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華凌光電股份有限公司



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SPECIFICATION

CUSTOMER : _____

MODULE NO.: **WF57FTLFFDBT0#**

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

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
			葉虹蘭
ISSUED DATE: 2015/04/27			

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



RECORDS OF REVISION

DOC. FIRST ISSUE

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2014/09/09		First issue
A	2015/01/06		Modify interface.
B	2015/04/10		Add Resistance Touch Panel General Specification
C	2015/04/27		Modify Reliability.

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.Touch Panel Information
- 13.Contour Drawing
- 14.Package Specification
- 15.Initial Code For Reference

1.Module Classification Information

W F 57 F T L F F D B T 0 #
 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					

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.

3.General Specifications

Item	Dimension	Unit
Size	5.7	inch
Dot Matrix	640 x RGBx480(TFT)	dots
Module dimension	127.14 x 100.94 x 10.3	mm
Active area	115.20 x 86.40	mm
Dot pitch	0.06 x 0.18	mm
LCD type	TFT, Normally White , Transmissive	
View Direction	6 o'clock	
Gray Scale Inversion Direction	12 o'clock	
Backlight Type	LED,Normally White	
Controller IC	SSD1963	
Interface	Digital 8080 family MPU	
With /Without TP	With RTP (TP overtake)	
Surface	Anti-Glare	

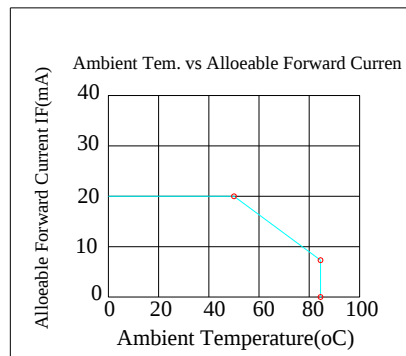
*Color tone slight changed by temperature and driving voltage.

4.Absolute Maximum Ratings

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

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

1. Temp. $\leq 60^{\circ}\text{C}$, 90% RH MAX. Temp. $> 60^{\circ}\text{C}$, Absolute humidity shall be less than 90% RH at 60°C



5. Electrical Characteristics

5.1. Operating conditions:

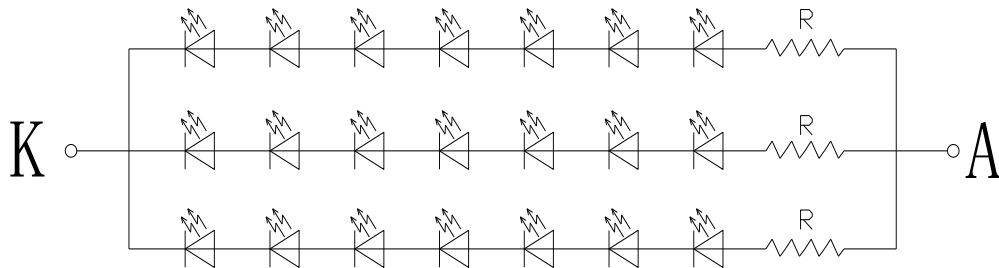
Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For LCM	V_{DD}	—	3.0	3.3	3.6	V
Supply Current For LCM	I_{DD}	—	—	120	190	mA

Note 1 : This value is test for $V_{DD}=3.3V$, $T_a=25\text{ }^{\circ}\text{C}$ only

5.2. LED driving conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current	-	-	60	-	mA	-
Power Consumption	--	-	1386	1470	mW	-
LED voltage	V_{BL+}	-	23.1	24.5	V	Note 1
LED Life Time		-	25,000	-	Hr	Note 2,3,4

