



SPECIFICATION FOR TFT LCD MODULE

CUSTOMER : _____

CUSTOMER MODULE : _____

HL MODEL : HG070WS011



■ Final Specification

Customer Confirmation column:

_____ Dept. : _____ Data : _____

Please return one of the copies of the specification with your signature to us within two weeks after you receive this document. If it is not returned, we will assume that you agree to the entire contents of this specification document.

Designed by	Checked by	Approved by

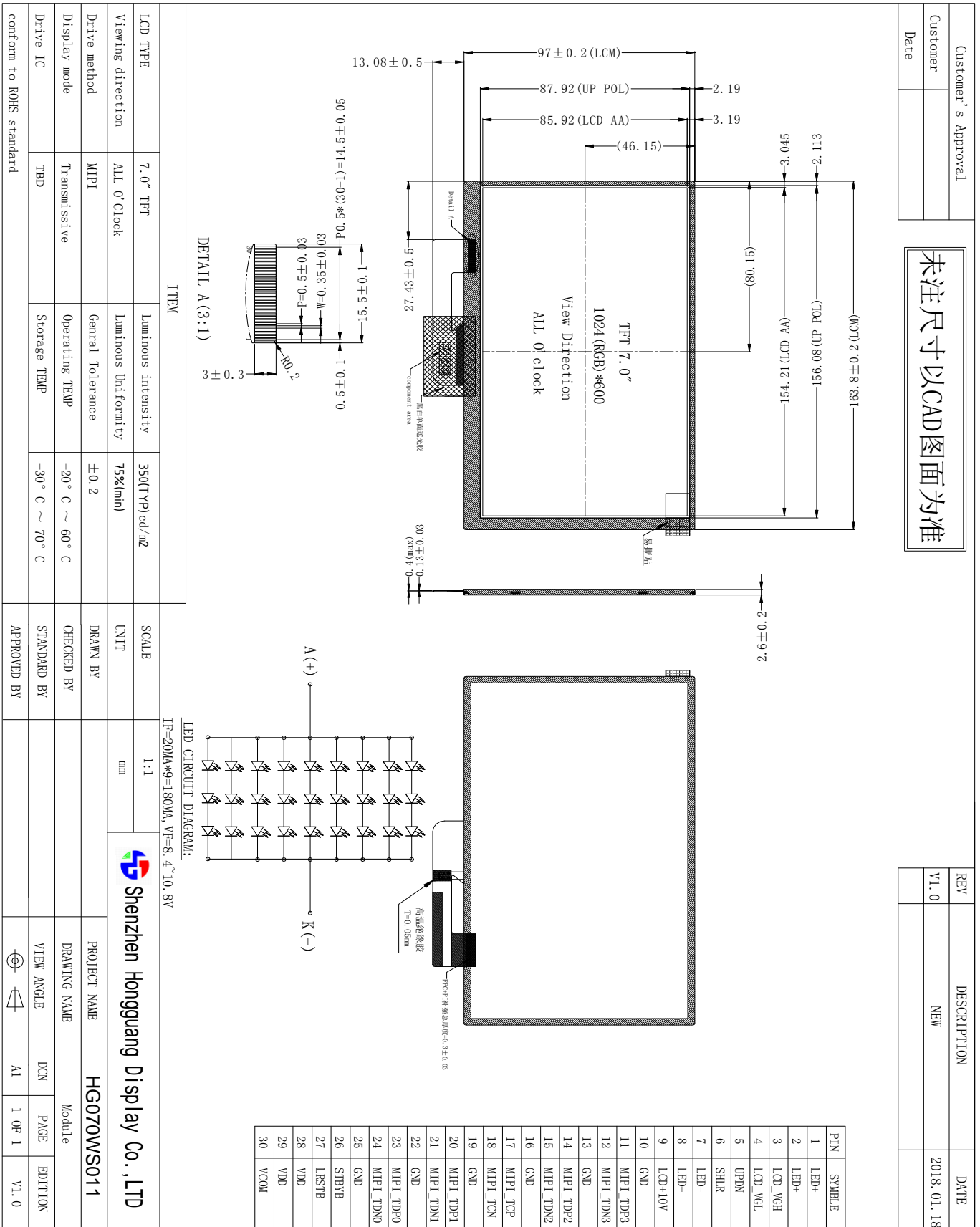


1. General Feature:

Item	Standard Value	Unit
Display Size	7'	--
Number of Pixels	1024(H)x3(RGB)x600(V)	--
Active Area	154.2144(H)*85.92(V)	mm
Pixel pitch	0.1506(L) × 0.1432(W)	mm
Outline Dimension	163.8(L) × 97(W) × 2.6(T)	mm
Pixel Arrangement	RGB vertical stripe	-
Display Mode	Normally Black	-
Number of color	16.7M	-
Viewing Direction	ALL Viewing direction	-
Surface Treatment	Anti-Glare	-
Interface	MIPI	-
Driver IC	TBD	-
Driver Condition	1.8	V
Backlight	White LED	-
Touch Panel	No Touch Panel	-
Operation Temperature	-20~60	°C
Storage Temperature	-30~70	°C
Weight	TBD	g



2. Mechanical Dimension





3.Pin Description

Pin NO.	Symbol	Description
1	LED+	LED Anode
