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LCD Module Specification

Model No.: TM102WV1-A01

Customer: Approval

DDL Approved



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GENERAL DESCRIPTION

OVERVIEW

This product is a 10.2" TFT Liquid Crystal Display Module with 1 edge CCFL Backlight unit and 6bit RGB pins TTL interface. This module supports 852 x 480 WVGA mode and can display 262K colors. The inverter module for Backlight is not built in.

FEATURES

- WVGA (852 x 480 pixels) resolution
- 1 edge CCFL (Cold Cathode Fluorescent Lamp)
- Standard Mode
- TTL Interface

APPLICATION

- PDVD (Portable Digital Video Disc)

GENERAL SPECIFICATIONS

Item	Spec.	Unit
Screen Size	10.2 Diagonal	inch
Bezel Opening Area	228.3 (H) x 130.1 (V)	mm
Effective Display Area	224.9 (H) x 126.7 (V)	mm
Driver Element	a-si TFT active matrix	-
Pixel Number	852xR.G.B.x480	pixel
Pixel size	88(H) x 264(W)	mm
Pixel Arrangement	RGB vertical stripe	-
Display Colors	6 bits, 262K	color
Transmissive Mode	Normally White	-
Surface Treatment	Haze 12,Hardness 3H, Anti-glare	-

MECHANICAL SPECIFICATIONS

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal (H)	(242.5)	243	(243.5)	mm	
	Module Size Vertical (V)	(149.5)	150	(150.5)	mm	
	Depth (D)	-	(7.0)	7.4	mm	
Weight		-	-	(360)	g	

1. ABSOLUTE MAXIMUM RATINGS

1.1 ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Values		Unit	Note
		Min.	Max.		
Storage temperature	Tst	-20	+60	°C	(1)
Operating temperature (Ambient Temperature)	Top	0	+50	°C	(1),(4)
Shock(non-operating)	Snop	-	220	G	(2),(5)
Vibration (non-operating)	Vnop	-	1.5	G	(3),(5)

Note (1) Temperature and relative humidity range is shown in the figure below.

90% RH Max. ($T_a \leq 40^{\circ}\text{C}$).

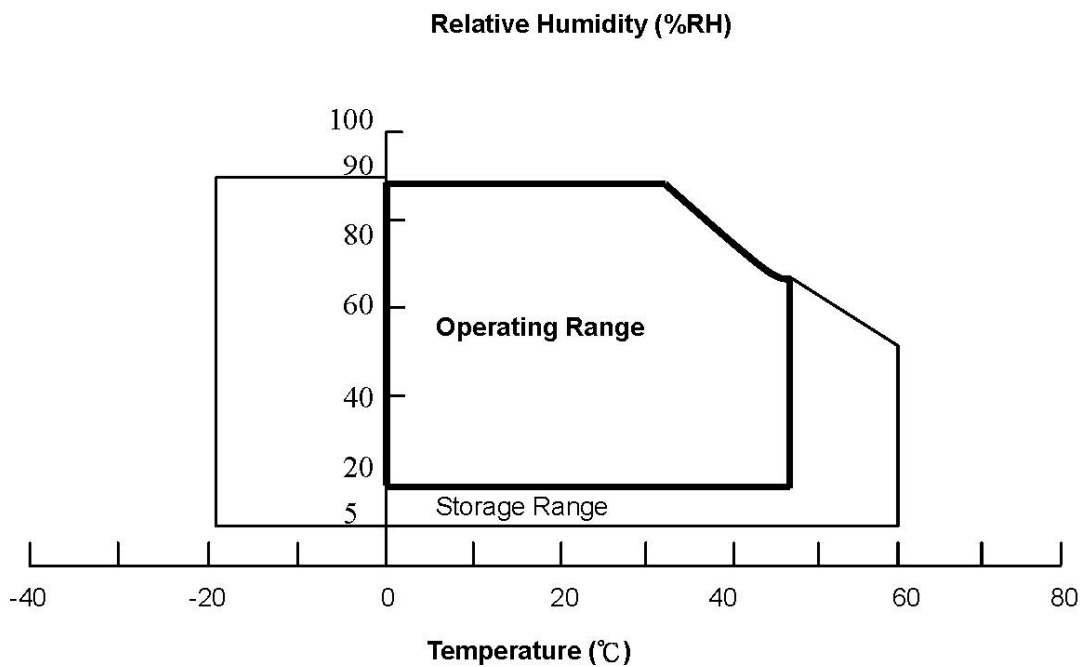
Maximum wet-bulb temperature at 39°C or less. ($T_a > 40^{\circ}\text{C}$) No condensation.

Note (2) 220G, 2ms, half-sine wave, 1 time for $\pm X$, $\pm Y$, $\pm Z$.

Note (3) 10-200 Hz, 1.5G, 30min/cycle, 1 cycle, for X, Y, Z direction,

Note (4) The temperature of panel surface should be 0°C Min. & 50°C Max.

Note (5) At testing Vibration and Shock, the fixture in holding the Module to be tested has to be hard and rigid enough so that the Module would not be twisted or bent by the fixture.



1.2 ELECTRICAL ABSOLUTE RATINGS

(1) TFT LCD MODULE

Item	Symbol	Values		Unit	Note
		Min.	Max.		
Power voltage	V_{DD}	-0.3	4.0	V	$T_a = 25 \pm 2^\circ\text{C}$
	V_{DDA}	-0.3	5.5	V	
	V_{GH}	-0.3	32.0	V	
	V_{GL}	-22.0	7.0	V	
	$V_{GH} - V_{GL}$	-0.3	45.0	V	
Input signal voltage	V_i	-0.3	$V_{DD} + 0.3$	V	Note 1
	V_i	-0.3	$V_{DD} + 0.3$	V	Note 2
	VCOM	0.0	7.0	V_{P-P}	V_{CAC}
		-0.3	2.5	V	V_{CDC}

Note 1: V_{rn} ($n=0 \sim 4$).

Note 2: $D0n$, $D1n$, $D2n$ ($n=0 \sim 5$), $STH1$, $STH2$, L/R , $STV1$, $STV2$, R/L , CPV , OE , INV , CLK , STB , AP , POL , GAM , BA .

(2) BACKLIGHT UNIT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Lamp Current	I_L	-	(7.5)	mA_{RMS}	(1),(2)
Lamp Frequency	F_L	-	(80)	Hz	(1)

Note (1) Permanent damage to device may occur if maximum values are exceeded. Function operation should be restricted to the conditions described under Normal Operating Conditions.

Note (2) Specified values are for lamp (Refer to 2.2 for further information).

