

TFT-DISPLAY DATASHEET

ONation
Model: OT070GGDDL-00

BRIEF SPEC.:

Main Feature	LandscapeType Transmissive
Active Screen Area	152.4 x 91.44 (mm)
Diagonal Format	7 " 15:9
Resolution	800 X 480
Colors	(6 Bit)
Backlight	LED
Brightness	400 cd/m ²
LED Life Time	
Interface	RGB
Viewing Angle	70/70 L/R 50/60 up/down
Touchscreen	yes
Power Supply	3.3 V (Typ.)
Module Outline	165.0 x 106.4 x 7.85 (mm)
Operation Temperature	-10... +60 °C
Storage Temperature	-20... +70 °C
Surface Treatment	Anti—glare



ONation Corporation

CUSTOMER' S APPROVAL SPECIFICATIONS

MODEL: OT070GGDDLT-00
(Complied with RoHS)

CUSTOMER: _____

Version:P0.5

C O N T E N T S




ISSUE:SEP.09.2013

Spec Condition: Preliminary

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APPROVAL	APPROVAL	CHECKER	PREPARE
	<i>John</i>	<i>Aiden</i>	<i>Josh</i>

2.RECORD OF REVISION

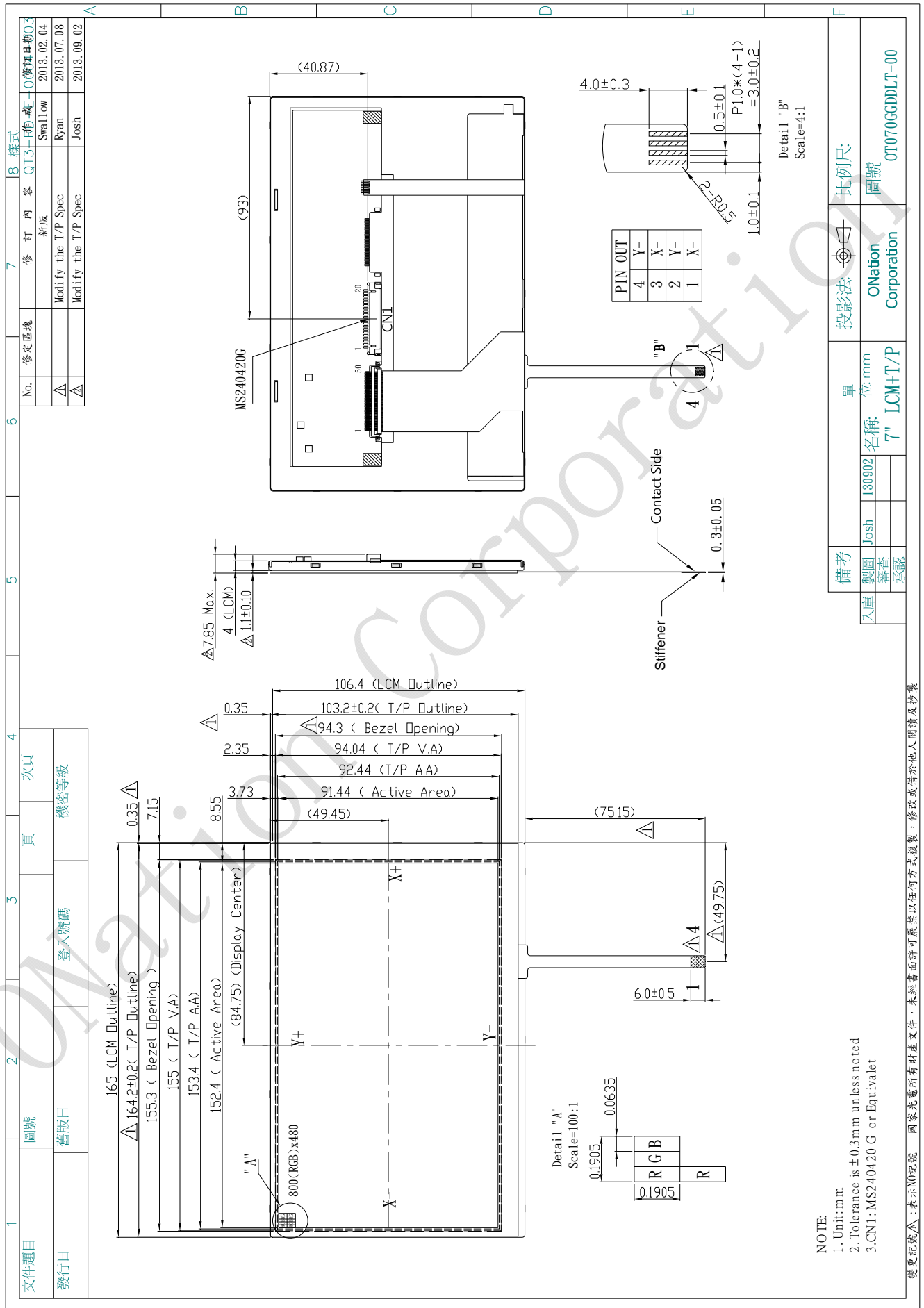
Rev	DATE	PAGE	SUMMARY																																																																																																																																																														
0.1	2012.09.07	ALL	Preliminary specification was first issued.																																																																																																																																																														
0.2	2012.11.21	2	Right View: 6.3W/COMPONENT→6.5W/COMPONENT																																																																																																																																																														
		6	<table border="1"> <thead> <tr> <th>ITEM</th> <th>SYMBOL</th> <th>CONDITIONS</th> <th>MIN.</th> <th>TYP.</th> <th>MAX.</th> <th>UNIT</th> <th>REMARK</th> </tr> </thead> <tbody> <tr> <td>Contrast Ratio</td> <td>CR</td> <td>At optimized Viewing angle</td> <td>300</td> <td>400</td> <td>-</td> <td>-</td> <td>Note (1)</td> </tr> <tr> <td rowspan="2">Response Time</td> <td>TR</td> <td rowspan="2">T=0</td> <td>-</td> <td>5</td> <td>10</td> <td>ms</td> <td rowspan="2">Note (2)</td> </tr> <tr> <td>TF</td> <td>-</td> <td>15</td> <td>20</td> <td>ms</td> </tr> <tr> <td>Brightness</td> <td></td> <td>ADJ=3.3V</td> <td>(320)</td> <td>(400)</td> <td>-</td> <td>cd/m²</td> <td rowspan="2">Note(5)</td> </tr> <tr> <td>Uniformity</td> <td></td> <td></td> <td>70</td> <td>-</td> <td>-</td> <td>%</td> </tr> <tr> <td rowspan="2">Chromaticity White</td> <td>x</td> <td rowspan="2">Viewing Angle θx-θy =0°</td> <td>0.28</td> <td>0.33</td> <td>0.38</td> <td>-</td> <td rowspan="2">Note (4)</td> </tr> <tr> <td>y</td> <td>0.33</td> <td>0.38</td> <td>0.43</td> <td>-</td> </tr> <tr> <td rowspan="4">Viewing Angle</td> <td>θx+</td> <td rowspan="4">CR≥10</td> <td>60</td> <td>70</td> <td>-</td> <td>-</td> <td rowspan="4">Note (3)</td> </tr> <tr> <td>θx-</td> <td>60</td> <td>70</td> <td>-</td> <td>-</td> </tr> <tr> <td>θy+</td> <td>40</td> <td>50</td> <td>-</td> <td>-</td> </tr> <tr> <td>θy-</td> <td>50</td> <td>60</td> <td>-</td> <td>-</td> </tr> </tbody> </table>  <table border="1"> <thead> <tr> <th>ITEM</th> <th>SYMBOL</th> <th>CONDITIONS</th> <th>MIN.