

IIDWay Technology Co. Ltd

PRODUCT SPECIFICATIONS

For Customer: _____

: APPROVAL FOR SPECIFICATION

Customer Model No. _____

: APPROVAL FOR SAMPLE

Module No.: GZ70102-DIT043TWQ

Date : 2024-8-27

Table of Contents

No.	Item	Page
1	Cover Sheet(Table of Contents)	P1
2	Revision Record	P2
3	General Specifications	P3
4	Outline Drawing	P4
5	Absolute Maximum Ratings	P5
6	Electrical Specifications	P6-P9
7	Optical Characteristics	P10-P13
8	Reliability Test Items and Criteria	P14
9	Precautions for Use of LCD Modules	P15-P16

For Customer's Acceptance:

Approved By	Comment

PREPARED	CHECKED	VERIFIED BY QA DEPT	VERIFIED BY R&D DEPT
DJF			

IIDWay Technology Co. Ltd

3. General Specifications

GZ70102-DIT043TWQ is a TFT-LCD module. It is composed of a TFT-LCD panel, driver IC, FPC, a back light unit. The 4.3" display area contains 480 x 272 pixels and can display up to 16.7M colors. This product accords with RoHS environmental criterion.

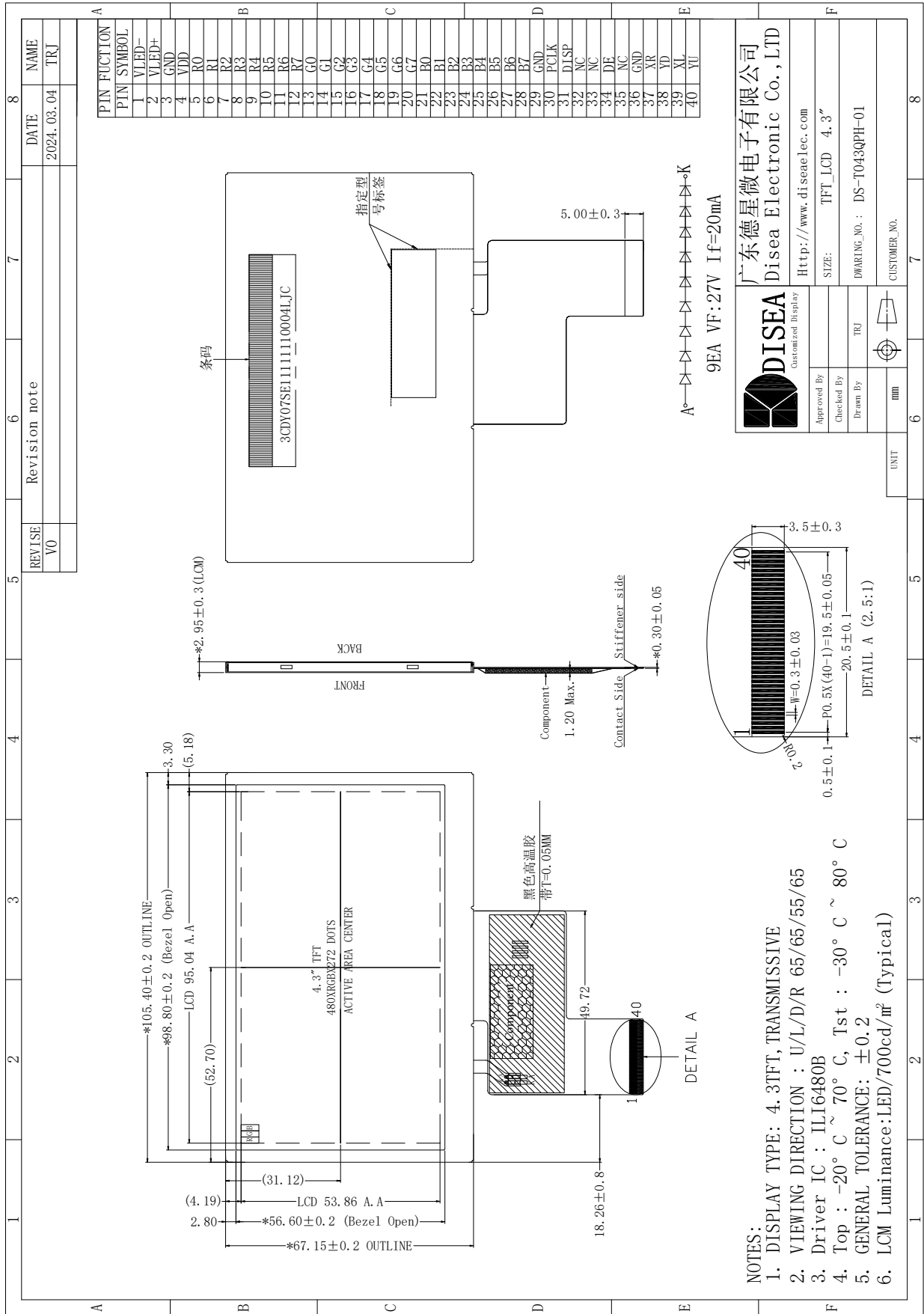
Item	Contents	Unit	Note
LCD Type	TFT	-	
Display color	16.7M	-	1
Viewing Direction	12	O'Clock	
Grey scale inversion	6	O'Clock	
Operating temperature	-20~+70	°C	
Storage temperature	-30~+80	°C	
Module size	Refer to outline drawing	mm	2
Active Area(W×H)	95.04X53.86	mm	
Number of Dots	480X272	dots	
Controller	ILI6480B	-	
Power Supply Voltage	3.3	V	
Outline Dimensions	Refer to outline drawing	-	
Backlight	9-LEDs	pcs	
Weight	---	g	
Interface	RGB	-	

