

## ***TFT-Display Datenblatt***

Modell OT070KGWDLL-02

### **Kurzdaten**

Hersteller	ONation
Diagonale	7,0" / 17,8 cm
Format	wide
Auflösung	800 x 480
Backlight	LED / 500 cd/m <sup>2</sup>
Interface	LVDS
Touchscreen	nein
Temperatur	-20... +70°C (Betrieb)



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Vertrieb durch:

## CUSTOMER' S APPROVAL SPECIFICATIONS

**MODEL: OT070KGWDLL-02**  
**(Complied with RoHS)**

CUSTOMER: \_\_\_\_\_

Version:P0.1

### C O N T E N T S

**ISSUE:APR.18.2013**

**Spec Condition: preliminary**

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CUSTOMER	ONATION		
APPROVAL	APPROVAL	CHECKER	PREPARE
	Mark	Mark	Kevin

2.RECORD OF REVISION

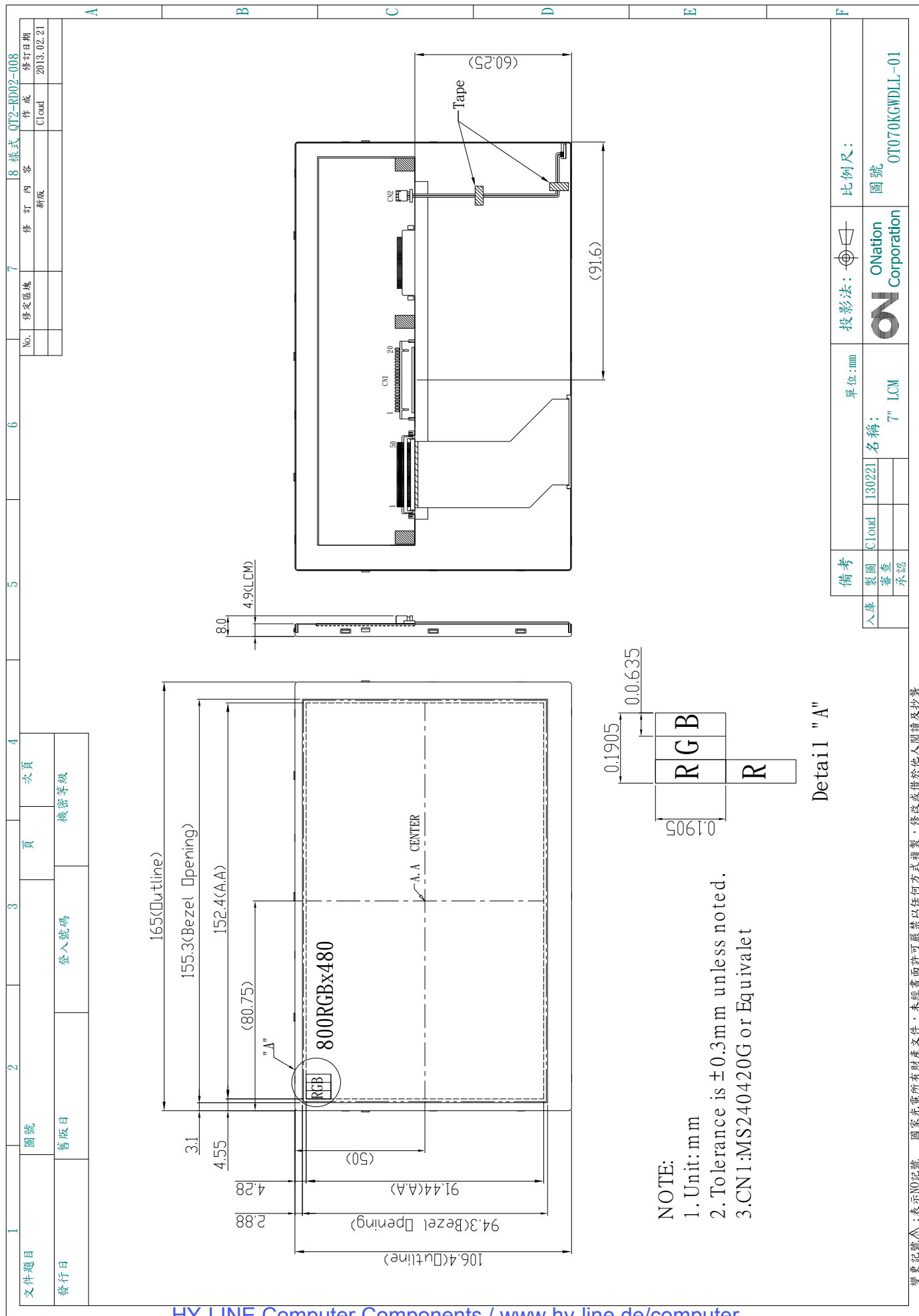
Rev	DATE	PAGE	SUMMARY
0.1	2013.04.18	ALL	Preliminary specification was first issued.