</th> <th>TYP.</th> <th>MAX.</th> <th>UNIT</th> <th>REMARK</th> </tr> </thead> <tbody> <tr> <td>Contrast Ratio</td> <td>CR</td> <td>At optimized Viewing angle</td> <td>300</td> <td>400</td> <td>-</td> <td>-</td> <td>Note (1)</td> </tr> <tr> <td rowspan="2">Response Time</td> <td>TR</td> <td rowspan="2">T=0</td> <td>-</td> <td>5</td> <td>10</td> <td>ms</td> <td rowspan="2">Note (2)</td> </tr> <tr> <td>TF</td> <td>-</td> <td>15</td> <td>20</td> <td>ms</td> </tr> <tr> <td>Brightness</td> <td></td> <td>ADJ=3.3V</td> <td>320</td> <td>400</td> <td>-</td> <td>cd/m²</td> <td rowspan="2">Note(5)</td> </tr> <tr> <td>Uniformity</td> <td></td> <td></td> <td>70</td> <td>-</td> <td>-</td> <td>%</td> </tr> <tr> <td rowspan="2">Chromaticity White</td> <td>x</td> <td rowspan="2">Viewing Angle θx-θy =0°</td> <td>0.28</td> <td>0.33</td> <td>0.38</td> <td>-</td> <td rowspan="2">Note (4)</td> </tr> <tr> <td>y</td> <td>0.33</td> <td>0.38</td> <td>0.43</td> <td>-</td> </tr> <tr> <td rowspan="4">Viewing Angle</td> <td>θx+</td> <td rowspan="4">CR≥10</td> <td>60</td> <td>70</td> <td>-</td> <td>-</td> <td rowspan="4">Note (3)</td> </tr> <tr> <td>θx-</td> <td>60</td> <td>70</td> <td>-</td> <td>-</td> </tr> <tr> <td>θy+</td> <td>40</td> <td>50</td> <td>-</td> <td>-</td> </tr> <tr> <td>θy-</td> <td>50</td> <td>60</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK	Contrast Ratio	CR	At optimized Viewing angle	300	400	-	-	Note (1)	Response Time	TR	T=0	-	5	10	ms	Note (2)	TF	-	15	20	ms	Brightness		ADJ=3.3V	(320)	(400)	-	cd/m ²	Note(5)	Uniformity			70	-	-	%	Chromaticity White	x	Viewing Angle θx-θy =0°	0.28	0.33	0.38	-	Note (4)	y	0.33	0.38	0.43	-	Viewing Angle	θx+	CR≥10	60	70	-	-	Note (3)	θx-	60	70	-	-	θy+	40	50	-	-	θy-	50	60	-	-	ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK	Contrast Ratio	CR	At optimized Viewing angle	300	400	-	-	Note (1)	Response Time	TR	T=0	-	5	10	ms	Note (2)	TF	-	15	20	ms	Brightness		ADJ=3.3V	320	400	-	cd/m ²	Note(5)	Uniformity			70	-	-	%	Chromaticity White	x	Viewing Angle θx-θy =0°	0.28	0.33	0.38	-	Note (4)	y	0.33	0.38	0.43	-	Viewing Angle	θx+	CR≥10	60	70	-	-	Note (3)	θx-	60	70	-	-	θy+	40	50	-	-	θy-	50	60
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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 7.85(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 Vertical Stripe
(11)	Driving Method	COG TYPE
(12)	Module Weight(g)	150±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. Tolerance is ±0.3mm unless noted
 3. CN1: MS240420 G or Equivalent