2	LED+	LED Anode
3	VGH	Positive power for TFT
4	VGL	Negative power for TFT
5	UPDN	Vertical inversion
6	SHLR	Horizontal inversion
7	LED-	LED Cathode
8	LED-	LED Cathode
9	AVDD	Power for Analog Circuit
10	GND	Ground
11	D3+	MIPI data Positive signal
12	D3-	MIPI data Negative signal
13	GND	Ground
14	D2+	MIPI data Positive signal
15	D2-	MIPI data Negative signal
16	GND	Ground
17	DCLK+	MIPI CLK Positive signal
18	DCLK	MIPI CLK Negative signal
19	GND	Ground
20	D1+	MIPI data Positive signal
21	D1-	MIPI data Negative signal
22	GND	Ground
23	D0+	MIPI data Positive signal
24	D0-	MIPI data Negative signal
25	GND	Ground
26	STBYB	Standby mode
27	LRSTB	Global reset pin 1.8V
28	VDD	Power for Analog Circuit 1.8V
29	VDD	Power for Analog Circuit 1.8V
30	VCOM	Common voltage



4. Electrical Characteristics

4.1 TFT LCD Module Operating Conditions

Item	Symbol	Min	Type	Max	Unit	Note
Supply Voltage	VDD	1.6	1.8	2.0	V	
	AVDD	-	9.6	-	V	
	VGH	-	18	-	V	
	VGL	-	-6		V	
VCOM	VCOM	-	-	-		
Input signal voltage	VIH	0.7V _{CC}	-	V _{CC}	V	
	VIL	0	-	0.3V _{CC}	V	

4.2 Environment Absolute Rating

Item	Symbol	Min	Max	Unit	Note
Operation temperature	TOPR	-20	60	°C	
Storage temperature	TSTG	-30	70	°C	

