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CERT. No.: 282Q19070712006



CERT. No.: 282E19070712007

## Product Specification

Model: TTX050QHI-03

**5.0" TFT Display Module (800\*480)**

This module uses RoHS material

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## 2 General Specifications

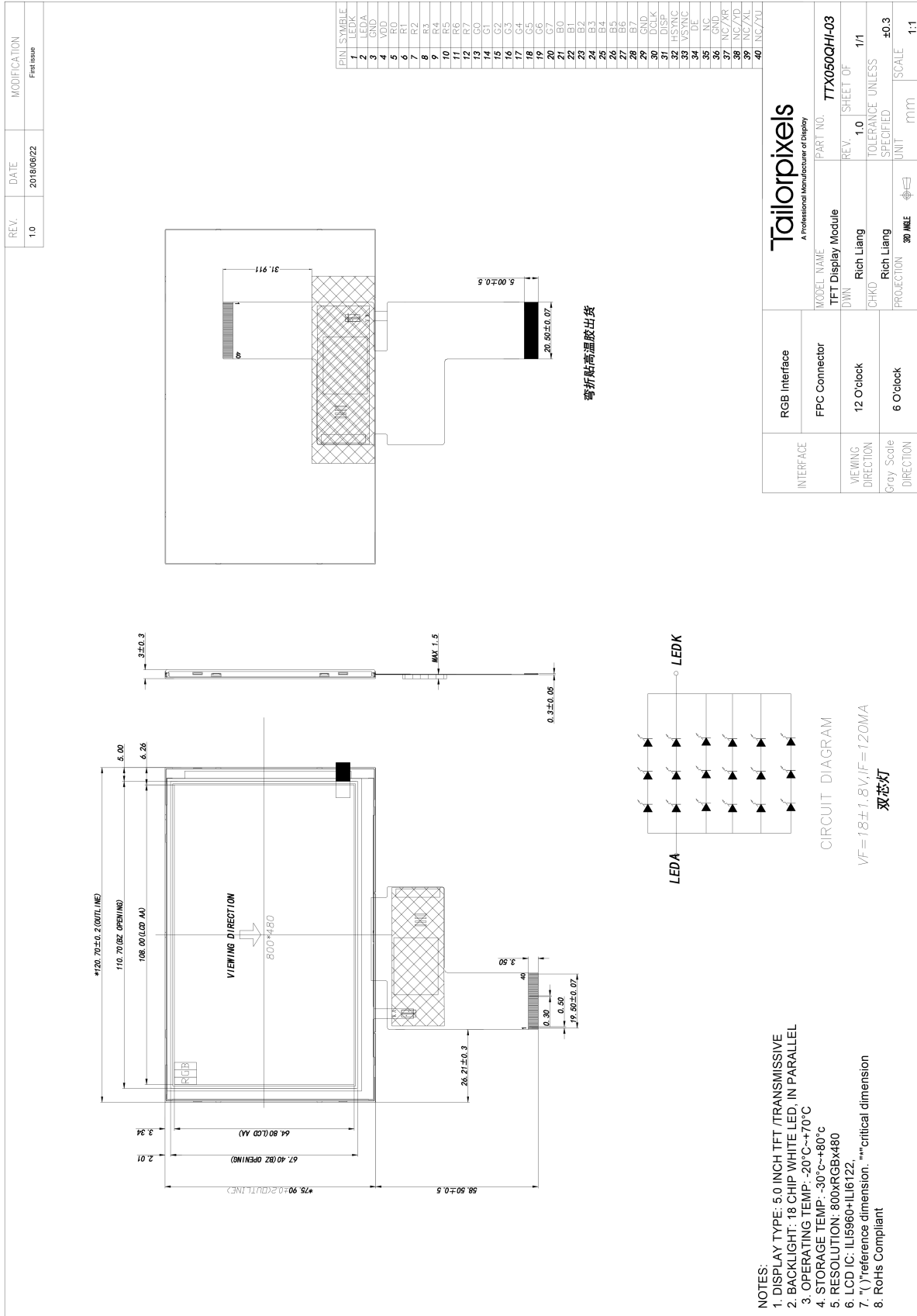
	Feature	Spec	
Characteristics	Size	5.0inch	
	Resolution	800(horizontal)*480(Vertical)	
	Interface	RGB-24bit	
	Connect type	Connector	
	Color Depth	16.7M	
	Technology type	a-Si	
	Pixel pitch (mm)	0.045 x 0.135	
	Pixel Configuration	R.G.B. Vertical Stripe	
	Display Mode	Normally White	
	LCD Driver IC	ILI5960+ILI6122	
	Viewing Direction	12 O'clock	
Gray Scale Inversion Direction	6 O'clock		
Mechanical	LCM (W x H x D) (mm)	120.7*75.9*3	
	Active Area(mm)	108 x 64.80	
	With /Without TSP	Without	
	Weight (g)	TBD	
	LED Numbers	18LEDs	