變更記錄: 表示N0記錄 國家電所有財產文件, 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: MS240420G or Equivalent)

PIN NO.	SYMBOL	FUNCTION	REMARK
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	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	

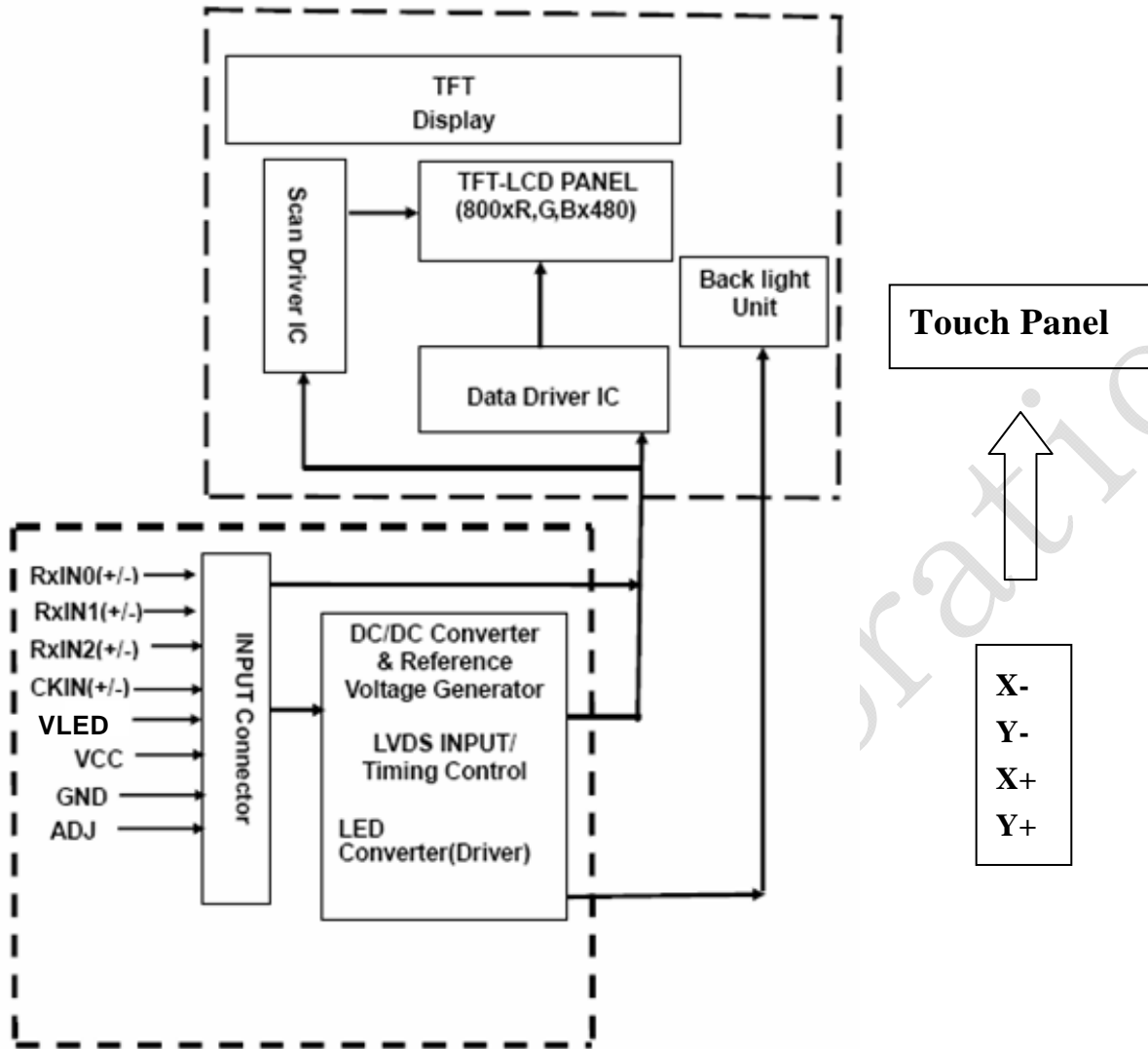
Remarks:

- (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.

5.2 TOUCH PANEL SCREEN

PIN NO.	SYMBOL	FUNCTION	REMARK
1	X-	Touch Panel Signal(X-Left)	
2	Y-	Touch Panel Signal(Y-Bottom)	
3	X+	Touch Panel Signal(X-Right)	
4	Y+	Touch Panel Signal(Y-TOP)	

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)	-10	60	-20	70	Note 1,2
Humidity(% RH)	Note 3		Note 3		

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 : Storage Ta=60°C & H=90% ≤ 72Hrs.

8.ELECTRICAL CHARACTERISTICS

8.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25°C

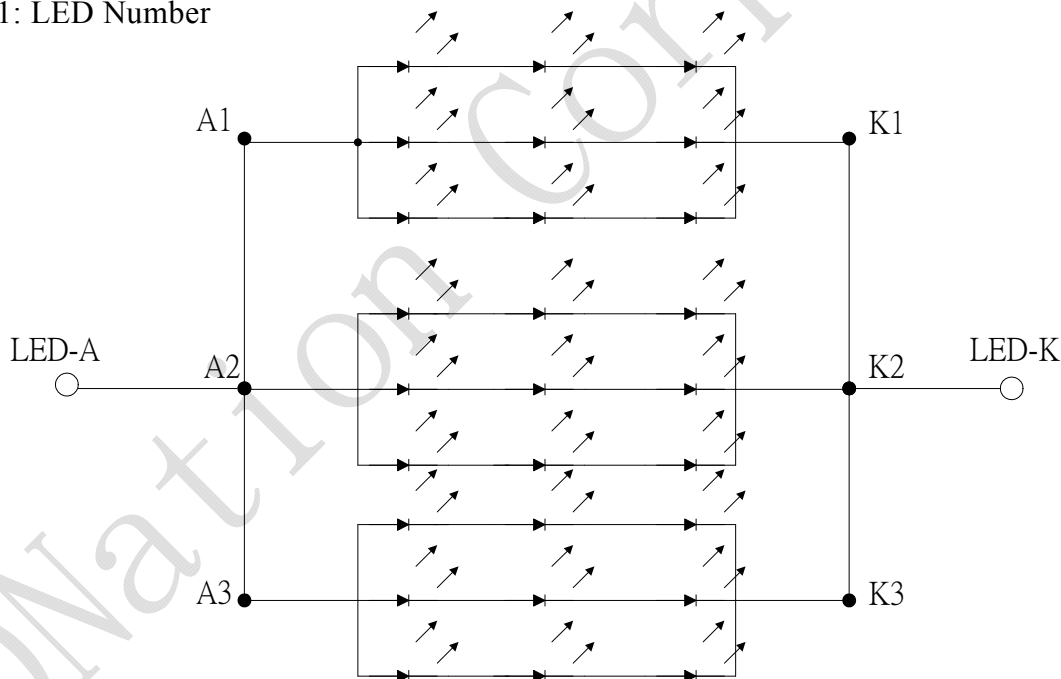
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
Power Voltage for LCD	VCC	3.0	3.3	3.6	V
	ICC	-	225	337.5	mA
Input High Voltage	V _{IH}	0.7*VCC	-	VCC	V
Input Low Voltage	V _{IL}	GND	-	0.3*VCC	V
Output High Voltage	V _{OH}	0.8VCC	-	VCC	V
Output Low Voltage	V _{OL}	GND	-	0.2VCC	V

8.2 BACKLIGHT UNITS

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
LED Driving Voltage	VLED	3	5	5.5	V
LED Driving Current	I _{LED} (VLED=3.3V)	-	650	850	mA
	I _{LED} (VLED=5V)	-	400	550	mA
ADJ Input Voltage	-	3	-	3.3	V
ADJ Frequency	-	19	20	21	KHz

Note 1: LED Number



Note 2: The LED of B/L is drive by current only, drive voltage is for reference only, drive voltage can make driving current under safety area(current between minimum and maximum). 20K hours is only an estimate for reference.

