

SPECIFICATION

OF

LIQUID CRYSTAL DISPLAY MODULE



CUSTOMER : URT-STD

Model No. : UMOH-9393MD-T(REV1)

Model version : 0

Document Revision : 0

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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Jul-11-2019
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Revision 0 ; UMOH-9393MD-T(REV1) Ver. 0 ; July-11-2019

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1. BASIC SPECIFICATION

1.1 Mechanical specifications

Items	Nominal Dimension	Unit
Active screen size	4.3" diagonal	-
Dot Matrix	480 x RGB x 272	Pixel
Module Size (W x H x T)	105.4 x 67.1 x 2.85	mm.
Active Area (W x H)	95.04 x 53.856	mm.
Pixel Size (W×H)	0.198 x 0.198	mm.
Color depth	16.7M	color
Interface	Parallel 24-bit RGB	-
Driving IC	SC7283	-
Module Weight	38±10%	g

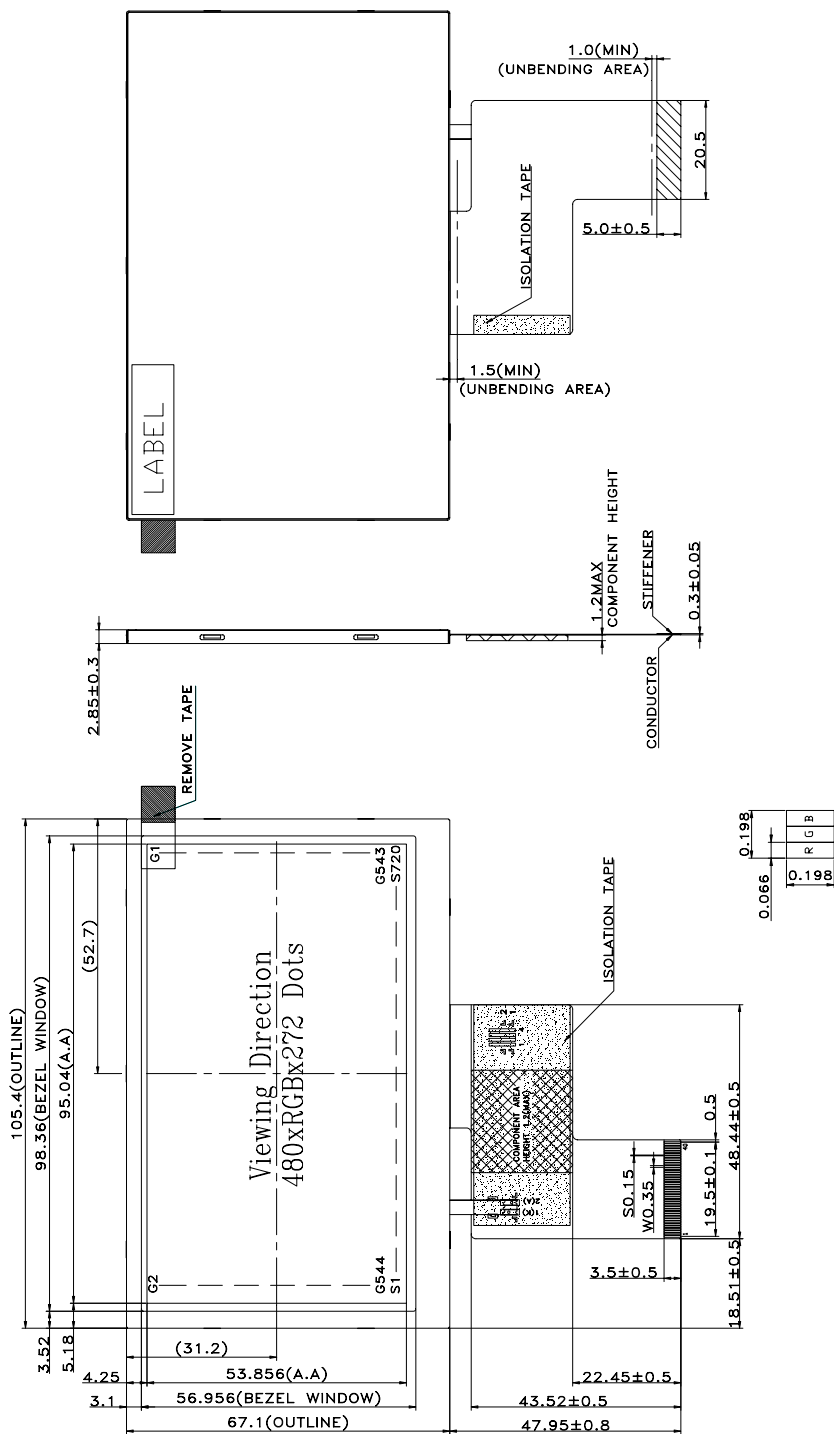
1.2 Display specification

Display	Descriptions	Note
LCD Type	IPS	-
LCD Mode	Normal Black	-
Polarizer Mode	Transmissive	-
Polarizer Surface	ANTI-GLARE	-
Pixel arrangement	RGB vertical stripe	-
Backlight Type	LED	-
Viewing Direction	ALL	-

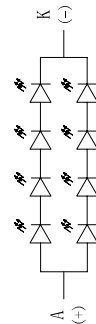
1.3 Outline dimension

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PIN NO.	SIGNAL	
1	LEDK	
2	LED A	
3	GND	
4	VDD	
5	R0	
6	R1	
7	R2	
8	R3	
9	R4	
10	R5	
11	R6	
12	R7	
13	G0	
14	G1	
15	G2	
16	G3	
17	G4	
18	G5	
19	G6	
20	G7	
21	B0	
22	B1	
23	B2	
24	B3	
25	B4	
26	B5	
27	B6	
28	B7	
29	GND	
30	DLCK	
31	DISP	
32	HSYNC	
33	VSYNC	
34	DE	
35	NC	
36	GND	
37	NC	
38	NC	
39	NC	
40	NC	



