

Approval sheet

Customer: _____

Model name: SEL-TRA10MZXH-01

Spec NO: _____

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Version: 01

- Preliminary Specification**
- Final Specification**

For Customer's Acceptance

Approved by	Content

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1. General Specification

No.	Item	Specification	Remark
1	LCD size	10.1 inch(Diagonal)	
2	Driver element	a-Si TFT active matrix	
3	Resolution	1024 × 3(RGB) × 600	
4	Display mode	Normally black, Transmission	
5	Pixel pitch	0.2175x0.2088mm	
6	Active area	222.72(W) × 125.28(H) mm	
7	Module size	235.00(W) × 143.00(H) × 5.0(T) mm	Note 1
8	Surface treatment	TBD	
9	Color arrangement	RGB-stripe	
11	Interface	LVDS	
12	Backlight power consumption	TBD	
13	Panel power consumption	TBD	
14	Weight	TBD	

2. Pin Assignment

Pin No.	Symbol	Function	Re
1	VCC	Power Voltage for digital circuit	
2	VCC	Power Voltage for digital circuit	
3	VSS	Ground	
4	VSS	Ground	
5	RIN0-	-LVDS differential data input	
6	RIN0+	+ LVDS differential data input	
7	VSS	Ground	
8	RIN1-	-LVDS differential data input	
9	RIN1+	+ LVDS differential data input	
10	VSS	Ground	
11	RIN2-	-LVDS differential data input	
12	RIN2+	+ LVDS differential data input	
13	VSS	Ground	
14	RCLK-	-LVDS differential clock input	
15	RCLK+	+ LVDS differential clock input	
16	VSS	Ground	
17	VDD_5V	Backlight power input	
18	VDD_5V	Backlight power input	
19	ADJ	Backlight driver chip enable	
20	VSS	Ground	

3. Operation Specifications

3.1 ABSOLUTEMAXIMUMRATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	NOTE
Operating Ambient Temperature	T_{OP}	-20	+70	°C	
Operating Ambient Humidity	H_{OP}	60	90	% (RH)	
Storage Temperature	T_{STG}	-30	+80	°C	
Storage Humidity	H_{STG}	60	90	% (RH)	

【Note1】

The absolute maximum ratings are the values that must not be exceeded at any time for this product. It is not allowed for any of these ratings to be exceeded. Should a product be used with any of the absolute maximum ratings exceeded, the characteristics of the product may not be recovered, or in an extreme case, the product may be permanently destroyed.

Therefore, when designing a system incorporating the product, make sure that adequate attentions be paid to the variations in the supply voltages, the characteristics of parts that are connected, surges in the input and output lines, and the ambient temperatures.

【Note2】

This specification applies after the driver IC mounting and the FPC mounting. (This specification isn't applicable at time of driver IC un-mounting and FPC un-mounting.) LCD should keep the condition that dew doesn't storage in case of driver IC un-mounting and FPC un-mounting. Dew may break the LCD. Especially part is very weak for dew.

3.1.2. Backlight Driving Conditions

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED backlight	V_L	--	9.6	--	V	Note 1
Current for LED backlight	I_L	--	260	--	mA	
LED life time	-	30,000	-	-	Hr	Note 2