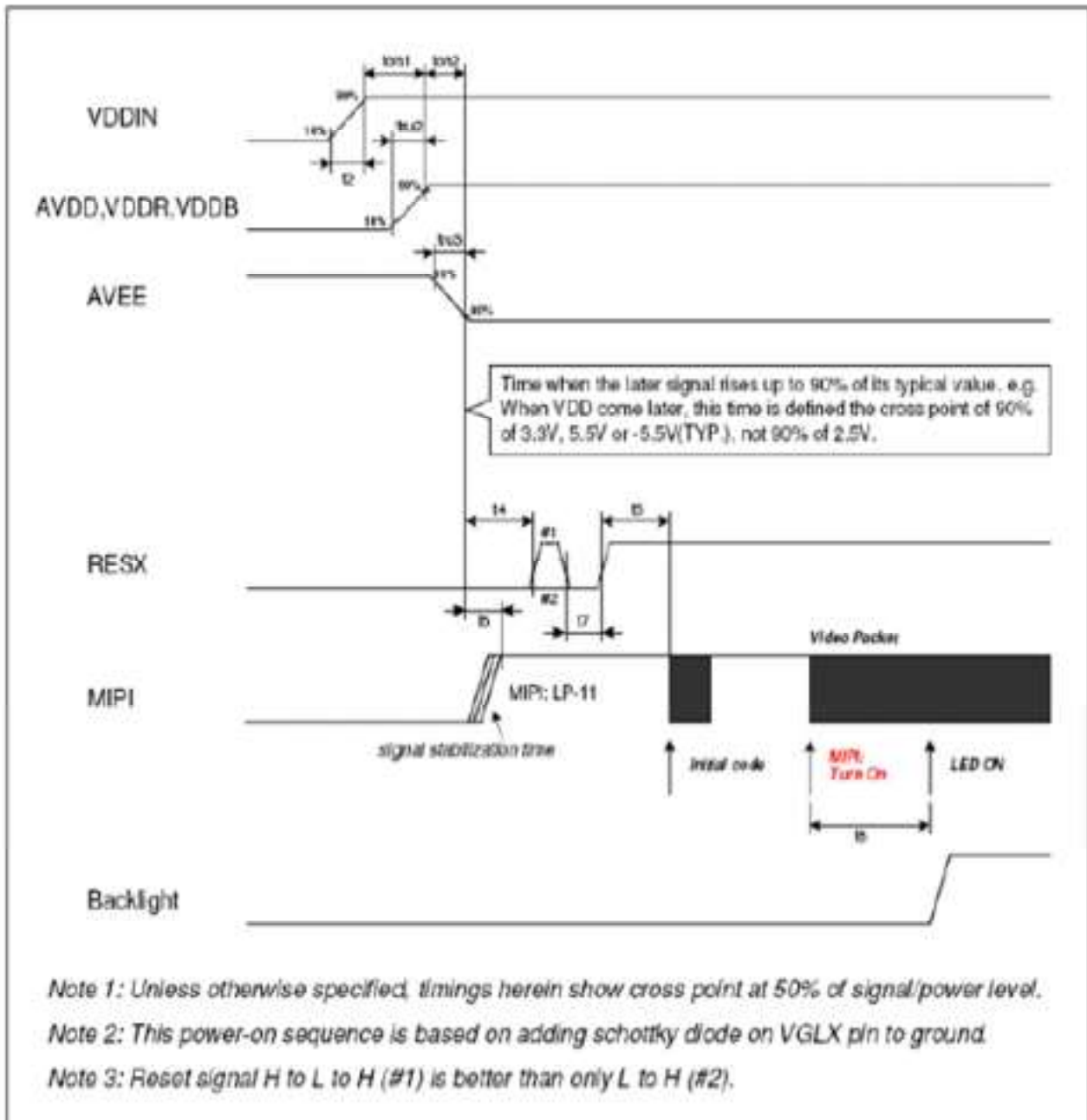
4.3 LED back light specification (per a chip)

Item	Symbol	Condition	Min	Type	Max	Unit
Forward voltage	Vled	If=20mA /1-chip	-	9.6	-	V
Forward current	Iled		-	180	-	ma
PWM Signal Voltage	PWM_h	-	2.0	3.3	3.6	V
PWM Signal Voltage	PWM_l	-	0	-	0.5	V
Output PWM frequency	PWM_f	-		200	1k	Hz
LED enable high Voltage	EN_h	-	2.6	3.3	3.6	V
LED enable low Voltage	EN_l	-	0	-	0.4	V
Luminance color	white					