Note 1: Viewing direction is following the data measured by optics equipment.

Note 2: Requirements on Environmental Protection: RoHS

Note 3: LCM weight tolerance: +/- 5%

### 3 Mechanical Drawing



## 4 Interface

No.	Symbol	Description
1	LEDK	Backlight LED Cathode
2	LEDA	Backlight LED Anode.
3	GND	System Ground
4	VCC	Power supply for logic operation
5~12	R0~R7	Data bus
13~20	G0~G7	Data bus
21~28	B0~B7	Data bus
29	GND	System Ground
30	CLK	Pixel clock signal
31	DISP	Display on/off control
32	HSYNC	Horizontal Sync signal
33	VSYNC	Vertical Sync signal
34	DEN	Data Enable
35	NC	No connect
36	GND	System Ground
37	XR(NC)	The right side signal of TP
38	YD(NC)	The down side signal of TP
39	XL(NC)	The left side signal of TP
40	YU(NC)	The up side signal of TP

## 5 Absolute Maximum Ratings

Item	Symbol	MIN	MAX	Unit	Remark
Supply Voltage	VCC	-0.3	4.6	V	
Operating Temperature	T <sub>OPR</sub>	-20	70	°C	
Storage Temperature	T <sub>STG</sub>	-30	80	°C	

## 6 Electrical Characteristics

### 6.1 Driving TFT LCD Panel

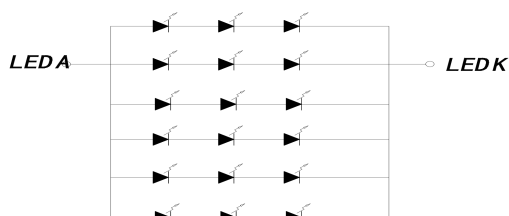
Item	Symbol	MIN	TYP	MAX	Unit	Remark
Analog Supply Voltage	VCC	3.0	3.3	3.6	V	
Input Signal Voltage	Low Level	V <sub>IL</sub>	VSS	-	0.3x VCC	V
	High Level	V <sub>IH</sub>	0.7x VCC	-	VCC	V

### 6.2 Driving Backlight

Ta = 25°C

Item	Symbol	MIN	TYP	MAX	Unit	Remark
LED current	I <sub>F</sub>	-	120	-	mA	Note 1 Note 2
LED Voltage	V <sub>F</sub>	16.2	18.0	19.8	V	
LED Life Time	W <sub>BL</sub>	20000		-	Hr	

