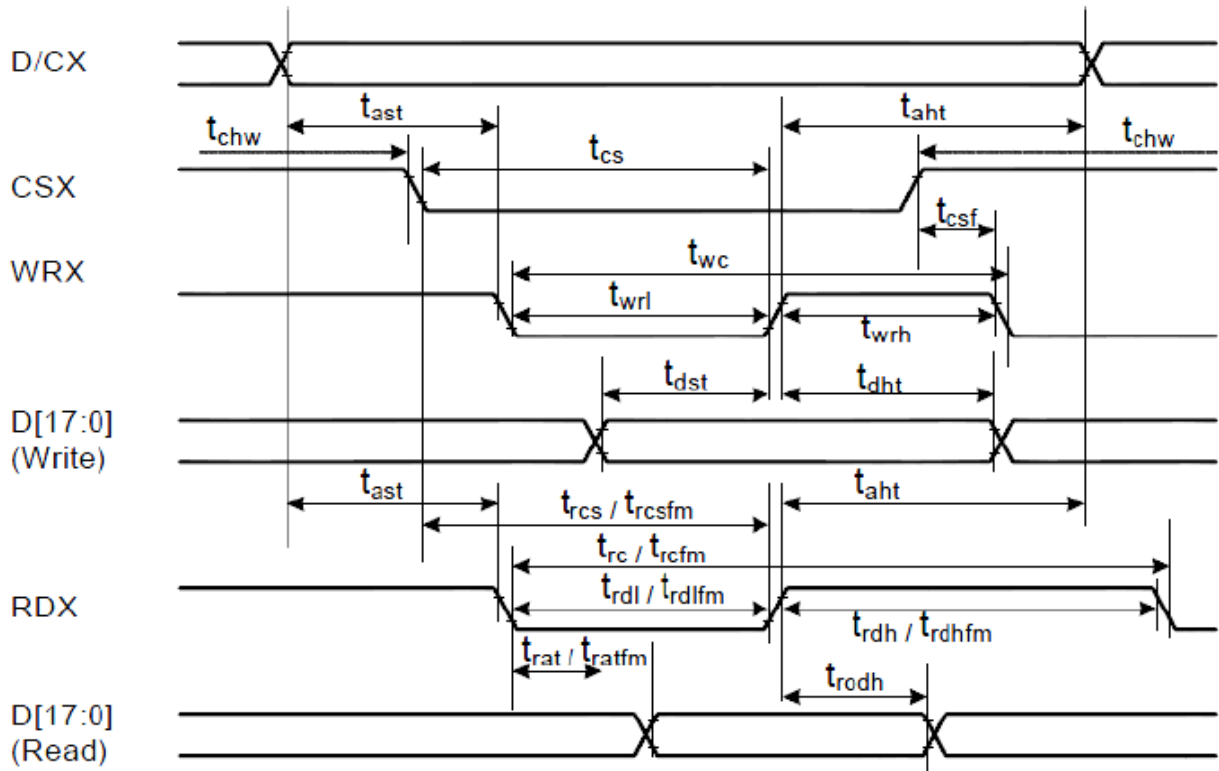
CIRCUIT DIAGRAM

LED_A(+) ○—— LED_K1(−)
—— LED_K2(−)
—— LED_K3(−)
—— LED_K4(−)
—— LED_K5(−)
—— LED_K6(−)
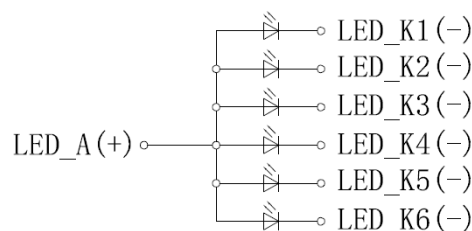
If= 120 mA; Vf=2.8~3.4 V