3.2 LVDS MODEDATA INPUT FORMAT.

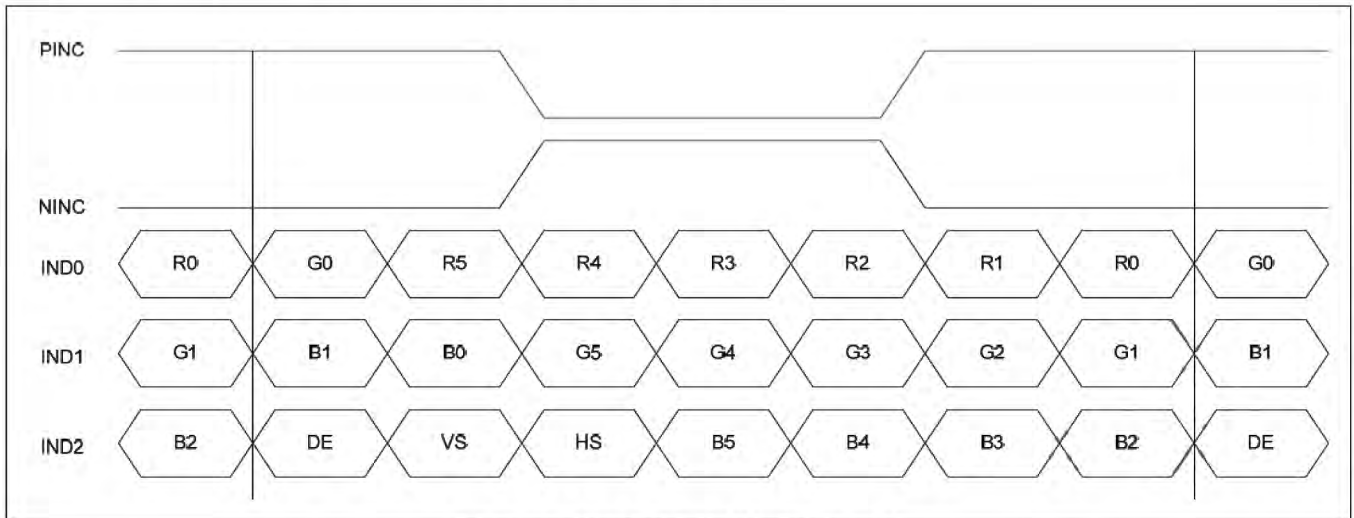


Figure 10.4: 6-bit LVDS input