### 3.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	800(R.G.B) X 480
(2)	Module Size(mm)	165.0(W) X 106.4(H) X 8.0(D)
(3)	Active Area(mm)	152.4(H) X 91.44(V)
(4)	Pixel Pitch(mm)	0.1905(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	Wide Viewing Angle
(9)	Gray Scale Inversion Direction	No GSI
(10)	Color Configuration	R.G.B Stripe
(11)	Module Weight(g)	140 ± 5%

\*\*Viewing direction for best image quality is different from TFT definition, there is the 180 degrees shift.

# 4. OUTLINE DIMENSIONS



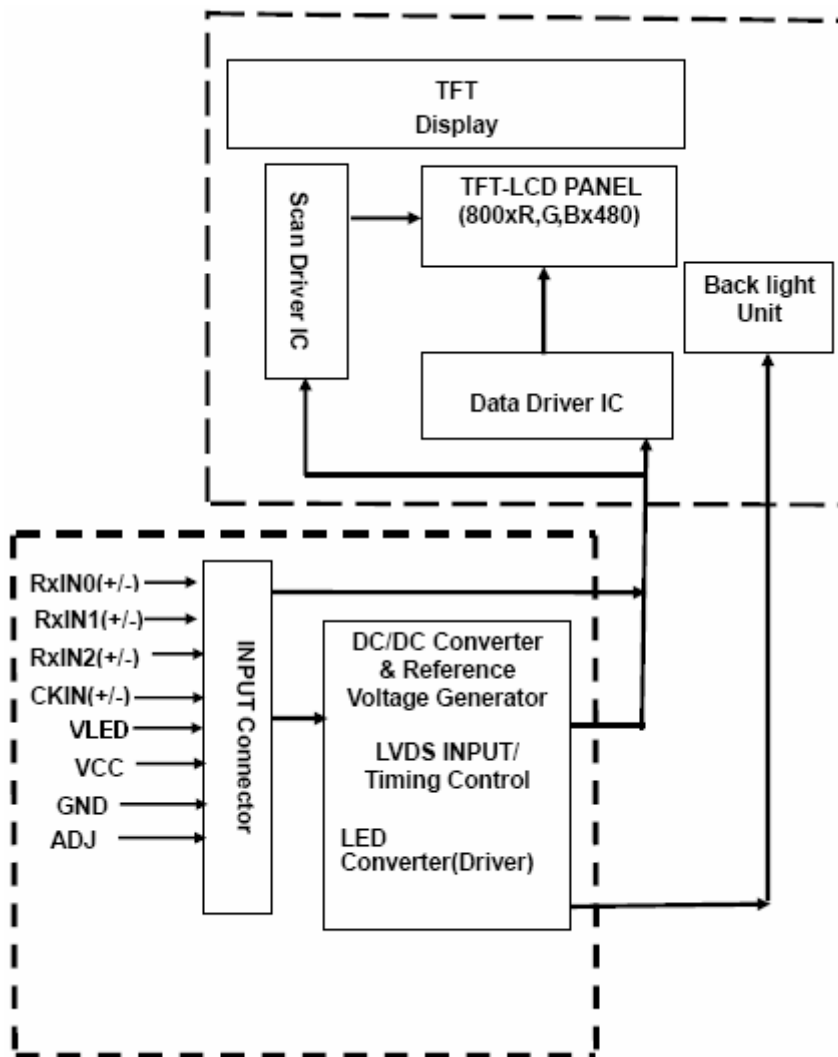
備考	單位: mm	投影法:	比例尺:
製圖	名稱:	ON Corporation	圖號
Cloud	130221	7" LCM	OT070KGWDDL-01
審核			
承認			

## 5. INTERFACE PIN CONNECTION

### 5.1 LCM PANEL DRIVING SECTION (CN1 Connector: MS240420 G 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(G0,R5~R0)
6	RxIN0+	Differential Data Input, CH0(G0,R5~R0)
7	GND	Ground
8	RxIN1-	Differential Data Input, CH1(B1,B0,G5~G1)
9	RxIN1+	Differential Data Input, CH1(B1,B0,G5~G1)
10	GND	Ground
11	RxIN2-	Differential Data Input, CH2(DE,B5~B2)
12	RxIN2+	Differential Data Input, CH2(DE,B5~B2)
13	GND	Ground
14	CKIN-	Differential Clock Input
15	CKIN+	Differential Clock Input
16	GND	Ground
17	VLED	Power Supply For LED Driver Circuit
18	VLED	Power Supply For LED Driver Circuit
19	GND	Ground
20	ADJ	Brightness Control For LED B/L

## 6. BLOCK DIAGRAM



## 7. ABSOLUTE MAXIMUM RATINGS

### 7.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
Power Supply Voltage	VCC	-0.3	+7.0	V	
Logic Output Voltage	V <sub>I</sub>	-0.3	VCC+0.3	V	

### 7.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		COMMENT
	MIN	MAX	MIN	MAX	
Ambient Temperature(°C)	-20	70	-30	80	Note 1,2,3
Humidity(% RH)	-	90	-	90	Note 4

Note 1 : The response time will become lower when operated at low temperature.

