

TFT-Display Datenblatt

Modell OT070KGDDDV-01

Kurzdaten

Hersteller	ONation
Diagonale	7,0" / 17,8 cm
Format	wide
Auflösung	800 x 480
Backlight	LED / 1000 cd/m ²
Interface	RGB
Touchscreen	nein
Temperatur	-20° ... +70°C (Betrieb)



ONation Corporation

CUSTOMER' S APPROVAL SPECIFICATIONS

MODEL: OT070KGDDDDV-01
(Complied with RoHS)

CUSTOMER: _____

Version:P0.1

C O N T E N T S

ISSUE:OCT.03.2012

Spec Condition: preliminary

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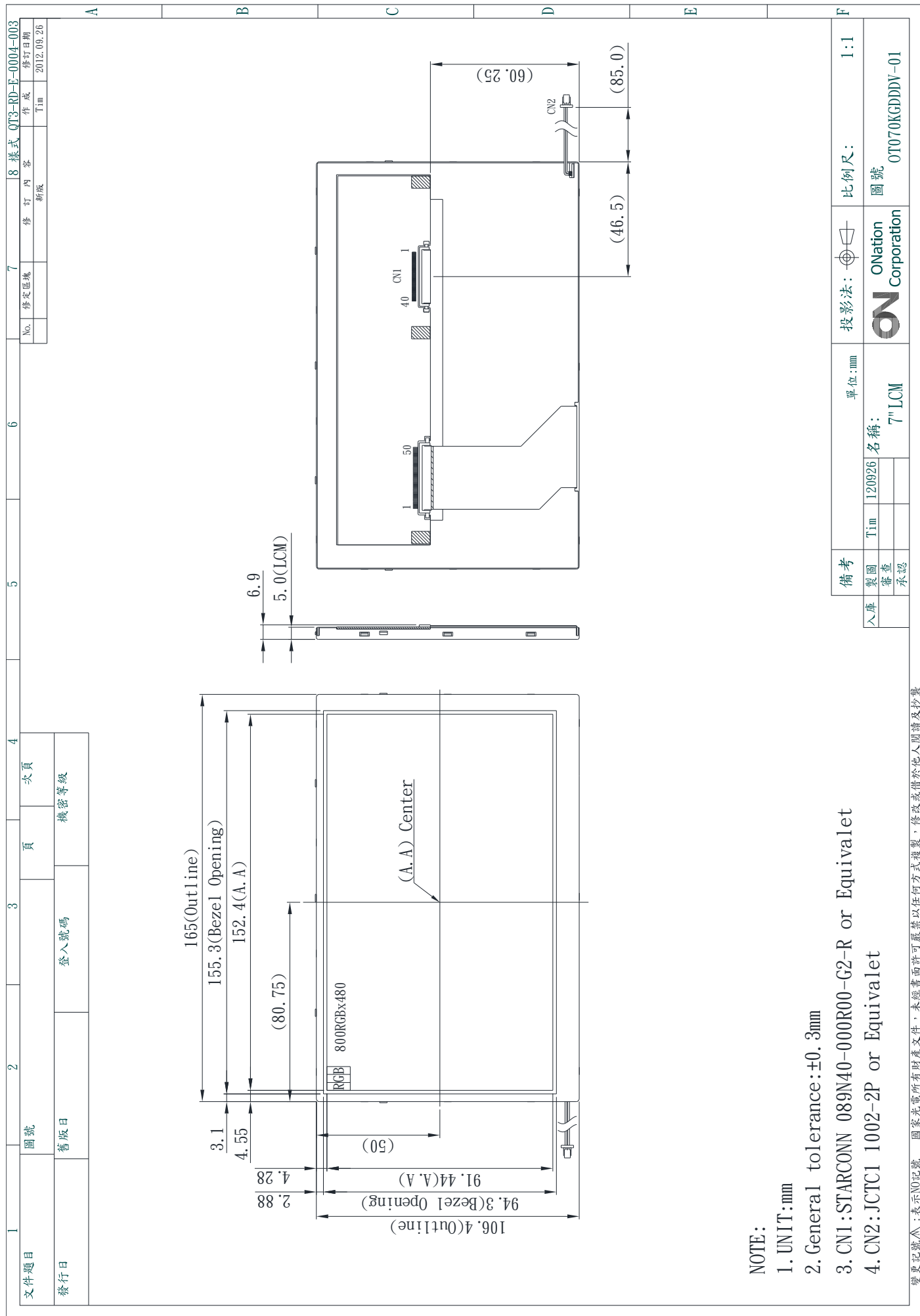
CUSTOMER	ONATION		
APPROVAL	APPROVAL	CHECKER	PREPARE
	<i>ch lee</i>	<i>ch lee</i>	<i>kevin</i>

