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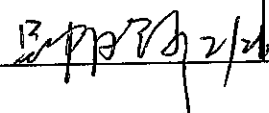
SPECIFICATION

CUSTOMER : _____

MODULE NO.: **WF70HTIFGDANO#**

未出样, 参数仅供参考

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

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
		 2013.2.21 	叶慧芬
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DOC. FIRST ISSUE

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2013.2.21		First issue

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1. Module Classification Information

W F 70 H T I F G D A N 0 #
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬

①	Brand : WINSTAR DISPLAY CORPORATION						
②	Display Type : H→Character Type, G→Graphic Type F→TFT Type						
③	Display Size : 7.0 ” TFT						
④	Model serials no.						
⑤	Backlight Type :		F→CCFL, White			T→LED, White	
⑥	LCD Polarize Type/ Temperature range/ Gray Scale Inversion Direction		I→Transmissive, W. T, 6:00 L→Transmissive, W.T,12:00				
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	
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 7.0' color TFT-LCD panel. The 7.0' 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 Specification

Item	Dimension	Unit
Dot Matrix	800 x RGB x 480(TFT)	dots
Module dimension	165.0(W) x 104.8(H) x 5.2(D)	mm
Active area	152.4 x 91.44	mm
Dot pitch	0.0635x0.1905	mm
LCD type	TFT, Negative, Transmissive	
View Direction	12 o'clock	
Gray Scale Inversion Direction	6 o'clock	
Backlight Type	LED, Normally White	

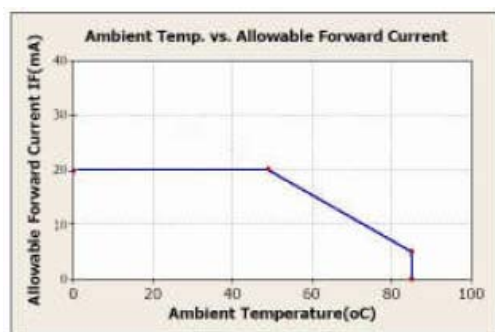
*Color tone slight changed by temperature and driving voltage.

4.Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	T _{OP}	-20	—	+70	°C
Storage Temperature	T _{ST}	-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

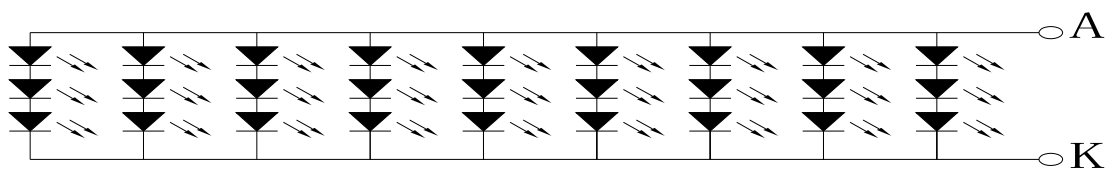
5.1. Operating conditions:

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	VCC	—	3.0	3.3	3.6	V

5.2 LED driving conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current		-	180	-	mA	
Power Consumption			1746	1890	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



Backlight LED Circuit

Note 2 : Ta = 25 °C

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

Note 4 : The single LED lamp case

6. DC Characteristics

Parameter	Symbol	Rating			Unit	Condition
		Min.	Typ.	Max.		
Low level input voltage	V _{IL}	0	-	0.3 VCC	V	
Hight level input voltage	V _{IH}	0.7 VCC	-	VCC	V	