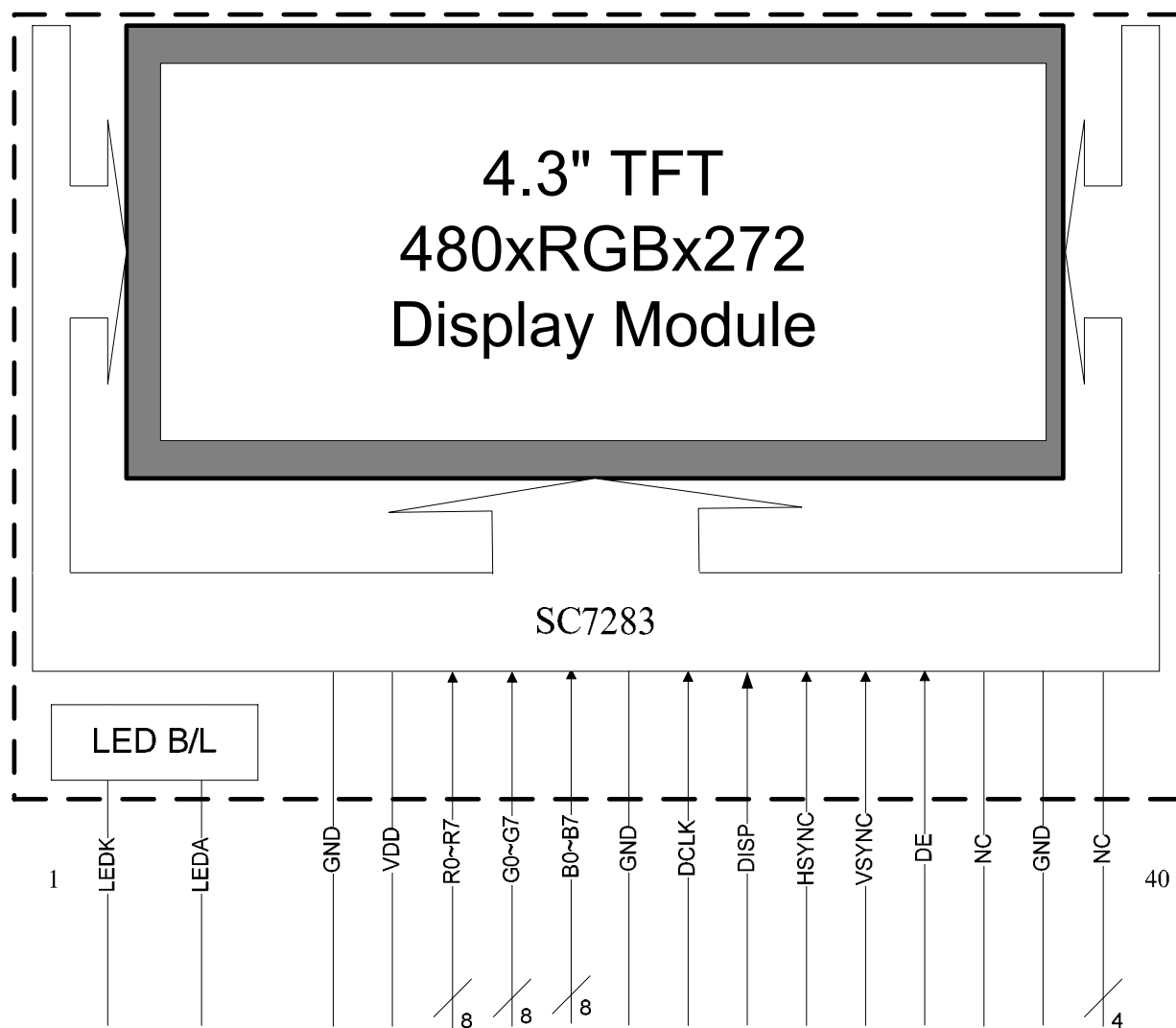
PIXEL DETAIL



BACKLIGHT DIAGRAM

- 1.LCD: TFT IPS, TRANSMISSIVE, NORMALLY BLACK,ANTI-GLARE
- 2.Top: -20°C~70°C, Tst:-30°C~80°C
- 3.VIEWING DIRECTION: U/L/D/R 80/80/80/80
- 4.THIS PRODUCT CONFORM WITH THE STANDARD OF ROHS
- 5.TOLERANCE FOR NOT ASSIGNED ±0.2
- 6.THE MINIMUM BENDABLE RADIUS(INNER) OF THE FPC IS 0.5mm
- 7.LED B/L: WHITE*8PCS
- 8.B/L/L:CONSTANT CURRENT IF=40mA, VF=12.4V(TYP)
- 9.IC:SC7283
- 10.COMPONENT AREA AND SOLDER AREA CAN NOT BENDING

1.4 Block diagram:



1.5 Interface Pin Connection

Pin No.	Pin Symbol	I/O	Description
1	LEDK	P	Power for LED backlight cathode.
2	LEDA	P	Power for LED backlight anode.
3	GND	P	Ground.
4	VDD	P	Power supply.
5 ~ 12	R0 ~ R7	I	Red data input pin.
13 ~ 20	G0 ~ G7	I	Green data input pin.
21 ~ 28	B0 ~ B7	I	Blue data input pin.
29	GND	P	Ground.
30	DCLK	I	Pixel clock input pin.
31	DISP	I	Sets the display mode. "L"= standby mode. "H"= normal display.
32	HSYNC	I	Horizontal sync signal, default is negative polarity.
33	VSNC	I	Vertical sync signal, default is negative polarity.
34	DE	I	Data input enable. Display access is enable when DE is "H".
35	NC	-	No connection.
36	GND	P	Ground.
37~40	NC	-	No connection.

2. ELECTRICAL CHARACTERISTICS

2.1 Absolute Maximum Ratings

Items	Symbol	Min.	Max.	Unit
Power supply voltage	VDD	-0.3	+4.0	V
Logic input/output voltage	VIO	-0.3	VDD+0.3	V
Operate temperature range	TOP	-20	70	°C
Storage temperature range	TST	-30	80	°C

*Note1 :

The operating temperature is for product's functionality, please pay attention to human injury when using the product under extreme temperature.

2.2 DC Characteristics:

T_a = 25°C

Items	Symbol	Min.	Typ.	Max.	Unit	Condition
Supply Voltage	VDD	3.0	3.3	3.6	V	-
Input Voltage	V _{IL}	0	-	0.3VDD	V	L level
	V _{IH}	0.7VDD	-	VDD	V	H level
Current Consumption	I _{VDD}	-	32	64	mA	Note 1

*Note1 :

Measuring Condition:

Standard Value Max.

