CUSTOMER' S APPROVAL SPECIFICATIONS

MODEL: CH070DLDL-001

(Complied with RoHS)

Spec Condition: preliminary

CUSTOMER	CHEFREE		
APPROVAL	APPROVAL	CHECKER	PREPARE
	ch lee	ch lee	cloud

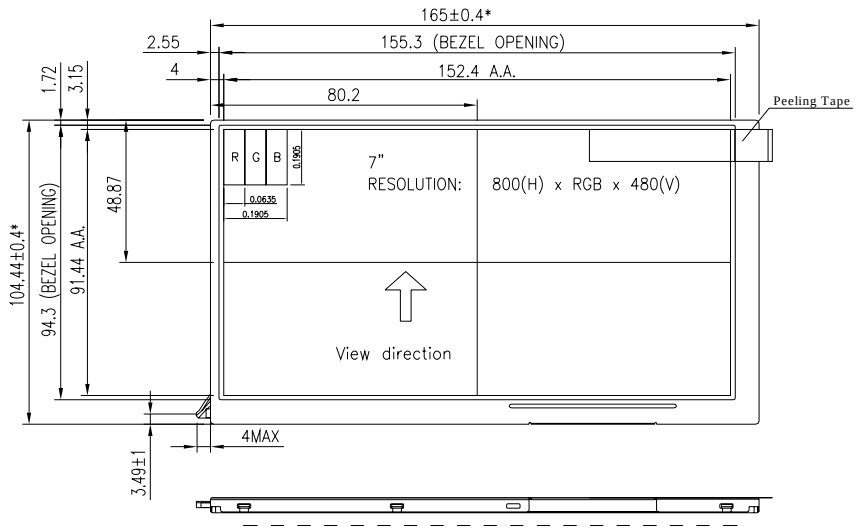
2.RECORD OF REVISION

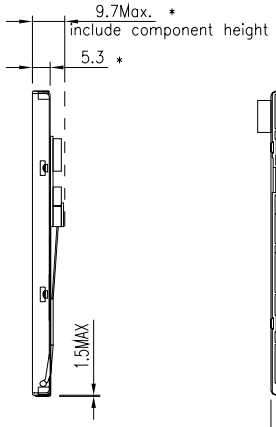
Rev	DATE	PAGE	SUMMARY
0.1	2013.04.22	ALL	Preliminary specification was first issued.
0.1	2014.09.30	6	Modify Brightness from 320nits typ. to 500nits typ.

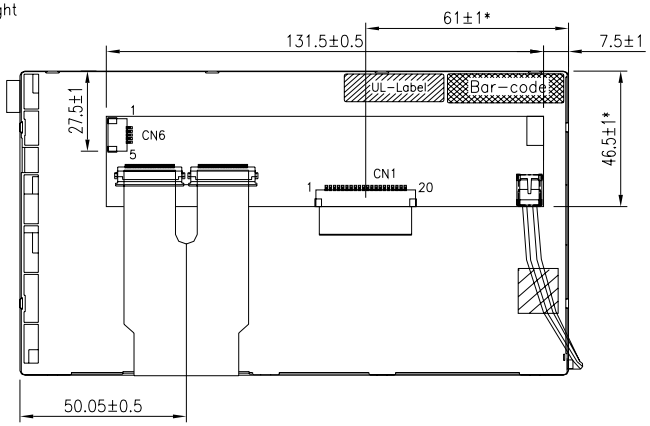
3.MECHANICAL SPECIFICATIONS

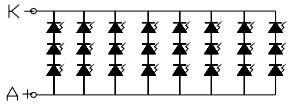
(1)	Number Of Dots (Dots)	800(R.G.B) X 480
(2)	Module Size(mm)	165.00(W) X 104.44(H) X 9.7(D) mm
(3)	Active Area(mm)	152.4(H) X 91.44(V)
(4)	Pixel Pitch(mm)	0.0635(H) X 0.1905(V)
(5)	LCD Model	TFT , Transmissive, Normally/White
(6)	Polarizer Model	Anti-glare
(7)	LED Backlight Color	White
(8)	Viewing Direction	6 o'clock
(9)	Color Configuration	R.G.B Stripe
(10)	Module Weight(g)	TBD

1	2	3	4	5	6	7	8 樣式 QT2-RD02-008
文件題目	圖號		頁 次頁				
發行日	舊版日	登入號碼	機密等級				









SMD-LED: 3*8=24PCS
20mA*8=160mA

LED circuit

CN6 PIN FUNCTION

1 VDD	3 GND	5 ADJ
2 VDD	4 GND	

CN1 PIN FUNCTION

1 Vcc	6 RxIN0+	11 RxIN2−	16 GND
2 Vcc	7 GND	12 RxIN2+	17 VDD
3 GND	8 RxIN1−	13 GND	18 VDD
4 GND	9 RxIN1+	14 CKIN−	19 GND
5 RxIN0−	10 GND	15 CKIN+	20 ADJ