Note 1: Color tune is slightly changed by temperature and driving voltage.

Note 2: Without FPC and Solder.

IIDWay Technology Co. Ltd

4.Outline Drawing



IIDWay Technology Co. Ltd

5. Absolute Maximum Ratings(Ta=25°C)

5.1 Electrical Absolute Maximum Ratings.(Vss=0V ,Ta=25°C)

Item	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	V _{DD}	-0.3	3.6	V	1, 2

Notes:

1. 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.

2. $V_{DD} > V_{SS}$ must be maintained.

5.2 Environmental Absolute Maximum Ratings.

Item	Storage		Operating		Note
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature	-30°C	80°C	-20°C	70°C	1,2
Humidity	-	-	-	-	3

1. The response time will become lower when operated at low temperature.

2. Background color changes slightly depending on ambient temperature.

The phenomenon is reversible.

3. $T_a \leq 40^\circ\text{C}$:85%RH MAX.

$T_a > 40^\circ\text{C}$:Absolute humidity must be lower than the humidity of 85%RH at 40 °C.

IIDWay Technology Co. Ltd

6. Electrical Specifications 6.1 Electrical characteristics(V_{SS}=0V ,T_a=25°C)

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Power supply	V _{DD}	T _a =25°C	2.7	3.3	3.6	V	
Input voltage	'H'	V _{IH}	-	0.7V _{DD}	-	V _{DD}	V
	'L'	V _{IL}	-	0	-	0.3V _{DD}	V

Note:

1:When an optimum contrast is obtained in transmissive mode.

2: Tested in 1×1 chessboard pattern.

6.2 LED backlight specification(V_{SS}=0V ,T_a=25°C)

Item	Symbol	Condition	Min	Typ	Max	Unit	Note
Supply voltage	V _f	I _f =20mA	24.3	27	28.8	V	1
Uniformity	Δ Bp	I _f =20mA	80	-	-	%	2
Life time	time	I _f =20mA	20K	-	-	hour	-

Note:

1: The "LED Life time" is defined as the module brightness decrease to 50% original brightness at T=25 °C and I_f=20mA.