Note 2 : Background color changes slightly depending on ambient temperature.

Note 3 : Operation Ta=70°C & -20°C ≤ 240Hrs.

Note 4 : Storage Ta=60°C & H=90% ≤ 240Hrs.

8. ELECTRICAL CHARACTERISTICS  
 8.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
Power Voltage for LCD	VCC	3.0	3.3	3.6	V
	ICC	-	175	262	mA
Input High Voltage	V <sub>IH</sub>	0.7*VCC	-	VCC	V
Input Low Voltage	V <sub>IL</sub>	GND	-	0.3*VCC	V
Output High Voltage	V <sub>OH</sub>	0.8VCC	-	VCC	V
Output Low Voltage	V <sub>OL</sub>	GND	-	0.2VCC	V

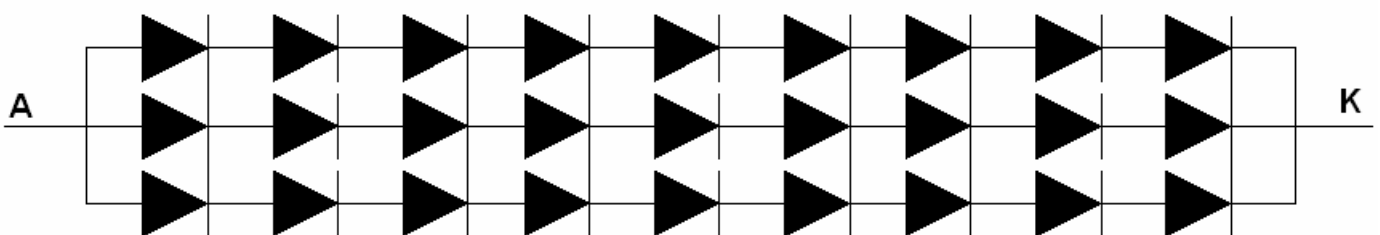
8.2 BACKLIGHT UNITS

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK	
LED Driving Voltage	VLED	4.5	5	12	V		
LED Driving Current	ILED	-	TBD	-	mA	VLED=12V	
Brightness control	Analog dimming	ADJ	0.7	-	1.4	V <sub>DC</sub>	Note 3
	PWM dimming		1.4	-	5.0	V <sub>P-P</sub>	Note 4
ADJ Frequency	-	100	-	1000	Hz		
LED Life Time	-	50000	-	-	Hr		

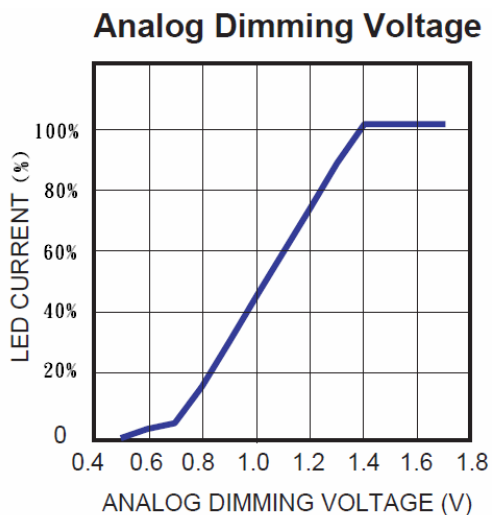
Note 1: If the module is driven at high ambient temperature & humidity condition. The operating life will be reduced.

Note 2: Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

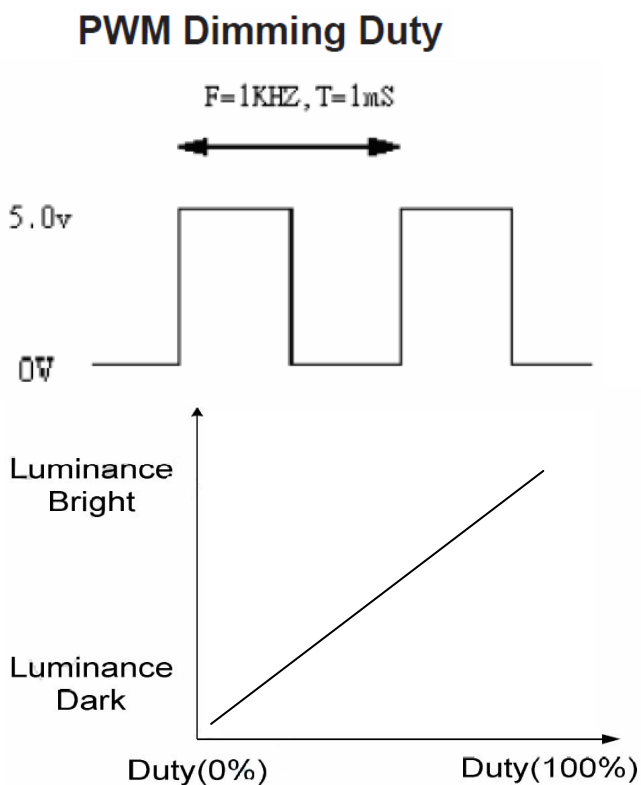




Note3: When the ADJ pin voltage rises from 0.7VDC to 1.4VDC, the LED current will change from 0% to 100% of the maximum LED current.



Note4: ADJ signal Vp-p = 1.4~5.0V, operation frequency: 100Hz ~ 1 kHz



9. OPTICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK	
Contrast Ratio	CR	Viewing	180	240	-	-	Note (1)	
Response Time	TR	Normal	-	5	10	ms	Note (2)	
	TF	Angle	-	15	20	ms		
Chromaticity	White	$\Theta_x = \Theta_y = 0^\circ$	x	(0.26)	(0.31)	(0.36)	-	Note (4)
			y	(0.28)	(0.33)	(0.38)	-	
Viewing Angle	Hor.	$\Theta_x = \Theta_y = 0^\circ$ CR $\geq 10$	$\Theta_{x+}$	-	89	-	Deg.	Note (3)
			$\Theta_{x-}$	-	89	-		
	Ver.		$\Theta_{y+}$	-	89	-		
			$\Theta_{y-}$	-	89	-		
Luminance	L	PWM=100%	400	500	-	cd/m <sup>2</sup>		
Luminance uniformity	YU		70	-	-	%	Note (5)	

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

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = L_{63} / L_0$$

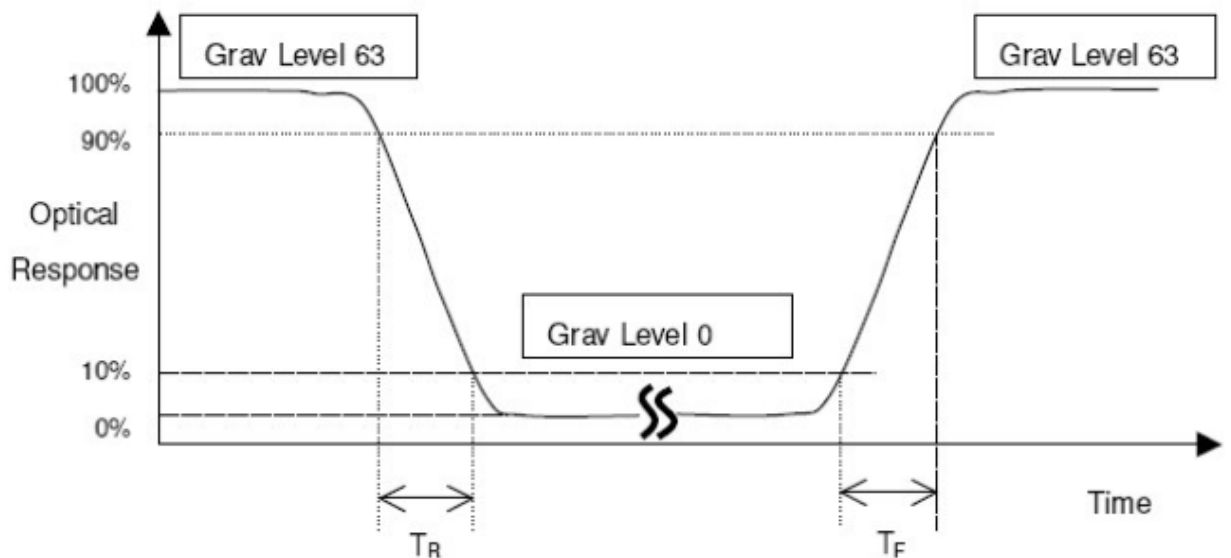
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

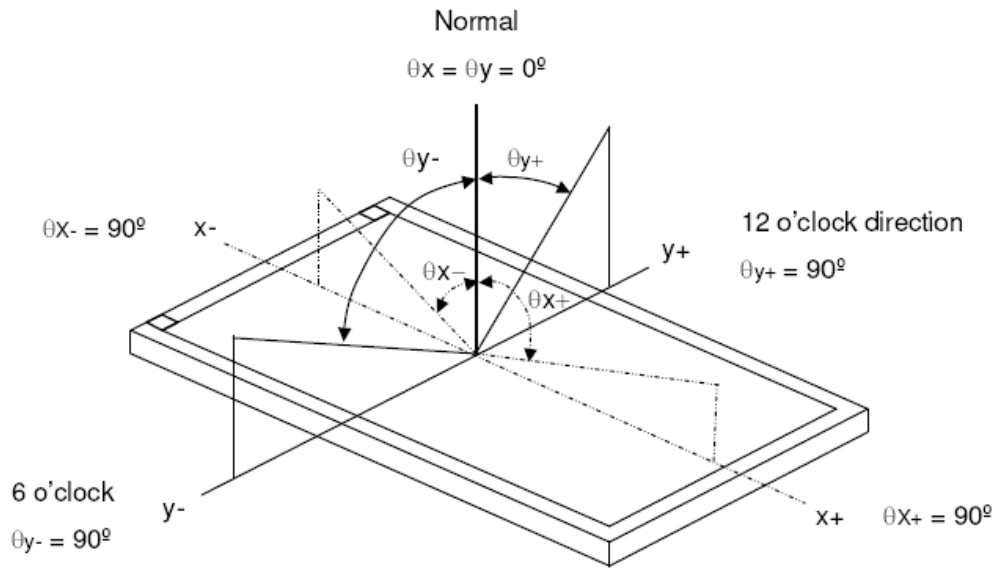
$$CR = CR (5)$$

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

\*Note (2) Definition of Response Time (TR, TF):

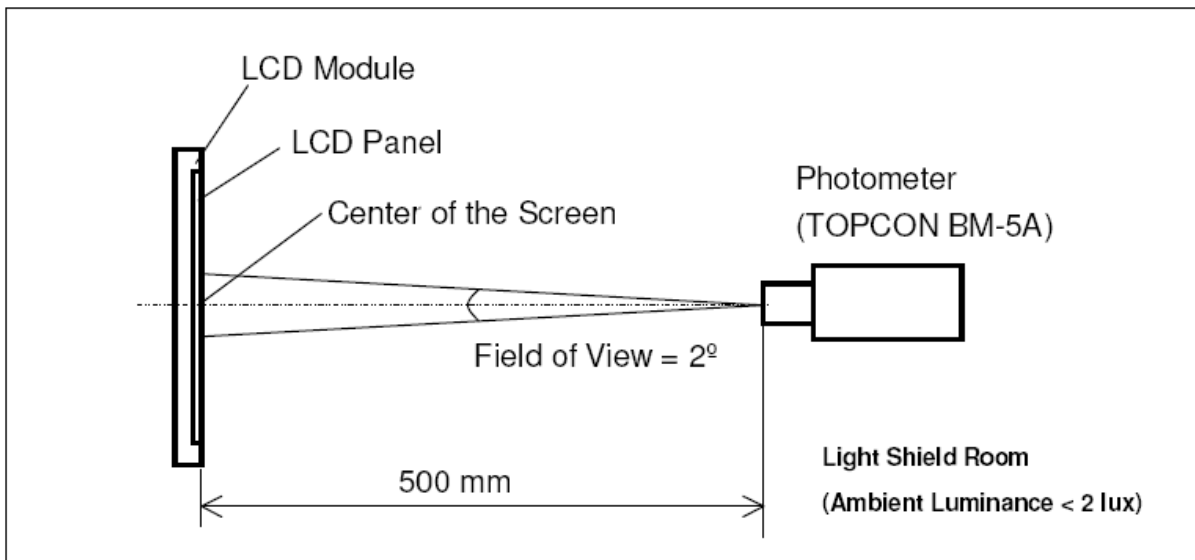


\*Note(3) Definition of Viewing Angle

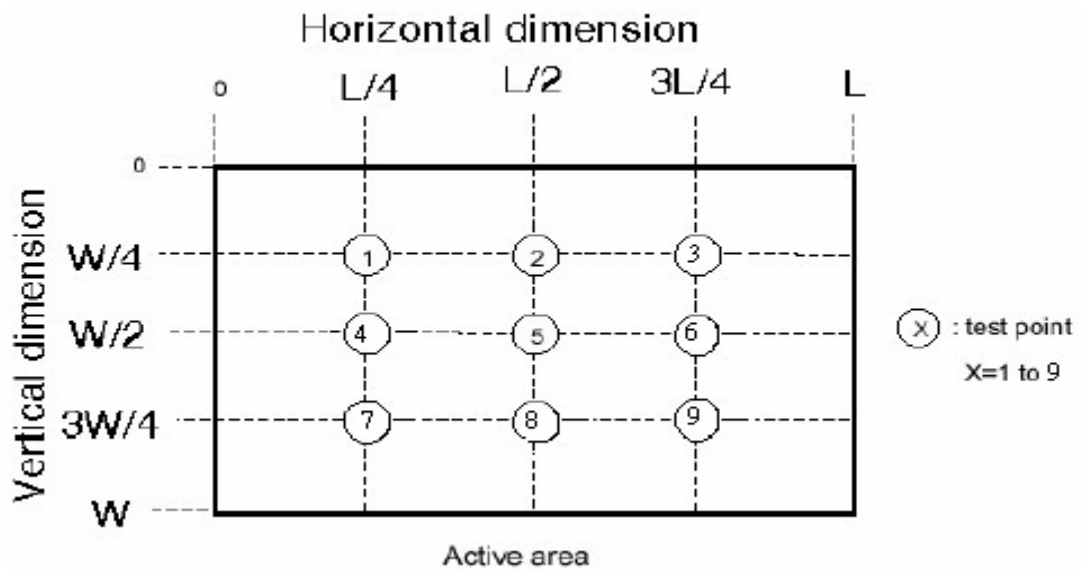


\*Note (4) Measurement Set-Up:

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)



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

## 10. TIMING SPECIFICATIONS

### 10.1.1 AC Electrical Characteristics

PARAMETER	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
HS setup time	$T_{hst}$	6	-	-	ns
HS hold time	$T_{hhd}$	6	-	-	ns
VS setup time	$T_{vst}$	6	-	-	ns
VS hold time	$T_{vhd}$	6	-	-	ns
Data setup time	$T_{dsu}$	6	-	-	ns
Data hold time	$T_{dhd}$	6	-	-	ns
DE setup time	$T_{esu}$	6	-	-	ns
Source output settling time	$T_{ST}$	-	-	15	$\mu$ s
Source output loading R	$R_{SL}$	-	2	-	K ohm
Source output loading C	$C_{SL}$	-	60	-	pF

### 10.1.2 Resolution : 800x480

- sync mode

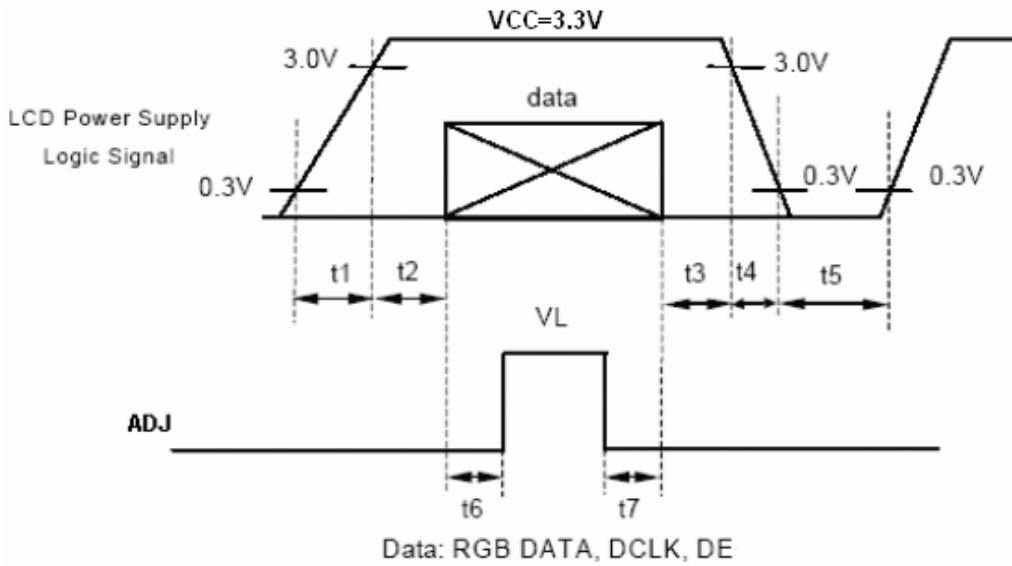
PARAMETER	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
CLK frequency	$F_{CPH}$	-	33.26	-	MHz
CLK period	$T_{CPH}$	-	30.06	-	ns
CLK pulse duty	$T_{CWH}$	40	50	60	%
HS period	$T_H$	930	1056	1057	$T_{CPH}$
HS pulse width	$T_{WH}$	1	128	-	$T_{CPH}$
HS-first horizontal data time	$T_{HS}$	STHD[7:0]+88 <sup>(1)</sup>			$T_{CPH}$
HS Active Time	$T_{HA}$	-	800	-	$T_{CPH}$
VS period	$T_V$	-	525	-	$T_H$
VS pulse width	$T_{WV}$	1	2	-	$T_H$
VS-DE time	$T_{VS}$	STVD[6:0]+8			$T_H$
VS Active Time	$T_{VA}$	-	480	-	$T_H$

- DE mode

PARAMETER	Symbol	Min.	Spec.		Unit
			Typ.	Max.	
CLK frequency	$F_{CPH}$	25	33.26	50	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	-	$T_{DEH}+T_{DEL}$