9.OPTICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK	
Contrast Ratio	CR	At optimized Viewing angle	300	400	-	-	Note (1)	
Response Time	TR	T=0	-	5	10	ms	Note (2)	
	TF		-	15	20	ms		
Brightness		ADJ=3.3V	300	400	-	cd/m2		
Uniformity			70	-	-	%	Note(5)	
Chromaticity	White	x	Viewing Angle $\Theta_x=\Theta_y=0^\circ$	0.28	0.33	0.38	-	Note (4)
		y		0.33	0.38	0.43	-	
Viewing Angle		Θ_{x+}	$CR \geq 10$	60	70	-	Deg.	Note (3)
		Θ_{x-}		60	70	-		
		Θ_{y+}		40	50	-		
		Θ_{y-}		50	60	-		

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

The contrast ratio can be calculated by the following expression.

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

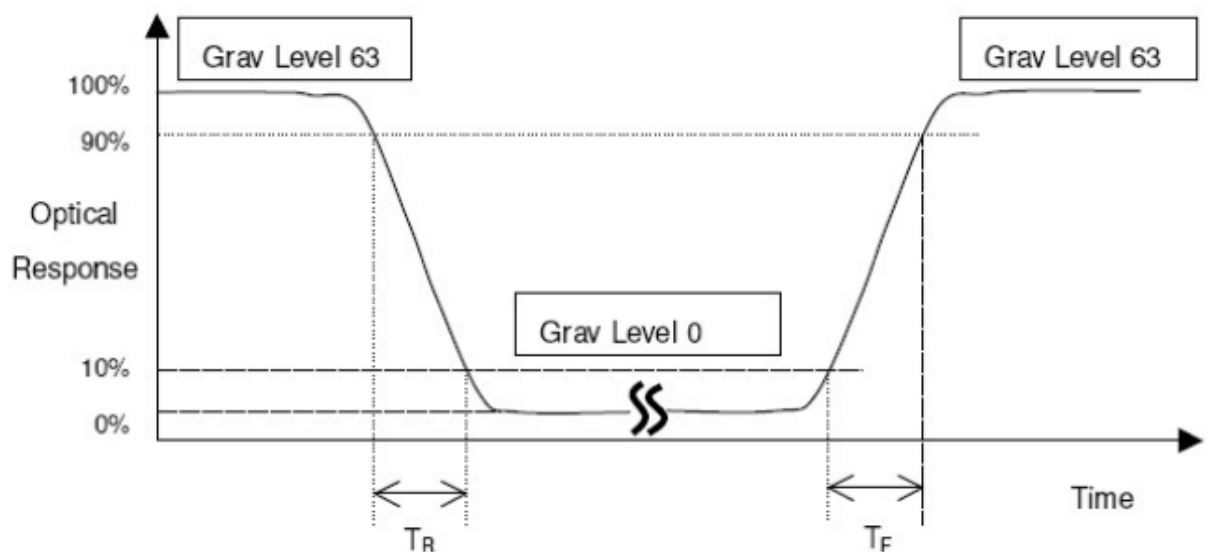
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