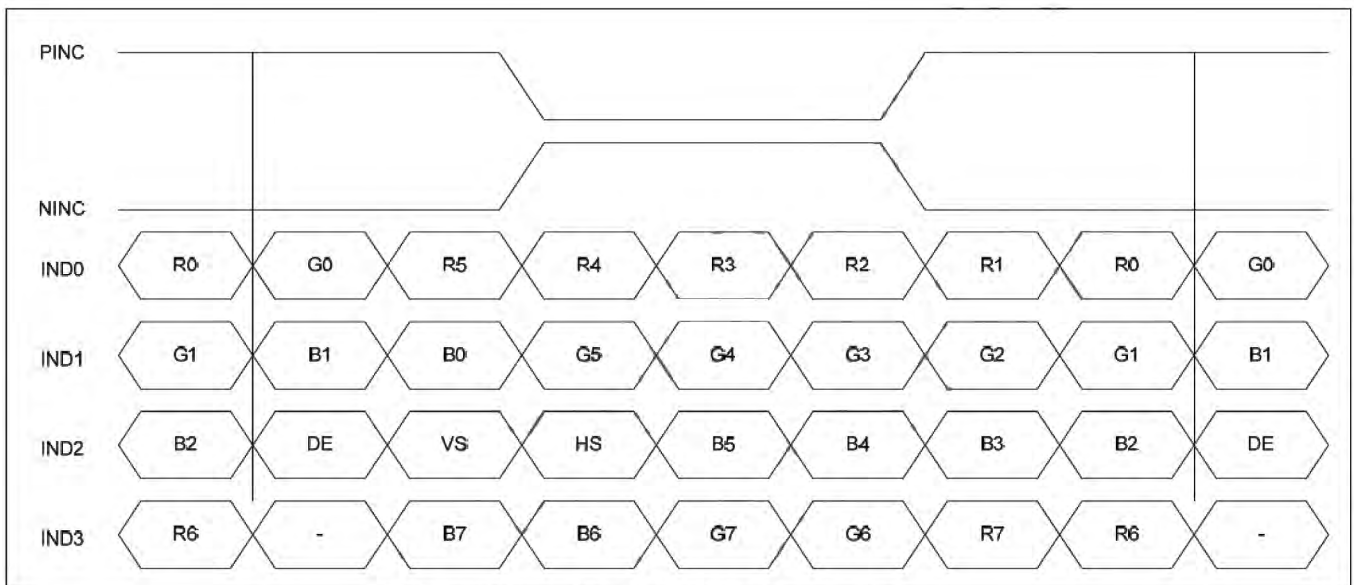
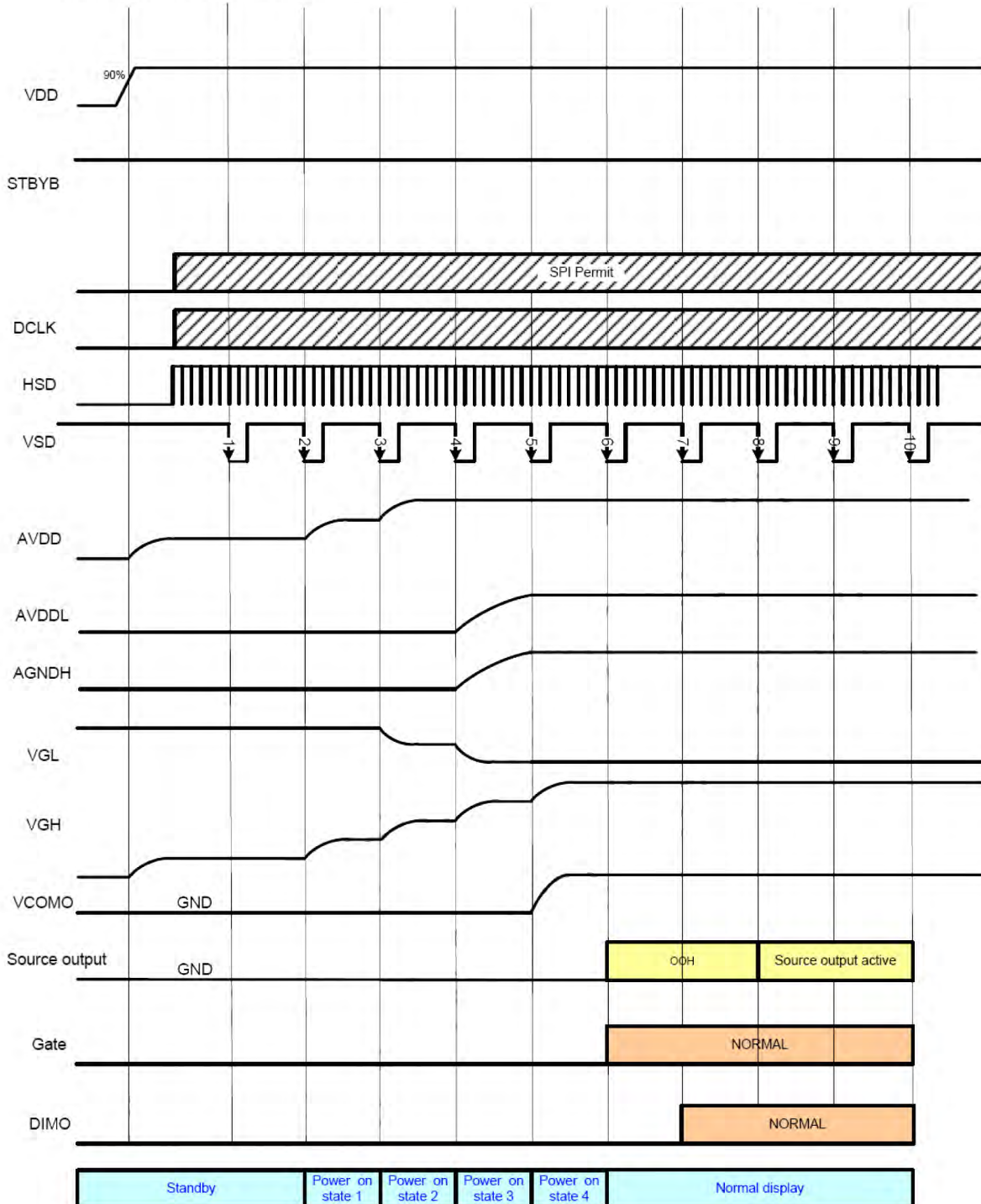


