



# SmarterGlass

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[www.smarterglass.com](http://www.smarterglass.com)  
978 465 6190  
[sales@smarterglass.com](mailto:sales@smarterglass.com)

**DLC Display Co., Limited**

**德爾西顯示器有限公司**



MODEL No: DLC0700WZG-1

TEL: 86-755-86029824

FAX: 86-755-86029827

E-MAIL: [sales@dlcdisplay.com](mailto:sales@dlcdisplay.com)

WEB: [www.dlcdisplay.com](http://www.dlcdisplay.com)

## Record of Revision

Date	Revision No.	Summary
2014-06-18	1.0	Rev 1.0 was issued
2015-05-27	1.1	Add current consumption

### 1. Scope

This data sheet is to introduce the specification of DLC0700WZG-1 active matrix TFT module. It is composed of a color TFT-LCD panel, driver ICs, FPC and a backlight unit. The 7.02" display area contains 1200(RGB) x 1920 pixels.

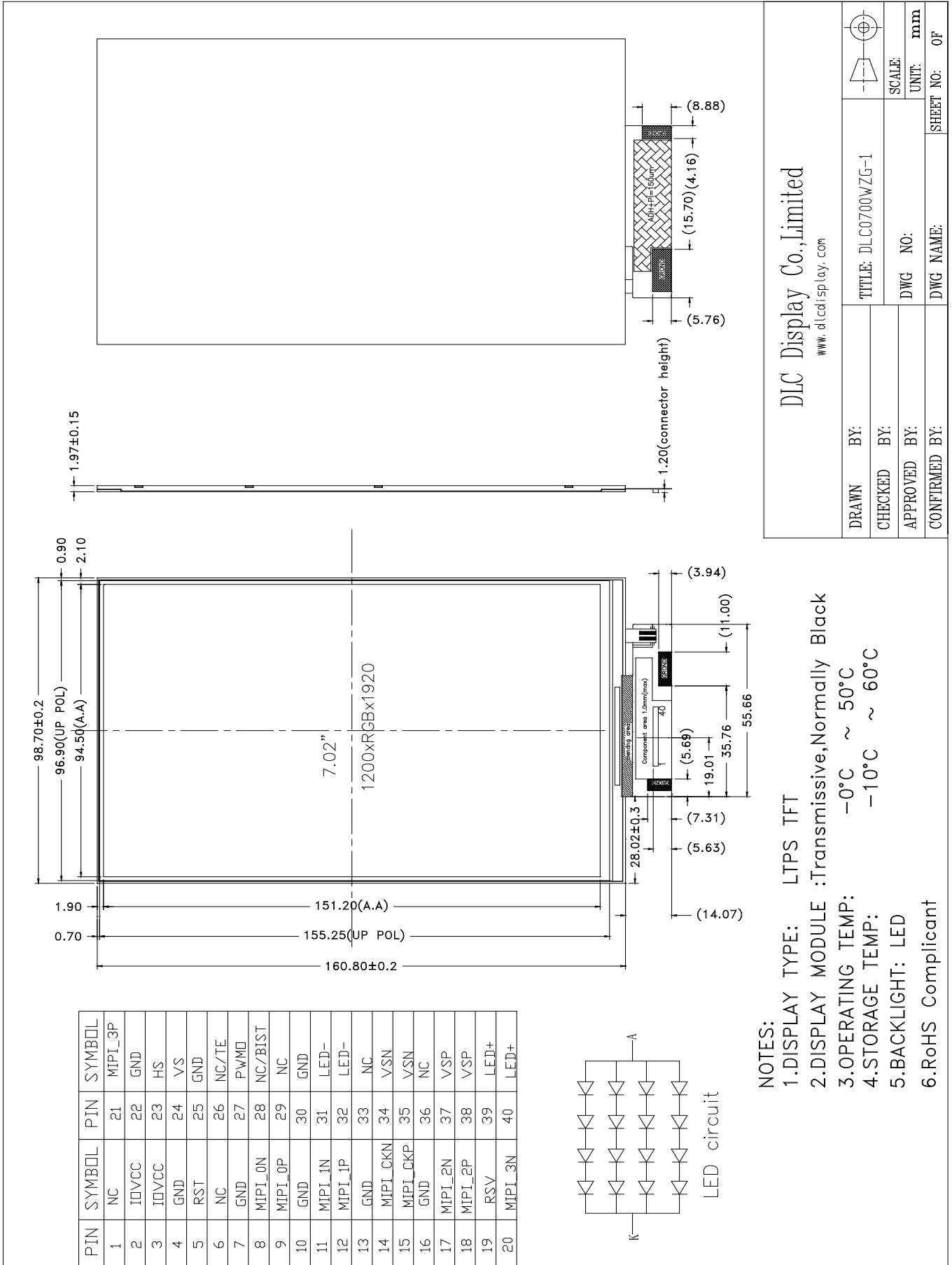
### 2. Application

Digital equipments which need color display, such as P.O.S, medical equipments and industrial equipments.

### 3. General Information

Item	Contents	Unit
Size	7.02	inch
Resolution	1200(RGB)x1920	/
Interface	MIPI	/
Technology type	LTPS TFT	/
Pixel pitch	0.07875x0.07875	mm
Pixel Configuration	R.G.B. Vertical Stripe	
Outline Dimension (W x H x D )	98.70x 160.80 x 1.97	mm
Active Area	94.5 x 151.2	mm
Display Mode	Transmissive, Normally Black	/
Backlight Type	LED	/
Weight	TBD	g

### 4. Outline Drawing



- NOTES:
- 1.DISPLAY TYPE: LTPS TFT
  - 2.DISPLAY MODULE :Transmissive,Normally Black
  - 3.OPERATING TEMP: -0°C ~ 50°C
  - 4.STORAGE TEMP: -10°C ~ 60°C
  - 5.BACKLIGHT: LED
  - 6.RoHS Complicant