	備考			單位:mm	投影法:	比例尺:
入庫	製圖	Swallow	04/22	名稱: 7" 800*480 LCM		圖號 CH070DLDL-001
	審查					
	承認					

5. INTERFACE PIN CONNECTION

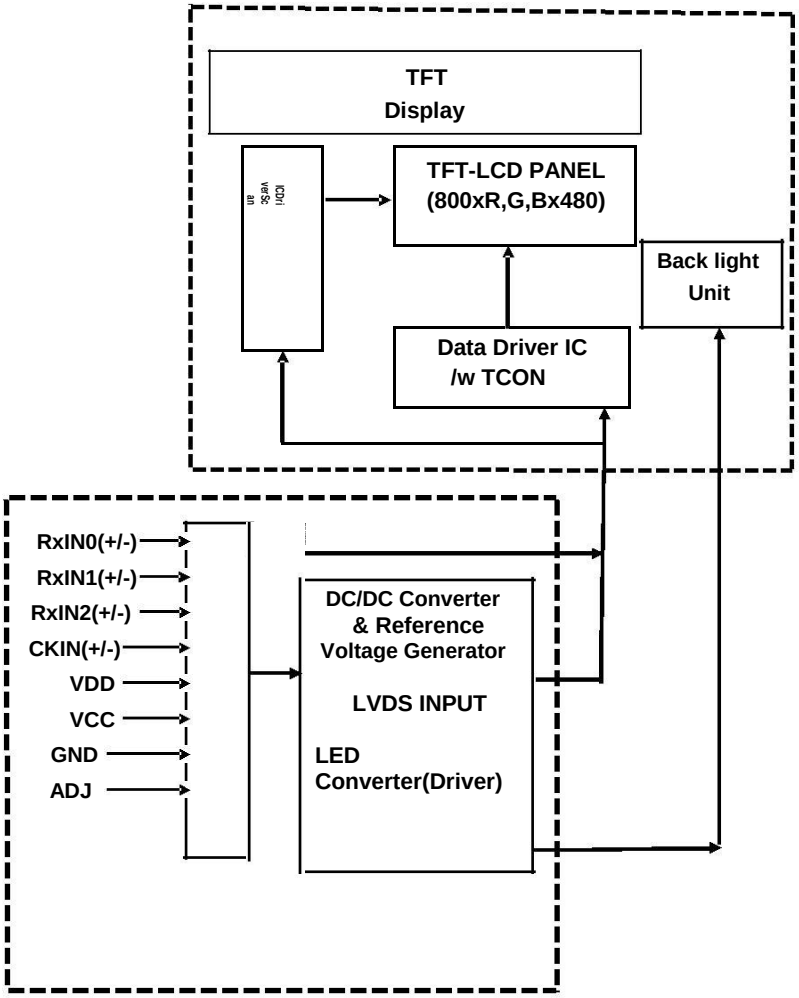
5.1 LCM PANEL DRIVING SECTION (CN1: DF14A-20P-1.25H or Equivalent)

PIN NO.	SIGNAL	FUNCTION
1	VCC	Power Supply For Digital Circuit
2	VCC	Power Supply For Digital Circuit
3	GND	Ground
4	GND	Ground
5	RxIN0-	Differential Data Input, CH0(Negative)
6	RxIN0+	Differential Data Input, CH0(Positive)
7	GND	Ground
8	RxIN1-	Differential Data Input, CH1(Negative)
9	RxIN1+	Differential Data Input, CH1(Positive)
10	GND	Ground
11	RxIN2-	Differential Data Input, CH2(Negative)
12	RxIN2+	Differential Data Input, CH2(Positive)
13	GND	Ground
14	CKIN-	Differential Clock Input(Negative)
15	CKIN+	Differential Clock Input(Positive)
16	GND	Ground
17	VDD	Power Supply For LED Driver Circuit
18	VDD	Power Supply For LED Driver Circuit
19	GND	Ground
20	ADJ	Brightness Control For LED B/L

Remarks：

1) ADJ is brightness control Pin. The larger of the pulse duty is, the higher of the brightness.
2) ADJ signal is 0~3.3V.Operation frequency is 20KHz
3) GND PIN must be grounding, can not be floating.