Figure 10.5: 8-bit LVDS Input

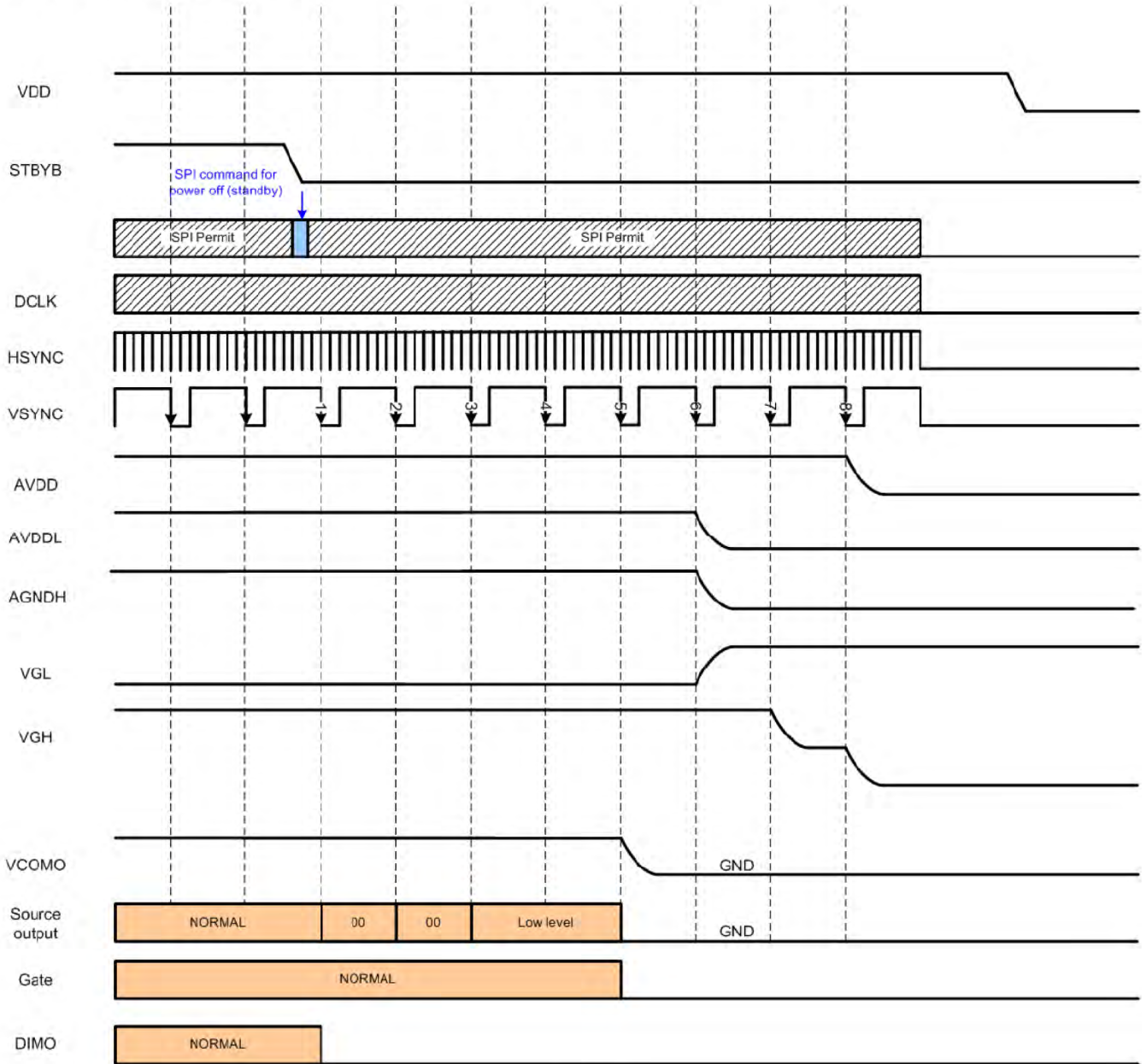
3.3 POWER SEQUENCE

To prevent a latch-up or DC operation of the LCD module, the power on/off sequence shall be as shown in below

Power-On Timing Sequence:



Power-OFF Timing Sequence:



4. Optical Specifications

Item	Symbol	Condition	Values			Unit	Remark
			Min.	Typ.	Max.		
Viewing angle (CR \geq 10)	θ_L	$\Phi=180^\circ$ (9 o'clock)	60	70	-	degree	Note 1
	θ_R	$\Phi=0^\circ$ (3 o'clock)	40	50	-		
	θ_T	$\Phi=90^\circ$ (12 o'clock)	60	70	-		
	θ_B	$\Phi=270^\circ$ (6 o'clock)	60	70	-		
Response time	T _{ON+}	Normal $\theta=\Phi=0^\circ$	-	25	40	msec	Note 3
	T _{OFF}					msec	Note 3
Contrast ratio	CR		-	600	-	-	Note 4
	W _X		-			-	
	W _Y		-			-	
Luminance	L			450		cd/m ²	Note 6
Luminance uniformity	YU			-	-	-	%