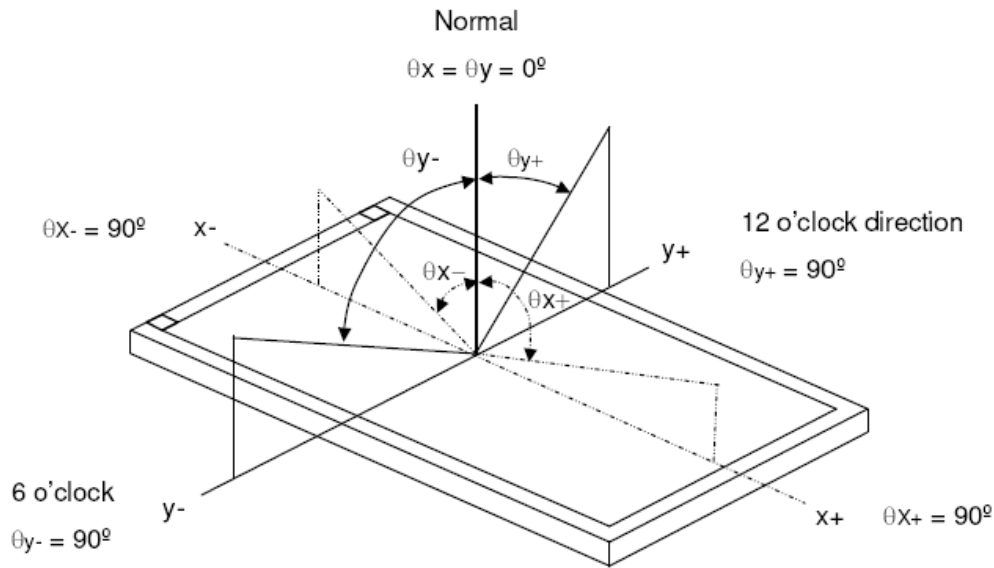
$$CR = CR (5)$$

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

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

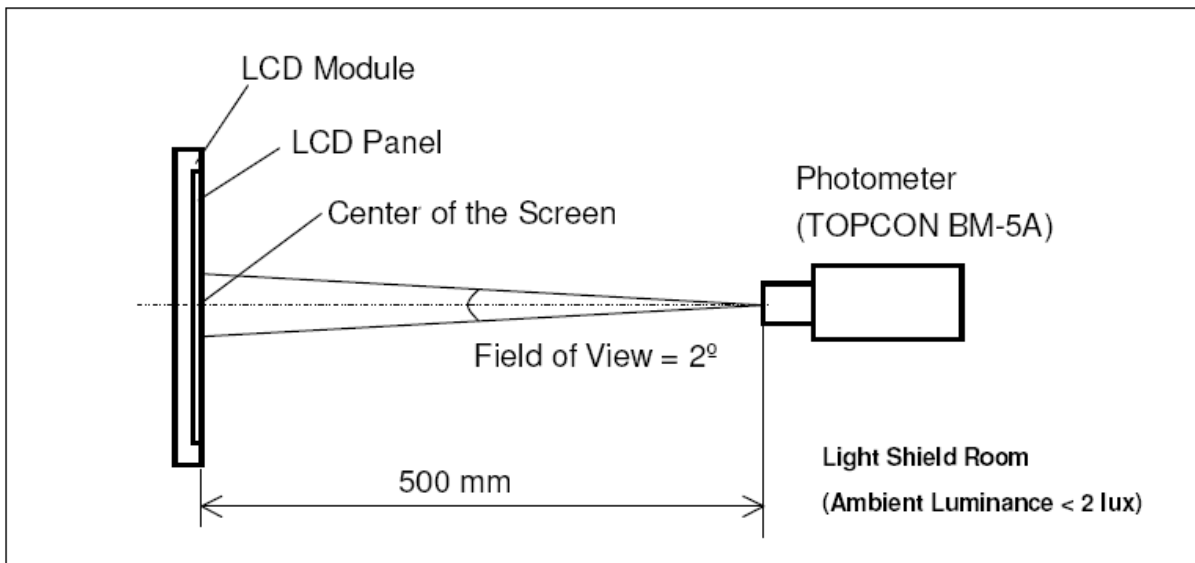


*Note(3) Definition of Viewing Angle

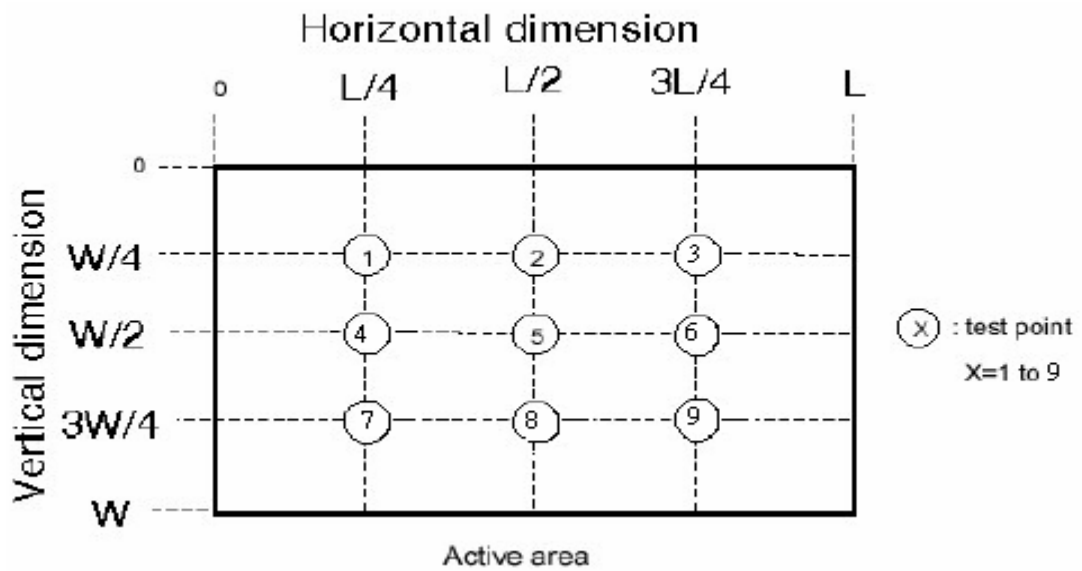


*Note (4) Measurement Set-Up:

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. TOUCH PANEL SPECIFICATIONS

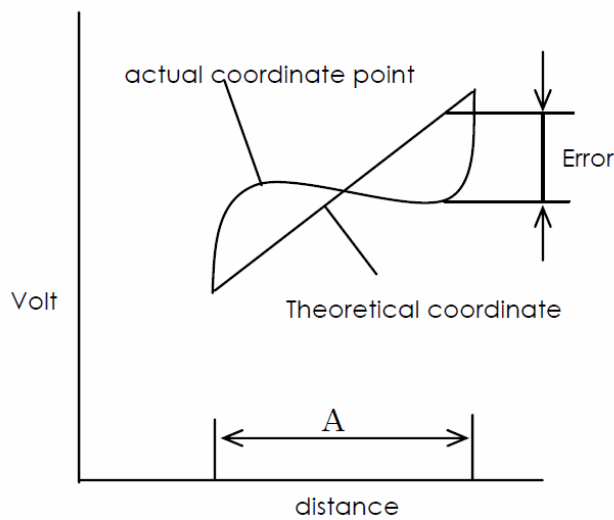
10.1 ELECTRICAL CHARACTERISTICS OF TOUCH PANEL

ITEM		SPECIFICATION
(1)	Loop Resistance	X: 400Ω~1000Ω, Y: 150Ω~500Ω
(2)	Linearity	$X \leq 1.5\%$, $Y \leq 1.5\%$ (see Note1)
(3)	Working Voltage	DC 5V Max.

Note 1

Difference between actual voltage & theoretical voltage is an error at ant points.

Linearity is the value max. Error voltage divided by voltage difference on active area inside 2mm.