Note 1 : There are 1 Groups LED



Note 2 : $T_a = 25\text{ }^{\circ}\text{C}$

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

Note 4 : The single LED lamp case

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	

7.Interface timing

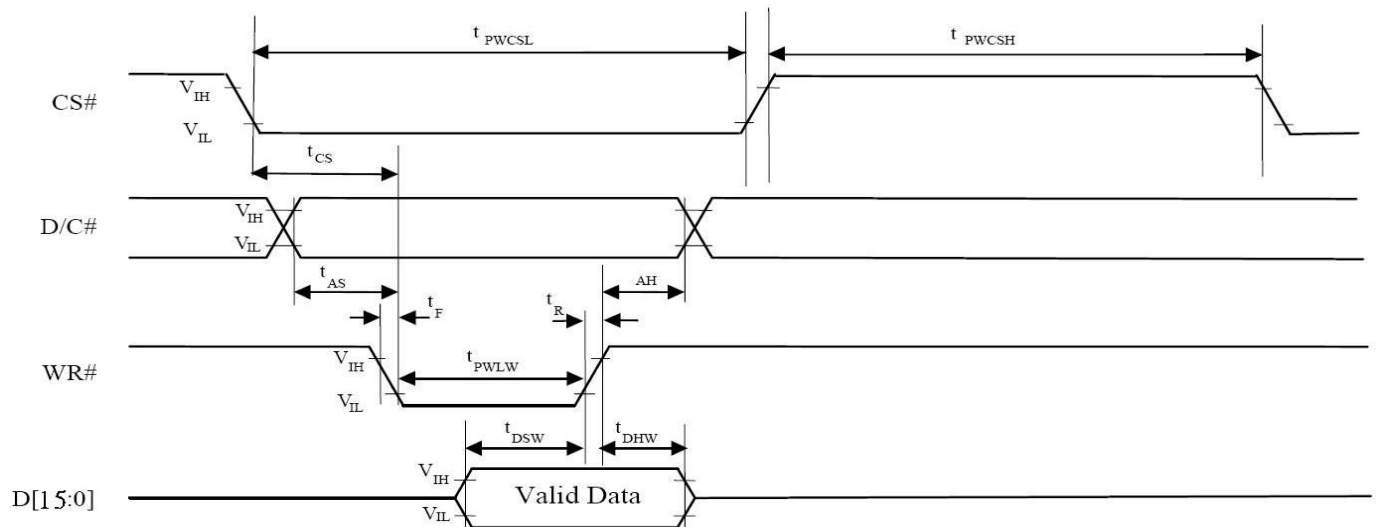
7.1. 8080 Mode

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#.

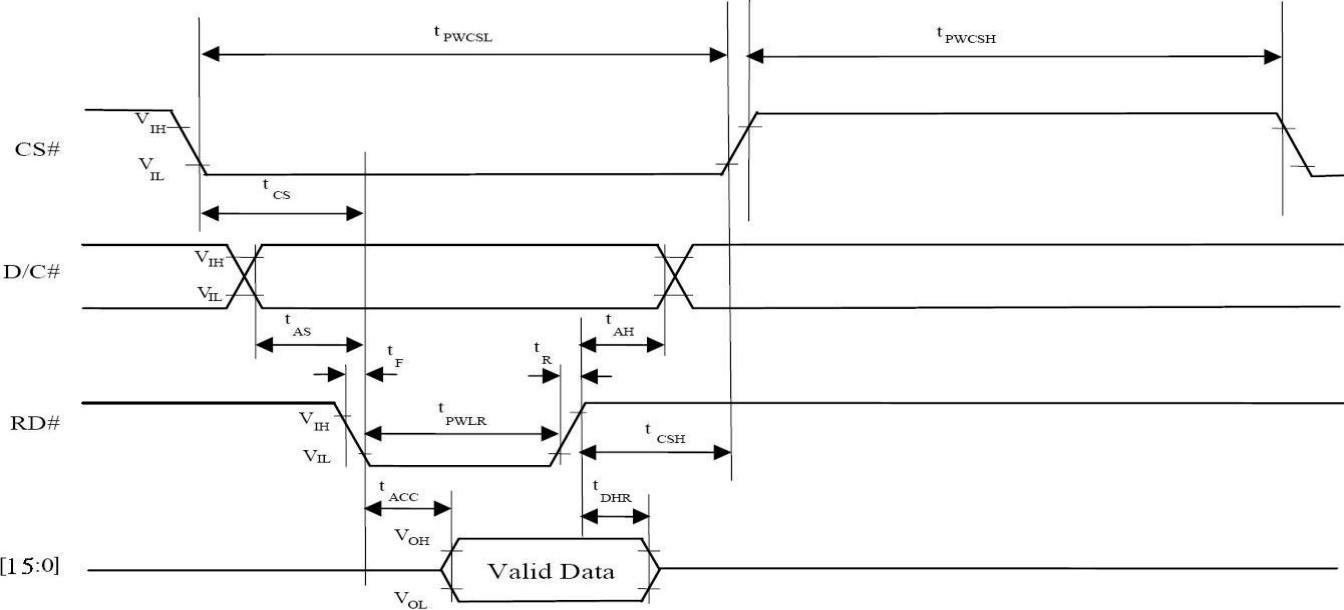
7.2. 8080 Mode Write Cycle

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
tPWLRL	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)	1 st	R5	R4	R3	R2	R1	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1
16 bits	1 st	R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0
	2 nd	B7	B6	B5	B4	B3	B2	B1	B0	R7	R6	R5	R4	R3	R2	R1	R0
	3 rd	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
8 bits	1 st									R7	R6	R5	R4	R3	R2	R1	R0
	2 nd									G7	G6	G5	G4	G3	G2	G1	G0
	3 rd									B7	B6	B5	B4	B3	B2	B1	B0

8.Optical Characteristics

Item		Symbol	Condition.	Min	Typ.	Max.	Unit	Remark
Response time		Tr+ Tf	$\theta =0^{\circ}$ 、 $\Phi =0^{\circ}$	-	50	80	ms	Note 3,5
Contrast ratio		CR	At optimized viewing angle	150	250	-	-	Note 4,5
Color Chromaticity	White	W _x	$\theta =0^{\circ}$ 、 $\Phi =0$	0.25	0.30	0.35	-	Note 2,6,7
		W _y		0.27	0.32	0.37	-	-
Viewing angle (Gray Scale Inversion Direction)	Hor.	Θ R	CR≥ 10	-	60	-	Deg.	Note 1
		Θ L		-	60	-		
	Ver.	Φ T		-	60	-		
		Φ B		-	40	-		
Brightness		-	-	180	210	-	cd/m ²	Center of display

Ta=25±2℃, IL=60mA

Note 1: Definition of viewing angle range

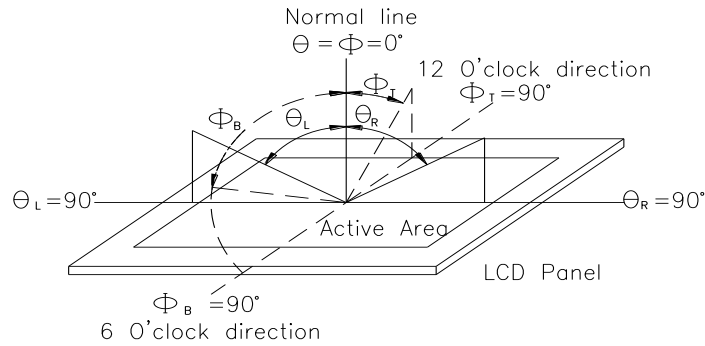


Fig. 8.1. Definition of viewing angle

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-7orBM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

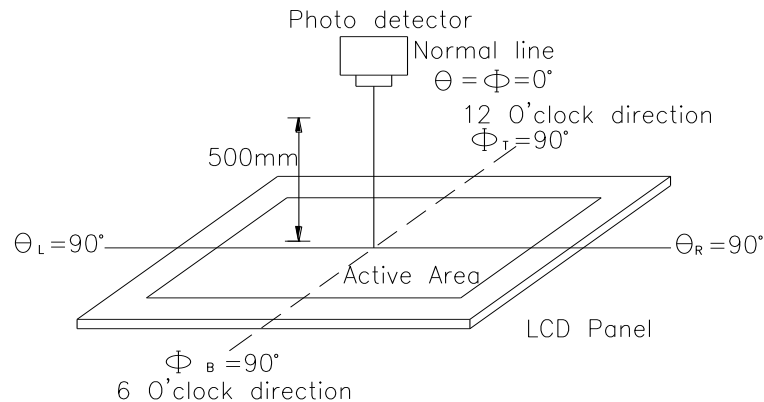
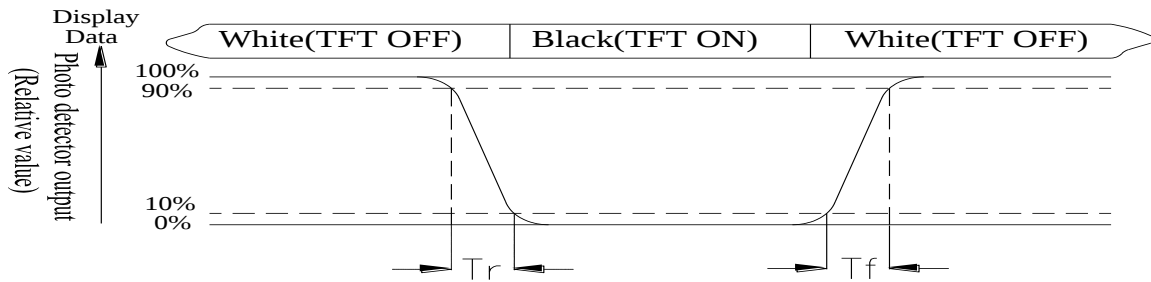


Fig. 8.2. Optical measurement system setup

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, T_r , is the time between photo detector output intensity changed from 90% to 10%. And fall time, T_f , 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 $V_i = V_{i50} \pm 1.5V$

Black $V_i = V_{i50} \pm 2.0V$

“ $\pm$ ” means that the analog input signal swings in phase with VCOM signal.

“ $\pm$ ” 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.

9.Interface

9.1. LCM PIN Definition

Pin	Symbol	Function	Remark
1	VDD	Power Supply : +3.3V	
2	VDD	Power Supply : +3.3V	
3	DB0	Data bus	
4	DB1	Data bus	
5	DB2	Data bus	
6	DB3	Data bus	
7	DB4	Data bus	
8	DB5	Data bus	
9	DB6	Data bus	
10	DB7	Data bus	
11	DB8	Data bus	
12	DB9	Data bus	
13	DB10	Data bus	
14	DB11	Data bus	
15	D12	Data bus	
16	DB13	Data bus	
17	DB14	Data bus	
18	DB15	Data bus	
19	CS	Chip select	
20	D/C	Data/Command select	
21	RD	Read strobe signal	
22	WR	Write strobe signal	
23	NC	No connect	
24	RST	Hardware reset	Note 1
25	UD	Left /right selection; Scan Direction; Default UD=L	Note 2,3
26	LR	Left /right selection; Scan Direction; Default RL=H	Note 2,3
27	NC	No connect	
28	NC	No connect	
29	NC	No connect	
30	NC	No connect	
31	NC	No connect	
32	GND	System ground pin of the IC. Connect to system ground.	

Note 1: DISPLAY DIRECTION OF THE PANEL

The UD and LR control the Display direction of the panel .

The settings of UD and LR are or following:

Note 2: Selection of scanning mode

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

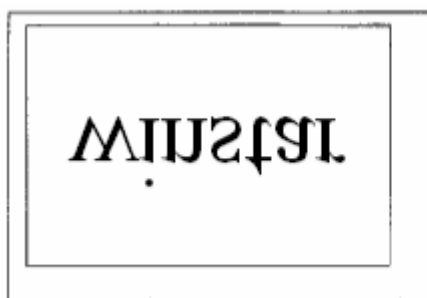
Note 3: Definition of scanning direction.Refer to the figure as below:



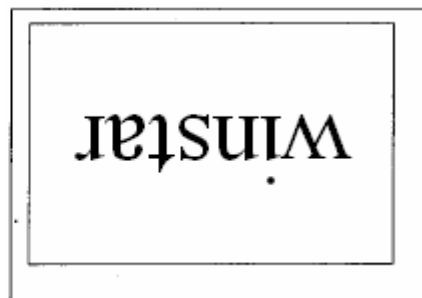
UD=VDD, LR=GND



UD=VDD, LR=VDD



UD=GND, LR=GND

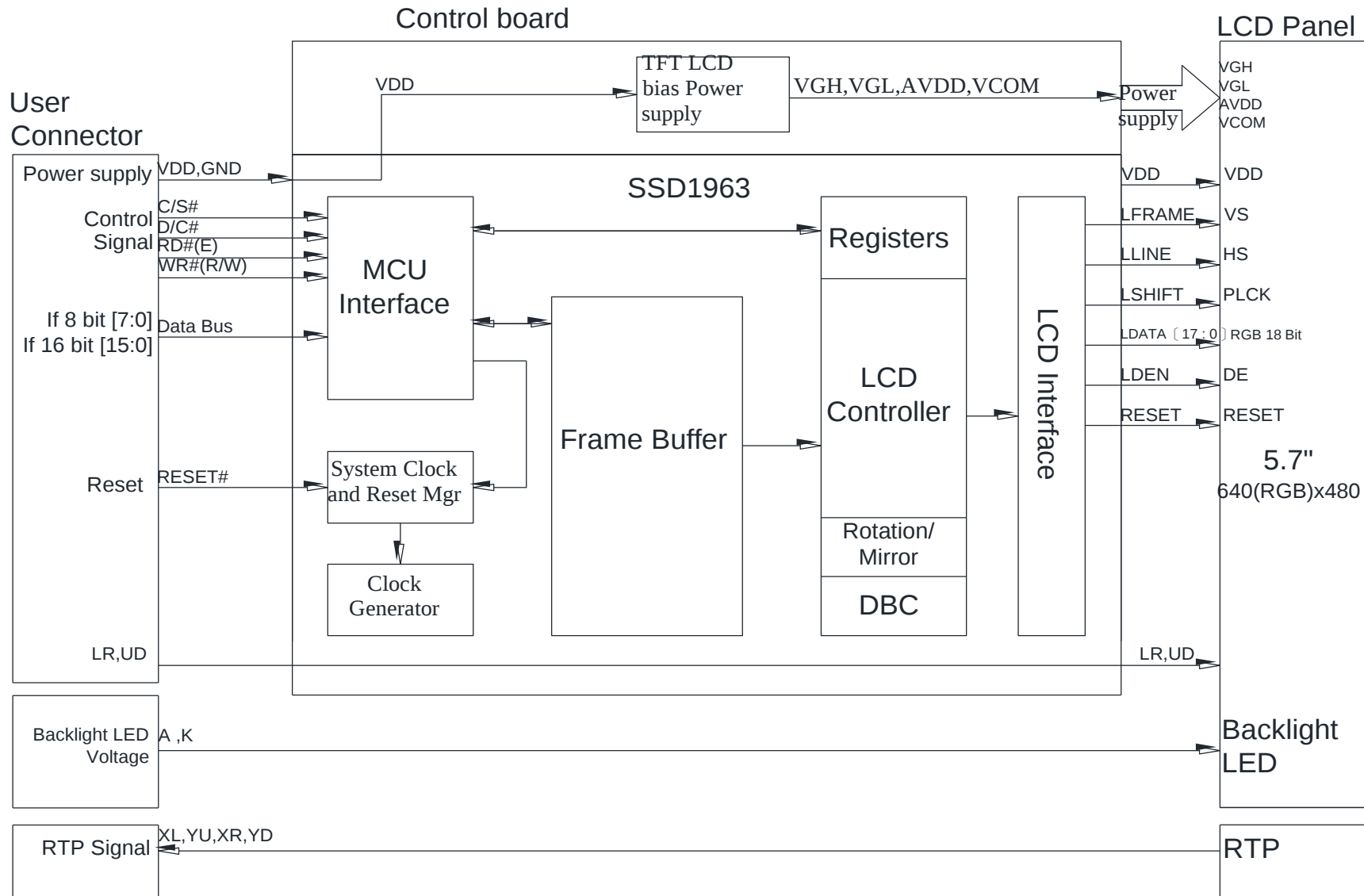


UD=GND, LR=VDD

9.2. Backlight PIN Definition: JST BHSR-02VS-1

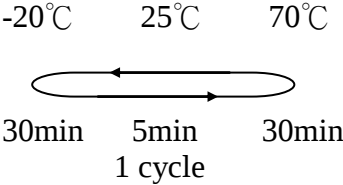
Pin No.	Symbol	I/O	Description
1	A	I	LED_ Anode (Red)
2	K	I	LED_ Cathode (Black)

10. Block Diagram



11. Reliability

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

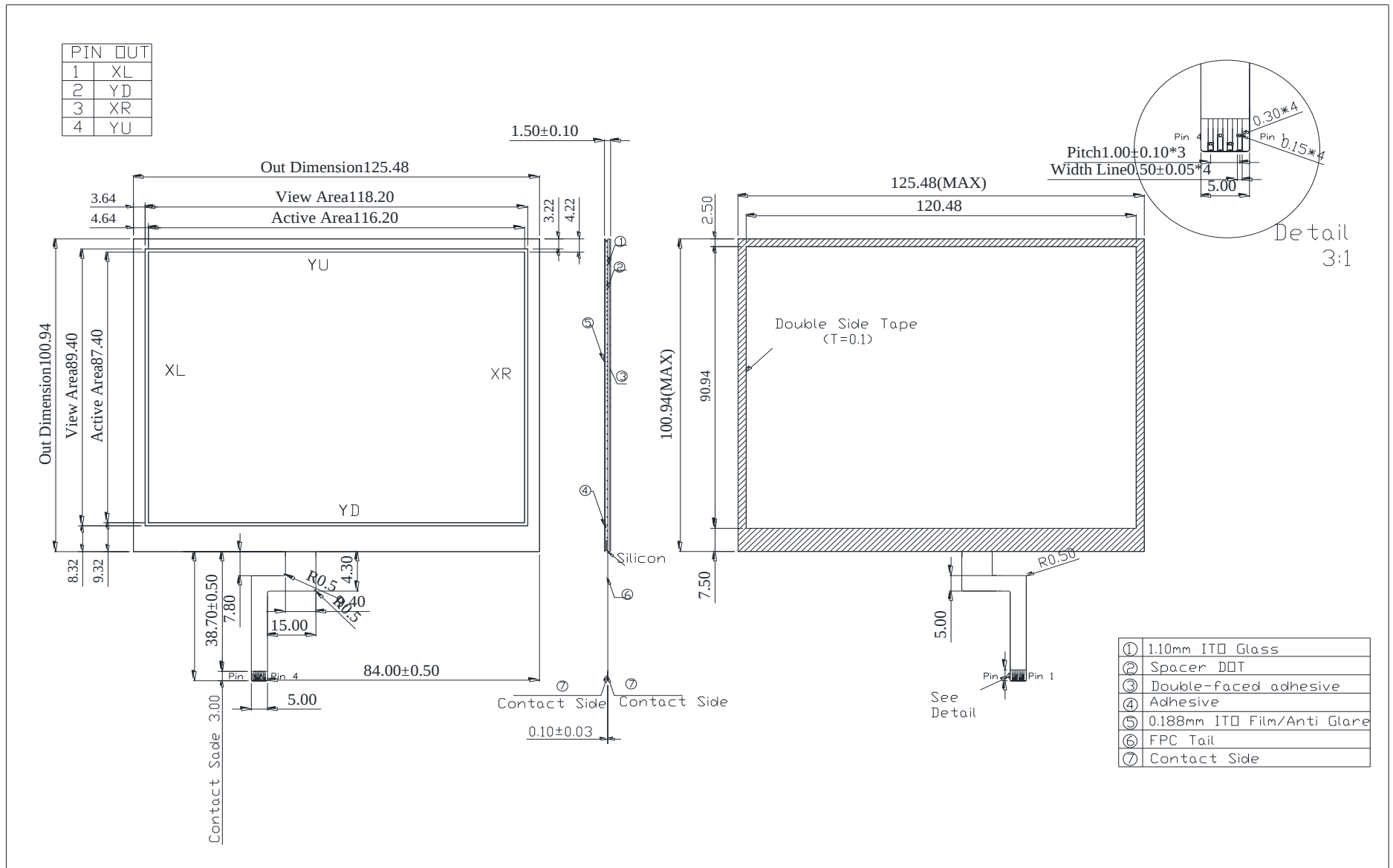
Environmental Test			
Test Item	Content of Test	Test Condition	Note
High Temperature storage	Endurance test applying the high storage temperature for a long time.	80°C 200hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30°C 200hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	70°C 200hrs	—
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-20°C 200hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 60 °C ,90%RH max	60°C ,90%RH 96hrs	1,2
Thermal shock resistance	The sample should be allowed stand the following 10 cycles of operation  -20°C 25°C 70°C 30min 5min 30min 1 cycle	-20°C /70°C 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.

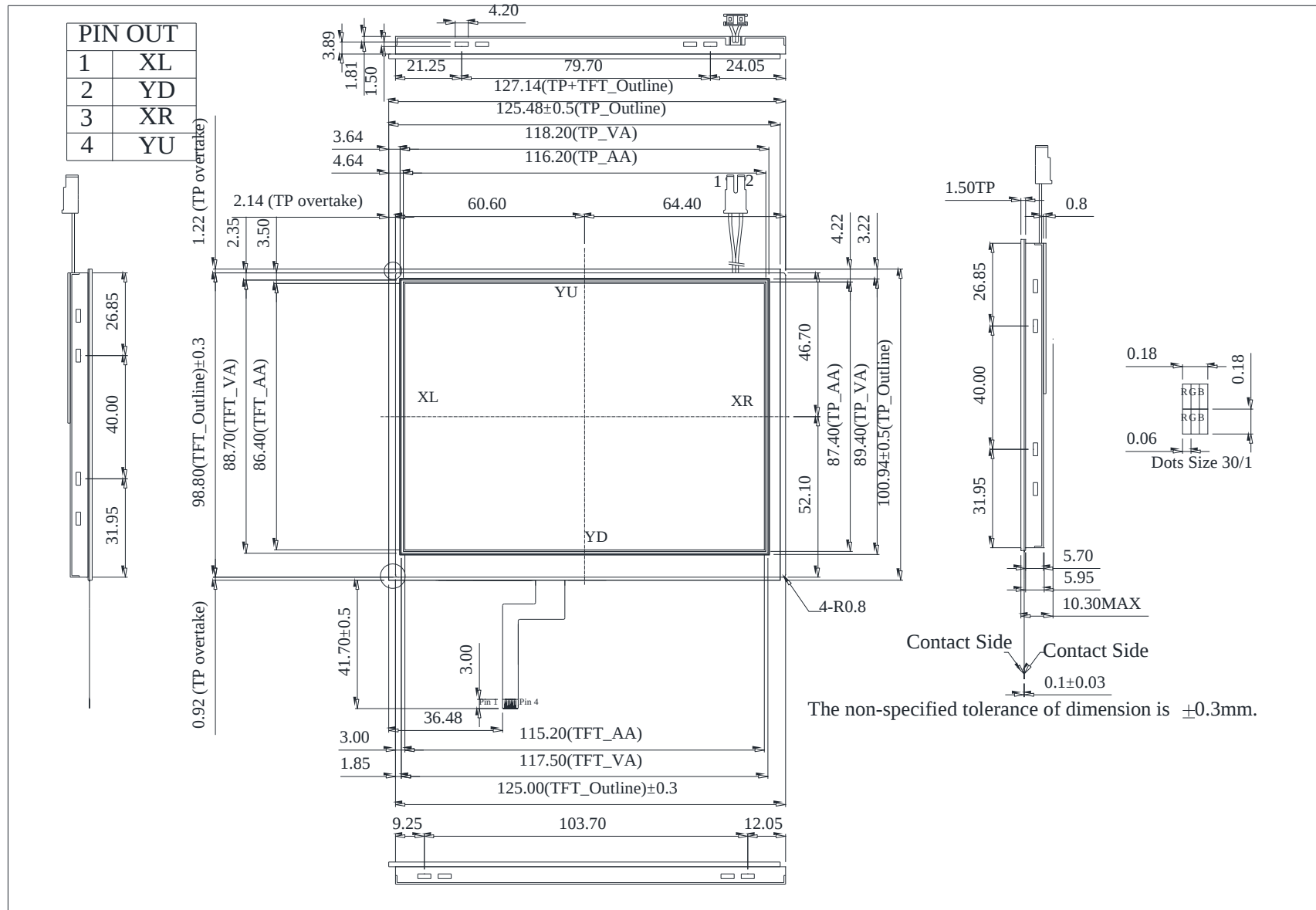
12.Touch Panel Information

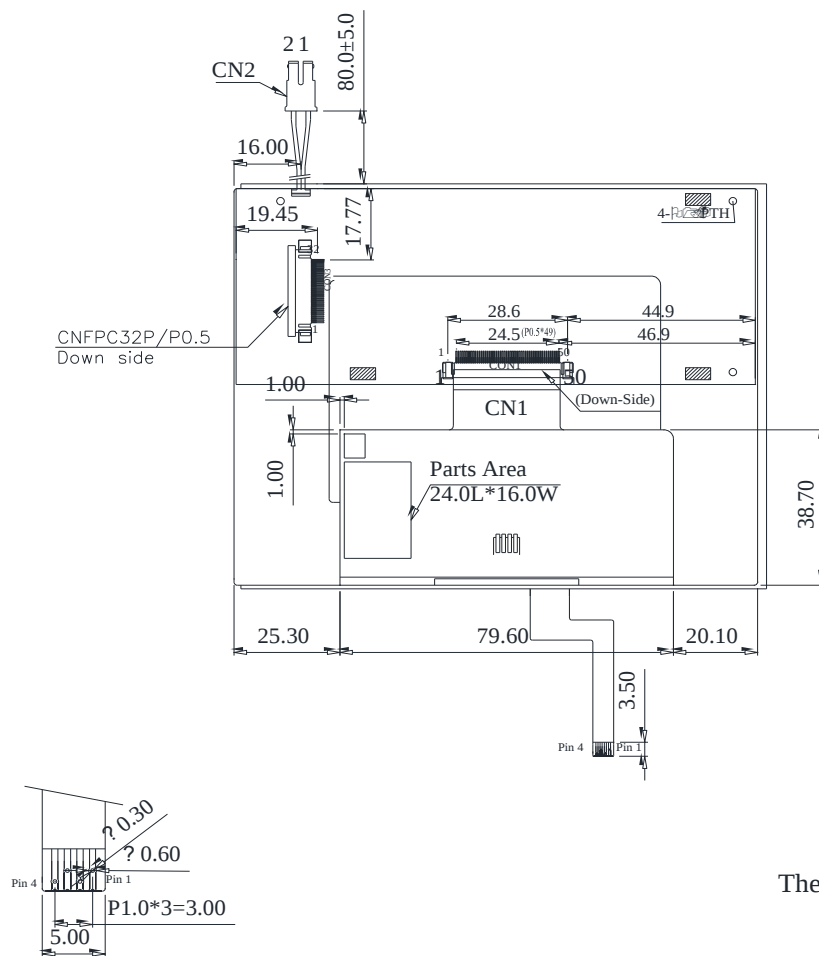


12.1. Resistance Touch Panel General Specifications

Item	Description
Driving condition	DC5V
Operating force	60~150g
Linearity max	$\leq \pm 1.5\%$
Insulating resistance	$> 20\text{M}\Omega$, 25V(DC)
Light transparence	70%
Structure type	ITO Film/ITO Glass(F/G)
Surface Hardness	3H typ
Pen Hitting Durability (with the silicon rubber)	$> 1000,000$ times
X Axis resistance	200~900 Ω
Y Axis resistance	200~900 Ω

13. Contour Drawing





SCALE 2/1

CON3

PIN NO.	SYMBOL
1	VDD
2	VDD
3	DB0
4	DB1
5	DB2
6	DB3
7	DB4
8	DB5
9	DB6
10	DB7
11	DB8
12	DB9
13	DB10
14	DB11
15	DB12
16	DB13
17	DB14
18	DB15
19	CS
20	D/C
21	RD
22	WR
23	NC
24	RST
25	UD

PIN NO.	SYMBOL
26	LR
27	NC
28	NC
29	NC
30	NC
31	NC
32	GND

CN2

PIN NO.	SYMBOL
1	A
2	K

The non-specified tolerance of dimension is $\pm 0.3\text{mm}$.

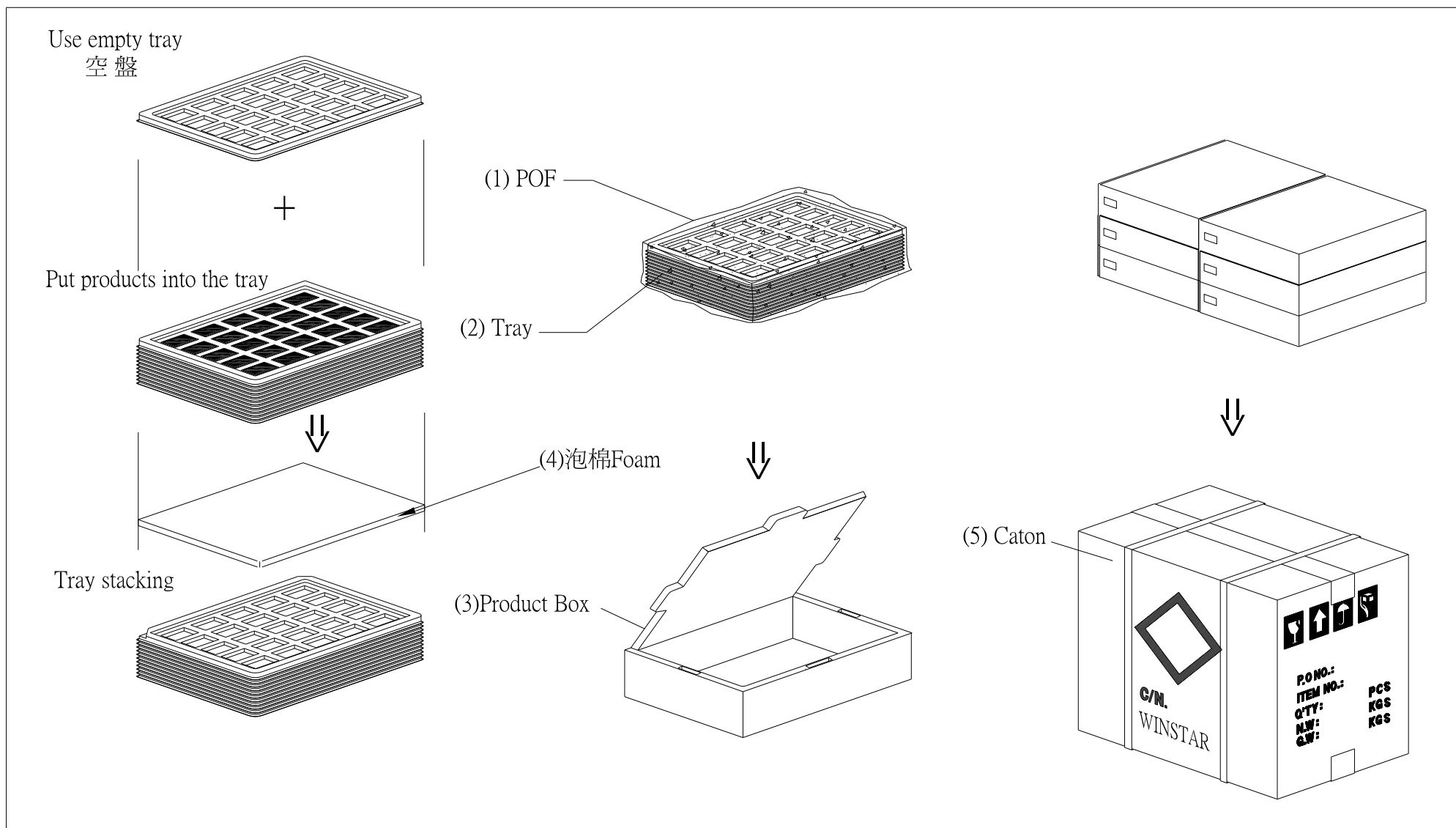
14. PACKAGE SPECIFICATION

LCM Model		WF57FTLFFDBT0#	LCM 包裝規格書		Approve	Check	Contact
Drawing NO.							
			DATE	初版	版次 Ver		
			14'02/07	13'11/08	A		

1.包裝材料規格表（Packaging Material）:(per carton)				
NO.	Item	Model	Dimensions	Quantity
1	成品（LCM）	WF57FTLFFDBT0#		90
2	TRAY 盤 (2)	PKCA1XXXXXXXXXXXX0184	315mm*265mm	30
3	BP01 內盒(3)Product Box	PK3Y1XXXXXXXXXXXX0001	332*280*100mm	6
4	泡棉(4)Foam	-----		6
5	外紙箱(5)Carton	PK4X1XXXXXXXXXXXX0000	565*340*320mm	1
6				
7				
8				
9				

2.單箱數量規格表(Packaging Specifications and Quantity)：				
(1)LCM quantity per box : no per tray	3	x no of tray	5 =	15
(2)Total LCM quantity in carton : quantity per box	15	x no of boxes	6 =	90

特 記 事 項 (REMARK)		
1. Label Specifications： MOOEL: LOT NO： QUANTITY: CHECK:		



15.Initial Code For Reference

```
void Initial_SSD1963(void)
{
    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_Data(0x0c);
    Write_Data(0x80);
    Write_Data(0x02);
    Write_Data(0x7F);
    Write_Data(0x01);
    Write_Data(0xDF);
    Write_Data(0x2d);

    Write_Command(0xf0);
    Write_Data(0x03);

    Write_Command(0xe6);
    Write_Data(0x02);
    Write_Data(0xff);
    Write_Data(0xff);

    ////////////
    Write_Command(0xb4);
    Write_Data(0x20);
    Write_Data(0xAF);
    Write_Data(0x00);
    Write_Data(0xA3);
    Write_Data(0x07);
    Write_Data(0x00);
    Write_Data(0x00);
    Write_Data(0x00);
    Write_Data(0x00);

    Write_Command(0xb6);
    Write_Data(0x01);
    Write_Data(0xEF);
    Write_Data(0x00);
    Write_Data(0x04);
    Write_Data(0x01);
    Write_Data(0x00);
    Write_Data(0x00);
```

```
Write_Command(0x2a);  
Write_Data(0x00);  
Write_Data(0x00);  
Write_Data(0x02);  
Write_Data(0x7f);  
  
Write_Command(0x2b);  
Write_Data(0x00);  
Write_Data(0x00);  
Write_Data(0x01);  
Write_Data(0xdf);  
  
Write_Command(0x29);  
}
```



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** <<



Module Number : _____

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 : / /