

DLC Display Co., Limited

德爾西顯示器有限公司



MODEL No: DLC0620BZP18RF-B-1

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Record of Revision

Date	Revision No.	Summary
2024-09-14	1.0	Rev 1.0 was issued

1. Scope

This data sheet is to introduce the specification of DLC0620BZP18RF-B-1 active matrix TFT module. It is composed of a color TFT-LCD panel, driver ICs, FPC, COVER Glass and a backlight unit. The 6.2'' display area contains 1024(RGB) x 600 pixels.

2. Application

Digital equipments which need color display, mobile navigator/video systems.

3. General Information

Item	Contents	Unit
Size	6.2	inch
Resolution	1024(RGB) x 600	/
Interface	RGB	/
Technology type	IPS	/
Pixel pitch	0.1342 x 0.1287	mm
Pixel Configuration	RGB stripes	
Outline Dimension (W x H x D)	152.81 x 104.01 x 7.05	mm
Active Area	137.47 x 77.23	mm
Display Mode	Transmissive, Normally black	/
Driver IC	JD9168S	/
Viewing Direction	ALL	/
Backlight Type	LED	/

5. Interface signals

Pin No.	Symbol	I/O	Function	Remark
1~2	VLED+	P	LED backlight Anode	
3~4	VLED-	P	LED backlight Cathode	
5	GND	P	Ground	
6	NC	-	No connection	
7	VDD	P	Power supply voltage	
8	NC	-	No connection	
9	DE	I	Data enable	
10	VS	I	Vertical synchronizing signal	
11	HS	I	Horizontal synchronizing signal	
12~19	B7~B0	I	Blue data signal	
20~27	G7~G0	I	Green data signal	
28~35	R7~R0	I	Red data signal	
36	GND	P	Ground	
37	DCLK	I	Pixel clock signal	
38	GND	P	Ground	
39	L/R	I	Source Right or Left sequence control	
40	U/D	I	Gate Up or Down scan control	
41	VPP	P	Not used. Let it open	
42	SDA	I	Serial data input / output pin in SPI interface operation	
43	CS	I	Chip select pin in SPI interface operation	
44	RESET	I	Global reset pin ("L" Active)	
45	SCL	I	Serial clock input in SPI interface	
46	NC	-	No connection	
47	STBYB	I	Standby mode. L=Standby Mode, H=Normal Mode	
48	GND	P	Ground	
49	NC	I	No connection	
50	NC	-	No connection	

6. Absolute maximum Ratings

6.1. Electrical Absolute max. ratings

Item	Symbol	MIN	MAX	Unit	Remark
Power supply voltage	VDD	-0.5	3.96	V	

6.2. Environment Conditions

Item	Symbol	MIN	MAX	Unit	Remark
Operating Temperature	TOPR	-30	80	°C	
Storage Temperature	TSTG	-40	85	°C	

7. Electrical Specifications

7.1 Electrical characteristics

Ta=25°C

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Power supply voltage	VDD	3.0	3.3	3.6	V	
Input logic high voltage	VIH	0.7*VDD	-	VDD	V	
Input logic low voltage	VIL	0	-	0.3*VDD	V	