A: Guaranteed active area

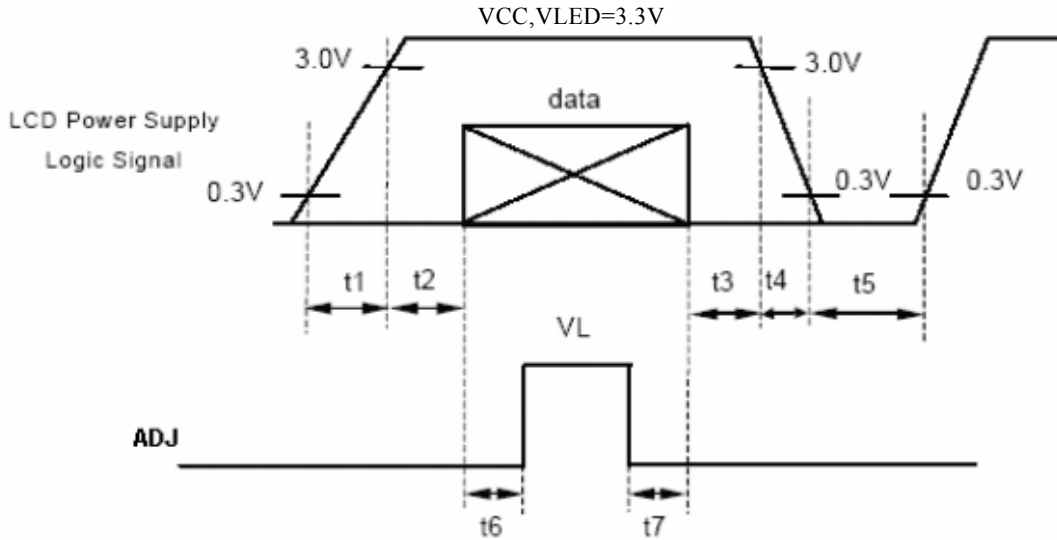
10.2 TOUCH PANEL SCREEN

PIN NO.	DESCRIPTION
1	X-
2	Y-
3	X+
4	Y+

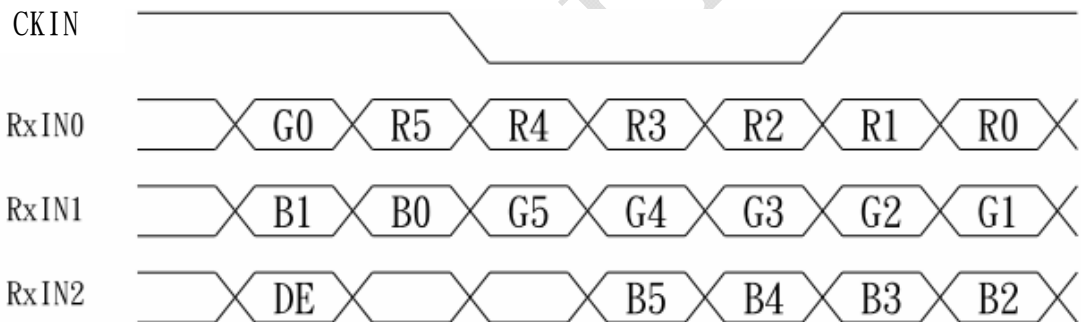
11. TIMING SPECIFICATIONS

11.1 POWER SIGNAL SEQUENCE:

- $t1 \leq 10ms$; $1 \text{ sec} \leq t5$
- $50ms \leq t2$; $200ms \leq t6$
- $0 < t3 \leq 50ms$; $200ms \leq t7$
- $0 < t4 \leq 10ms$



11.2 THE INPUT DATA FORMAT



SIGNAL NAME	DESCRIPTION	REMARK
R5 R4 R3 R2 R1 R0	Red Data 5 Red Data 4 Red Data 3 Red Data 2 Red Data 1 Red Data 0	Red-pixel Data 6Bits LVDS input MSB : R5 ; LSB : R0
G5 G4 G3 G2 G1 G0	Green Data 5 Green Data 4 Green Data 3 Green Data 2 Green Data 1 Green Data 0	Green-pixel Data 6Bits LVDS input MSB : G5 ; LSB : G0
B5 B4 B3 B2 B1 B0	Blue Data 5 Blue Data 4 Blue Data 3 Blue Data 2 Blue Data 1 Blue Data 0	Blue-pixel Data 6Bits LVDS input MSB : B5 ; LSB : B0
CKIN	LVDS Data Clock	
DE	Data Enable Signal	When the signal is high, the pixel data shall be valid to be displayed.

11.3 AC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
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	μs
Source output loading R	R _{SL}	-	2	-	K ohm
Source output loading C	C _{SL}	-	60	-	pF

11.4 RESOLUTION : 800x480

Sync mode

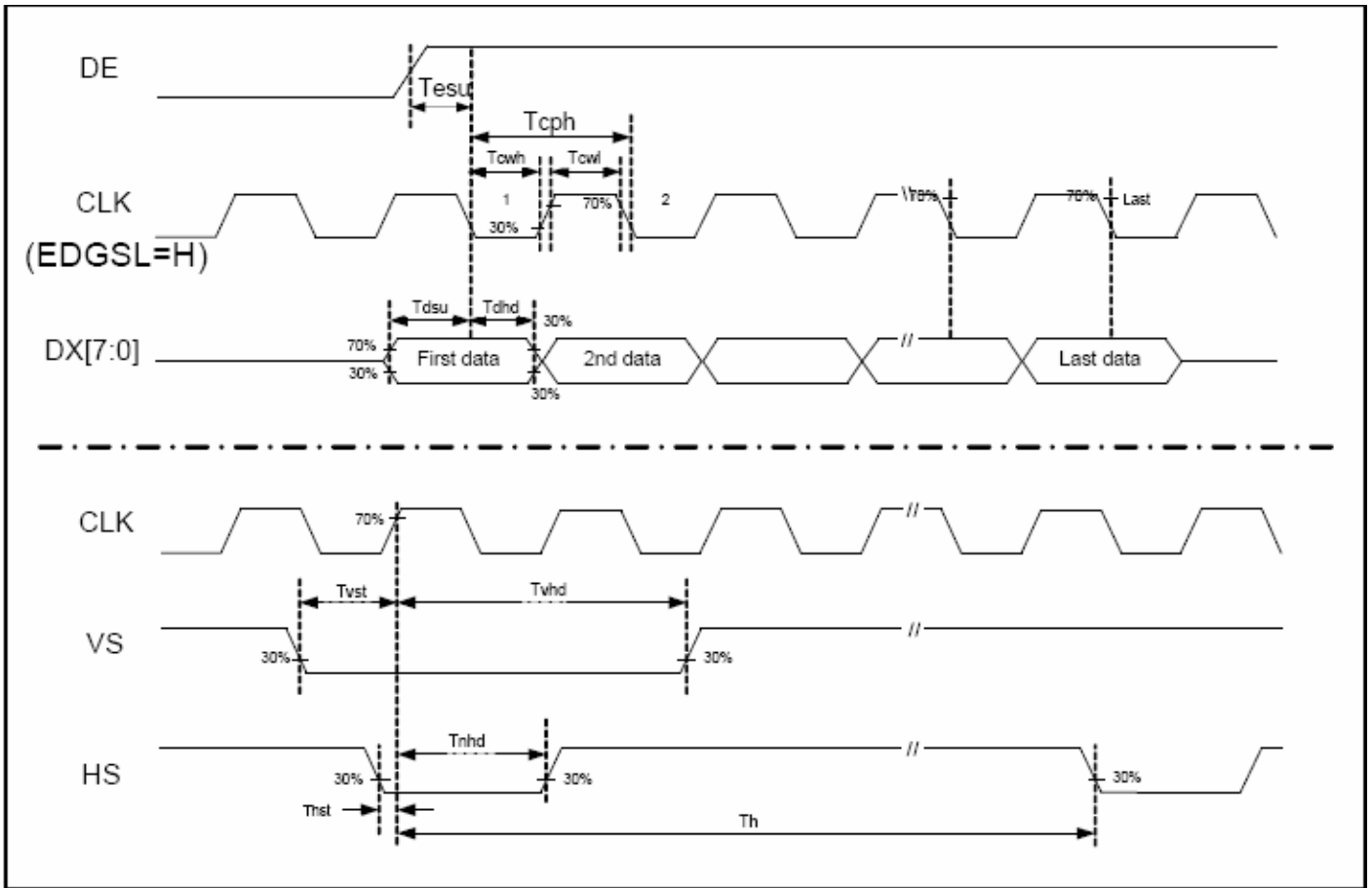
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
CLK frequency	F _{CPH}	-	33.26	-	MHz
CLK period	T _{CPH}	-	30.06	-	ns
CLK pulse duty	T _{CPWH}	40	50	60	%
HS period	T _H	930	1056	1057	T _{CPH}
HS pulse width	T _{WH}	1	128	-	T _{CPH}
HS-first horizontal data time	T _{HS}	STHD[7:0]+88			T _{CPH}
HS active time	T _{HA}	-	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.	TYP.	MAX.	UNIT
CLK frequency	F _{CPH}	25	33.26	50	MHz
CLK period	T _{CPH}	-	30.06	-	ns
CLK pulse duty	T _{CPWH}	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}