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 6.9(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	12 O'clock
(9)	Gray Scale Inversion Direction	6 O'clock
(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



NOTE:

1. UNIT:mm
2. General tolerance:±0.3mm
3. CN1:STARCONN 089N40-000R00-G2-R or Equivalet
4. CN2:JCTC1 1002-2P or Equivalet

變更記號:表示N0記號 國家光電所有財產文件,未經書面許可嚴禁以任何方式複製,修改或借於他人閱讀及抄襲

5. INTERFACE PIN CONNECTION

5.1 LCM PANEL DRIVING SECTION (CN1 Connector: Starconn 089N40-000R00-G2)

PIN No.	SIGNAL	FUNCTION
1	GND	GROUND
2	GND	GROUND
3	NC	No connection
4	NC	No connection
5	NC	No connection
6	NC	No connection
7	VCC	POWER SUPPLY FOR DIGITAL CIRCUIT
8	VCC	POWER SUPPLY FOR DIGITAL CIRCUIT
9	DE	DATA ENABLE
10	GND	GROUND
11	GND	GROUND
12	GND	GROUND
13	B5	BLUE DATA SIGNAL(MSB)
14	B4	BLUE DATA SIGNAL
15	B3	BLUE DATA SIGNAL
16	GND	GROUND
17	B2	BLUE DATA SIGNAL
18	B1	BLUE DATA SIGNAL
19	B0	BLUE DATA SIGNAL(LSB)
20	GND	GROUND
21	G5	GREEN DATA SIGNAL(MSB)
22	G4	GREEN DATA SIGNAL
23	G3	GREEN DATA SIGNAL
24	GND	GROUND
25	G2	GREEN DATA SIGNAL
26	G1	GREEN DATA SIGNAL
27	G0	GREEN DATA SIGNAL(LSB)
28	GND	GROUND
29	R5	RED DATA SIGNA(MSB)
30	R4	RED DATA SIGNA
31	R3	RED DATA SIGNA
32	GND	GROUND
33	R2	RED DATA SIGNA
34	R1	RED DATA SIGNA
35	R0	RED DATA SIGNA(LSB)
36	GND	GROUND
37	GND	GROUND
38	DCLK	CLOCK SIGNALS
39	GND	GROUND
40	GND	GROUND