7.2 LED Backlight

Ta=25°C

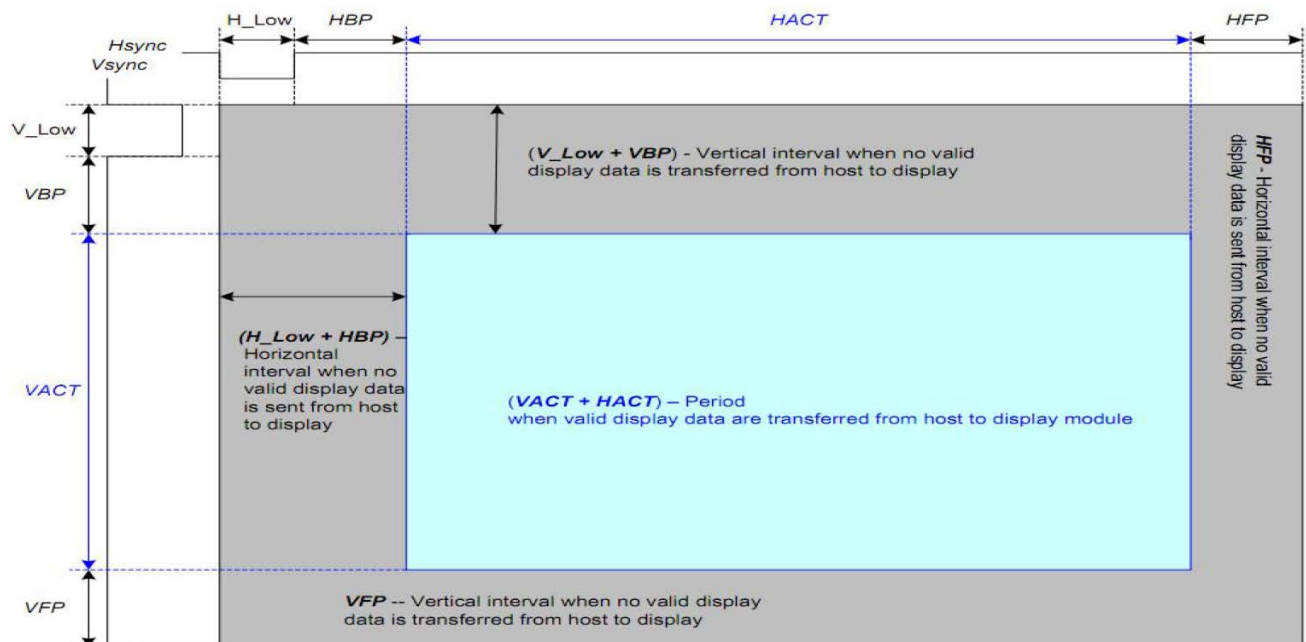
Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	IF	--	200	--	mA	
Forward Voltage	VF	16.2	18	19.2	V	
LED Life time	--	50,000	--	--	Hrs	Note

Note: The "LED life time" is defined as the module brightness decrease to 50% original brightness at Ta=25°C and IF= 200mA. The LED life time could be decreased if operating IF is larger than 200mA.