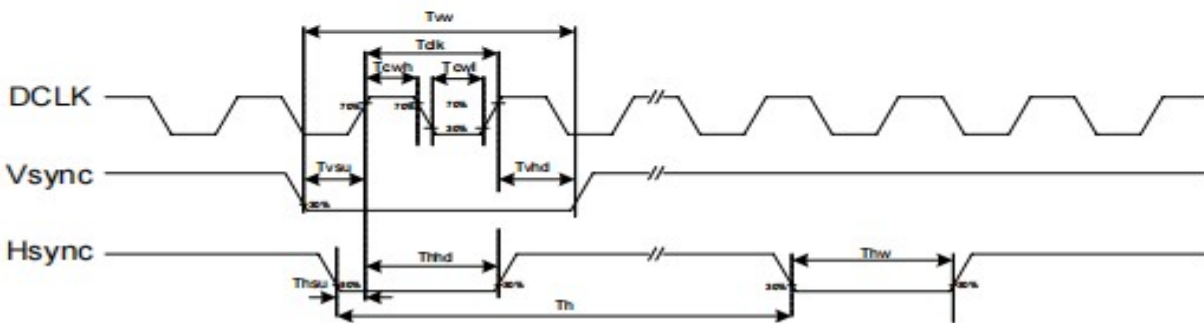
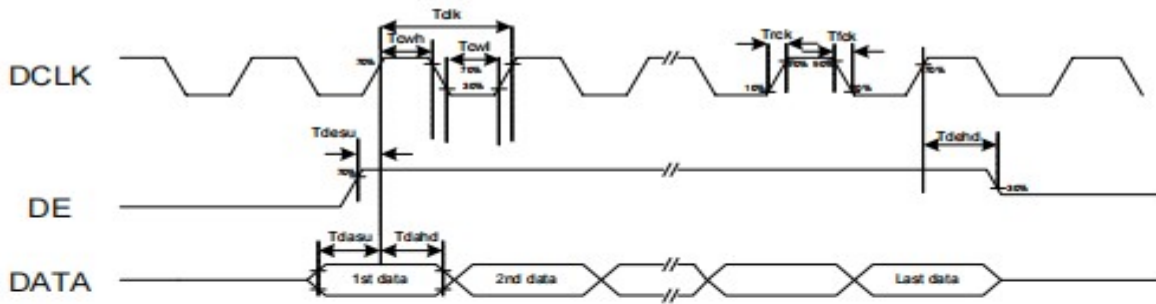
IIDWay Technology Co. Ltd

6.3 Interface signals

Pin No.	Symbol	I/O	Function
1	VLED-	P	LED back light(Cathode).
2	VLED+	P	LED back light(Anode).
3	GND	P	Ground.
4	VDD	P	Power supply.
5-12	R0~R7	I	Red data bus.
13-20	G0~G7	I	Green data bus.
21-28	B0~B7	I	Blue data bus.
29	GND	P	Ground.
30	PCLK	I	Data clock.
31	DISP	I	Standby mode select pin.
32	NC(HSYNC)	-	No connection.(Line sync input).
33	NC(VSYNC)	-	No connection.(Frame sync input).
34	DE	I	Data enable pin.
35	NC	-	No connection.
36	GND	P	Ground.
37	XR	O	Touch Panel Control pin.
38	YD	O	
39	XL	O	
40	YU	O	

