APPROVAL

PART NO.	DESCRITION	REMARKS
HS5701C-T	**LCD MODULE** (320 × RGB× 240) wioth Touch Screen	* **This is ROHS compliant**

CUSTOMER APPLICATION P/N	
APPROVED BY	
DATE	

PLEASE KINDLY FIND AND APPROVE THE SPECIFICATIONS INSERTED
HEREIN AND RETURN ONE COPY HERE OF WITH YOUR SIGNATURE OF APPROVAL.

PERPARED BY	CHECKED BY	CONFIRMED BY

HYES Optoelectronics, Inc.
2000 Wyatt Drive Suite 6
Santa Clara, CA 95054 USA

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1. BASIC SPECIFICATION

1.1 Mechanical specifications

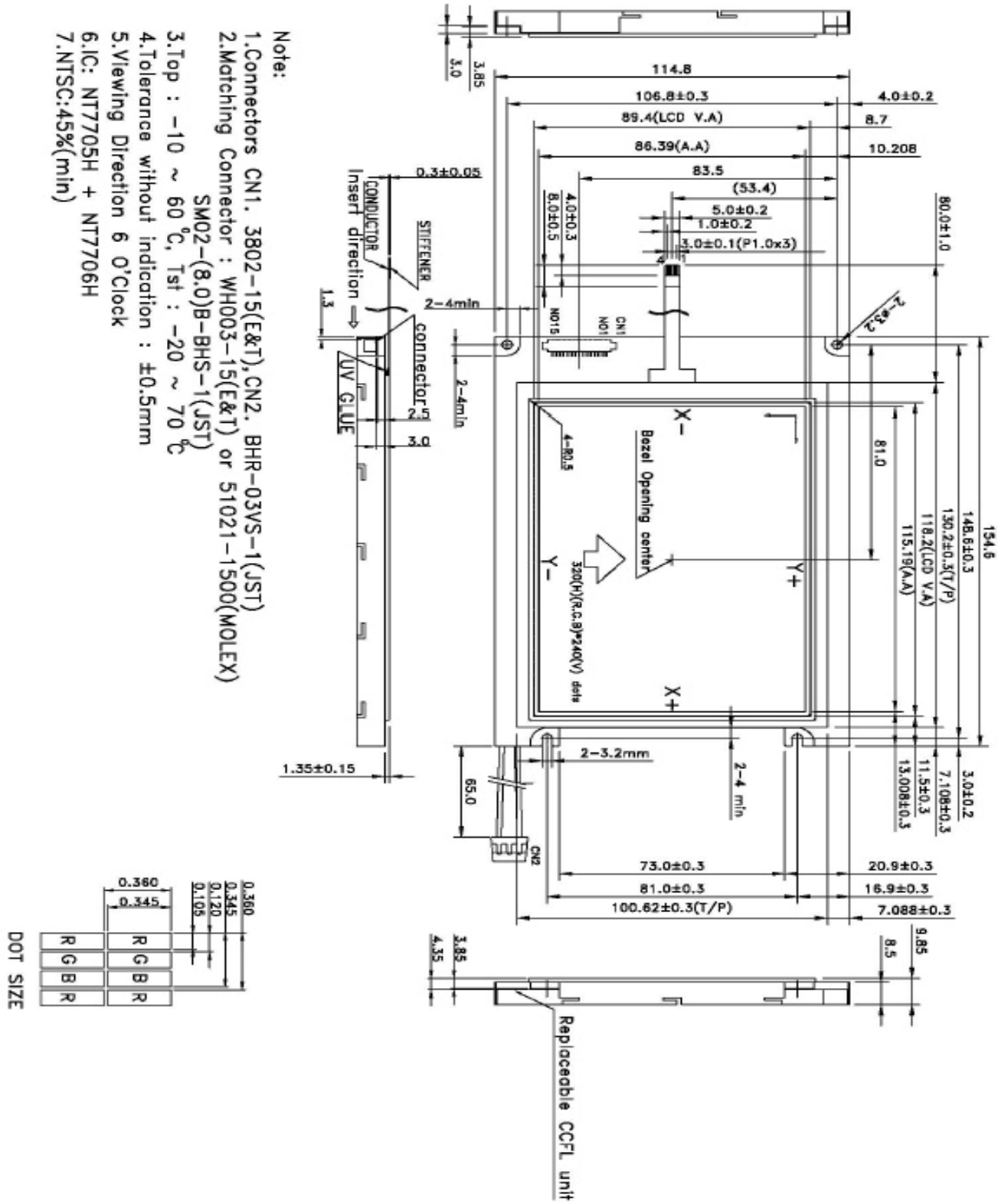
Items	Nominal Dimension	Unit
Dot Matrix	320*RGB*240	dots
Module Size (W x H x T)	154.6 x 114.8 x 9.85	mm
Viewing Area (W x H)	118.18 x 89.38	mm
Active Area (W x H)	115.18 x 86.38	mm
Dot Size (W x H)	0.105 x 0.345	mm
Dot Pitch (W x H)	0.12 x 0.36	mm
Driving method	1/240	Duty
	1/16	Bias
Driving IC Package	TAB	

* Expose the driver IC under blaze (luminosity over than 1 cd) when using the LCM may cause IC operating failure.