8. Command/AC Timing

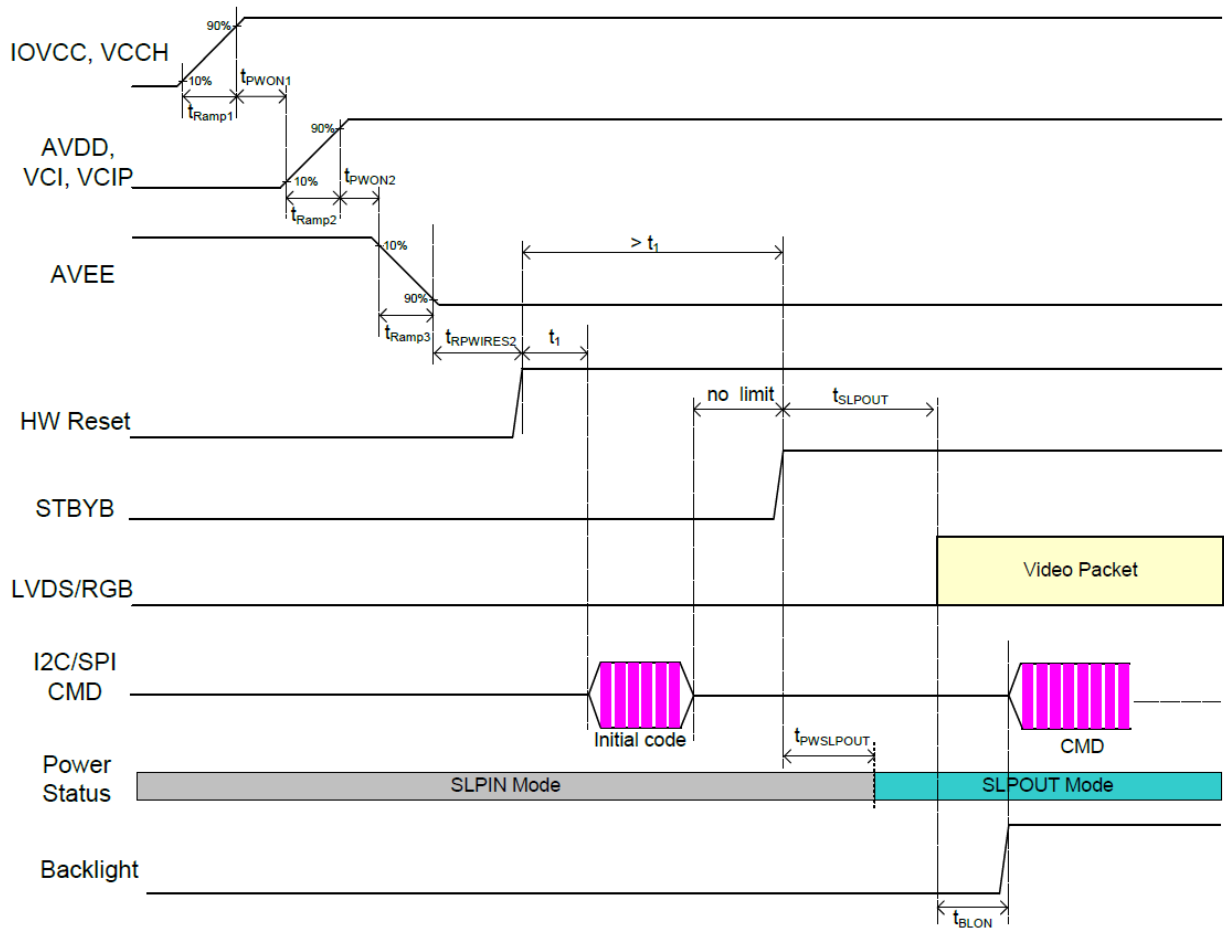
8.1 Timing Characteristics

Item		Symbol	Timing	Unit	
LCD	Frame Rate	-	(60)	Hz	
Timing	DCLK	Frequency	fclk	(45)	MHz
		Period	tclk	(22)	ns
	Horizontal	Horizontal total time	tHP	1180	tclk
		Horizontal Active time	tHACT	1024	tclk
		Horizontal Pluse Width	tHsync	20	tclk
		Horizontal Back Porch	tHBP	68	tclk
		Horizontal Front Porch	tHFP	68	tclk
	Vertical	Vertical total time	tvp	641	tclk
		Vertical Active time	tVACT	600	tclk
		Vertical Pluse Width	tVsync	8	tclk
		Vertical Back Porch	tVBP	21	tclk
		Vertical Front Porch	tVFP	12	tclk
	Differential Swing		VDswing	-	mV
	MIPI Clock		Mclk	-	Mbps
Pixel Format			(888)	Data bit/pixel	
Lane			-	Lane	