6. BLOCK DIAGRAM



7. ABSOLUTE MAXIMUM RATINGS

GND=0V

Parameter		Symbol	MIN.	MAX.	Unit	Remark
Power supply voltage		VCC	- 0.3	6.0	V	Ta=25 C
Logic input voltage		VI	- 0.3	V_{CC}+0.3	V	
Operating temperature		Top	- 20	+70	C	Module surface*
Storage temperature		Tst	-30	+80	C	
Humidity	Operation	20%~90% relative humidity				Ta<=38 C
	Non Operation	5%~90% relative humidity				Ta<=38 C

8. ELECTRICAL CHARACTERISTICS

8.1 ELECTRICAL CHARACTERISTICS OF LCD

GND=0V, fH=30KHz, fV=60Hz, fCLK=33.3MHz,Ta=25 C

Parameter	Symbol	MIN.	Typ.	MAX.	Unit	Remark
Power Supply voltage for LCD	V_{CC}	+3.0	+3.3	+3.6	V	
Power Supply Current for LCD	I_{CC}		150	200	mA	V_{CC} =3.3V
Power Supply voltage for LED	V_{DD}	3	3.3	5.5	V	
Power Supply Current for LED	I_{DD}		650	850	mA	V_{DD} =3.3V
Power Supply Current for LED	I_{DD}		400	550	mA	V_{DD} =5.0V
Ripple voltage	V_{RF}	-	-	100	mV_{P-P}	
ADJ frequency		19K	20K	21K	Hz	
ADJ input voltage	VIH	3.0	-	3.3	V	
	VIL	0	-	0.3	V	
Differential Input High Threshold	VTH	-	-	100	[mV]	VCM=1.2V Note 1
Differential input Low Threshold	VTL	-100	-	-	[mV]	
LED dice life time			20000		Hr	Note 2

9. OPTICAL CHARACTERISTICS

Ta=25℃

ITEM		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio		CR	Viewing Normal Angle Θx=Θy =0°	250	400	-	-	Note (1)
Response Time		TR		-	5	10	ms	Note (2)
		TF		-	11	16	ms	
Chromaticity	White	x		0.26	0.31	0.37	-	Note (4)
		y		0.28	0.33	0.39	-	
Viewing Angle	Hor.	Θx+	Viewing Angle Θx=Θy =0° CR≧10	60	70	-	Deg.	Note (3)
		Θx-		60	70	-		
	Ver.	ΘY+		40	50	-		
		ΘY-		50	60	-		
Luminance		L	PWM=100%	400	500	-	cd/m2	
Luminance uniformity		YU		70	80	-	%	Note(5)

*Note (1) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63 / L0

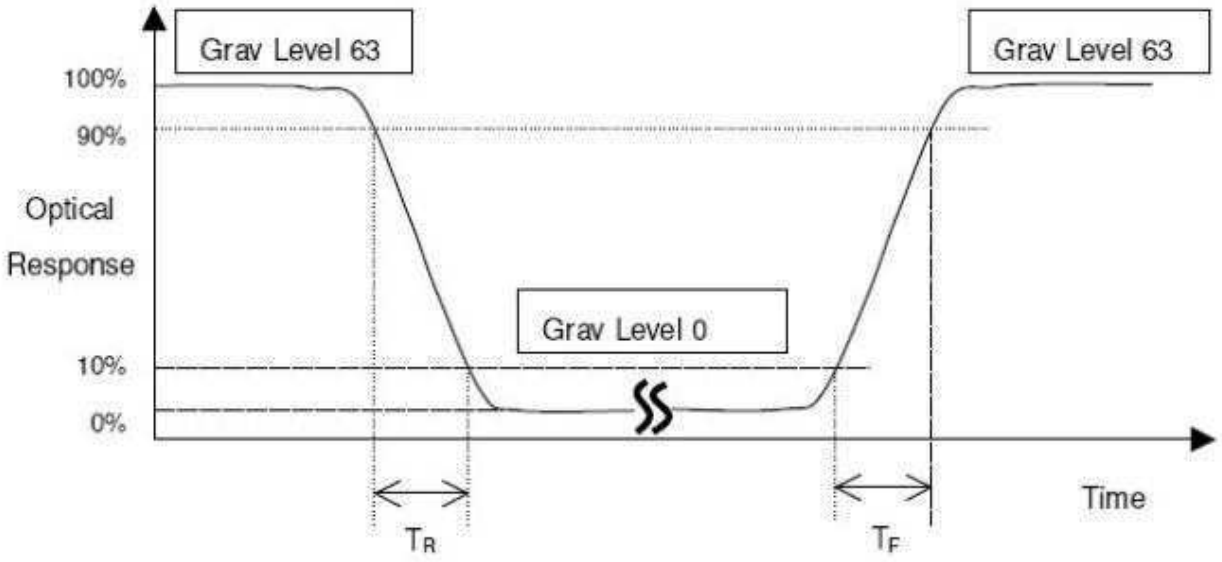
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

