DLC Display Co., Limited

德爾西顯示器有限公司

MODEL No: DLC0840CQQ00LF-1

TEL: 86-755-86029824

FAX: 86-755-86029827

E-MAIL: sales@dlcdisplay.com

WEB: www.dlcdisplay.com

Record of Revision

Date	Revision No.	Summary
2018-07-01	1.0	Rev 1.0 was issued

1. Scope

This data sheet is to introduce the specification of DLC0840CQQ00LF-1 active matrix TFT module. It is composed of a color TFT-LCD panel, driver IC, FPC and a backlight unit. The 8.4″ display area contains 1024(RGB) x 768 pixels.

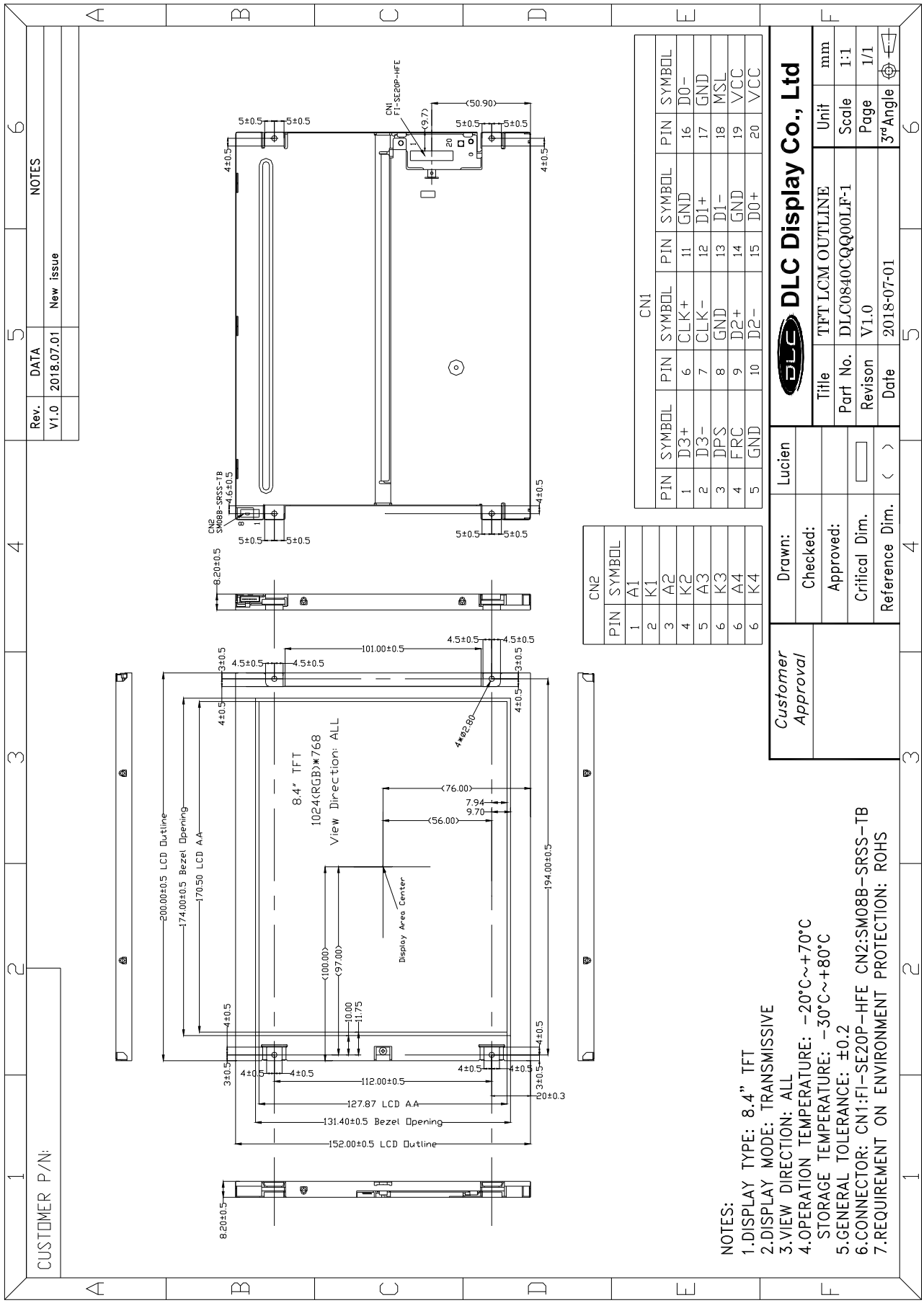
2. Application

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

3. General Information

Item	Contents	Unit
Size	8.4	inch
Resolution	1024(RGB) x 768	/
Interface	LVDS	/
Technology type	a-Si TFT	/
Pixel pitch	0.1665 x 0.1665	mm
Pixel Configuration	RGB stripes	
Outline Dimension (W x H x D)	200.0 x 152.0 x 8.2	mm
Active Area	170.496 x 127.872	mm
Display Mode	Transmissive	/
Viewing Direction	ALL	/
Backlight Type	LED	/
Weight	260	g

4. Outline Drawing



5. Interface signals

5.1 LCD Interface Signal (CN1):

CN1 socket: FI-SE20P-HFE (Japan Aviation Electronics Industry Limited(JAE)).
Adaptable plug: FI-S20S (Japan Aviation Electronics Industry Limited (JAE)).

Pin No.	Symbol	Function	Remark
1	D3+	Pixel data. Connect GND when using 6bit LVDS.	Note 1,2,3
2	D3-	Pixel data. Connect GND when using 6bit LVDS.	Note 1,2,3
3	DPS	Selection of scan direction High: Reverse scan Low or Open: Normal scan	Note 4
4	FRC	Selection of the number of colors High: 16,777,216 colors Low or Open: 262,144 colors	Note 3
5	GND	Ground	Note 2
6	CLK+	Pixel clock	Note 1
7	CLK-	Pixel clock	
8	GND	Ground	Note 2
9	D2+	Pixel data	Note 1
10	D2-	Pixel data	
11	GND	Ground	Note 2
12	D1+	Pixel data	Note 1
13	D1-	Pixel data	
14	GND	Ground	Note 2
15	D0+	Pixel data	Note 1
16	D0-	Pixel data	
17	GND	Ground	Note 2
18	MSL	Selection of LVDS input map	Note 3
19	VCC	Power supply	Note 2
20	VCC	Power supply	Note 2

Note 1: Twist pair wires with 100 (Characteristic impedance) should be used between LCD panel signal processing board and LVDS transmitter.
Note 2: All GND and VCC terminals should be used without any non-connected lines.
Note 3: See “8.2 Connection between receiver and transmitter for LVDS”.
Note 4: See”8.5 Scanning Direction”.

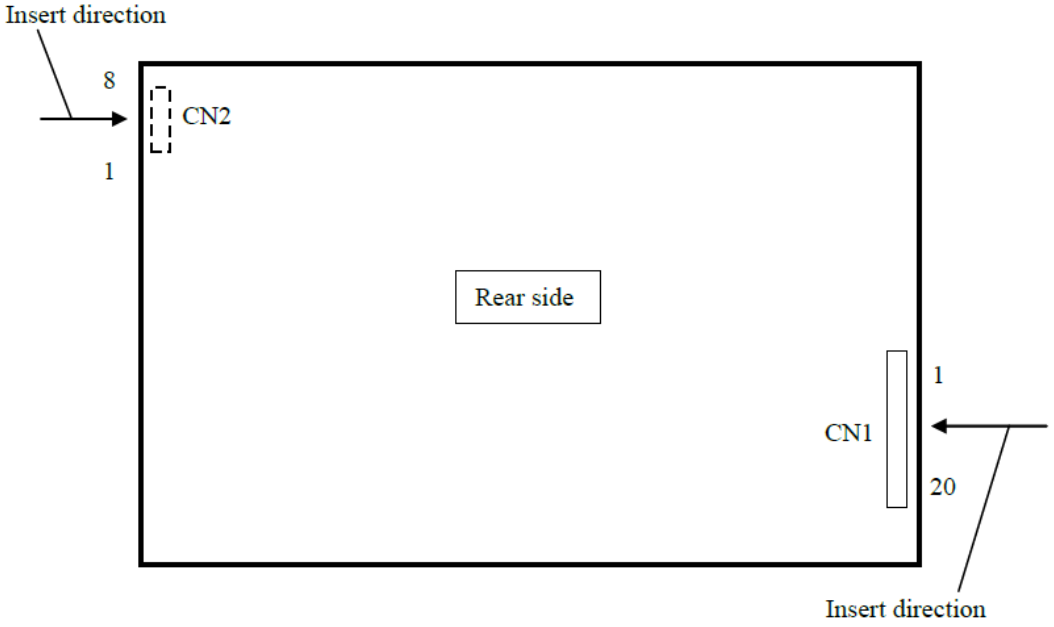
5.2 LED Backlight Interface Signal (CN2):

CN2 Plug: SM08B-SRSS-TB (J.S.T.Mfg.Co., Ltd)

Adaptable socket: SHR-08V-S, SHR-08V-S-B (J.S.T.Mfg.Co., Ltd)

Pin No.	Symbol	Function	Remark
1	A1	Anode1	
2	K1	Cathode1	
3	A2	Anode2	
4	K2	Cathode2	
5	A3	Anode3	
6	K3	Cathode3	
7	A4	Anode4	
8	K4	Cathode4	

Note: Positions of plug and socket



6. Absolute maximum Ratings

6.1. Electrical Absolute max. ratings Ta=25℃

Parameter	Symbol	MIN	MAX	Unit	Remark
Power supply voltage	VCC	-0.3	4.0	V	
Input voltage for signals	VD	-0.3	VCC+0.3	V	Display signal Note 1
	VF	-0.3	VCC+0.3	V	Function signal Note 2

Note1: Display signals are D0+/-, D1+/-, D2+/-, D3+/- and CLK+/-.

