Winstar Display Co., LTD
華凌光電股份有限公司
WEB: http://www.winstar.com.tw E-mail: winstar@winstar.com.tw

SPECIFICATION

CUSTOMER : _____

MODULE NO.: WF57BTIBCDAN0#010

APPROVED BY: **(FOR CUSTOMER USE ONLY)**	**PCB VERSION:** **DATA:**

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
			葉虹蘭
ISSUED DATE: 2015/02/02			

TFT Display Inspection Specification: http://www.winstar.com.tw/service.php

Represented by:
first FC components
FIRST Components s.r.l.
www.first-components.com
technical@first-components.com
+39 0332 1888005

Winstar Display Co., LTD 華凌光電股份有限公司	MODLE NO：
RECORDS OF REVISION	**DOC. FIRST ISSUE**

VERSION	DATE	REVISED PAGE NO.	**SUMMARY**
0	2015/02/02		First issue

first FC components

Contents

1.Module Classification Information

2.Summary

3.General Specification

4.Absolute Maximum Ratings

5.Electrical Characteristics

6.DC Characteristics

7.Interface Timing Characteristics

8.Optical Characteristics

9.Interface

10.Block Diagram

11.Reliability

12.Contour Drawing

13.Initial Code For Reference

first FC components

1.Module Classification Information

W	F	57	B	T	I	B	C	D	A	N	0	#010
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬

①	Brand：WINSTAR DISPLAY CORPORATION		
②	Display Type：F→TFT Type, J→Custom TFT		
③	Display Size：5.7” TFT		
④	Model serials no.		
⑤	Backlight Type：	F→CCFL, White S→LED, High Light White	T→LED, White
⑥	LCD Polarize Type/ Temperature range/ Gray Scale Inversion Direction	C→Transmissive, N. T, 6:00 ; I→Transmissive, W. T, 6:00 F→Transmissive, N.T,12:00 ; L→Transmissive, W.T,12:00 N→Transmissive, Super W.T, 6:00 Q→Transmissive, Super W.T, 12:00 X→Transmissive, W.T, VA TFT V→Transmissive, Super W.T, VA TFT R→Transmissive, Super W.T, O-TFT Z→Transmissive, W.T, O-TFT A→Transmissive, N.T, IPS TFT Y→Transmissive, W.T, IPS TFT	
⑦	A：TFT LCD B：TFT+FR+CONTROL BOARD C：TFT+FR+A/D BOARD D：TFT+FR+A/D BOARD+CONTROL BOARD E：TFT+FR+POWER BOARD F：TFT+CONTROL BOARD	G：TFT+FR H：TFT+D/V BOARD I：TFT+FR+D/V BOARD J：TFT+POWER BD	

⑧	Solution:						
	A: 128160	B:320234	C:320240	D:480234	E:480272	F: 640480	G: 800480
	H:1024600	I:320480	J:240320	K:800600	L:240400	M :1024768	P :1280800
⑨	D: Digital L：LVDS						
⑩	Interface： N：without control board A：8Bit B：16Bit						
⑪	TS：N：Without TS T：resistive touch panel C：capacitive touch panel (G-F-F) G：capacitive touch panel(G-G)						
⑫	Version						
⑬	Special Code	#:Fit in with ROHS directive regulations 01：Sales code 0：Version Conformal coating on the component side					

2.Summary

This technical specification applies to 5.7’ color TFT-LCD panel. The 5.7’ color TFT-LCD panel is designed for camcorder, digital camera application and other electronic products which require high quality flat panel displays. This module follows RoHS.

first FC components

3.General Specifications

Item	Dimension	Unit
Size	5.7	inch
Dot Matrix	320 x RGBx240(TFT)	dots
Module dimension	160.0 x 109.00 x 11.5	mm
Active area	115.2 x 86.4	mm
Dot pitch	0.12 x 0.36	mm
LCD type	TFT, Normally White, Transmissive	
View Direction	12 o'clock	
Gray Scale Inversion Direction	6 o'clock	
Backlight Type	LED ,Normally White	
Controller IC	SSD1963	
Interface	Digital 8080 family MPU	
With /Without TP	Without TP	
Surface	No Anti-Glare	

*Color tone slight changed by temperature and driving voltage.