Note 1: There are 6 Groups LED



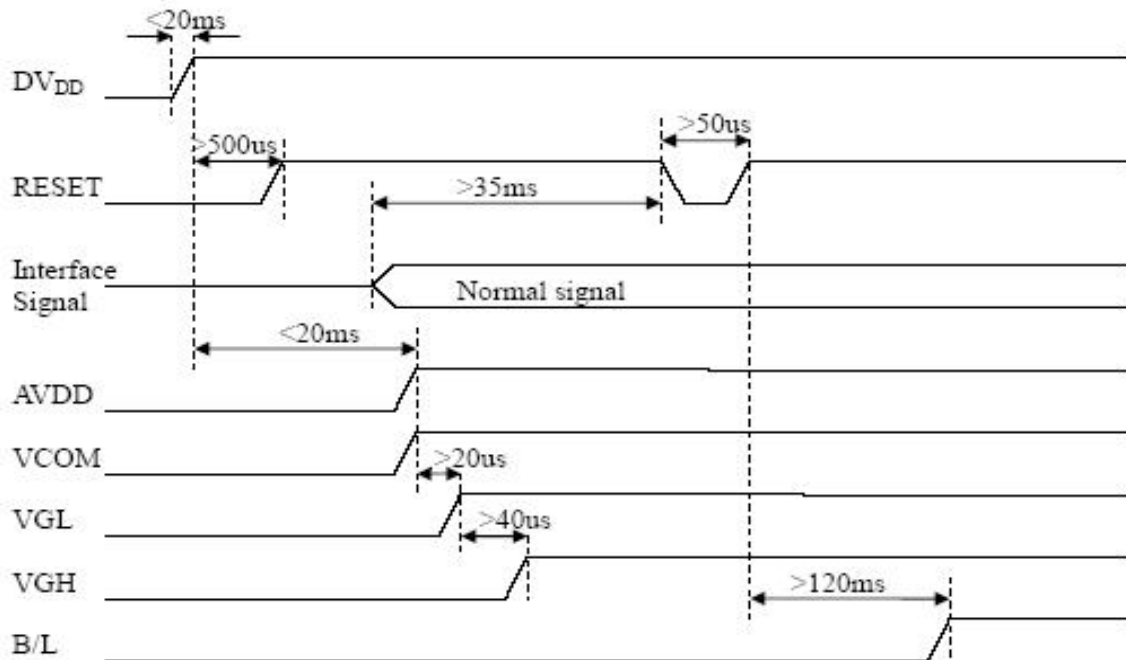
CIRCUIT DIAGRAM

Note 2: Brightness to be decreased to 50% of the initial value

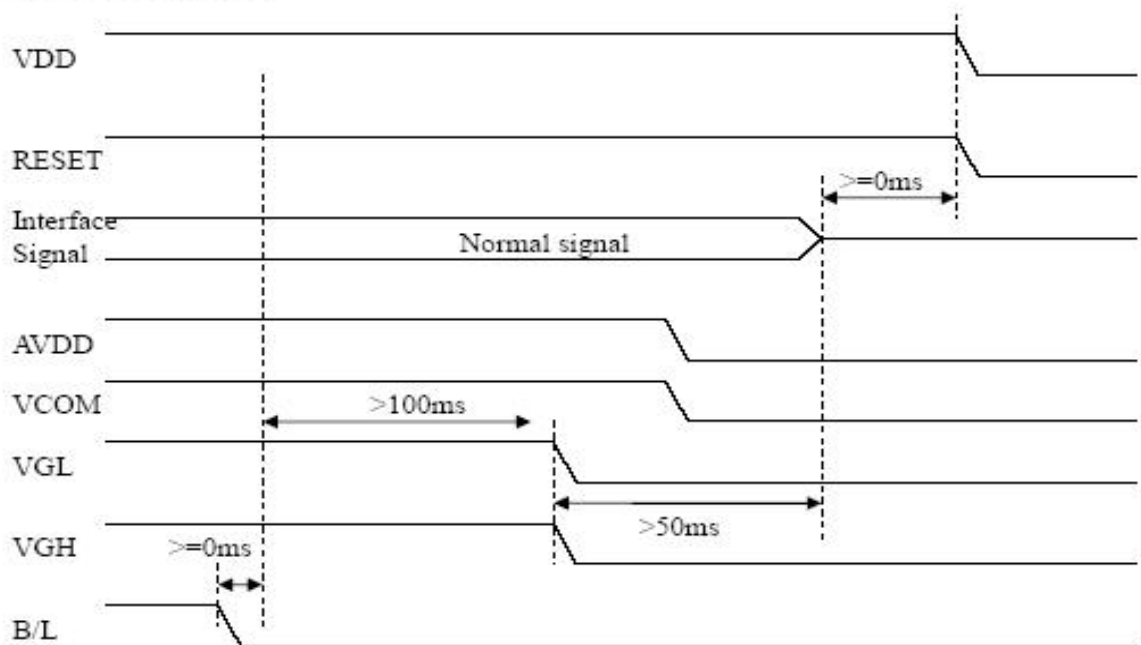
### 6.3 Power Sequence

To prevent a latch-up or DC operation of the LCD module, the power on/off sequence should be as the diagram below.

**a. Power on sequence:**



**b. Power off sequence:**







## 6.6 Timing

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Horizontal Display Area	thd	-	800	-	DCLK	
DCLK Frequency	fclk	26.4	33.3	46.8	MHz	