Note2: Function signals are DPS, FRC and MSL.

6.2. Environment Conditions

Item	Symbol	MIN	MAX	Unit	Remark
Operating Temperature	TOPR	-20	70	℃	
Storage Temperature	TSTG	-30	80	℃	

7. Electrical Specifications

7.1 Electrical characteristics

GND=0V, Ta=25℃

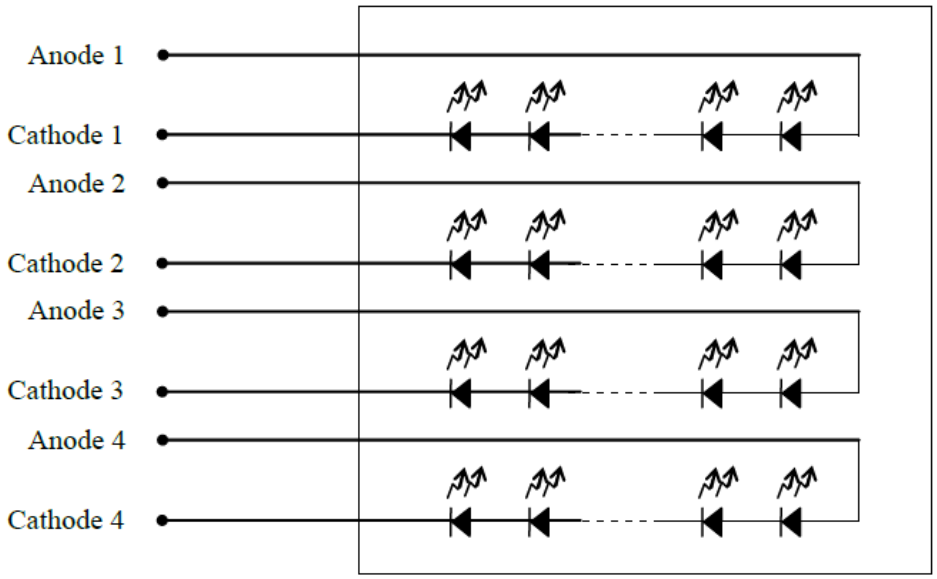
Item		Symbol	MIN	TYP	MAX	Unit	Remark
Power supply voltage		VCC	3.0	3.3	3.6	V	
Permissible ripple voltage		VRP	-	-	100	mVp-p	for VCC
Differential input Threshold voltage	High	VTH	-	-	+100	mV	at VCM=1.2V
	Low	VTL	-100	-	-	mV	
Terminating resistance		RT	-	100	-	Ω	
Input voltage for DPS,FRC and MSL signals	High	VFH	0.7*VCC	-	VCC	V	CMOS level
	Low	VFL	0	-	0.3*VCC	V	
Input current for FRC and MSL signals	High	IFH	-	-	300	μA	
	Low	IFL	-300	-	-	μA	

7.2 LED Backlight

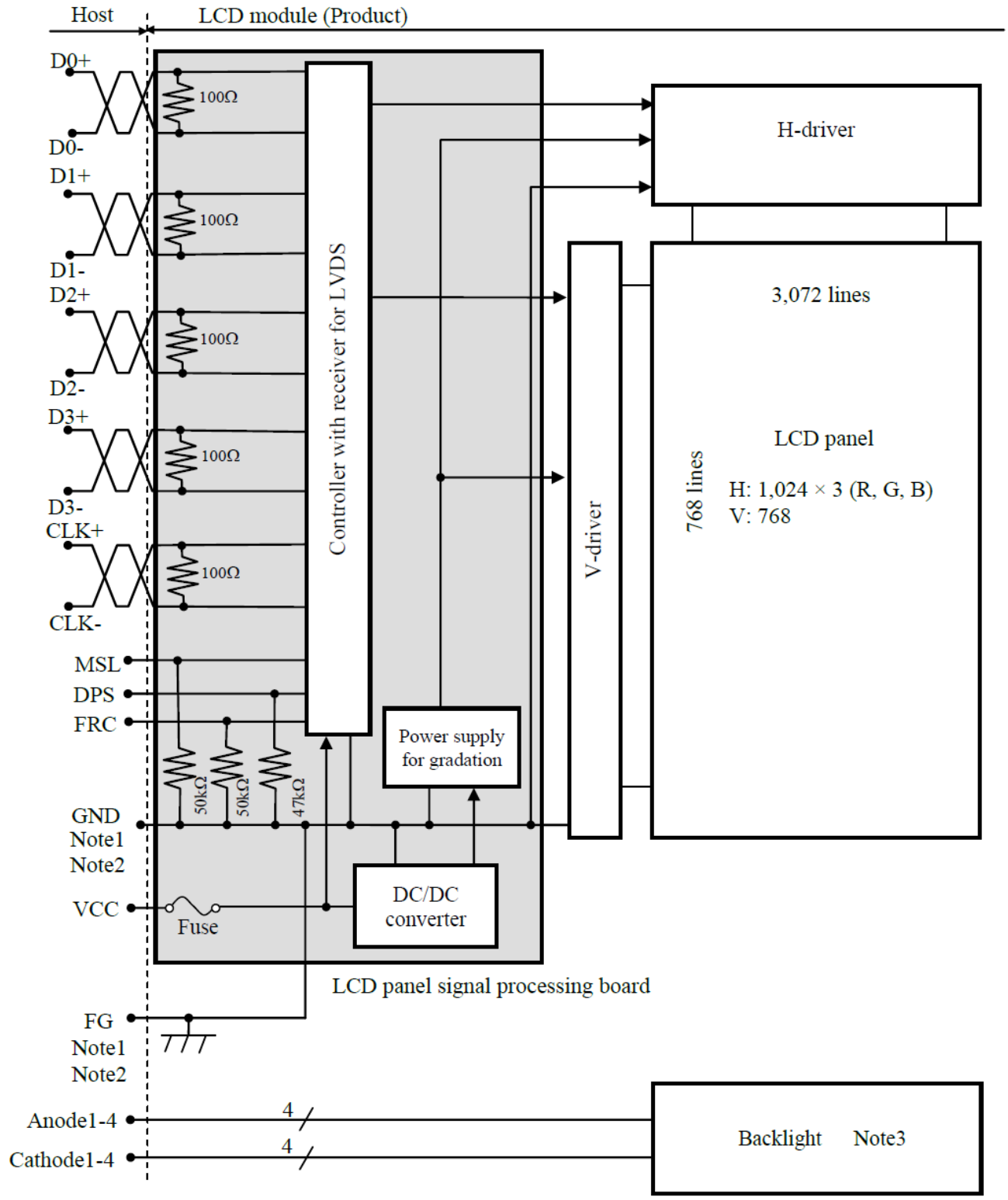
Ta=25℃

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Voltage for LED backlight	VL	18.6	21.0	23.8	V	Note1
Current for LED backlight	IL	-	50.0	55.0	mA	
LED Life time		-	100,000	-	Hrs	Note2

Note 1: The LED Supply Voltage is defined by the number of LED at Ta=25℃and IL =50mA.
Note 2: The luminance lifetime is the time from initial luminance to half-luminance. This lifetime is the estimated value, and is not guarantee value.



7.3 Block Diagram



Note1: Relations between GND (Signal ground), GNDB (LED driver ground) and FG (Frame ground) in the LCD module are as follow.

