



SPECIFICATION FOR LCD MODULE

MODULE NO: YB-TG800480S22A-N-A0

Doc.Version:00

Customer Approval:

<input type="checkbox"/> Accept	<input type="checkbox"/> Reject
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YEEBO	NAME	SIGNATURE	DATE
Prepare	Electronic Engineer		2013-12-31
Check	Mechanical Engineer		2013-12-31
Verify			2013.12.31
Approval			2013.12.31

APPROVAL FOR SPECIFICATIONS ONLY

APPROVAL FOR SPECIFICATIONS AND SAMPLE

WIMRD005-02-C



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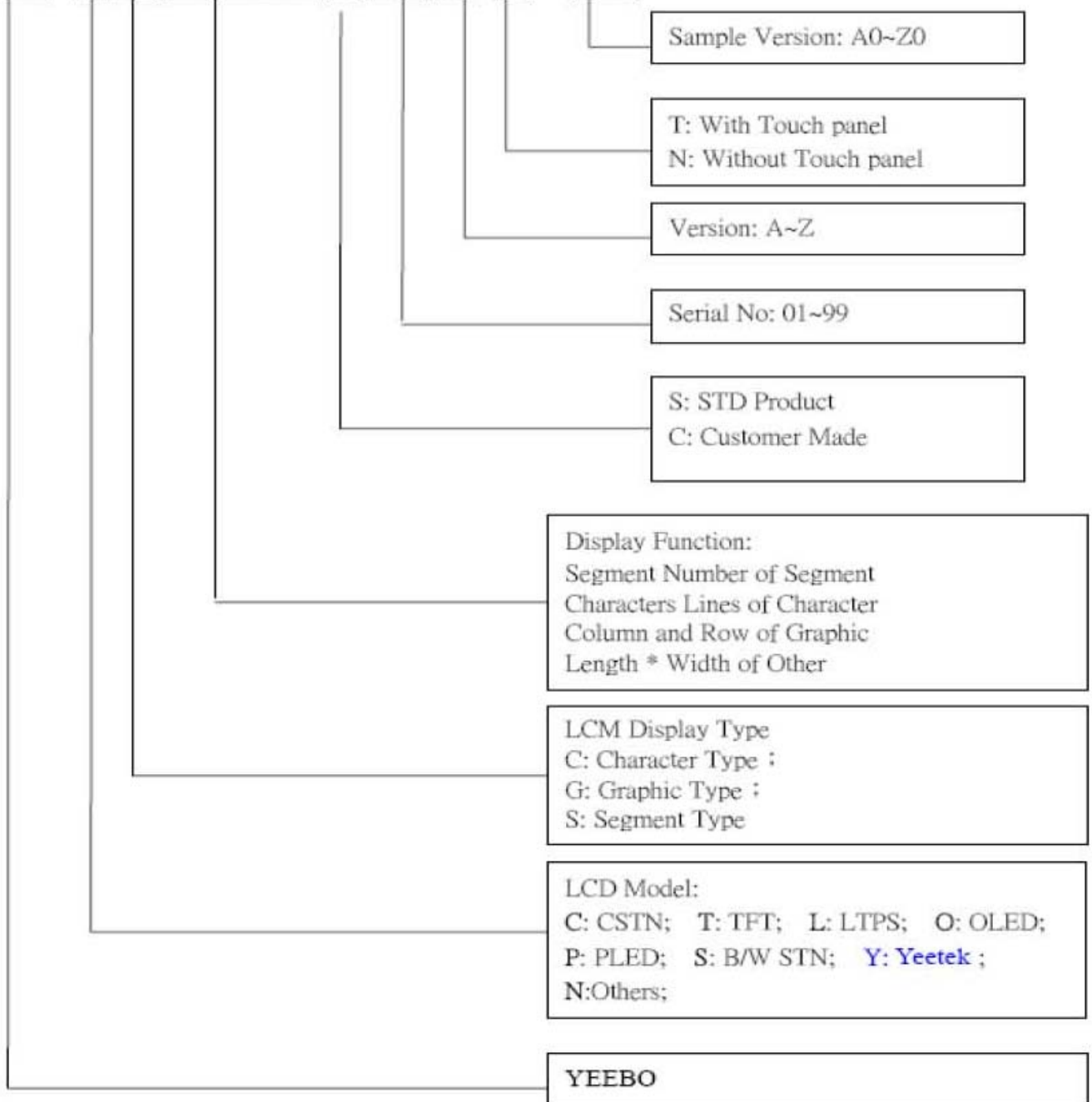
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3. Module Numbering System:

(Example)