2. ELECTRICAL SPECIFICATIONS

2.1 TFT LCD MODULE

MODULE						
Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Power Supply	V_{DD}	2.5	3.3	3.6	V	
	V_{DDA}	4.5	5.0	5.5	V	
	V_{GH}	-	15.0	-	V	
	V_{GL}	-	-15.0	-	V	
VCOM	V_{CAC}	-	5.0	-	V_{P-P}	
	V_{CDC}	-	1.32	-	V	
Reference Voltage	$V_{r0} - V_{r4}$	$V_{SSA} + 0.1$	-	$V_{DDA} - 0.1$	V	$V_{DDA} \geq V_{r0} \geq V_{r1} \geq V_{r2} \geq V_{r3} \geq V_{r4} \geq V_{SSA}$
Input Signal Voltage	H Level	V_{1H}	$0.8V_{DD}$	V_{DD}	V	Note1
	L Level	V_{1L}	0	$0.2V_{DD}$	V	

Note1: D0n, D1n, D2n(n=0 ~5), STH1, STH2, L/R, STV1, STV2, R/L, CPV, OE, INV, CLK, STB, AP, POL, GAM, BA.

2.2. Current consumption (VSSD=VSSA=0V)

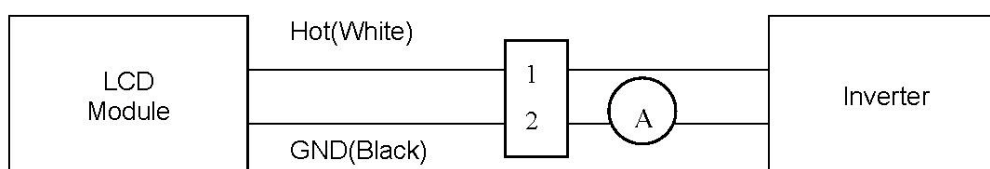
MODULE						
Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Current of Drivers	I_{GH}	-	0.3	-	mA	$V_{GH}=15V$
	I_{GL}	-	0.9	-	mA	$V_{GL}=-15V$
	I_{DD}	-	6.4	-	mA	$V_{DD}=3.3V$
	I_{DDA}	-	20	-	mA	$V_{DDA}=5.0V$
Current of Vcom	I_{VCOM}	-	30	-	mA	$V_{CAC}=5.0Vp-p$

2.3 BACKLIGHT UNIT

BACKLIGHT(one CCFL)						
Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Lamp Input Voltage	V_L	(472)	(525)	(578)	V_{RMS}	I_L
Lamp Current	I_L	(2.0)	(7.0)	(7.5)	mA_{RMS}	(1)
Lamp Turn On Voltage	V_S	-	-	(830)(25°C)	V_{RMS}	(2)
Operating Frequency	F	-	-	(1300)(0°C)	V_{RMS}	(2)
		(40)	(55)	(80)	HKz	(3)
Lamp Life Time	L_{BL}	10,000	(20,000)	-	Hrs	(5)
Power Consumption	P_L	-	(7.3)	-	W	(4), $I_L=7.0mA$

Note (1) Lamp current is measured by utilizing a current meter for high frequency as shown below:

Hot(White)



(Equipment Model:Y2016)

Note (2) The voltage shown above should be applied to the lamp for more than 1 second after startup. Otherwise the lamp may not be turned on.

Note (3) The lamp frequency may produce interference with horizontal synchronous frequency from the display, and this may cause line flow on the display. In order to avoid interference the lamp frequency should be detached from the horizontal synchronous frequency and its harmonics as far as possible.

Note (4) $P_L = I_L \times V_L$.

Note (5) The lifetime (Hr) of a lamp can be defined as the time in which it continues to operate under the condition $T_a = 25 \pm 2^\circ C$ and $I_L = 7.0 mA_{RMS}$ until one of the following event occurs:

- (a) When the brightness becomes 50% or lower than its original,
- (b) When the effective ignition length becomes 80% or lowers than its original value. (Effective ignition length is defined as an area that has less than 70% brightness compared to the brightness in the center point.)

Note (6) The waveform of the voltage output of inverter must be area-symmetric and the design of the Inverter must have specifications for the modularized lamp. The performance of the backlight, such as lifetime or rightness, is greatly influenced by the characteristics of the DC-AC inverter for the lamp. All the parameters of an inverter should be designed with care so as not to produce too much current leakage from high-voltage output of the inverter. When designing or ordering the inverter please make sure that a poor lighting caused by the mismatch of the backlight and the inverter (miss-lighting, flicker, etc.) never occurs. When the above situation is confirmed, the module should be operated in the same manners as it is installed in your instrument.

The connector information of Black light unit.

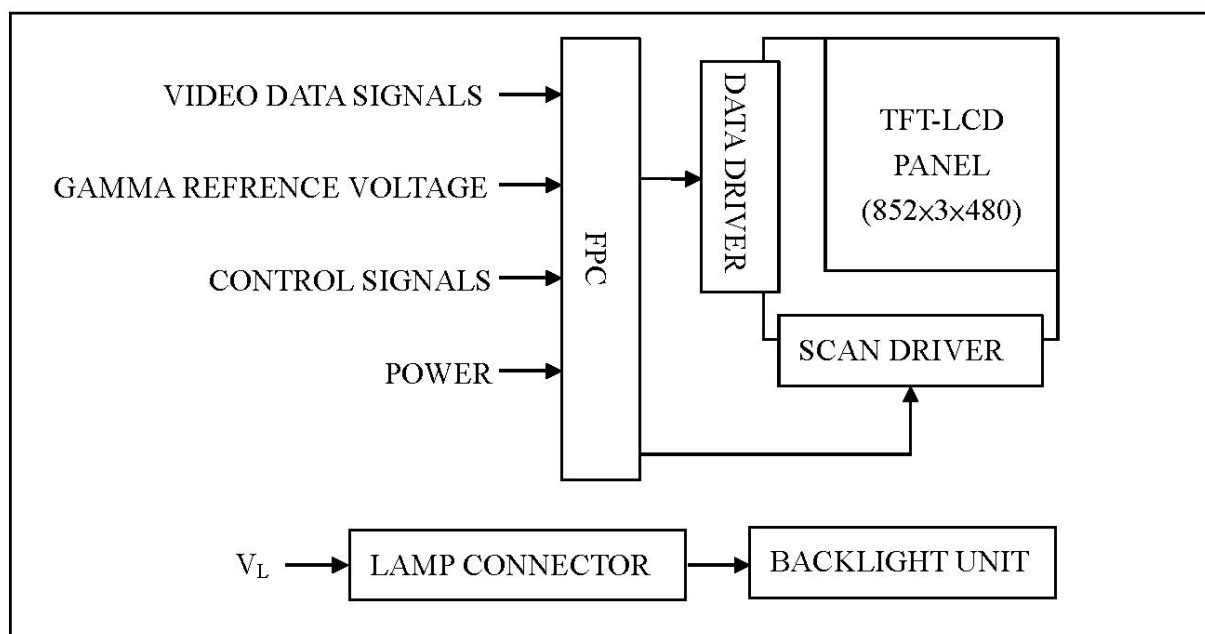
Pin	Symbol	Description	Remark
1	HV	High Voltage	White
2	LV	Ground	Black