GND-FG	**Connected**

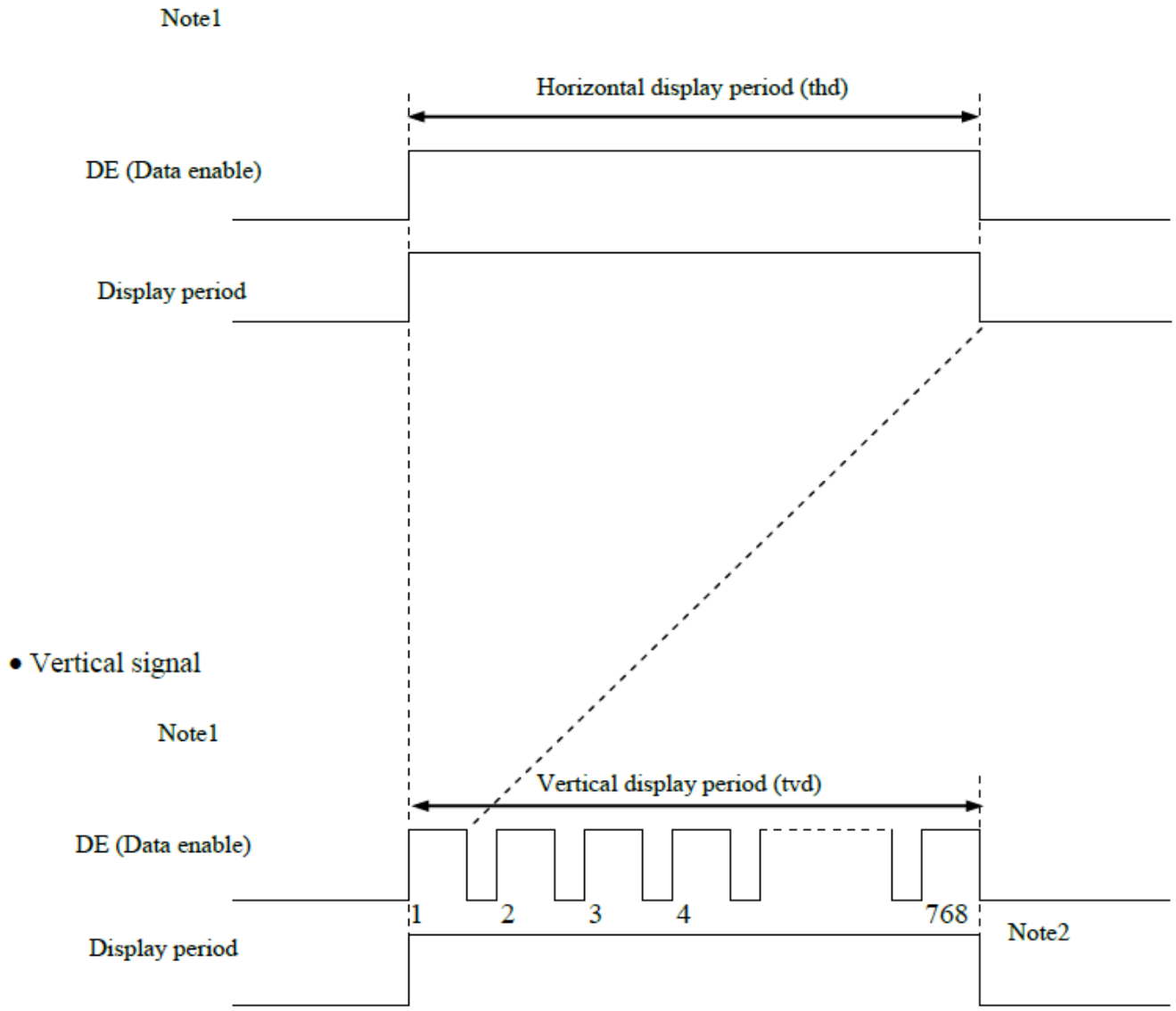
Note2: GND and FG must be connected to customer equipment's ground, and it is recommended that these grounds be connected together in customer equipment.

8. Command/AC Timing

8.1 Input Signal Timings

8.1.1 Outline of input signal timings

• Horizontal signal



Note1: This diagram indicates virtual signal for set up to timing.

Note2: See "8.1.3 Input signal timing chart" for the pulse number.

8.1.2 Timing characteristics

Parameter			Symbol	Min.	Typ.	Max.	Unit	Remarks
CLK	Frequency		1/tc	60.0	65.0	68.0	MHz	15.385 ns (typ.)
	Duty		-	-			-	-
	Rise time, Fall time		-				ns	
DATA	CLK-DATA	Setup time	-	-			ns	-
		Hold time	-				ns	
	Rise time, Fall time		-				ns	

DE	Horizontal	Cycle	th	19.67	20.676	22.4	us	48.363 kHz (typ)
				-	1344	-	CLK	
		Display period	thd	1024			CLK	
	Vertical (One frame)	Cycle	tv	13.3	16.666	18.5	ms	60.0Hz (typ.)
				780	806	-	H	
		Display period	tvd	768			H	
	CLK-DE	Setup time	-	-			ns	-
		Hold time	-				ns	
	Rise time, Fall time		-				ns	

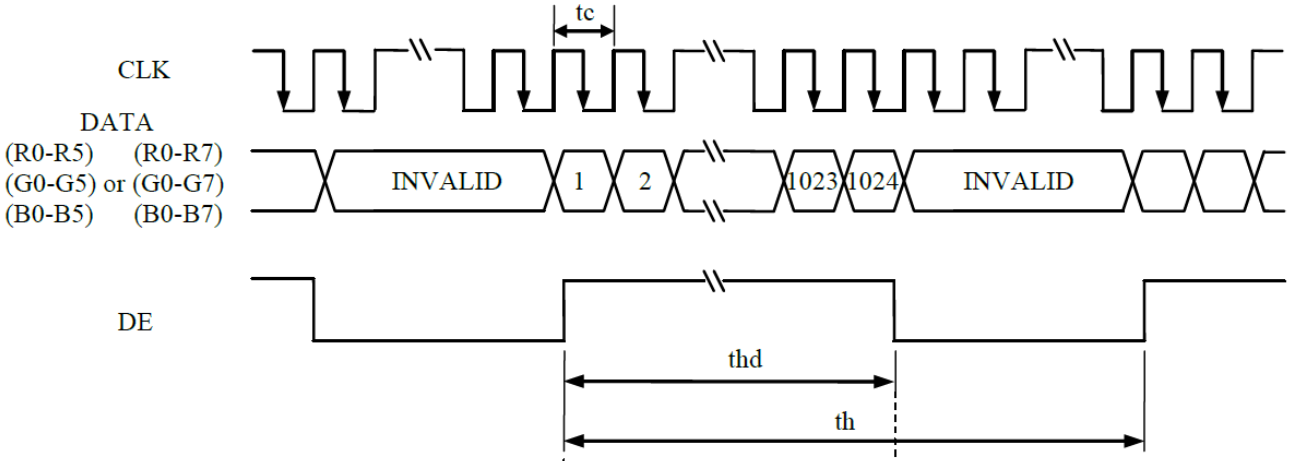
Note1: Definition of parameters is as follows. tc= 1CLK, th= 1H

Note2: See the data sheet of LVDS transmitter.

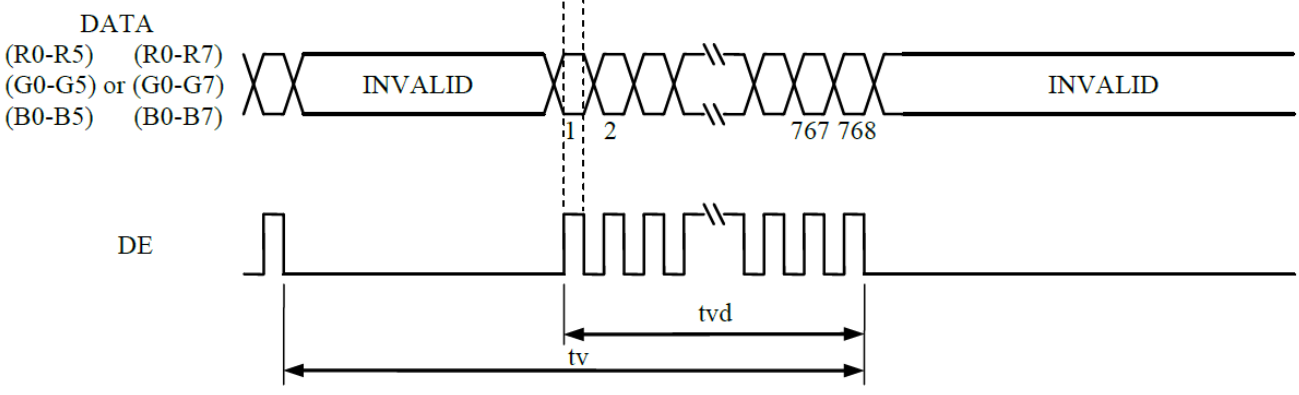
Note3: Vertical cycle (tv) should be specified in integral multiple of Horizontal cycle (th).