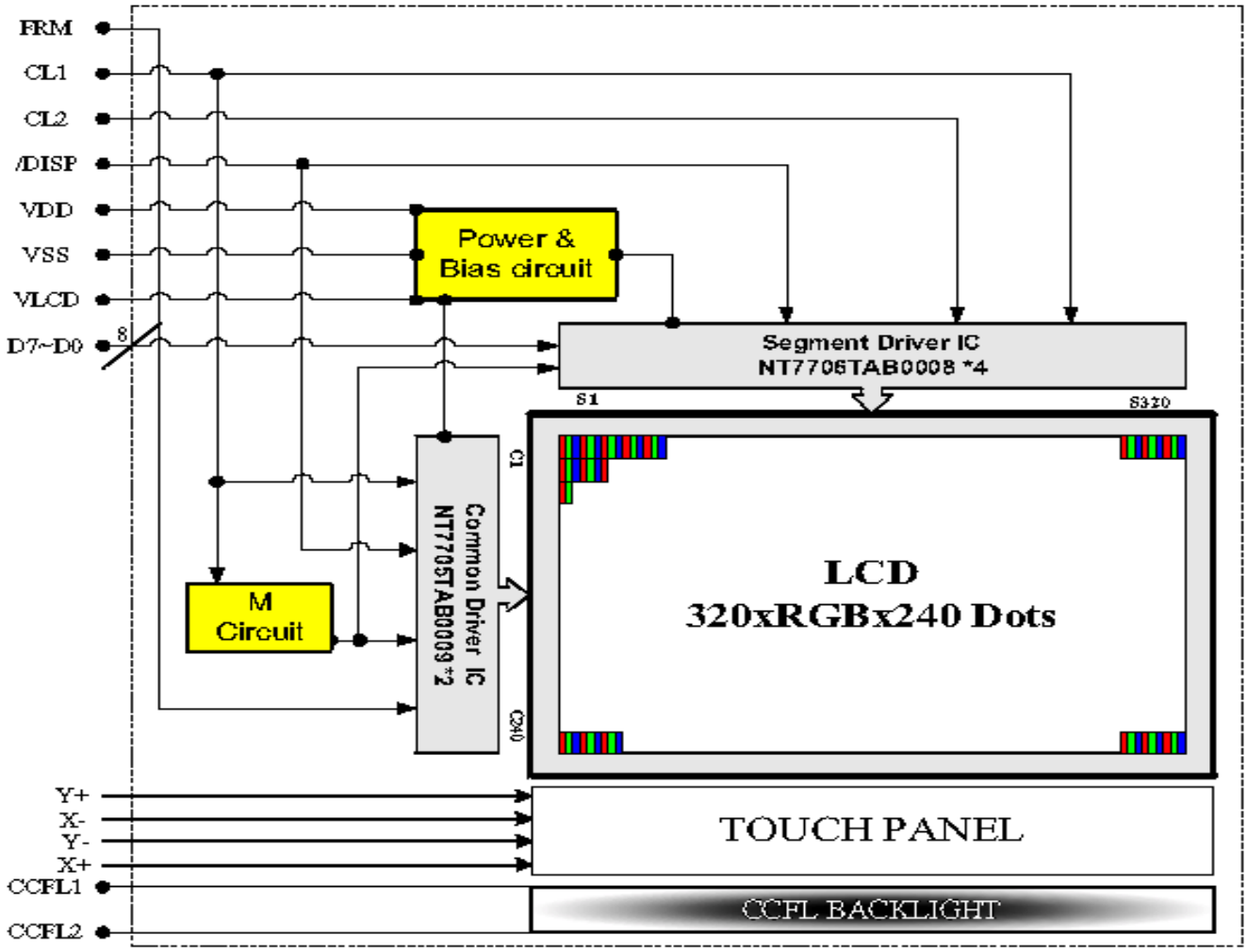
1.2 Display specification

Display	Descriptions	Note
LCD Type	5.7" Color STN	
LCD Mode	Negative	
Polarizer Mode	Transmissive	
Polarizer UV-Cutting	With	
Polarizer Surface	Normal	
Background Color	Black	
Backlight Type	CCFL	
Backlight Color	White	
Viewing Direction	6 O'clock Direction	

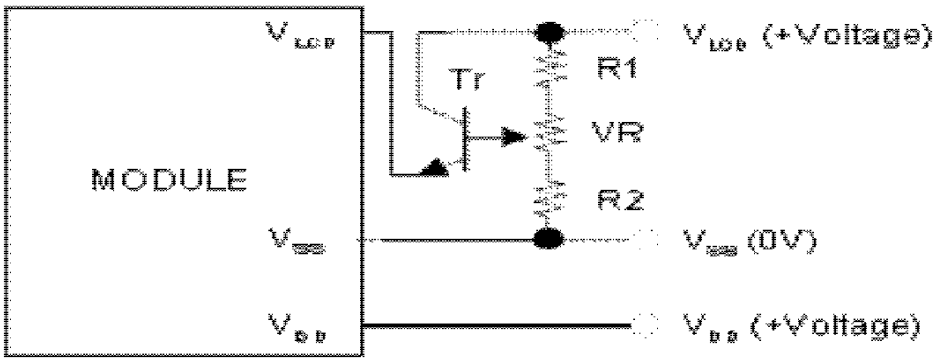
1.3 Outline dimension



1.4 Block diagram:



Recommended Circuit for Contrast Adjustment



R1+R2+VR=10 ~ 20KΩ
Tr=2SA1202 or equivalent

1.5 Interface pin :

Pin No.	Pin Symbol	I/O	Description
1	FRM	I	It is active during the last line of each frame, and is shifted through the COM drivers one by one, to scan the display's common connections.
2	CL1	I	Latch pulse input pin for display data. Data is latched on the falling edge of the clock pulse.
3	CL2	I	Display data shift clock input pin for taking display data Data is read on the falling edge of the clock pulse
4	/DISP	I	Control input for deselect output level. H (On), L (Off)
5	VDD	P	Power supply input pin for the circuit system.(+5.0V)
6	VSS	P	Ground pin for the circuit system.
7	VLCD	P	Power supply for LCD driving voltage.
8~15	D7~D0	I	Display data input

Touch panel interface pin :

Pin No.	Pin Symbol	I/O	Description
1	Y+	-	Touch screen.
2	X-	-	Touch screen.
3	Y-	-	Touch screen.
4	X+	-	Touch screen.

Backlight interface pin :

Pin No.	Pin Symbol	I/O	Description
1	CCFL1	P	CCFL AC voltage power supply input. (From inverter)
2	NC	-	No connect
3	CCFL2	P	CCFL AC voltage ground line input. (From inverter)

2. ELECTRICAL CHARACTERISTICS

2.1 Absolute Maximum Ratings

Items	Symbol	Min.	Max.	Unit
Supply voltage for logics	VDD	-0.3	7.0	V
Supply voltage for driving LCD	VLCD	-0.3	40	V
Input voltage	V_t	-0.3	VDD+0.3	V
Operate temperature range	T_{OP}	-10	60	℃
Storage temperature range	T_{ST}	-20	70	℃

2.2 DC Characteristics

Items	Symbol	Min.	Typ.	Max.	Unit	Condition
Supply voltage (Logic)	VDD	2.5	5	5.5	V	-
Supply voltage (LCD)	VLCD	-	(24.95)	-	V	Top = 60℃
		25.5	26.5	27.5	V	※NOTE1
		-	(27.35)	-	V	Top = -10℃
Input high level voltage	V_{IH}	0.8VDD	-	-	V	-
Input low level voltage	V_{IL}	-	-	0.2VDD	V	-
Output high level voltage	V_{OH}	VDD-0.4	-	-	V	-
Output low level voltage	V_{OL}	-		0.4	V	-
Display data shift clock	XCK	-	2.268	-	MHZ	-
AC-converting signal input for LCD driver wavefrom(1)	FRAME	70	-	90	HZ	For 256 colors
AC-converting signal input for LCD driver wavefrom(2)	FRAME	120	-	150	HZ	For 4096 colors
AC-converting signal input for LCD driver wavefrom(3)	FRAME	160	-	240	HZ	For 65K colors
Power supply current	IDD	-	0.5	1	mA	*NOTE1
Power supply current(LCD)	ILCD	-	7	14	mA	*NOTE1

※NOTE1 : Min. and Max. Voltage is mean within the range will has optimum contrast at Ta:25℃

Typ. Voltage is specified as module driving condition: Ta=25℃,V_{OP} at Optimum Contrast, the measuring condition as below, this value is **HYES** recommend when customer change the set condition , the V_{LCD} will be change.

NOTE2 :

Measuring Condition :

Standard Value MAX.

Ta = 25℃

VDD-VSS = 5.0V

VLCD - GND = V_{OP} at optimum Contrast

Bias = 1/16

Duty = 1/240

Display Patten = Checkered pattern

2.3 Back-light Specification

Items	Symbol	Min.	Typ.	Max.	Unit	Condition
Frequency	F_L	25	35	45	KHz	T=25±3℃
Lamp Current	I_L	-	5.0	-	mArms	T=25±3℃
Start voltage	Vs	410	-	-	Vrms	T=25±3℃
Output Open Voltage	V_{open}	-	-	460	Vrms	T=25±3℃
Lamp Voltage	V_{Load}	320	340	360	Vrms	T=25±3℃
Brightness	B	2500	-	-	cd/m^2	T=25±3℃ I_L=5mA(*Note3)
Brightness Uniformity	B_U	75	-	-	%	(*Note4)
Operating Life	TB	50000	-	-	Hrs	T=25±3℃ I_L=5mA(*Note5)

*Note3: These specifications are on the surface of the Backlight unit.