T_a = 25°C

VDD -GND = 3.3V

Display Pattern : white pattern

2.3 Back-light only Specification :

PARAMETER	SYMBOL	Min.	Typ.	Max.	unit	Test Condition	NOTE
Supply Current	IF	-	40	-	mA	Ta=25°C	-
Supply Voltage	VF	10.8	12.4	13.2	V	Ta=25°C	@ 40mA
Half-Life Time	Lf	-	50000	-	hrs	Ta=25°C	Note 1

Note 1 : The "Half-Life Time" is defined as the LED chip brightness decreases to 50% than original brightness, based on Ta 25±2°C,60±10% RH condition.

2.4 AC Characteristics

Parallel RGB Input Timing Requirement

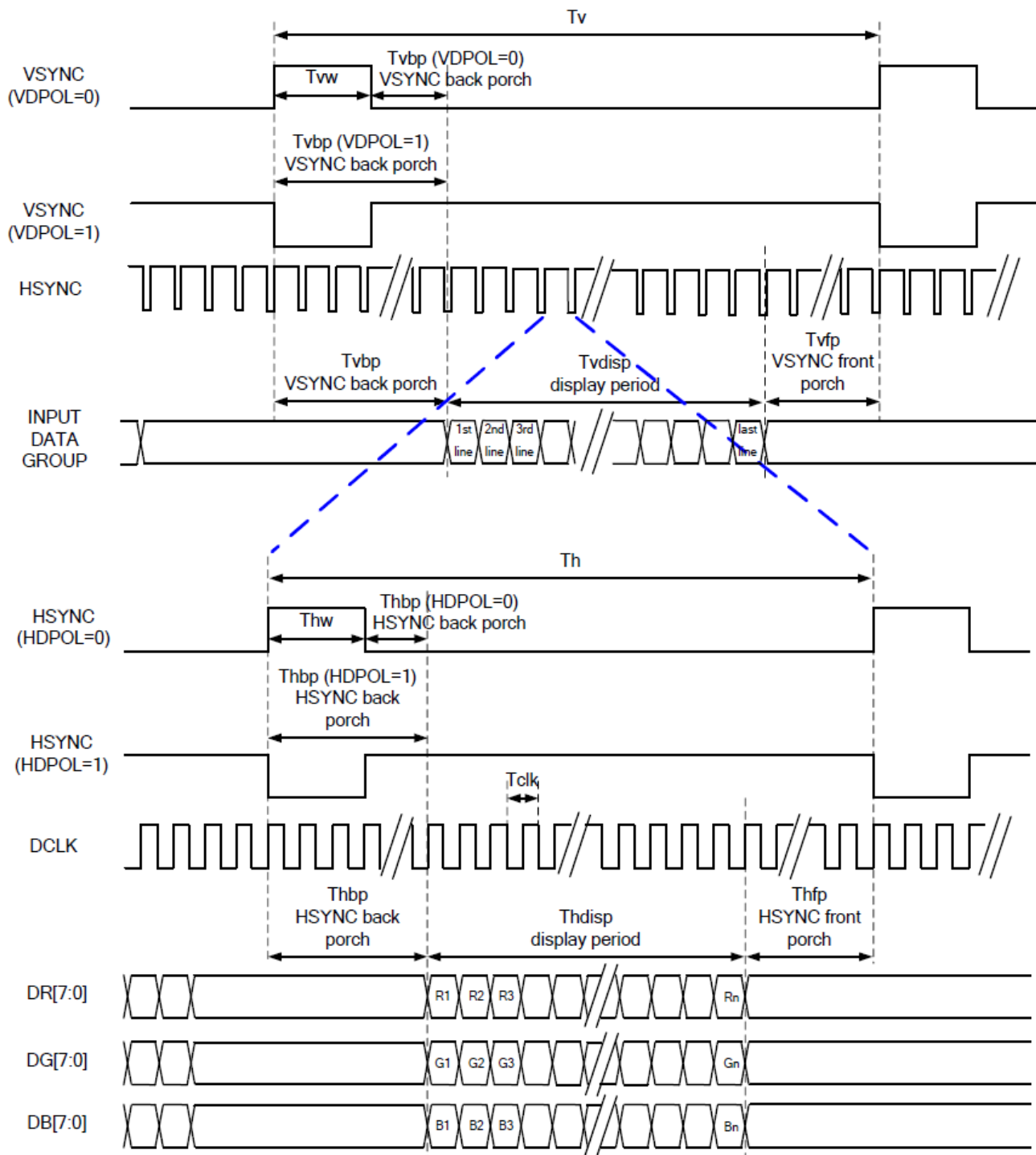
Parallel 24-bit RGB Input Timing (PVDD=VDD=VDDI= 3.3V, AGND= 0V, TA=25°C)

480RGB X 272 Resolution Timing Table							
Item		Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency		Fclk	8	9	12	MHz	
DCLK Period		Tclk	83	111	125	ns	
HSYNC	Period Time	Th	485	531	598	DCLK	
	Display Period	Thdisp		480		DCLK	
	Back Porch	Thbp	3	43	43	DCLK	By H_BLANKING setting
	Front Porch	Thfp	2	8	75	DCLK	
	Pulse Width	Thw	2	4	43	DCLK	
VSYNC	Period Time	Tv	276	292	321	HSYNC	
	Display Period	Tvdisp		272		HSYNC	
	Back Porch	Tvbp	2	12	12	HSYNC	By V_BLANKING setting
	Front Porch	Tvfp	2	8	37	HSYNC	
	Pulse Width	Tvw	2	4	12	HSYNC	