8.1.3 Input Signal timing chart

Horizontal timing

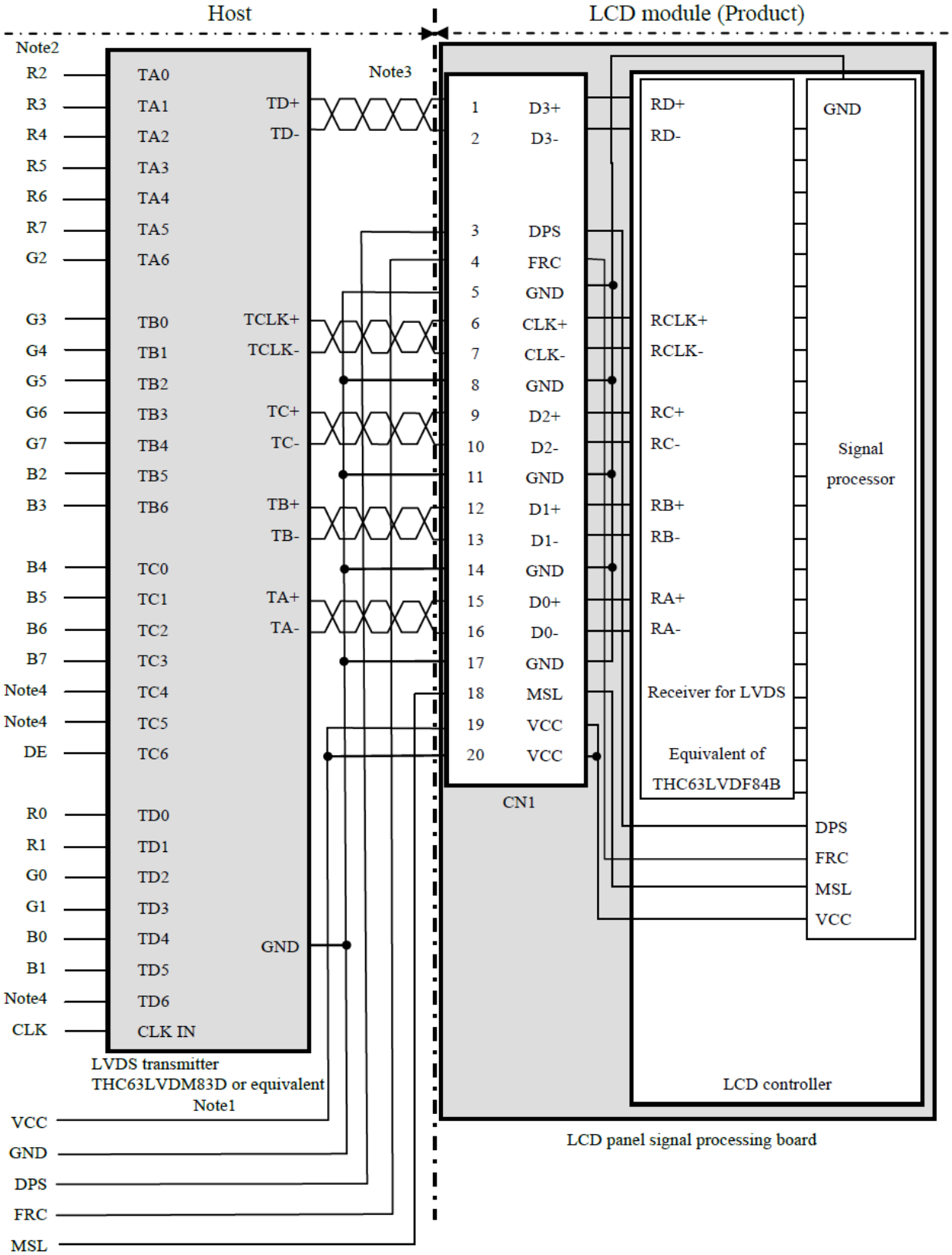


Vertical timing



8.2 Connection between receiver and transmitter for LVDS

(1) Input data signal: 8bit, MAP A



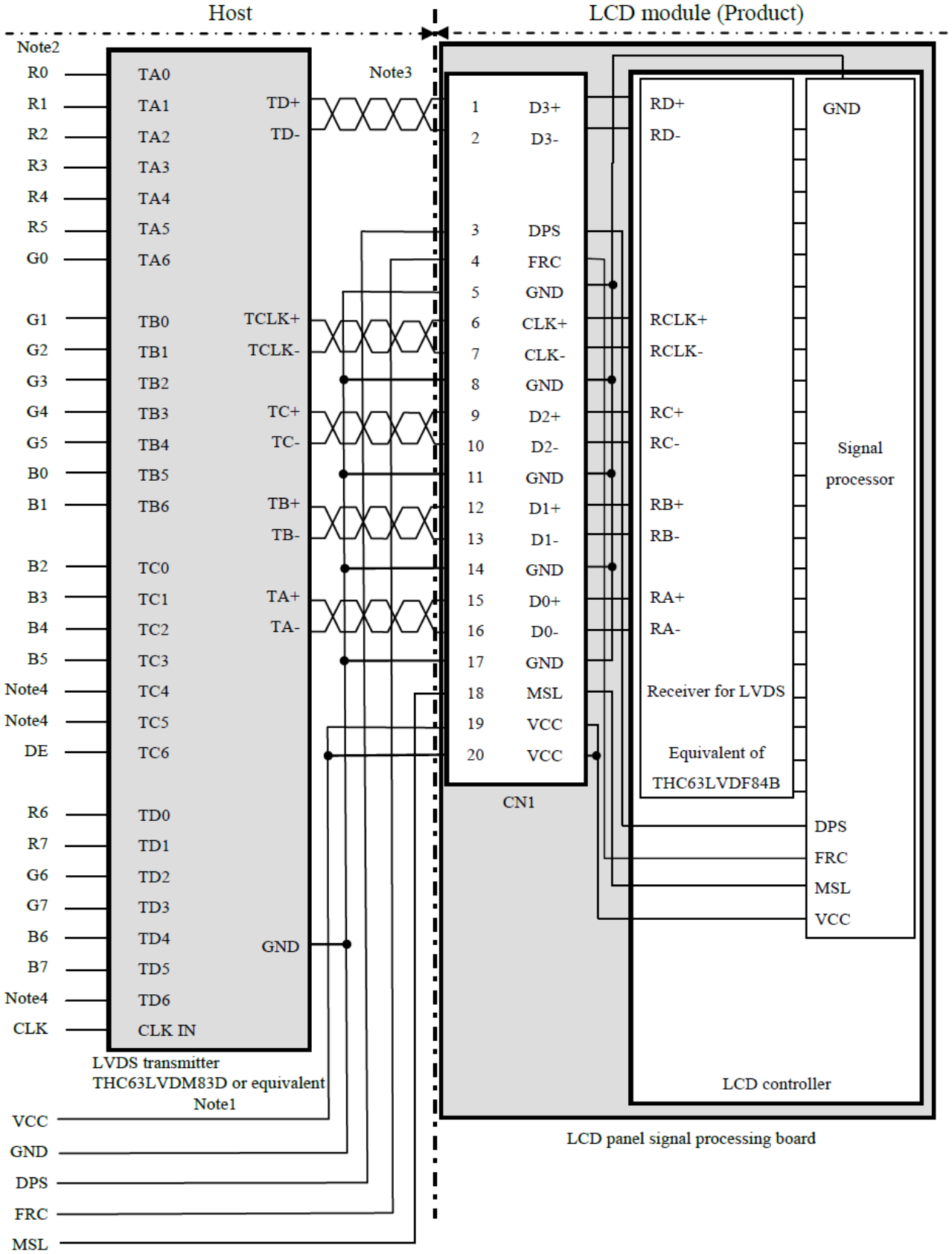
Note1: Recommended transmitter THC63LVDM83D (Thine Electronics Inc.) or equivalent.

Note2: LSB (Least Significant Bit) - R0, G0, B0 MSB (Most Significant Bit) - R7, G7, B7.

Note3: Twist pair wires with 100 (Characteristic impedance) should be used between LCD panel signal processing board and LVDS transmitter.