Note (1) Connector Part No.: BHSR-02VS-1 (JST)

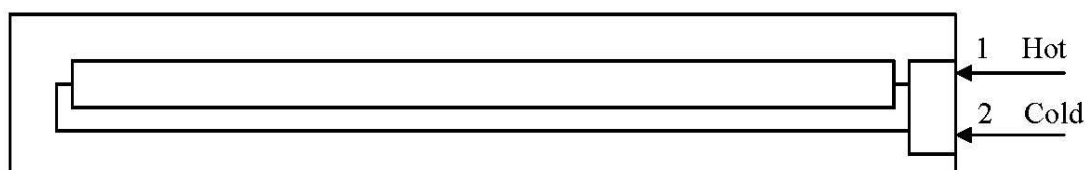
Note (2) User's connector Part No.: SM02B-BHSS-1-TB (JST)

3. BLOCK DIAGRAM

3.1 TFT LCD MODULE



3.2 BACKLIGHT UNIT



4. INTERFACE SPECIFICATIONS

4.1 THE PIN ASSIGNMENT OF TTL INTERFACE CONNECTOR

Pin	Symbol	Description	Pin	Symbol	Description
1	STV2 ⁽²⁾	Vertical start pulse 2	1	CLK	Horizontal shift clock input
2	VGH	Gate on voltage	2	INV	Data inversion signal
3	VDDD	Digital power supply(+3.3V)	3	D25	Blue data(MSB)
4	VSSD	Digital power ground	4	D24	Blue data
5	VGL	Gate off voltage	5	D23	Blue data
6	STV1 ⁽²⁾	Vertical start pulse 1	6	D22	Blue data
7	CPV	Vertical shift clock input	7	D21	Blue data
8	L/R	STV selection	8	D20	Blue data(LSB)
9	OE	Output enable control	9	VSSD	Digital power ground
10	VCOM	Common electric voltage	10	D15	Green data(MSB)
11	VCOM	Common electric voltage	11	D14	Green data
12	NC	Non-connection	12	D13	Green data
13	NC	Non-connection	13	D12	Green data
14	NC	Non-connection	14	D11	Green data
15	NC	Non-connection	15	D10	Green data(LSB)
16	NC	Non-connection	16	VSSD	Digital power ground
17	Vr4	Gamma voltage 4	17	D05	Red data(MSB)
18	Vr3	Gamma voltage 3	18	D04	Red data
19	Vr2	Gamma voltage 2	19	D03	Red data
20	Vr1	Gamma voltage 1	20	D02	Red data
21	Vr0	Gamma voltage 0	21	D01	Red data
22	GAM	Reference gamma voltage control	22	D00	Red data(LSB)
23	STH2 ⁽¹⁾	Horizontal start pulse 2	23	VDDD	Digital power supply
24	VDDA	Analog power supply	24	VSSD	Digital power ground
25	VDDD	Digital power supply	25	VSSA	Analog power ground
26	VSSD	Digital power ground	26	VDDA	Analog power supply
27	VSSA	Analog power ground	27	STH1 ⁽¹⁾	Horizontal start pulse 1
28	R/L	STH selection	28	BA	Bias current control
29	AP	OP bias current on/off control	29	POL	Polarity inversion signal
30	VSSD	Digital power ground	30	STB	Latch input



Note 1. Selection for horizontal scanning direction

R/L	STH1	STH2	Scanning direction(pixel configuration)
High	Input	Output	Normal scanning(1,Y)→(852,Y)
Low	Output	Input	Reverse scanning(852,Y)→(1,Y)

Note 2. Selection for vertical scanning direction

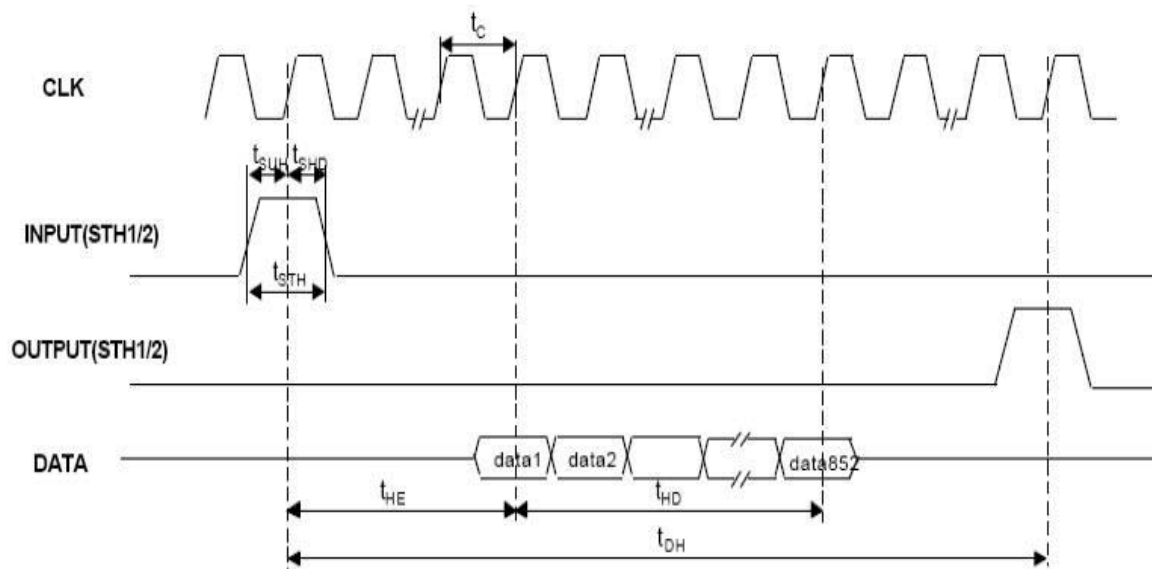
L/R	STV1	STV2	Scanning direction(Pixel configuration)
High	Input	Output	Reverse scanning(X,480) ↓ (X,1)
Low	Output	Input	Normal scanning(X,1) ↓ (X,480)