YB - T G 240320 S 01 D - T - A0



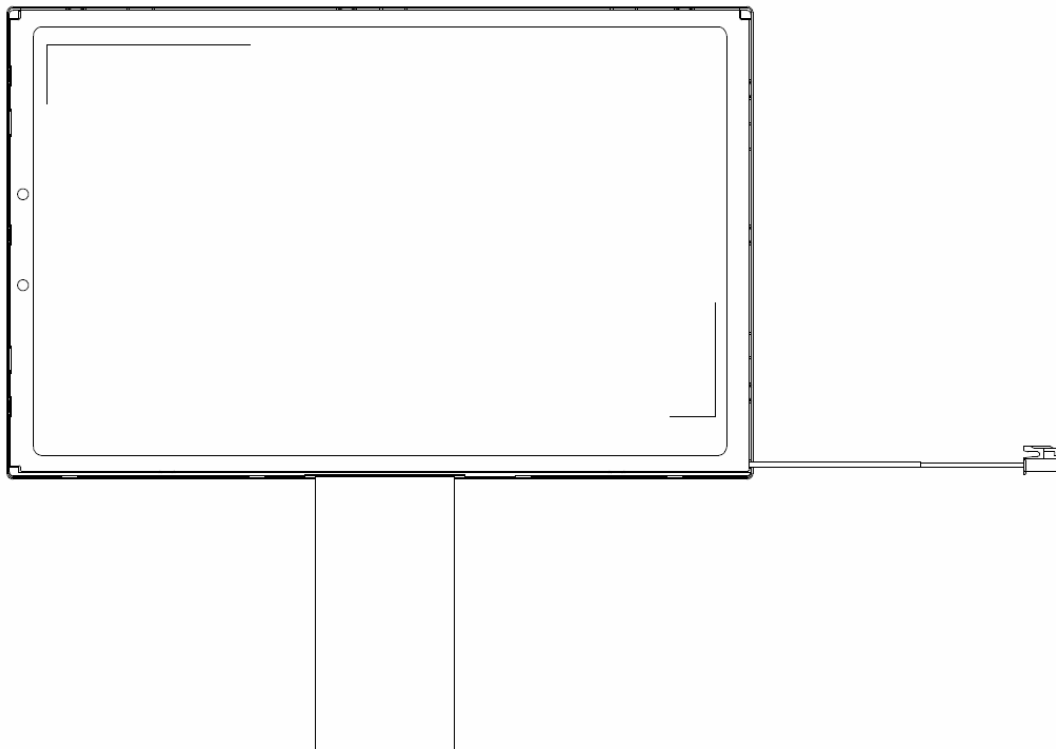
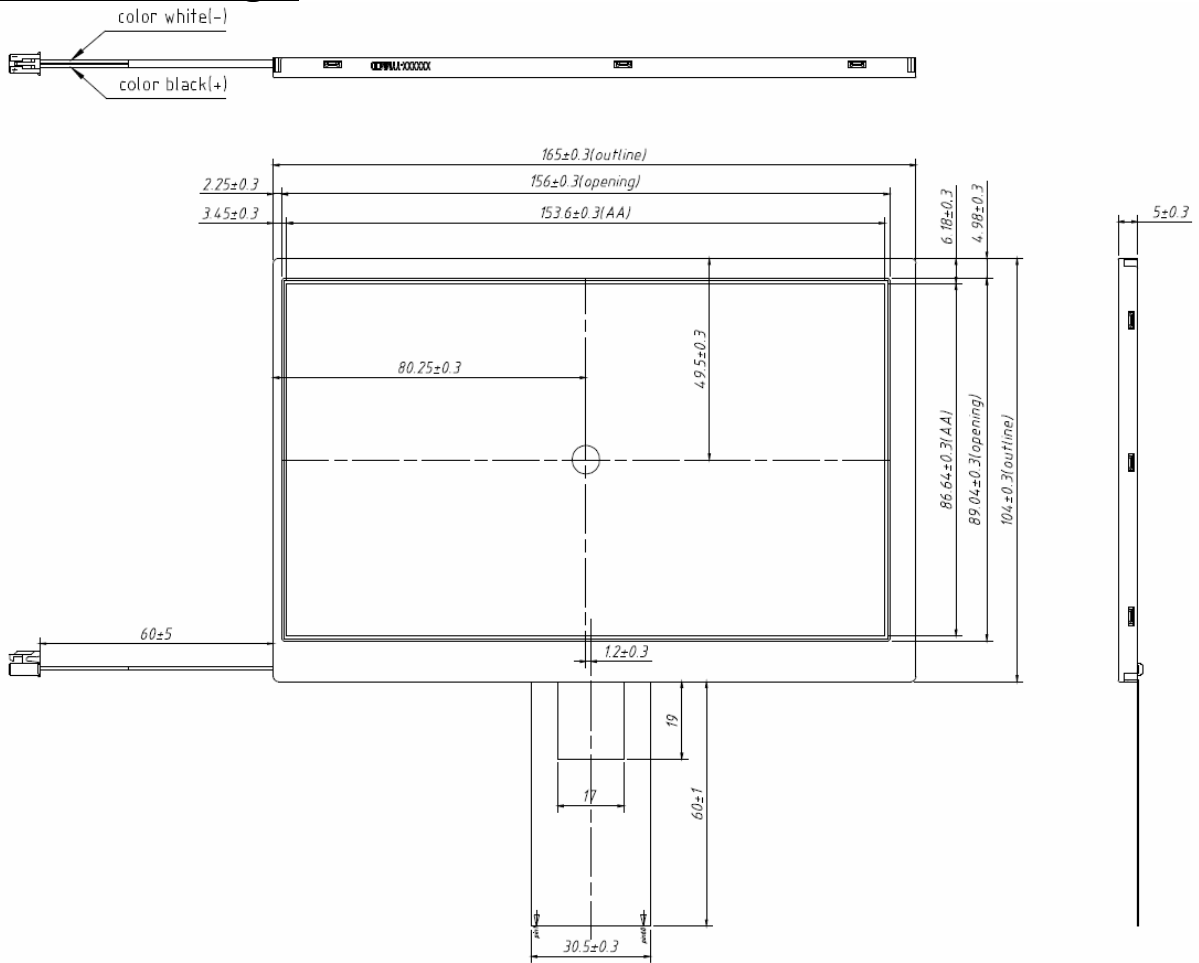