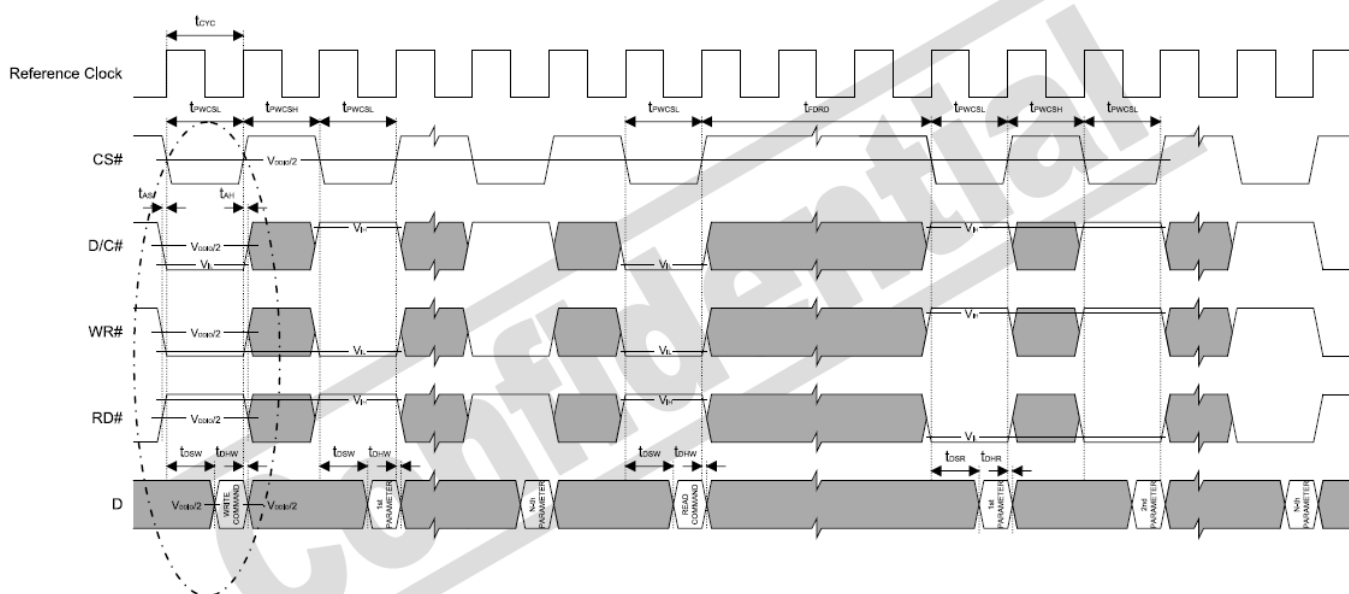
7. Interface Timing

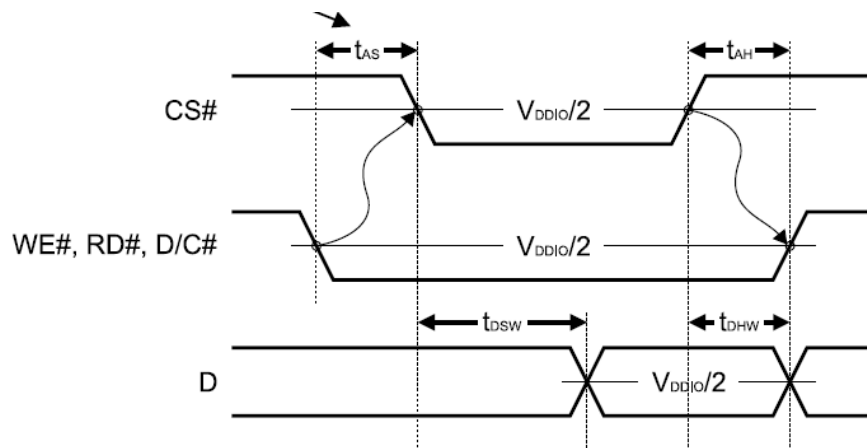
7.1.1 8080 Mode

The 8080 mode MCU interface consist of CS#, D/C#, RD#, WR#, D[23:0] and TE signals (Please refer to Table 6-1 for pin multiplexed with 6800 mode). 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#.

7.1.2 8080 Mode Write Cycle

Symbol	Parameter	Min	Typ	Max	Unit
t_{cyc}	Reference Clock Cycle Time	9	-	-	ns
t_{PWCSL}	Pulse width CS# low	1	-	-	t_{cyc}
t_{PWCSH}	Pulse width CS# high	1	-	-	t_{cyc}
t_{FDRD}	First Read Data Delay	5	-	-	t_{cyc}
t_{AS}	Address Setup Time	1	-	-	ns
t_{AH}	Address Hold Time	1	-	-	ns
t_{DSW}	Data Setup Time	4	-	-	ns
t_{DHW}	Data Hold Time	1	-	-	ns
t_{DSR}	Data Access Time	-	-	5	ns
t_{DHR}	Output Hold time	1	-	-	ns