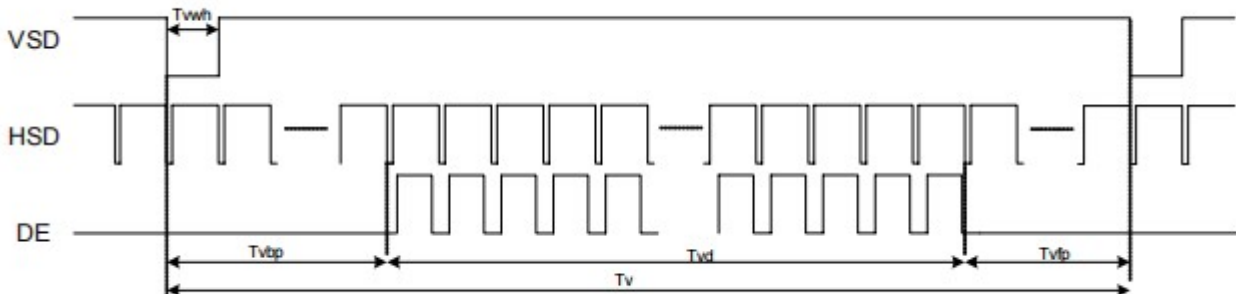
IIDWay Technology Co. Ltd

6.4.1 Timing Chart

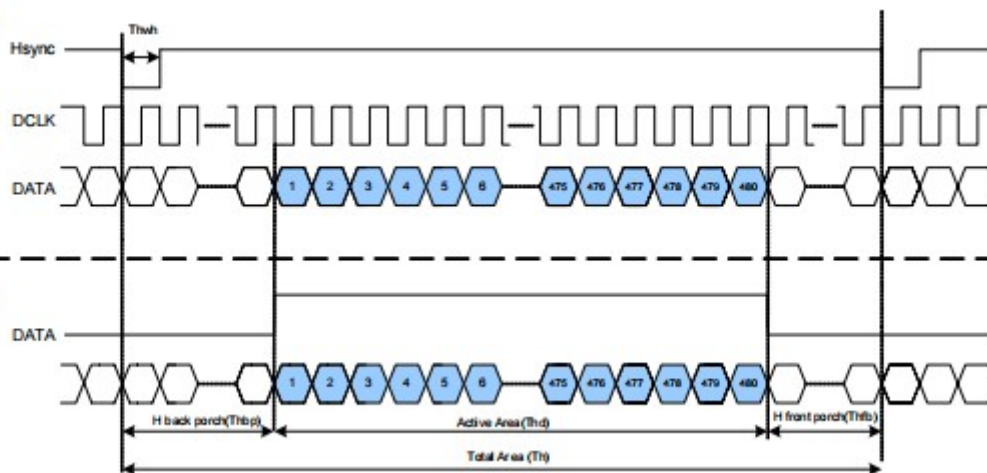


6.4.2 Data Input Format

Vertical input timing



(HV Mode)



(DE Mode)

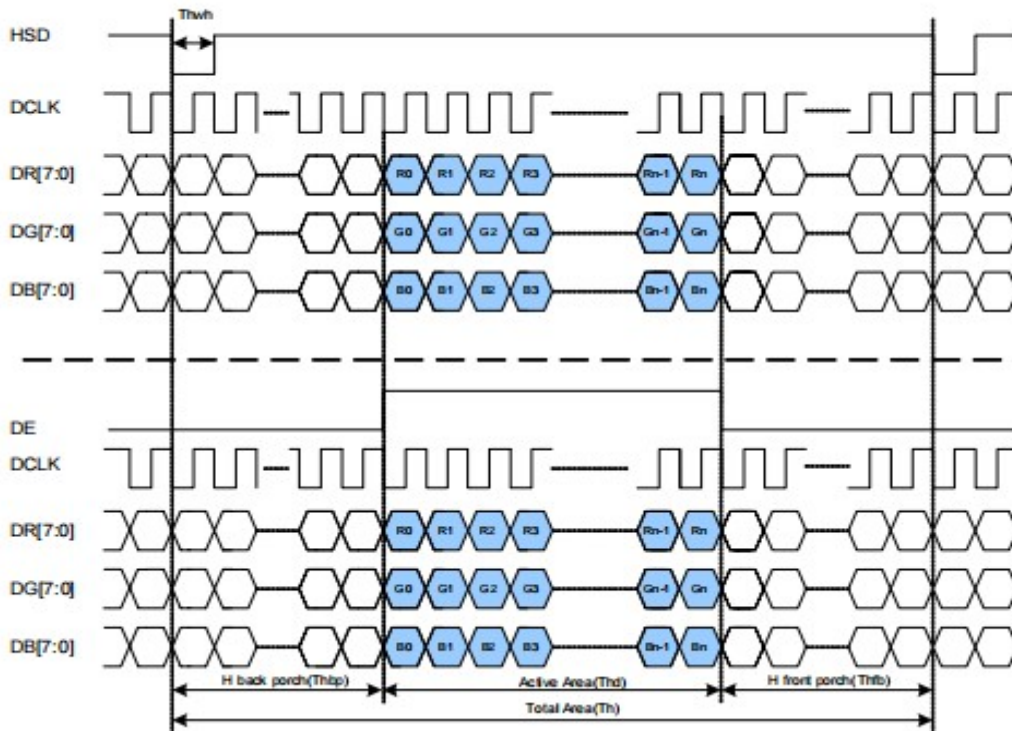


IIDWay Technology Co. Ltd

Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
DCLK frequency	Fclk	24	27	30	MHz	
DCLK cycle time	Tclk	83	110	200	ns	
DCLK pulse duty	Tcwh	40	50	60	%	
Time from HSD to source output	Thso	-	13	-	DCLK	
Time from HSD to gate output	Thgo	-	27	-	DCLK	
Time from HSD to gate output off	Thgz	-	3	-	DCLK	
Time from HSD to VCOM	Thvc	-	12	-	DCLK	