Note 1: Definition of viewing angle range

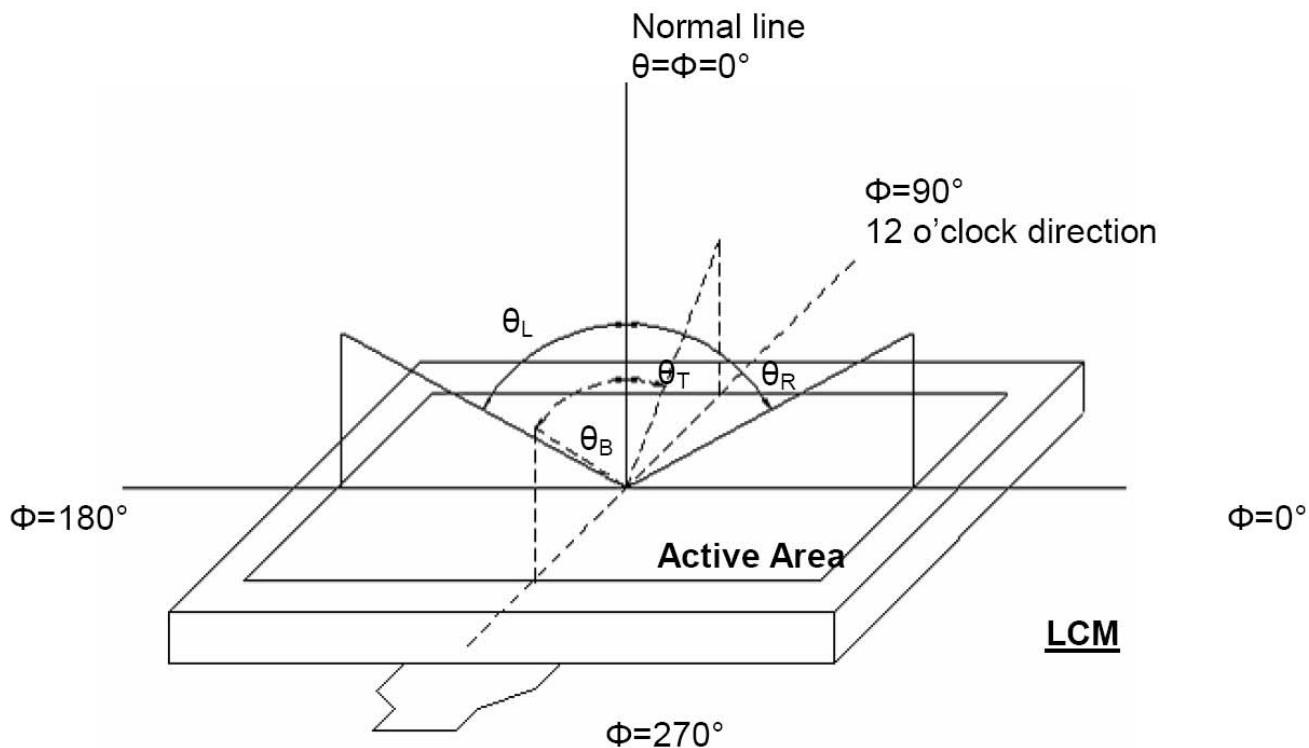


Fig. 4-1 Definition of viewing angle

Note 2: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/Field of view: 1° /Height: 500mm.)