4. General Specification:

ITEM	CONTENTS
Module Size	165.0(W) * 104.0(H) * 5.0(T) mm
Module Size(With FPC)	165.0(W) * 164.0(H) * 5.0(T) mm
Display Size (Diagonal)	7.0 inch
Display Format	800(RGB)* 480 Pixels
Active Area	153.6 (W) * 86.64 (H) mm
Dots Pitch	0.192 * 0.1805 mm
LCD Type	TFT (16.7M)/ Transmissive / Normal White/Anti-Glare
TFT Interface	24bit_RGB
Viewing Direction	6 O'clock
Weight	125.6g



5. LCM drawing:





6. Electrical Characteristics

6-1 Absolute Maximum Ratings

(Ta=25°C GND=0V)

Item	Symbol	Min.	Type	Max.	Unit	Remark
Power Supply voltage	VCC	-0.3	-	5.0	Volt	
	AVDD	0.5	-	15	Volt	
	VGH	0.3	-	40	Volt	
	VGL	-20	-	0.3	Volt	
	VCOM in	0	-	6	Volt	
	VI	-0.3	-	VCC+0.3	Volt	
Operating Temperature	Topr	-20	-	+70	°C	
Storage Temperature	Tstg	-30	-	+80	°C	
Vibration(non-operating)	Vnop	-	-	1.5	G	(2)
Shock (non-operating)	Snop	-	-	240	G	(3)

Note: (1) Absolute maximum rating is the limit value beyond which the IC maybe broken.

(2) 10-500Hz, random vibration, 1h for X, Y, Z axis

(3) 2ms, half sine wave, one time for X, Y, Z axis

6-2 Operating Conditions

(Ta=25°C)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply voltage	VCC	-	3.0	3.3	3.6	Volt
	AVDD	-	10.29	10.44	10.59	Volt
	VCOM in	-	3.6	3.9	4.2	Volt
	VGH	-	21	22	23	Volt
	VGL	-	-8.0	-7.0	-6.0	Volt
Level Input Voltage (Digital signal)	VIH	-	0.7*VCC	-	VCC	Volt
	VIL	-	0	-	0.3*VCC	Volt
Power Supply Current for LCM	IDD	-	-	TBD	-	mA

Note:GND=0V

6-3 Gamma Voltage(V)