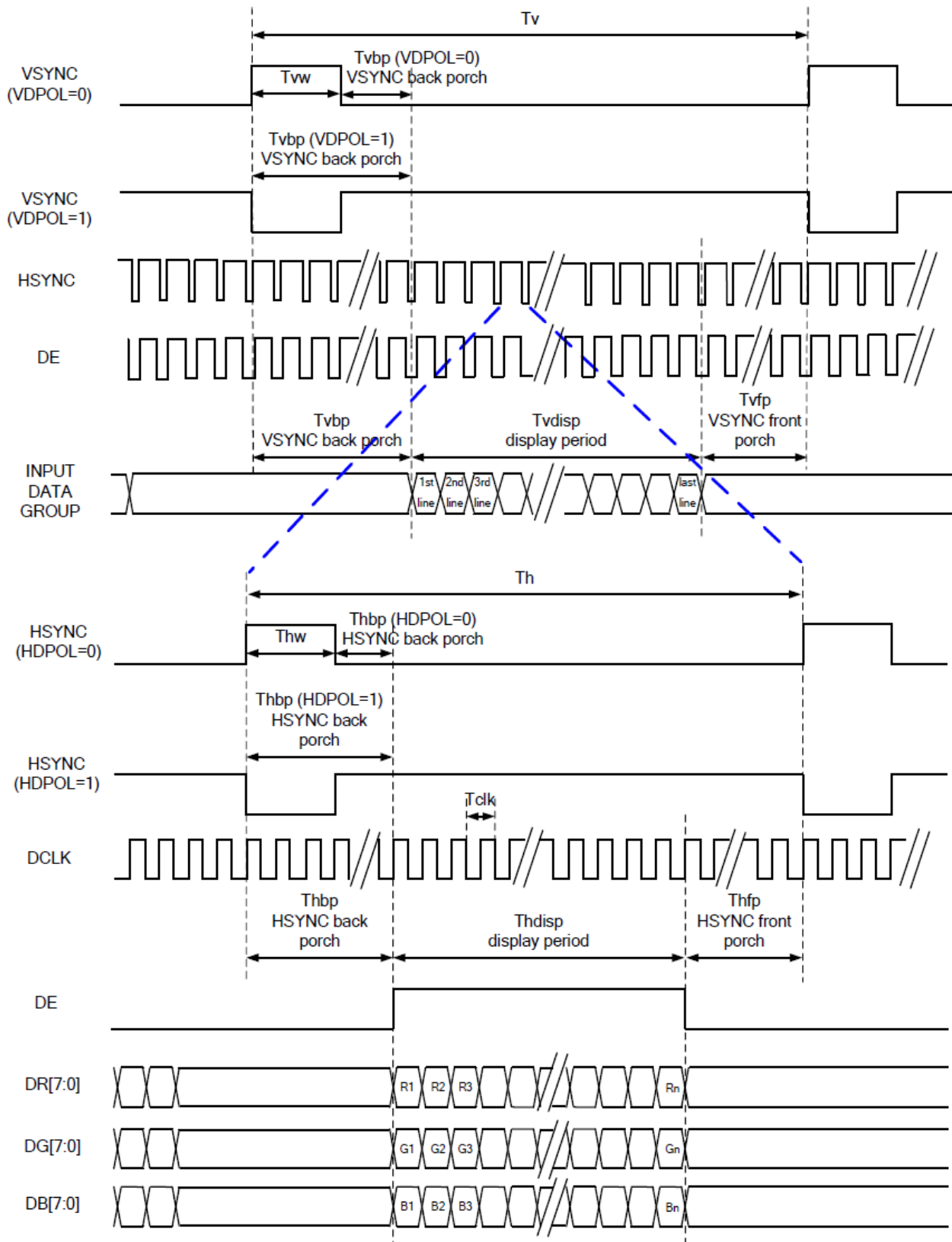
Note: It is necessary to keep Tvbp =12 and Thbp =43 in sync mode. DE mode is unnecessary to keep it.