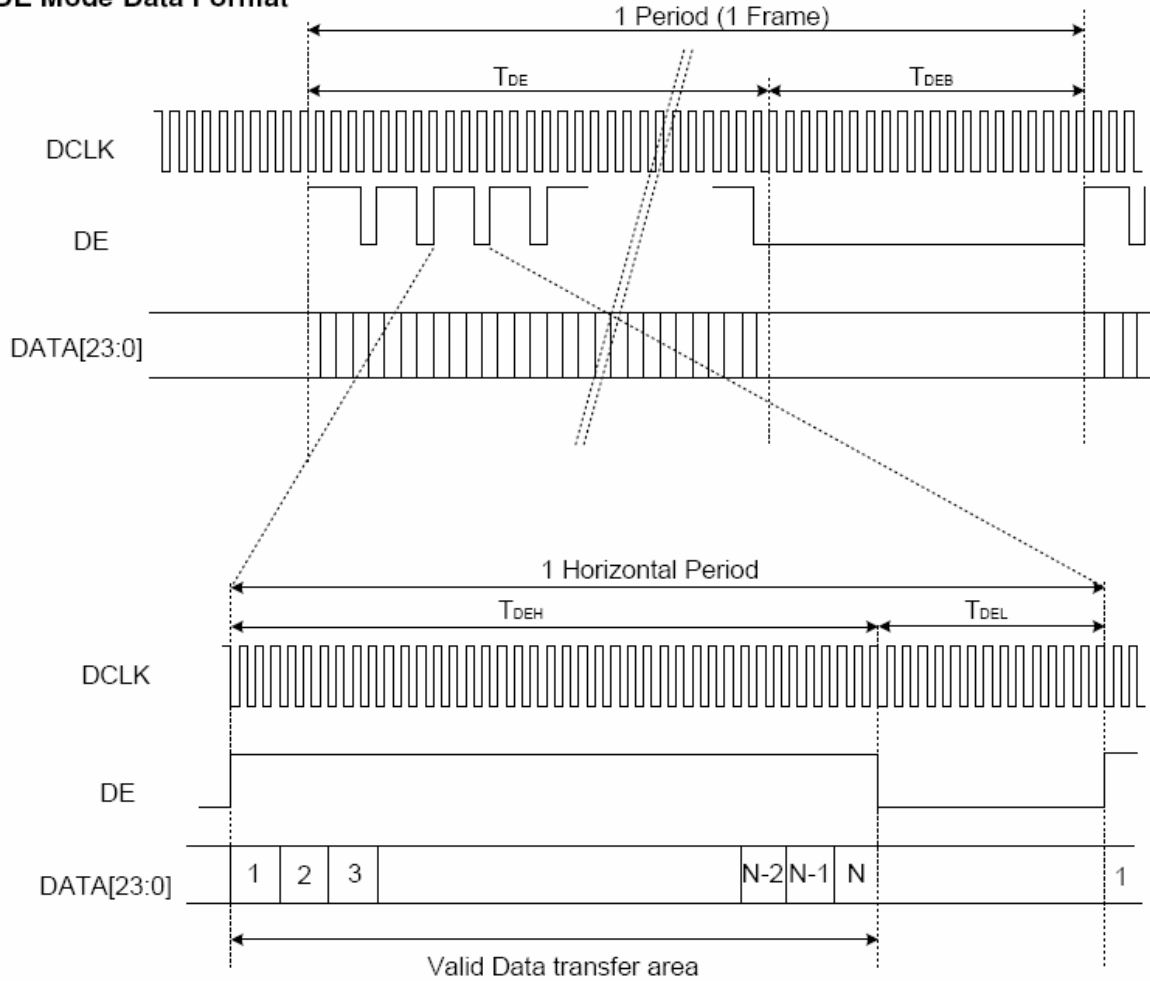
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
DE Horizontal Period	T _{HP}	1000	1056	1200	T _{CLK}
DE Horizontal Valid	T _{HV}	800	800	800	T _{CLK}
DE Horizontal Blank	T _{HBK}	200	256	400	T _{CLK}
DE Vertical Period	T _{VP}	490	525	590	T _{HP}
DE Vertical Valid	T _{VV}	480	480	480	T _{HP}
DE Vertical Blank	T _{VBK}	10	45	110	T _{HP}
DE Vertical Frequency	F _V	51	60	70	Hz