4.2 AC CHARACTERISTICS

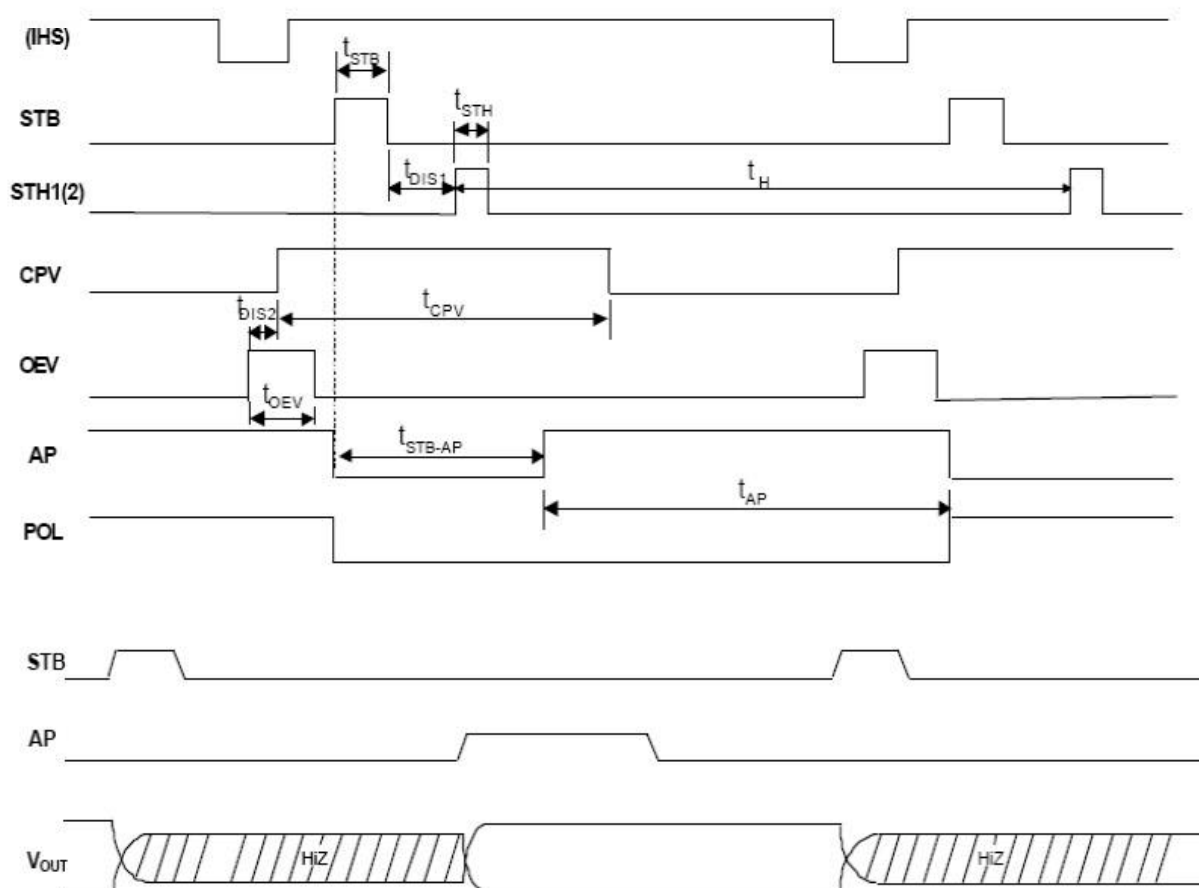
PARAMETER	Symbol	Min.	Typ.	Max.	Unit
CLK period	t_c	-	30.0	-	ns
STH period	t_H	-	31.7	-	us
		-	1056	-	t_c
Horizontal display period	t_{HD}	-	25.5	-	us
		-	852	-	tc
Horizontal display range	t_{DH}	-	960	-	tc
Horizontal display start position	t_{HE}	-	180	-	tc
Horizontal lines per frame	t_v	-	16.6	-	ms
		-	525	-	t_H
Vertical display period	t_{VD}	-	15.2	-	ms
		-	480	-	t_H
Clock pulse duty	t_{CWH}	40	50	60	%
STH setup time	t_{SUH}	-	$T_c/2$	-	t_c
STH hold time	t_{HD}	-	$T_c/2$	-	t_c
STH pulse width	t_{STH}	-	1	-	t_c
STB pulse width	t_{STB}	-	16	-	t_c
OEV pulse width	t_{OEV}	-	63	-	t_c
CPV pulse width	t_{CPU}	-	489	-	t_c
AP pulse width	t_{AP}	-	635	-	t_c
STB low to STH high time	t_{DIS1}	-	41	-	t_c
OEV high to CPV low time	t_{DIS2}	-	23	-	t_c
STB -AP time	t_{STB-AP}	-	352	-	t_c
STV setup time	t_{SUV}	-	28	-	t_c
STV pulse width	t_{STV}	-	1	-	t_H