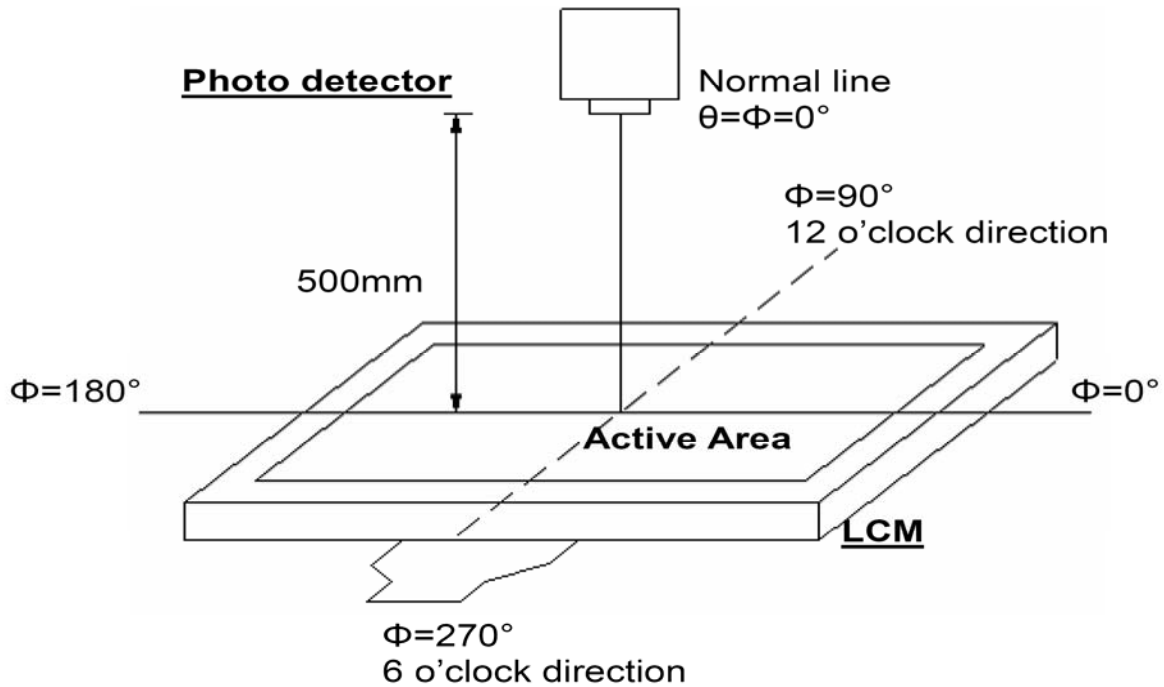


Figure 4-2 Optical measurement system setup

Note 3: Definition of Response time

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (T_{ON}) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 10% to 90%.

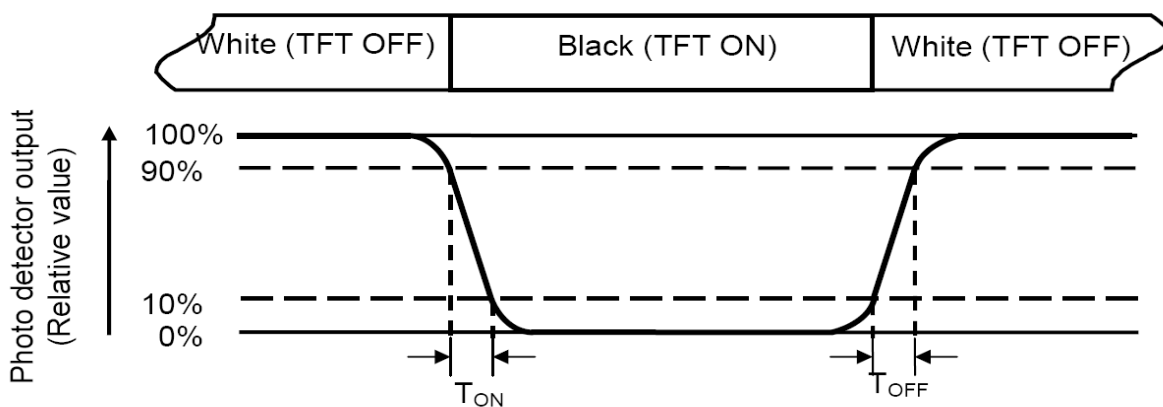


Figure 4-3 Definition of response time

Note 4: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{state White " " the on LCD when measured Luminance}}{\text{Luminance measured when LCD on the " Black" state}}$$

Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note 6: All input terminals LCD panel must be ground while measuring the center area of the panel. The LED driving condition is $I_L=180\text{mA}$.

Note 7: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer to Fig. 4-4).

Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (YU)} = \frac{B_{\min}}{B_{\max}}$$