One Horizontal Line	th	862	1056	1200	DCLK	
HS pulse width	thpw	1	-	40	DCLK	
HS Blanking	thb	46	46	46	DCLK	
HS Front Porch	thfp	16	210	354	DCLK	

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Vertical Display Area	tvd	-	480	-	TH	
VS period time	tv	510	525	650	TH	
VS pulse width	tvpw	1	-	20	TH	
VS Blanking	tvb	23	23	23	TH	
VS Front Porch	tvfp	7	22	147	TH	

### 6.7 Data Input Format



Figure 3. 1 Horizontal input timing diagram.

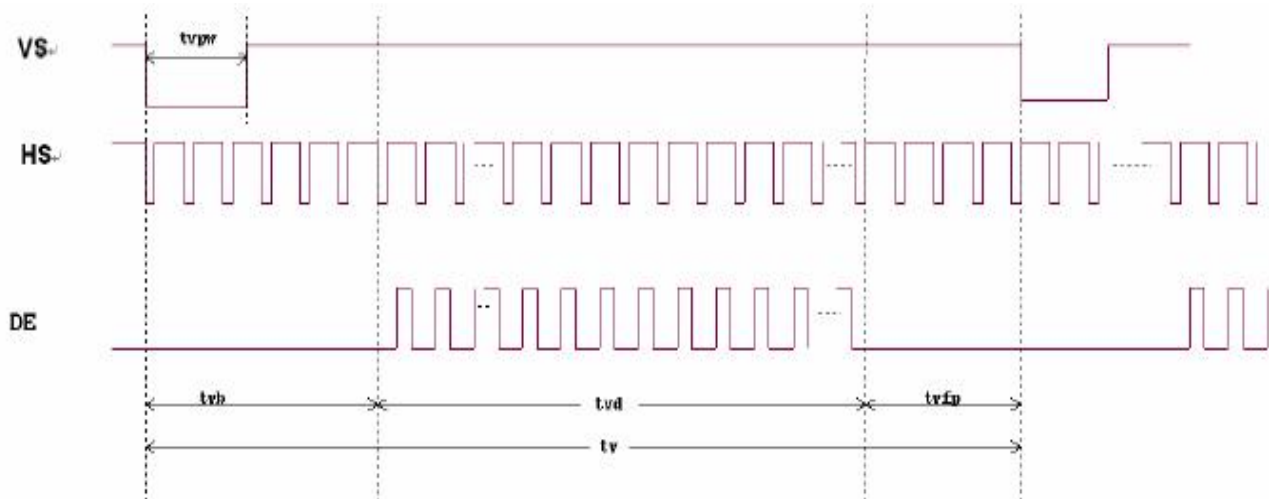


Figure 3. 2 Vertical input timing diagram.