2.5 Interface Timing Chart

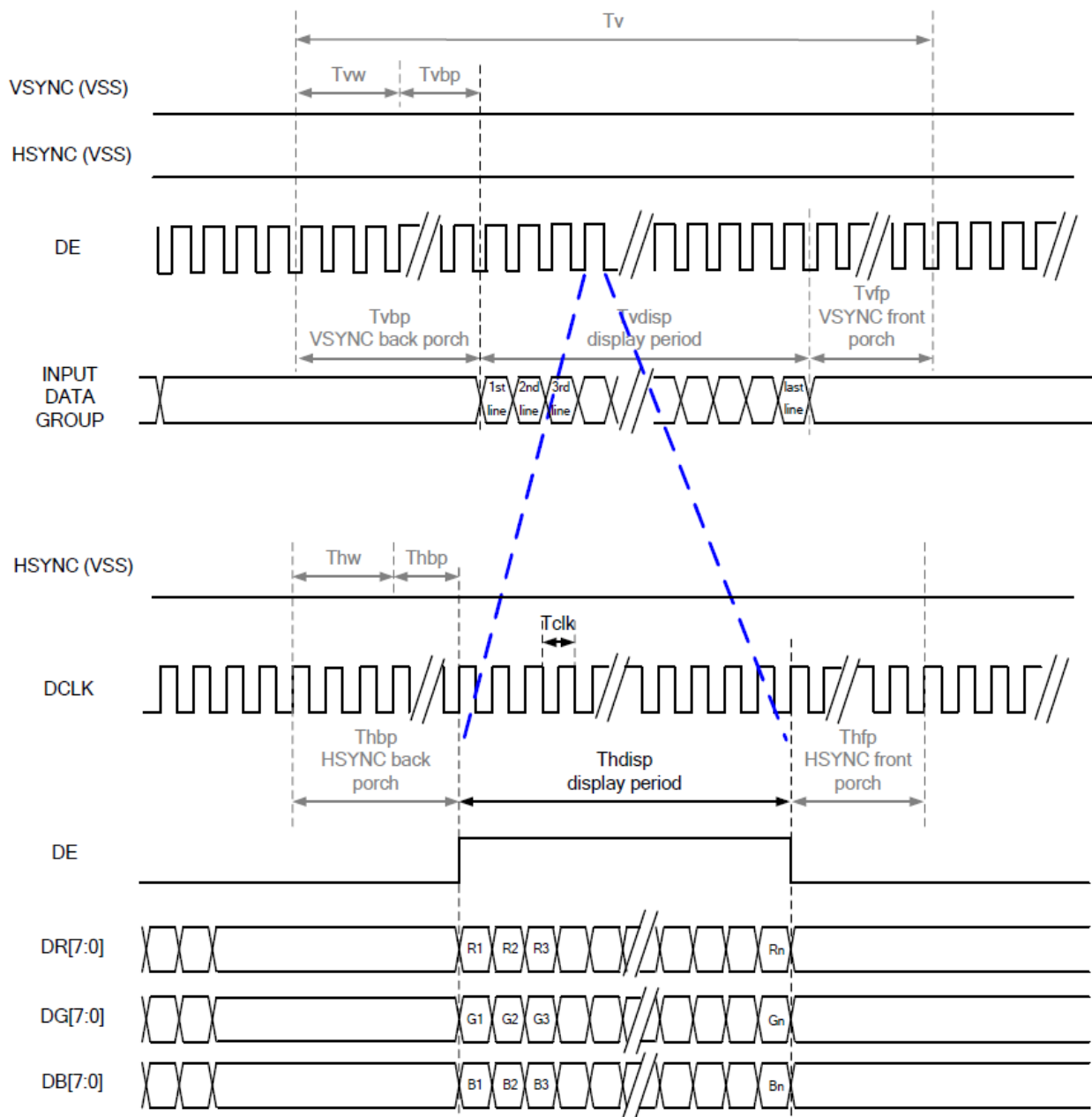
2.5.1 SYNC Mode



2.5.2 SYNC-DE Mode



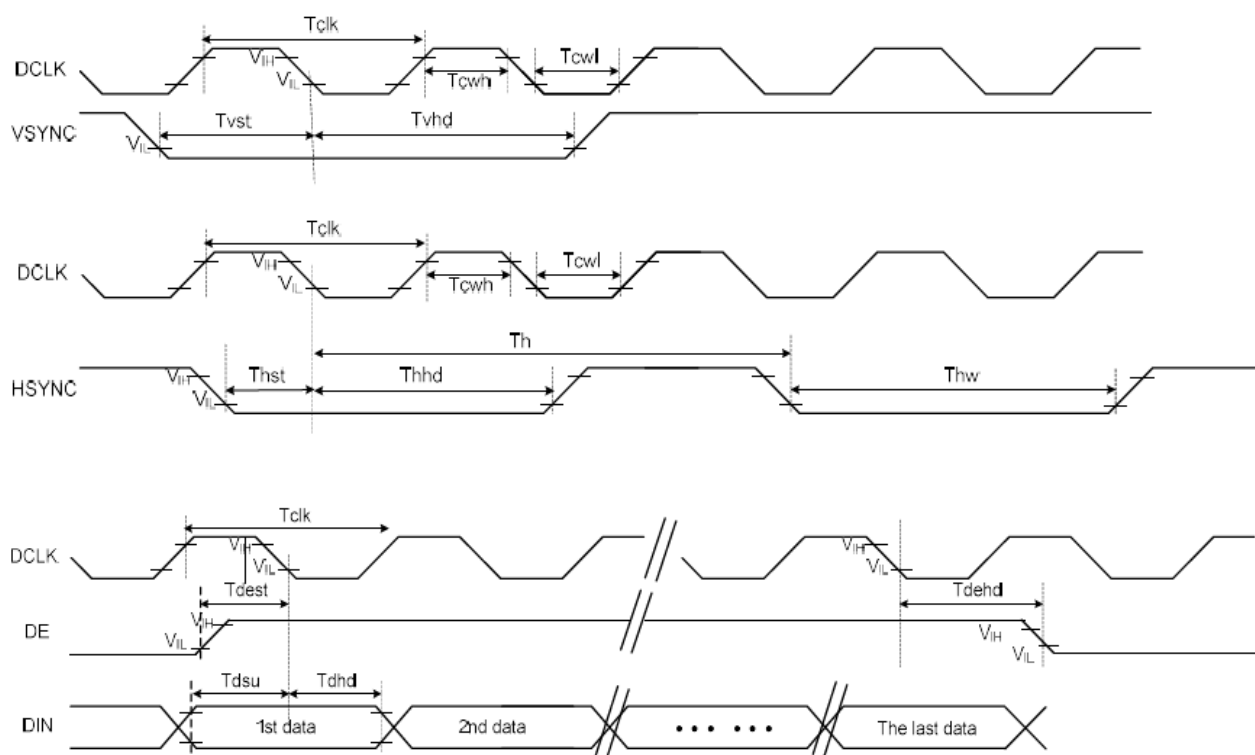
2.5.3 DE Mode



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.

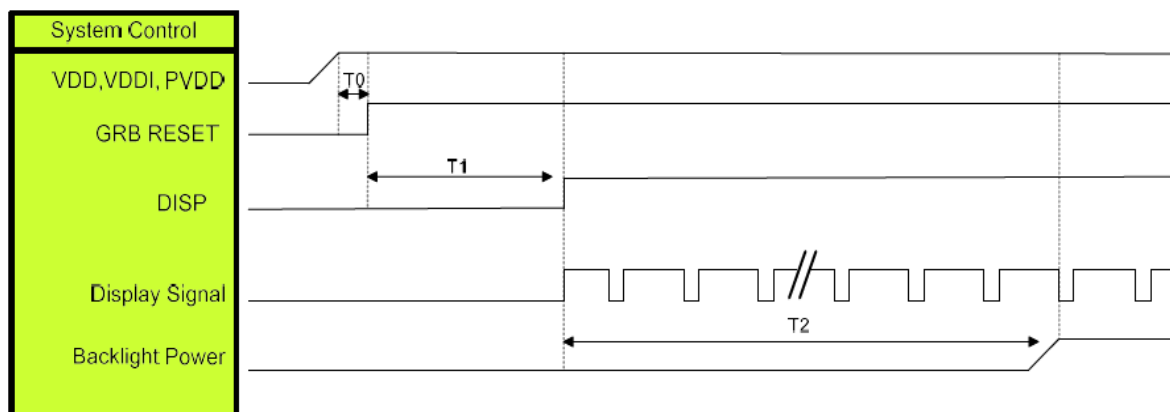
2.6 System Bus Timing for RGB Interface



Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
CLK Pulse Duty	T_{cw}	40	50	60	%	
HSYNC Width	T_{hw}	2	-	-	DCLK	
HSYNC Period	T_h	55	60	65	us	
VSYNC Setup Time	T_{vst}	12	-	-	ns	
VSYNC Hold Time	T_{vhd}	12	-	-	ns	
HSYNC Setup Time	T_{hst}	12	-	-	ns	
HSYNC Hold Time	T_{hhd}	12	-	-	ns	
Data Setup Time	T_{dsu}	12	-	-	ns	
Data Hold Time	T_{dhd}	12	-	-	ns	
DE Setup Time	T_{dest}	12	-	-	ns	
DE Hold Time	T_{dehd}	12	-	-	ns	