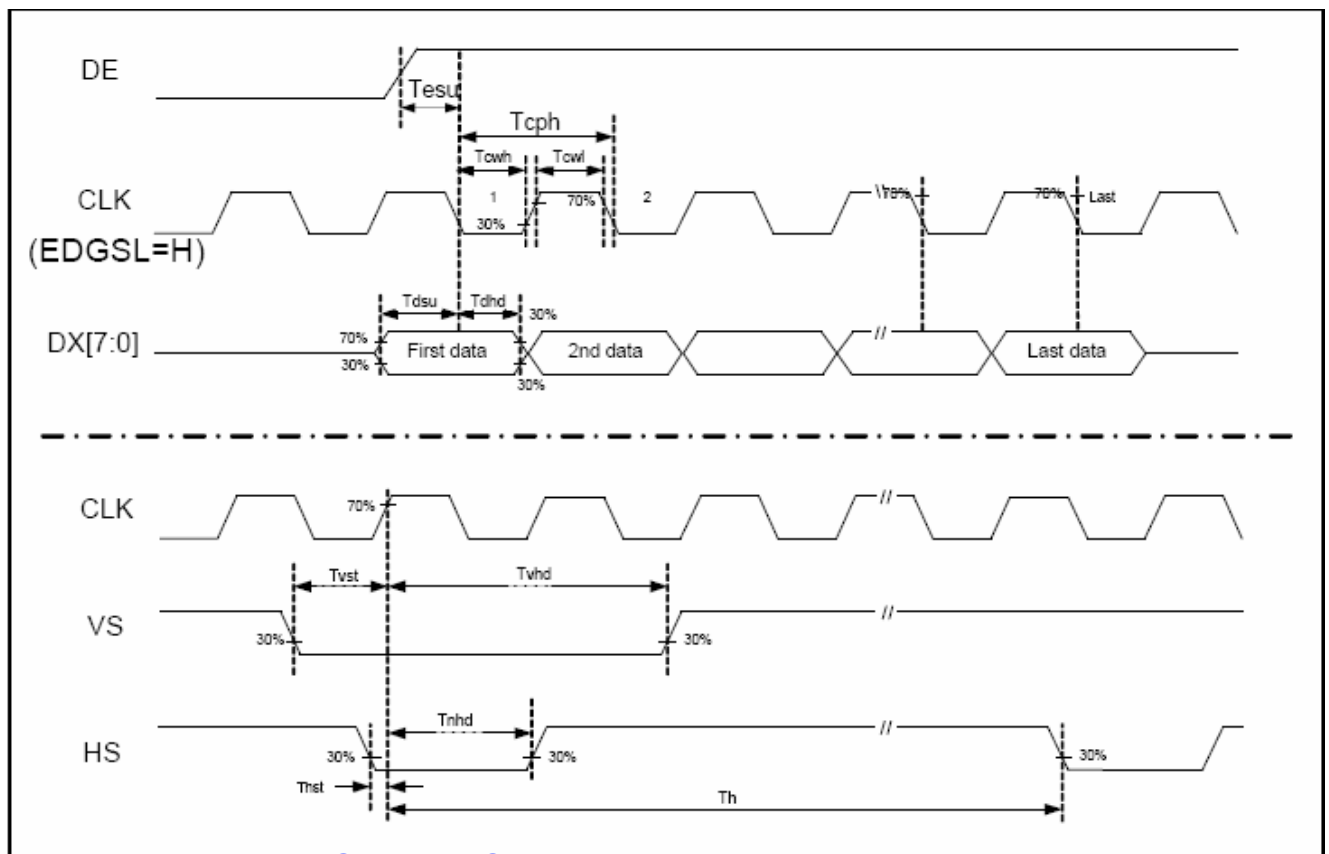
PARAMETER	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DE Horizontal Period	$T_{HP}$	1000	1056	1200	$T_{CLK}$
DE Horizontal Valid	$T_{HV}$	800	800	800	
DE Horizontal Blank	$T_{HBK}$	200	256	400	
DE Vertical Period	$T_{VP}$	490	525	590	$T_{HP}$
DE Vertical Valid	$T_{VV}$	480	480	480	
DE Vertical Blank	$T_{VBK}$	10	45	110	
DE Vertical Frequency	FV	51	60	70	Hz

## 10.2 POWER SIGNAL SEQUENCE

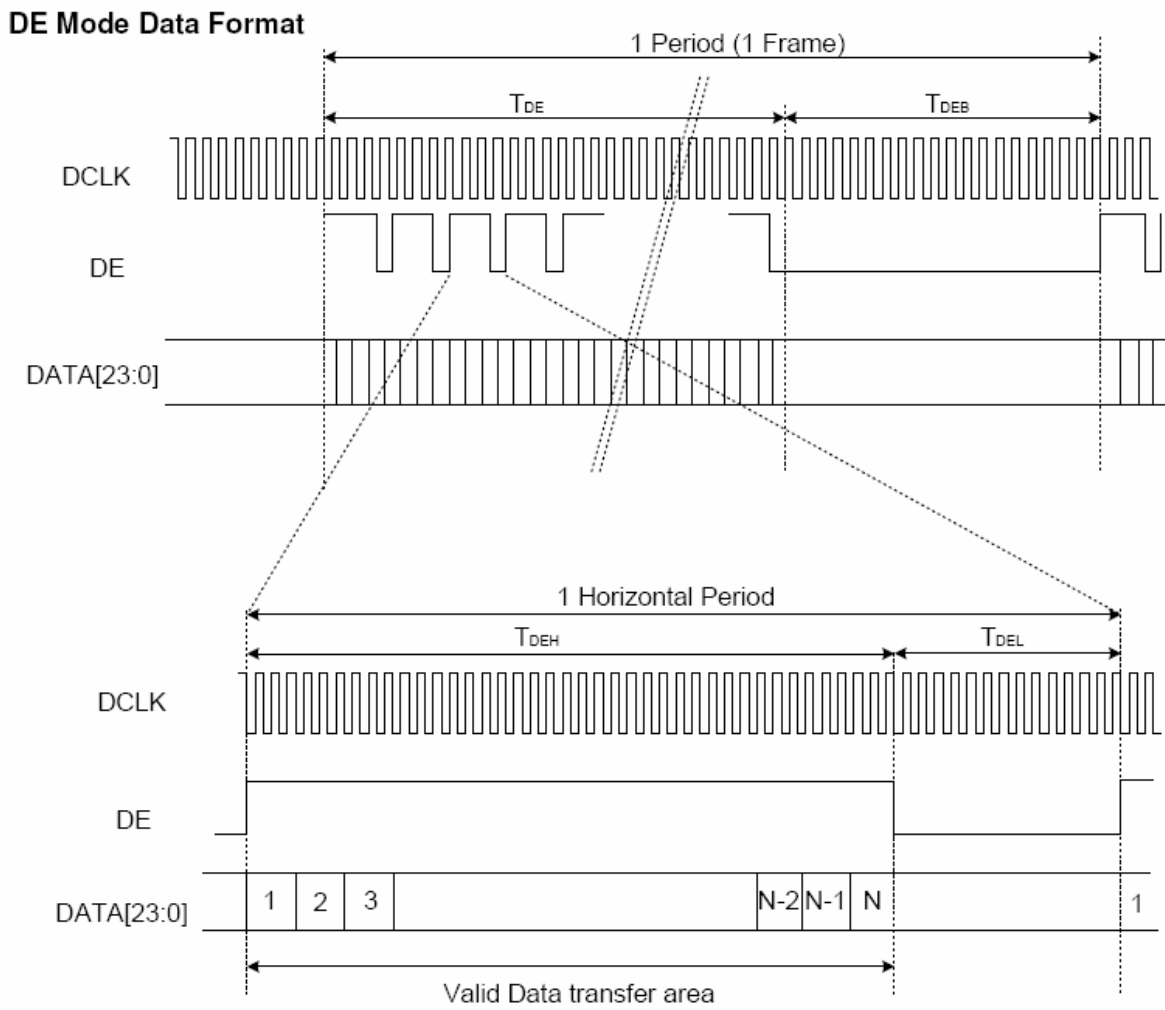


PARAMETER	MIN.	TYP.	MAX.	UNIT
T1	-	-	10	ms
T2	50	-	-	ms
T3	0	-	50	ms
T4	0	-	10	ms
T5	60	-	-	ms
T6	200	-	-	ms
T7	200	-	-	ms

## 10.3 CLOCK AND DATA WAVEFORMS

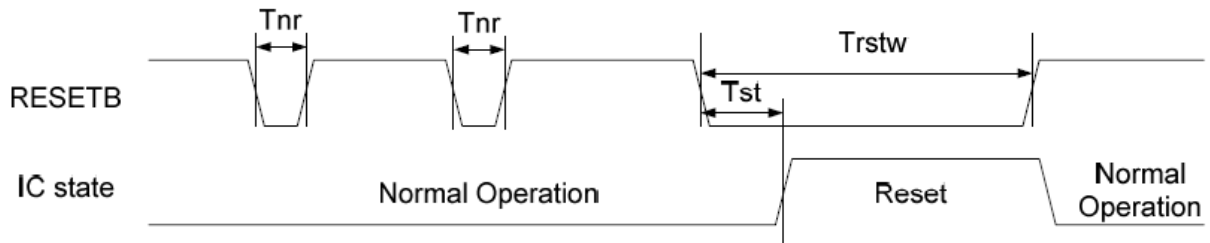


## 10.4 DATA INPUT FORMAT



## 10.5 HARDWARE RESET TIMING

PARAMETER	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
RESETB low pulse width	$T_{rstw}$	10	-	-	$\mu\text{s}$
Negative noise pulse width	$T_{nr}$		-	4	$\mu\text{s}$
Reset start time	$T_{st}$	4	-		$\mu\text{s}$





# 11. RELIABILITY TEST

Ta = 25°C

Environmental Test				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	80°C	240HRS	
2	Low Temperature Storage	-30±3°C	240HRS	
3	High Temperature Humidity Storage	60°C 90%RH	240HRS	NOTE(2)
4	High Temperature Operation	70°C	240HRS	NOTE(2)
5	Low Temperature Operation	-20°C	240HRS	NOTE(2)
6	Temperature Cycle	-30°C ← 25°C → 80°C (30min) (5min) (30min)	10CYCLE	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. PACKAGE METHOD

TBD