



Winstar Display Co., LTD
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SPECIFICATION

CUSTOMER : _____

MODULE NO.: **WF57PTIBCDBNO#**

APPROVED BY: (FOR CUSTOMER USE ONLY)	 PCB VERSION: DATA:
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SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
			葉虹蘭
ISSUED DATE: 2014/12/23			

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

RECORDS OF REVISION

DOC. FIRST ISSUE

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2014/04/23		First issue
A	2014/06/03		Correct Electrical Characteristics & Optical Characteristics.
B	2014/08/11		Modify Initial Code.
C	2014/12/23		Add size & Surface. Modify Block Diagram& Static electricity test.

Contents

1.Module Classification Information

2.Summary

3.General Specification

4.Absolute Maximum Ratings

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11.Reliability

12.Contour Drawing

13.Package Specification

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1.Module Classification Information

W F 57 P T I B C D B N 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 Z→Transmissive, W.T, Wide Viewing Angle for O-FILM Y→Transmissive, W.T, Wide View					
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						
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	320 x RGBx240(TFT)	dots
Module dimension	141.12 × 101.55 ×12.8	mm
Active area	115.2 × 86.4	mm
Dot pitch	0.12 × 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	RA8875	
Interface	Digital 8080 family MPU	
With /Without TP	Without TP	
Surface	No Anti-Glare	

*Color tone slight changed by temperature and driving voltage.

4. Absolute Maximum Ratings

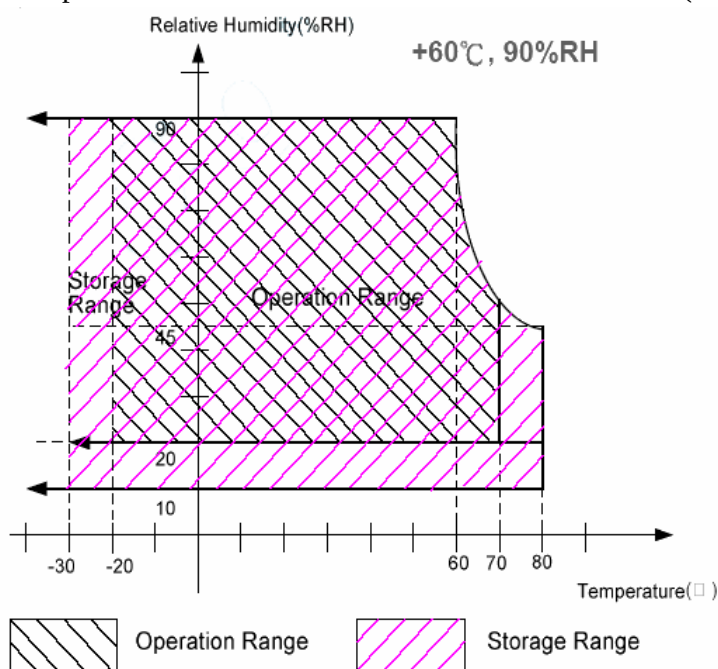
Item	Symbol	Values		Unit	Remark
		Min	max		
Power Supply Voltages	VDD	-0.5	3.5	V	
Input signal voltage	Logic input	-0.5	3.5	V	
Operating Temperature	Topa	-20	70	° C	Note3,4
Storage Temperature	Tst	-30	80	° C	Note3,4
LED Reverse Voltage	Vr	-	1.2	V	Each LED Note2
LED Forward Current	IF	-	25	mA	Each LED

Note 1: The absolute maximum rating values of this product are not allowed to be exceeded at any times. A module should be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme condition, the module may be permanently destroyed.

Note 2: VR Conditions: Zener Diode 20mA

Note 3: 90% RH Max. (Max wet temp. is 60°C)

Maximum wet-bulb temperature is at 60°C or less. And No condensation (no drops of dew)



Note 4: In case of temperature below 0°C, the response time of liquid crystal (LC) becomes slower and the color of panel darker than normal one.

5. Electrical Characteristics

5.1. Typical operation conditions

Item	Symbol	Values			Unit	Remark
		Min	TYP	max		
Power voltage	VDD	3.1	3.3	3.5	V	-
Current of driver	IVDD	-	214	-	mA	VDD =3.3V

5.2. Backlight Driving Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Operation Current For LED Driver	VLED=5V	250	—	375	mA	Note 1,2
Power Consumption	VLED=5V	1250	—	1875	mW	Note 1,2
Supply Voltage For LED Driver	VLED+	—	5	—	V	—
LED Life Time	—	—	50,000	—	Hr	Note 2,3,4

Note 1 : Base on VLED= 5V for the back light driver IC specification

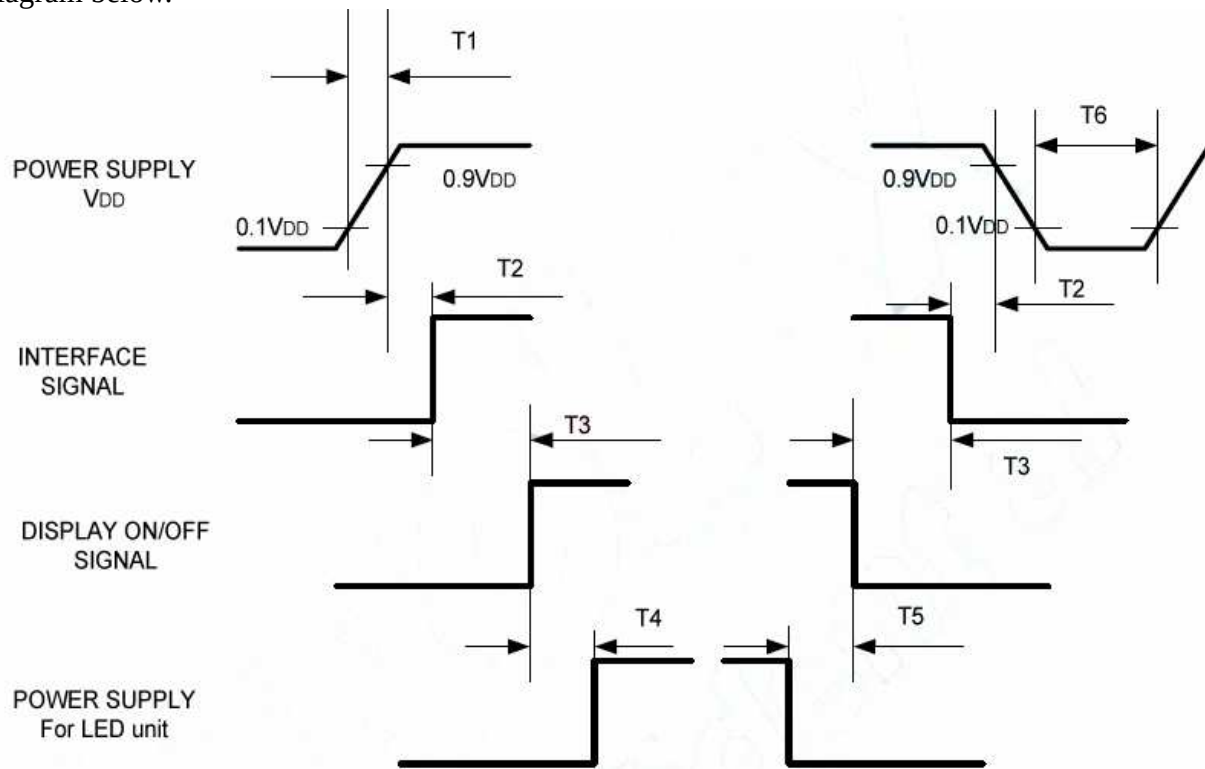
Note 2 : Ta = 25 °C

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

Note 4 : The single LED lamp case

5.3. Power Sequence

To prevent a latch-up or DC operation of the LCD module, the power on/off sequence should be as the diagram below.



Symbol	Specification	Symbol	Specification
T1	$0 \leq T1 \leq 10 \text{ msec}$	T4	$160 \text{ msec} \leq T4$
T2	$0 \leq T2 \leq 100 \text{ msec}$	T5	$160 \text{ msec} \leq T5$
T3	$0 \leq T3 \leq 200 \text{ msec}$	T6	$1 \text{ msec} \leq T6$

6.DC CHARATERISTICS

Parameter	Symbol	Rating			Unit	Condition
		Min	Typ	Max		
Low level input voltage	VIL	GND	-	0.2 VDD	V	
High level input voltage	VIH	0.8 VDD	-	VDD	V	

7.AC CHARATERISTICS

7.1. Parallel I/F Protocol

The following timing charts are used to describe the timing specification of the standard 8080 and 6800 interfaces.

6800 – 8/16-bit Interface

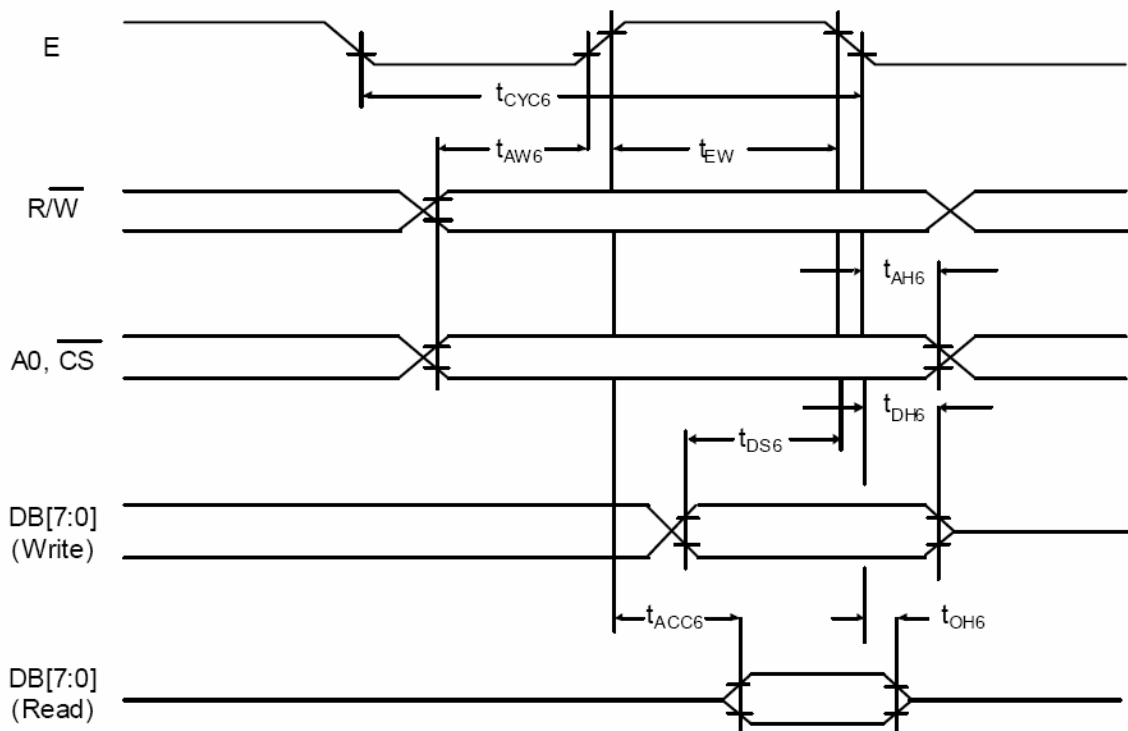


Figure 1: 6800 MCU Waveform

Table 1: 6800 MCU I/F Timing

Symbol	Parameter	Rating		Unit	Symbol
		Min.	Max		
t_{CYC6}	Cycle time	50	--	ns	tc is one system clock period: $tc = 1/SYS_CLK$
t_{EW}	Strobe Pulse width	20	--	ns	
t_{AW6}	Address setup time	0	--	ns	
t_{AH6}	Address hold time	10	--	ns	
t_{DS6}	Data setup time	20	--	ns	
t_{DH6}	Data hold time	10	--	ns	
t_{ACC6}	Data output access time	0	20	ns	
t_{OH6}	Data output hold time	0	20	ns	

8080 – 8/16-bit Interface

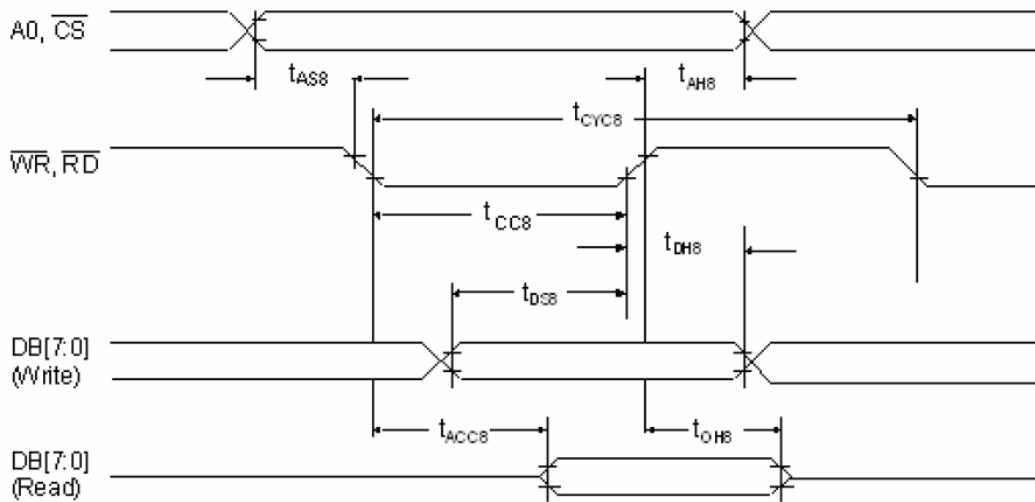


Figure 2: 8080 Waveform
Table 2: 8080 MCU I/F Timing

Symbol	Parameter	Rating		Unit	Symbol
		Min.	Max.		
tCYC8	Cycle time	50	--	ns	tc is one system clock period: tc = 1/SYS_CLK
tCC8	Strobe Pulse width	20	--	ns	
tAS8	Address setup time	0	--	ns	
tAH8	Address hold time	10	--	ns	
tDS8	Data setup time	20	--	ns	
tDH8	Data hold time	10	--	ns	
tACC8	Data output access time	0	20	ns	
tOH8	Data output hold time	0	20	ns	

The data bus width of RA8875 can be selected to 8-bit/16-bit by setting the Bit [1:0] of SYSR. When Bit [1:0] of SYSR is cleared to “00”, then the data bus is 8-bit. If Bit [1:0] of SYSR is set to “11”, then the data transition is set as 16-bit. No matter what type of MCU I/F is selected (6800/8080), both of them can be changed the bus width when need. But if the 8-bit is used, it needs double transmission time than 16-bit bus and all of the registers must be accessed by 8-bit data. The continuous data write speed determines the display update speed. The cycle-to-cycle interval must be larger than 4 times of system clock period. Over the specification may cause the data lose or function fail. Please refer to Figure 6-5 and Figure 6-6 for waveform detail.

In order to reduce the transmission interference between MCU interface and RA8875, It is suggested that a small capacitor to the GND should be added at the signal of CS#, RD#, and WR#. If using cable to connect MCU and RA8875, please keep the cable length less than 20cm. Otherwise it's suggested to add 1~10Kohm pull-up resistors on pins CS#, RD#, WR# and RS.

MPU6800 Data Write Speed Limit

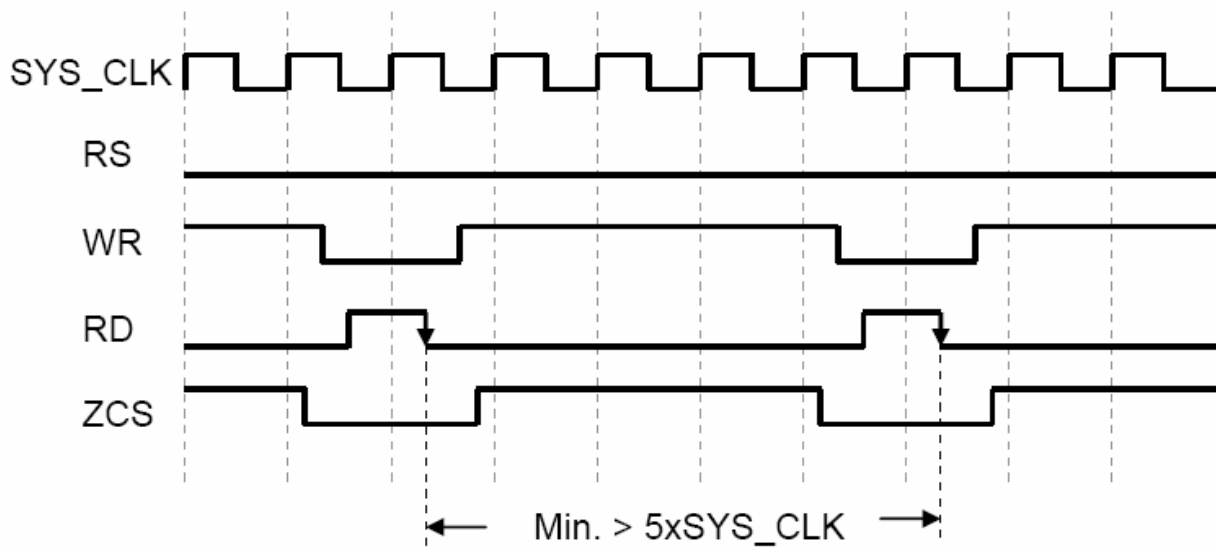


Figure 3: 6800 I/F Continuous Data Write Cycle Waveform

MPU8080 Data Write Speed Limit

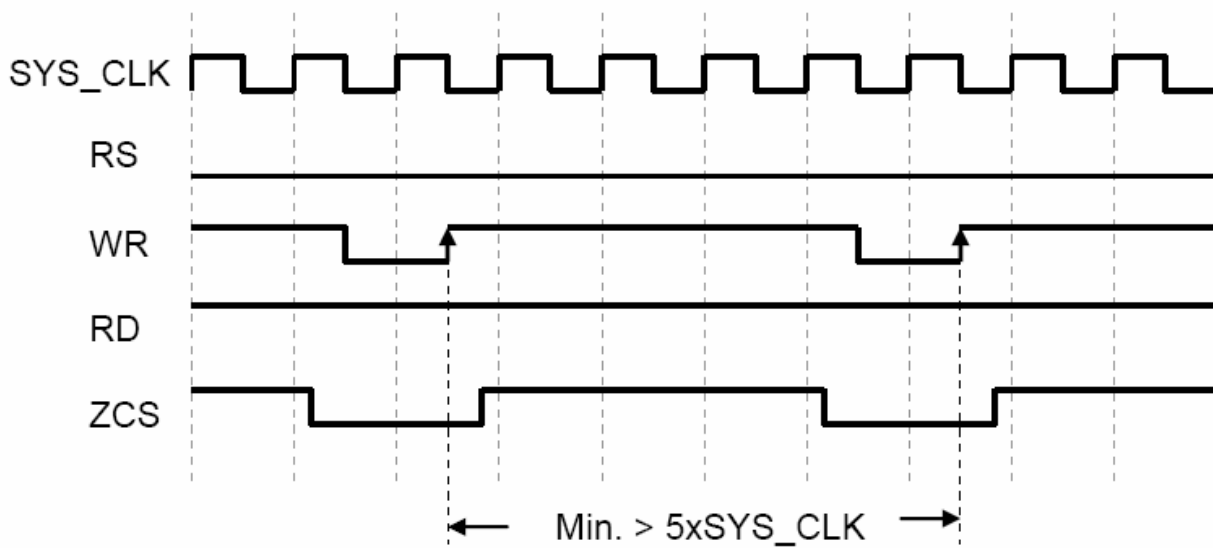


Figure4: 8080 I/F Continuous Data Write Cycle Waveform

7.2. Data transfer order Setting

MCU Data Bus 8-Bit

The following illustration is used for 16-bit MCU.

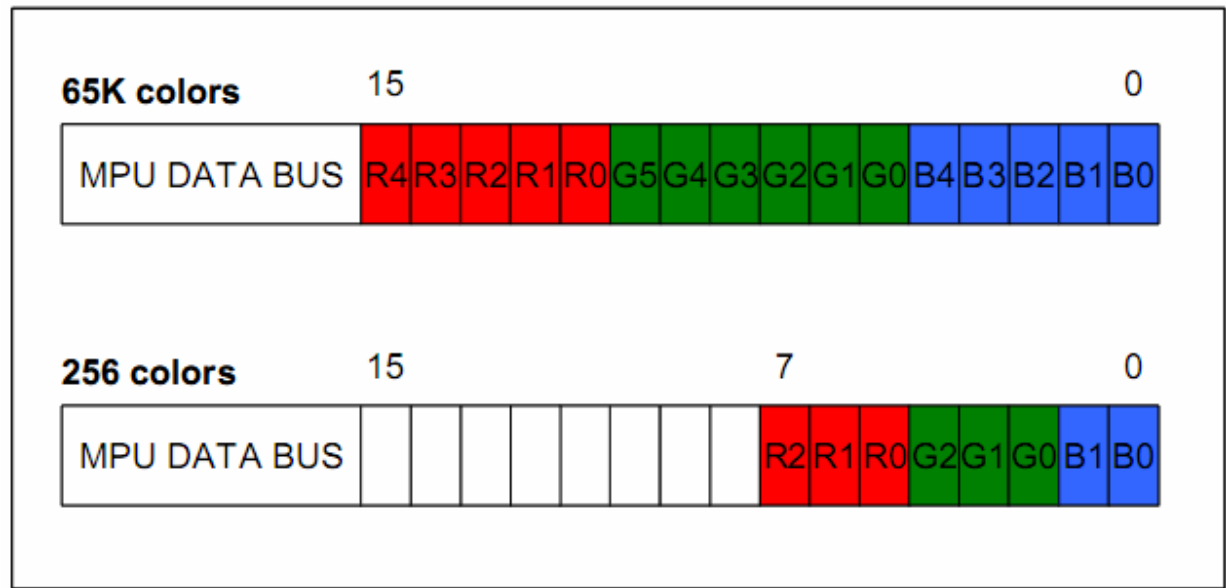


Figure 5: Color illustrations for 16-Bit Data Bus MCU

7.3. Register Depiction

Please consult the spec of RA8875

Please consult the spec of FOCALTECH FT5x06

8.Optical Characteristics

Item	Symbol	Condition.	Min	Typ.	Max.	Unit	Remark
Response time	Tr	$\theta = 0^\circ$ 、 $\Phi = 0^\circ$	-	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	$\theta = 0^\circ$ 、 $\Phi = 0^\circ$	0.282	0.312	0.342		Note 2,5,6
			0.319	0.349	0.379		
Viewing angle (Gray Scale Inversion Direction)	Hor.	Θ_R	60	70	-	Note 1	Note 1
		Θ_L	60	70	-		
	Ver.	Φ_T	40	50	-		
		Φ_B	60	70	-		
Brightness	-	-	400	500	-	cd/m ²	Center Of Display

Ta=25±2℃, V_{LED} / I_{LED}= 5V / 250mA

Note 1: Definition of viewing angle range

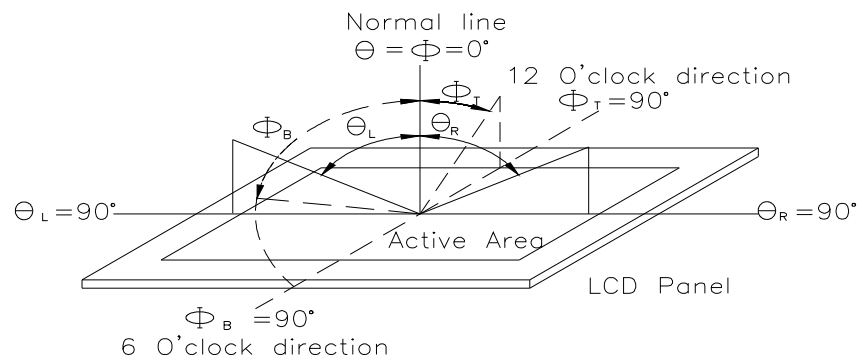


Fig. 8.1. Definition of viewing angle

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.

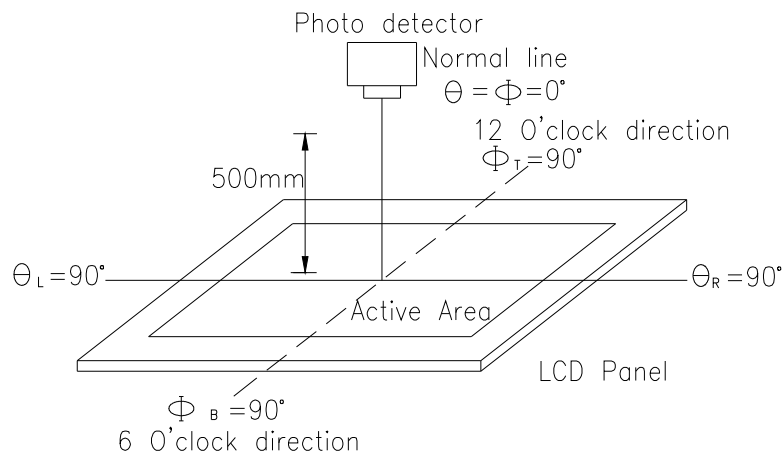
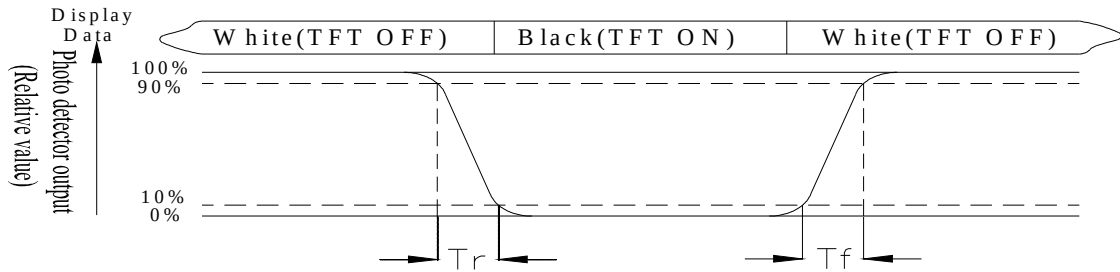


Fig. 8.2. Optical measurement system setup

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

“±” 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.

9.Interface

9.1. LCM PIN Definition

TFT LCD Panel Driving Section

FPC Connector is used for the module electronics interface.

Pin	Symbol	Function	Remark
1	GND	System ground	
2	VDD	Power Supply : +3.3V	
3	NC	No connection	
4	RS	Data/Command select	
5	WR	Write strobe signal	
6	RD	Read strobe signal	
7	D0	Data bus	
8	D1	Data bus	
9	D2	Data bus	
10	D3	Data bus	
11	D4	Data bus	
12	D5	Data bus	
13	D6	Data bus	
14	D7	Data bus	
15	D8	Data bus	
16	D9	Data bus	
17	D10	Data bus	
18	D11	Data bus	
29	D12	Data bus	
20	D13	Data bus	
21	D14	Data bus	
22	D15	Data bus	
23	WAIT	Wait Signal Output(H:active)	
24	NC	No connection	
25	CS	Chip select	
26	RST	Hardware reset	
27	L/R	Left / right selection; Default L/R=H	Note 2,3
28	U/D	Up/down selection; ; Default U/D=L	Note 2,3
29	NC	No connection	
30	NC	No connection	
31	NC	No connection	
32	NC	No connection	
33	VLED-	Power for LED backlight cathode(GND)	
34	VLED-	Power for LED backlight cathode(GND)	
35	VLED+	Power for LED backlight anode(+5V)	
36	VLED+	Power for LED backlight anode(+5V)	

Note1: When select 8bit mode, DB0~DB7 be used, DB8~DB15 no connect
When select 16bit mode, DB0~DB15 be used

Note 2: Selection of scanning mode

Setting of scan control input		Scanning direction
U/D	L/R	
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

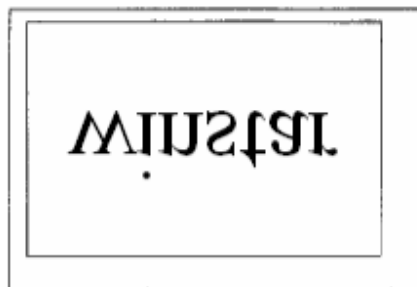
Note 3: Definition of scanning direction.Refer to the figure as below:



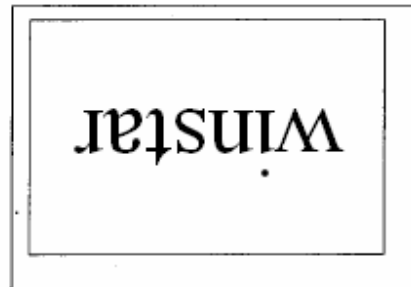
U/D=L, L/R=H



U/D=L, L/R=L

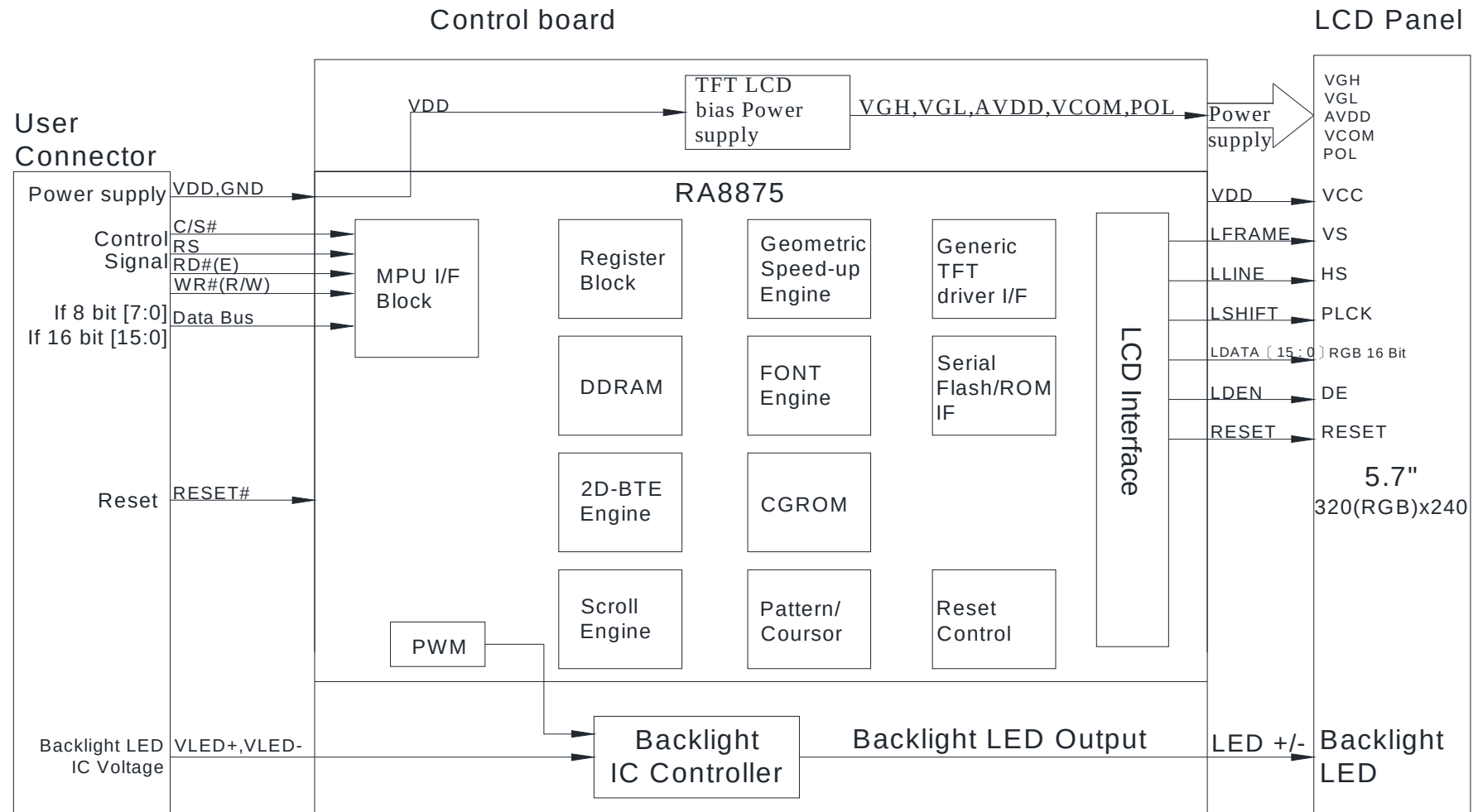


U/D=H, L/R=H



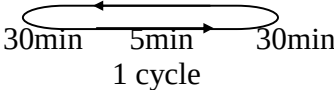
U/D=H, L/R=L

10. Block Diagram



11. Reliability

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

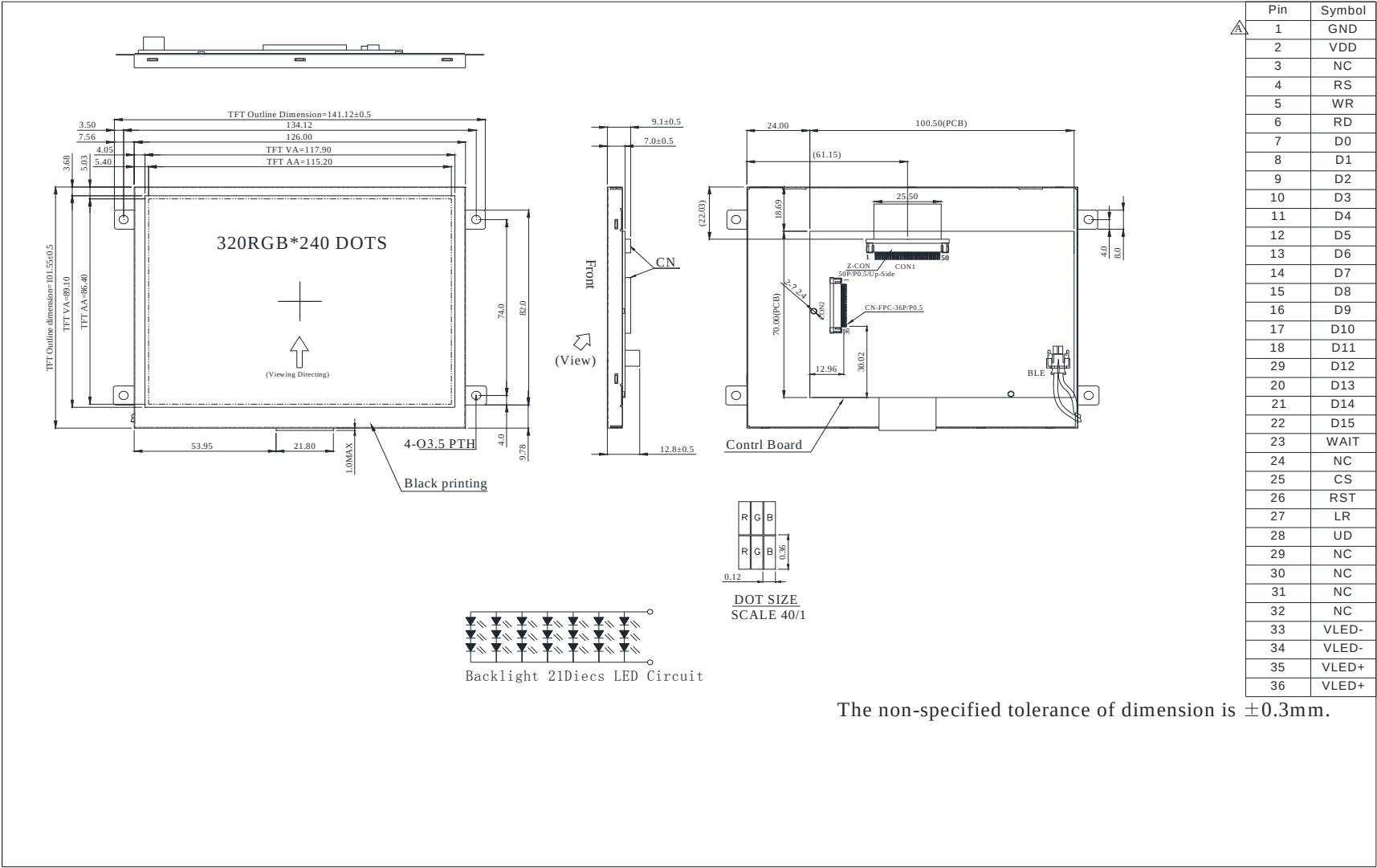
Environmental Test			
Test Item	Content of Test	Test Condition	Note
High Temperature storage	Endurance test applying the high storage temperature for a long time.	80°C 200hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30°C 200hrs	1,2
High Temperature 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 For 96hrs under no-load condition excluding the polarizer, Then taking it out and drying it at normal temperature.	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 	-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.

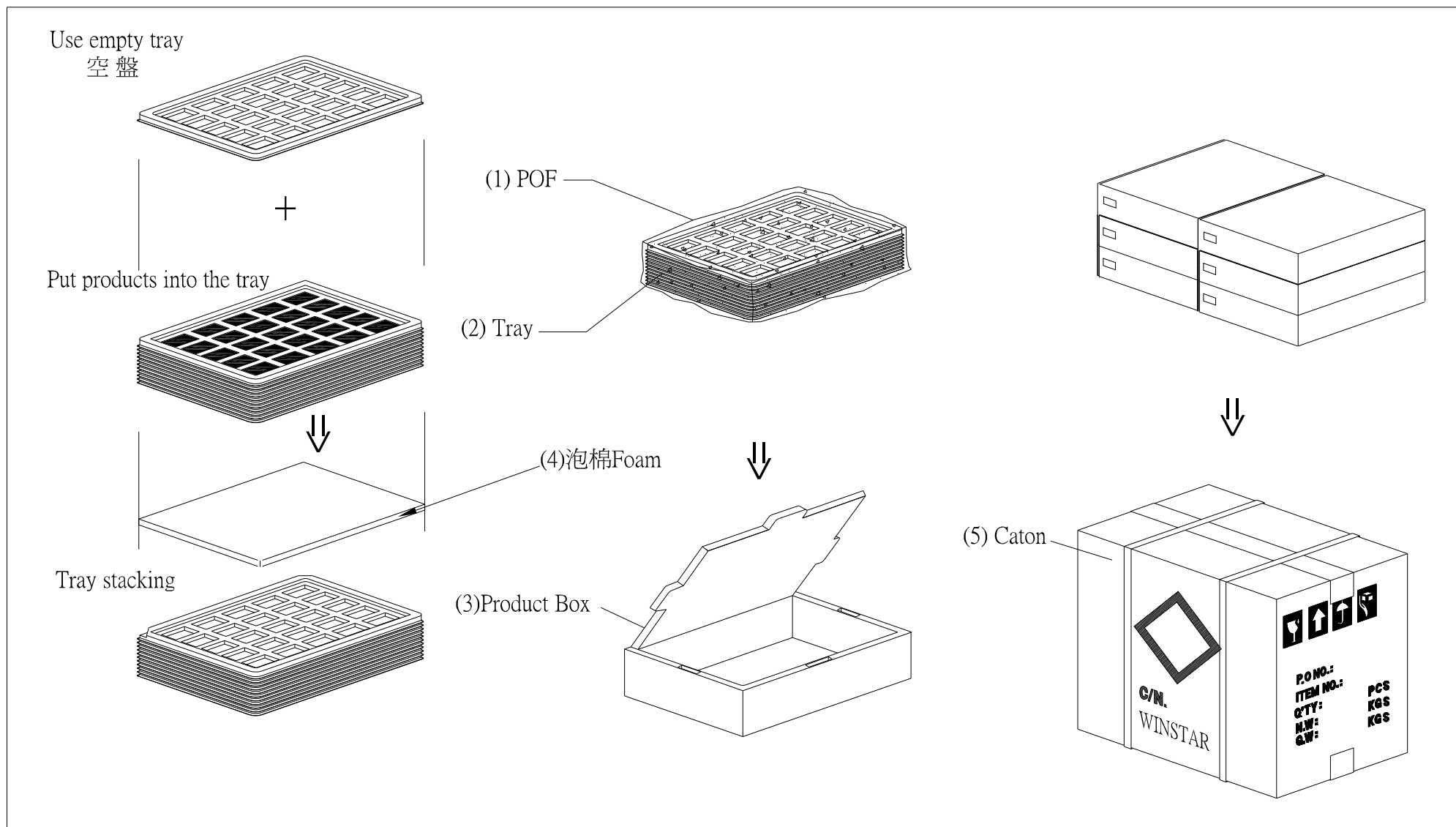
12.Contour Drawing



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

13. PACKAGE SPECIFICATION

LCM ModelWF57PTIBCDBN0# Drawing NO.		LCM 包裝規格書 LCM Packaging Specifications		Approve Check Contact DATE 14'02/07 初版 13'11/08 版次 Ver A	
1.包裝材料規格表（Packaging Material）:(per carton)					
NO.	Item	Model	Dimensions	Quantity	
1	成品（LCM）	WF57PTIBCDBN0#		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 tray3x no of tray5 = 15					
(2)Total LCM quantity in carton：quantity per box15x no of boxes6 = 90					
特 記 事 項 (REMARK)					
1. Label Specifications：					
MOOEL: LOT NO： QUANTITY: CHECK:					



14.Initial Code For Reference

```
void Initial_RA8875()
{
    RES = 1;
    Delay1ms (10);
    RES = 0;          //Active low
    Delay1ms (50);
    RES = 1;
    Delay1ms (100);

    LCD_CmdWrite(0x88);
    LCD_DataWrite(0x0a);
    Delay1ms(1);
    LCD_CmdWrite(0x89);
    LCD_DataWrite(0x02);
    Delay1ms(1);

    LCD_CmdWrite(0x10);
    LCD_DataWrite(0x0F);
    LCD_CmdWrite(0x04);
    LCD_DataWrite(0x01);
    Delay1ms(1);

    //Horizontal set
    LCD_CmdWrite(0x14);
    LCD_DataWrite(0x27);
    LCD_CmdWrite(0x15);
    LCD_DataWrite(0x80);
    LCD_CmdWrite(0x16);
    LCD_DataWrite(0x03);
    LCD_CmdWrite(0x17);
    LCD_DataWrite(0x02);
    LCD_CmdWrite(0x18);
    LCD_DataWrite(0x03);

    //Vertical set
    LCD_CmdWrite(0x19);
    LCD_DataWrite(0xef);
    LCD_CmdWrite(0x1a);
    LCD_DataWrite(0x00);
    LCD_CmdWrite(0x1b);
    LCD_DataWrite(0x0f);
    LCD_CmdWrite(0x1c);
    LCD_DataWrite(0x00);
    LCD_CmdWrite(0x1d);
    LCD_DataWrite(0x0e);
    LCD_CmdWrite(0x1e);
    LCD_DataWrite(0x06);
    LCD_CmdWrite(0x1f);
```



```
LCD_DataWrite(0x01);
```

```
//Active window set  
//setting active window X  
LCD_CmdWrite(0x30);  
LCD_DataWrite(0x00);  
LCD_CmdWrite(0x31);  
LCD_DataWrite(0x00);  
LCD_CmdWrite(0x34);  
LCD_DataWrite(0x3F);  
LCD_CmdWrite(0x35);  
LCD_DataWrite(0x01);
```

```
//setting active window Y  
LCD_CmdWrite(0x32);  
LCD_DataWrite(0x00);  
LCD_CmdWrite(0x33);  
LCD_DataWrite(0x00);  
LCD_CmdWrite(0x36);  
LCD_DataWrite(0xeF);  
LCD_CmdWrite(0x37);  
LCD_DataWrite(0x00);
```

```
}
```



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 <<



Winstar

Module Number : _____

Page: 2

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 : / /