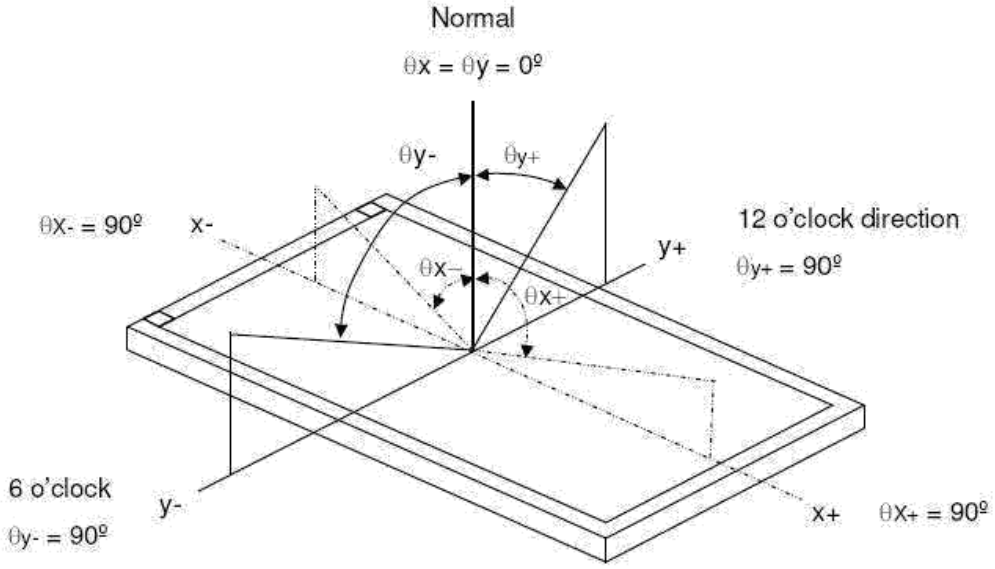
CR = CR (5)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (5).

*Note (2) Definition of Response Time (T_R, T_F):