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DRAWN BY:	TITLE: DLC0700WZG-1	SCALE:	UNIT: mm
CHECKED BY:		DWG NO:	
APPROVED BY:		DWG NAME:	
CONFIRMED BY:		SHEET NO:	OF

5. Interface signals

No	Symbol	Description	Remarks
1	NC	No connection.	
2	IOVCC	Power supply for system ,IOVCC=1.8V	
3	IOVCC	Power supply for system ,IOVCC=1.8V	
4	GND	GROUND	
5	RST	Device reset signal	
6	NC	No connection.	
7	GND	GROUND	
8	MIPI_0N	MIPI Negative data signal (-)	
9	MIPI_0P	MIPI Positive data signal (+)	
10	GND	GROUND	
11	MIPI_1N	MIPI Negative data signal (-)	
12	MIPI_1P	MIPI Positive data signal (+)	
13	GND	GROUND	
14	MIPI_CKN	MIPI Negative clock signal (-)	
15	MIPI_CKP	MIPI Positive clock signal (+)	
16	GND	GROUND	
17	MIPI_2N	MIPI Negative data signal (-)	
18	MIPI_2P	MIPI Positive data signal (+)	
19	GND	GROUND	
20	MIPI_3N	MIPI Negative data signal (-)	
21	MIPI_3P	MIPI Positive data signal (+)	
22	GND	GROUND	
23	HS	Horizontal scan Signal for touch	

24	VS	Vertical scan Signal for touch	
25	GND	GROUND	
26	NC/TE	Tearing effect output signal for NVM(OTP),Let it open when not in use	
27	PWMO	PWM control signal for LED driver (CABC)	
28	NC/BIST	Enables the Test Image Generation function,if not used,connect to ground	
29	NC	No connection.	
30	GND	GROUND	
31	LED-	LED cathode	
32	LED-	LED cathode	
33	NC	No connection.	
34	VSN	Analog supply negative voltage(-5~-6V)	
35	VSN	Analog supply negative voltage(-5~-6V)	
36	NC	No connection.	
37	VSP	Analog supply positive voltage (5~6V)	
38	VSP	Analog supply positive voltage (5~6V)	
39	LED+	LED anode	
40	LED+	LED anode	