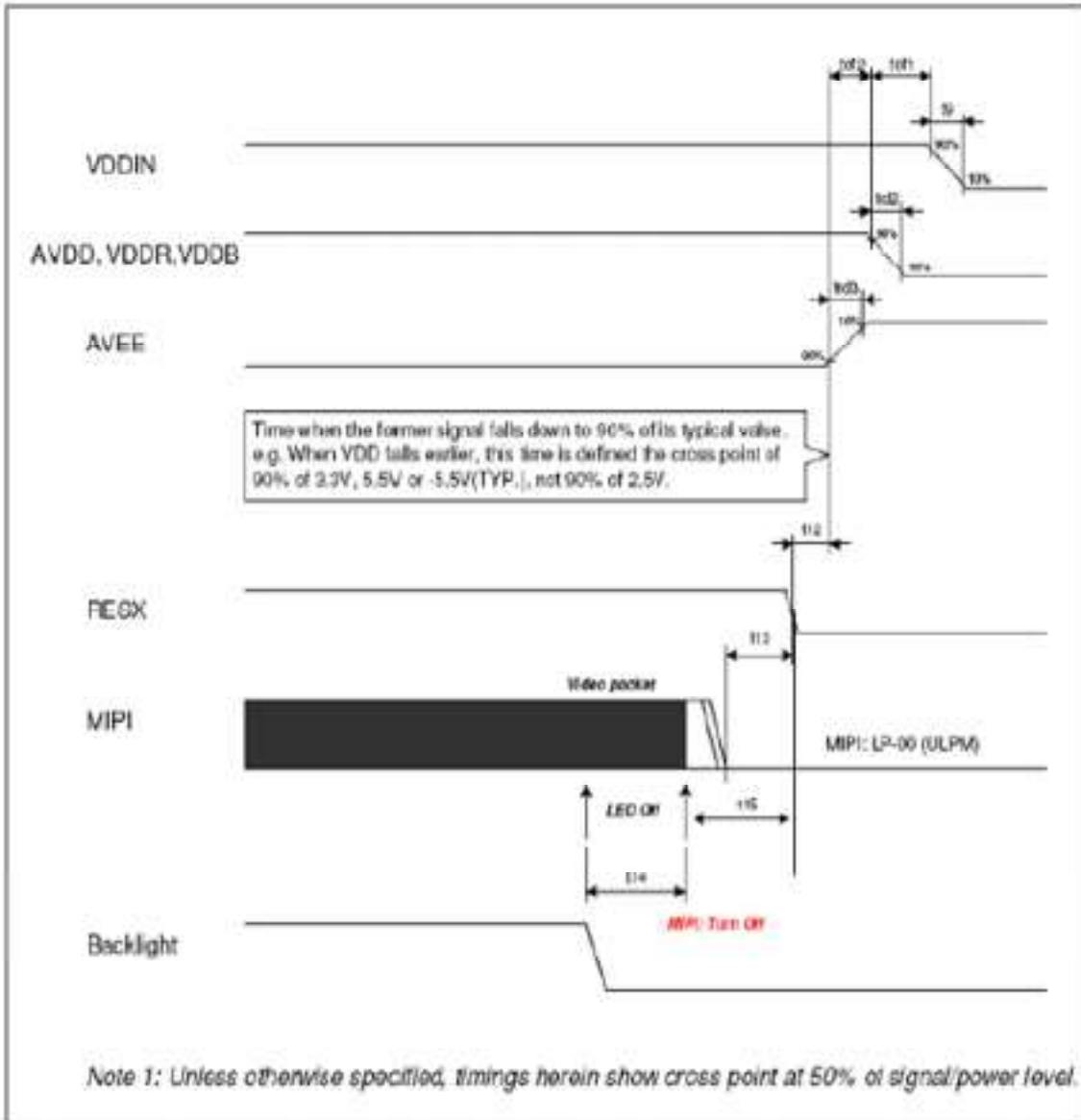
5. Power、Signal Sequence

Power ON





Power OFF



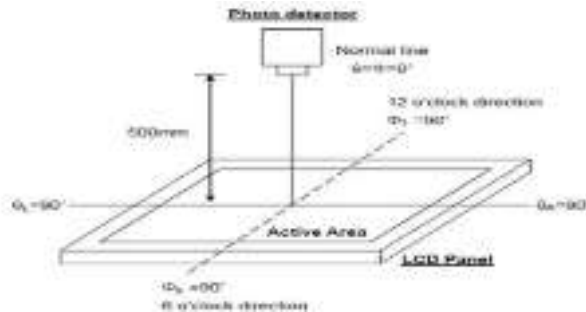


6. Optical Characteristics

Item	Symbol	Min	Typ	Max	Unit	Note	
Contrast Ratio	CR	-	800	-		Note1 Note3	
Luminance(center)	L		350	-	cd/m2	Note1 Note5 Note7	
Luminous Uniformity(9 Point)	LU	75	-		%	Note7	
Response Time	Rising+ Falling	-	25	40	ms	Note1 Note4	
Viewing Angle K=Contrast Ratio>10	horizontal	θR	-	85	-	degree	Note2
		θL	-	85	-		
	vertical	θU	-	85	-		
		θD	-	85	-		
Color Chromaticity (CIE1931)	Red	X	TYP- 0.03	TBD	Typ+ 0.03	-	Note1 Note5 Note7
		Y		TBD			
	Green	X		TBD			
		Y		TBD			
	Blue	X		TBD			
		Y		TBD			
	White	X		0.3			
		Y		0.365			
Color gamut (NTSC ratio)	-	-	50	-	%		

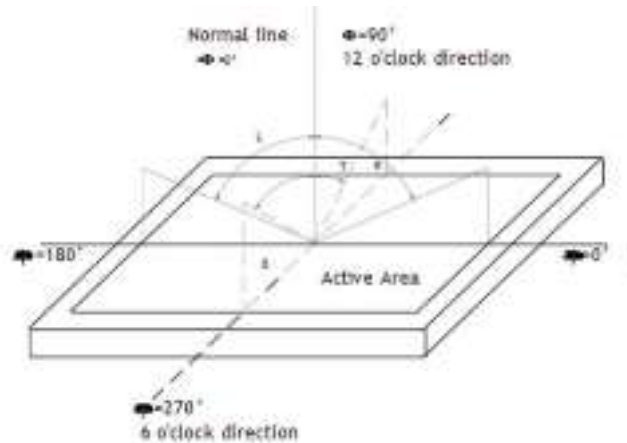