*Note4: Brightness uniformity = (B_{min} / B_{max})×100%

*Note5: Until half of initial brightness

*Recommend the inverter type number: TDK XAD018SR-1

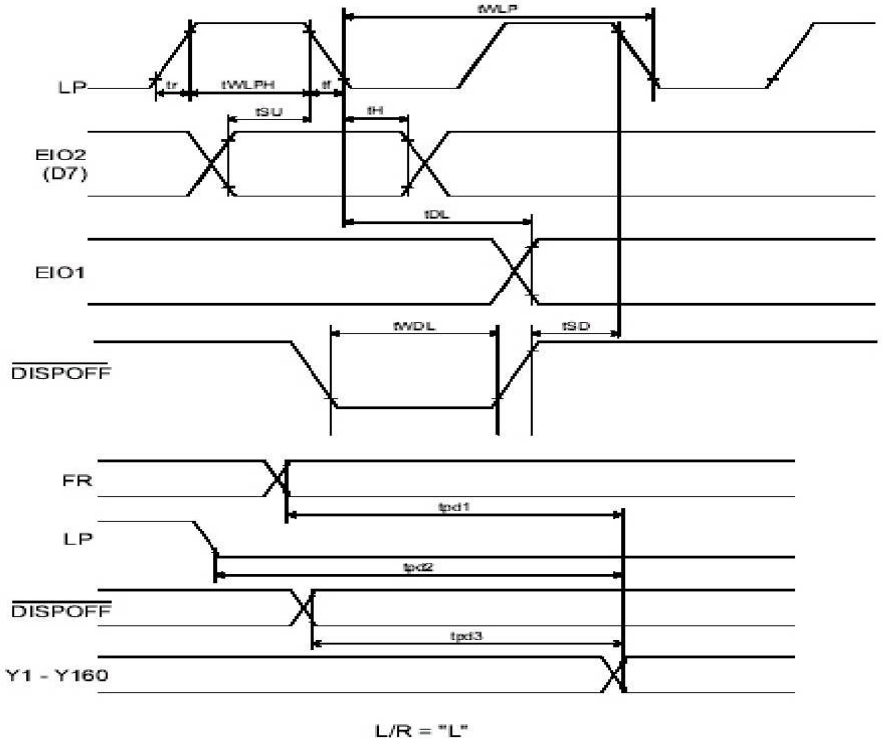
2.4 AC Characteristics

NT7705

Common Mode (V_{SS} = V_5 = 0V, V_{DD} = 2.5 - 5.5V, V_0 = 15 to 40V and T_A = -30 to +85°C, unless otherwise noted)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Shift clock period	t_{WLP}	250	-	-	ns	t_r, $t_f \leq$ 20ns
Shift clock "H" pulse width	t_{WLPH}	15	-	-	ns	V_{DD} = +5.0V ± 10%
		30	-	-	ns	V_{DD} = +2.5 - +4.5V
Data setup time	t_{SU}	30	-	-	ns	
Data hole time	t_H	50	-	-	ns	
Input signal rise time	t_r		-	50	ns	
Input signal fall time	t_f		-	50	ns	
$\overline{\text{DISPOFF}}$ Removal time	t_{SD}	100	-	-	ns	
$\overline{\text{DISPOFF}}$ enable pulse width	t_{WDL}	1.2	-	-	µs	
Output delay time (1)	t_{DL}	-	-	200	ns	C_L = 15pF
Output delay time (2)	t_{pd1}, t_{pd2}	-	-	1.2	µs	C_L = 15pF
Output delay time (3)	t_{pd3}	-	-	1.2	µs	C_L = 15pF

Timing Characteristics of Common Mode



L/R = "L"

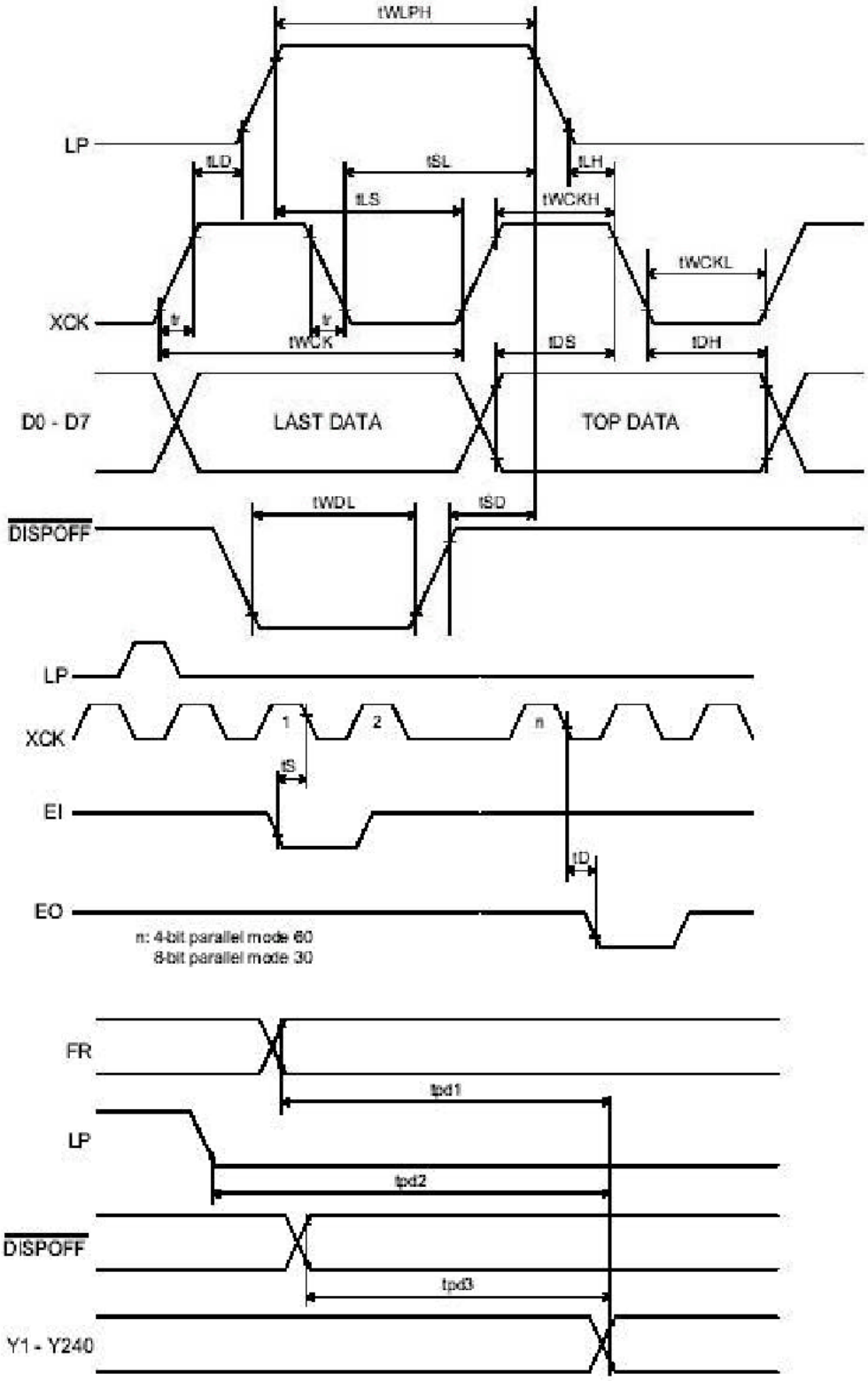
Segment Mode 1 (V_{SS} = V_5 = 0V, V_{DD} = 4.5 - 5.5V, V_0 = 15 to 40V, and T_A = -30 to +85°C, unless otherwise noted)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Shift clock period	t_{WCK}	50	-		ns	tr, tf ≦ 10ns, Note 1
Shift clock "H" pulse width	t_{WCKH}	15	-		ns	
Shift clock "L" pulse width	t_{WCKL}	15	-		ns	
Data setup time	t_{DS}	10	-		ns	
Data hole time	t_{DH}	12	-		ns	
Latch pulse "H" pulse width	t_{WLPH}	15	-		ns	
Shift clock rise to Latch pulse rise time	t_{LD}	0	-		ns	
Shift clock fall to Latch pulse fall time	t_{SL}	30	-		ns	
Latch pulse rise to Shift clock rise time	t_{LS}	25	-		ns	
Latch pulse fall to Shift clock rise time	t_{LH}	25	-		ns	
Input signal rise time	t_r		-	50	ns	Note 2
Input signal fall time	t_f		-	50	ns	Note 2
Enable setup time	t_S	10	-		ns	
$\overline{\text{DISPOFF}}$ Removal time	t_{SD}	100	-		ns	
$\overline{\text{DISPOFF}}$ enable pulse width	t_{WDL}	1.2	-		µs	
Output delay time (1)	t_D		-	30	ns	CL = 15pF
Output delay time (2)	t_{pd1}, t_{pd2}		-	1.2	µs	CL = 15pF
Output delay time (3)	t_{pd3}		-	1.2	µs	CL = 15pF