V1	10.258
V2	8.515
V3	7.986
V4	7.676
V5	6.361
V6	5.669
V7	3.396
V8	2.868
V9	2.119
V10	0.199

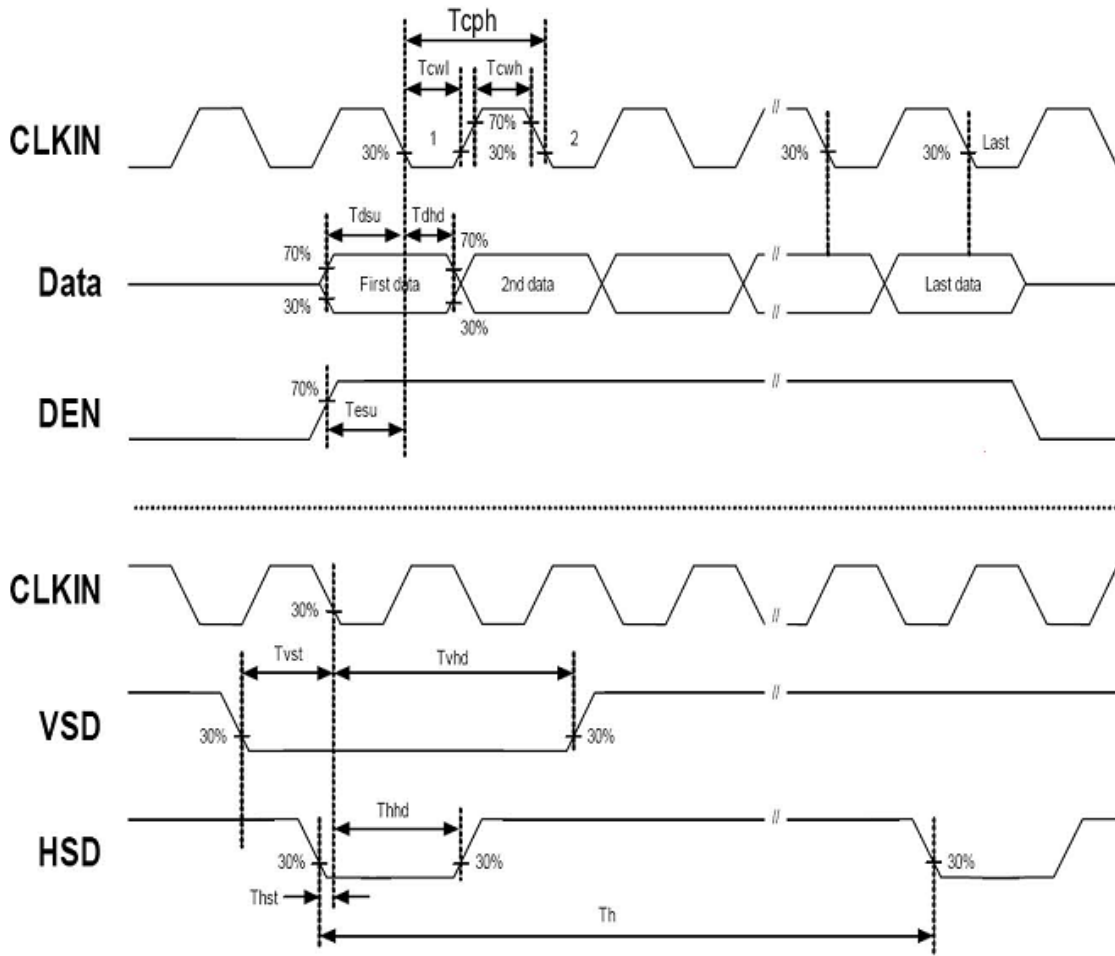


6-4 Interface Timings Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Note
DCLK cycle time	Tcph	25	-	-	ns	-
DCLK frequency	fclk	-	30	40	MHZ	-
DCLK pulse duty	Tcwh	40	50	60	%	-
VSD setup time	Tvst	8	-	-	ns	-
VSD hold time	Tvhd	8	-	-	ns	-
HSD setup time	Thst	8	-	-	ns	-
HSD hold time	Thhd	8	-	-	ns	-
Data setup time	Tdsu	8	-	-	ns	-
Data hold time	Tdhd	8	-	-	ns	-
DE setup time	Tesu	8	-	-	ns	-
DE hold time	Tehd	8	-	-	ns	-
Horizontal display area	thd	-	800	-	Tcph	-
HSD period time	th	-	928	-	Tcph	-
HSD pulse width	thpw	1	48	-	Tcph	-
HSD back porch	thb	-	40	-	Tcph	-
HSD front porch	thfp	-	40	-	Tcph	-
Vertical display area	tvd	-	480	-	th	-
VSD period time	tv	-	525	-	th	-
VSD pulse width	tvpw	-	3	-	th	-
VSD back porch	tvb	-	29	-	th	-
VSD front porch	tvfp	-	13	-	th	-