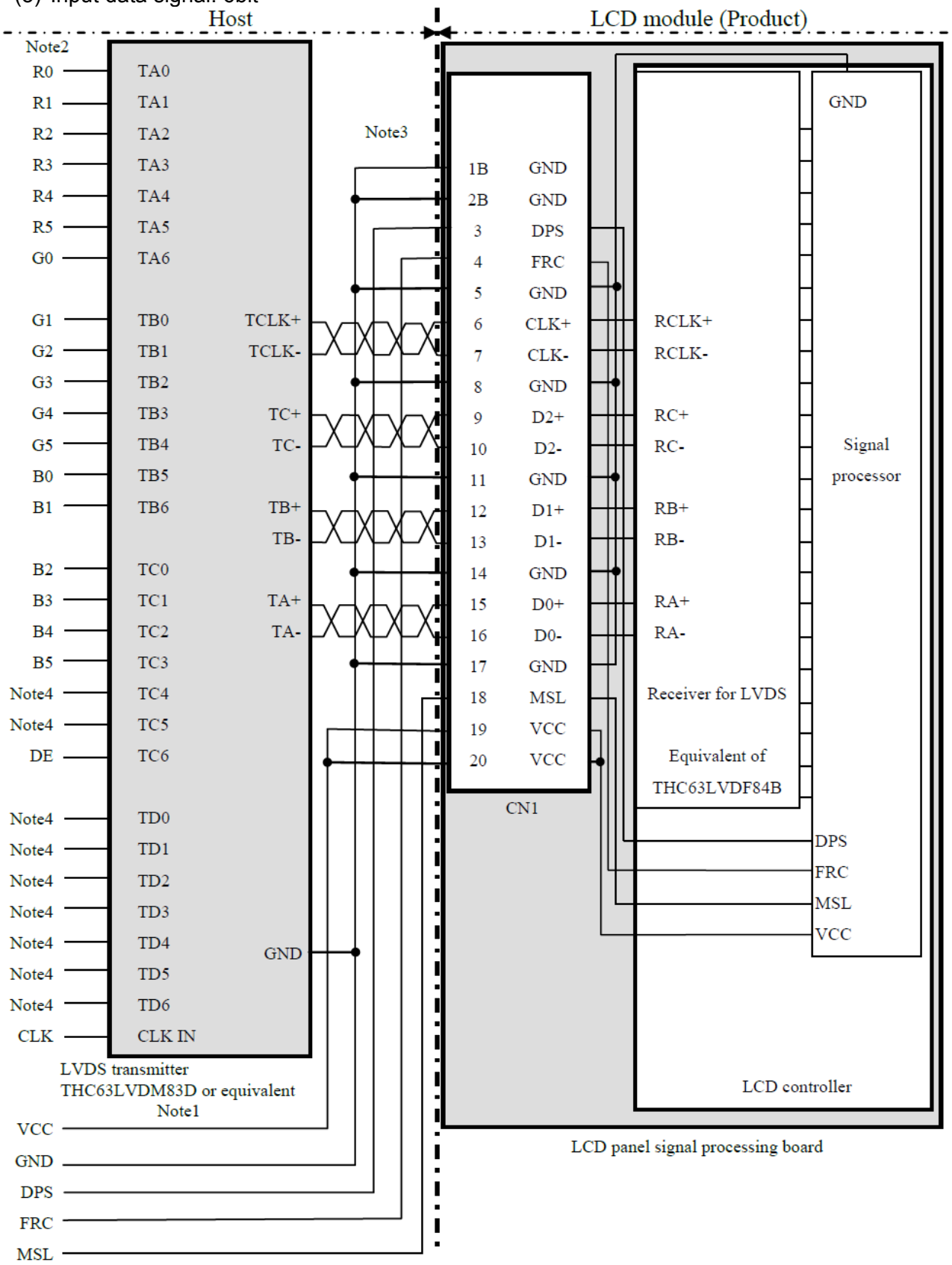
Note4: Input signals to TC4, TC5 and TD6 are not used inside the product, but do not keep TC4, TC5 and TD6 open to avoid noise problem.

(2) Input data signal: 8bit, MAP B



Note1: Recommended transmitter THC63LVDM83D (Thine Electronics Inc.) or equivalent.
Note2: LSB (Least Significant Bit) - R0, G0, B0 MSB (Most Significant Bit) - R7, G7, B7.
Note3: Twist pair wires with 100 (Characteristic impedance) should be used between LCD panel signal processing board and LVDS transmitter.
Note4: Input signals to TC4, TC5 and TD6 are not used inside the product, but do not keep TC4, TC5 and TD6 open to avoid noise problem.

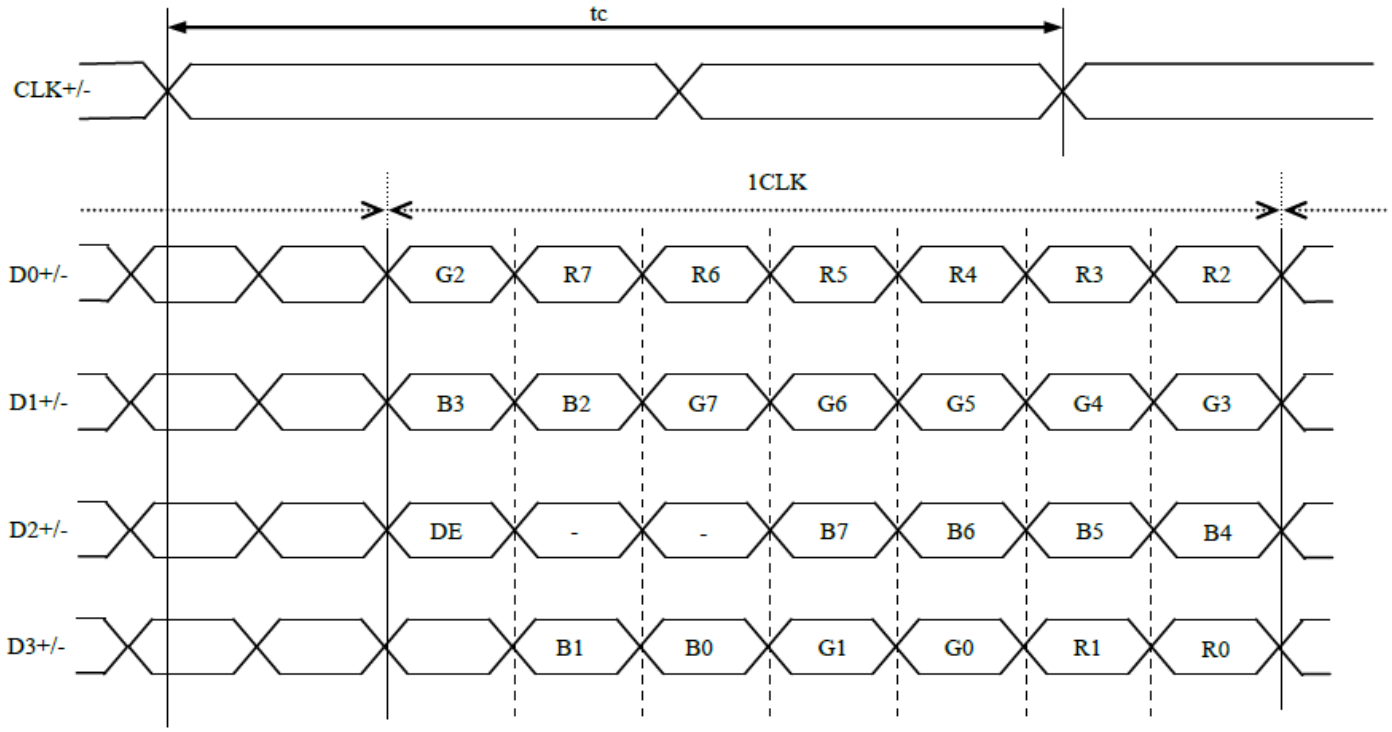
(3) Input data signal: 6bit



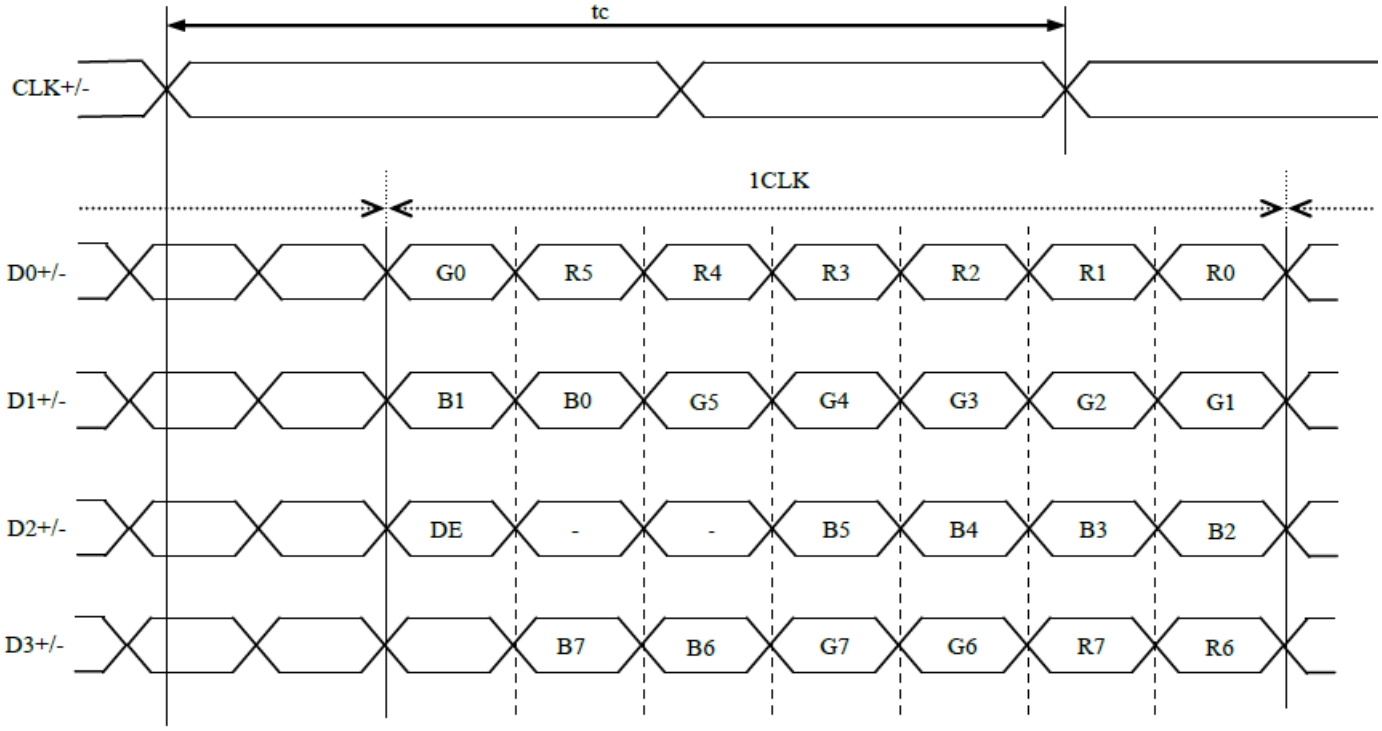
Note1: Recommended transmitter THC63LVDM83D (Thine Electronics Inc.) or equivalent.
Note2: LSB (Least Significant Bit) - R0, G0, B0 MSB (Most Significant Bit) – R5, G5, B5.
Note3: Twist pair wires with 100 (Characteristic impedance) should be used between LCD panel signal processing board and LVDS transmitter.
Note4: Input signals to TC4, TC5 and TD0-6 are not used inside the product, but do not keep TC4, TC5 and TD0-6 open to avoid noise problem.