Note1: Definition of optical measurement system (BM-7)



Note2: Definition of viewing angle range and measurement system

Viewing angle is measured at the center point of the LCD by CONOSCOPE (ergo-80).



Note3: 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%.

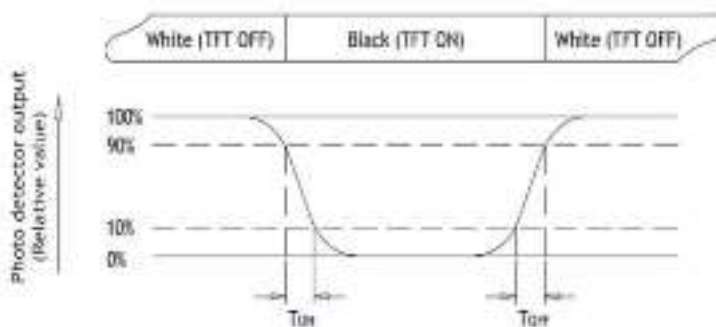


Fig. 6-3 Definition of response time



Note4: Definition of contrast ratio

$$\text{Contrast ratio(CR)} = \frac{\text{Luminance measured when LCD on the Whitestate}}{\text{Luminance measured when LCD on the Blackstate}}$$

“White state “: The state is that the LCD should drive by V_{white} . “Black state”: The state is that the LCD should drive by V_{black} . V_{white} : To be determined V_{black} : To be determined.