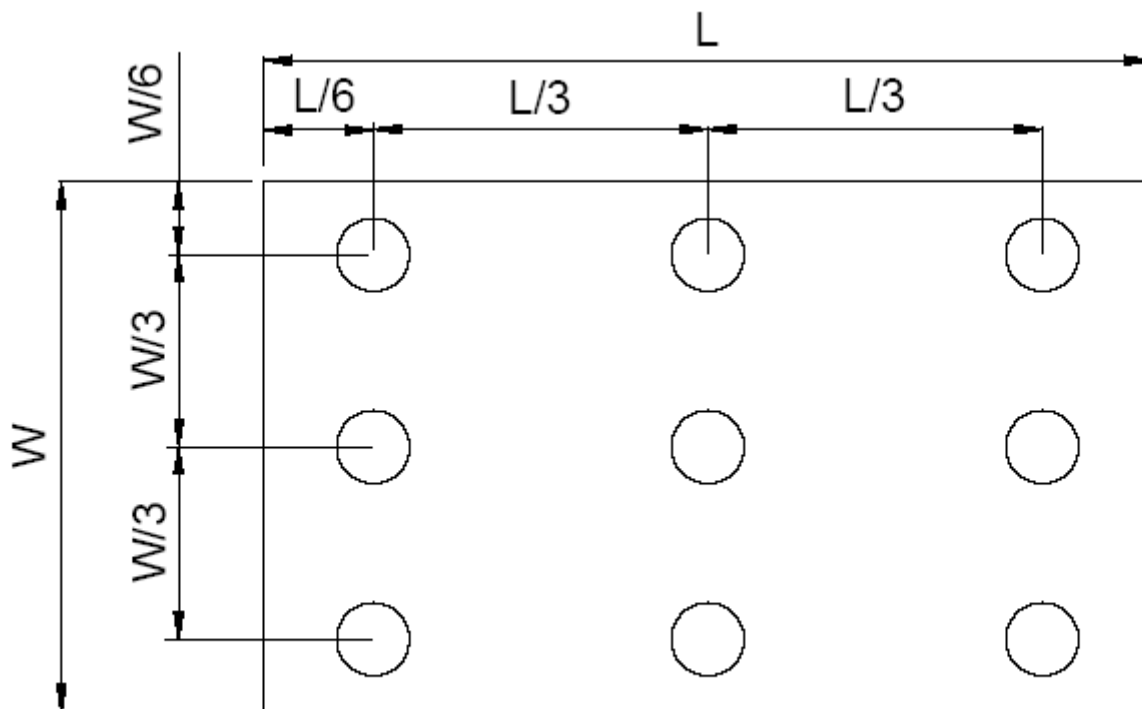


Fig. 4-4 Definition of measuring points

B_{\max} : The measured maximum luminance of all measurement position.

B_{\min} : The measured minimum luminance of all measurement position.

5. Reliability Test Items

(NOTE 3)

Item	Test Conditions	Remark
High temperature storage	Ta=80°C 240hrs	NOTE1 , NOTE4
Low temperature storage	Ta=-30°C 240hrs	NOTE1 , NOTE4
High temperature operation	Ta=70°C 240hrs	NOTE2 , NOTE4
Low temperature operation	Ta=-20°C 240hrs	NOTE2 , NOTE4
Operate at high temperature and humidity	+60°C, 90%RH 240hrs	NOTE4
Thermal Shock	-30°C/30min~+80°C/30min for a total 100 cycles ,start with cold temperature and end with high temperature .	NOTE4
Vibration Test	Frequency range:10~55HZ Stroke:1.5mm Swap:10HZ~55HZ~10HZ 2 hours of each direction of X.Y. Z (6 hours for total)	
Mechanical shock	100G 6ms, ± X, ± Y, ± Z 3 times for each direction	
Package vibration test	Random vibration :0.15G*G/HZ from 5-200 HZ,-6dB/Octave from 200-500HZ of each direction of X.Y. Z (6 hours for total)	
Low temperature storage	Height:60cm 1 corner ,3 edges ,6 surfaces	
Low temperature storage	± 2KV ,Human Body Mode, 100pF/1500 Ω	

Note 1: Ta is the ambient temperature of samples.

Note 2: Ts is the temperature of panel' s surface.

Note 3: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don' t guarantee all of the cosmetic specification.

Note 4: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

6. General Precautions

6.1. Safety

Liquid crystal is poisonous. Do not put it in your mouth. If liquid crystal touches your skin or clothes, wash it off immediately by using soap and water.

6.2. Handling

1. The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.

2. The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.

3. To avoid contamination on the display surface, do not touch the module surface with bare hands.

4. Keep a space so that the LCD panels do not touch other components.

5. Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.

6. Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.