8.3 Input Data Mapping

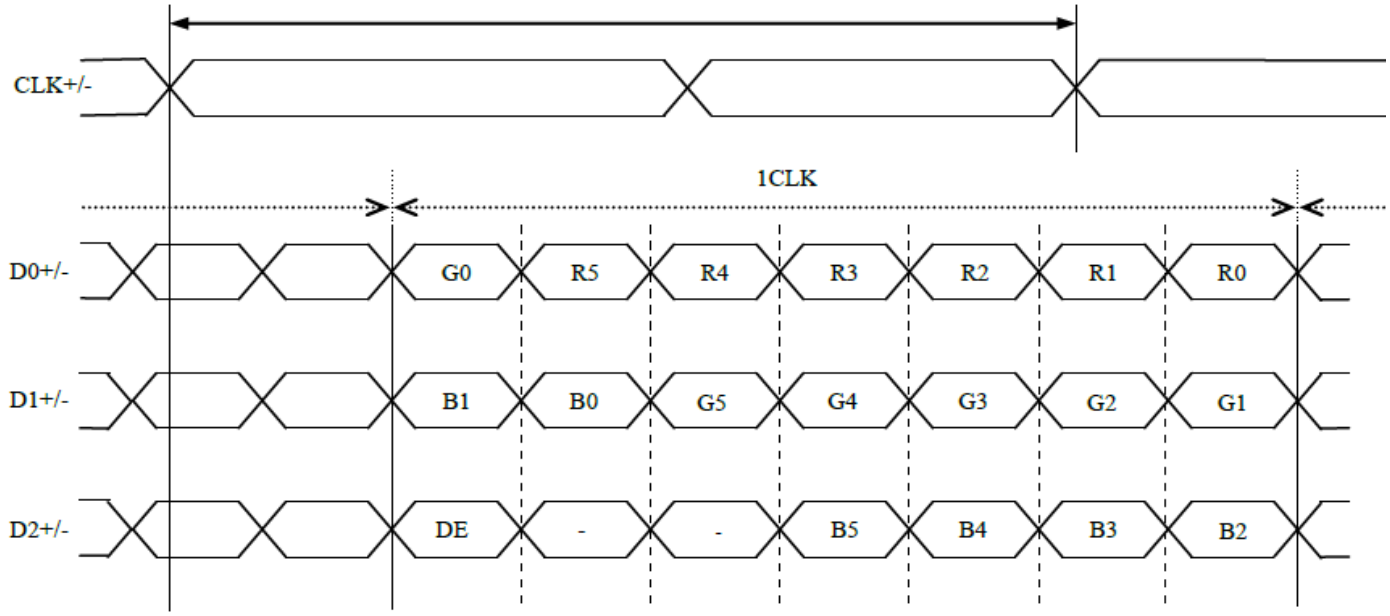
(1) Input data signal: 8bit, MAP A



(2) Input data signal: 8bit, MAP B



(3) Input data signal: 6bit



8.4 Display Colors And Input Data Signals

8.4.1 Combinations of input data signals, FRC and MSL signal

This product can display 16,777,216 colors equivalent with 256 gray scales and 262,144 colors with 64 gray scales by combination of input data signals, FRC and MSL signal. See the following table.

Combination	Input data signals	Input data mapping	CN1-Pin No.1 and 2	FRC terminal	MSL terminal	Display colors	Remarks
1	8 bit	MAP A	D3+/-	High	Low	16,777,216	Note1
2	8 bit	MAP B	D3+/-	High	High	16,777,216	Note1
3	6 bit	-	GND	Low or Open	Low	262,144	Note2

Note1: See "8.4.2 16,777,216 colors".

Note2: See "8.4.3 262,144 colors".

8.4.2 16,777,216 Colors

This product can display 16,777,216 colors equivalent with 256 gray scales by combination 1 or 2. (See "8.4.1 Combinations of input data signals, FRC and MSL signal".)

Also the relation between display colors and input data signals is as follows.

Display colors		Data signal (0: Low level, 1: High level)																									
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Red gray scale	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	dark	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	↑					:								:								:			
	↓					:								:								:			
	bright	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green gray scale	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	↑					:								:								:			
	↓					:								:								:			
	bright	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Blue gray scale	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	↑					:								:								:			
	↓					:								:								:			
	bright	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

8.4.3 262,144 Colors

This product can display 262,144 colors with 64 gray scales by combination 3. (See "8.4.1 Combinations of input data signals, FRC and MSL signal ".)

Also the relation between display colors and input data signals is as follows.

Display colors		Data signal (0: Low level, 1: High level)																	
		R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0
Basic colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Red gray scale	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	dark	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	↑				:						:						:		
	↓				:						:						:		
	bright	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
		1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Green gray scale	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	dark	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	↑				:						:						:		
	↓				:						:						:		
	bright	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0
		0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
Blue gray scale	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	↑				:						:						:		
	↓				:						:						:		
	bright	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1
		0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1

8.5 Scanning Directions

The following figures are seen from a front view.

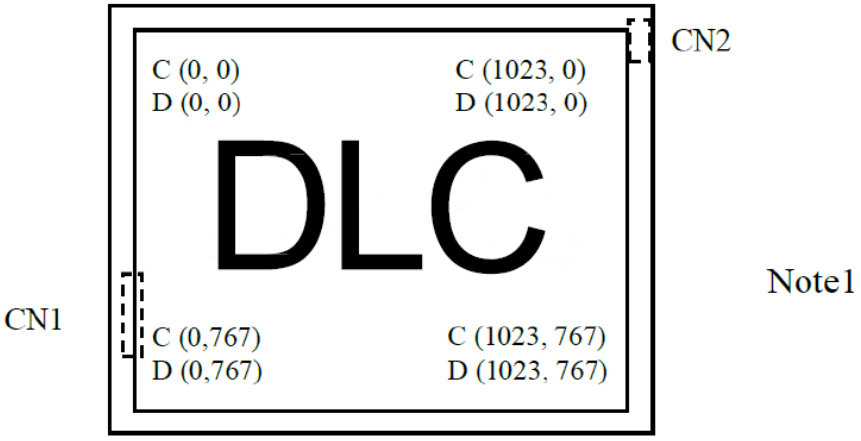


Figure: Normal scan (DPS: Low or Open)

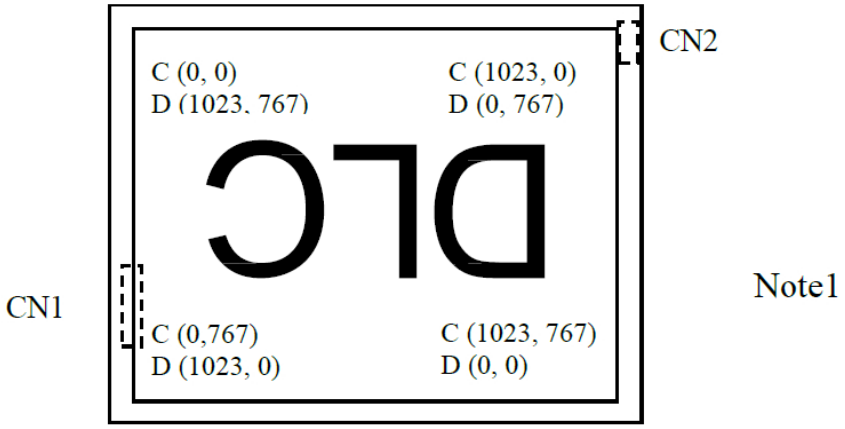


Figure: Reverse scan (DPS: High)

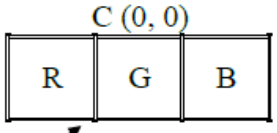
Note1: Meaning of C (X, Y) and D (X, Y)

C (X, Y): The coordinates of the display position (See "8.6 DISPLAY POSITIONS".)