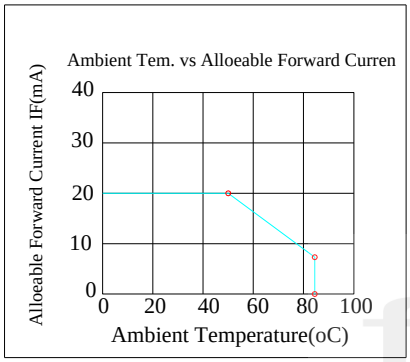
first components

4.Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	-20	—	+70	℃
Storage Temperature	TST	-30	—	+80	℃

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above

1. Temp. ≦60℃, 90% RH MAX. Temp.＞60℃, Absolute humidity shall be less than 90% RH at 60℃



first FC components

5.Electrical Characteristics

5.1. Operating conditions:

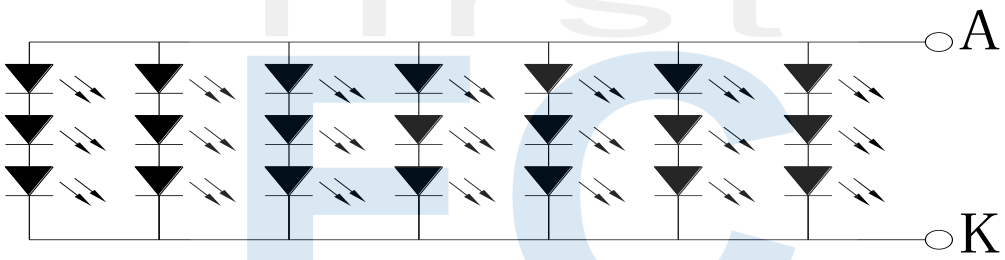
Item	Symbol	Condition	Min	Typ	Max	Unit	Remark
Supply Voltage For LCM	VDD	—	3.0	3.3	3.6	V	-
Supply Current For LCM	IDD	—	—	120	180	mA	Note1

Note 1 : This value is test for VDD=3.3V , Ta=25 ℃ only

5.2. LED driving conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current		-	140	-	mA	
Power Consumption		1260	-	1470	mW	
LED voltage	VBL+	9.0	-	10.5	V	Note 1
LED Life Time		-	50,000	-	Hr	Note 2,3,4

Note 1 : There are 1 Groups LED



Note 2 : Ta = 25 ℃

Note 3 : Brightness to be decreased to 50% of the initial value

Note 4 : The single LED lamp case

first components

6.DC CHARATERISTICS

Parameter	Symbol	Rating			Unit	Condition
		Min	Typ	Max		
Low level input voltage	V_{IL}	0	-	0.3VDD	V	
High level input voltage	V_{IH}	0.7VDD	-	VDD	V	