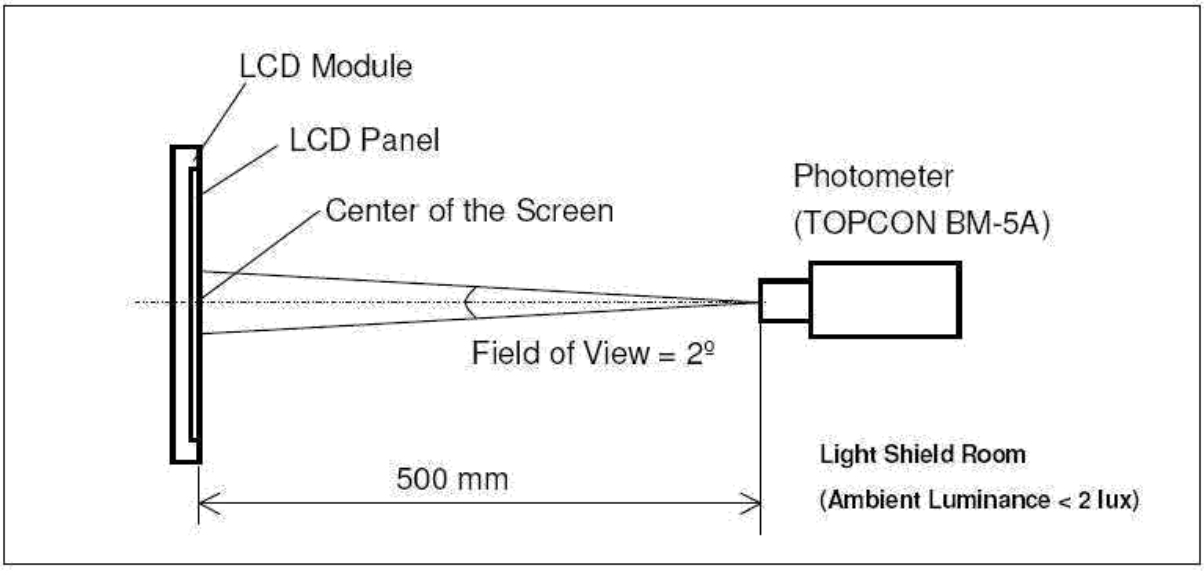


*Note(3) Definition of Viewing Angle

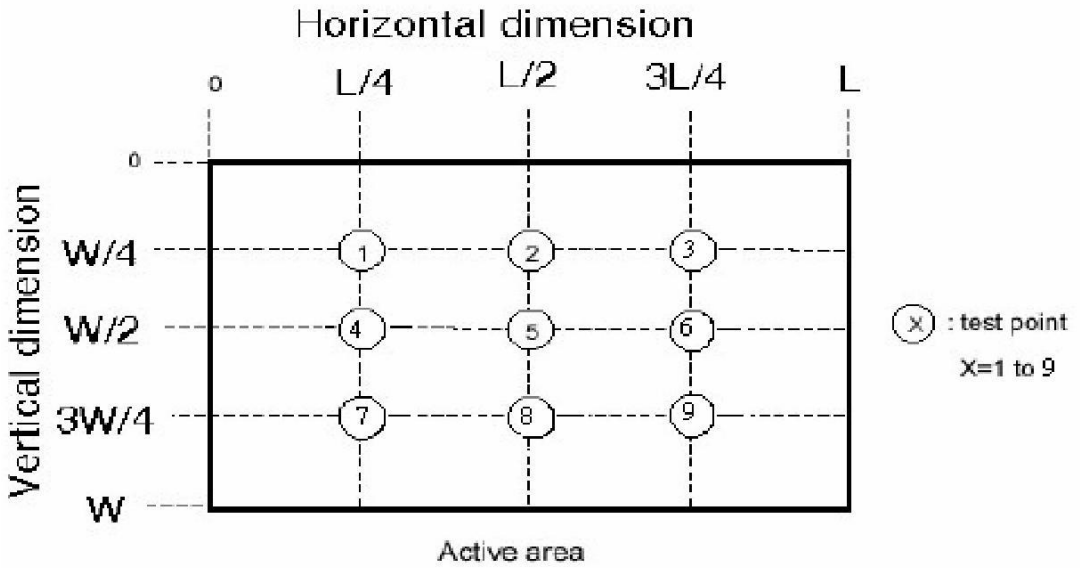


*Note (4) Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



***Note (5)**

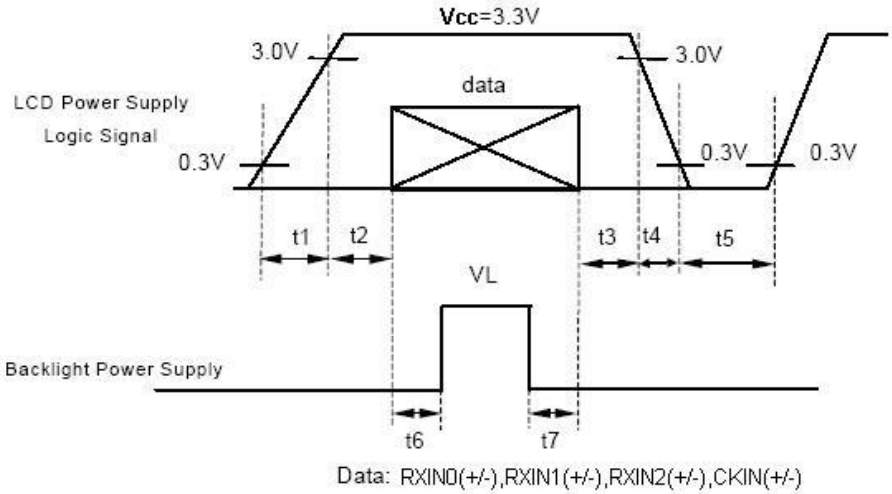


$$\left(1 - \frac{\text{MAX Luminance} - \text{Average Luminance}}{\text{Average Luminance}}\right) \times 100\% > \textbf{70\%}$$

10. TIMING SPECIFICATIONS

10.1 POWER SINGAL SEQUENCE

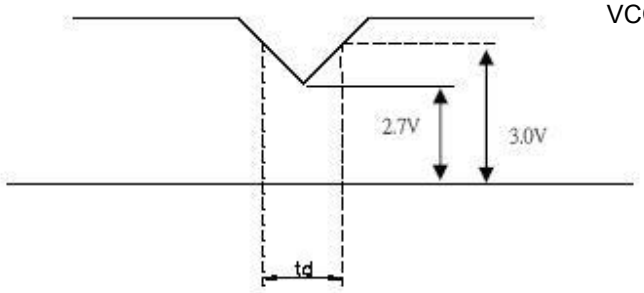
t1 10ms ; 1 sec ≤t5
50ms t2 ; 200ms ≤t6
0 t3 50ms ; 200ms ≤t7
0 t4 10ms



VCC-dip condition:

(1) 2.7V ≤VCC < 3.0V, td ≤10 ms

(2) VCC > 3.0V, VCC-dip condition should be the same with VCC-turn-on condition.