## 7 Optical Characteristics

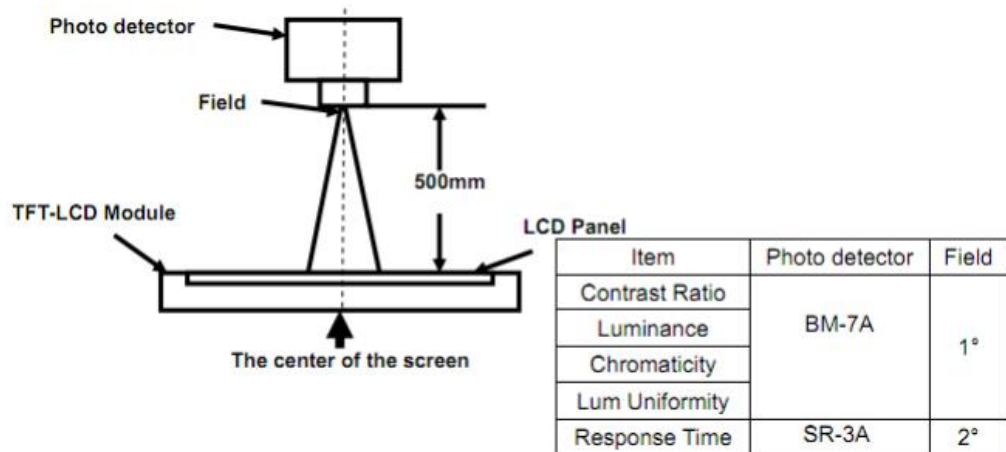
Items	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark	
Viewing angles	$\theta_T$	Center CR $\geq$ 10	40	50	-	Degree.	Note2	
	$\theta_B$		60	70	-			
	$\theta_L$		60	70	-			
	$\theta_R$		60	70	-			
Contrast Ratio	CR	$\Theta = 0$	500	600	-	-	Note1, Note3	
Response Time	T <sub>ON</sub>	25°C	-	20	30	ms	Note1, Note4	
	T <sub>OFF</sub>		-	20	30			
Chromaticity	White	X <sub>W</sub>	Backlight is on	0.324	0.326	0.328	-	Note1, Note5
		Y <sub>W</sub>		0.364	0.366	0.368	-	
	Red	X <sub>R</sub>		0.611	0.613	0.615	-	
		Y <sub>R</sub>		0.333	0.335	0.337	-	
	Green	X <sub>G</sub>		0.305	0.307	0.309	-	
		Y <sub>G</sub>		0.558	0.560	0.562	-	
	Blue	X <sub>B</sub>		0.133	0.135	0.137	-	
		Y <sub>B</sub>		0.158	0.160	0.162	-	
Uniformity	U		80	-	-	%	Note1, Note6	
NTSC				50		%	Note5	
Luminance	L		-	1200			Note1, Note7	

### Test Conditions:

1. IF= 20mA (one channel), the ambient temperature is 25°C.
2. The test systems refer to Note 1 and Note 2.

### Note 1: Definition of optical measurement system.

The optical characteristics should be measured in the darkroom. After 5 minutes of operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.



Note 2: Definition of viewing angle range and measurement system.  
Viewing angle is measured at the center point of the LCD by CONOSCOPE (ergo-80).