8 Command/AC Timing

### 8.1 8080 Series MCU parallel interface characteristics: 18/16/9/8-bit bus

Signal	Symbol	Parameter	Min	Max	Unit	Description
DCX	Tast	Address setup time	0	-	ns	
	Taht	Address hold time (write/read)	0	-	ns	
CSX	Tchw	CSX "H" pulse width	0	-	ns	
	Tcs	Chip select setup time (Write)	15	-	ns	
	Trcs	Chip select setup time (Read ID)	45	-	ns	
	Trcsfm	Chip select setup time (Read FM)	355	-	ns	
	Tcsf	Chip select wait time (Write/Read)	10	-	ns	
WRX	Twc	Write cycle	66	-	ns	
	Twrh	Write control pulse H duration	15	-	ns	
	Twrl	Write control pulse duration	15	-	ns	
RDX(FM)	Trcfm	Read cycle (FM)	450	-	ns	
	Trdhfm	Read control H duration(FM)	90	-	ns	
	Trdlfm	Read control L duration(FM)	355	-	ns	
RDX(ID)	Trc	Read cycle (ID)	160	-	ns	
	Trdh	Read control pulse H duration	90	-	ns	
	Trdl	Read control pulse L duration	45	-	ns	
D[17:0]	Tdst	Write data setup time	10	-	ns	For maximum

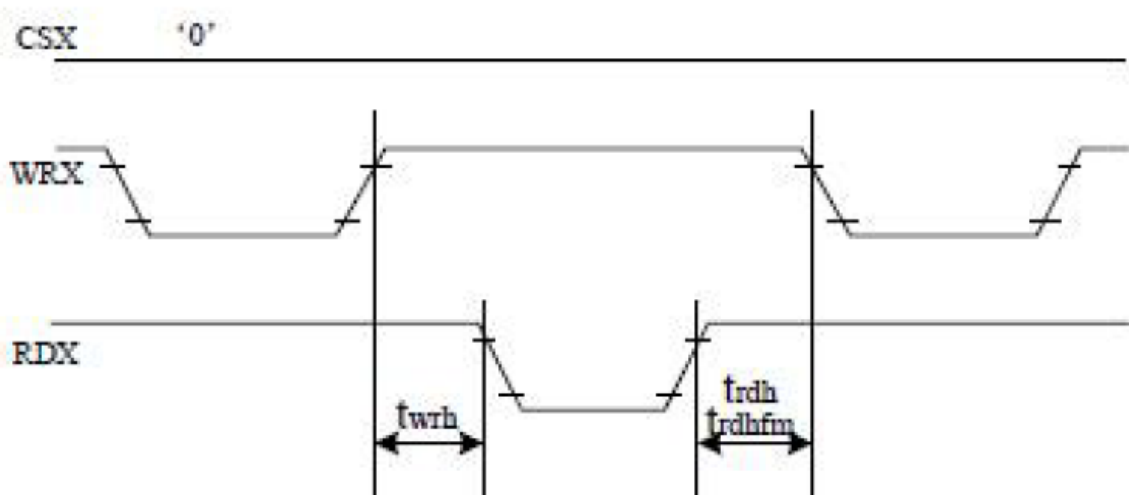| D[15:0] D[8:0] D[7:0]	Tdht	Write data hold time	10	-	ns	CL =30pF For minimum = 8 pF
	Trat	Read access time	-	40	ns	
	Tratfm	Read access time	-	340		
	trod	Read output disable time	20	80	ns	