Note5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

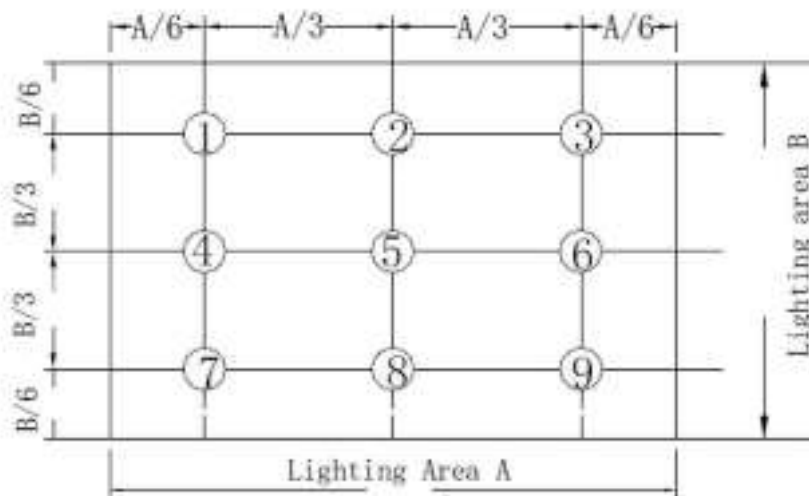
Note6: All input terminals LCD panel must be ground while measuring the center area of the panel. The LED driving condition is $I_L=60\text{mA}$

Note7: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas. Every measuring point is placed at the center of each measuring area.

Luminance Uniformity (U) = $L_{\text{min}} / L_{\text{max}}$

L----Active area length, W---- Active area width



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

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



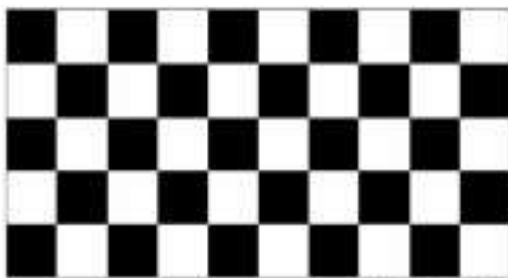
7. RELIABILITY TEST

7-1 Temperature and Humidity

TEST ITEMS	CONDITIONS	NOTE
High Temperature Operation	60°C ; 96hrs	
High Temperature Storage	70°C ; 96hrs	
High Temperature High Humidity Operation	40°C; 90%RH ; 96hrs (No condensation)	
Low Temperature Operation	-20°C ; 96hrs	
Low Temperature Storage	-30°C ; 96hrs	
Thermal Shock	-20°C (0.5hr) ~ 60°C (0.5hr) ; 10 Cycles	Non-Operating
Image Sticking	25°C ; 2hrs	1

Note 1: Condition of Image Sticking test: 25°C ±2°C

Operation with test pattern sustained for 30 mins, then change to gray pattern immediately. After 2 mins, the mura must be disappeared completely .



(a) Test Pattern (chess board Pattern)



(b) Gray Pattern

7-3 Electrostatic Discharge

TEST ITEM	CONDITIONS
ESD (Non-operation)	150pF,330Ω, Contact±4KV,Air :±8KV.Note 1
	200pF,0Ω, ±200V Contact test.Note 2

Note:Measure Point:

- 1.LCD glass and metal bezel
- 2.IF connector pins



8. HANDLING PRECAUTION

- (1) Don't disassemble and reassemble the module by self.
- (2) Acid, alkali, alcohol or touched directly by hand will damage the display.
- (3) Static electricity will damage the module. Please configure grounding device.
- (4) The strong vibration, shock, twist or bend will cause material damage, even module broken.
- (5) It is easy to cause image sticking while displaying the same pattern for very long time.
- (6) The response time, brightness and performance will vary from different temperature.
- (7) 12 months of the product term, the starry shipment date began to count.

- END -