Note : Connector Part No.: F62240-H1210B or equivalent

## 6. Electrical Specifications

### 6.1. Electrical characteristics

Parameter		Symbol	MIN	TYP	MAX	Unit	Remark
Power Supply Voltage for analog		VSP	5.3	5.5	5.7	V	
		VSN	-5.7	-5.5	-5.3	V	
Power supply voltage for Logic		IOVCC	1.70	1.80	1.90	V	
Input signal voltage(RES)		V <sub>IL</sub>	0	-	0.3*IOVCC	V	
		V <sub>IH</sub>	0.7*IOVCC	-	IOVCC	V	
Output signal voltage(TE)		V <sub>OL</sub>	0	-	0.2*IOVCC	V	
		V <sub>OH</sub>	0.8*IOVCC	-	IOVCC	V	
Input signal voltage(DSI)	Low level	V <sub>IL(DSI)</sub>	-500	-	550	mV	Low power receiver
	High level	V <sub>IH(DSI)</sub>	880	-	1350	mV	
	Input voltage	V <sub>CMRX</sub>	70	-	-	mV	High speed receiver
	Differential input low threshold	V <sub>IDTL</sub>	-70	-	-	mV	
	Differential input high threshold	V <sub>IDTH</sub>	-	-	70	mV	

Note:

The recommended operating condition refers to a range in which operation of this product is guaranteed. Should this range is exceeded, the operation cannot be guaranteed even if the values may be with the absolute maximum ratings. Accordingly, please make sure that the module is used within this range

### 6.2. Current Consumption

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Current for Driver	I <sub>IOVCC</sub>	--	12	--	mA	IOVCC=1.80V
	I <sub>VSP</sub>	--	10	--	mA	VSP=5.5V
	I <sub>VSN</sub>	--	10	--	mA	VSN=-5.5V

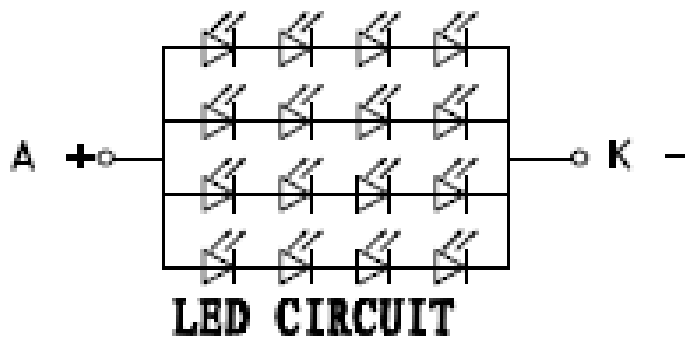


6.3.Environment Conditions

Item	Symbol	MIN	MAX	Unit	Remark
Operating Temperature	TOPR	0	50	°C	
Storage Temperature	TSTG	-10	60	°C	

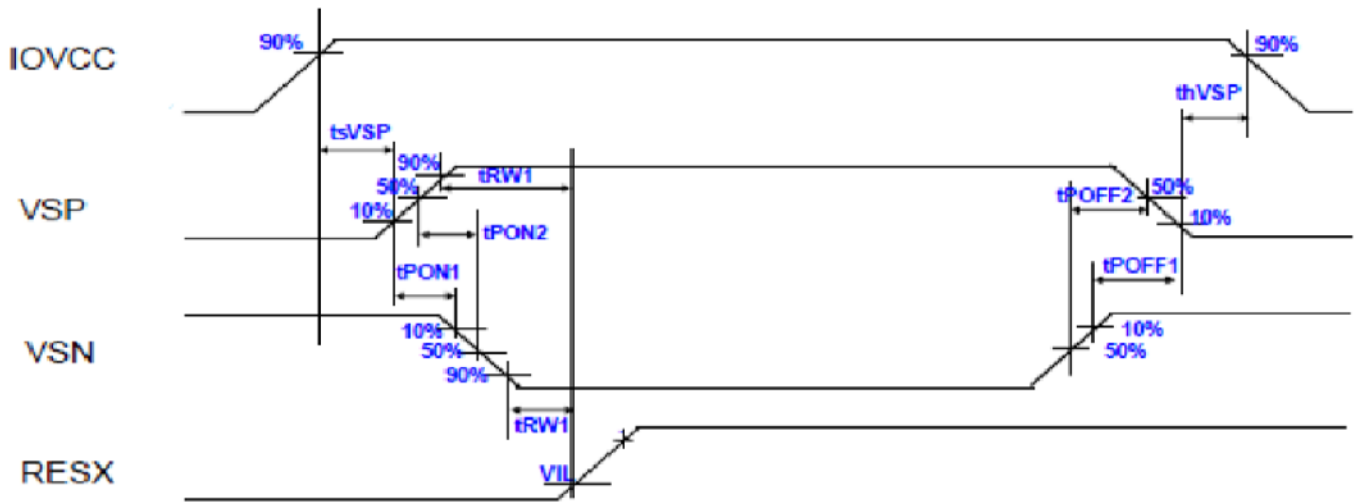
6.4. Driving Backlight

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Converter voltage	Vf	12.0	13.2	14.0	V	
Enable voltage	If	-	80	-	mA	
Life time	-	-	25,000	-	Hr	



## 7. Command/AC Timing

### Power Sequence



GND=0V, Ta=25°C

Item	Symbol	MIN	MAX	Unit	Remark
IOVCC on to VSP on time	tsVSP	1	-	ms	
VSP on to VSN on time	tPON1	0	-	ms	
VSN on to REST on time	tRW1	1	-	ms	-
VSN off to VSP off time	tPOFF1	0	-	ms	-
VSP off to IOVCC off time	thVSP	0	-	ms	-

## 8. Optical Specification

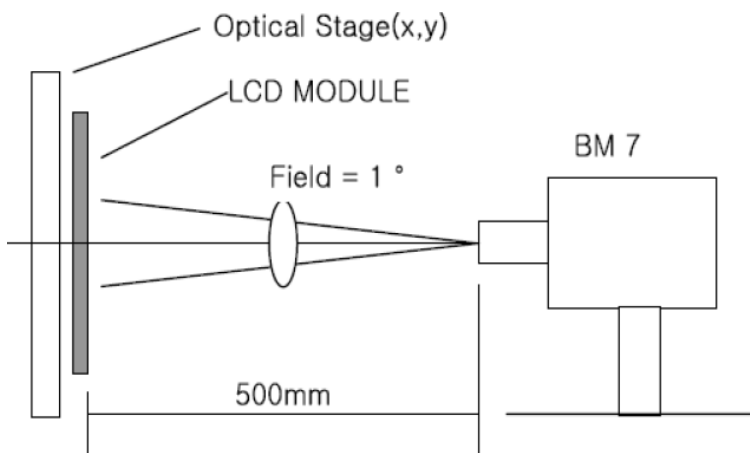
Ta=25°C

Item	Symbol	Condition	Min	Typ.	Max.	Unit	Remark
Contrast Ratio	CR	$\theta=0^\circ$	-	(1200)	-		Note1 Note2
Response Time	Ton/ Toff	25°C	-	TBD	-	ms	Note1 Note3
				TBD	-		
View Angles	$\theta T$	$CR \geq 10$	-	(89)	-	Degree	Note 4
	$\theta B$		-	(89)	-		
	$\theta L$		-	(89)	-		
	$\theta R$		-	(89)	-		
Chromaticity	W	Brightness is on	0.260	0.310	0.360		Note5, Note1
			0.280	0.330	0.380		
Luminance	L		-	300	-	cd/m <sup>2</sup>	Note1 Note6
NTSC	-	-	-	70	-	%	
Uniformity	U		75	-	-	%	Note1 Note7

Note 1: Definition of optical measurement system.

Temperature = 25°C(±3°C)

LED back-light: ON, Environment brightness < 150 lx

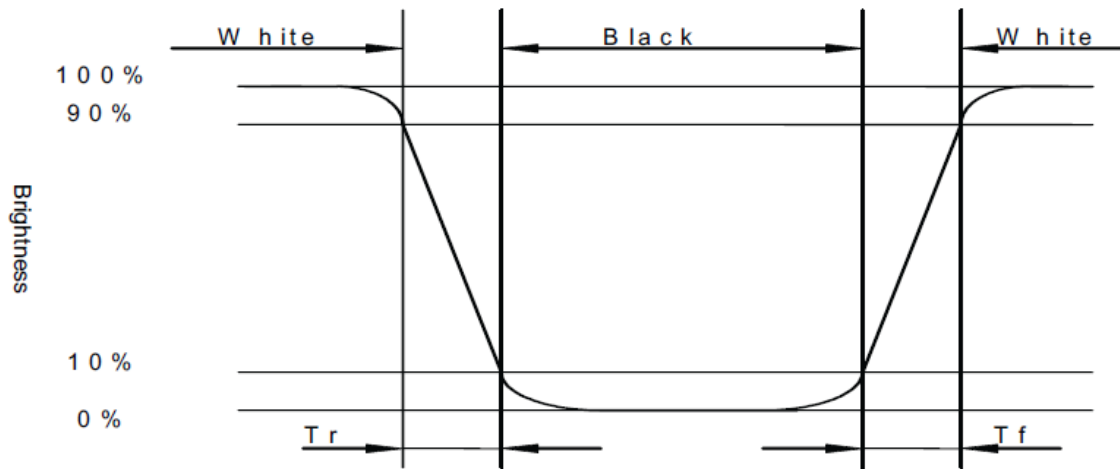


Note 2: Contrast ratio is defined as follow:

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

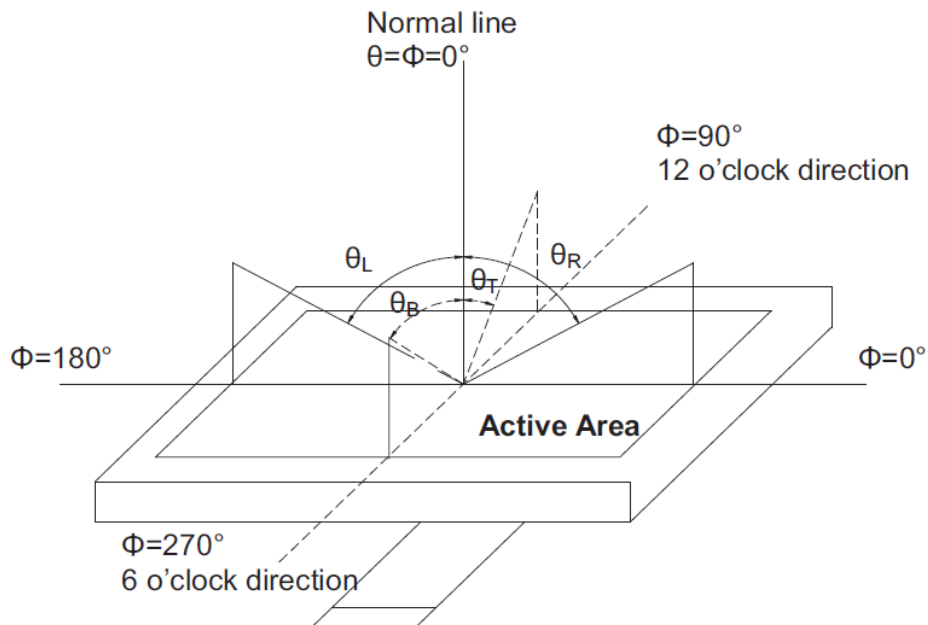
Note 3: Response time is defined as follow:

Response time is the time required for the display to transition from black to white (Rise Time,  $T_r$ ) and from white to black (Decay Time,  $T_f$ ).



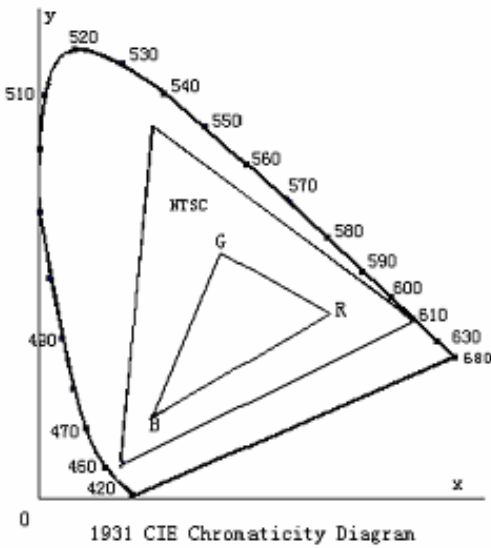
Note 4: Viewing angle range is defined as follow:

Viewing angle is measured at the center point of the LCD.



Note 5: Color chromaticity is defined as follow: (CIE1931)

Color coordinates measured at center point of LCD.



$$S = \frac{\text{area of RGB triangle}}{\text{area of NTSC triangle}} \times 100\%$$

Note 6: Luminance is defined as follow:

Luminance is defined as the brightness of all pixels “White” at the center of display area on optimum contrast.

Note 7: Luminance Uniformity is defined as follow:

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

$$\text{Uniformity}(U) = \frac{\text{Minimum Luminance(brightness) in 9 points}}{\text{Maximum Luminance(brightness) in 9 points}}$$