CSX timings:
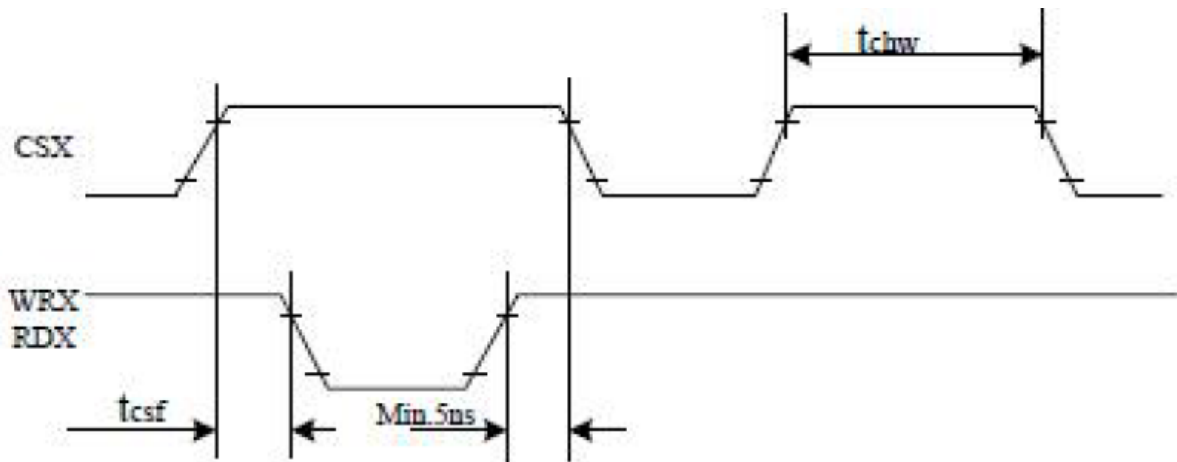
Note: Logic high and low levels are specified as 30% and 70% of IOVCC for input signals.

Write to read or read to write timings:

Note: Logic high and low levels are specified as 30% and 70% of IOVCC for input signals.

9 Optical Specification

Ta=25℃

Item		Symbol	Condition	Min	Typ.	Max.	Unit	Remark
Contrast Ratio		CR	θ=0°	-	250	-		Note1 Note3
Response Time		Tr + Tf	25℃	-	30	-	ms	Note1 Note4
View Angles		ΘT	CR≧10	-	65	-	Degree	Note 2
		ΘB		-	55	-		
		ΘL		-	65	-		
		ΘR		-	65	-		
Chromaticity	White	x	Backlight is on	Typ-0.05	0.3117	Typ+0.05		Note 1 Note 5
		y			0.3564			
	Red	x			0.5880			
		y			0.3509			
	Green	x			0.3385			
		y			0.5906			
	Blue	x			0.1418			
		y			0.0868			
Luminance		L		-	700	-	cd/m2	Note1 Note6
Uniformity		U		80	-	-	%	Note1 Note7

Note 1: Definition of optical measurement system.

Temperature = 25℃(±3℃)

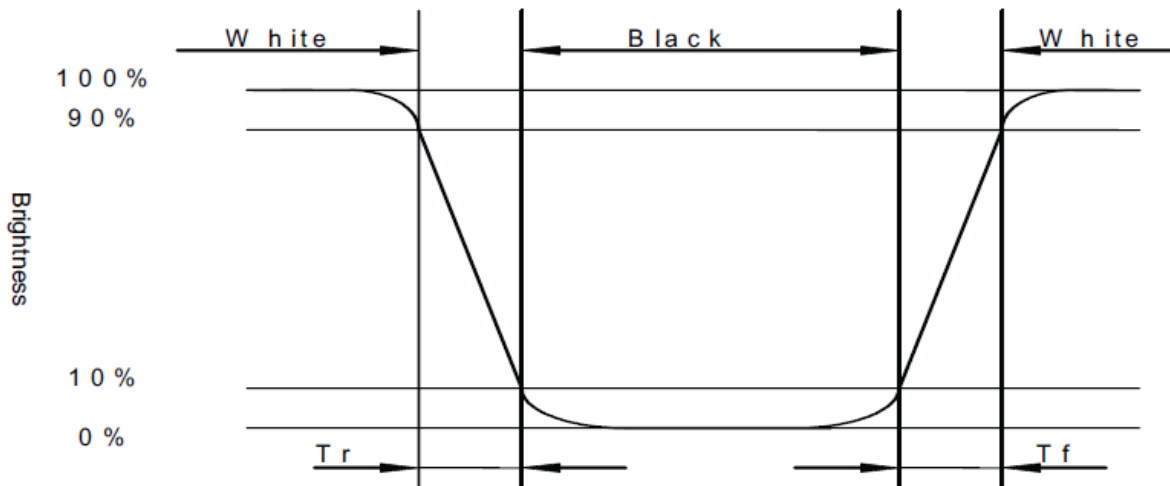LED back-light: ON, Environment brightness < 150 lx
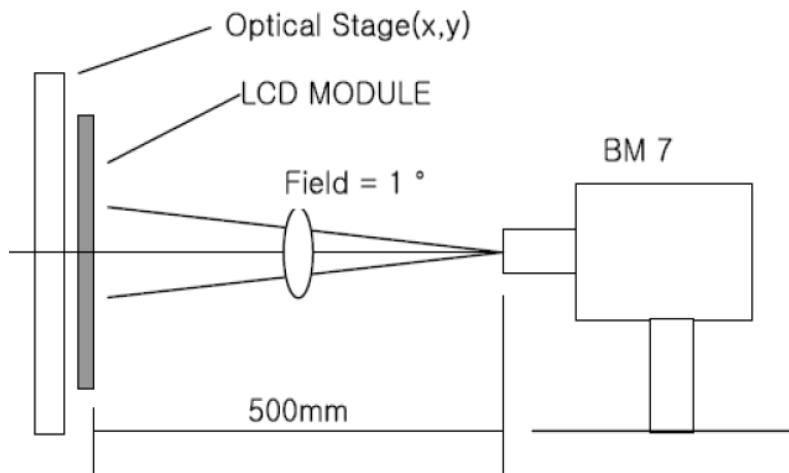
Note 2: Contrast ratio is defined as follow:

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$
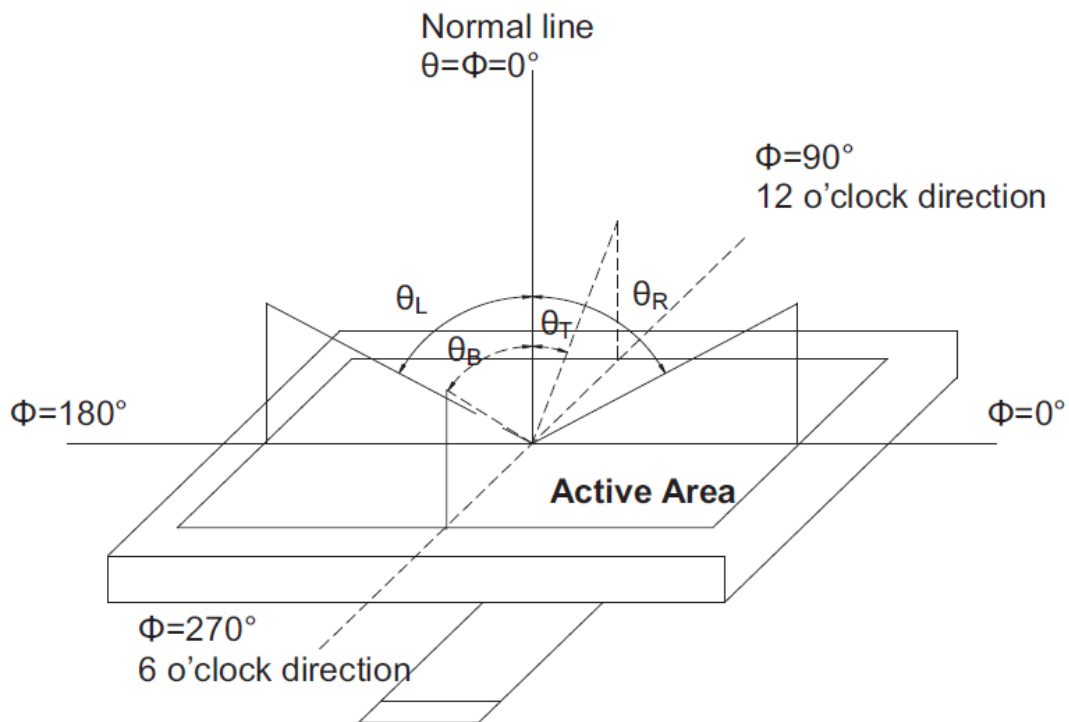
Note 3: Response time is defined as follow:

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).
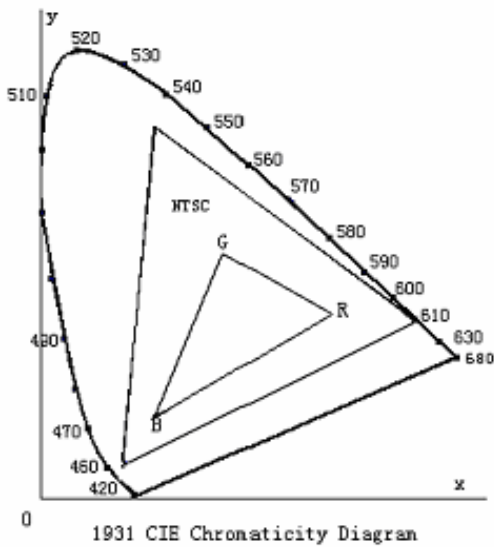

Note 4: Viewing angle range is defined as follow:

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.

1931 CIE Chromaticity Diagram

$$S = \frac{area \ of \ RGB \ triangle}{area \ of \ NTSC \ triangle} \times 100\%$$

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.

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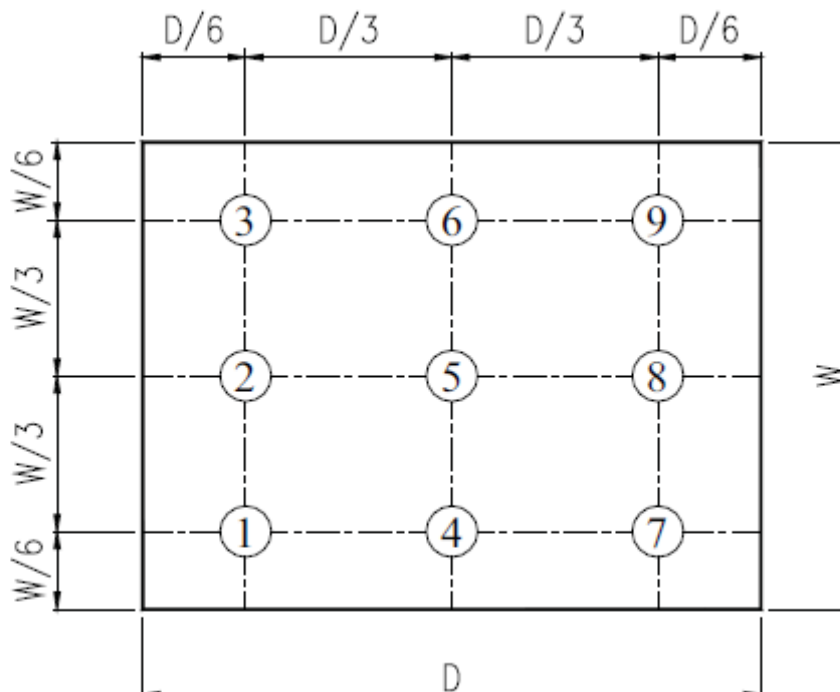

Fig. 2 Definition of uniformity

10 Environmental / Reliability Tests

No	Test Item	Condition	Judgment criteria
1	High Temp Operation	Ta= +70℃, 96hrs	Per table in below
2	Low Temp Operation	Ta= -20℃, 96hrs	Per table in below
3	High Temp Storage	Ts= +80℃, 96hrs	Per table in below
4	Low Temp Storage	Ts= -30℃, 96hrs	Per table in below
5	High Temp & High Humidity Storage	Ts= +60℃, 90% RH, 96hours	Per table in below (polarizer discoloration is excluded)
6	Thermal Shock (Non-operation)	-30℃ 30 min~+80℃ 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℃±10℃ 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

A. Bezel edge must be positioned in the area between the Active area and View area. The bezel may press th 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.

B. In order to make the display assembly stable and firm, ASI recommends to design some supporting at the display backside, especially for the display with tape-attached touch panel, such supporting is important and essential, or else, the display may drop-off from front after some period of time.

C. Do not display the fixed pattern for a long time because it may develop image sticking due to the LCD structure. If the screen is displayed with fixed pattern, use a screen saver.