first FC components

7.Interface timing

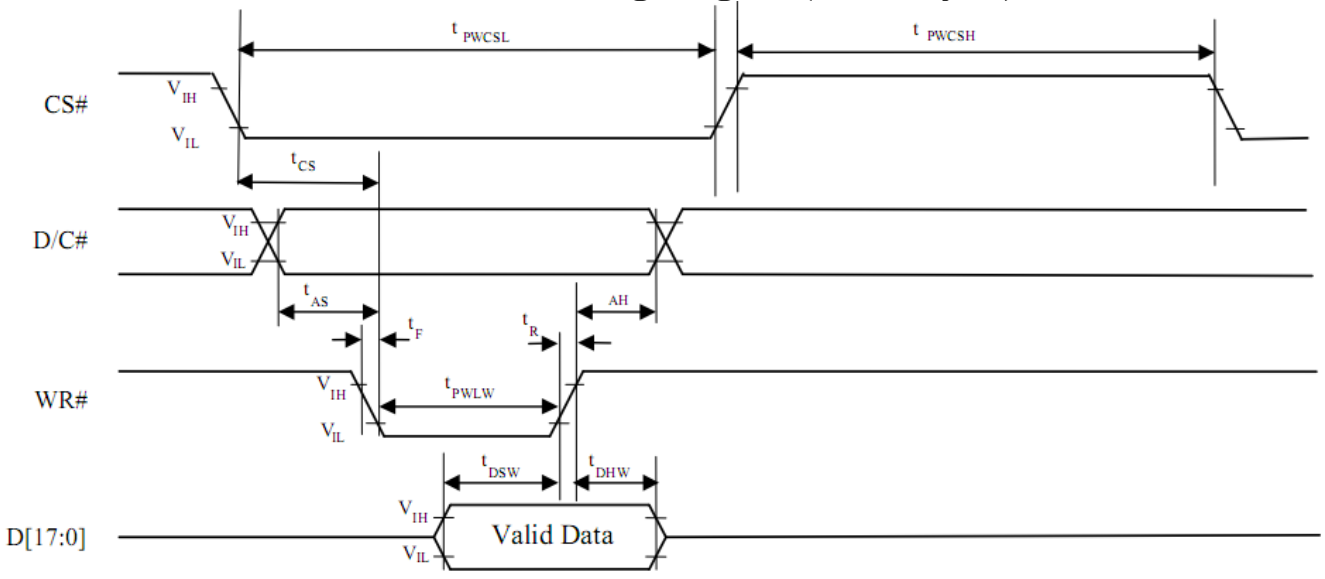
7.1. 8080 Mode

The 8080 mode MCU interface consist of CS#, D/C#, RD#, WR#, Data Bus. This interface use WR# to define a write cycle and RD# for read cycle. If the WR# goes low when the CS# signal is low, the data or command will be latched into the system at the rising edge of WR#. Similarly, the read cycle will start when RD# goes low and end at the rising edge of RD#.