7. Do not leave module in direct sunlight to avoid malfunction of the ICs.

6.3. Static Electricity

1. Be sure to ground module before turning on power or operating module.

2. Do not apply voltage which exceeds the absolute maximum rating value.

6.4. Storage

1. Store the module in a dark room where must keep at $25\pm 10^{\circ}\text{C}$ and 65%RH or less.

2. Do not store the module in surroundings containing organic solvent or corrosive gas.

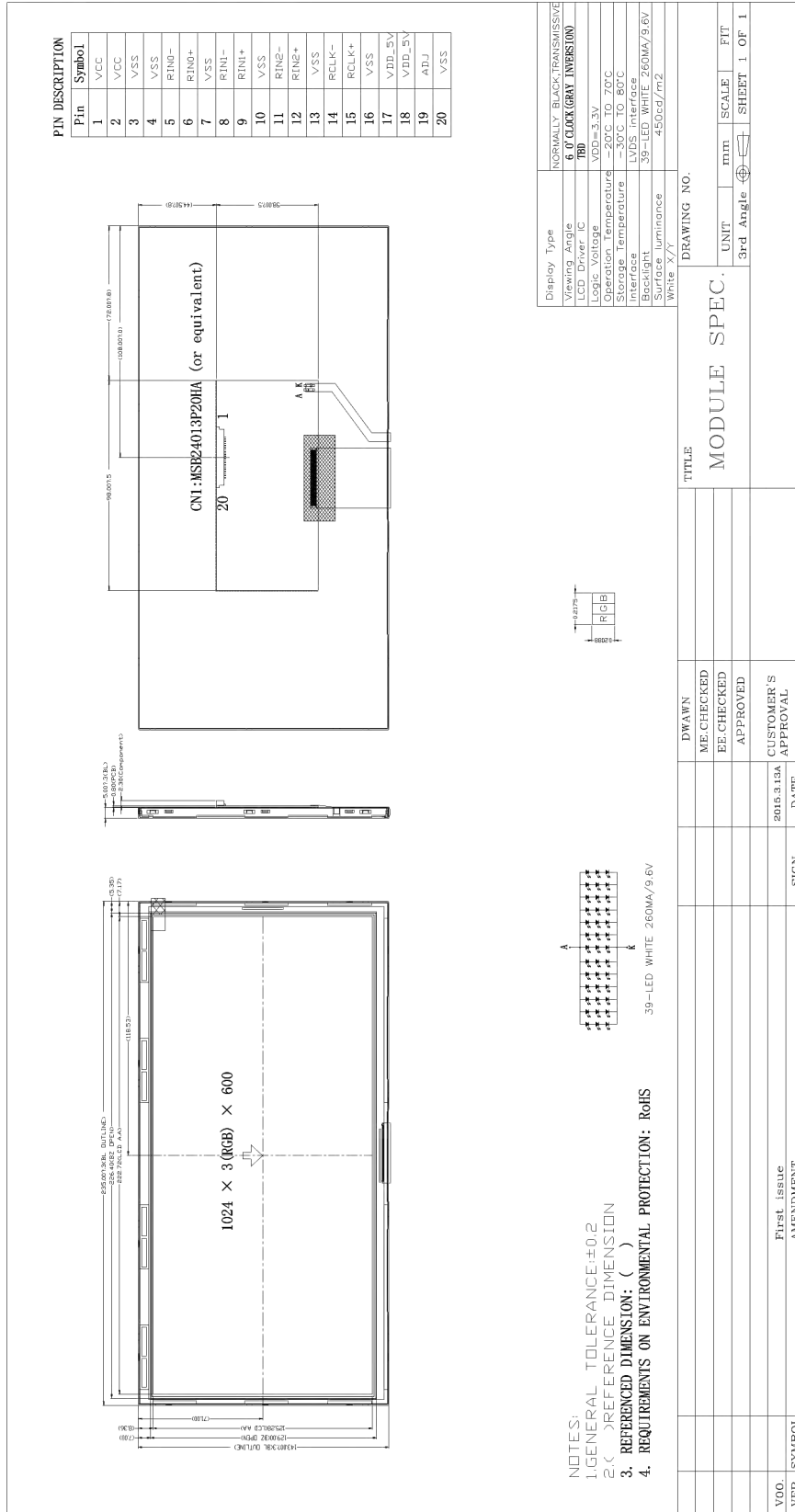
3. Store the module in an anti-electrostatic container or bag.

6.5. Cleaning

1. Do not wipe the polarizer with dry cloth. It might cause scratch.

2. Only use a soft sloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer .

7. Mechanical Drawing



8. Package Drawing

--TBD