4.3 TIMING DIAGRAM

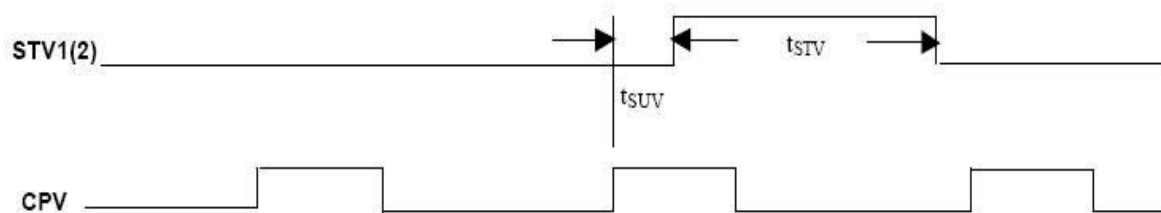
4.3.1 HORIZONTAL DISPLAY TIMING RANGE



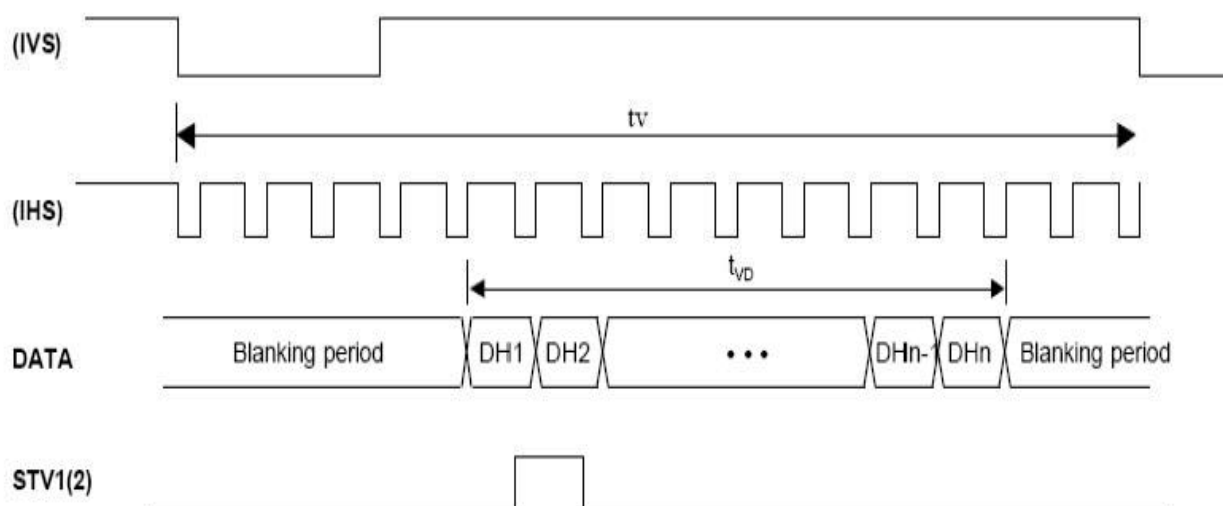
4.3.2 HORIZONTAL DISPLAY TIMING



4.3.3 VERTICAL SHIFT CLOCK TIMING



4.3.4 VERTICAL TIMING



4.4 COLOR DATA INPUT ASSIGNMENT

Color		Data Signal																	
		Red						Green						Blue					
		D0 5	D0 4	D0 3	D0 2	D0 1	D0 0	D1 5	D1 4	D1 3	D1 2	D1 1	D1 0	D2 5	D2 4	D2 3	D2 2	D2 1	D2 0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale Of Red	Red(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	⋮	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Red(61)	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(62)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale Of Green	Green(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	Green(2)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	Green(61)	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0
	Green(62)	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
Gray Scale Of Blue	Green(63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	Blue(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Blue(2)	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
	⋮	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1
	Blue(61)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
	Blue(62)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	Blue(63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1



5. OPTICAL CHARACTERISTICS

5.1 TEST CONDITIONS

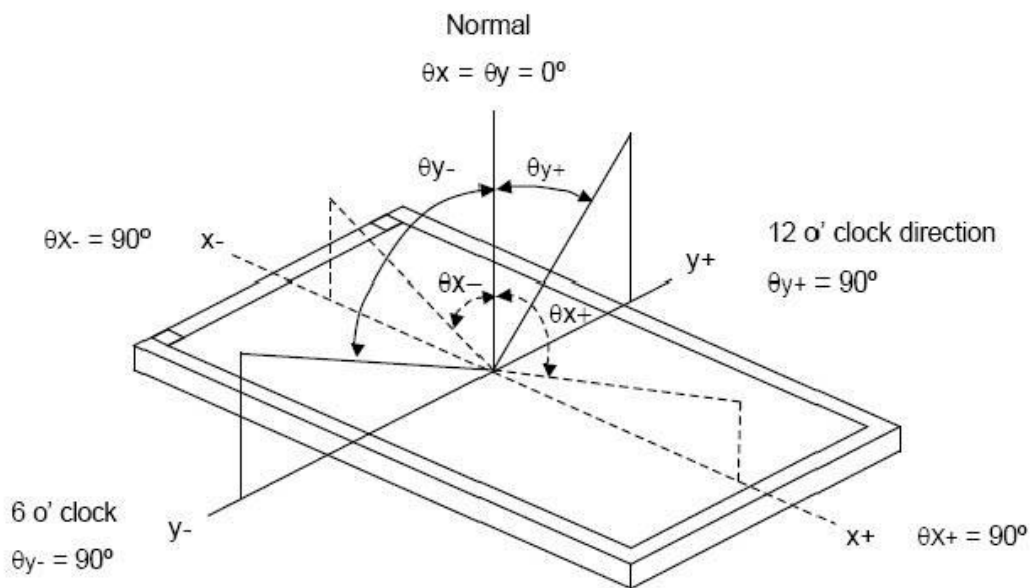
Item	Symbol	Value	Unit
Ambient Temperature	Ta	25±2	°C
Ambient Humidity	Ha	50±10	%RH
Supply Voltage	V _{CC}	3.3	V
Input Signal	According to typical value in "Electrical Characteristics"		
Inverter Current	I _L	(7.0)	mA
Inverter Driving Frequency	F _L	(63)	KHz
Inverter	-		

The measuring method is shown in 5.2. The following items are measured under stable conditions about 20 minutes after the module works. The optical characteristics should be measured under lamp current I_L = 7.0 mA and in a dark environment (≤ 2 lux) or equivalent state with the methods shown in Note (6).

5.2 OPTICAL SPECIFICATIONS

Item		Symbol	Conditions	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	$\theta_x=0^\circ, \theta_y=0^\circ$ Viewing Normal Angle	300	350	-	-	(2),(5)
Response Time		TR		-	15	-	Ms	(3)
		T _F		-	35	-	Ms	
Average Luminance of White		L _{AVE}		400	450	-	Cd/m ²	(4),(5)
White Variation		δW		-	1.1	1.2	-	(5),(6)
Color Chromaticity	Red	R _x		0.56	0.59	0.62	-	(1),(5)
		R _y		0.32	0.35	0.38	-	
	Green	G _x		0.28	0.31	0.34	-	
		G _y		0.55	0.58	0.61	-	
	Blue	B _x		0.12	0.15	0.18	-	
		B _y		0.09	0.12	0.15	-	
	White	W _x		0.28	0.31	0.34	-	
		W _y		0.30	0.33	0.36	-	
Viewing Angle	Horizontal	θ_{x+}	CR ≥ 10	50	(60)	-	Deg	
		θ_{x-}		50	(60)	-		
	Vertical	θ_{y+}		30	(40)	-		
		θ_{y-}		50	(60)	-		

Note (1) Definition of Viewing Angle(θ_x, θ_y)



Note (2) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L_{63} / L_0

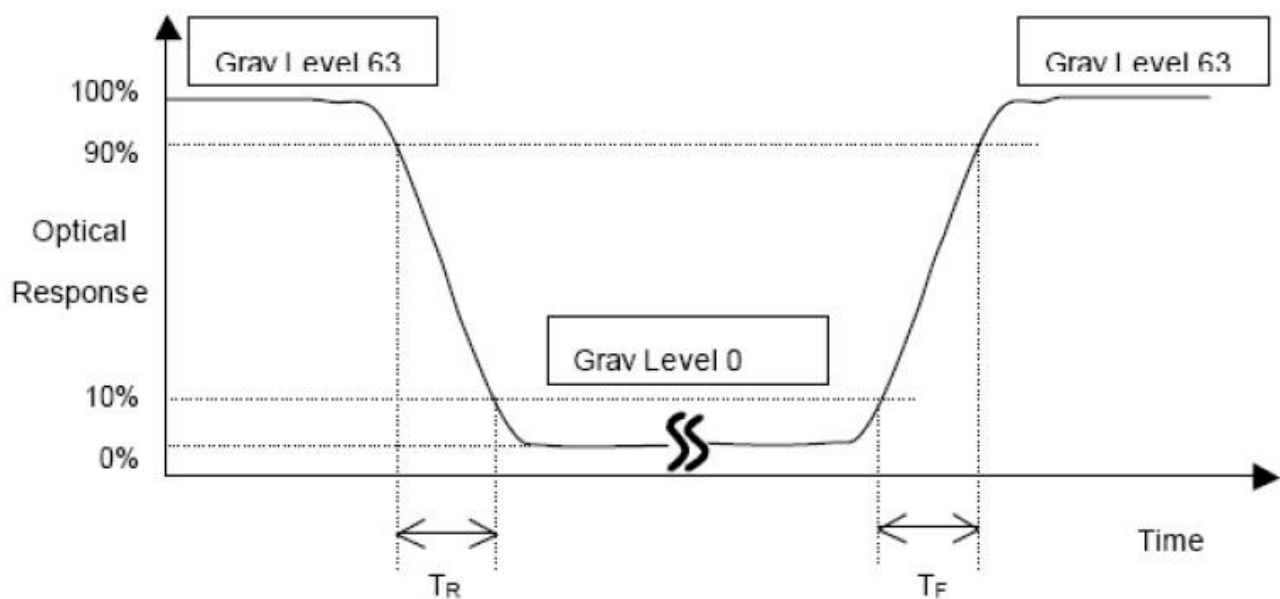
L_{63} : Luminance of gray level 63

L_0 : Luminance of gray level 0

CR = CR (10)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (6).

Note (3) Definition of Response Time (T_R, T_F):



Note (4) Definition of Average Luminance of White (L_{AVE})

Measure the luminance of gray level 63 at 5 points

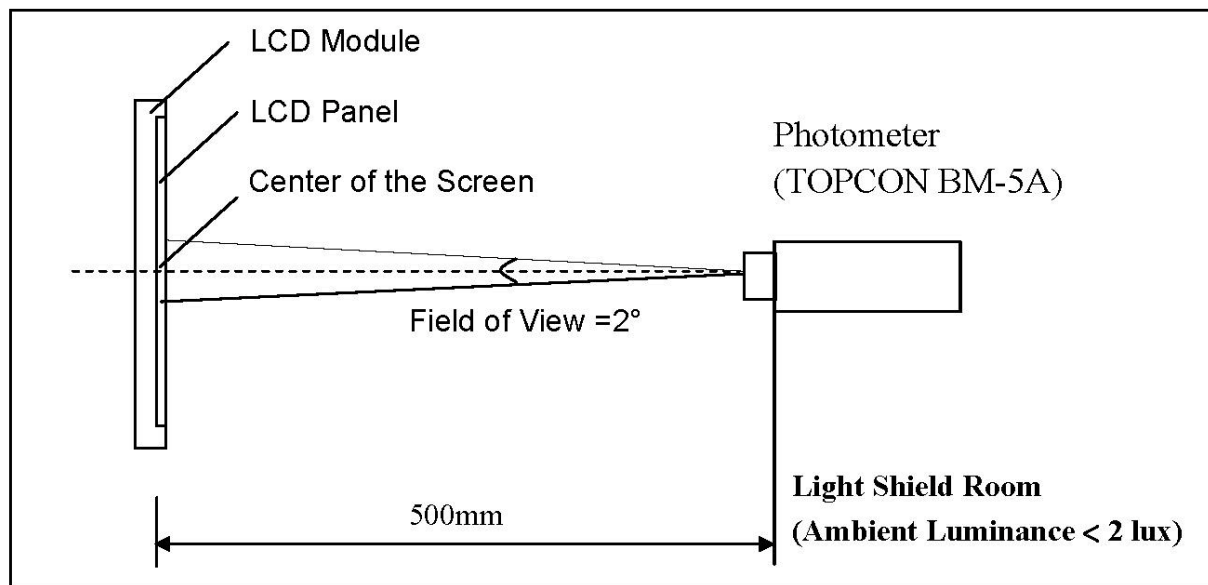
$$L_{AVE} = [L(1) + L(2) + L(3) + L(4) + L(5)] / 5$$

$L(x)$ is corresponding to the luminance of the point X at Figure in Note (6).

Note (5) Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt

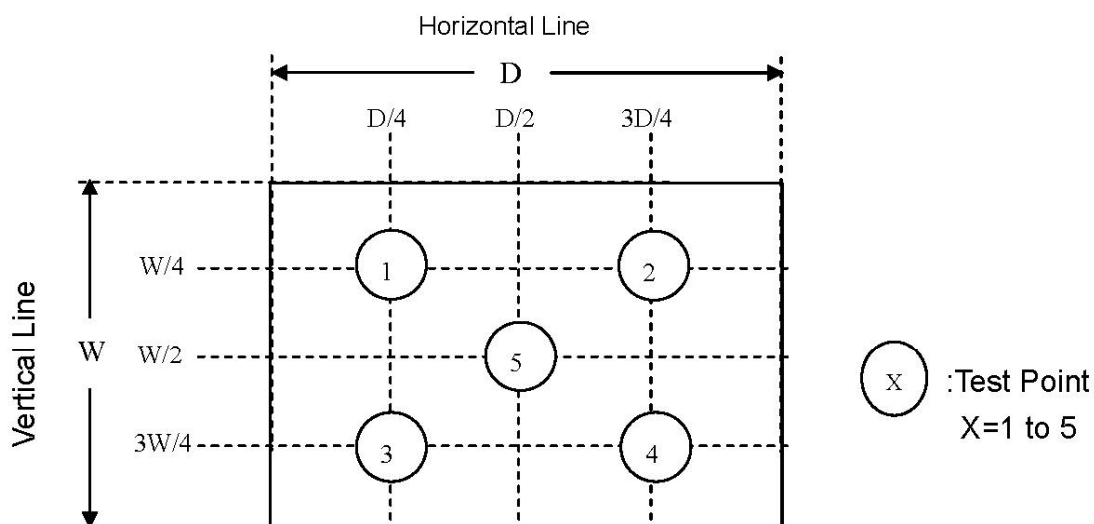
Temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



Note (6) Definition of White Variation (δW):