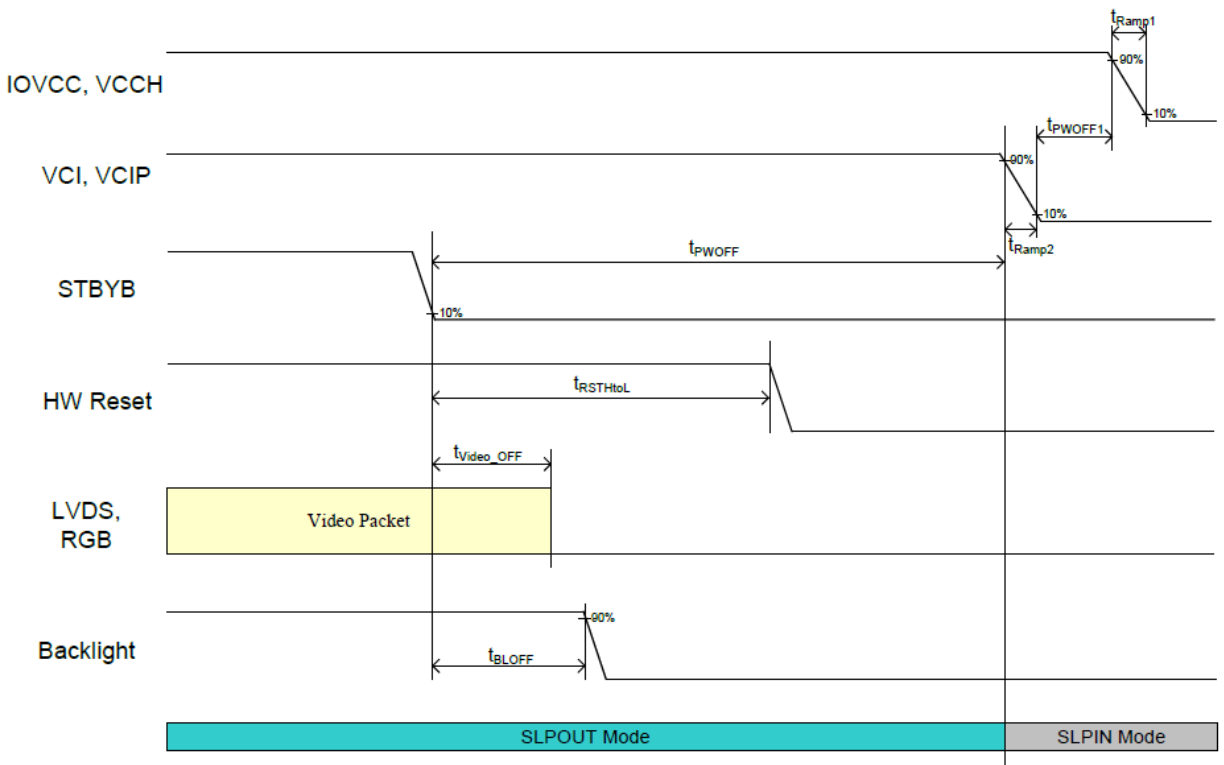


8.2 Power Sequence

8.2.1 Power On Sequence



8.2.2 Power Off Sequence



9. Optical Specification

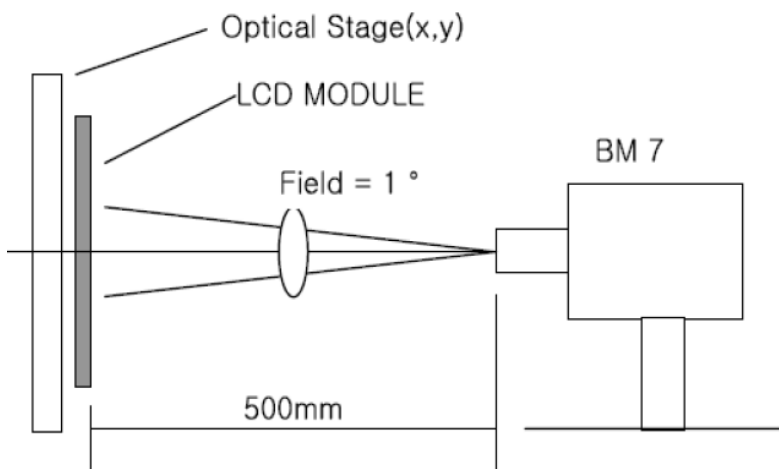
Ta=25°C

Item	Symbol	Condition	Min	Typ.	Max.	Unit	Remark
Contrast Ratio	CR	$\theta=\Phi=0^\circ$	800	1000	-		Note1 Note2
Response Time	Tr+Tf	25°C	--	30	35	ms	Note1 Note3
View Angles	θT	CR \geq 10	68	80-	--	Degree	Note 4
	θB		68	80	--		
	θL		68	80	--		
	θR		68	80	--		
Chromaticity	White	x	Brightness is on	Typ-0.05	0.290	Typ+0.05	Note5, Note1
		y			0.330		
	Red	x			TBD		
		y			TBD		
	Green	x			TBD		
		y			TBD		
	Blue	x			TBD		
		y			TBD		
Luminance	L		--	1500	--	cd/m ²	Note1 Note6
Uniformity	U		70	75	--	%	Note1 Note7

Note 1: Definition of optical measurement system.