VCC,

10.2 TIMING CHARACTERISTICS OF INPUT SIGNALS

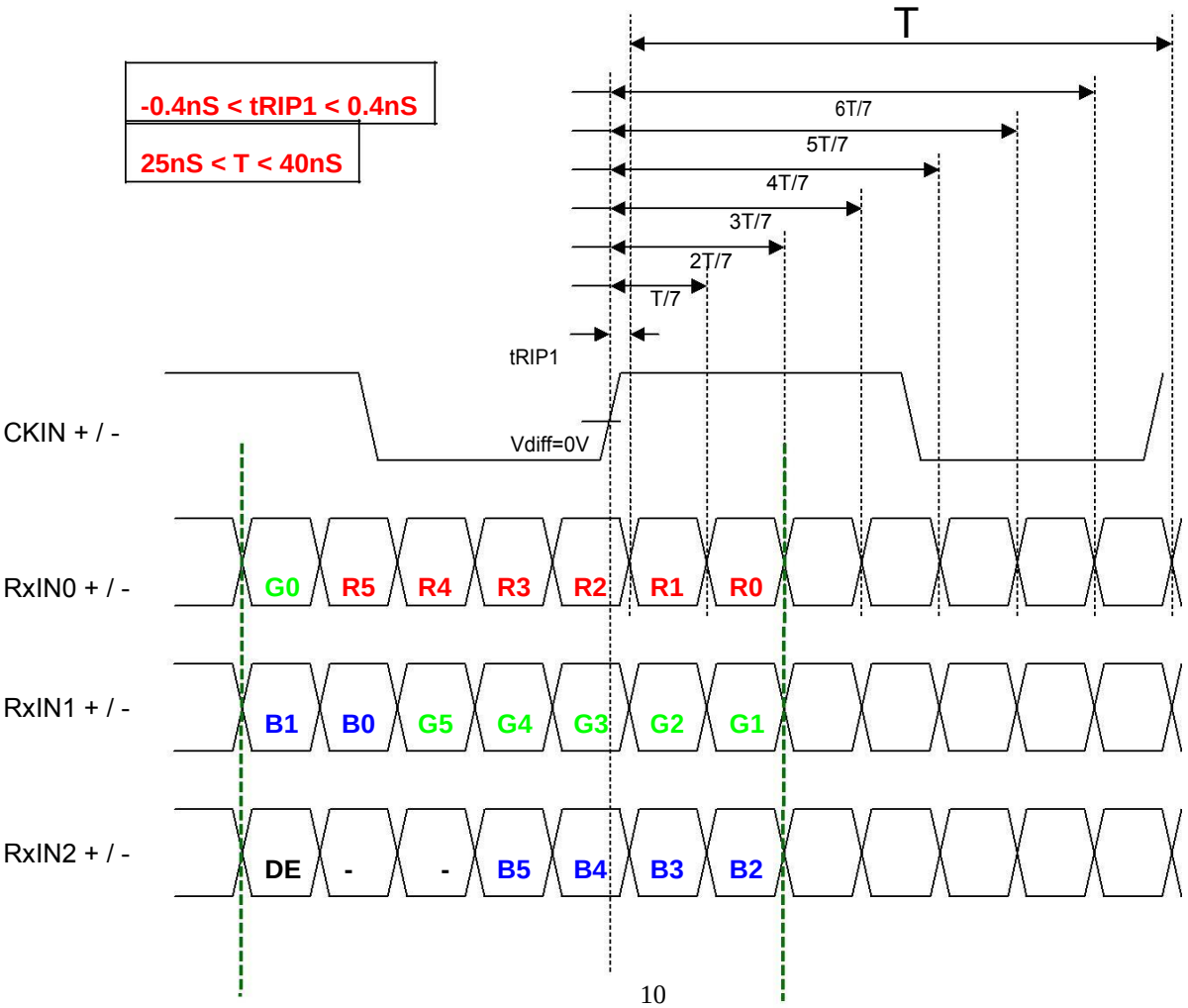
1_.__1 AC Electrical Characteristics

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Data setup time	T_{dsu}	6			ns
Data hold time	T_{dhd}	6	-	-	ns
DE setup time	T_{esu}	6	-	-	ns

1_.__2 Resolution：800x480

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
CLK frequency	F_{CPH}	25	33.26	40	MHz
CLK period	T_{CPH}	-	30.06	-	ns
CLK pulse duty	T_{CWH}	40	50	60	%
DE period	$T_{DEH}+T_{DEL}$	1000	1056	1200	T_{CPH}
DE pulse width	T_{DEH}	-	800	-	T_{CPH}
DE frame blanking	T_{DEB}	10	45	110	$T_{DEH}+T_{DEL}$
DE frame width	T_{DE}	-	480	-	$T_{DEH}+T_{DEL}$