11.5 CLOCK AND DATA WAVEFORMS



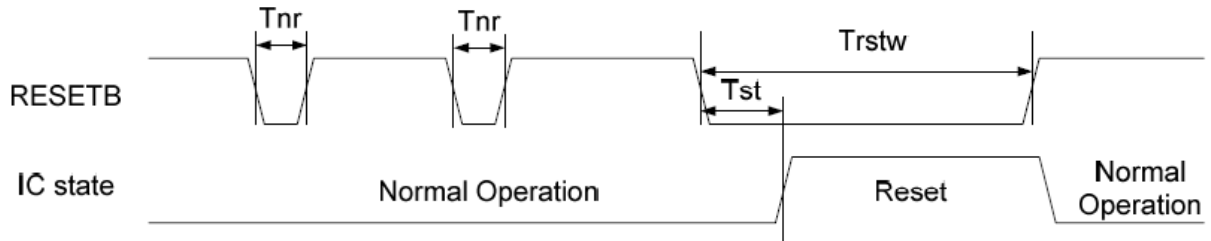
11.6 DATA INPUT FORMAT

DE Mode Data Format



11.7 HARDWARE RESET TIMING

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
RESETB low pulse width	T_{rstw}	10	-	-	μs
Negative noise pulse width	T_{nr}	-	-	4	μs
Reset start time	T_{st}	4	-	-	μs



12. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	70°C	72HRS	
2	Low Temperature Storage	-20°C	72HRS	
3	High Temperature Operation	60°C	72HRS	NOTE(2)
4	Low Temperature Operation	-10°C	72HRS	NOTE(2)
5	Temperature Cycle	-10°C ← → 60°C (30min) (30min)	10CYCLE	NOTE(2)
6	High Temperature Humidity Storage	60°C 90%RH	72HRS	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%

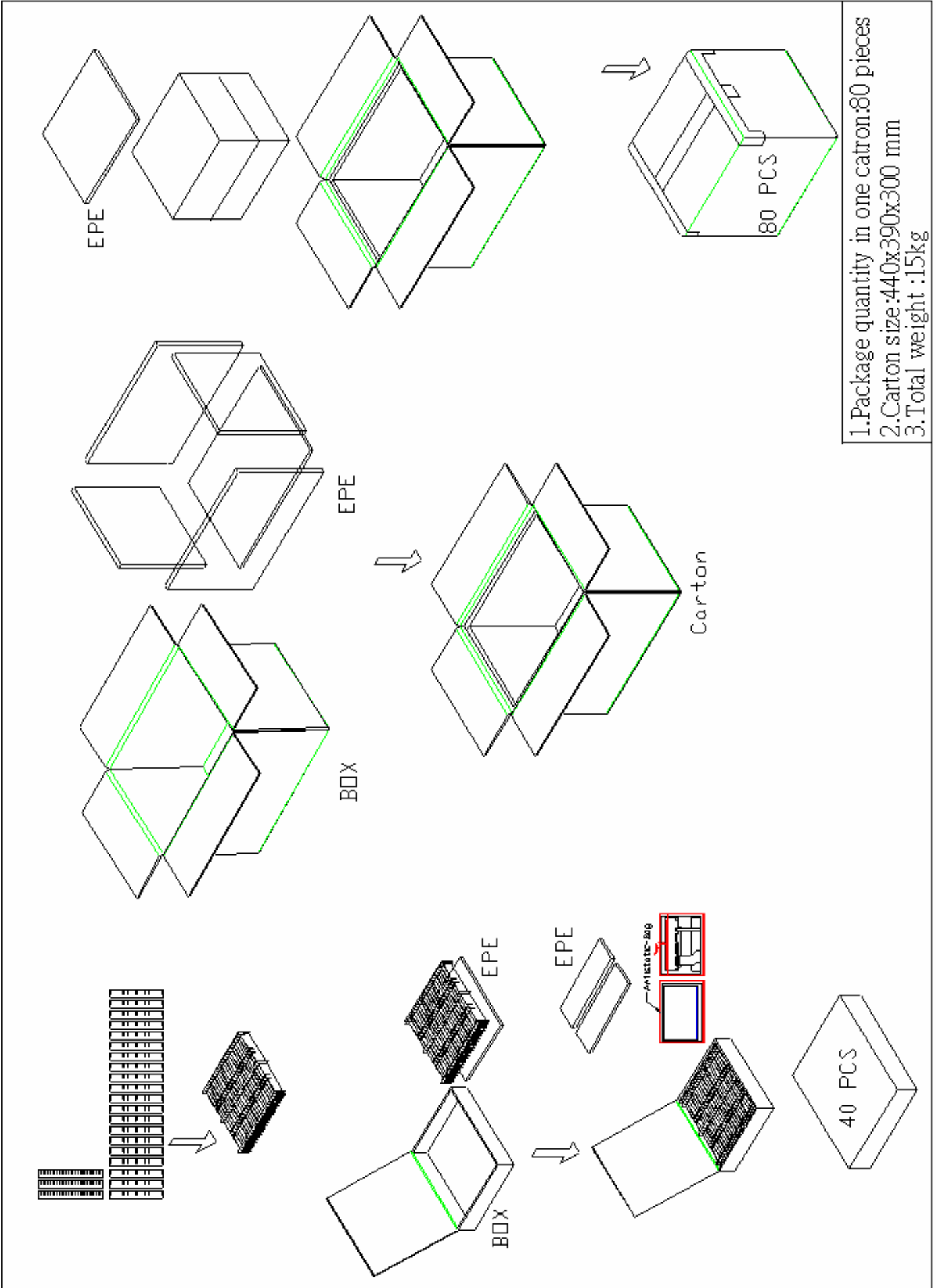
NOTE (2): a. THE MODULE SHOULD WORK PROPERLY.

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

c. THE MODULES CAN'T BE APART.

NOTE (3): EVALUATION SHOULD BE TESTED AFTER STORAGE AT ROOM TEMPERATURE FOR 24 HOURS.

13. PACKAGE INFORMATION



- 1.Package quantity in one carton:80 pieces
- 2.Carton size:440x390x300 mm
- 3.Total weight :15kg