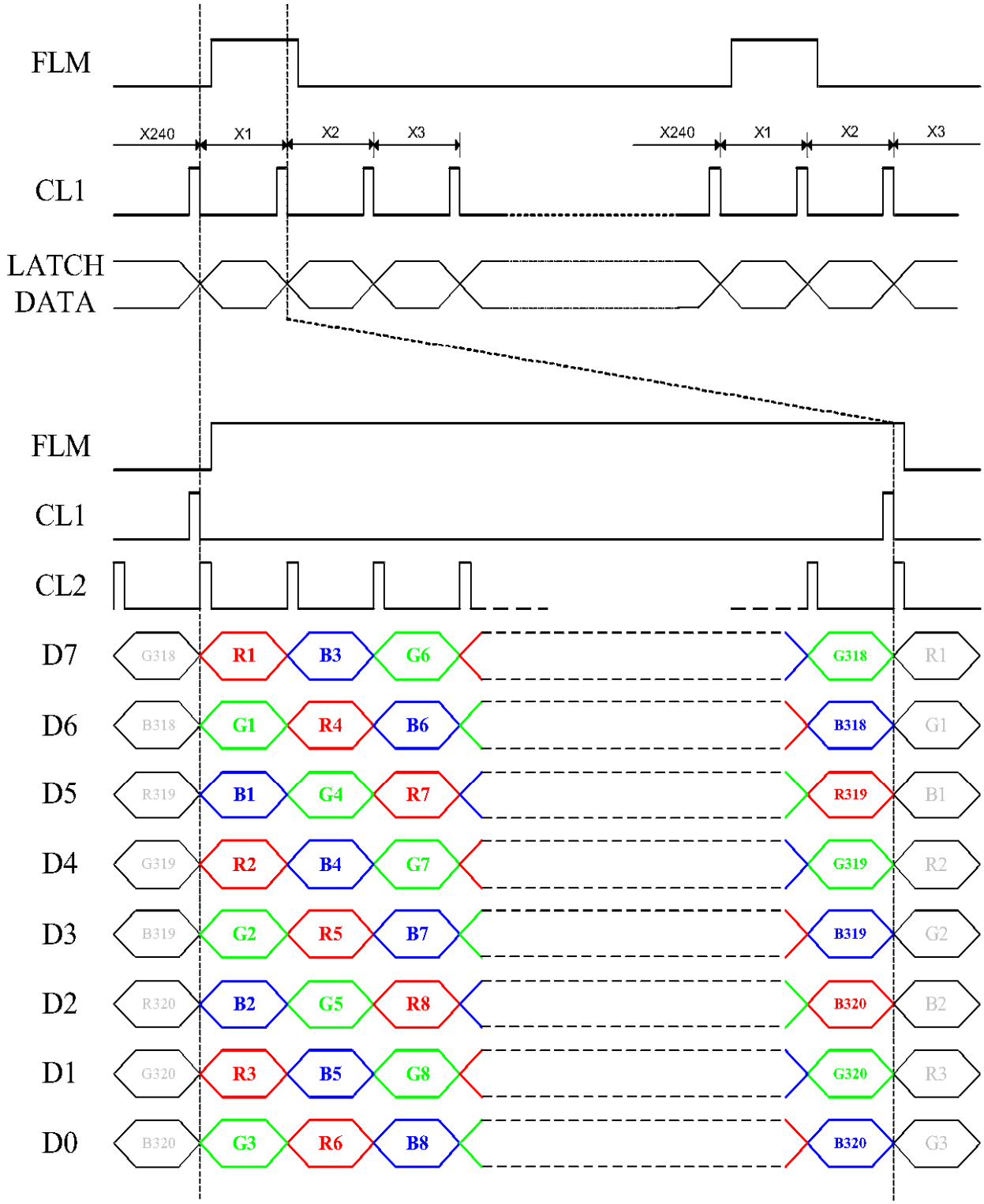
Note

1. Take the cascade connection into consideration.
2. (t_{CK}-t_{WCKII}-t_{wckI})/2 is the maximum in the case of high speed operation.

Timing waveform of the Segment Mode



2-5 Interface Timing Chart



3. OPTICAL CHARACTERISTICS

3.1 Characteristics

Driving condition

Item	Duty	Bias	Note
Value	1/240	1/16	1

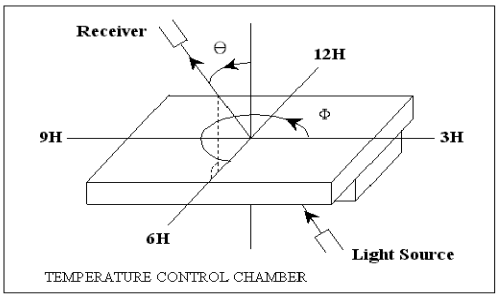
Electrical and Optical Characteristics

No.	Item		symbol / temp.		Min.	Typ.	Max.	Unit	Note
2	Response Time		Tr	25 ℃	-	145	290	ms	2
			Tf	25 ℃	-	80	160		
3	Viewing Angle	Front-Rear	Θ1	Φ = 270°	-10	-	30	degree	3
		Left-Right	Θ2		-30	-	30		
4	Contrast Ratio		Cr	25 ℃	-	25	-	-	4
5	Red x-code		Rx	25 ℃	0.55	0.60	0.65	-	5
	Red y-code		Ry		0.28	0.33	0.38		
	Green x-code		Gx		0.24	0.29	0.34		
	Green y-code		Gy		0.52	0.57	0.62		
	Blue x-code		Bx		0.10	0.15	0.20		
	Blue y-code		By		0.04	0.09	0.14		
	White x-code		Wx		0.27	0.32	0.37		
	White y-code		Wy		0.28	0.33	0.38		
	Brightness		Y		65	80	-	cd/m^2	
6	Brightness Uniformity			25 ℃	80	-	-	%	6