Parallel RGB Mode Data format

(HV Mode)



Parallel RGB input timign table

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	5	9	12	MHz
VSD period time	Tv	277	288	400	H
VSD display area	Tvd	272			H
VSD back porch	Tvb	3	8	31	H
VSD front porch	Tvfp	2	8	93	H
HSD period time	Th	520	525	800	DCLK
HSD display area	Thd	480			DCLK
HSD back porch	Thbp	36	40	255	DCLK
HSD front porch	Thfp	4	5	65	DCLK

IIDWay Technology Co. Ltd

7. Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note	
Brightness	Bp	$\theta=0^\circ$	-	700	-	Cd/m ²	1	
Uniformity	Δ Bp	$\Phi=0^\circ$	80	-	-	%	1,2	
Viewing Angle	3:00	Cr \geq 10	-	65	-	Deg	3	
	6:00		-	55	-			
	9:00		-	65	-			
	12:00		-	65	-			
Contrast Ratio	Cr	$\theta=0^\circ$ $\Phi=0^\circ$	400	500	-	-	4	
Response Time	T _r		-	10	20	ms	5	
	T _f	-	15	30	ms			
Color of CIE Coordinate	W	x	$\theta=0^\circ$ $\Phi=0^\circ$	Typ-0 .05	TBD	Typ+0. 05	-	1,6
		y					-	
	R	x					-	
		y					-	
	G	x					-	
		y					-	
	B	x					-	
		y					-	

Note: The parameter is slightly changed by temperature, driving voltage and materiel

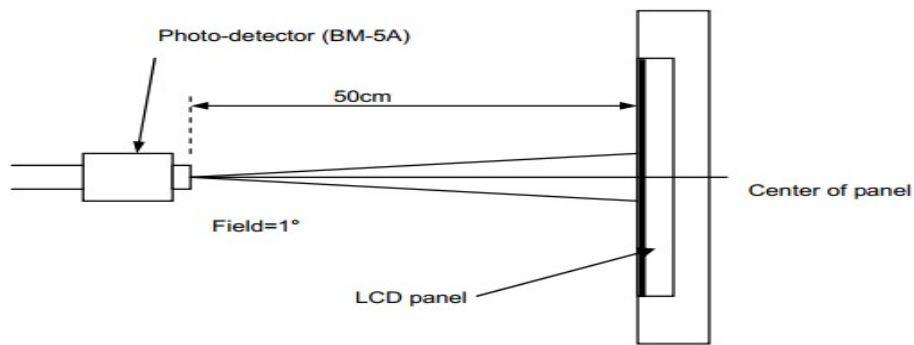
Note 1: The data are measured after LEDs are turned on for 15 minutes. LCM displays full white. The brightness is the average value of 9 measured spots. Measurement equipment BM-7 (Φ 5mm)

Measuring condition:

- Measuring surroundings: Dark room.
- Measuring temperature: Ta=25°C.
- Adjust operating voltage to get optimum contrast at the center of the display.

Measured value at the center point of LCD panel after more than 15 minutes while backlight turning on.

IIDWay Technology Co. Ltd

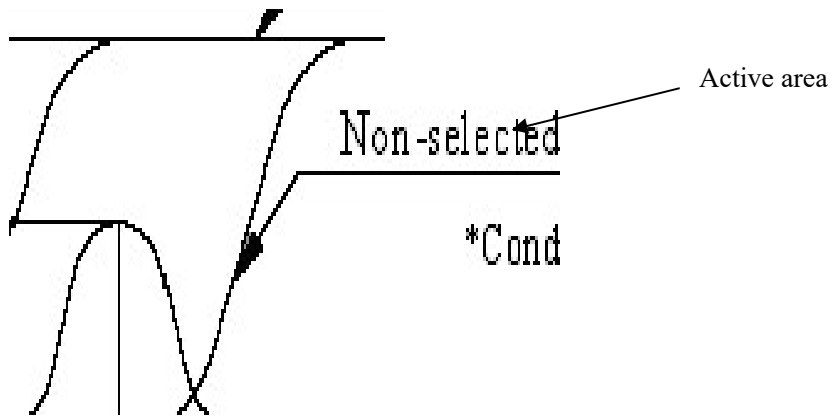


Note 2: The luminance uniformity is calculated by using following formula.