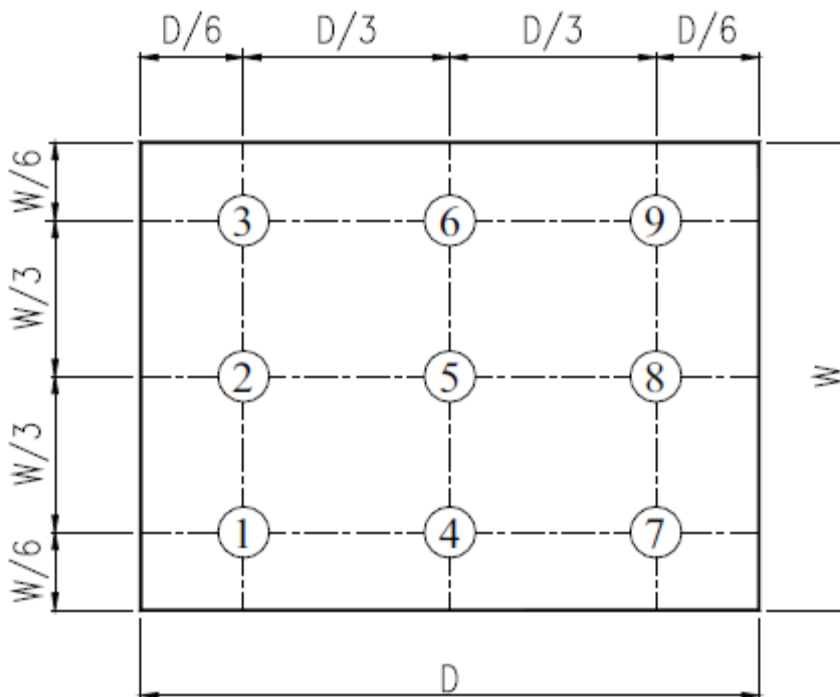


Fig. 2 Definition of uniformity

9. Environmental / Reliability Tests

No	Test Item	Condition	Judgment criteria
1	High Temp Operation	Ts=+50°C, 240hrs	Per table in below
2	Low Temp Operation	Ta=0°C, 240hrs	Per table in below
3	High Temp Storage	Ta=+60°C, 240hrs	Per table in below
4	Low Temp Storage	Ta=-10°C, 240hrs	Per table in below
5	High Temp & High Humidity Storage	Ta=+60°C, 90% RH 240 hours	Per table in below (polarizer discoloration is excluded)
6	Thermal Shock (Non-operation)	-0°C 30 min~+50°C 30 min, Change time:5min, 10 Cycles	Per table in below
7	ESD (Operation)	C=150pF, R=330Ω · 5points/panel Air:±8KV, 5times; Contact:±4KV, 5 times;	Per table in below
8	Vibration (Non-operation)	10Hz~150Hz, 100m/s <sup>2</sup> , 120min	Per table in below
9	Shock (Non-operation)	Half- sine wave, 300m/s <sup>2</sup> , 18ms	Per table in below
10	Package Drop Test	Height:80 cm, 1 corner, 3 edges, 6 surfaces	Per table in below

INSPECTION	CRITERION(after test)
Appearance	No Crack on the FPC, on the LCD Panel
Alignment of LCD Panel	No Bubbles in the LCD Panel No other Defects of Alignment in Active area
Electrical current	Within device specifications
Function / Display	No Broken Circuit, No Short Circuit or No Black line No Other Defects of Display

## 10. Precautions for Use of LCD Modules

### 10.1 Safety

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

### 10.2 Handling

- A. The LCD and touch panel is made of plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
- B. Do not handle the product by holding the flexible pattern portion in order to assure the reliability
- C. Transparency is an important factor for the touch panel. Please wear clear finger sacks, gloves and mask to protect the touch panel from finger print or stain and also hold the portion outside the view area when handling the touch panel.
- D. Provide a space so that the panel does not come into contact with other components.
- E. To protect the product from external force, put a covering lens (acrylic board or similar board) and keep an appropriate gap between them.
- F. Transparent electrodes may be disconnected if the panel is used under environmental conditions where dew condensation occurs.
- G. Property of semiconductor devices may be affected when they are exposed to light, possibly resulting in IC malfunctions.
- H. To prevent such IC malfunctions, your design and mounting layout shall be done in the way that the IC is not exposed to light in actual use.

### 10.3 Static Electricity

- A. Ground soldering iron tips, tools and testers when they are in operation.
- B. Ground your body when handling the products.
- C. Power on the LCD module before applying the voltage to the input terminals.
- D. Do not apply voltage which exceeds the absolute maximum rating.
- E. Store the products in an anti-electrostatic bag or container.

### 10.4 Storage

- A. Store the products in a dark place at  $+25^{\circ}\text{C} \pm 10^{\circ}\text{C}$  with low humidity (40% RH to 60% RH). Don't expose to sunlight or fluorescent light.
- B. Storage in a clean environment, free from dust, active gas, and solvent.

### 10.5 Cleaning

- A. Do not wipe the touch panel with dry cloth, as it may cause scratch.
- B. Wipe off the stain on the product by using soft cloth moistened with ethanol. Do not allow ethanol to get in between the upper film and the bottom glass. It may cause peeling issue or defective operation. Do not use any organic solvent or detergent other than ethanol.

### 10.6 Cautions for installing and assembling

Bezel edge must be positioned in the area between the Active area and View area. The bezel may press the touch screen and cause activation if the edge touches the active area. A gap of approximately 0.5mm is needed between the bezel and the top electrode. It may cause unexpected activation if the gap is too narrow. There is a tolerance of 0.2 to 0.3mm for the outside dimensions of the touch panel and tail. A gap must be made to absorb the tolerance in the case and connector.