3.2 Definition of optical characteristics

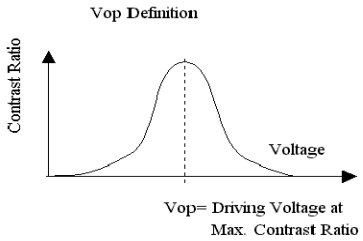
Measurement condition :

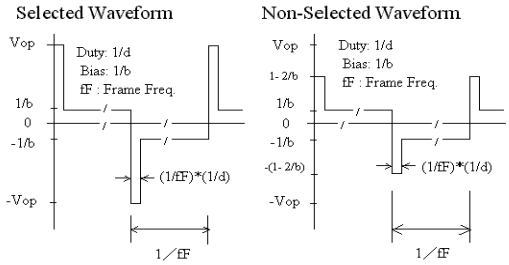
Transmissive and Transflective type



PHOTAL LCD-5000

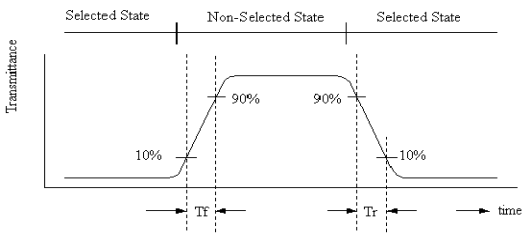
[Note 1] Definition of LCD Driving Vop and Waveform :



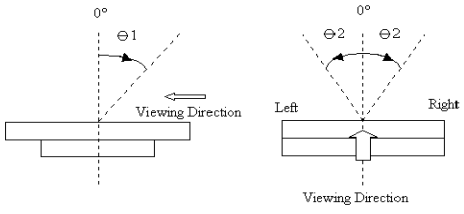


[Note 2] Definition of Response Time

for Positive type :

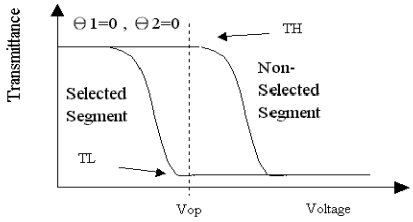


[Note 3] Definition of Viewing Angle :



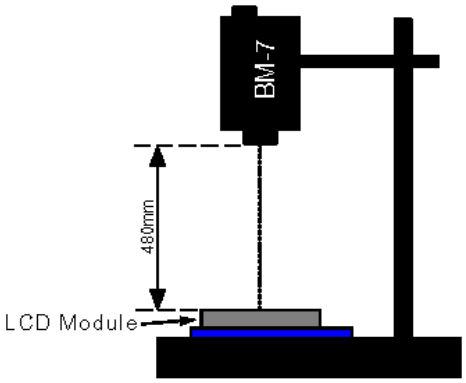
[Note 4] Definition of Contrast Ratio :

for Positive type

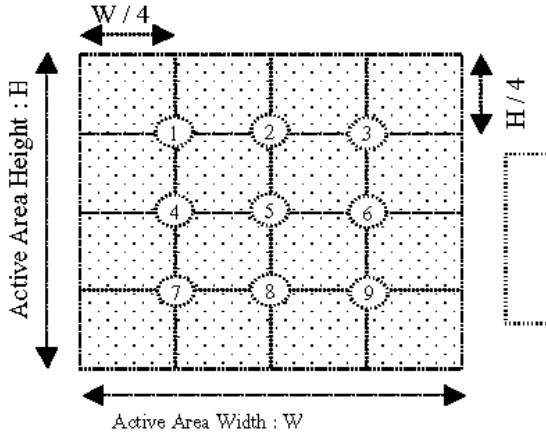


$$\text{Contrast Ratio} = \frac{TH}{TL}$$

[Note 5] Definition of measurement of Color Chromaticity and Brightness

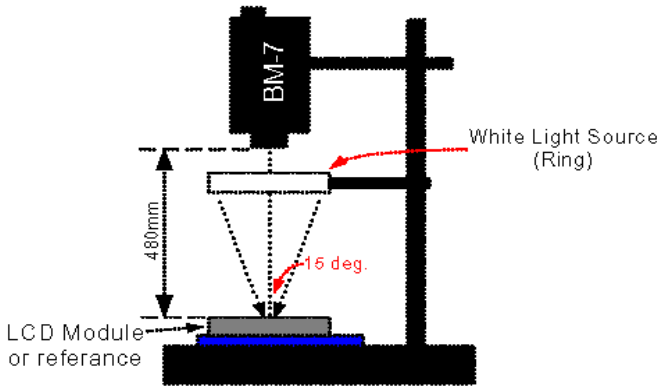


[Note 6] Definition of Brightness Uniformity



$$\text{Brightness Uniformity} = \frac{\text{Minimum Brightness of Point 1~9}}{\text{Maximum Brightness of Point 1~9}}$$

[Note 7] Definition of Measurement of Reflectance



4. RELIABILITY :

Item No	Items	Condition	Remark
1	High temperature operating	70 ℃ , 200 hours	Finish product (With polarizer)
2	Low temperature operating	-20 ℃ , 200 hours	Finish product (With polarizer)
3	High temperature storage	60 ℃ , 200 hours	Finish product (With polarizer)
4	Low temperature storage	-10 ℃ , 200 hours	Finish product (With polarizer)
5	High temperature & humidity storage	60℃, 90%RH, 100 hours	Finish product (With polarizer)
6	Thermal Shock storage	-10℃, 30min.<=> 60℃, 30min. 10 Cycles	Finish product (With polarizer)
7	Vibration test	10 => 55 =>10 => 55 => 10 Hz , within 1 minute Amplitude : 1.5mm. 15 minutes for each Direction (X,Y,Z)	Finish product (With polarizer)
8	Drop test	Packed, 100CM free fall, 6 sides, 1 corner, 3edges	Finish product (With polarizer)
9	Life time	50,000 hours 25℃ , 70%RH below , specification condition driving	Finish product (With polarizer)

* One single product test for only one item.

* Judgment after test : keep in room temperature for more than 2 hours.

- Current consumption < 2 times of initial value
- Contrast > 1/2 initial value
- Function : work normally

5. PRODUCT HANDING AND APPLICATION

☐ PRECAUTION FOR HANDLING LCM

- The LCD module contains a C-MOS LSI. People who operate the LCM should wear ESD protection eguipement to prevent ESD hurt on products.
- Do not input any signal before power is turned on.
- Do not take LCM from its packaging bag until it is assembled.
- Peel off the LCM protective film slowly since static electricity may be generated.
- Pay attention to the humidity of the work shop, 50~60%RH is satisfactory.
- Use a non-leak iron for soldering LCM.
- Do not touch the display surface or connection terminals area with bare hands.Smudges on the display surface reduce the insulation between terminals.
- Cautions for soldering to LCM:

  Condition for soldering I/O terminals:
  Temperature at iron tip :280℃±10℃.
  Soldering time : 3~4sec./ terminals.
  Type of solder : Eutectic solder(rosin flux filled).

☐ PRECAUTION IN USE OF LCD

- Do not contact or scratch the front surface and the contact pads of a LCD panel with hard materials such as metal or glass or with one' s nail.
- To clean the surface , wipe it gently with soft cloth dampened by alcohol.
- Do not attempt to wiped off the contact pads.
- Keep LCD panels away from direct sunlight , also avoid them in high-temperature & high humidity environment for a long period.
- Do not drive LCD panels by DC voltage.
- Do not expose LCD panels to organic solvent.
- Liquid in LCD is hazardous substance. In case a contact with liquid crystal material is occured, be sure to immediately wash such material away by soap and water.
- The polarizer is easily damaged and should be handle with special care. Don' t press or rub it with hard objects.

☐ PRECAUTION FOR STORING LCM

- To avoid degradation of the device , do not store the module under the conditions of direct sunlight , high temperature or high humidity . Keep the module in bags designed to prevent static electricity charging under low temperature / normal humidity conditions(avoid high temperature / high humidity and low temperature below 0℃)

☐ USING ON MEDICAL CARE , SAFETY OR HAZARDOUS APPLICATION OR SYSTEM

- For the application in medical care, safety and hazardous prodcuts or systems, an authorization from **HYES** is required. **HYES** will not responsible for any damage or loss which caused by the products without any authorization given by **HYES**.
- This product is not allowed to be designed and used for military application and/or purpose.
- The delivery of this product to the countries and/or regions where the embargoes are imposed by U.N. is prohibited.

6. DATE CODE OF PRODUCTS

- Date code will be shown on each product :

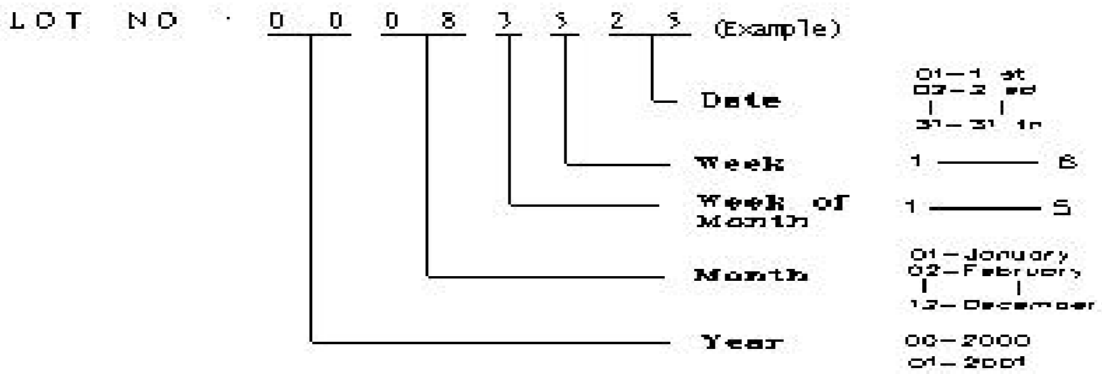
- **Y MM DD - XXX**

  Year Month Day - Production lots

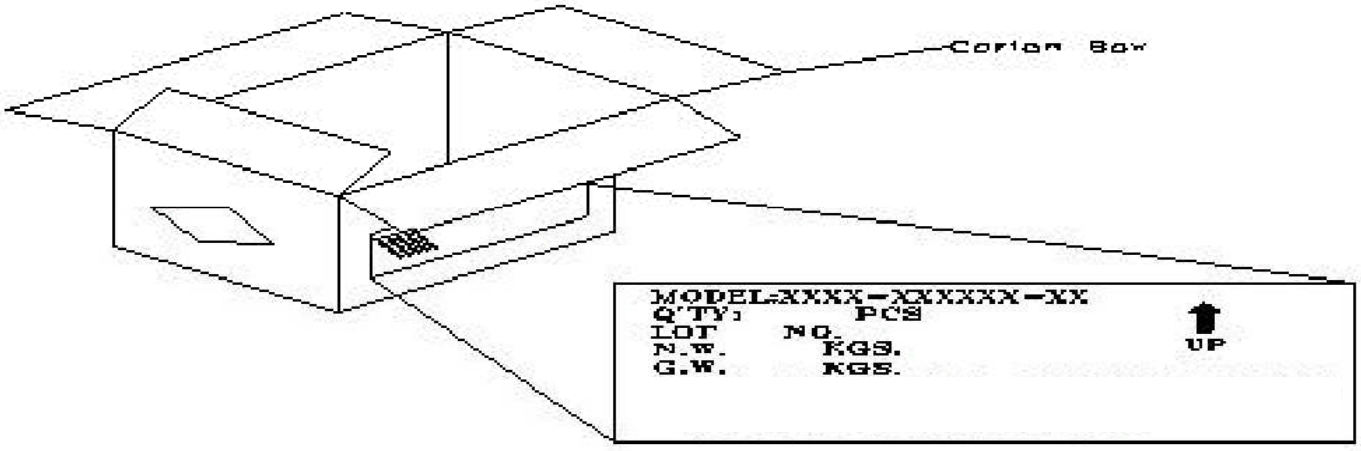
- Example: 2 1 2 2 3 - 0 0 3 ==>Year 2002, Dec.,23rd , Batch no.03

7. PACKING

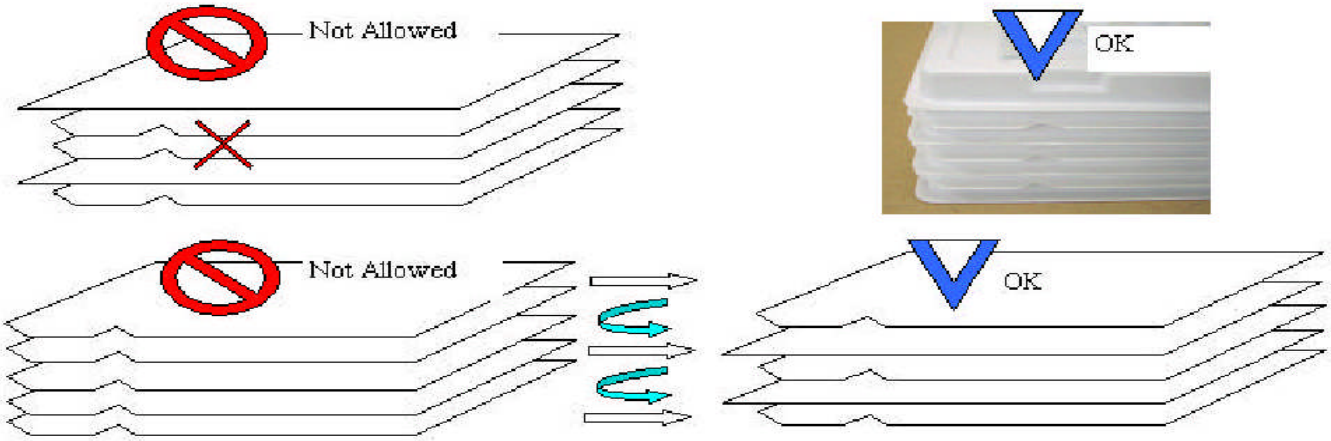
Instruction of lot number:



Lable of carton:

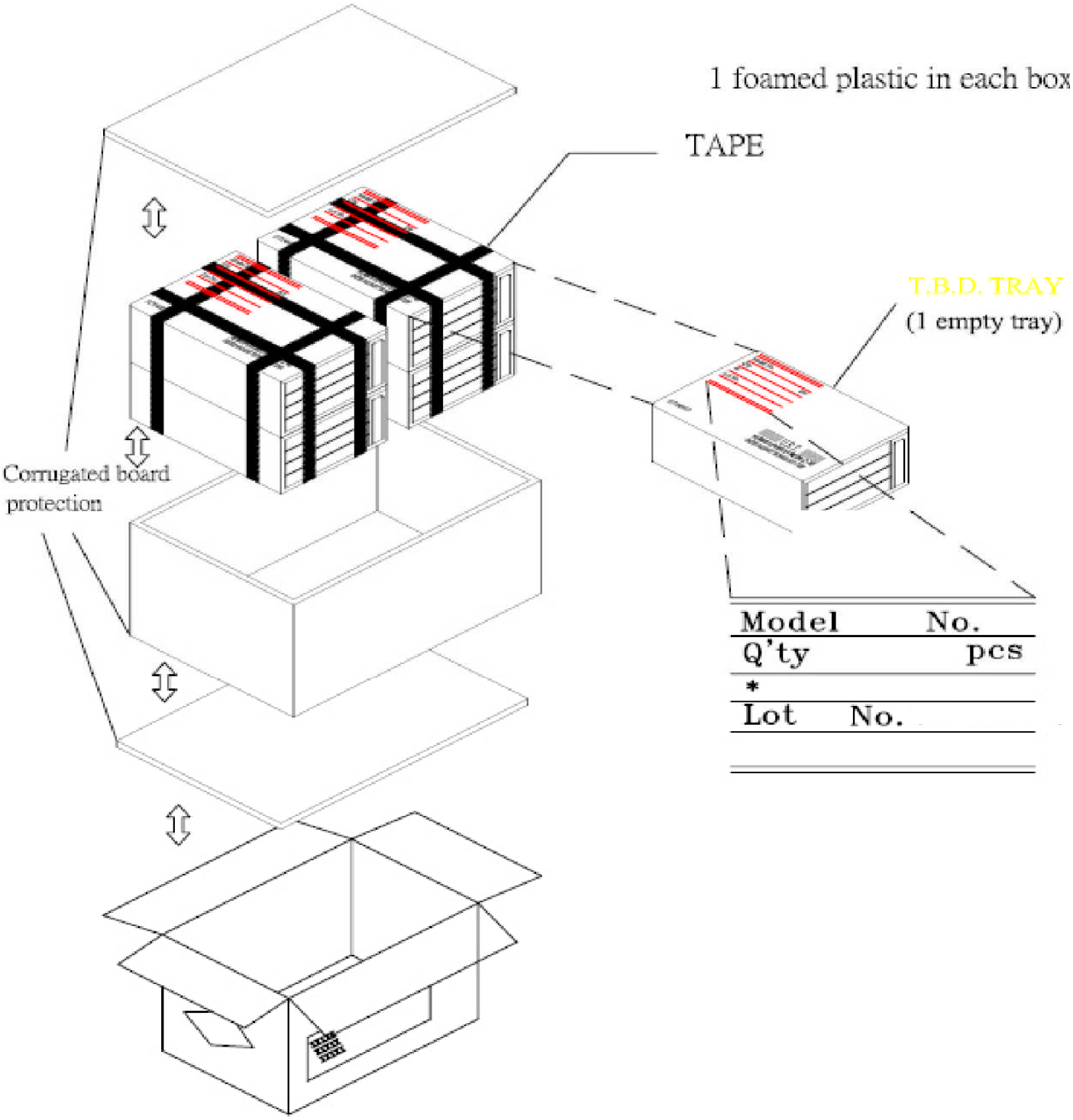


Packing tray must be stacked with alternated direction to each others.
To tacks packing trays in same direction will cause product damaged.



T.B.D pcs / Tray
T.B.D Tray / Box
T.B.D Box / Carton
T.B.D pcs / Carton

NOTE:
(1)Be warned ,the direction of the tray has to turn it by 180 degree before stack it up.Otherwise, it will be packager's responsibility!!
(2)Safe Stack : 5 cartons only



8. INSPECTION STANDARD

8.1. QUALITY :

THE QUALITY OF GOODS SUPPLIED TO PURCHASER SHALL COME UP TO THE FOLLOWING STANDARD.

8.1.1. THE METHOD OF PRESERVING GOODS

AFTER DELIVERY OF GOODS FROM **HYES** TO PURCHASER. PURCHASER SHALL CONTROL THE LCM AT -10℃ ~ 40℃ ,AND IT MIGHT BE DESIRABLE TO KEEP AT THE NORMAL ROOM TEMPERATURE AND HUMIDITY UNTIL INCOMING INSPECTION OR THROWING INTO PROCESS LINE.

8.1.2. INCOMING INSPECTION

(A) THE METHOD OF INSPECTION

IF PURCHASER MAKE AN INCOMING INSPECTION , A SAMPLING PLAN SHALL BE APPLIED ON THE CONDITION THAT QUALITY OF ONE DELIVERY SHALL BE REGARDED AS ONE LOT.

(B) THE STANDARD OF QUALITY

ISO-2859-1 (or MIL-STD-105D) , LEVEL Ⅱ SINGLE PLAN.

CLASS	AQL(%)
CRITICAL	0.4 %
MAJOR	0.65 %
MINOR	1.5 %
TOTAL	1.5 %

EVERY ITEM SHALL BE INSPECTED ACCORDING TO THE CLASS.

(C) MEASURE

IF AS THE RESULT OF ABOVE RECEIVING INSPECTION , A LOT OUT IS DISCOVERED. PURCHASER SHALL BE INFORM SELLER OF IT WITHIN SEVEN DAYS. BUT FIRST SHIPMENT WITHIN FOURTEEN DAYS.

8.1.3. WARRANTY POLICY

HYES WILL PROVIDE ONE-YEAR WARRANTY FOR THE PRODUCTS ONLY IF UNDER SPECIFICATION OPERATING CONDITIONS. **HYES** WILL REPLACE NEW PRODUCTS FOR THESE DEFECT PRODUCTS WHICH UNDER WARRANTY PERIOD AND BELONG TO THE RESPONSIBILITY OF **HYES**.

8.2. CHECKING CONDITION

8.2.1. CHECKING DIRECTION SHALL BE IN THE 45 DEGREE AREA TO FACE THE SAMPLE.

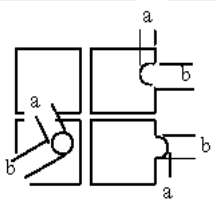
8.2.2. CHECKER SHALL SEE OVER 30 cm. WITH BARE EYES FAR FROM SAMPLE AND USING 2 PCS. OF 20W FLUORESCENT LAMP.

8.3. INSPECTION PLAN :

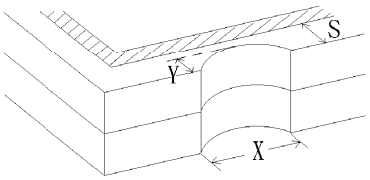
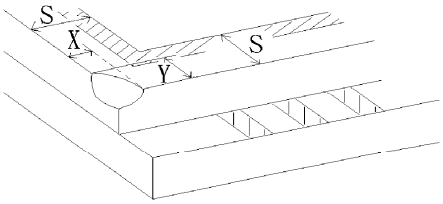
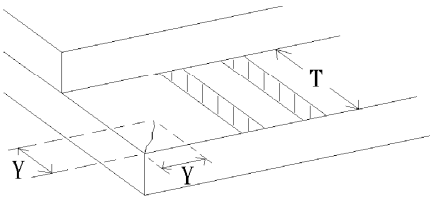
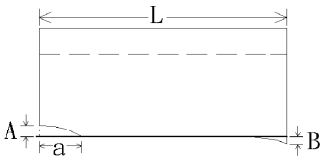
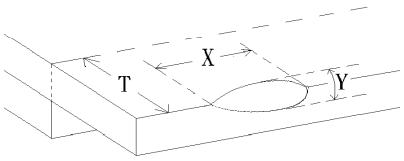
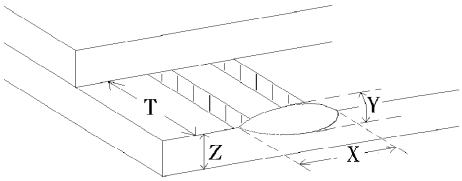
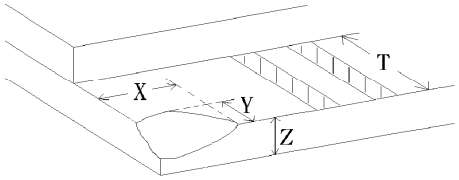
CLASS	ITEM	JUDGEMENT	CLASS
PACKING & INDICATE	1. OUTSIDE AND INSIDE PACKAGE	"MODEL NO." , "LOT NO." AND "QUANTITY" SHOULD INDICATE ON THE PACKAGE.	Minor
	2. MODEL MIXED AND QUANTITY	OTHER MODEL MIXED.....REJECTED QUANTITY SHORT OR OVER.....REJECTED	Critical
	3. PRODUCT INDICATION	"MODEL NO." SHOULD INDICATE ON THE PRODUCT	Major
ASSEMBLY	4. DIMENSION, LCD GLASS SCRATCH AND SCRIBE DEFECT.	ACCORDING TO SPECIFICATION OR DRAWING.	Major
APPEARANCE	5. VIEWING AREA	POLARIZER EDGE OR LCD'S SEALING LINE IS VISABLE IN THE VIEWING AREA .....REJECTED	Minor
	6. BLEMISH、BLACK SPOT、 WHITE SPOT IN THE LCD AND LCD GLASS CRACKS	ACCORDING TO STANDARD OF VISUAL INSPECTION (INSIDE VIEWING AREA)	Minor
	7. BLEMISH、BLACK SPOT WHITE SPOT AND SCRTCH ON THE POLARIZER	ACCORDING TO STANDARD OF VISUAL INSPECTION (INSIDE VIEWING AREA)	Minor
	8. BUBBLE IN POLARIZER	ACCORDING TO STANDARD OF VISUAL INSPECTION (INSIDE VIEWING AREA)	Minor
	9. LCD'S RAINBOW COLOR	STRONG DEVIATION COLOR (OR NEWTON RING) OF LCD.....REJECTED. OR ACCORDING TO LIMITED SAMPLE (IF NEEDED, AND INSIDE VIEWING AREA)	Minor
ELECTRICAL	10. ELECTRICAL AND OPTICAL CHARACTERISTICS (CONTRAST、VOP、 CHROMATICITY ... ETC)	ACCORDING TO SPECIFICATION OR DRAWING . (INSIDE VIEWING AREA)	Critical
	11.MISSING PATTERN	MISSING DOT、LINE、CHARACTER ....REJECTED	Critical
	12.SHORT CIRCUIT、 WRONG PATTERN DISPLAY	NON DISPLAY、WRONG PATTERN DISPLAY、CURRENT CONSUMPTION OUT OF SPECIFICATION..... REJECTED	Critical
	13. PIN HOLE、PATTERN DEFORMITY	ACCORDING TO STANDARD OF VISUAL INSPECTION	Minor

8.4. STANDARD OF VISUAL INSPECTION

<table>
<tr><th>NO.</th><th>CLASS</th><th>ITEM</th><th>JUDGEMENT</th></tr>
<tr><td>8.4.1</td><td>MINOR</td><td>· BLEMISH、BLACK SPOT、
WHITE SPOT IN THE LCD.

· BLEMISH、BLACK SPOT、
WHITE SPOT AND SCRATCH
ON THE POLARIZER</td><td>(A) ROUND TYPE: unit : mm.
<table>
<tr><th colspan="3">DIAMETER (mm.)</th><th>ACCEPTABLE Q'TY</th></tr>
<tr><td colspan="3">Φ ≤ 0.1</td><td>DISREGARD</td></tr>
<tr><td>0.1 <</td><td>Φ</td><td>≤ 0.2</td><td>2</td></tr>
<tr><td>0.2 <</td><td>Φ</td><td>≤ 0.25</td><td>1</td></tr>
<tr><td>0.25 <</td><td>Φ</td><td></td><td>0</td></tr>
</table>
NOTE: Φ=(LENGTH+WIDTH)/2
(B) LINER TYPE: unit : mm.
<table>
<tr><th>LENGTH</th><th colspan="3">WIDTH</th><th>ACCEPTABLE Q'TY</th></tr>
<tr><td>------</td><td colspan="2">W</td><td>≤0.03</td><td>DISREGARD</td></tr>
<tr><td>L ≤ 5.0</td><td>0.03 <</td><td>W</td><td>≤0.05</td><td>3</td></tr>
<tr><td>L ≤ 5.0</td><td>0.05 <</td><td>W</td><td>≤0.07</td><td>1</td></tr>
<tr><td>------</td><td>0.07 <</td><td>W</td><td></td><td>FOLLOW ROUND TYPE</td></tr>
</table></td></tr>
<tr><td>8.4.2</td><td>MINOR</td><td>BUBBLE IN POLARIZER</td><td>unit : mm.
<table>
<tr><th colspan="3">DIAMETER</th><th>ACCEPTABLE Q'TY</th></tr>
<tr><td colspan="3">Φ ≤0.15</td><td>DISREGARD</td></tr>
<tr><td>0.15 <</td><td>Φ</td><td>≤ 0.5</td><td>2</td></tr>
<tr><td>0.5 <</td><td>Φ</td><td></td><td>0</td></tr>
</table></td></tr>
<tr><td>8.4.3</td><td>MINOR</td><td>PIN HOLE 、
PATTERN DEFORMITY</td><td>

Φ=(a+b)/2
unit : mm.
<table>
<tr><th colspan="3">DIAMETER</th><th>ACC. Q'TY</th></tr>
<tr><td colspan="3">Φ ≤ 0.1</td><td>DISREGARD</td></tr>
<tr><td>0.1 <</td><td>Φ</td><td>≤ 0.25</td><td>3</td></tr>
<tr><td>0.25 <</td><td>Φ</td><td></td><td>0</td></tr>
</table></td></tr>
</table>

NO.	CLASS	ITEM	JUDGEMENT
8.4.4	MINOR	CHIPPING	 Y > S REJ.
8.4.5	MINOR	CHIPPING	 X or Y > S REJ.
8.4.6	MAJOR	GLASS CRACK	 Y > (1/2) T REJ.
8.4.7	MAJOR	SCRIBE DEFECT	 1. a> L/3 , A>1.5mm. REJ. 2. B : ACCORDING TO DIMENSION
8.4.8	MINOR	CHIPPING (ON THE TERMINAL AREA)	 Φ= (x+y)/2 > 2.5 mm REJ.
8.4.9	MINOR	CHIPPING (ON THE TERMINAL SURFACE)	 Y > (1/3) T REJ.
8.4.10	MINOR	CHIPPING	 Y > T REJ.