7.1.3 Pixel Data Format

Interface	Cycle	D[23]	D[22]	D[21]	D[20]	D[19]	D[18]	D[17]	D[16]	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]
24 bits	1 st	R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
18 bits	1 st							R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0
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									R5	R4	R3	R2	R1	R0	X	X	G5	G4	G3	G2	G1	G0	X	X
	2 nd									B5	B4	B3	B2	B1	B0	X	X	R5	R4	R3	R2	R1	R0	X	X
	3 rd									G5	G4	G3	G2	G1	G0	X	X	B5	B4	B3	B2	B1	B0	X	X
9 bits	1 st																R5	R4	R3	R2	R1	R0	G5	G4	G3
	2 nd																G2	G1	G0	B5	B4	B3	B2	B1	B0
8 bits	1 st																	R5	R4	R3	R2	R1	R0	X	X
	2 nd																	G5	G4	G3	G2	G1	G0	X	X
	3 rd																	B5	B4	B3	B2	B1	B0	X	X

X: Don't Care

8. Optical Characteristics

Item		Symbol	Condition.	Min	Typ.	Max.	Unit	Remark
Response time		Tr	$\theta =0^{\circ}$ 、 $\Phi =0^{\circ}$	-	10	20	.ms	Note 3
		Tf		-	15	30	.ms	
Contrast ratio		CR	At optimized viewing angle	100	-	-	-	Note 4
Color Chromaticity	White	W _x	$\theta =0^{\circ}$ 、 $\Phi =0$	0.22	0.27	0.32		Note 2,5,6
		W _y		0.23	0.28	0.33		
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		-	-	350	-	500	cd/m ²	Center of display