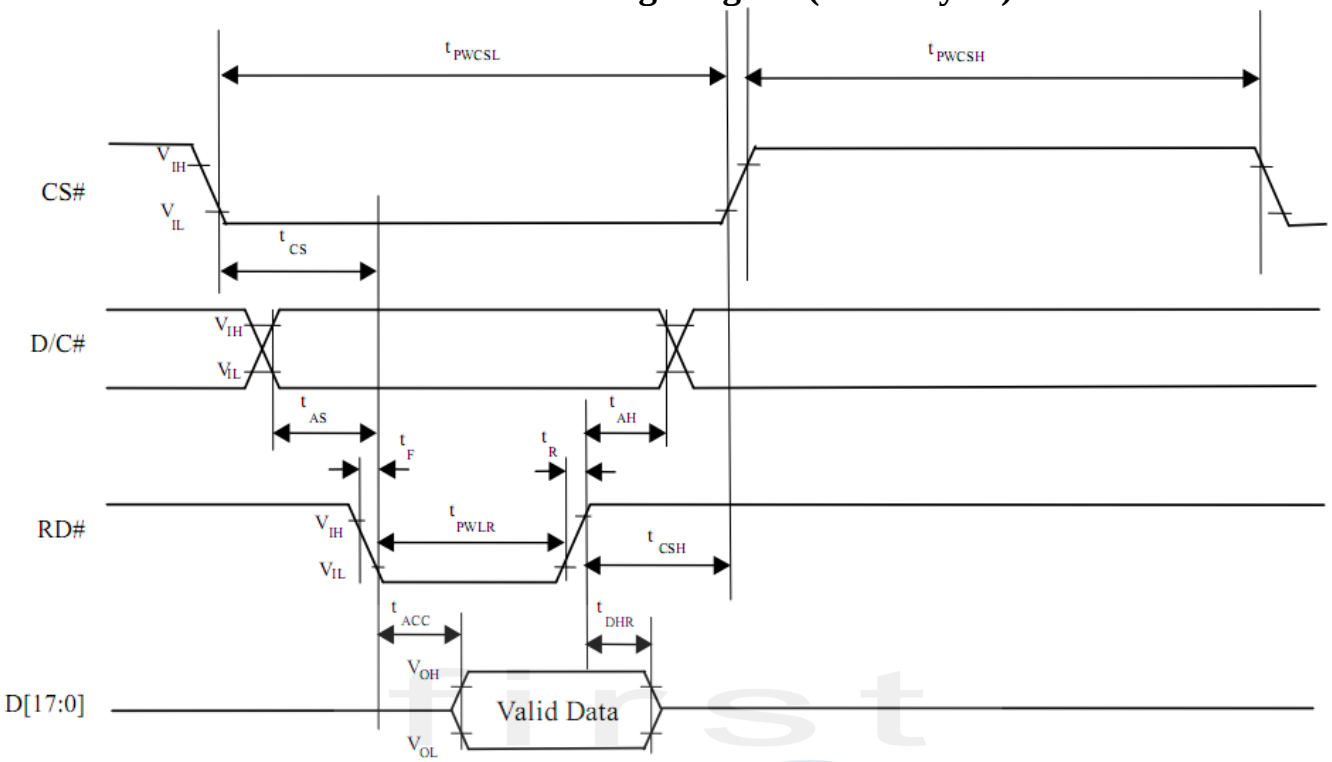
7.2. 8080 Mode Write Cycle

Symbol	Parameter	Min	Typ	Max	Unit
fMCLK	System Clock Frequency	1	-	110	MHz
tMCLK	System Clock Period	1/ fMCLK	-	-	ns
tPWCSH	Control Pulse High Width Write Read	13 30	1.5* tMCLK 3.5* tMCLK	-	ns
tPWCSL	Control Pulse Low Width Write (next write cycle) Write (next read cycle) Read	13 80 80	1.5* tMCLK 9* tMCLK 9* tMCLK	-	ns
tAS	Address Setup Time	1	-	-	ns
tAH	Address Hold Time	2	-	-	ns
tDSW	Write Data Setup Time	4			ns
tDHW	Write Data Hold Time	1	-	-	ns
tPWLW	Write Low Time	12			ns
tDHR	Read Data Hold Time	1	-	-	ns
tACC	Access Time	32			ns
tPWLR	Read Low Time	36	-	-	ns
tR	Rise Time	-		0.5	ns
tF	Fall Time	-	-	0.5	ns
tCS	Chip select setup time	2		-	ns
tCSH	Chip select hold time to read signal	3	-	-	ns

7.3. Parallel 8080-series Interface Timing Diagram(Write Cycle)



7.4. Parallel 8080-series Interface Timing Diagram(Read Cycle)



7.5. Pixel Data Format

Interface	Cycle	D[15]	D[14]	D[13]	D[12]	D[11]	D[10]	D[9]	D[8]	D[7]	D[6]	D[5]	D[4]	D[3]	D[2]	D[1]	D[0]
16 bits (565 format)	1st	R5	R4	R3	R2	R1	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1
16 bits	1st	R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0
	2nd	B7	B6	B5	B4	B3	B2	B1	B0	R7	R6	R5	R4	R3	R2	R1	R0
	3rd	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
8 bits	1st									R7	R6	R5	R4	R3	R2	R1	R0
	2nd									G7	G6	G5	G4	G3	G2	G1	G0
	3rd									B7	B6	B5	B4	B3	B2	B1	B0

first components

8.Optical Characteristics

Item		Symbol	Condition.	Min	Typ.	Max.	Unit	Remark
Response time		Tr	θ =0°、Φ=0°	-	15	30	.ms	Note 3,5
		Tf		-	35	50	.ms	
Contrast ratio		CR	At optimized viewing angle	150	250	-	-	Note 4,5
Color Chromaticity	White	Wx	θ =0°、Φ=0	0.282	0.312	0.342		Note 2,6,7
		Wy		0.319	0.349	0.379		
Viewing angle	Hor.	Θ R	CR≧10	60	70		Deg.	Note 1
		Θ L		60	70			
	Ver.	Φ T		40	50			
		Φ B		60	70			
Brightness		-	-	400	500		cd/㎡	Center of display

Ta=25±2℃, IL=140mA

Note 1: Definition of viewing angle range

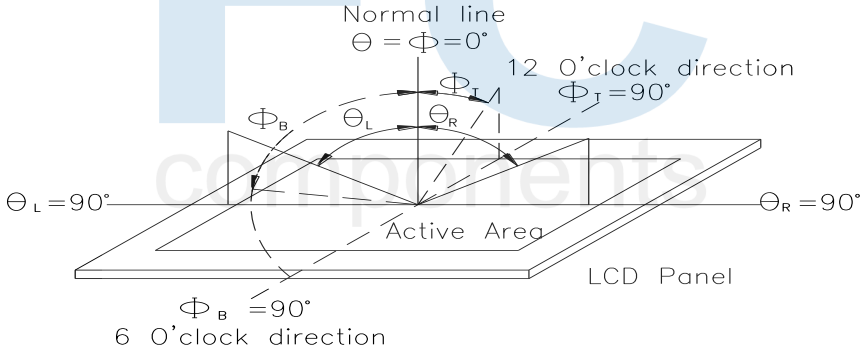


Fig. 8.1. Definition of viewing angle

Note 2: Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7 or BM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