$$\Delta B_p = B_p (\text{Min.}) / B_p (\text{Max.}) \times 100 (\%)$$

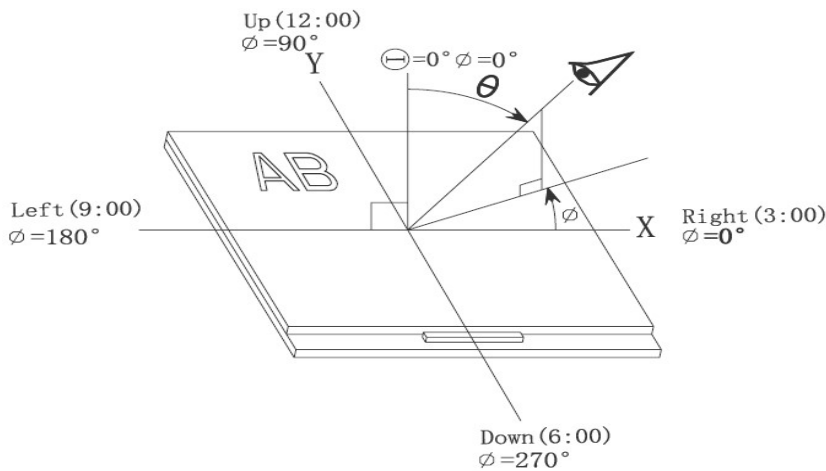
$B_p (\text{Max.})$ = Maximum brightness in 5 measured spots

$B_p (\text{Min.})$ = Minimum brightness in 5 measured spots.



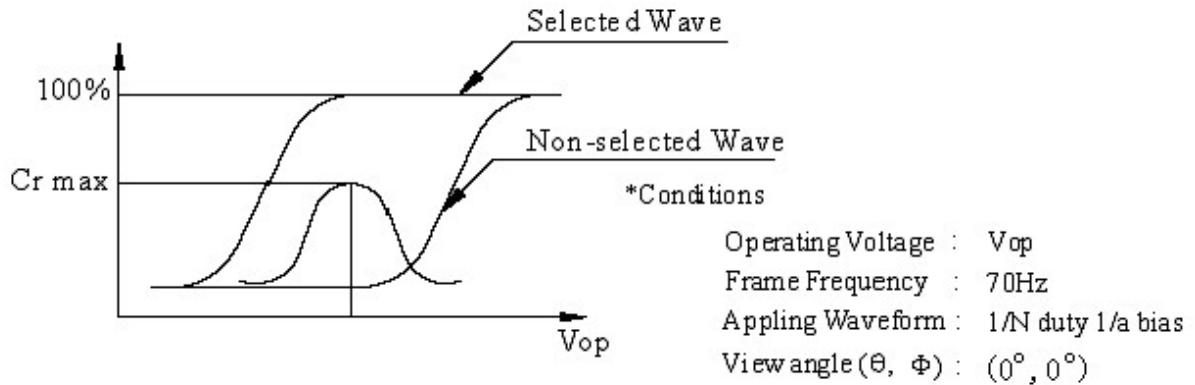
Note 3: The definition of viewing angle:

Refer to the graph below marked by θ and Φ .



Note 4: Definition of contrast ratio.

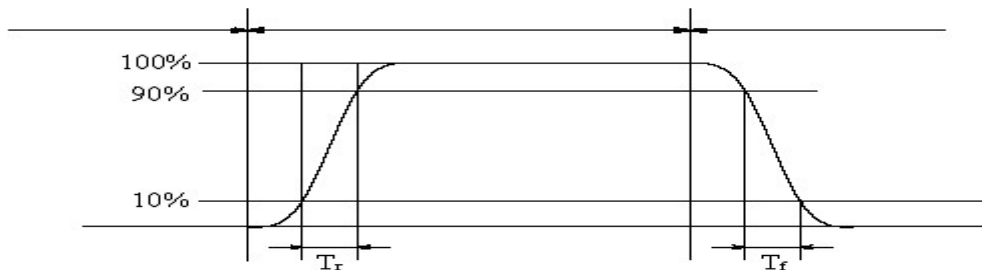
IIDWay Technology Co. Ltd



$$\text{Contrast ratio}(Cr) = \frac{\text{Brightness of selected dots}}{\text{Brightness of non-selected dots}}$$