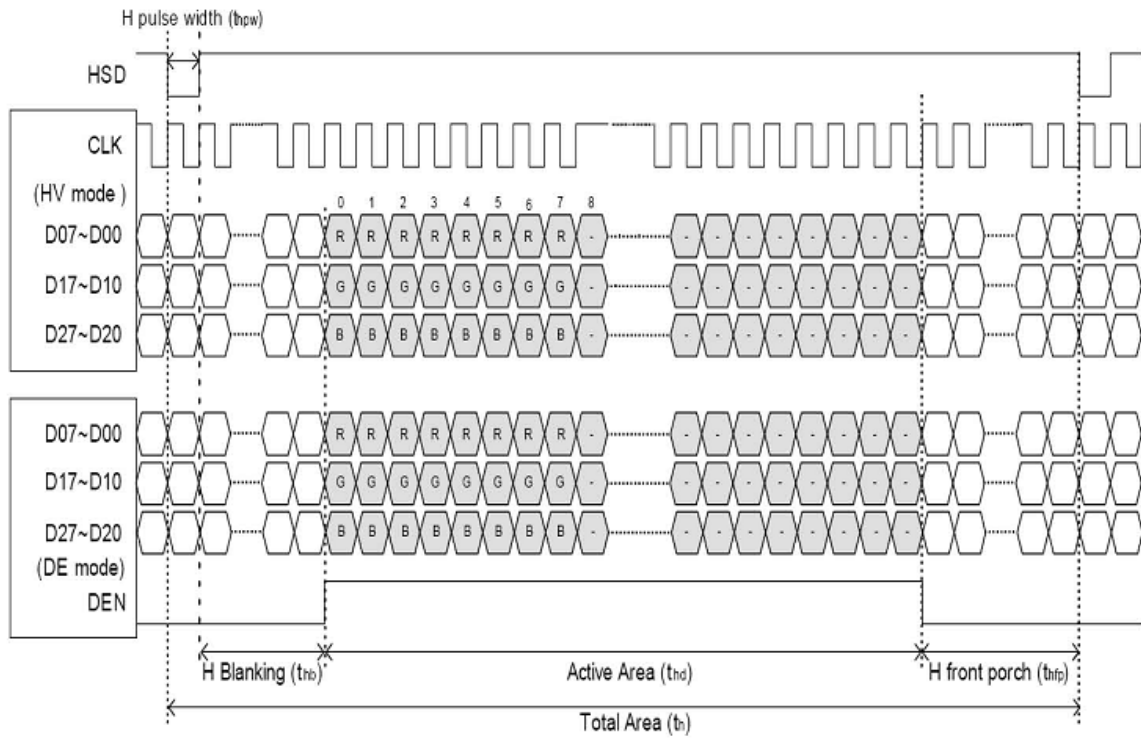


Timing Diagram of Interface Signal

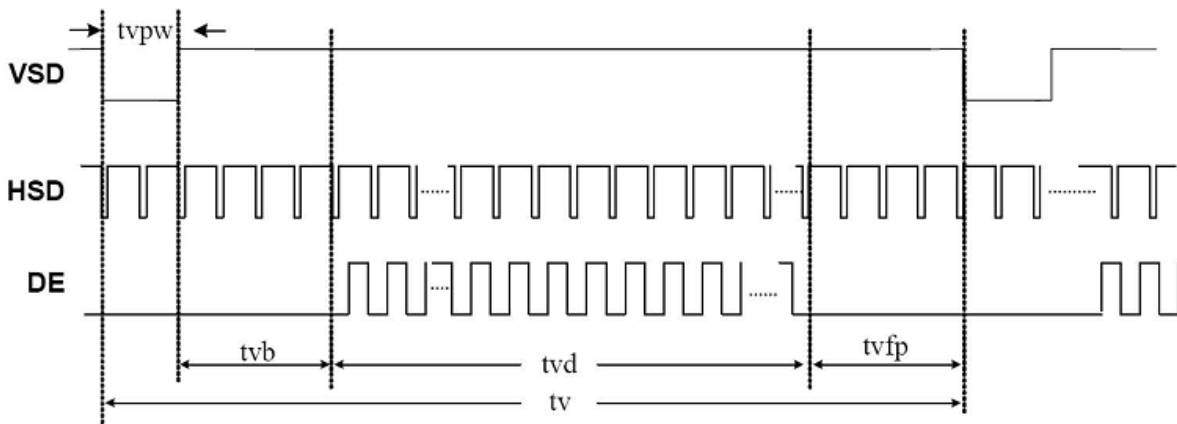




Horizontal display timing range

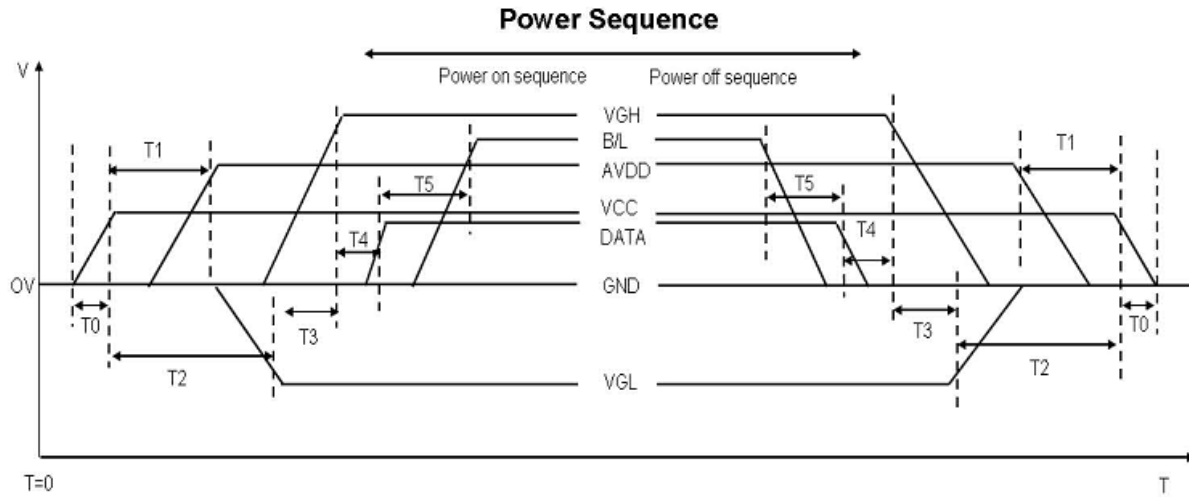


Vertical timing



6-5 Power ON/OFF Sequence

Power on/off sequence is as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-resistance state or low level when VCC is off.



Power Sequencing Requirements

Item	Min.	Typ.	Max.	Unit
T0	0.5	-	20	ms
T1	16	-	-	ms
T2	20	-	-	ms
T3	10	-	-	ms
T4	10	-	50	ms
T5	50	-	-	ms

Note (1) Power On Sequence: VCC-> AVDD -> VGL -> VGH -> Data -> B/L

(2) Power Off Sequence: B/L-> Data -> VGH -> VGL -> AVDD -> VCC



7. Optical Characteristics:

Item	Symbol	Conditions	Specifications			Unit	Note	
			Min	Typ	Max			
Transmittance	T(%)	-	-	5.2	-	-	-	
Contrast Ratio	CR	$\theta=0$ Normal Viewing angle	-	500	-		(1) (2)	
Response time	TR+TF	-	-	16	-	ms	(1) (3)	
Viewing angle	Hor.	Θ_{x+}	CR ≥ 10	60	70	-	deg.	-
		Θ_{x-}		60	70	-		
	Ver.	Θ_{y+}		40	50	-		
		Θ_{y-}		50	60	-		