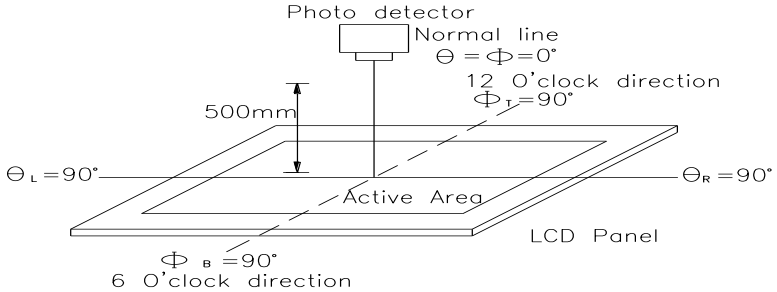
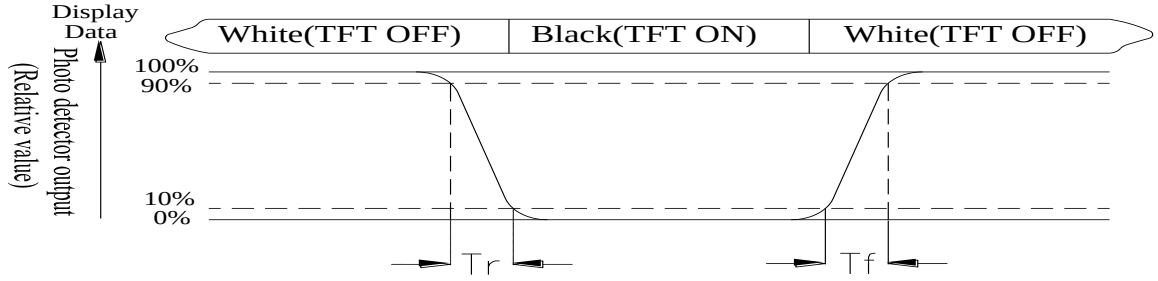


Fig. 8.2. Optical measurement system setup

Note 3: Definition of Response time:
The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time, Tr, is the time between photo detector output intensity changed from 90%to 10%. And fall time, Tf, is the time between photo detector output intensity changed from 10%to 90%



Note 4: Definition of contrast ratio:
The contrast ratio is defined as the following expression.

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: White Vi = Vi50 ± 1.5V
Black Vi = Vi50 ± 2.0V
“±” means that the analog input signal swings in phase with VCOM signal.
“±” means that the analog input signal swings out of phase with VCOM signal.
The 100% transmission is defined as the transmission of LCD panel when all the input terminals of module are electrically opened.

Note 6: Definition of color chromaticity (CIE 1931)
Color coordinates measured at the center point of LCD

Note 7: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

first components

9.Interface

9.1. LCM PIN Definition

Pin No.	Symbol	Description	Remark
1	GND	System ground pin of the IC. Connect to system ground.	
2	VDD	Power Supply : +3.3V	
3	NC	No connection	
4	D/C	Data/Command select	
5	WR	Write strobe signal	
6	RD	Read strobe signal	
7	DB0	Data bus	
8	DB1	Data bus	
9	DB2	Data bus	
10	DB3	Data bus	
11	DB4	Data bus	
12	DB5	Data bus	
13	DB6	Data bus	
14	DB7	Data bus	
15	CS	Chip select	
16	RST	Hardware reset	Note 1
17	NC	No connection	
18	RL	Left /right selection; Scan Direction; Default RL=H	Note 2,3
19	UD	Up/down selection; Scan Direction; Default UD=L	Note 2,3
20	NC	No connection	

Note 1: Global reset pin. Active low to enter reset state. Suggest to connect with an RC reset circuit for stability. Normally pull high.

Note 2: Selection of scanning mode

Setting of scan control input		Scanning direction
UD	LR	
GND	VDD	Up to down, left to right
VDD	GND	Down to up, right to left
GND	GND	Up to down, right to left
VDD	VDD	Down to up, left to right

Note3: Definition of scanning direction.Refer to the figure as below:



UD=L, LR=H



UD=L, LR=L



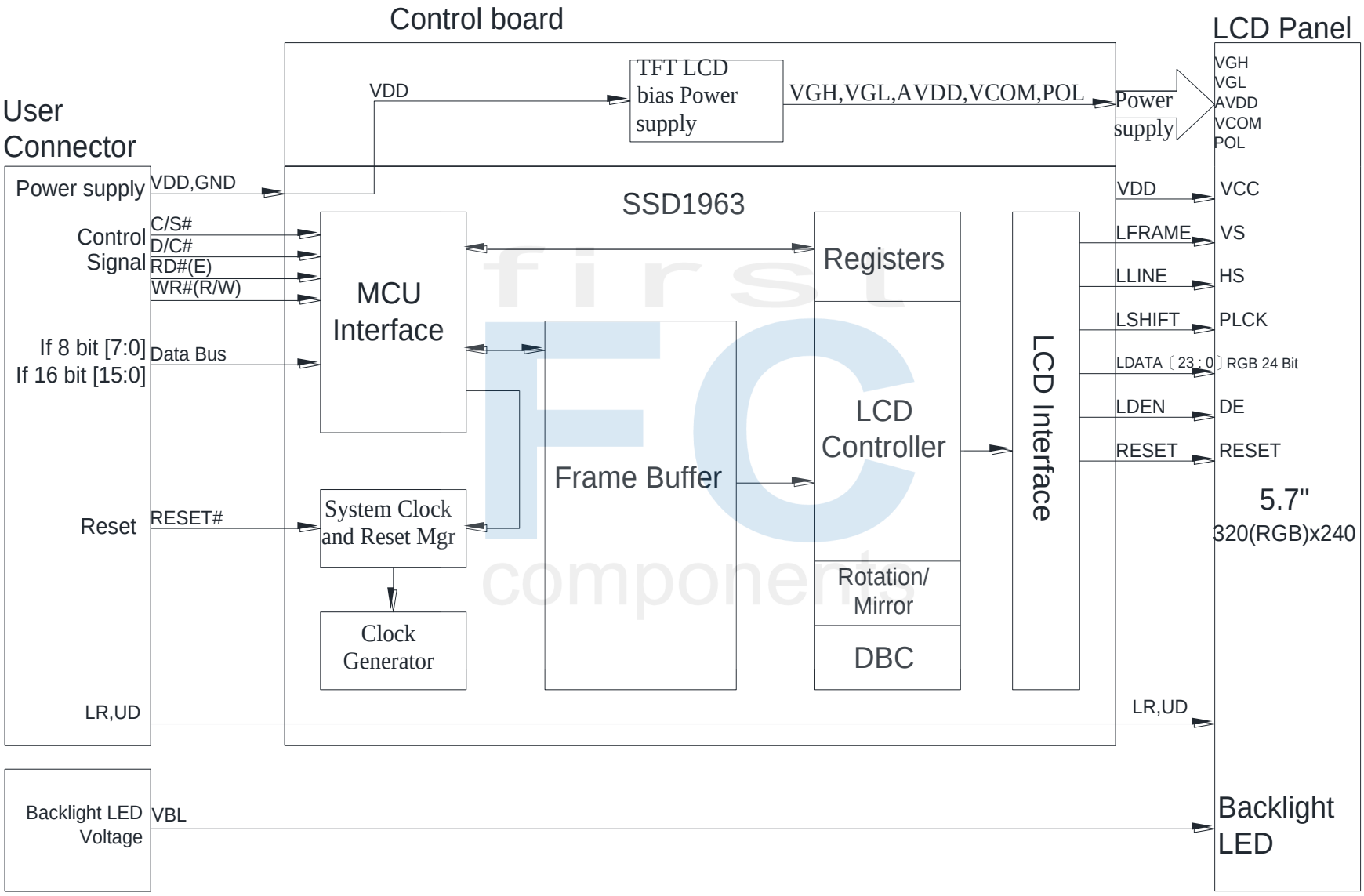
UD=H, LR=H



UD=H, LR=L

first
FC
components

10.Block Diagram



11.Reliability

Content of Reliability Test (Wide temperature, -20℃~70℃)