D (X, Y): The data number of input signal for LCD panel signal processing board

8.6 Display Positions

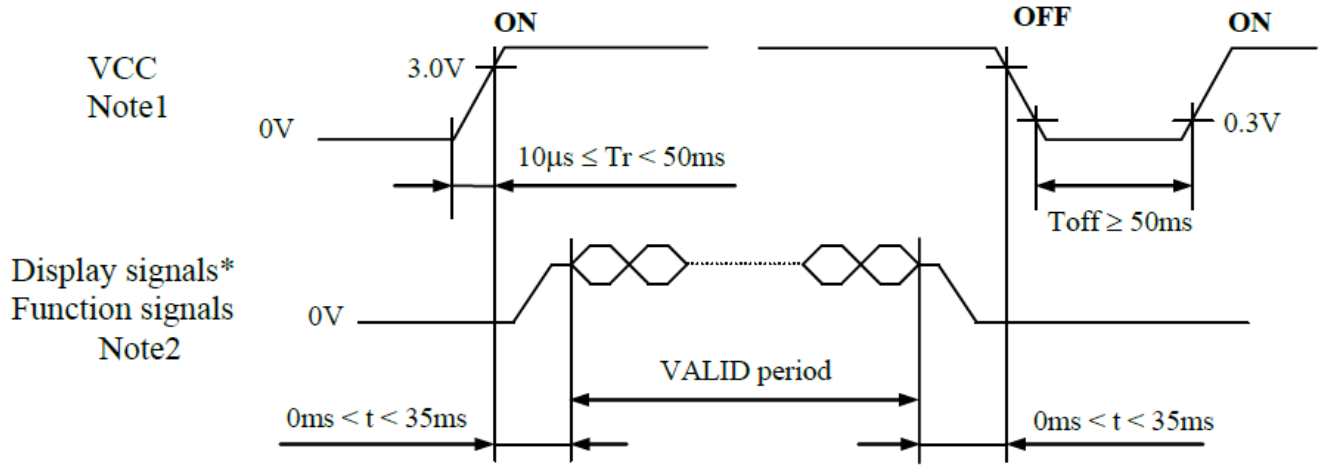
The following table is the coordinates per pixel (See "8.5 SCANNING DIRECTIONS".).



C(0, 0)	C(1, 0)	• • •	C(X, 0)	• • •	C(1022, 0)	C(1023, 0)
C(0, 1)	C(1, 1)	• • •	C(X, 1)	• • •	C(1022, 1)	C(1023, 1)
•	•	•	•	•	•	•
•	•	• • •	•	• • •	•	• • •
•	•	•	•	•	•	•
C(0, Y)	C(1, Y)	• • •	C(X, Y)	• • •	C(1022, Y)	C(1023, Y)
•	•	•	•	•	•	•
•	•	• • •	•	• • •	•	•
•	•	•	•	•	•	•
C(0, 766)	C(1, 766)	• • •	C(X, 766)	• • •	C(1022, 766)	C(1023, 766)
C(0, 767)	C(1, 767)	• • •	C(X, 767)	• • •	C(1022, 767)	C(1023, 767)

8.7 Power Supply Voltage Sequence

8.7.1 LCD Panel Signal Processing Board



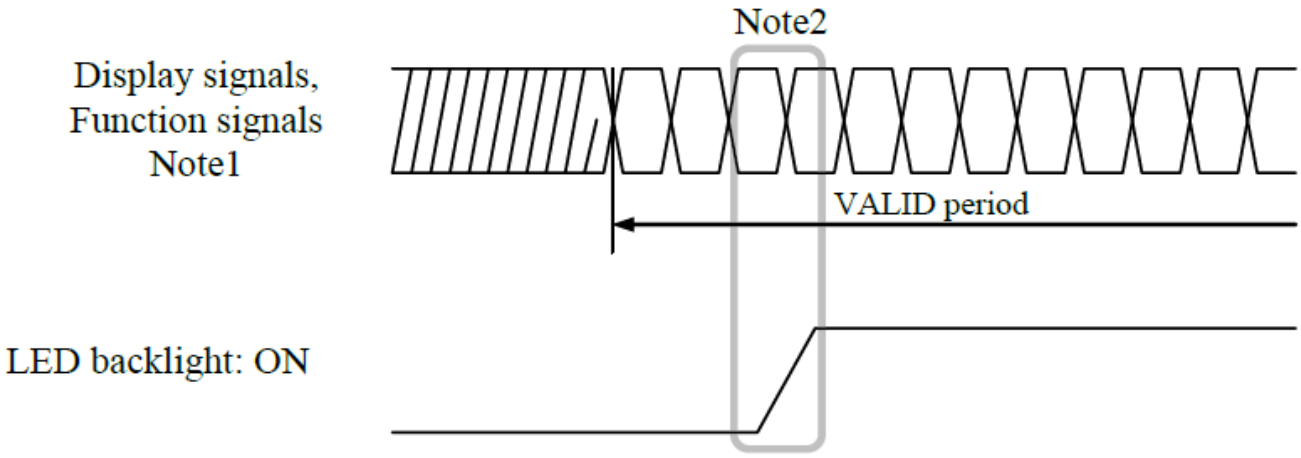
*These signals should be measured at the terminal of 100 Ω resistance.

Note1: If there is a voltage variation (voltage drop) at the rising edge of VCC below 3.0V, there is a possibility that a product does not work due to a protection circuit.

Note2: Display signals (D0+/-, D1+/-, D2+/-, D3+/- and CLK+/-) and function signals (DPS, FRC and MSL) must be set to Low or High-impedance, except the VALID period (See above sequence diagram), in order to avoid the circuitry damage.

If some of display and function signals of this product are cut while this product is working, even if the signal input to it once again, it might not work normally. If a customer stops the display and function signals, VCC also must be shut down.

8.7.2 LED Driver Board



Note1: These are the display and function signals for LCD panel signal processing board.

Note2: The backlight should be turned on within the valid period of display and function signals, in order to avoid unstable data display.

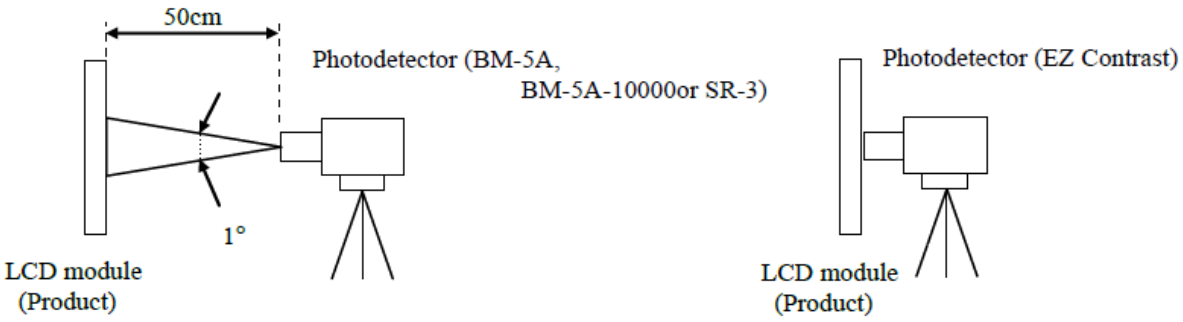
9. Optical Specification

Ta=25℃

Item		Symbol	Condition	Min	Typ.	Max.	Unit	Remark
Contrast Ratio		CR	θ=0°	500	1000	-		Note1 Note2
Response Time		Tr	25℃	-	13	20	ms	Note1 Note3
		Tf		-	12	20		
View Angles		ΘT	CR≧10	70	88	-	Degree	Note 4
		ΘB		70	88	-		
		ΘL		70	88	-		
		ΘR		70	88	-		
Chromaticity	White	x	Brightness is on	0.263	0.313	0.363		Note5, Note1
		y		0.279	0.329	0.379		
Luminance		L		300	500	-	cd/m2	Note1 Note6
Luminance Uniformity		LU		-	1.25	1.4	%	Note1 Note7

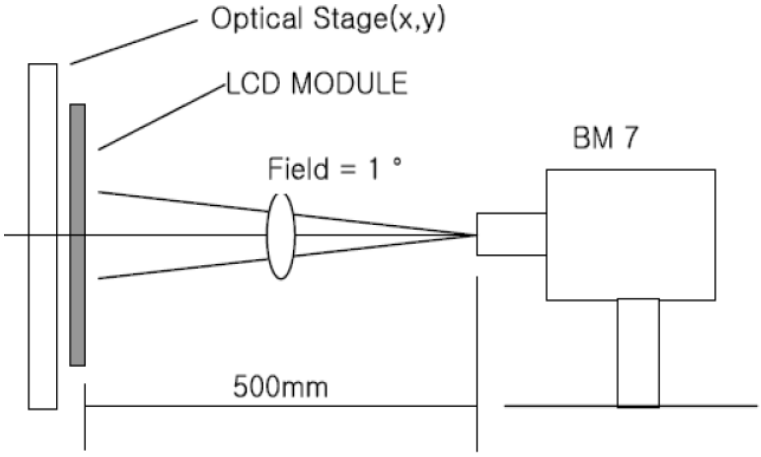
Test conditions: Ta=25℃, VCC= 3.3V, IL= 50mA/One Circuit, Display mode: XGA, Horizontal cycle= 1/48.363kHz, Vertical cycle= 1/60.0Hz, DPS= Low or Open, FRC= High.