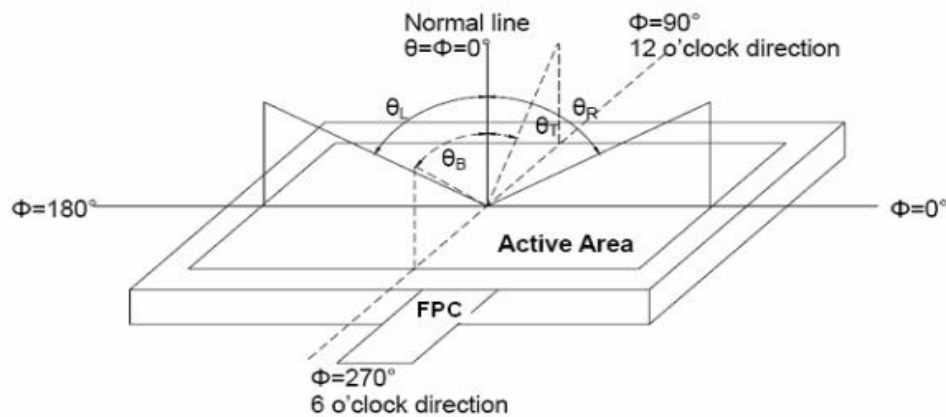


Fig. 1 Definition of viewing angle

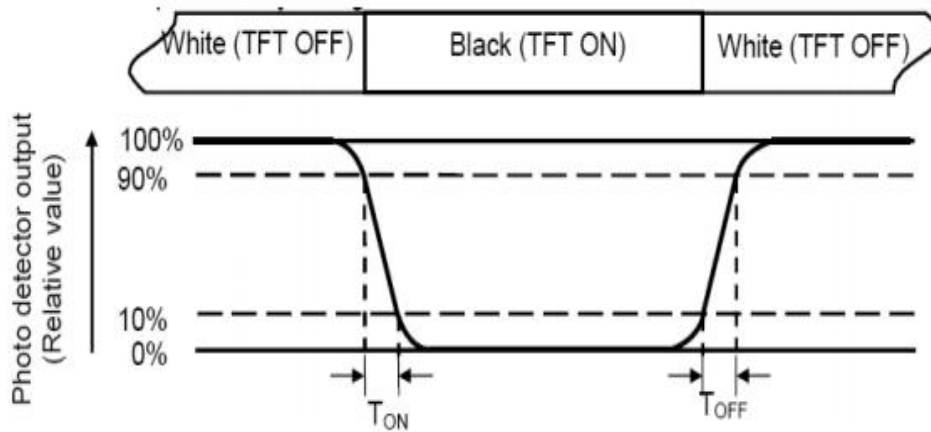
Note 3: Definition of contrast ratio

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

Note 4: Definition of Response time

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state.

Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%



Note 5: Definition of color chromaticity (CIE1931)  
 Color coordinates measured at center point of LCD.

Note 6: Definition of Luminance Uniformity  
 Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the Center of each measuring area  
 Luminance Uniformity (U) =  $L_{min} / L_{max} \times 100\%$   
 L-----Active area length W----- Active area width

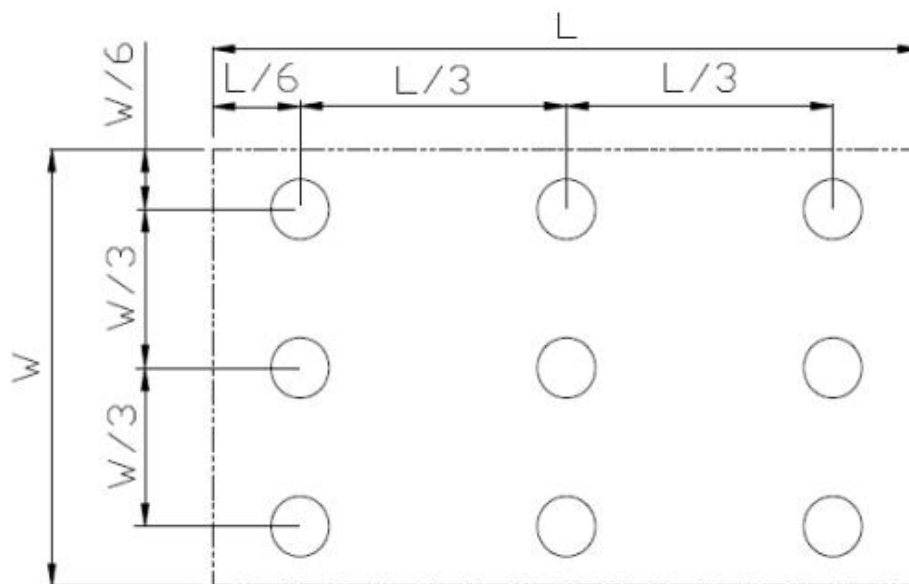


Fig. 2 Definition of uniformity

$L_{max}$ : The measured maximum luminance of all measurement position.  
 $L_{min}$ : The measured minimum luminance of all measurement position.

Note 7: Definition of Luminance:  
 Measure the luminance of white state at center point.

## 8 Environmental / Reliability Tests

No	Test Item	Condition	Remarks
1	High Temperature Operation	T <sub>s</sub> = +70°C, 240hrs	Note 1 IEC60068-2-2, GB2423. 2-89
2	Low Temperature Operation	T <sub>a</sub> = -20°C, 240hrs	Note 2 IEC60068-2-1 GB2423.1-89
3	High Temperature Storage	T <sub>a</sub> = +80°C, 240hrs	IEC60068-2-2 GB2423. 2-89
4	Low Temperature Storage	T <sub>a</sub> = -30°C, 240hrs	IEC60068-2-1 GB/T2423.1-89
5	High Temperature & Humidity Storage	T <sub>a</sub> = +60°C, 90% RH max, 160 hours	IEC60068-2-3 GB/T2423.3-2006
6	Thermal Shock (Non-operation)	-30°C 30 min ~ +80°C 30 min Change time: 5min, 30 Cycle	Start with cold temperature, end with high temperature IEC60068-2-14, GB2423.22-87
7	Electro Discharge (Operation) Static	C=150pF, R=330 Ω, 5 points/panel Air:±8KV, 5 times; Contact: ±4KV, 5 times; (Environment: 15°C ~ 35°C, 30% ~ 60%, 86Kpa ~ 106Kpa)	IEC61000-4-2 GB/T17626.2-1998
8	Vibration (Non-operation)	Frequency range: 10~55Hz, Stroke: 1.mm Sweep: 10Hz~55Hz~10Hz 2 hours for each direction of X.Y. Z. (package condition)	IEC60068-2-6 GB/T2423.5-1995
9	Shock (Non-operation)	60G 6ms, ± X, ±Y, ± Z 3 times for each direction	IEC60068-2-27 GB/T2423.5-1995
10	Package Drop Test	Height: 80 cm, 1 corner, 3 edges, 6 surfaces	IEC60068-2-32 GB/T2423.8-1995

Note: 1. T<sub>s</sub> is the temperature of panel's surface.

2. T<sub>a</sub> is the ambient temperature of sample.

## 9 Precautions For Use of LCD modules

### 9.1 Handling Precautions

9.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

9.1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

9.1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

9.1.4 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

9.1.5 If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten the cloth with one of the following solvents:

- Isopropyl alcohol
- Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following: Water; Ketene; Aromatic solvents

9.1.6 Do not attempt to disassemble the LCD Module.

9.1.7 If the logic circuit power is off, do not apply the input signals.

9.1.8 To prevent the destruction of the elements by static electricity, be careful to maintain an optimum work environment.

9.1.8.1 Be sure to ground the body when handling the LCD Modules.

9.1.8.2 Tools required for assembly, such as soldering irons, must be properly ground.

9.1.8.3 To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

9.1.8.4 The LCD Module is coated with a film to protect the display surface. Be careful when peeling off this protective film since static electricity may be generated.

### 9.2 Storage Precautions

9.2.1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

9.2.2 The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommended condition is:

Temperature: 0°C ~ 40°C, Relatively humidity: ≤80%

9.2.3 The LCD modules should be stored in the room without acid, alkali, and harmful gas.

### 9.3 Transportation Precautions

The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, dampness, and sunshine.