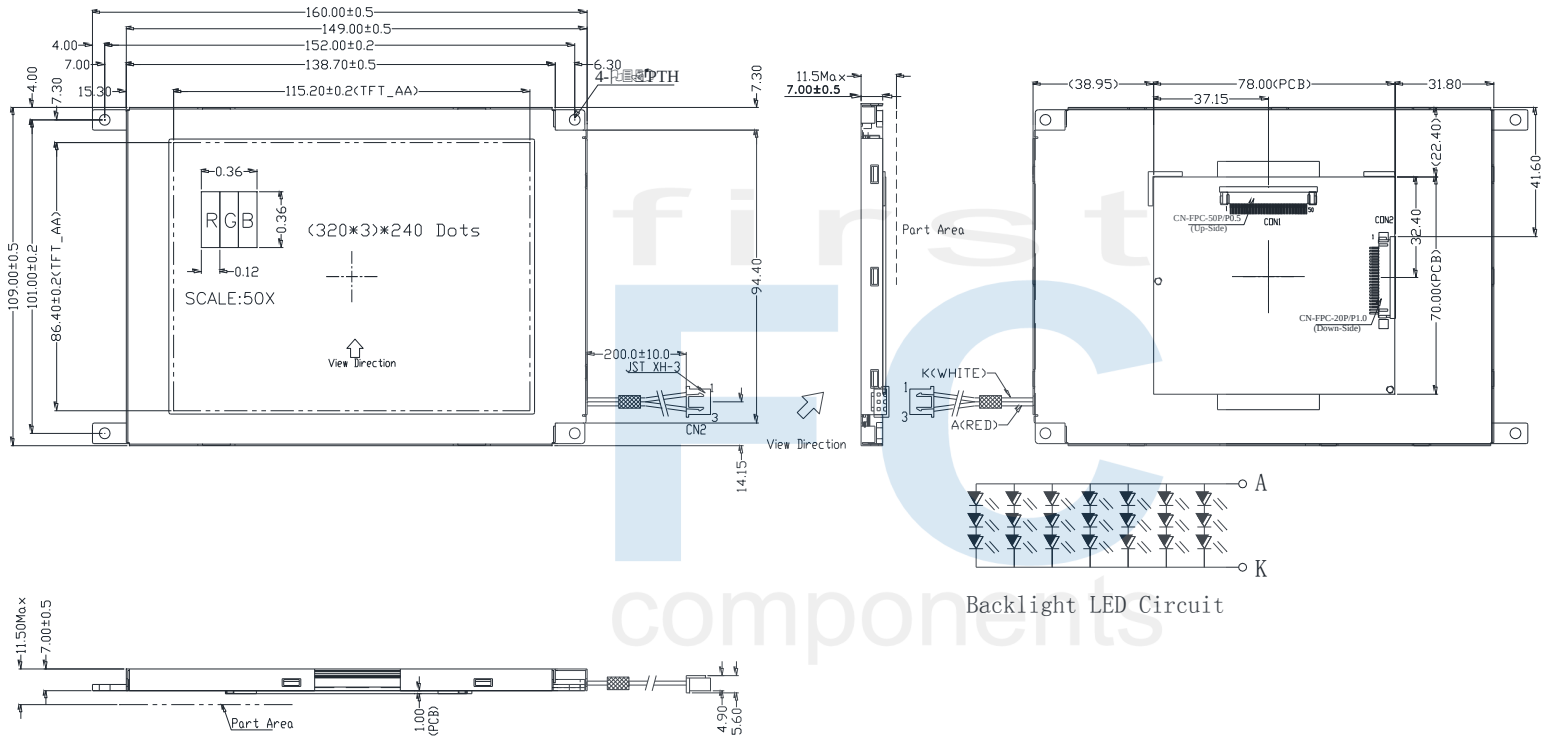
Environmental Test			
Test Item	**Content of Test**	**Test Condition**	**Note**
High Temperature storage	Endurance test applying the high storage temperature for a long time.	80℃ 200hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30℃ 200hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	70℃ 200hrs	——
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-20℃ 200hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 60℃,90%RH max For 96hrs under no-load condition excluding the polarizer, Then taking it out and drying it at normal temperature.	60℃,90%RH 96hrs	1,2
Thermal shock resistance	The sample should be allowed stand the following 10 cycles of operation -20℃ 25℃ 70℃ 30min 5min 30min 1 cycle	-20℃/70℃ 10 cycles	——
Vibration test	Endurance test applying the vibration during transportation and using.	Total fixed amplitude : 15mm Vibration Frequency : 10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes	3
Static electricity test	Endurance test applying the electric stress to the terminal.	VS=800V, RS=1.5kΩ CS=100pF 1 time	——

Note1: No dew condensation to be observed.

Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.

Note3: The packing have to including into the vibration testing.

12.Contour Drawing



CON2

PIN NO.	SYMBOL
1	GND
2	VCC
3	NC
4	D/C
5	WR
6	RD
7	DB0
8	DB1
9	DB2
10	DB3
11	DB4
12	DB5
13	DB6
14	DB7
15	CS
16	RST
17	NC
18	RL
19	UD
20	NC

The non-specified tolerance of dimension is ±0.3mm.