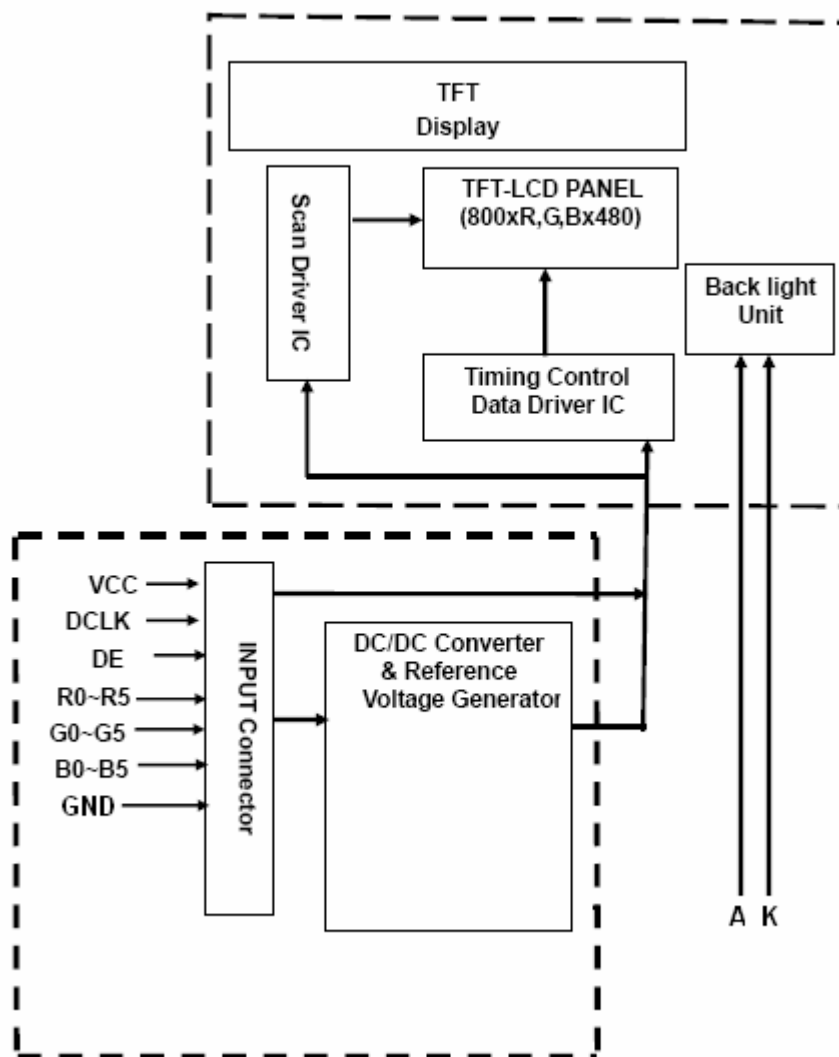
5.2 BACKLIGHT DRIVING SECTION

CN2 Connector: JCTC1 1002-2P

Mating Connector:87213-0200G or Compatible.

PIN No	SYMBOL	FUNCTION	REMARK
1	A	POWER SUPPLY FOR BACKLIGHT DRIVE CIRCUIT	RED
2	K	GROUND	WHITE

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 _I	-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 _{IH}	0.7*VCC	-	VCC	V
Input Low Voltage	V _{IL}	GND	-	0.3*VCC	V
Output High Voltage	V _{OH}	0.8VCC	-	VCC	V
Output Low Voltage	V _{OL}	GND	-	0.2VCC	V

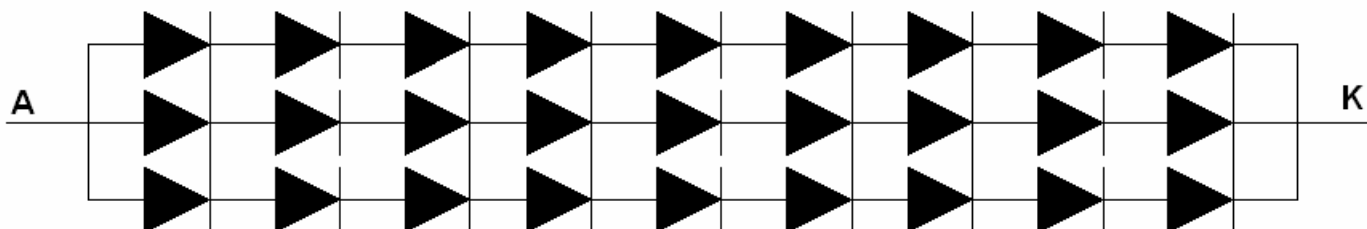
8.2 BACKLIGHT UNITS

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
LED Driving Voltage	V _{A-K}	-	24.5	32	V
LED Driving Current	I _{A-K}	-	100	-	mA
LED Life Time	-	20000	-	-	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.



9. OPTICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK	
Contrast Ratio	CR	Viewing	300	400	-	-	Note (1)	
Response Time	TR	Normal	-	5	10	ms	Note (2)	
	TF	Angle	-	15	20	ms		
Chromaticity	White	x	0.26	0.31	0.36	-	Note (4)	
		y				0.28		0.33
Viewing Angle	Hor.	Θ _{X+}	Viewing	60	70	-	Deg.	Note (3)
		Θ _{X-}		Angle	60	70		
	Ver.	Θ _{Y+}	Θ _X =Θ _Y =0°	40	50	-		
		Θ _{Y-}		CR ≥ 10	50	60		
Luminance	L		900	1000	-	cd/m ²		
Luminance uniformity	YU	I _{A-K} =100mA	70	75	-	%	Note (5)	

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

The contrast ratio can be calculated by the following expression.