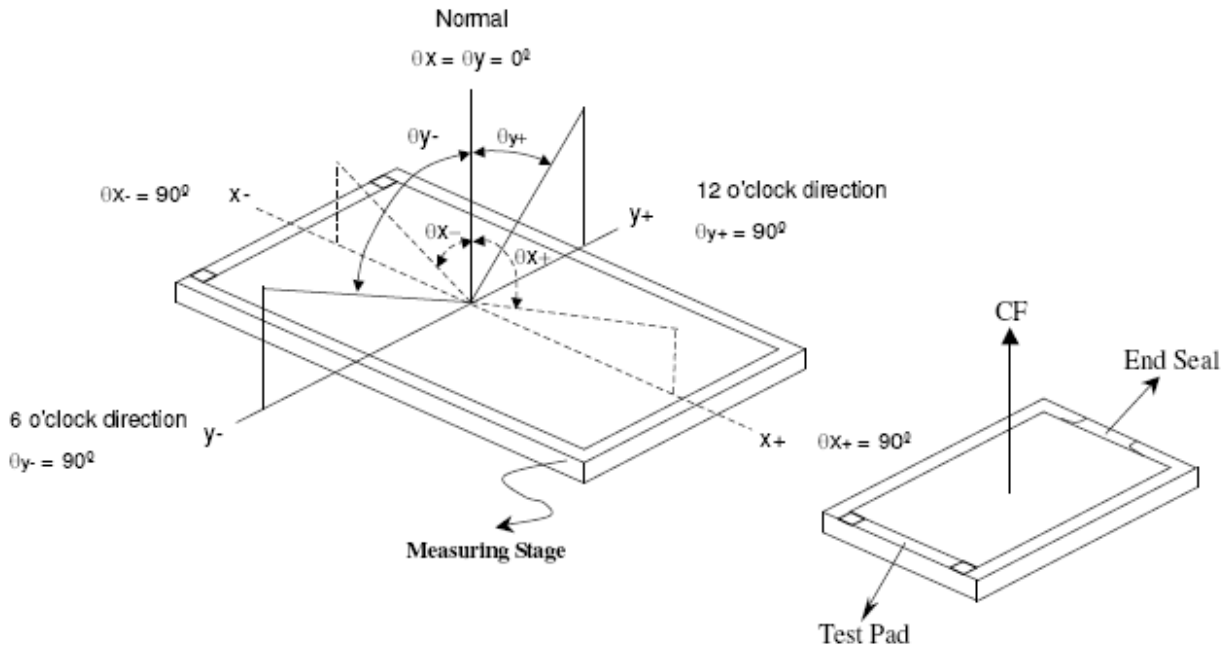
Measuring Condition

1. Measuring surrounding: dark room
2. Ambient temperature: $25 \pm 2^\circ\text{C}$
3. 30 min. Warm-up time.

Color of CIE Coordinate:

Item		Symbol	Min.	Typ.	Max.
Chromaticity Coordinates (Transmissive)	Red	x	0.546	0.596	0.646
		y	0.301	0.351	0.401
	Green	x	0.268	0.318	0.368
		y	0.531	0.581	0.631
	Blue	x	0.111	0.161	0.211
		y	0.051	0.101	0.151
	White	x	0.260	0.310	0.360
		y	0.280	0.330	0.380

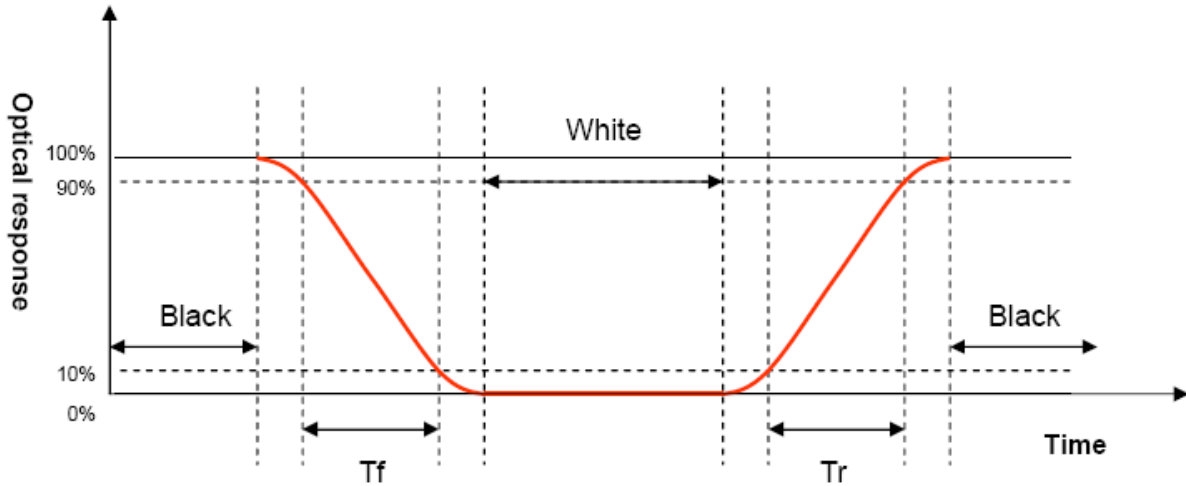
Note (1) Definition of Viewing Angle :



Note (2) Definition of Contrast Ratio(CR) :
measured at the center point of panel

$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at "White" state}}{\text{Photo detector output when LCD is at "Black" state}}$$