Ta=25±2°C, IL=20mA

Note 1: Definition of viewing angle range

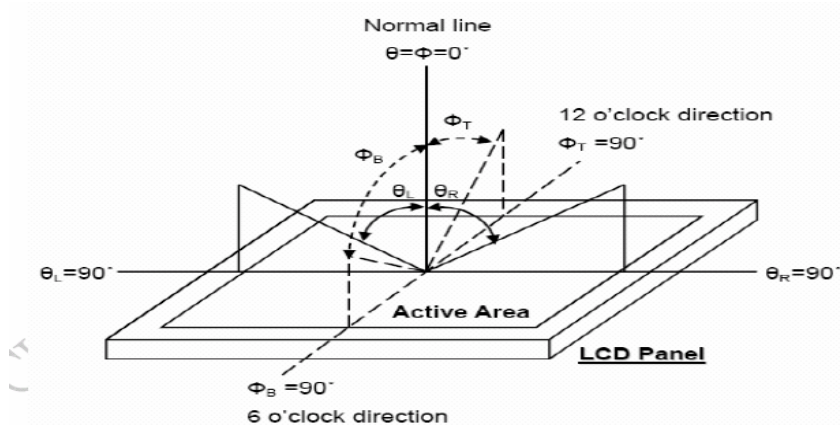


Fig. 8-1 Definition of viewing angle

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

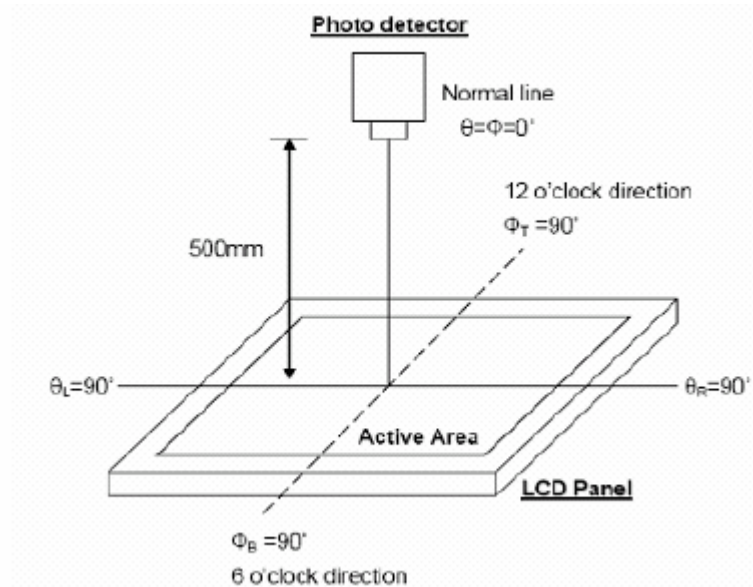
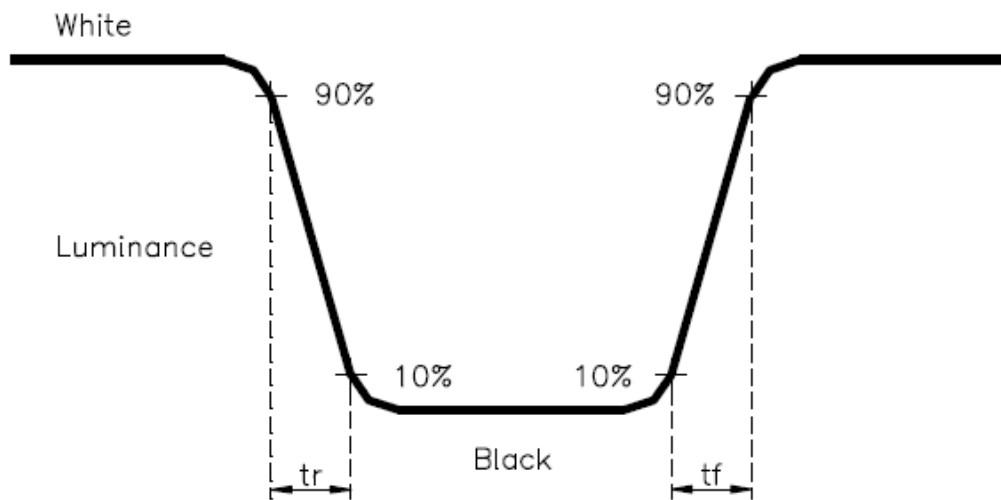


Fig. 8-2 Optical measurement system setup

Note 3: Definition of Response time:

Definition of response time : The response time is defined as the time interval between the 10% and 90% amplitudes.



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: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

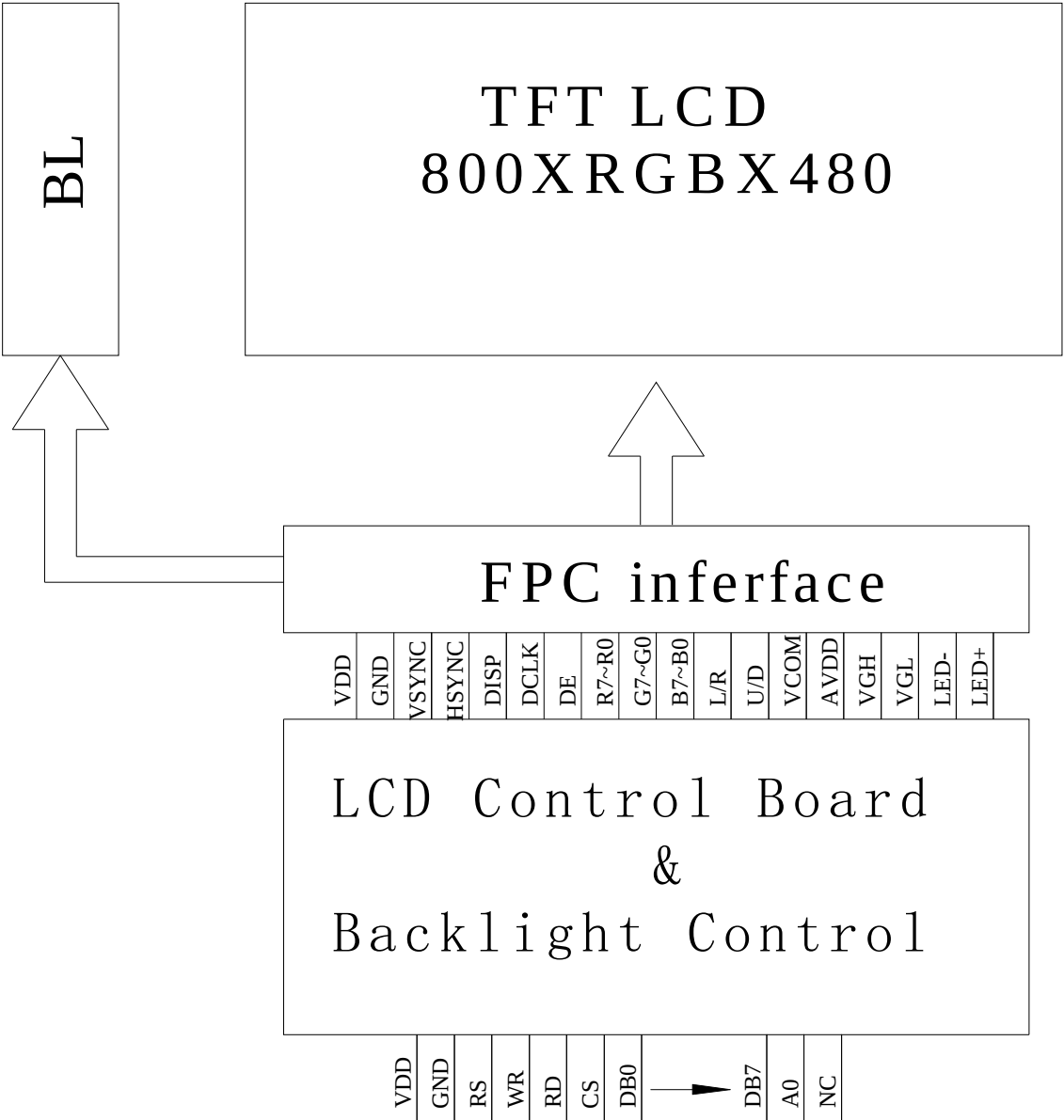
Note 6: All input terminals LCD panel must be ground while measuring the center area of the panel.