Optical characteristics are measured at luminance saturation 20minutes after the product works in the dark room. Also measurement methods are as follows.



Note 1: Definition of optical measurement system.

Temperature = 25℃(±3℃) LED back-light: ON, Environment brightness < 150 lx

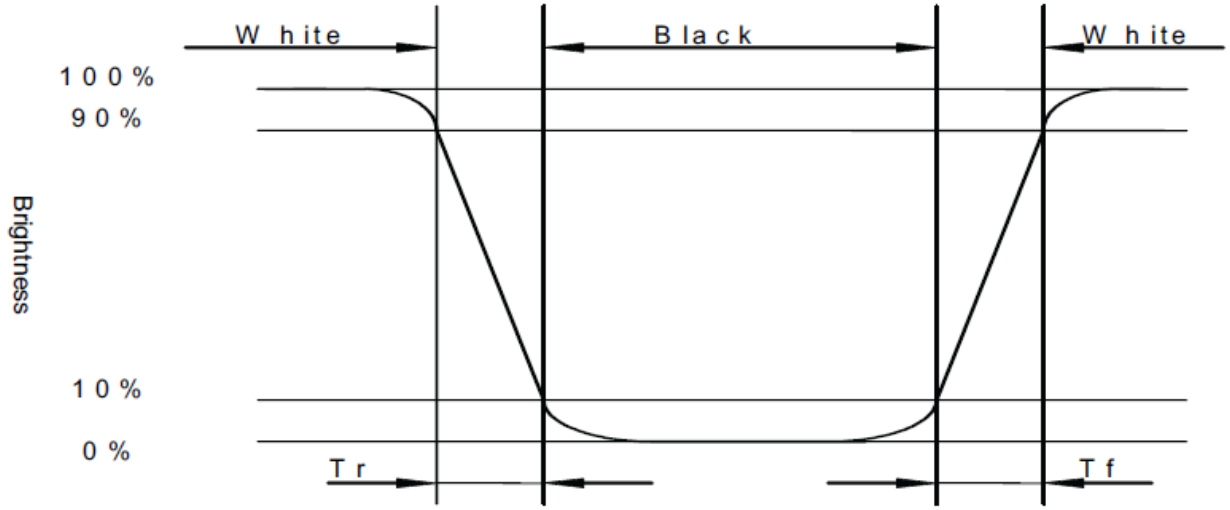


Note 2: Contrast ratio is defined as follow:

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

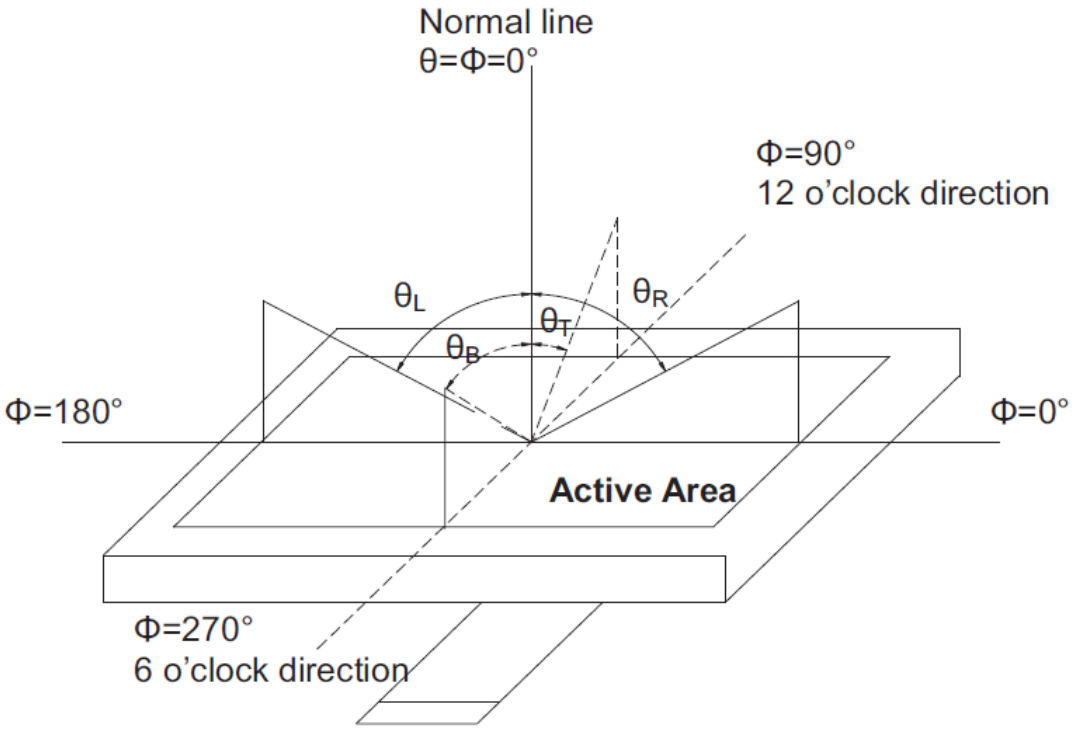
Note 3: Response time is defined as follow:

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



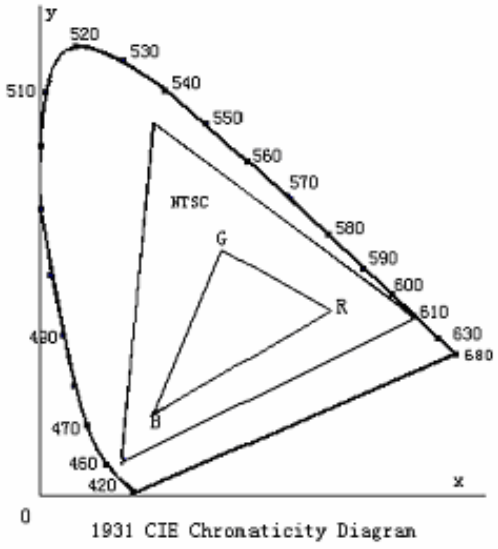
Note 4: Viewing angle range is defined as follow:

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:

The luminance uniformity is calculated by using following formula.

$$\text{Luminance uniformity (LU)} = \frac{\text{Maximum luminance from ① to ⑤}}{\text{Minimum luminance from ① to ⑤}}$$

The luminance is measured at near the 5 points shown below.

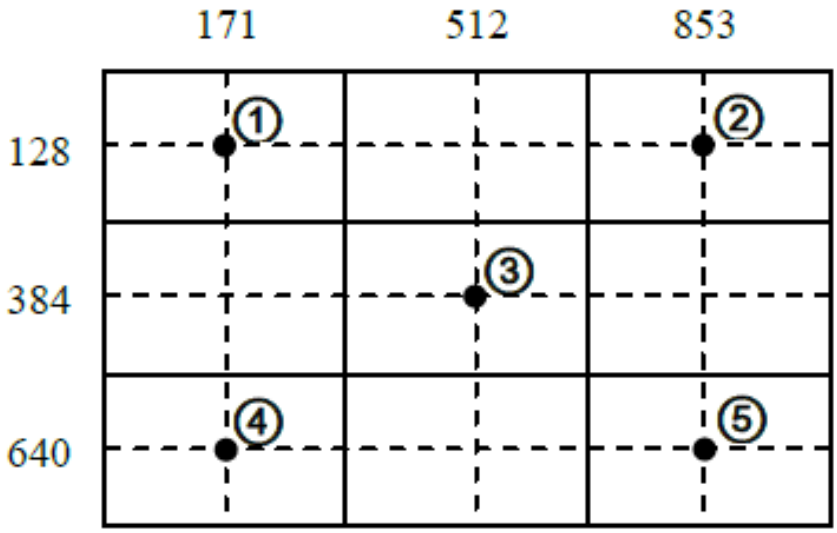


Fig. Definition of Luminance Uniformity

10. Environmental / Reliability Tests

No	Test Item	Condition	Judgment criteria
1	High Temp Operation	Ts=+70℃, 120hrs	Per table in below
2	Low Temp Operation	Ta=-20℃, 120hrs	Per table in below
3	High Temp Storage	Ta=+80℃, 120hrs	Per table in below
4	Low Temp Storage	Ta=-30℃, 120hrs	Per table in below
5	High Temp & High Humidity Storage	Ta=+60℃, 90% RH 120 hours	Per table in below (polarizer discoloration is excluded)
6	Thermal Shock (Non-operation)	-30℃/30 min ~ +80℃/30 min for a total 100 cycles, Start with cold temperature and end with high temperature.	Per table in below
7	ESD (Operation)	150pF, 150Ω, ±10kV; 9 places on a panel surface; 10 times each points at 1 sec interval.	Per table in below
8	Vibration(Non-operation)	5 to 100Hz, 19.6m/s^2; 1 minute/cycle; X, Y, Z directions; 120 times each directions.	Per table in below
9	Shock (Non-operation)	539m/ s^2, 11ms; X, Y, Z directions; 5 times each directions.	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.

11.4Storage

A. Store the products in a dark place at +25℃±10℃ 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.