Note (3) Definition of Response Time : Sum of TR and TF





8. Interface Pin Assignment:

8-1 TFT FPC Interface

No.	Symbol	Function
1	AGND	Analog Ground.
2	AVDD	Analog Power.
3	VCC	Digital Power.
4~11	R0~R7	Read Data Input ,R0(LSB) ,R7(MSB).
12~19	G0~G7	Green Data Input ,G0(LSB) ,G7(MSB).
20~27	B0~B7	Blue Data Input ,B0(LSB) ,B7(MSB).
28	DCLK	Clock for input data.
29	DE	Input data enable control.
30	HSD	Horizontal sync input. Negative polarity.
31	VSD	Vertical sync input . Negative polarity.
32	MODE3	DE / SYNC mode select. MODE="L", for entering SYNC mode. MODE="H", for entering DE mode.
33	RSTB	Hardware global reset. Low active.
34	STBYB	Standby mode control. STBYB="L", enter standby mode for power saving. Timing controller and source driver will turn off, all outputs are Hi-Z. STBYB="H", normal operation.
35	SHLR	Source shift direction control. SHLR="L", shift direction is "S1200 _ S1199 _ 1198 _ ... S3 _ S2 _ S1" SHLR="H", shift direction is "S1 _ S2 _ S3 _ ... _ S1198 _ S1199 _ S1200". Note: Normal pull high
36	VCC	Digital Power
37	UPDN	Gate scan direction control UPDN="L", Down shift:G1_G2_G3_....G480; UPDN="H", Down shift:G480_G479_G478_....G1.
38	GND	Digital Ground.
39	AGND	Analog Ground.
40	AVDD	Analog Power.
41	VCOM in	For external VCOM DC input



No.	Symbol	Function
42	DITH	Dithering function enable control. DITHB="L", to enable internal dithering function. DITHB="H", to disable internal dithering function.
43~44	NC	Not connect
45~54	V10~V1	Gamma Correction Voltage Reference.
55	NC	Not connect. Test pin for internal function , Float the pin .
56	VGH	Power supply for LCM drive input. (Positive Voltage).
57	VCC	Digital Power.
58	VGL	Power supply for LCM drive input. (Negative Voltage).
59	GND	Digital Ground.
60	NC	Not connect

8-2 Back Light Interface

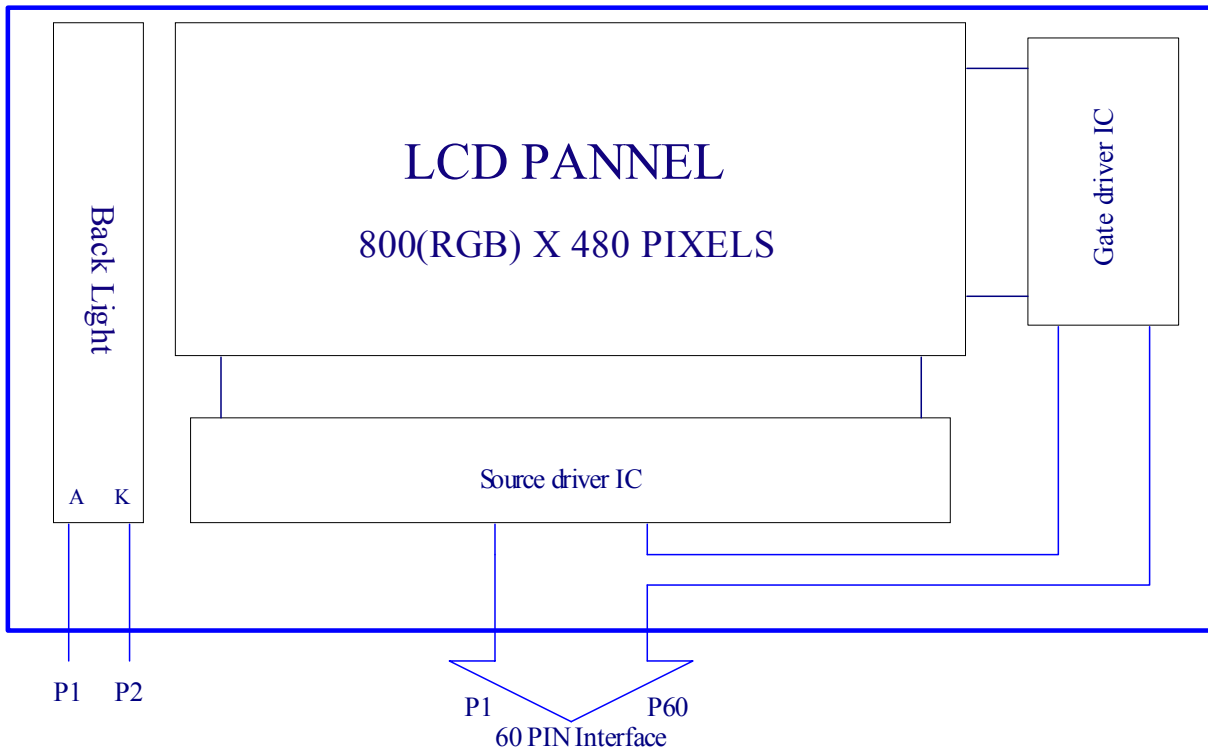
No.	Symbol	Function
1	Black	LED Power Supply. Note: line color: Black.
2	White	LED Low Voltage. Note: line color: White