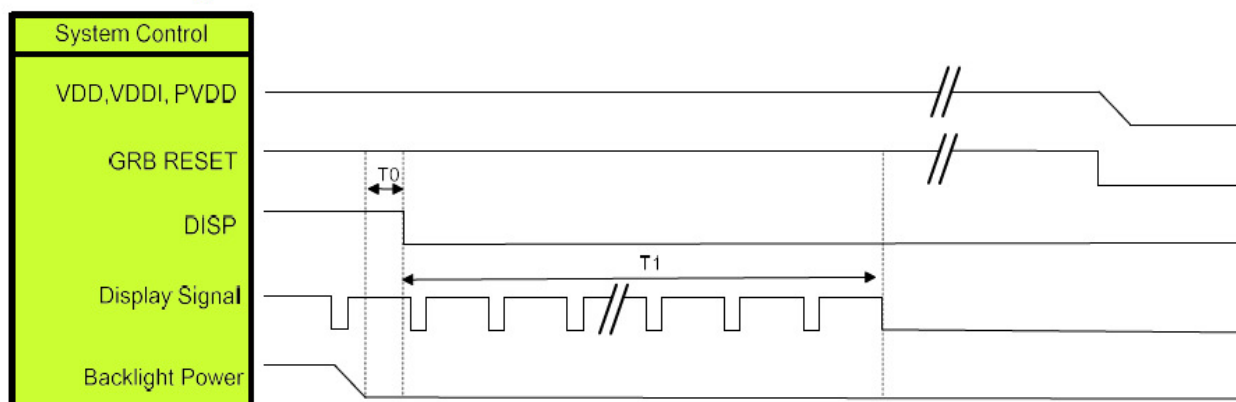
2.7 Power Sequence Timing

Power On Sequence



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

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

3. OPTICAL CHARACTERISTICS

3.1 Characteristics

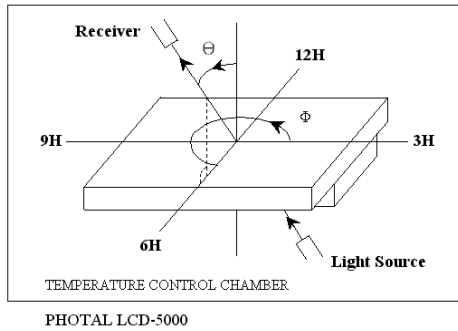
Electrical and Optical Characteristics

No.	Item			symbol / temp.		Min.	Typ.	Max.	Unit	Note
1	Response Time			Tr+Tf	25	-	30	40	ms	2
2	Viewing Angle	Hor.	Cr > 10	θ_{2+}	$\Phi = 0^{\circ}$	70	80	-	degree	3
				θ_{2-}	$\Phi = 180^{\circ}$	70	80	-		
		Ver.		θ_{1+}	$\Phi = 270^{\circ}$	70	80	-		
				θ_{1-}	$\Phi = 90^{\circ}$	70	80	-		
3	Contrast Ratio			Cr	25	640	800	-	-	4
4	Red x-code			Rx		0.557	0.607	0.657		5
	Red y-code			Ry		0.295	0.345	0.395		
	Green x-code			Gx		0.329	0.379	0.429		
	Green y-code			Gy		0.522	0.572	0.622		
	Blue x-code			Bx		0.097	0.147	0.197		
	Blue y-code			By		0.050	0.100	0.150		
	White x-code			Wx		0.270	0.320	0.370		
	White y-code			Wy		0.285	0.335	0.385		
	Brightness			Y		450	530	-	cd/m ²	
5	Brightness Uniformity				25	80	-	-	%	6

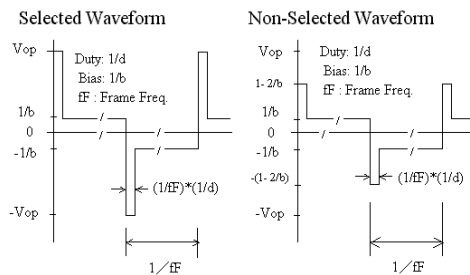
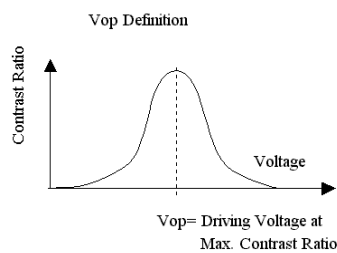
3.2 Definition of optical characteristics

Measurement condition :

Transmissive and Transflective type

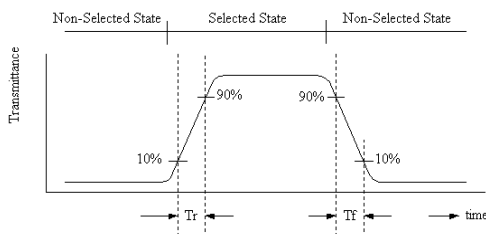


[Note 1] Definition of LCD Driving Vop and Waveform :

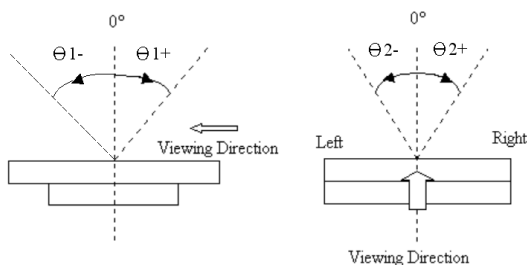


[Note 2] Definition of Response Time

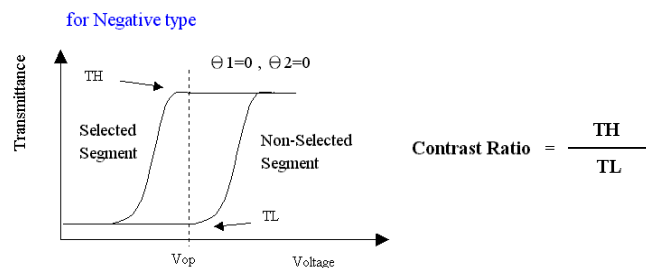
for Negative type :



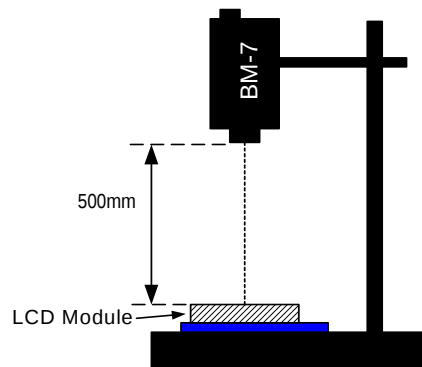
[Note 3] Definition of Viewing Angle :