Note 5: Definition of Response time.(Test LCD using DMS501):

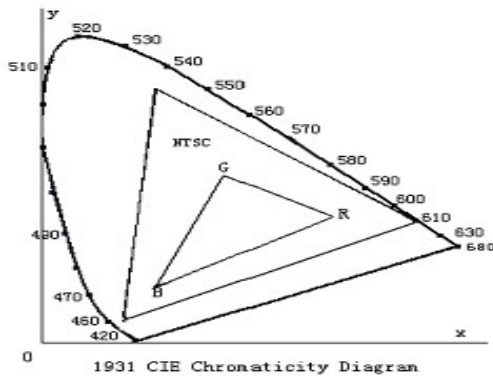
The output signals of photo detector are measured when the input signals are changed from “black” to “white”(falling time) and from “white” to “black”(rising time), respectively. The response time is defined as the time interval between the 10% and 90% of amplitudes.Refer to figure as below.



The definition of response time

Note 6: Definition of Color of CIE Coordinate and NTSC Ratio.

Color gamut:

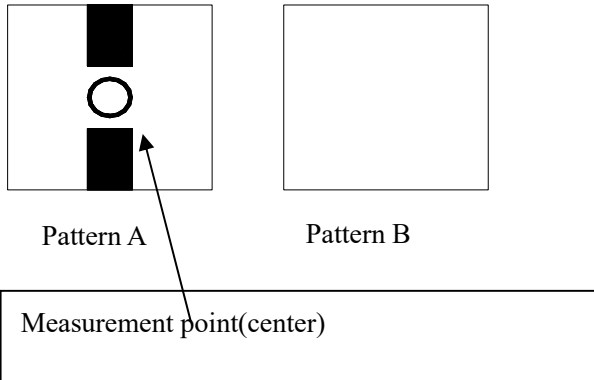


$$S = \frac{\text{area of RGB triangle}}{\text{area of NTSC triangle}} \times 100\%$$

IIDWay Technology Co. Ltd

Note 7: Definition of cross talk.

*Cross talk ratio(%)=|pattern A Brightness-pattern B Brightness|/pattern A Brightness*100.*



Electric volume value=3F+/-3Hex

IIDWay Technology Co. Ltd

8. Reliability Test Items and Criteria

No	Test Item	Test condition	Criterion
1	High Temperature Storage	80°C±2°C 96H Restore 2H at 25°C Power off	1.After testing, cosmetic and electrical defects should not happen. 2. Total current consumption should not be more than twice of initial value.
2	Low Temperature Storage	-30°C±2°C 96H Restore 2H at 25°C Power off	
3	High Temperature Operation	70°C±2°C 96H Restore 2H at 25°C Power on	
4	Low Temperature Operation	-20°C±2°C 96H Restore 4H at 25°C Power on	
5	High Temperature/Humidity Operation	60°C±2°C 90%RH 96H Power on	
6	Temperature Cycle	-30°C —————>80°C 30min 5min 30min after 5 cycle, Restore 2H at 25°C Power off	

Note: Operation: Supply 3.3V for logic system.

The inspection terms after reliability test, as below

ITEM	Inspection
Contrast	CR>50%
IDD	IDD<200%
Brightness	Brightness>60%
Color Tone	Color Tone+/-0,05

IIDWay Technology Co. Ltd

9. Precautions for Use of LCD Modules

9.1 Handling Precautions

9.1.1 *The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.*

9.1.2 *If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.*

9.1.3 *Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.*

9.1.4 *The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.*

9.1.5 *If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:*

— Isopropyl alcohol — Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

— Water — Ketone — Aromatic solvents

9.1.6 *Do not attempt to disassemble the LCD Module.*

9.1.7 *If the logic circuit power is off, do not apply the input signals.*

9.1.8 *To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.*

a. *Be sure to ground the body when handling the LCD Modules.*

b. *Tools required for assembly, such as soldering irons, must be properly ground.*

c. *To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.*

d. *The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.*

IIDWay Technology Co. Ltd

9.2 Storage precautions

9.2.1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

9.2.2 The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:

Temperature : $0^{\circ}\text{C} \sim 40^{\circ}\text{C}$

Relatively humidity: $\leq 80\%$

9.2.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.

9.3 The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.

END