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

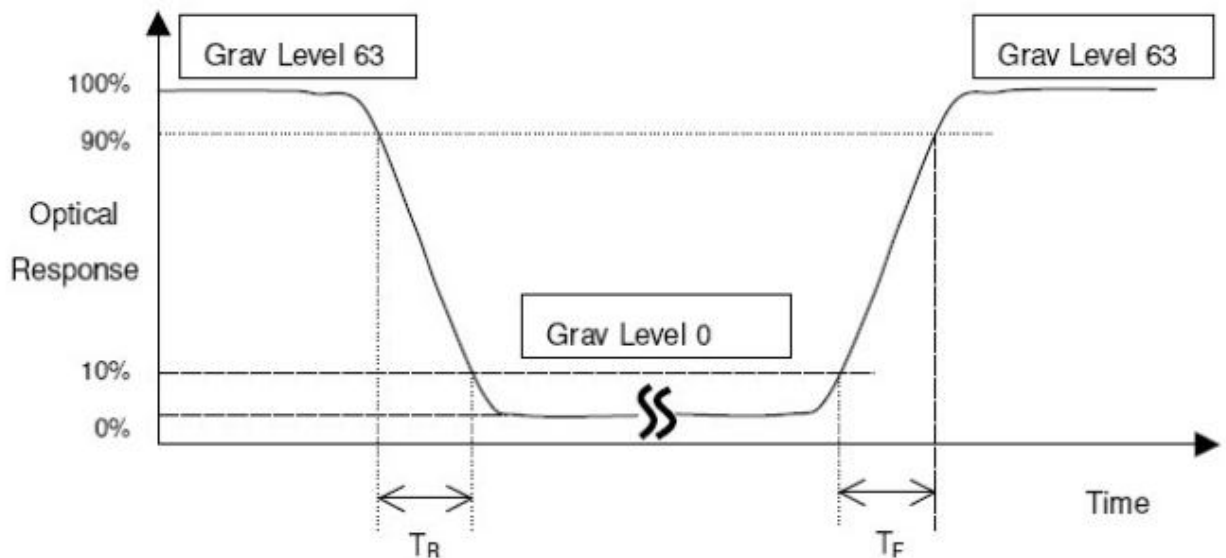
L₆₃: Luminance of gray level 63

L₀: Luminance of gray level 0

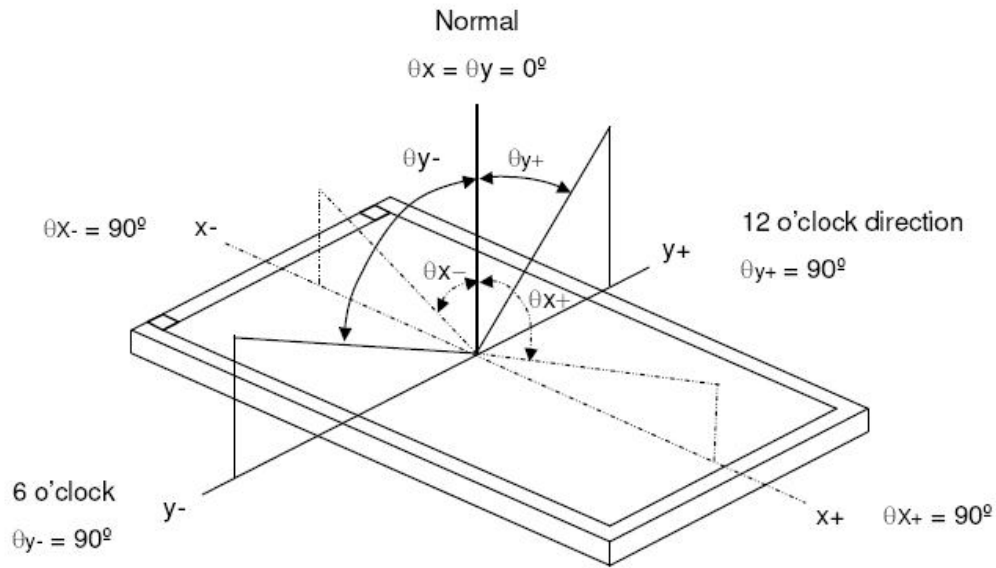
$$\text{CR} = \text{CR} (5)$$

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):