13.Initial Code For Reference

```
void Initial_SSD1963()
{

        Write_Command(0x01);
        Delay_ms(10);
        Write_Command(0xe0);
        Write_Parameter(0x01);
        Delay_ms(50);
        Write_Command(0xe0);
        Write_Parameter(0x03);
        Delay_ms(5);

        Write_Command(0xb0);
        Write_Parameter(0x0c);
        Write_Parameter(0x80);
        Write_Parameter(0x01);
        Write_Parameter(0x3f);
        Write_Parameter(0x00);
        Write_Parameter(0xef);
        Write_Parameter(0x00);

        Write_Command(0xf0);
        Write_Parameter(0x03);


        Write_Command(0xe2);
        Write_Parameter(0x1d);
        Write_Parameter(0x02);
        Write_Parameter(0x54);

        Write_Command(0xe6);
        Write_Parameter(0x01);
        Write_Parameter(0x40);
        Write_Parameter(0xff);

        Write_Command(0xb4);
        Write_Parameter(0x01);
        Write_Parameter(0xb8);
        Write_Parameter(0x00);
        Write_Parameter(0x44);
        Write_Parameter(0x07);
        Write_Parameter(0x00);
        Write_Parameter(0x00);
        Write_Parameter(0x00);

        Write_Command(0xb6);
        Write_Parameter(0x01);
        Write_Parameter(0x08);
```

```
        Write_Parameter(0x00);
        Write_Parameter(0x13);
        Write_Parameter(0x07);
        Write_Parameter(0x00);
        Write_Parameter(0x00);

        Write_Command(0x2a);
        Write_Parameter(0x00);
        Write_Parameter(0x00);
        Write_Parameter(0x01);
        Write_Parameter(0x3f);

        Write_Command(0x2b);
        Write_Parameter(0x00);
        Write_Parameter(0x00);
        Write_Parameter(0x00);
        Write_Parameter(0xef);

        Write_Command(0x29);
        Write_Command(0x2c);
}
```

first FC components

winstar **LCM Sample Estimate Feedback Sheet**

Module Number：_____ **Page: 1**

1、Panel Specification：

1. Panel Type： □ Pass □ NG ,_____
2. View Direction： □ Pass □ NG ,_____
3. Numbers of Dots： □ Pass □ NG ,_____
4. View Area： □ Pass □ NG ,_____
5. Active Area： □ Pass □ NG ,_____
6. Operating Temperature： □ Pass □ NG ,_____
7. Storage Temperature： □ Pass □ NG ,_____
8. Others：_____

2、Mechanical Specification：

1. PCB Size： □ Pass □ NG ,_____
2. Frame Size： □ Pass □ NG ,_____
3. Material of Frame： □ Pass □ NG ,_____
4. Connector Position： □ Pass □ NG ,_____
5. Fix Hole Position： □ Pass □ NG ,_____
6. Backlight Position： □ Pass □ NG ,_____
7. Thickness of PCB： □ Pass □ NG ,_____
8. Height of Frame to PCB： □ Pass □ NG ,_____
9. Height of Module： □ Pass □ NG ,_____
10. Others： □ Pass □ NG ,_____

3、Relative Hole Size：

1. Pitch of Connector： □ Pass □ NG ,_____
2. Hole size of Connector： □ Pass □ NG ,_____
3. Mounting Hole size： □ Pass □ NG ,_____
4. Mounting Hole Type： □ Pass □ NG ,_____
5. Others： □ Pass □ NG ,_____

4、Backlight Specification：

1. B/L Type： □ Pass □ NG ,_____
2. B/L Color： □ Pass □ NG ,_____
3. B/L Driving Voltage (Reference for LED Type)： □ Pass □ NG ,_____
4. B/L Driving Current： □ Pass □ NG ,_____
5. Brightness of B/L： □ Pass □ NG ,_____
6. B/L Solder Method： □ Pass □ NG ,_____
7. Others： □ Pass □ NG ,_____

>> **Go to page 2** <<

first components

5、Electronic Characteristics of Module：

1.	Input Voltage：	□ Pass	□ NG ,_____
2.	Supply Current：	□ Pass	□ NG ,_____
3.	Driving Voltage for LCD：	□ Pass	□ NG ,_____
4.	Contrast for LCD：	□ Pass	□ NG ,_____
5.	B/L Driving Method：	□ Pass	□ NG ,_____
6.	Negative Voltage Output：	□ Pass	□ NG ,_____
7.	Interface Function：	□ Pass	□ NG ,_____
8.	LCD Uniformity：	□ Pass	□ NG ,_____
9.	ESD test：	□ Pass	□ NG ,_____
10.	Others：	□ Pass	□ NG ,_____

6、Summary：

Sales signature：_____

Customer Signature：_____ **Date**：____/____/____

first FC components