LVDS Timing Chart



10.3 TIMING SEQUENCE(TIMING CHART)

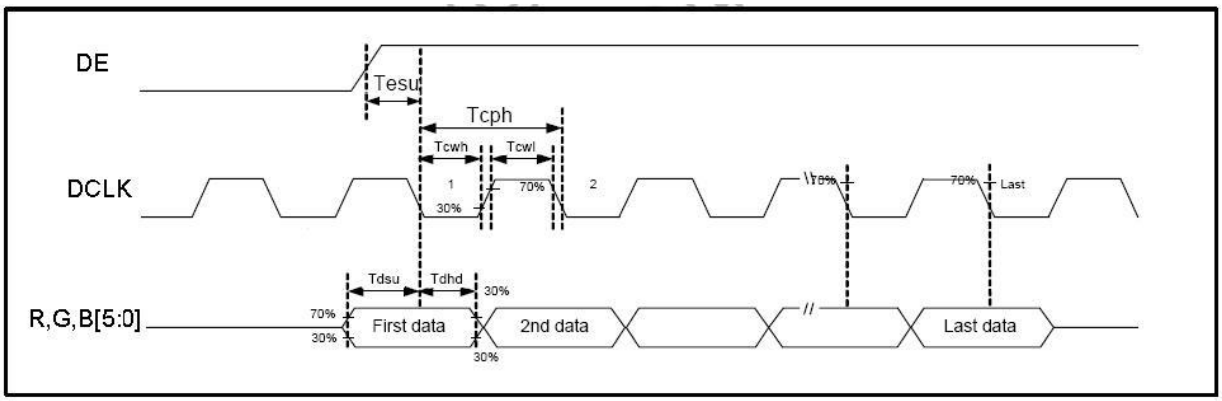


Figure 1 Clock and Data input waveforms.