Temperature = 25°C(±3°C)

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

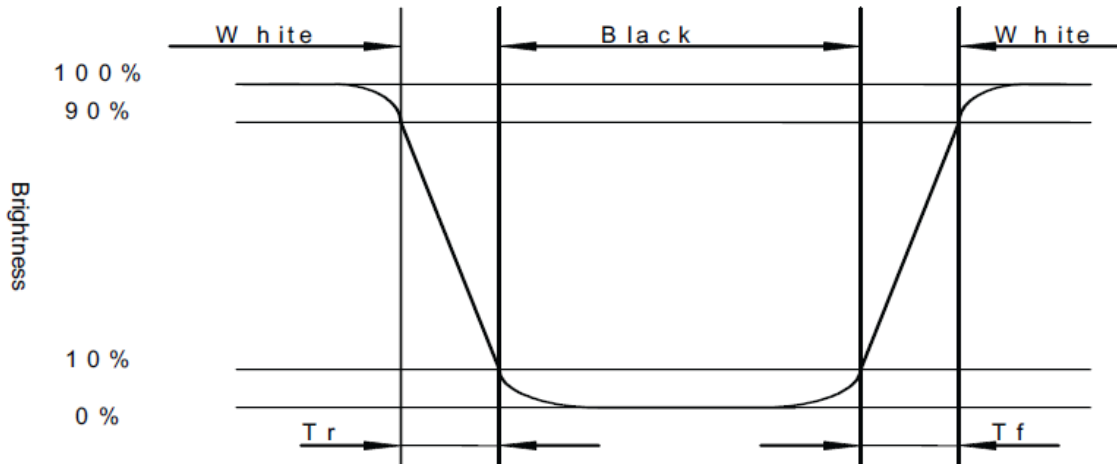


Note 2: Contrast ratio is defined as follow:

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

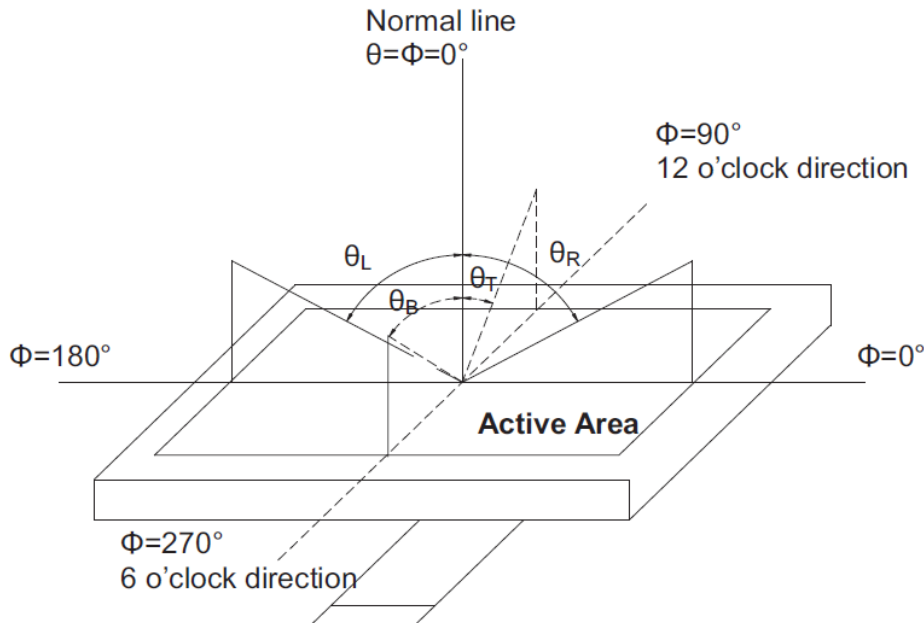
Note 3: Response time is defined as follow:

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).