8-3 Connector Name / Designation

Item	Description
LED Power Source	12005W00-NP-S1-XX-HF
Mating Connector	12005TOP-5H or equivalent



9. Block Diagram:





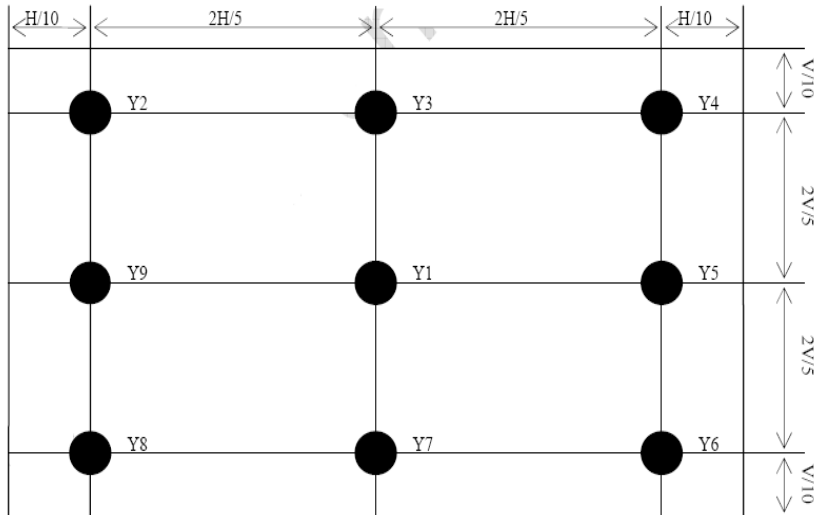
10. Backlight:

PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Note
LED Forward Voltage	Vf	-	26.4	-	V	4.
LED Forward Current	If	-	12	-	mA	4.
Luminous Intensity for LCM	Lv	400	500	-	Cd/m ²	1.4.
Uniformity for LCM	-	70	-	-	%	2.4.
Life Time	-	50000	-	-	Hr.	3.4.

NOTE:

1. Average Luminous Intensity of P1-P9
2. Uniformity = Min/Max * 100%
3. The LED life time define as the estimated time to 50% degradation of initial luminous.
4. Operating temperature 25°C, humidity 55%

Measured Method: (X*Y: Light Area)





11. Standard Specification for Reliability:

11.1 Use Restriction

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life-threatening or otherwise catastrophic.

11.2 Handling Precaution

- (1) Please mount LCD module by using mounting holes arranged in four corners tightly.
- (2) Do not disassemble or modify the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display. YB does not warrant the module, if customers disassemble or modify the module.
- (3) If LCD panel is broken and liquid crystal spills out, do not ingest or inhale liquid Crystal, and do not contact liquid crystal with skin. If liquid crystal contacts mouth or eyes, rinse out with water immediately. If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and Rinse thoroughly with water.
- (4) Disconnect power supply before handling LCD module
- (5) Refrain from strong mechanical shock and /or any force to the module.
- (6) Do not exceed the absolute maximum rating values, such as the supply voltage variation, input voltage variation, variation in parts' parameters, environmental temperature; etc otherwise LCD module may be damaged. It's recommended employing protection circuit for power supply.
- (7) Do not touch, push or rub the polarizer with anything harder than HB pencil lead. Use fingerstalls of soft gloves in order to keep clean display quality, when Persons handle the LCD module for incoming inspection or assembly.
- (8) When the surface is dusty, please wipe gently with absorbent cotton or other soft Material. When cleaning the adhesives, please use absorbent cotton wetted with a little Petroleum benzene or other adequate solvent.
- (9) Wipe off saliva or water drops as soon as possible. If saliva or water drops Contact with polarizer for a long time, they may cause deformation or color Fading.
- (10) Protection film must remove very slowly from the surface of LCD module to Prevent from electrostatic occurrence.
- (11) Because LCD module uses CMOS-IC on circuit board and TFT-LCD panel, it is Very weak to electrostatic discharge, Please be careful with electrostatic Discharge .Persons who handle the module should be grounded through adequate methods.
- (12) Do not adjust the variable resistor located on the module.

11.3 Storage Precaution

- (1) Please do not leave LCD module in the environment of high humidity and high temperature for a long time.
- (2) The module shall not be exposed under strong light such as direct sunlight. Otherwise, Display characteristics may be changed.
- (3) The module should be stored in a dark place. It is prohibited to apply sunlight or fluorescent light in storage.

11.4 Operation Precaution

- (1) Do not connect or disconnect the module in the "Power On" condition.
- (2) Power supply should always be turned on/off by 9.0 "Power on/off sequence"
- (3) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference should be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.
- (4) After installation of the TFT Module into an enclosure, do not twist nor bend the TFT Module even momentary. At designing the enclosure, it should be taken into consideration that no bending/twisting forces are applied to the TFT Module from outside. Otherwise the TFT Module may be damaged.



11.5 Others

- (1) Ultra-violet ray filter is necessary for outdoor operation.
- (2) Avoid condensation of water which may result in improper operation or disconnection of electrode.
- (3) If the module keeps displaying the same pattern for a long period of time, the image may be "sticked" to the screen.
- (4) This module has its circuitry PCB's on the rear side and should be handled carefully in order not to be stressed.

11.6 Disposal

When disposing LCD module, obey the local environmental regulations.