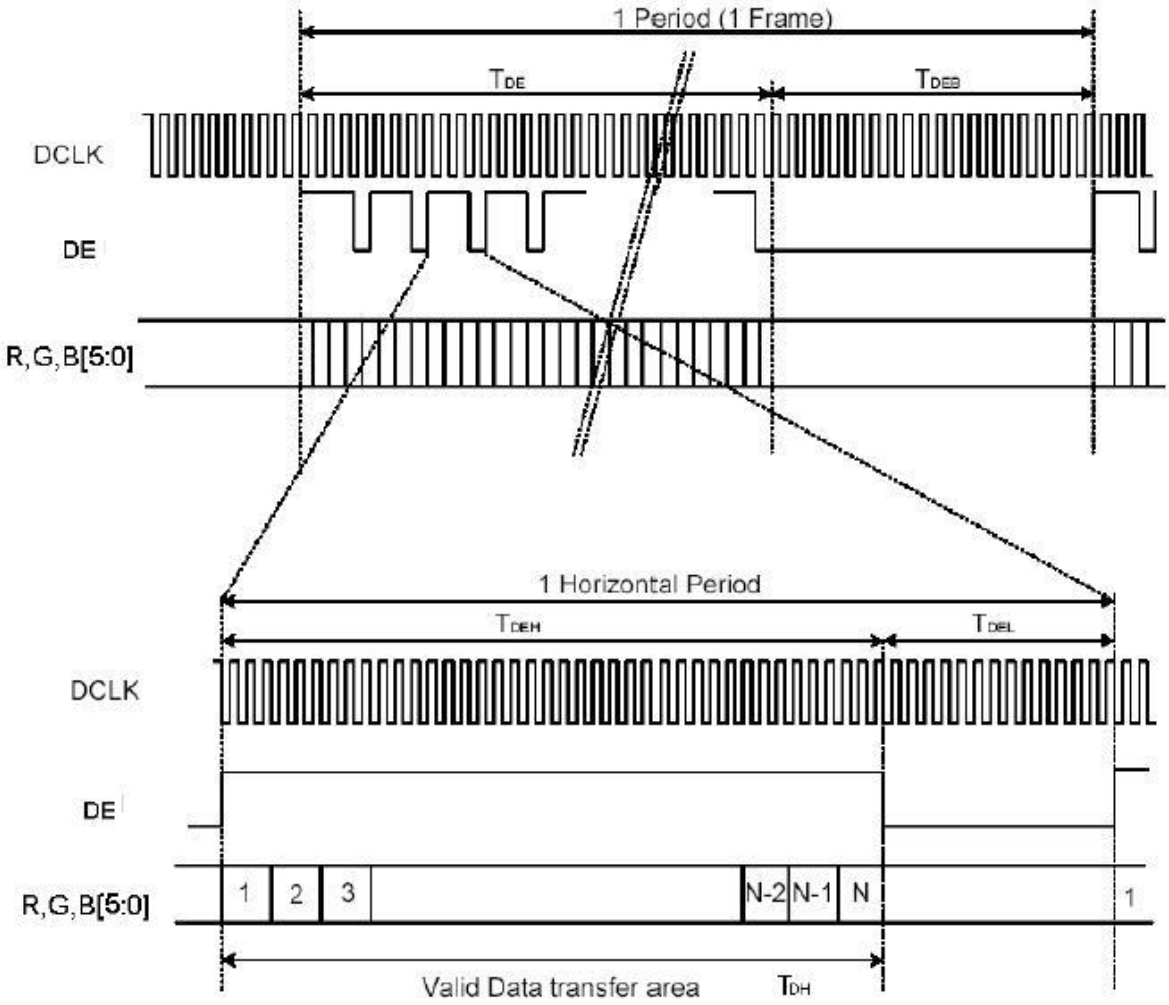


Figure 2 DE Mode Data Format

10.4 COLOR DATA INPUT ASSIGNMENT

Color		Data Signal																	
		Red						Green						Blue					
		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
	Red	1	1	1	1	1	1	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	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
Gray Scale of Red	Red(0) / Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(1)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Red(2)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
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	Red(61)	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Red(62)	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale of Green	Green(0)/ Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	Green(2)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
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	Green(61)	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0
	Green(62)	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
	Green(63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
Gray Scale of Blue	Blue(0)/ Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Blue (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
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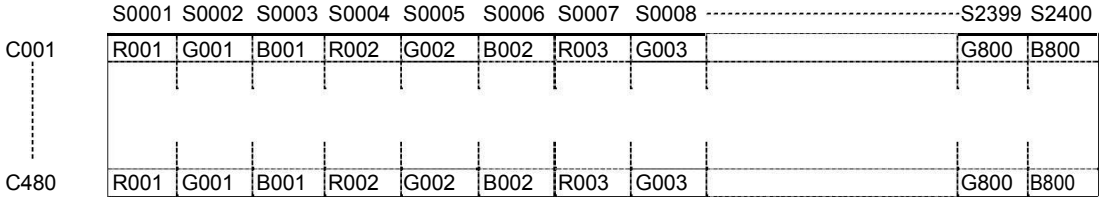
	Blue (61)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1
	Blue (62)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
	Blue (63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1

Correspondence between Data and Display Position



11. RELIABILITY TEST

Ta = 25℃

Environmental Test				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	80℃	240HRS	
2	Low Temperature Storage	-30℃	240HRS	
3	High Temperature Humidity Operation	40℃ 90%RH	240HRS	NOTE(2)
4	High Temperature Operation	70℃	240HRS	NOTE(2)
5	Low Temperature Operation	-20℃	240HRS	NOTE(2)
6	Temperature Cycle	-30℃→25℃→80℃ (30min) (5min) (30min)	100CYCLE	NOTE(2)

NOTE (1): a. THE MODULE SHOULD WORK PROPERLY.

b. BEFORE AND AFTER FUNCTION TEST, THE DIFFERENCE OF CONSUMPTIVE CURRENT.SHOULD BE WITHIN 10%

NOTE (2): a. THE MODULE SHOULD WORK PROPERLY.

b. THE MODLUE WON'T BE DEFORMATIVE, COLOR CHANGEABLE OR BROKEN.

c. THE MODULES CAN'T BE APART.

NOTE (3): BEFORE COSMETIC AND FUNCTION TEST, THE PRODUCT MUST HAVE ENOUGH RECOVERY TIME, AT LEAST 2 HOURS AT ROOM TEMPERATURE.

12.PRECAUTZONS FOR USE

12.1 SAFETY

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

12.2 HANDLING

a. The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
b. The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.
c. To avoid contamination on the display surface, do not touch the module surface with bare hands.
d. Keep a space so that the LCD panels do not touch other components.
e. Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.
f. Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.
g. Do not leave module in direct sunlight to avoid malfunction of the ICs.

12.3 STATIC ELECTRICITY

a. Be sure to ground module before turning on power or operating module.
b. Do not apply voltage which exceeds the absolute maximum rating value.

12.4 STORAGE

a. Store the module in a dark room where must keep at 25±10℃ and 65%RH or less. b. Do not store the module in surroundings containing organic solvent or corrosive gas. c. Store the module in an anti-electrostatic container or bag.

12.5 CLEANING

a. Do not wipe the polarizer with dry cloth. It might cause scratch.
b. Only use a soft sloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer