

## SPECIFICATION

OF

## LIQUID CRYSTAL DISPLAY MODULE

CUSTOMER : URT-STDModel No. : UMOH-8065MD-9TModel version : 0Document Revision : 1

## Preliminary

CUSTOMER APPROVED SIGNATURE			

This specification need to be signed by purchaser or customer as a specification of products production and delivery from URT. Without signature of this specification , any purchase order for this model no. will be treated and considered that this specification is automatically acknowledged and accepted by purchaser or customer.

 **U.R.T. UNITED RADIANT TECHNOLOGY CORPORATION**

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Sep-03-2024  
Date

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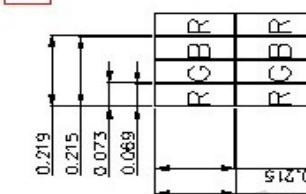
Revision record			
Document Revision	Model No. Version No.	Description	Revision by
0	UMSH-8065MD-9T Version No.0	3.5" TFT.	William Don Eric Wang 11-Mar-2022
1	UMOH-8065MD-9T Version No.0	1. Change TFT LCD & Driver IC. 2. Modify Module Number from UMSH-8065MD-9T To UMOH-8065MD-9T.	William Don Eric Wang 03-Sep-2024
 U.R.T.		Revision 1 ; UMOH-8065MD-9T Ver. 0 ; September-03-2024	Page: 2

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U.R.T.																																			
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### 1.3 Outline dimension

CONFIDENTIAL (B)

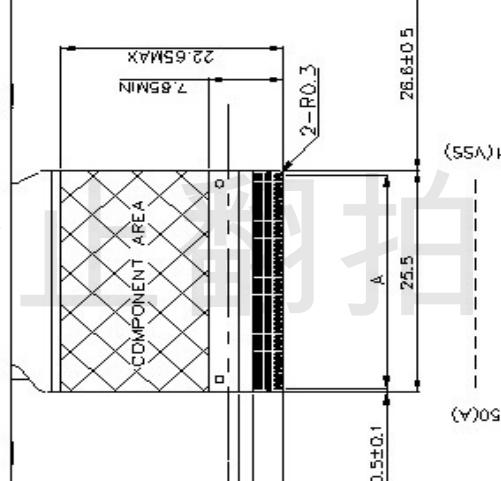
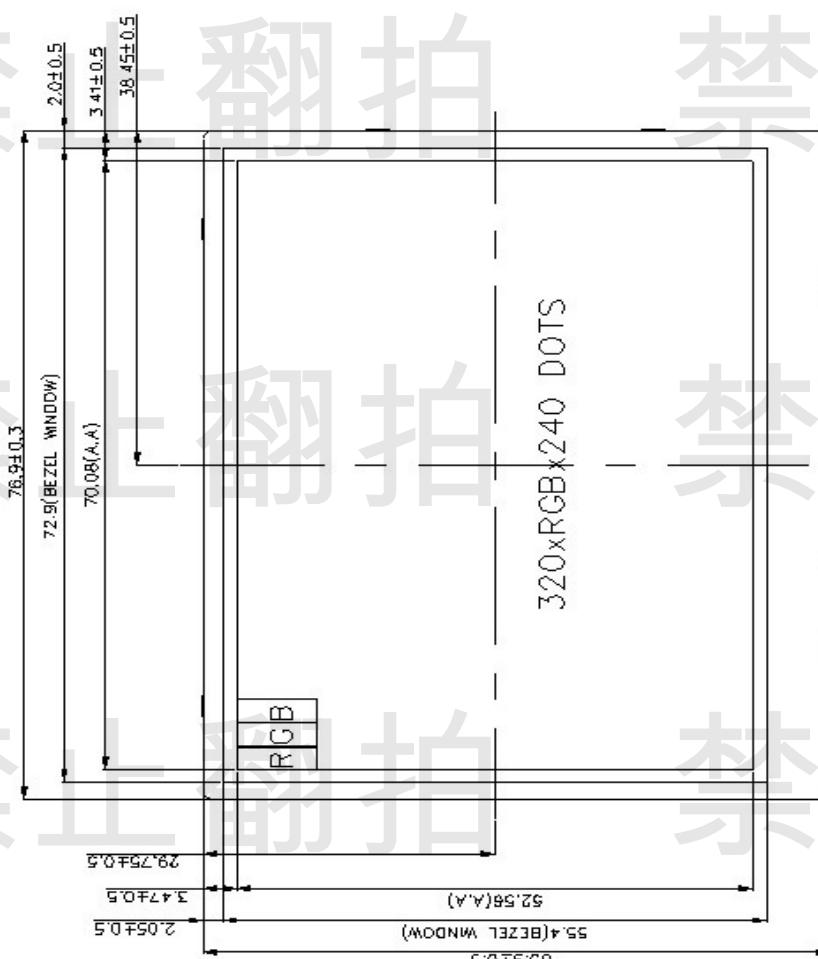
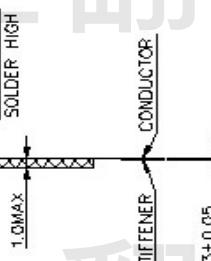


DOTS DETAIL

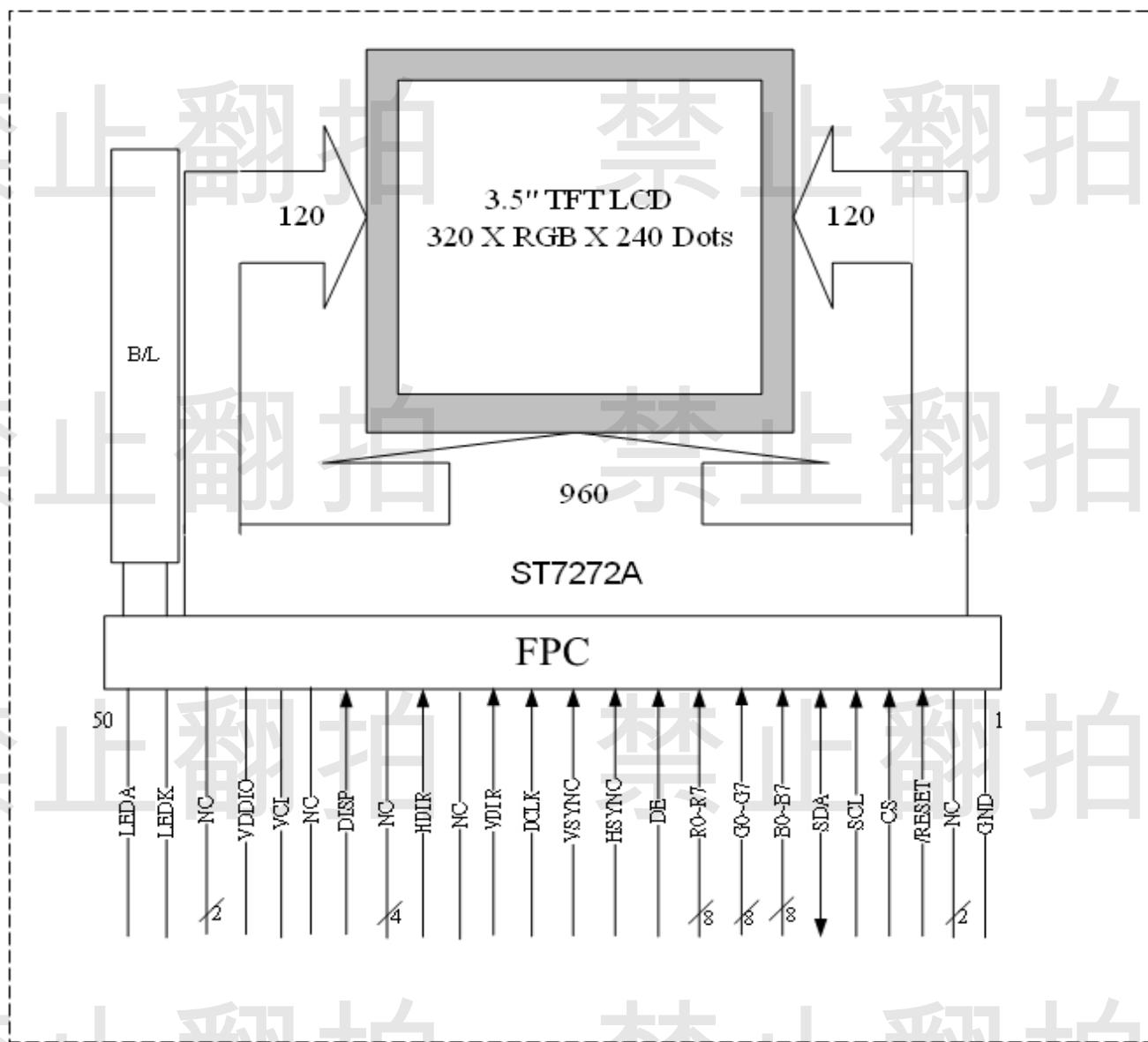
320xRGBx240 DOTS

NOTE : \_\_\_\_\_

1. LCD: TFT TRANSMISSIVE MODE, NORMAL BLACK
  2. VIEWING DIRECTION : FREE
  3. Top : -20~70°C , Tst : -30~80°C
  4. TOLERANCE FOR NOT ASSIGNED:  $\pm 0.2$
  5. LED COLOR : WHITE , 6PCS DICE
  6. CONSTANT CURRENT IF=20.0mA ; VLED=20.4V(Typ)
  7. A:  $24.5 \pm 0.05$ ( $0.5 \times 49$ ) , W=  $0.3 \pm 0.05$
  8. THE MINIMUM BENDING RADIUS (INNER) OF THE FPC IS 0.5mm
  9. COMPONENT AREA AND SOLDER AREA CAN NOT BENDING



## 1.4 Block diagram:



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<b>1.5 Interface pin Connection:</b>									
Pin No.	Pin Symbol	I/O	Description						
1	GND	P	Ground.						
2~3	NC	-	No Connector						
4	/RESET	I	Reset signal input terminal, active at 'L'						
5	CS	I	SPI interface data enable signal						
6	SCL	I	This pin is used serial interface clock in SPI						
7	SDA	I/O	Serial input signal in SPI I/F.						
8~15	B0~B7	I	Blue data bus						
16~23	G0~G7	I	Green Data bus.						
24~31	R0~R7	I	Red Data bus						
32	DE	I	Data enable input. Active high to enable the input data bus.						
33	H SYNC	I	Horizontal sync input in RGB mode.						
34	V SYNC	I	Vertical sync input in RGB mode						
35	DCLK	I	Pixel clock input pin						
36	VDIR	I	Vertical scan direction control pin. This pin must be connected to "H" or "L" according to system application. <table border="1"> <tr> <td>VDIR</td><td>Function Description</td></tr> <tr> <td>L</td><td>From down to up.</td></tr> <tr> <td>H</td><td>From up to down.</td></tr> </table>	VDIR	Function Description	L	From down to up.	H	From up to down.
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39~42	NC	-	No Connector						
43	DISP	I	DISP sets the display mode. L Standby mode H Normal display mode						
44	NC	-	No Connector						
45	VCI	P	Power Supply for Analog Circuits.						
46	VDDIO	P	Voltage input pin for I/O logic.						
47~48	NC	-	No Connector						
49	LEDK	P	Cathode input for LED backlight.						
50	LEDA	P	Anode input for LED backlight.						
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<h2>2. ELECTRICAL CHARACTERISTICS</h2>																															
<h3>2.1 Absolute Maximum Ratings</h3>																															
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<p>Notes:</p> <ol style="list-style-type: none"><li>If the module is above these absolute maximum ratings. It may become permanently damaged. Using the module within the following electrical characteristic conditions are also exceeded, the module will malfunction and cause poor reliability.</li><li>VCI &amp; VDDIO&gt;GND must be maintained.</li><li>Please be sure users are grounded when handing LCD Module</li><li>The response time will become lower when operated at low temperature.</li><li>Background color changes slightly depending on ambient temperature. The phenomenon is reversible.</li></ol>																															
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## 2.2 DC Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
Power Supply voltage	V <sub>CI</sub>	3.0	3.3	3.6	V	
IO Supply voltage	V <sub>DDIO</sub>	1.65	3.3	3.6	V	
Input high level voltage	V <sub>IH</sub>	0.7V <sub>DDIO</sub>	-	V <sub>DDIO</sub>	V	-
Input low level voltage	V <sub>IL</sub>	GND	-	0.3 V <sub>DDIO</sub>	V	-
Output high level voltage	V <sub>OH</sub>	V <sub>DDIO</sub> -0.4		V <sub>DDIO</sub>		
Output low level voltage	V <sub>OL</sub>	GND		GND+0.4		
Power supply current	I <sub>VCI+VDDIO</sub>	-		TBD	mA	NOTE

**NOTE :**

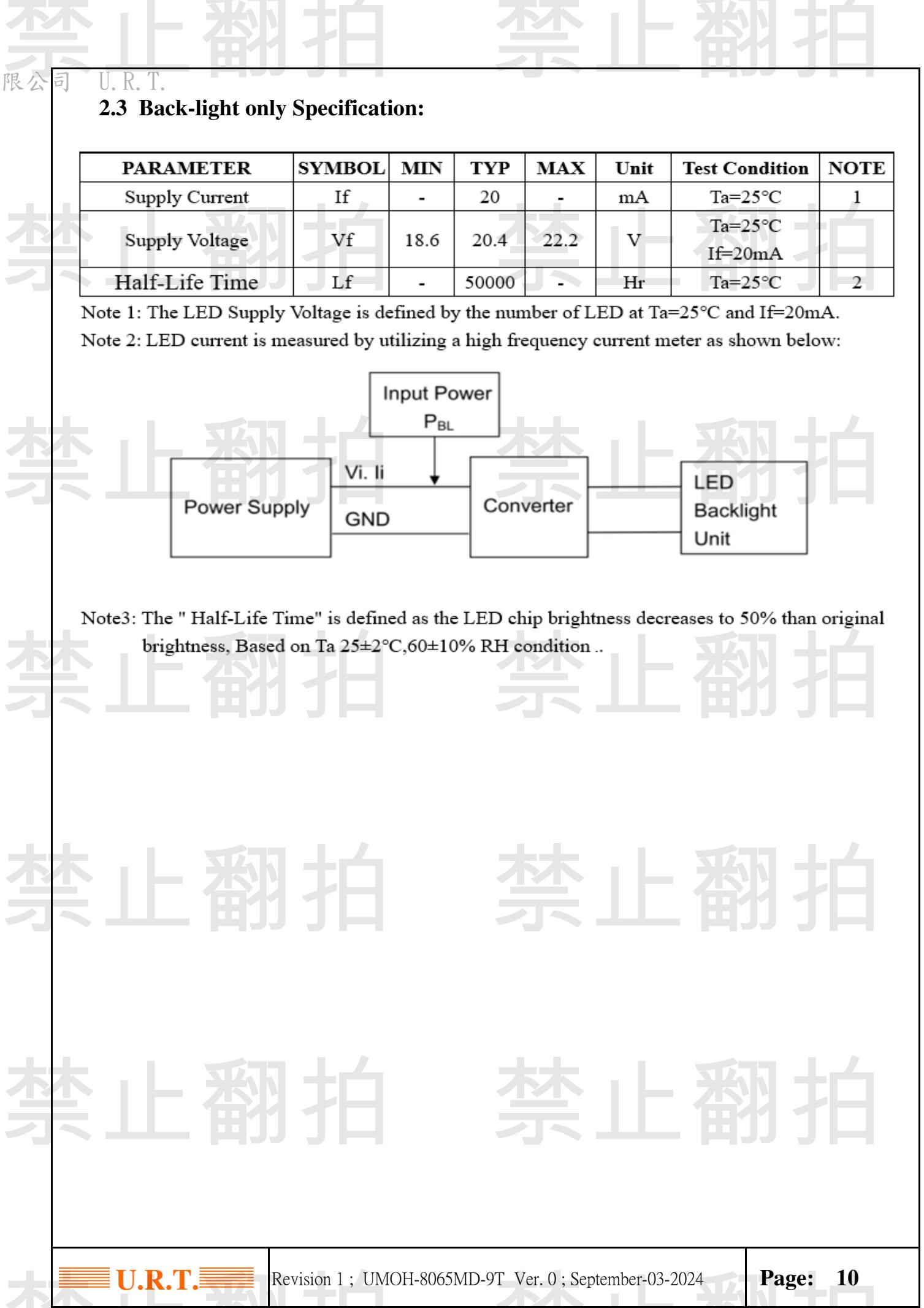
### Measuring Condition :

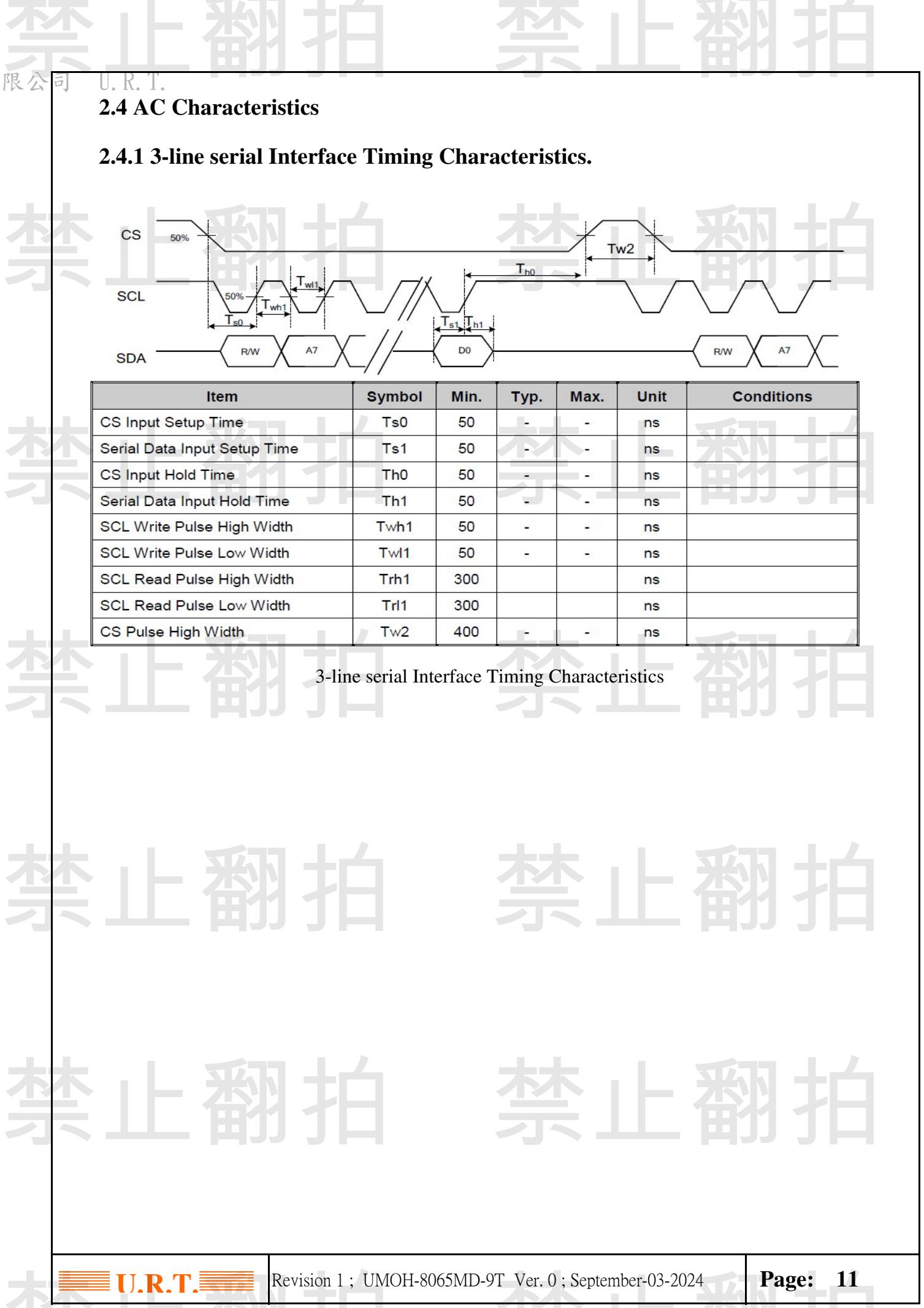
### Standard Value MAX.

T<sub>a</sub> = 25°C

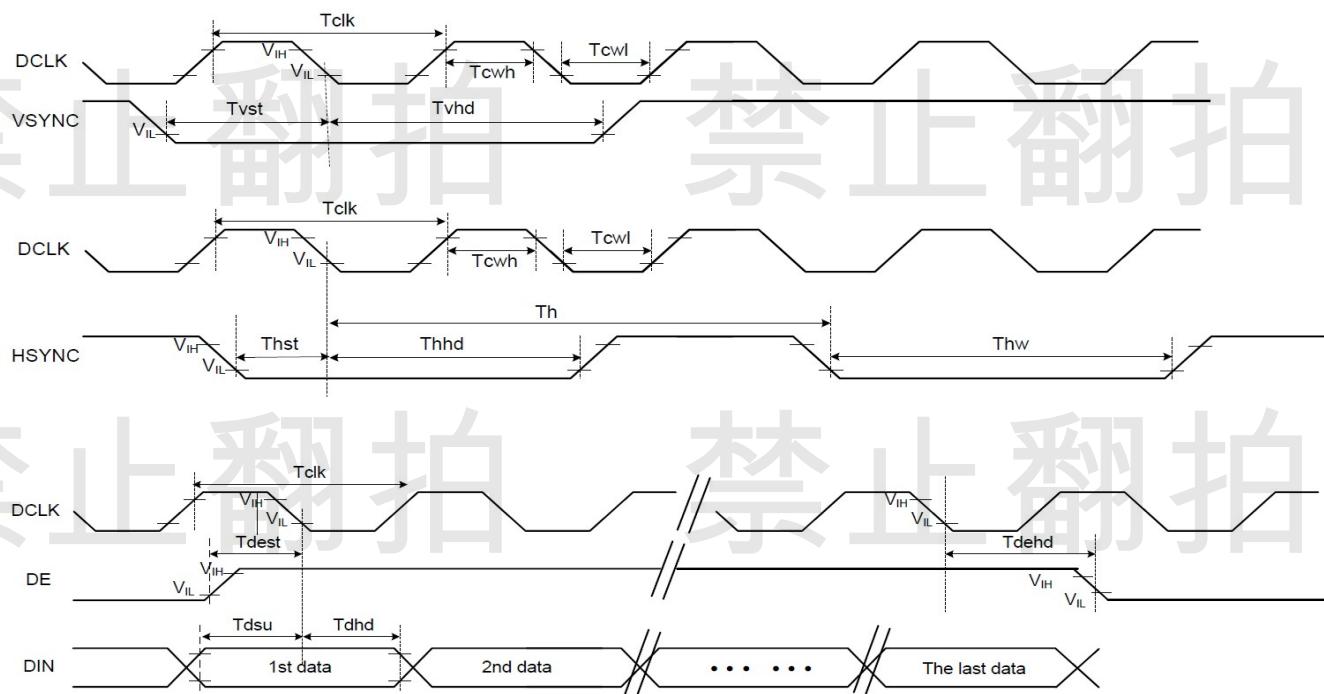
V<sub>CI</sub>=V<sub>DIO</sub> = +3.3V

### Display Pattern





## 2.4.2 System Bus Timing for RGB Interface

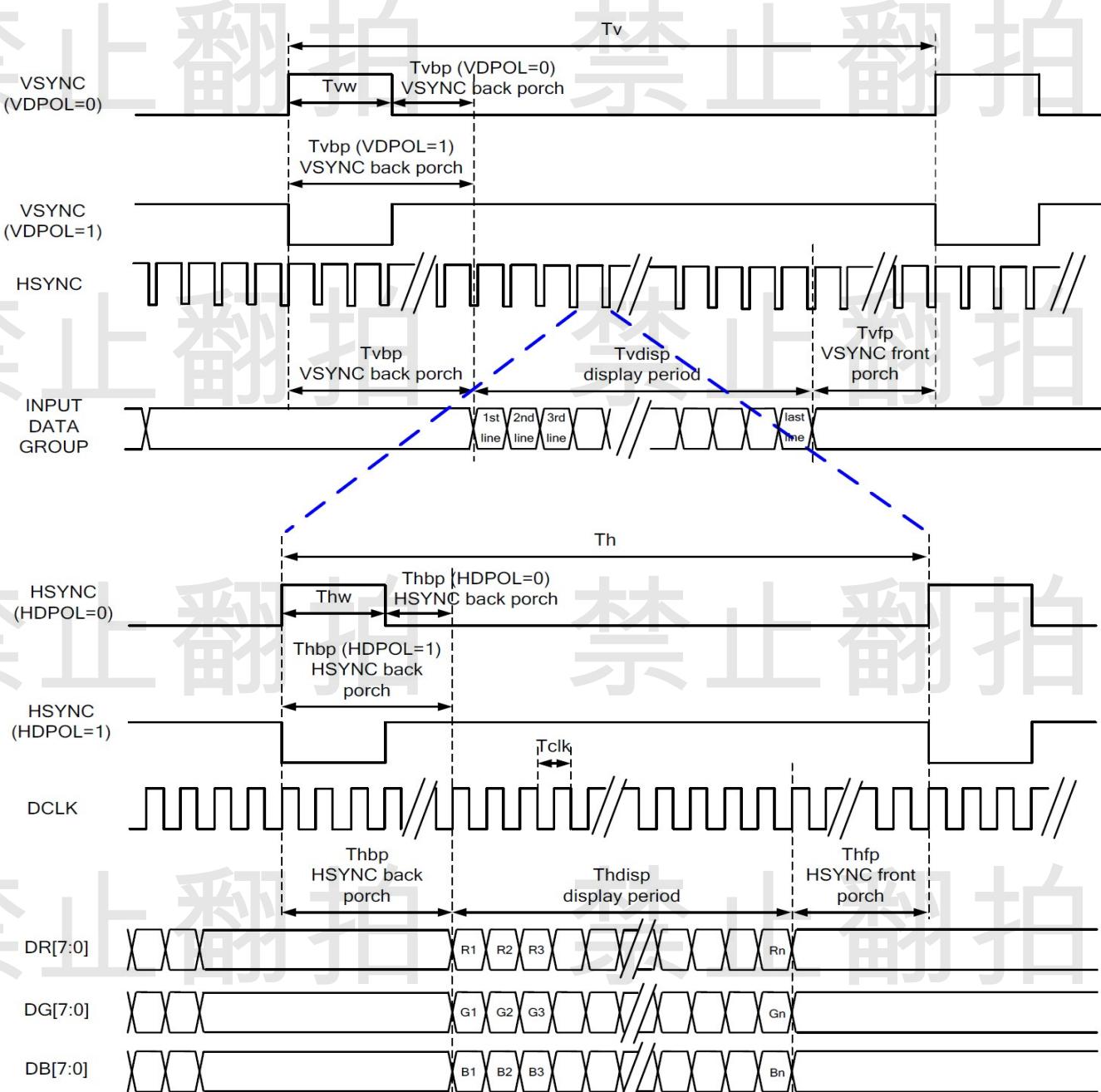


Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
CLK Pulse Duty	Tclk	40	50	60	%	
HSYNC Width	Thw	2	-	-	us	DCLK
HSYNC Period	Th	55	60	65	us	
VSYNC Setup Time	Tvst	12	-	-	ns	
VSYNC Hold Time	Tvh	12	-	-	ns	
HSYNC Setup Time	Thst	12	-	-	ns	
HSYNC Hold Time	Thhd	12	-	-	ns	
Data Setup Time	Tdsu	12	-	-	ns	
Data Hold Time	Tdhd	12	-	-	ns	
DE Setup Time	Tdest	12	-	-	ns	
DE Hold Time	Tdehd	12	-	-	ns	

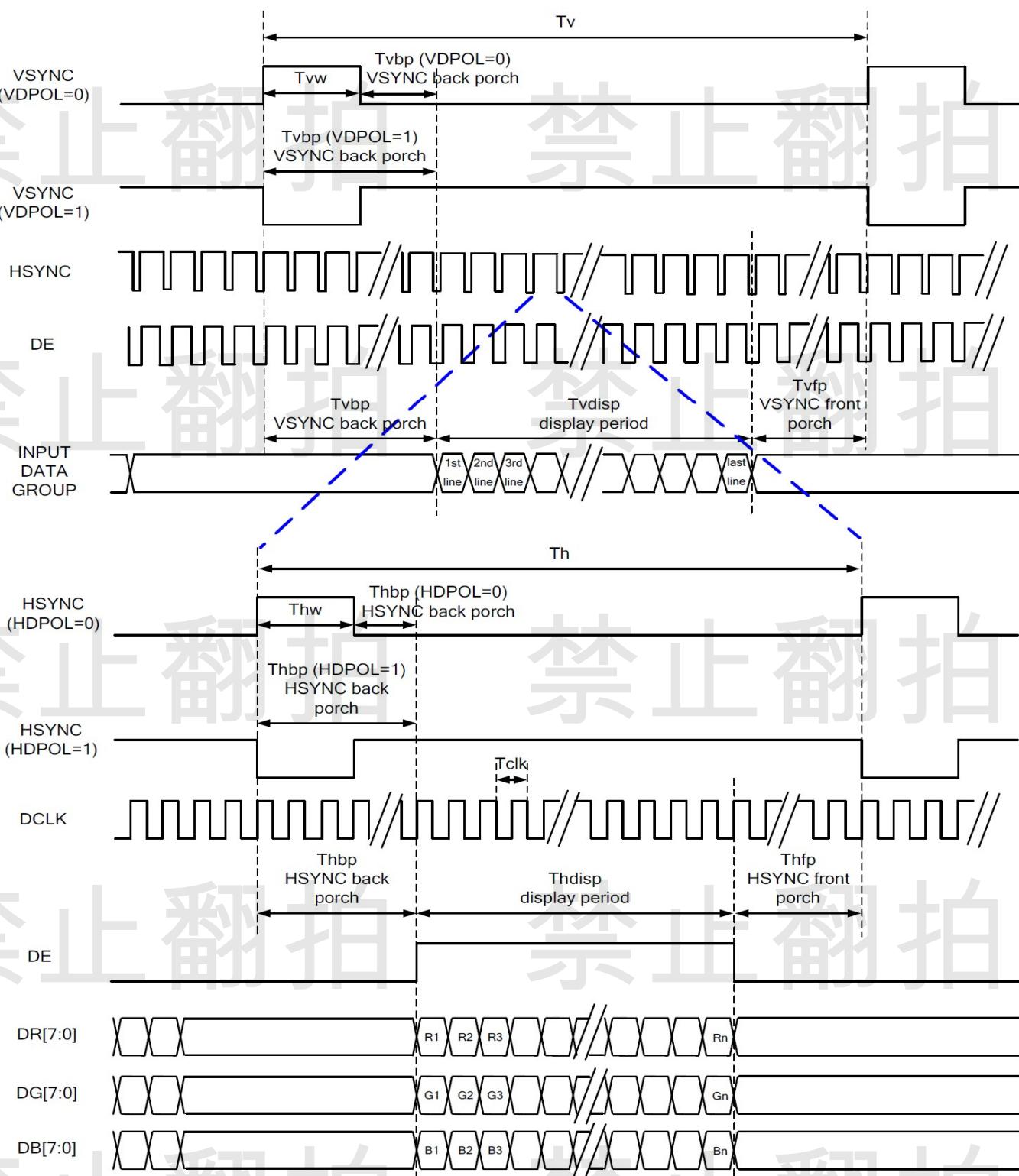
Figure. Mode shift flow chart

## 2.5 RGB Interface

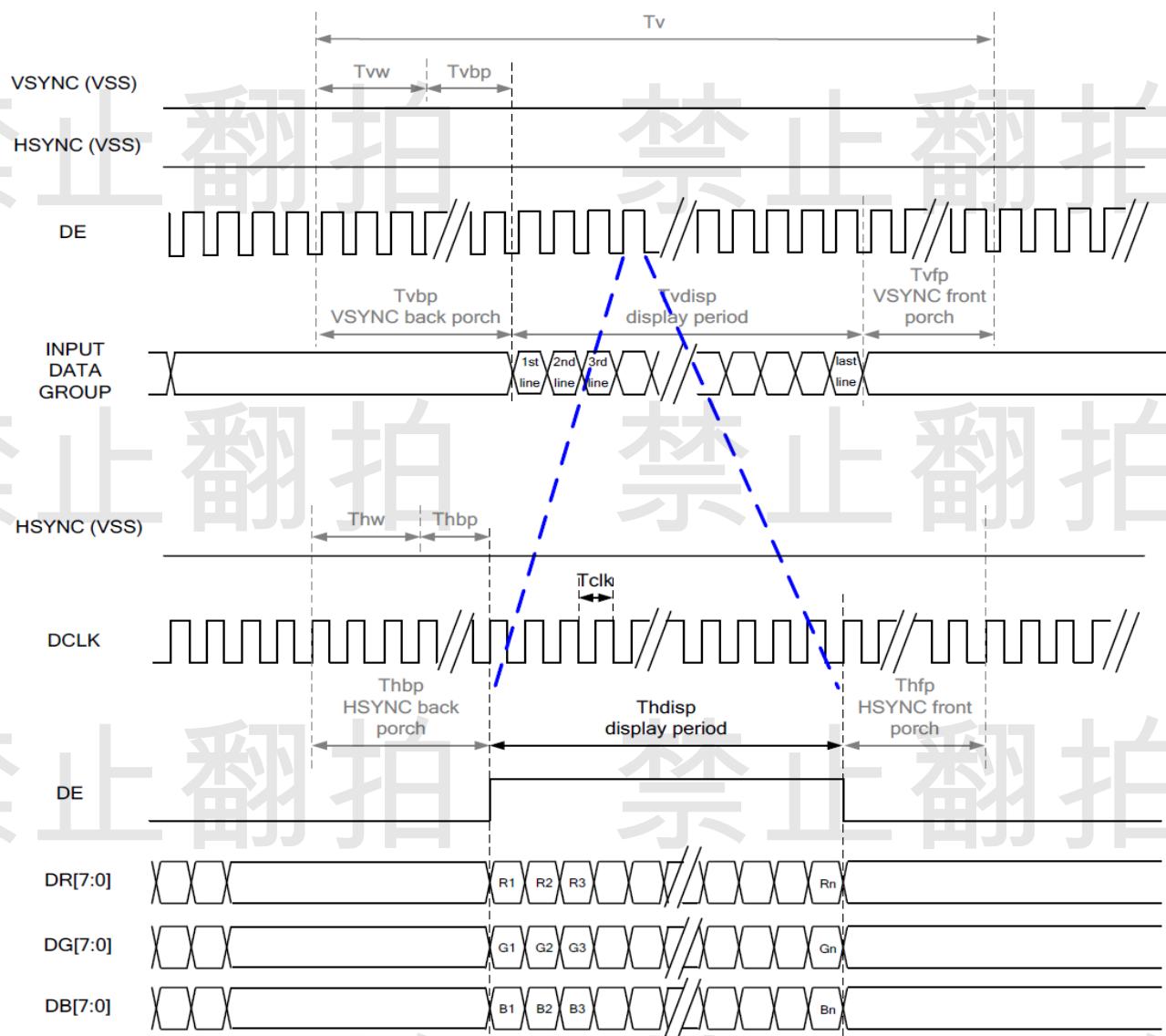
### 2.5.1 SYNC MODE



## 2.5.2 SYNC-DE Mode



### 2.5.3 DE Mode



RGB Mode Selection Table	DCLK	HSYNC	VSYNC	DE
SYNC - DE Mode	Input	Input	Input	Input
SYNC Mode	Input	Input	Input	GND
DE Mode	Input	GND	GND	Input

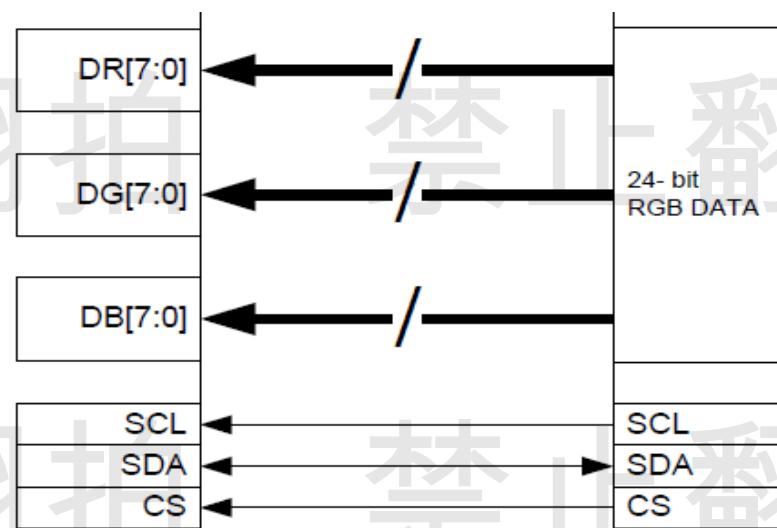
Note: "Input" means these signals are driven by host side.

## 2.5.4 Parallel 24-bit RGB Input Timing Table

Parallel 24-bit RGB Input Timing (VCC3.3V, AGND= 0V, TA=25°C)

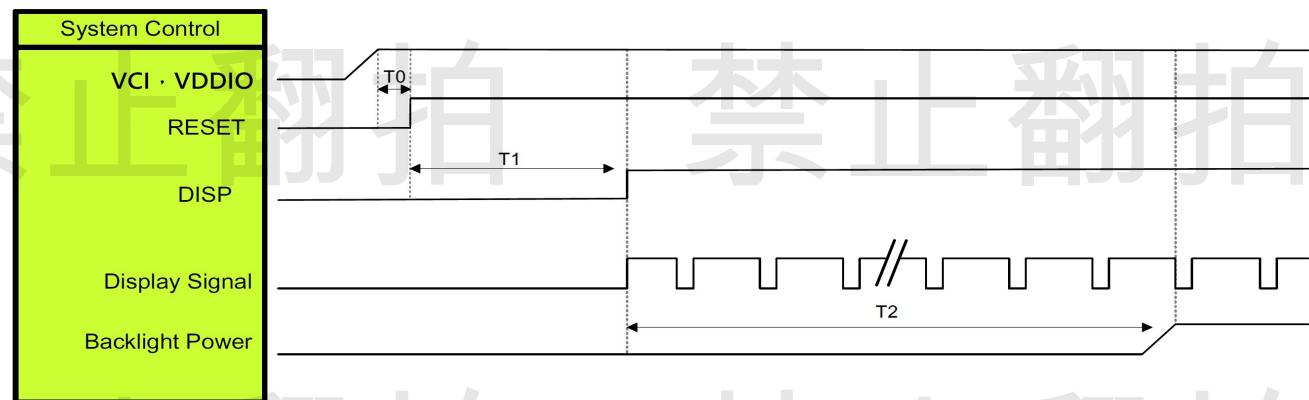
Parallel 24-bit RGB Input Timing Table						
Item	Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency	Fclk	5	6	8	MHz	
DCLK Period	Tclk	125	167	200	ns	
HSYNC	Period Time	Th	325	371	438	DCLK
	Display Period	Thdisp		320		DCLK
	Back Porch	Thbp	3	43	43	DCLK
	Front Porch	Thfp	2	8	75	DCLK
	Pulse Width	Thw	2	4	43	DCLK
VSYNC	Period Time	Tv	244	260	289	HSYNC
	Display Period	Tvdisp		240		HSYNC
	Back Porch	Tvbp	2	12	12	HSYNC
	Front Porch	Tvfp	2	8	37	HSYNC
	Pulse Width	Tvw	2	4	12	HSYNC

Note: It is necessary to keep  $Tvbp = 12$  and  $Thbp = 43$  in sync mode. DE mode is unnecessary to keep it.



## 2.6 Power ON/OFF Sequence

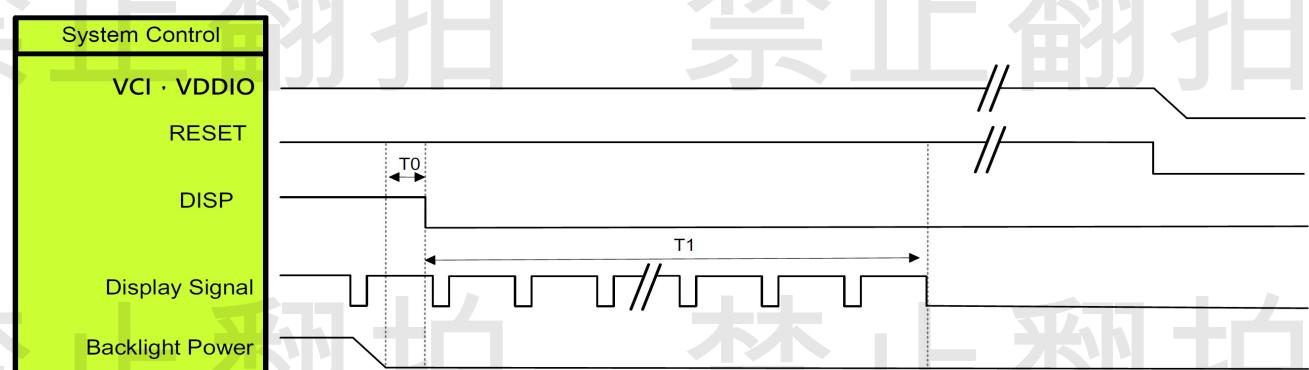
### Power On Sequence



Symbol	Description	Min. Time	Unit
T0	System power stability to RESET signal	0	ms
T1	GRB RESET= "High" to DISP= "High"	10	ms
T2	Display Signal output to Backlight Power on	250	ms

Note: Display signal: DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0]

### Power Off Sequence



Symbol	Description	Min. Time	Unit
T0	Backlight Power off to DISP= "Low"	5	ms
T1	DISP= "Low" to IC internal voltage discharge complete	80	ms

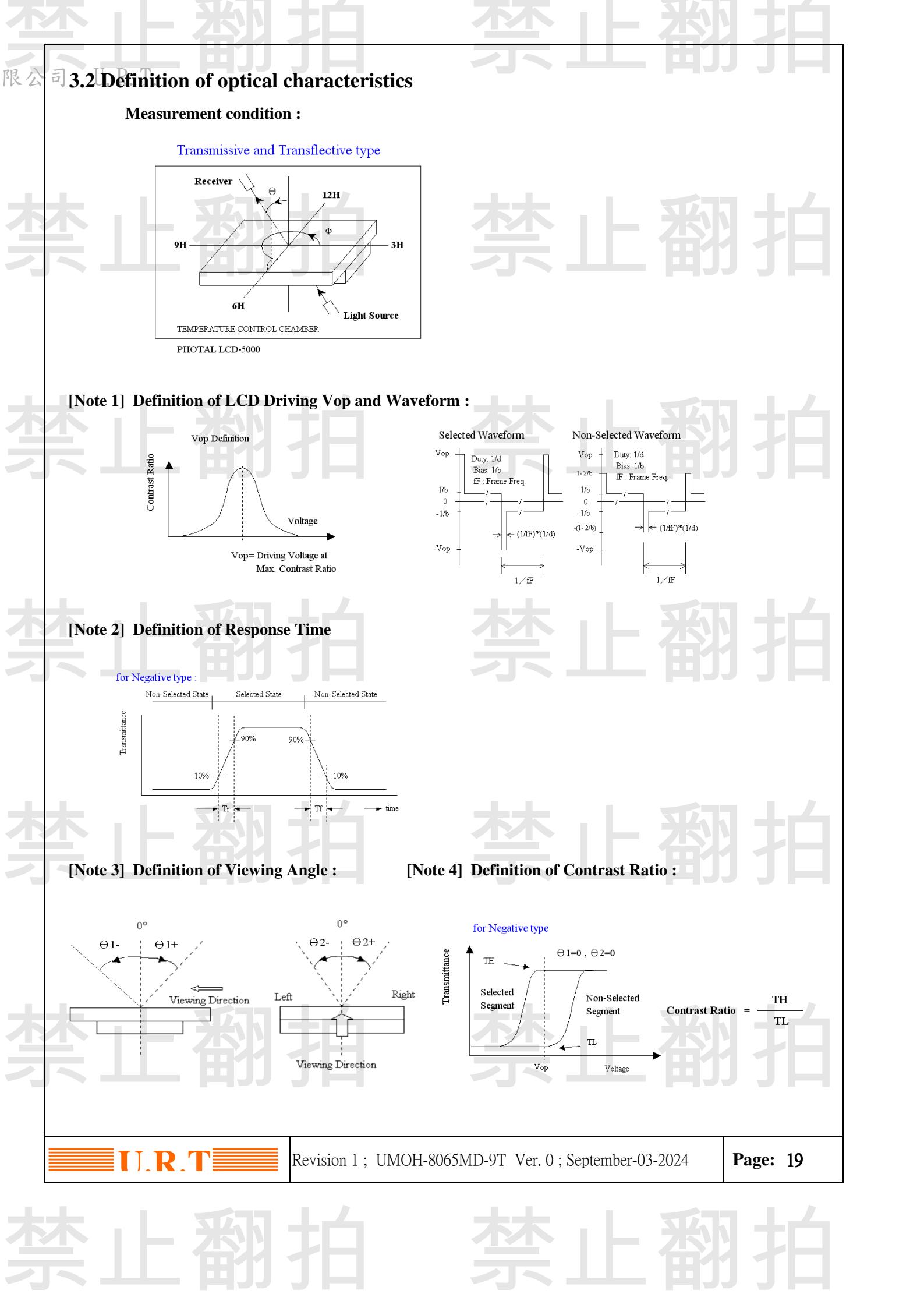
Note: Display signal: DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0]

### 3. OPTICAL CHARACTERISTICS

### 3.1 Characteristics

## Electrical and Optical Characteristics

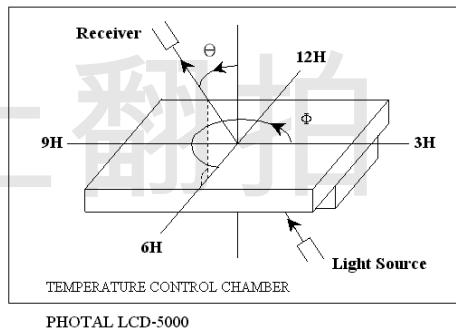
Electrical and Optical Characteristics									
No.	Item		symbol / temp.	Min.	Typ.	Max.	Unit	Note	
1	Response Time		Tr+TF	25 °C	-	TBD	-	ms 2	
2	Viewing Angle	Hor.	Cr ≥ 10	θ <sub>2+</sub>	Φ = 0°	-	TBD	-	
				θ <sub>2-</sub>	Φ = 180°	-	TBD	-	
		Ver.		θ <sub>1+</sub>	Φ = 270°	-	TBD	-	
				θ <sub>1-</sub>	Φ = 90°	-	TBD	-	
3	Contrast Ratio		Cr	25 °C	-	TBD	-	- 4	
4	Red x-code		Rx	25 °C	-	TBD	-	5	
	Red y-code		Ry		-	TBD	-		
	Green x-code		Gx		-	TBD	-		
	Green y-code		Gy		-	TBD	-		
	Blue x-code		Bx		-	TBD	-		
	Blue y-code		By		-	TBD	-		
	White x-code		Wx		-	TBD	-		
	White y-code		Wy		-	TBD	-		
	Brightness		Y		-	TBD	-	cd/m <sup>2</sup>	
5	Brightness Uniformity			25 °C	-	TBD	-	% 6	



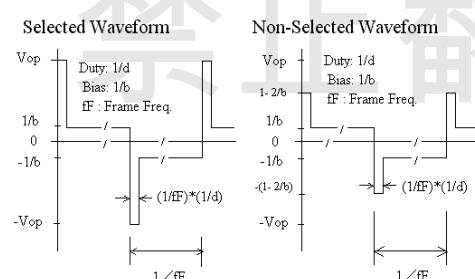
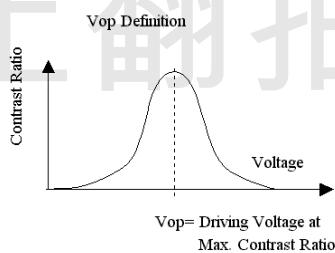
### 3.2 Definition of optical characteristics

Measurement condition :

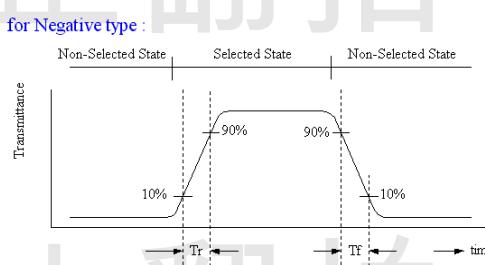
Transmissive and Transflective type



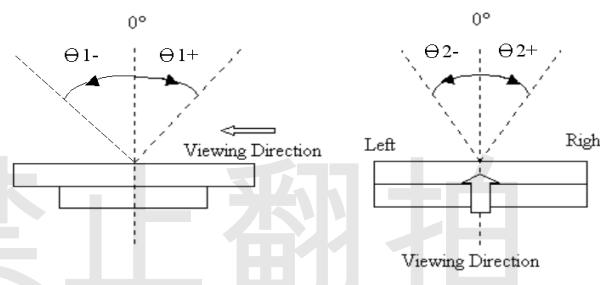
#### [Note 1] Definition of LCD Driving Vop and Waveform :



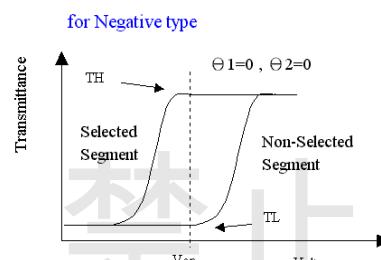
#### [Note 2] Definition of Response Time



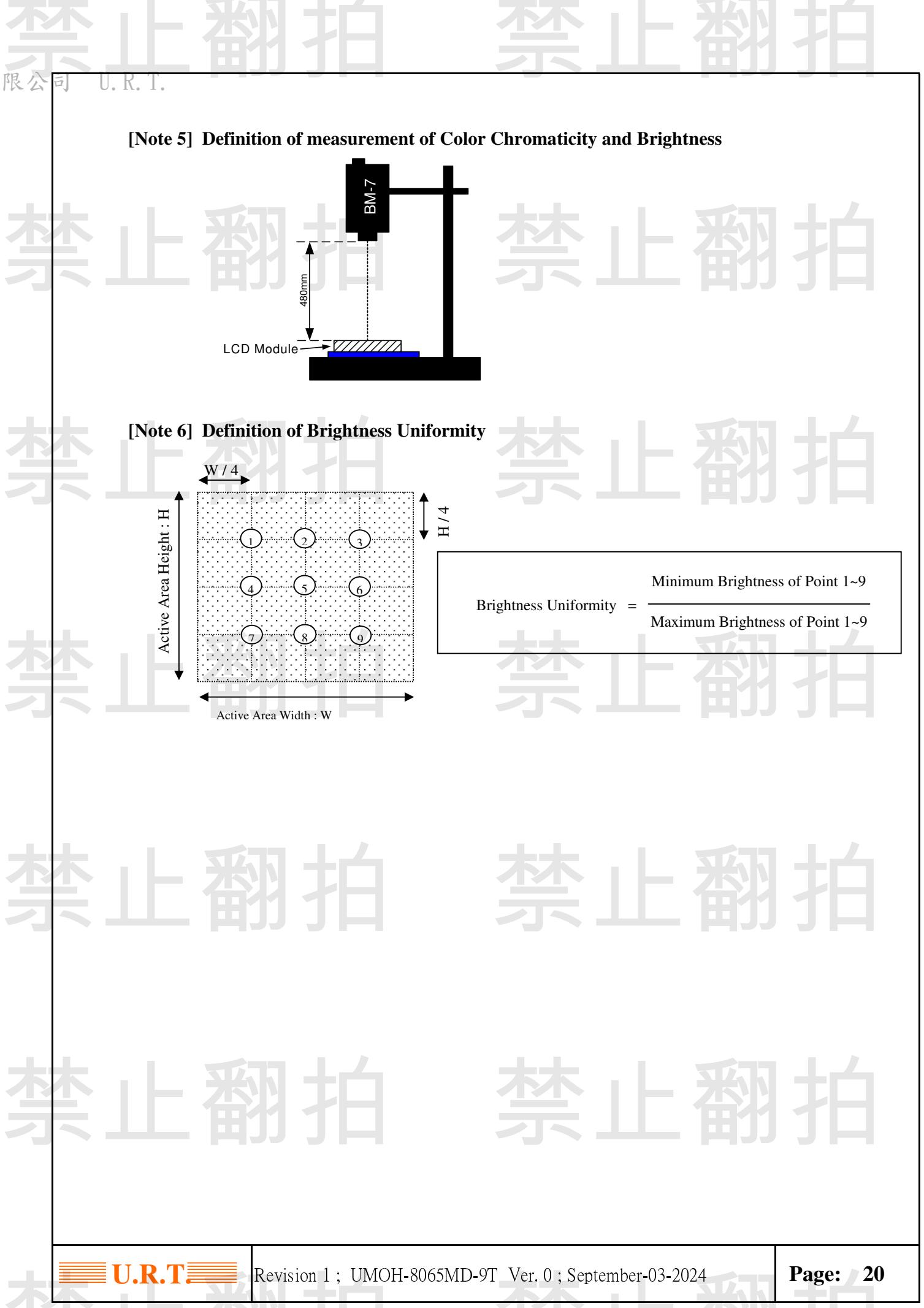
#### [Note 3] Definition of Viewing Angle :



#### [Note 4] Definition of Contrast Ratio :



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



4. RELIABILITY :			
Item No	Items	Condition	Remark
1	High temperature operating	70 °C , 200 hours	1
2	Low temperature operating	-20 °C , 200 hours	1
3	High temperature storage	80 °C , 200 hours	1
4	Low temperature storage	-30 °C , 200 hours	1
5	High temperature & humidity storage	60°C, 90%RH, 100 hours	2
6	Thermal Shock storage	-30°C, 30min.<=> 80°C, 30min. 10 Cycles	1
7	Vibration test	10 => 55 =>10 => 55 => 10 Hz , within 1 minute Amplitude : 1.5mm. 15 minutes for each Direction ( X,Y,Z )	
8	Drop test	Packed, 100CM free fall, 6 sides, 1 corner, 3edges	
9	Life time	50,000 hours 25°C , 60%RH , specification condition driving	

Note 1 : The product move into the room temperature for at least 2 hours with no condensation.

Note 2 : The product move into the room temperature for at least 24 hours with no condensation.

Note 3 : Please change the display picture (autorun) during operating mode. Avoid displaying static images to avoid image sticking , and the image sticking is accelerated by temperature.

- \* 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
  - Function : work normally

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<h2>5. PRODUCT HANDLING AND APPLICATION</h2>		
<h3>5.1 PRECAUTION FOR HANDLING LCM</h3>		
● The LCD module contains a C-MOS LSI. People who operate the LCM should wear ESD protection equipment 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.	● Use a non-leak iron for soldering LCM, soldering Temperature at iron tip : $350^{\circ}\text{C}\pm20^{\circ}\text{C}$ .	● Do not touch the display surface or connection terminals area with bare hands. Smudges on the display surface reduce the insulation between terminals.
● Do not twist or bend the modules and also avoid any inappropriate external force on display surface during assembly.	● Do not expose LCM to organic solvent. If clean the surface, wipe it gently with soft cloth dampened by alcohol.	● Do not attempt to wipe off the contact pads.
● Keep LCM panels away from direct sunlight or fluorescent light, also avoid them in high-temperature & high humidity environment for a long period.	● It is an indispensable condition to drive LCD's within the specified voltage limit since the higher voltage then the limit cause the shorter LCD life.	● Response time will be extremely delayed at lower temperature than the operating temperature range and on the other hand at higher temperature LCD's have dark color in them. However those phenomena do not mean malfunction or out of order with LCD's, which will come back in the specified operation temperature.
● If the display area is pushed hard during operation, some font will be abnormally displayed but it resumes normal condition after turning off once.	● Never use the LCD, LCM under 45 Hz, the liquid crystal will decompose and cause permanent damage on display !!	● The polarizer is easily damaged and should be handled with special care. Don't press or rub it with hard objects.
● Liquid in LCM is hazardous substance. In case of contact with liquid crystal material is occurred, be sure to immediately wash such material away by soap and water.	● Store the module in a dark room where must keep at $25\pm10^{\circ}\text{C}$ and 65%RH or less.	● Do not store the module in surroundings containing organic solvent or corrosive gas
● Store the module in an anti-electrostatic container or bag.		
<h3>5.2 PRECAUTION FOR STORING</h3>		
● For the application in medical care, safety and hazardous products or systems, an authorization from URT is required. URT will not be responsible for any damage or loss which is caused by the products without any authorization given by URT.	● 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.
● The application and delivery of this product must comply with Strategic High-Tech Commodities (SHTC) export control and the sales to the embargoed and/or sanctioned countries or regions are strictly prohibited.		
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## 6. DATE CODE OF PRODUCTS

- Date code will be shown on each product :

- YY MM DD - XXXX

Year Month Day - Serial No.

- Example: 121108 - 0 0 0 3 ==> Year 2012, November,8th , Serial No.0003

Note : The lot no. attached on the packing box will be used for tracking once the part is too small to print the date code.

7. LOT NO.

Instruction of lot number:

LOT NO. : 0 0 0 8 3 5 2 5 (EX)

└ Date

01-1 st  
02-2 nd  
| |  
31-31 th

## Week

1 ————— 7

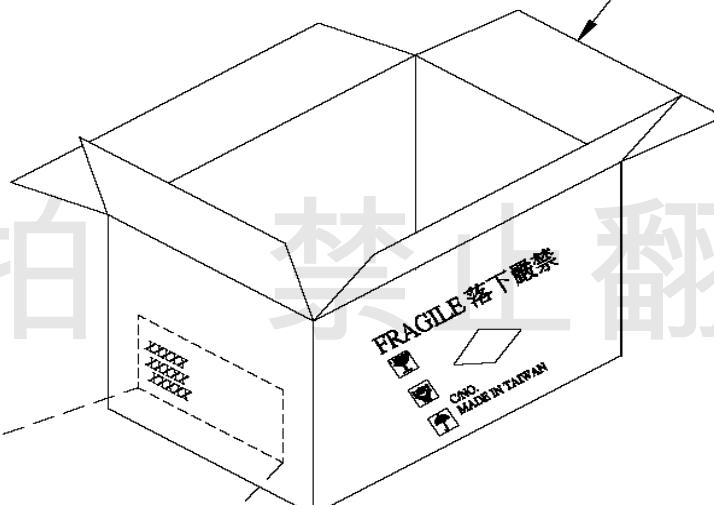
Week  
Month

01—January  
02—February  
|      |  
12—December

Year

00-2000  
01 2001

### Table of carton:



MODEL:XXXX-XXXXXX-XX  
Q'TY: PCS  
LOT NO. UP  
N.W. KGS.  
G.W. KGS.  
UNITED RADIANT TECHNOLOGY CORP.

光聯科技股份有限公司

## 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 U.R.T. TO PURCHASER. PURCHASER SHALL CONTROL THE LCM AT -10 °C TO 40 °C, 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

ISO2859-1 ( SAME AS MIL-STD-105E ), LEVEL II SINGLE PLAN.

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

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

## 8.2. CHECKING CONDITION

### 8.2.1. VIEWING DISTANCE IS APPROXIMATELY : $30 \pm 5$ CM.

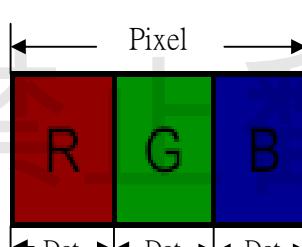
### 8.2.2. VIEWING ANGLE IS NORMAL TO THE LCD PANEL WITH $45^\circ$ .

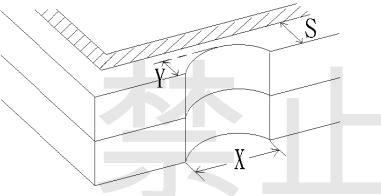
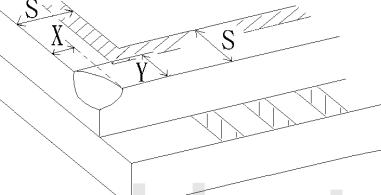
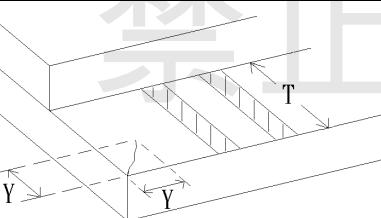
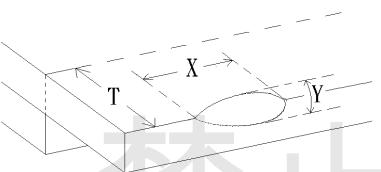
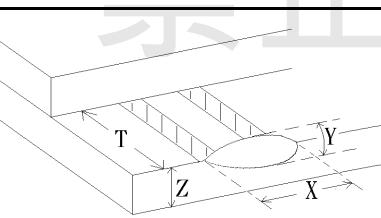
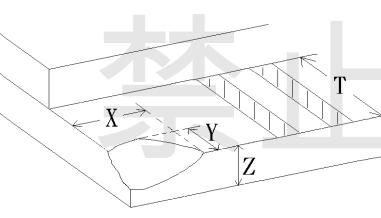
### 8.2.3. AMBIENT ILLUMINANCE : 2 PCS OF 20W FLUORESCENT LAMPS( DISTANCE TO THE SAMPLE $>100$ CM ) OR $1000 \pm 200$ LUX.

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. CANNOT BE REMOVED, BLEMISH BLACK SPOTS, WHITE SPOTS, ON THE LCD AND LCD GLASS CRACKS.	ACCORDING TO STANDARD OF VISUAL INSPECTION ( INSIDE VIEWING AREA )	Minor
	7. BLEMISH 、BLACK SPOT WHITE SPOT AND SCRATCH 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 LINE	MISSING DOT 、LINE 、CHARACTER .....REJECTED	Critical
	12. SHORT CIRCUIT 、 WRONG PATTERN DISPLAY	NO DISPLAY 、WRONG PATTERN DISPLAY 、CURRENT CONSUMPTION OUT OF SPECIFICATION..... REJECTED	Critical
	13. DOT DEFECT (FOR COLOR AND TFT)	ACCORDING TO STANDARD OF VISUAL INSPECTION	Minor

Note: If Viewing Area (VA) have the same dimension with Active Area(AA), then only Active Area will be defined in the drawing , use the AA as VA for inspection judgement

## 8.4. STANDARD OF VISUAL INSPECTION

NO.	CLASS	ITEM	JUDGEMENT																				
8.4.1	MINOR	BLACK AND WHITE SPOT FOREIGN MATERIEL DUST IN THE CELL BLEMISH SCRATCH	<p>(A) ROUND TYPE: unit : mm.</p> <table border="1"> <thead> <tr> <th>DIAMETER (mm.)</th> <th>ACCEPTABLE Q'TY</th> </tr> </thead> <tbody> <tr> <td><math>\Phi \leq 0.1</math></td> <td>DISREGARD</td> </tr> <tr> <td><math>0.1 &lt; \Phi \leq 0.25</math></td> <td>3 (Distance&gt;5mm)</td> </tr> <tr> <td><math>0.25 &lt; \Phi</math></td> <td>0</td> </tr> </tbody> </table> <p>NOTE: <math>\Phi = (\text{LENGTH} + \text{WIDTH})/2</math></p> <p>(B) LINEAR TYPE: unit : mm.</p> <table border="1"> <thead> <tr> <th>LENGTH</th> <th>WIDTH</th> <th>ACCEPTABLE Q'TY</th> </tr> </thead> <tbody> <tr> <td>-----</td> <td><math>W \leq 0.03</math></td> <td>DISREGARD</td> </tr> <tr> <td><math>L \leq 5.0</math></td> <td><math>0.03 &lt; W \leq 0.07</math></td> <td>3 (Distance&gt;5mm)</td> </tr> <tr> <td>-----</td> <td><math>0.07 &lt; W</math></td> <td>FOLLOW ROUND TYPE</td> </tr> </tbody> </table>	DIAMETER (mm.)	ACCEPTABLE Q'TY	$\Phi \leq 0.1$	DISREGARD	$0.1 < \Phi \leq 0.25$	3 (Distance>5mm)	$0.25 < \Phi$	0	LENGTH	WIDTH	ACCEPTABLE Q'TY	-----	$W \leq 0.03$	DISREGARD	$L \leq 5.0$	$0.03 < W \leq 0.07$	3 (Distance>5mm)	-----	$0.07 < W$	FOLLOW ROUND TYPE
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-----	$0.07 < W$	FOLLOW ROUND TYPE																					
8.4.2	MINOR	BUBBLE IN POLARIZER DENT ON POLARIZER	<table border="1"> <thead> <tr> <th>DIAMETER</th> <th>ACCEPTABLE Q'TY</th> </tr> </thead> <tbody> <tr> <td><math>\Phi \leq 0.2</math></td> <td>DISREGARD</td> </tr> <tr> <td><math>0.2 &lt; \Phi \leq 0.5</math></td> <td>2 (Distance&gt;5mm)</td> </tr> <tr> <td><math>0.5 &lt; \Phi</math></td> <td>0</td> </tr> </tbody> </table>	DIAMETER	ACCEPTABLE Q'TY	$\Phi \leq 0.2$	DISREGARD	$0.2 < \Phi \leq 0.5$	2 (Distance>5mm)	$0.5 < \Phi$	0												
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8.4.3	MINOR	Dot Defect	<table border="1"> <thead> <tr> <th>Items</th> <th>ACC. Q'TY</th> </tr> </thead> <tbody> <tr> <td>Bright dot</td> <td><math>N \leq 4</math> (Distance&gt;5mm)</td> </tr> <tr> <td>Dark dot</td> <td><math>N \leq 4</math> (Distance&gt;5mm)</td> </tr> </tbody> </table> <p>Pixel Define</p>  <p>Not 1: The definition of dot: The size of a defective dot over 1/2 of whole dot is regarded as one defective dot.</p> <p>Not 2: Bright dot: Dots appear bright and unchanged in size in which LCD panel is displaying under black pattern.</p> <p>Not 3: Dark dot: Dots appear dark and unchanged in size in which LCD panel is displaying under pure red, green, blue pattern.</p>	Items	ACC. Q'TY	Bright dot	$N \leq 4$ (Distance>5mm)	Dark dot	$N \leq 4$ (Distance>5mm)														
Items	ACC. Q'TY																						
Bright dot	$N \leq 4$ (Distance>5mm)																						
Dark dot	$N \leq 4$ (Distance>5mm)																						

NO.	CLASS	ITEM	JUDGEMENT
8.4.4	MINOR	LCD GLASS CHIPPING	 $Y > S$ Reject
8.4.5	MINOR	LCD GLASS CHIPPING	 $X \text{ or } Y > S$ Reject
8.4.6	MAJOR	LCD GLASS GLASS CRACK	 $Y > (1/2)T$ Reject
8.4.7	MAJOR	LCD GLASS SCRIBE DEFECT	 1. $a > L/3$ , $A > 1.5\text{mm}$ Reject 2. B : ACCORDING TO DIMENSION
8.4.8	MINOR	LCD GLASS CHIPPING (ON THE TERMINAL AREA)	 $\Phi = (x+y)/2 > 3.0 \text{ mm}$ Reject
8.4.9	MINOR	LCD GLASS CHIPPING (ON THE TERMINAL SURFACE)	 $Y > (1/3)T$ Reject
8.4.10	MINOR	LCD GLASS CHIPPING	 $Y > T$ Reject