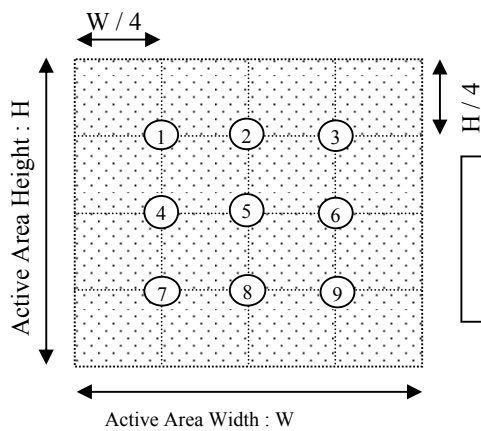
[Note 4] Definition of Contrast Ratio :



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

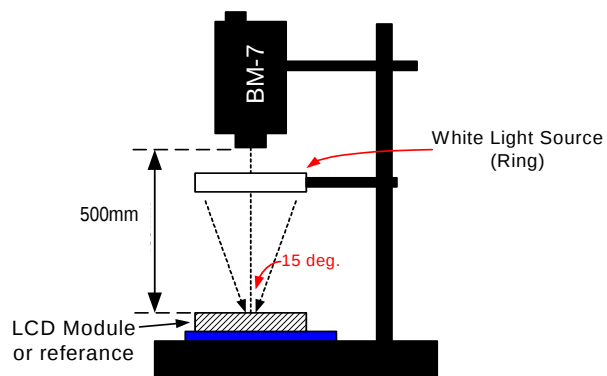


[Note 6] Definition of Brightness Uniformity



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

[Note 7] Definition of Measurement of Reflectance



4. RELIABILITY :

Item No	Items	Condition	Note
1	High temperature operating	70 , 200 hours	1
2	Low temperature operating	-20 , 200 hours	1
3	High temperature storage	80 , 200 hours	1
4	Low temperature storage	-30 , 200 hours	1
5	High temperature & humidity storage	60 , 90%RH, 100 hours	2
6	Thermal Shock storage	-30 , 30min.<=> 80 , 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	

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
 - Contrast > 1/2 initial value
 - Function : work normally

5. PRODUCT HANDLING AND APPLICATION

□ PRECAUTION FOR HANDLING LCM

- 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.
- 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 :350 ±15 .
Soldering time : 3~4sec./ terminals.
Type of solder : Eutectic solder(rosin flux filled).

□ PRECAUTION IN USE OF LCM

- Do not contact or scratch the front surface and the contact pads of a LCM 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 LCM panels away from direct sunlight , also avoid them in high-temperature & high humidity environment for a long period.
- Do not drive LCM by DC voltage.
- Do not expose LCM to organic solvent.
- Liquid in LCM is hazardous substance. In case a contact with liquid crystal material is occurred, 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 AND USE OF 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)
- Never use the LCD , LCM under 45 Hz , the liquid crystal will decomposition and cause permently damage on display !!

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

- For the application in medical care, safety and hazardous products or systems, an authorization from URT is required. URT will not responsible for any damage or loss which 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.

6. DATE CODE OF PRODUCTS

- Date code will be shown on each product :

- **YY MM DD - XXXX**

| | | |
Year Month Day - Serial no.

- Example: 121108 - 0003 ==> 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 of
Month

1 — 5

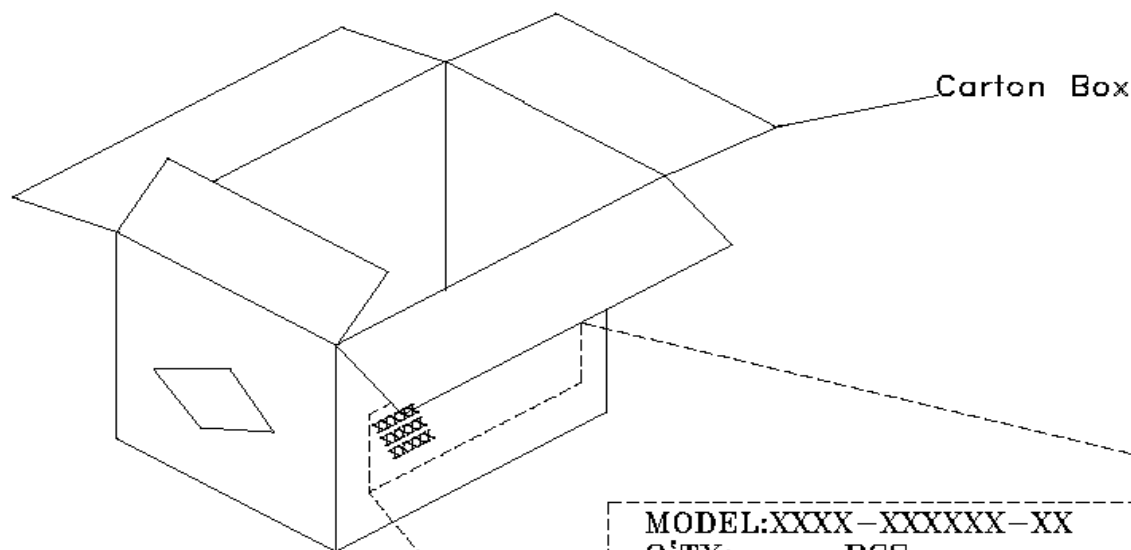
Month

01—January
02—February
| |
12—December

Year

00-2000
01-2001

Lable of carton:



MODEL:XXXX-XXXXXX-XX

Q'TY: PCS

LOT NO.

N.W.	KGS.
1	100
2	200
3	300
4	400
5	500
6	600
7	700
8	800
9	900
10	1000
11	1100
12	1200
13	1300
14	1400
15	1500
16	1600
17	1700
18	1800
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80	8000
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87	8700
88	8800
89	8900
90	9000
91	9100
92	9200
93	9300
94	9400
95	9500
96	9600
97	9700
98	9800
99	9900
100	10000

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 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 (SAME AS MIL-STD-105E) , LEVEL 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

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 PRODUCT: WHICH UNDER WARRANTY PERIOD AND BELONG TO THE RESPONSIBILITY OF U.R.T.