Measure the luminance of gray level 63 at 5 points

$$\delta W = \text{Maximum} [L(1), L(2), L(3), L(4), L(5)] / \text{Minimum} [L(1), L(2), L(3), L(4), L(5)]$$



6. MECHANICAL DRAWING

- NOTE: 1: 6 O'CLOCK DIRECTION IS THE OPTIMUM VIEWING ANGLE
 2: GENERAL TOLERANCE: 0.3mm
 3: ALLOWED DEPTH OF USERHOLE SCREW INSERTION IS 2.2mm MAX
 4: CCFL CONNECTOR FOR BACKLIGHT TO BE SPECIFIED IS JST BHSR-02VS-1

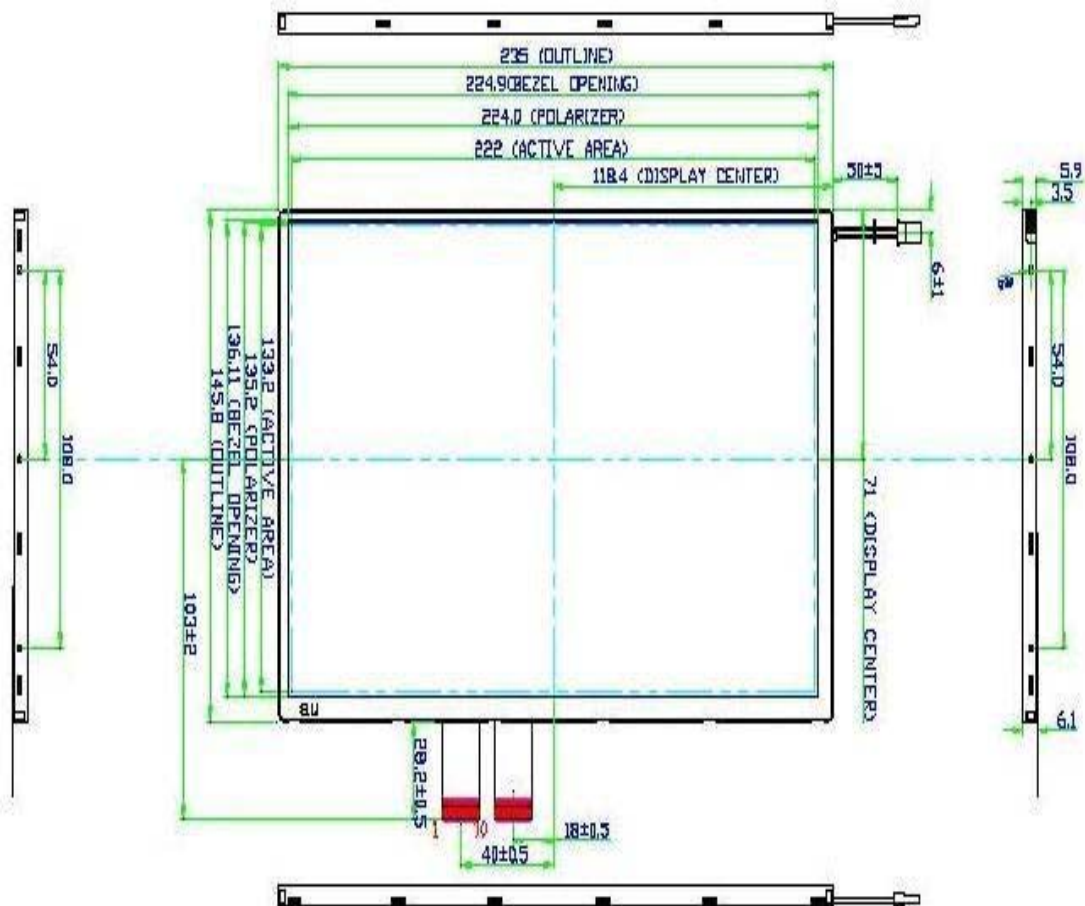


Fig.1 Outline dimension of TFT-LCD module (Front Side)

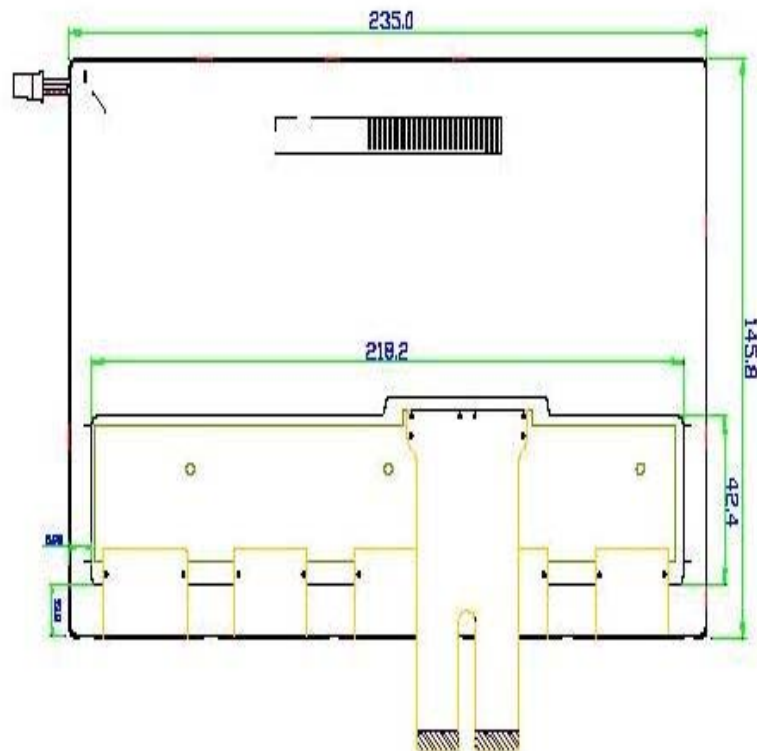


Fig.2 Outline dimension of TFT-LCD module (Rear Side)

7. PRECAUTION

7. 1 ASSEMBLY AND HANDLING PRECAUTION

- (1) Do not apply rough force such as bending or twisting to the module during assembly.
- (2) To assemble or install module into user system can be only in clean working areas. The dust and oil may cause electrical short or worsen the polarizer.
- (3) It not permitted to have pressure or impulse on the module because the LCD panel and Backlight will be damaged.
- (4) Always follow the correct power sequence when LCD module is connecting and operating. This can prevent damage to the CMOS LSI chips during latch-up.
- (5) Do not pull the I/F connector in or out while the module is operating.
- (6) Do not disassemble the module.
- (7) Use a soft dry cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched.
- (8) It is dangerous that moisture come into or contacted the LCD module, because moisture may damage LCD module when it is operating.