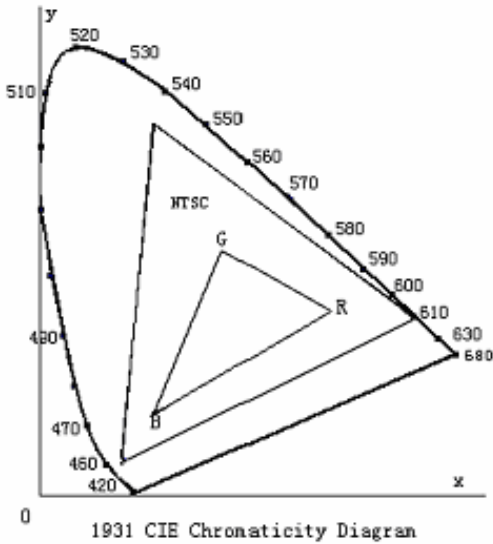
Note 4: Viewing angle range is defined as follow:

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.

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

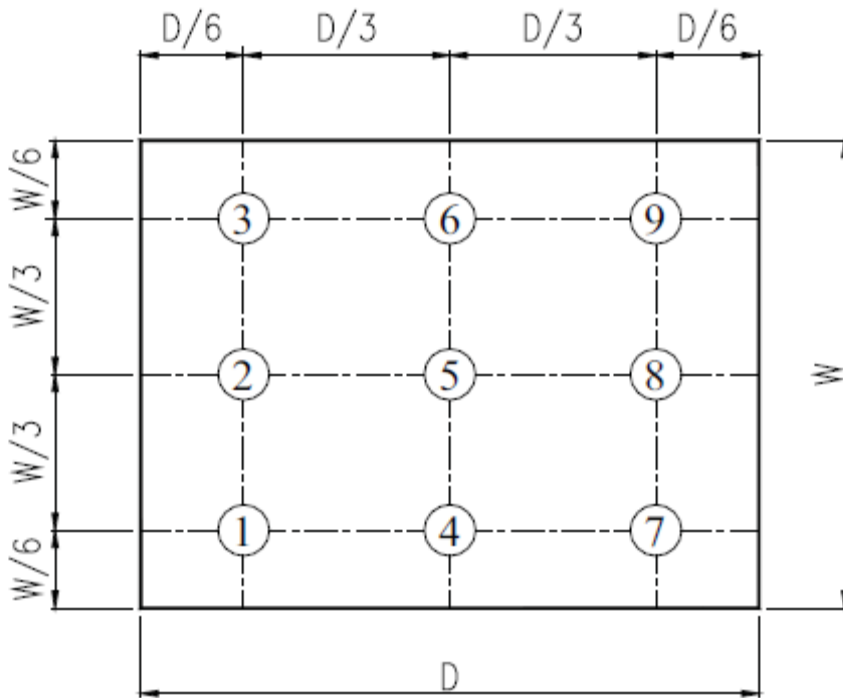


Fig. 2 Definition of uniformity

10. Environmental / Reliability Tests

No	Test Item	Condition	Judgment criteria
1	High Temp Operation	Ta= +80°C, 240hrs	Per table in below
2	Low Temp Operation	Ta= -30°C, 240hrs	Per table in below
3	High Temp Storage	Ta= +85°C, 240hrs	Per table in below
4	Low Temp Storage	Ta= -40°C, 240hrs	Per table in below
5	High Temp & High Humidity Storage	Ta= +60°C, 90% RH max, 240hours	Per table in below (polarizer discoloration is excluded)
6	Thermal Shock (Non-operation)	-30°C 30 min~+80°C 30 min, Change time:5min, 100 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)	Frequency range:10~55Hz, Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X.Y.Z.	Per table in below
9	Shock (Non-operation)	100G 6ms, ±X,±Y,±Z 3times, for each direction	Per table in below
10	Package Drop Test	Height:60 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

11. Precautions for Use of LCD Modules

11.1 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.

11.2 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.

11.3 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.

11.4 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.

11.5 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.

11.6 Cautions for installing and assembling

- A. 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.
- B. In order to make the display assembly stable and firm, DLC recommends to design some supporting at the display backside, especially for the display with tape-attached touch panel, such supporting is important and essential, or else, the display may drop-off from front after some period of time.
- C. Do not display the fixed pattern for a long time because it may develop image sticking due to the LCD structure. If the screen is displayed with fixed pattern, use a screen saver.