8.2. CHECKING CONDITION

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

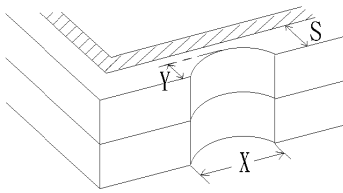
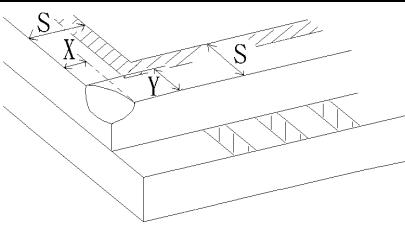
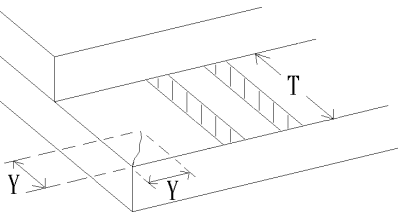
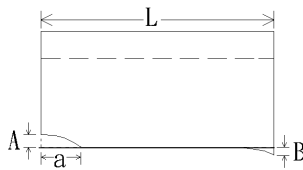
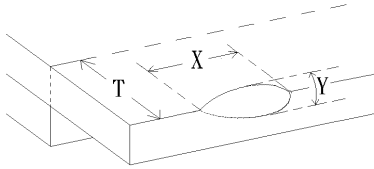
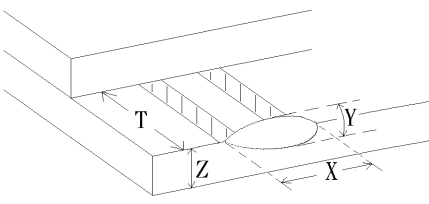
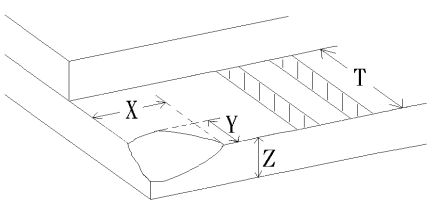
8.2.2. CHECKER SHALL SEE OVER 300±25 mm. WITH BARE EYES FAR FROM SAMPLE AND USING 2 PCS. OF 20W FLUORESCENT LAMP.

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 AREAREJECTED	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 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, CHARACTERREJECTED	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

NO.	CLASS	ITEM	JUDGEMENT																				
8.4.1	MINOR	BLACK AND WHITE SPOT FOREIGN MATERIEL DUST IN THE CELL BLEMISH SCRATCH	(A) ROUND TYPE: unit : mm.<table><tr><th>DIAMETER (mm.)</th><th>ACCEPTABLE Q'TY</th></tr><tr><td>Φ 0.10</td><td>DISREGARD</td></tr><tr><td>0.10 < Φ 0.25</td><td>3(Distance>5mm)</td></tr><tr><td>0.25 < Φ</td><td>0</td></tr></table> NOTE: Φ=(LENGTH+WIDTH)/2 (B) LINEAR TYPE: unit : mm.<table><tr><th>LENGTH</th><th>WIDTH</th><th>ACCEPTABLE Q'TY</th></tr><tr><td>-----</td><td>W 0.03</td><td>DISREGARD</td></tr><tr><td>L 5.0</td><td>0.03 < W 0.07</td><td>3(Distance>5mm)</td></tr><tr><td>-----</td><td>0.07 < W</td><td>FOLLOW ROUND TYPE</td></tr></table>	DIAMETER (mm.)	ACCEPTABLE Q'TY	Φ 0.10	DISREGARD	0.10 < Φ 0.25	3(Distance>5mm)	0.25 < Φ	0	LENGTH	WIDTH	ACCEPTABLE Q'TY	-----	W 0.03	DISREGARD	L 5.0	0.03 < W 0.07	3(Distance>5mm)	-----	0.07 < W	FOLLOW ROUND TYPE
DIAMETER (mm.)	ACCEPTABLE Q'TY																						
Φ 0.10	DISREGARD																						
0.10 < Φ 0.25	3(Distance>5mm)																						
0.25 < Φ	0																						
LENGTH	WIDTH	ACCEPTABLE Q'TY																					
-----	W 0.03	DISREGARD																					
L 5.0	0.03 < W 0.07	3(Distance>5mm)																					
-----	0.07 < W	FOLLOW ROUND TYPE																					
8.4.2	MINOR	BUBBLE IN POLARIZER DENT ON POLARIZER	unit : mm.<table><tr><th>DIAMETER</th><th>ACCEPTABLE Q'TY</th></tr><tr><td>Φ 0.2</td><td>DISREGARD</td></tr><tr><td>0.2 < Φ 0.5</td><td>2 (Distance>5mm)</td></tr><tr><td>0.5 < Φ</td><td>0</td></tr></table>	DIAMETER	ACCEPTABLE Q'TY	Φ 0.2	DISREGARD	0.2 < Φ 0.5	2 (Distance>5mm)	0.5 < Φ	0												
DIAMETER	ACCEPTABLE Q'TY																						
Φ 0.2	DISREGARD																						
0.2 < Φ 0.5	2 (Distance>5mm)																						
0.5 < Φ	0																						
8.4.3	MINOR	Dot Defect	<table><tr><th>Items</th><th>ACC. Q'TY</th></tr><tr><td>Bright dot</td><td>N 4 (Distance>5mm)</td></tr><tr><td>Dark dot</td><td>N 4 (Distance>5mm)</td></tr></table> Pixel Define : Pixel R G B Dot Dot Dot Note 1: The definition of dot: The size of a defective dot over 1/2 of whole dot is regarded as one defective dot. Note 2: Bright dot: Dots appear bright and unchanged in size in which LCD panel is displaying under black pattern. Note 3: Dark dot: Dots appear dark and unchanged in size in which LCD panel is displaying under pure red, green ,blue pattern.	Items	ACC. Q'TY	Bright dot	N 4 (Distance>5mm)	Dark dot	N 4 (Distance>5mm)														
Items	ACC. Q'TY																						
Bright dot	N 4 (Distance>5mm)																						
Dark dot	N 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	 $a > L/3$, $A > 1.5\text{mm}$. Reject - 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