- (9) High temperature or humidity may reduce the performance of module. Please store LCD module within the specified storage conditions.
- (10) When ambient temperature is lower than 10°C may reduce the display quality. For example, the response time will become slowly, and the starting voltage of CCFL will be higher than room temperature.

7.2 SAFETY PRECAUTION

- (1) The start-up voltage of Backlight is approximately (1000) Volts. It may cause electrical shock while assembling with inverter. Do not disassemble the module or insert anything into the Backlight unit.
- (2) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.
- (3) After the module end of life, it is not harmful in case of normal operation and storage.

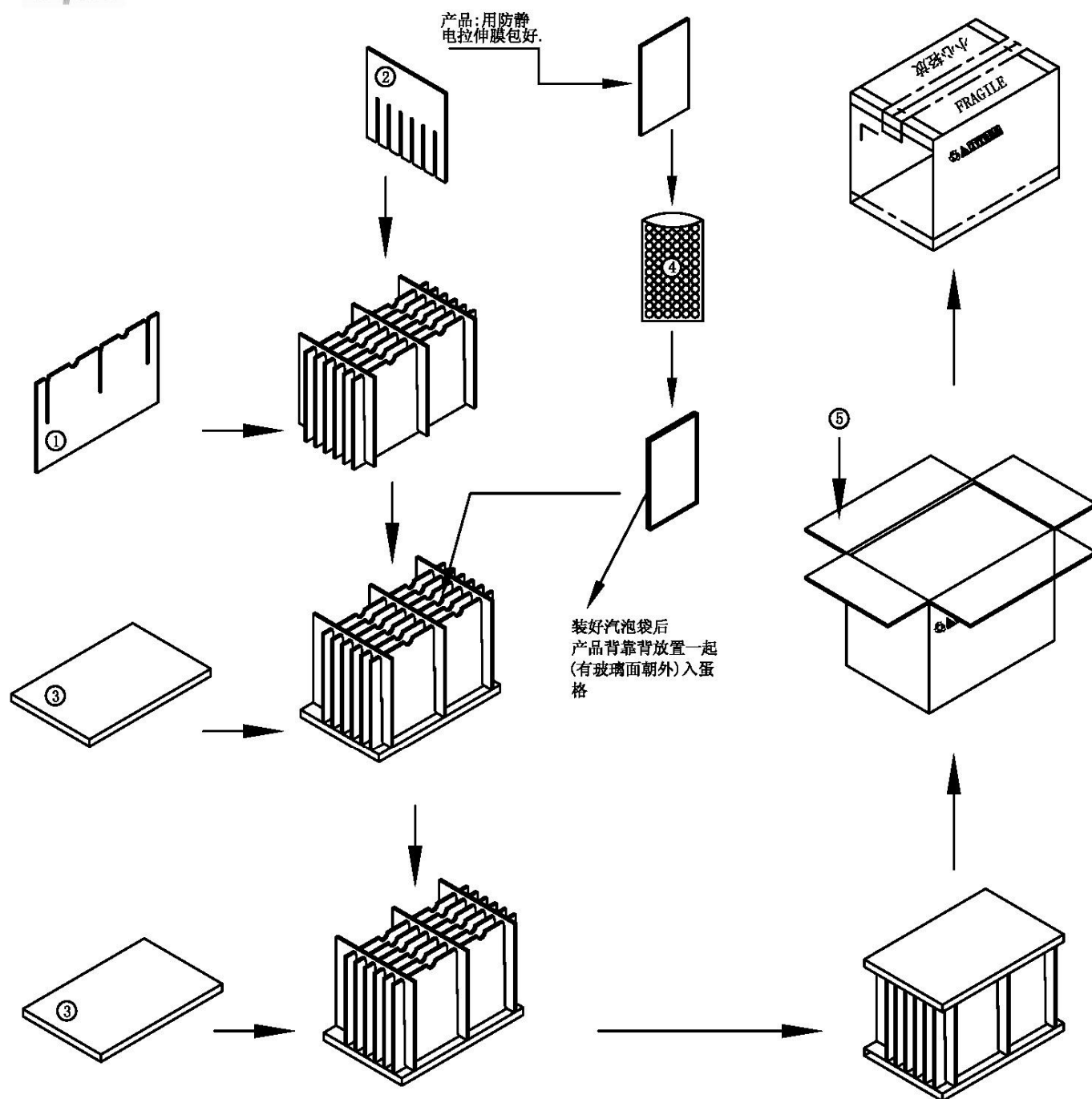
8. PRECAUTIONS

8.1 HANDLING PRECAUTIONS

- (1) The module should be assembled into the system firmly by using every mounting hole. Be careful not to twist or bend the module.
- (2) While assembling or installing modules, it can only be in the clean area. The dust and oil may cause electrical short or damage the polarizer.
- (3) Use fingerstalls or soft gloves in order to keep display clean during the incoming inspection and assembly process.
- (4) Do not press or scratch the surface harder than a HB pencil lead on the panel because the Polarizer is very soft and easily scratched.
- (5) If the surface of the polarizer is dirty, please clean it by some absorbent cotton or soft cloth. Do not use Ketone type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanently damage the polarizer due to chemical reaction.
- (6) Wipe off water droplets or oil immediately. Staining and discoloration may occur if they left on panel for a long time.
- (7) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contacting with hands, legs or clothes, it must be washed away thoroughly with soap.
- (8) Protect the module from static electricity, it may cause damage to the C-MOS Gate Array IC.
- (9) Do not disassemble the module.
- (10) Do not pull or fold the lamp wire.
- (11) Pins of I/F connector should not be touched directly with bare hands.

8.2 STORAGE PRECAUTIONS

- (1) High temperature or humidity may reduce the performance of module. Please store LCD module within the specified storage conditions.
- (2) It is dangerous that moisture come into or contacted the LCD module, because the moisture may damage LCD module when it is operating.
- (3) It may reduce the display quality if the ambient temperature is lower than 10 . For example, the response time will become slowly, and the starting voltage of lamp will be higher than the room temperature.



注:外卡通箱用量为1/20, 表示20PCS产品入一纸箱!

6		干燥剂	2/20	5克装干燥剂		
5		外包装箱	1/20	A=A	395*260*298	
4		气泡袋	20/20	红色防静电气泡袋	165(开口)*275	
3		珍珠棉	2/20		395*260*20	
2		蛋格二	3/20	A=B	240*246	
1		蛋格一	6/20	A=B	240*382	
序号	代号	名称	数量	材料	规格	备注
包装指导图					图号:	
签名		日期	规格/型号		版本	B00
设计	胡建华	2007.09.30	标准化	A102YW1LEF-1	标记	质量
工艺		材料		第 张		共 张
审核		批准				