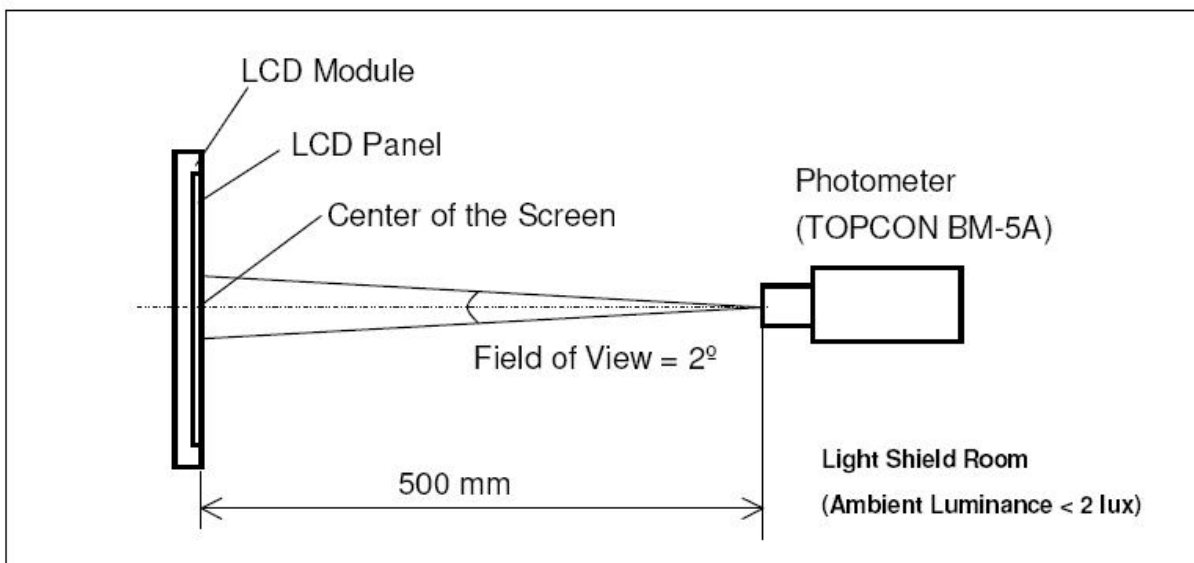


*Note(3) Definition of Viewing Angle

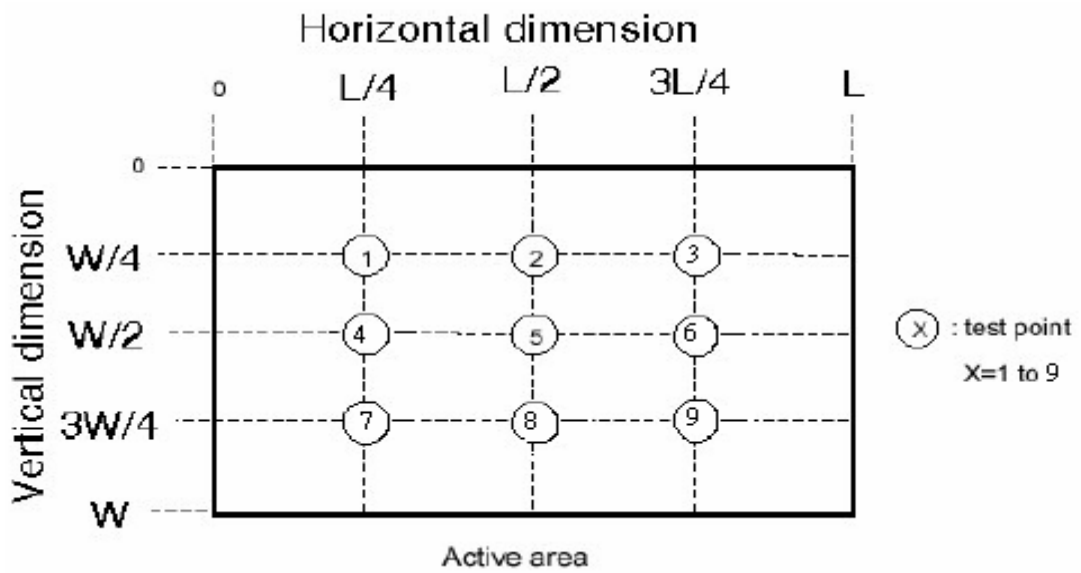


*Note (4) Measurement Set-Up:

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)



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

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	μ 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

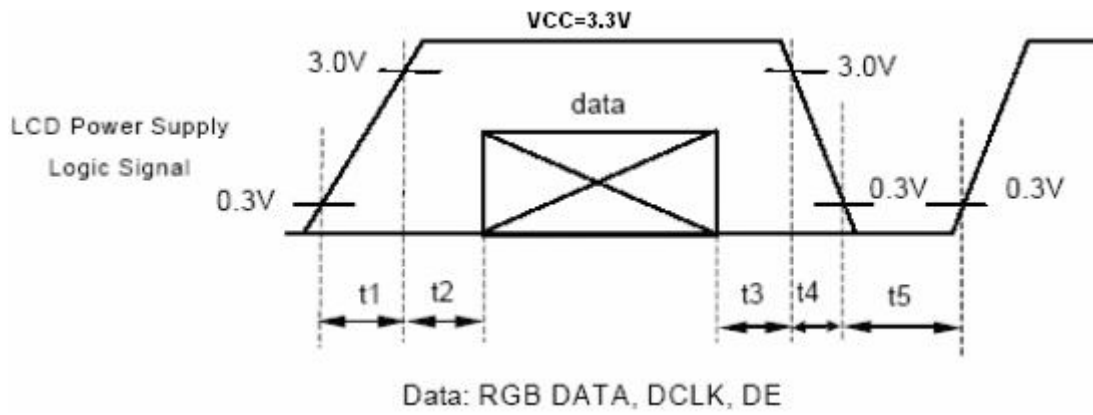
PARAMETER	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
CLK frequency	F_{CPH}	-	33.26	-	MHz
CLK period	T_{CPH}	-	30.06	-	ns
CLK pulse duty	T_{CWH}	40	50	60	%
HS period	T_H	930	1056	1057	T_{CPH}
HS pulse width	T_{WH}	1	128	-	T_{CPH}
HS-first horizontal data time	T_{HS}	STHD[7:0]+88 ⁽¹⁾			T_{CPH}
HS Active Time	T_{HA}	-	800	-	T_{CPH}
VS period	T_V	-	525	-	T_H
VS pulse width	T_{VW}	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	Spec.			Unit
		Min.	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	-	$T_{DEH}+T_{DEL}$

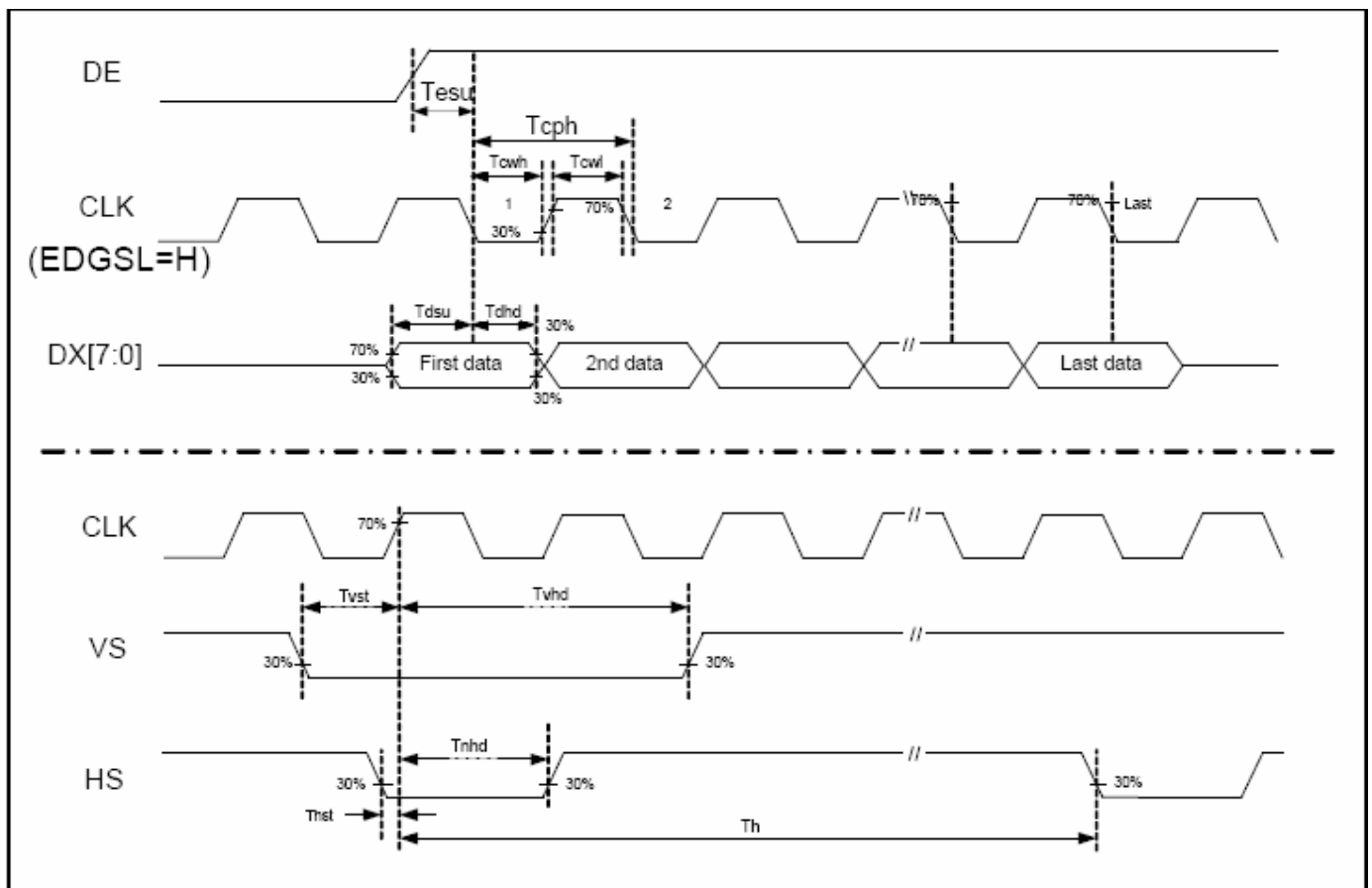
PARAMETER	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DE Horizontal Period	T_{HP}	1000	1056	1200	T_{CLK}
DE Horizontal Valid	T_{HV}	800	800	800	
DE Horizontal Blank	T_{HBK}	200	256	400	
DE Vertical Period	T_{VP}	490	525	590	T_{HP}
DE Vertical Valid	T_{VV}	480	480	480	
DE Vertical Blank	T_{VBK}	10	45	110	
DE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

10.2 POWER SIGNAL SEQUENCE

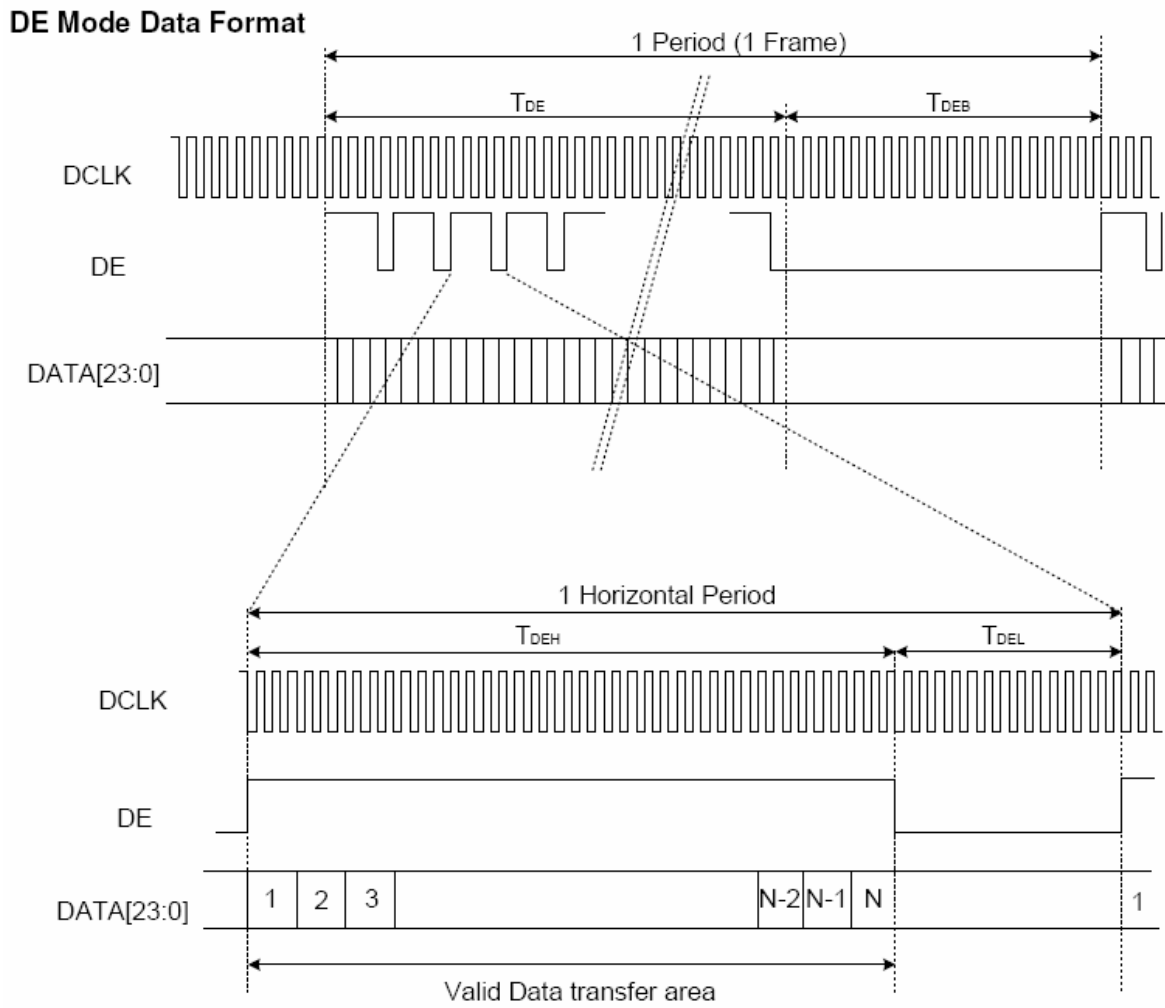


PARAMETER	MIN.	TYP.	MAX.	UNIT
T1	-	-	10	ms
T2	50	-	-	ms
T3	0	-	50	ms
T4	0	-	10	ms
T5	60	-	-	ms

10.3 CLOCK AND DATA WAVEFORMS

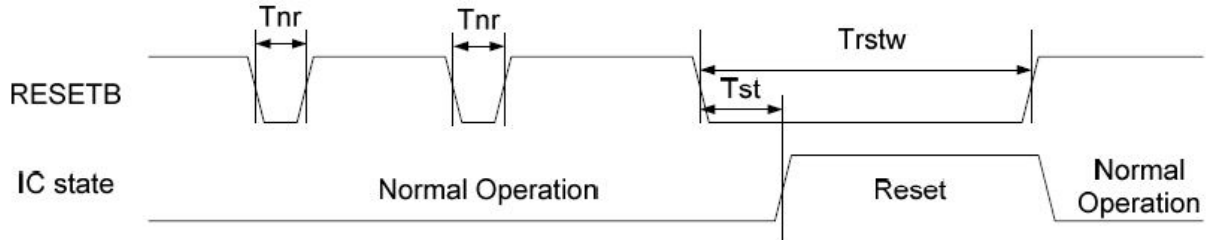


10.4 DATA INPUT FORMAT



10.5 HARDWARE RESET TIMING

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



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