9. Interface

9.1. LCM PIN Definition

Pin	Symbol	I/O	Function	Remark
1	GND		Power Ground	
2	VDD		Power Supply : +3.3V	
3	NC		No connect	
4	A0		display data	
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	NC		No connect	
17	NC		No connect	
18	RST		Hardware reset	
19	NC		No connect	
20	NC		No connect	

10. BLOCK DIAGRAM



11. Reliability

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

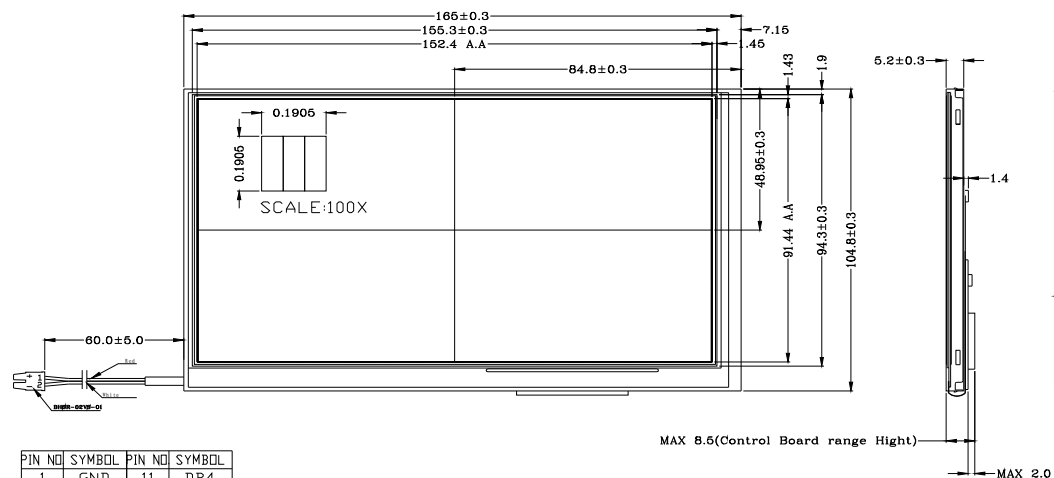
Environmental Test			
Test Item	Content of Test	Test Condition	Note
High Temperature storage	Endurance test applying the high storage temperature for a long time.	80°C 200hrs	2
Low Temperature storage	Endurance test applying the high storage temperature for a long time.	-30°C 200hrs	1,2
High Temperature 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 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 : 3 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.

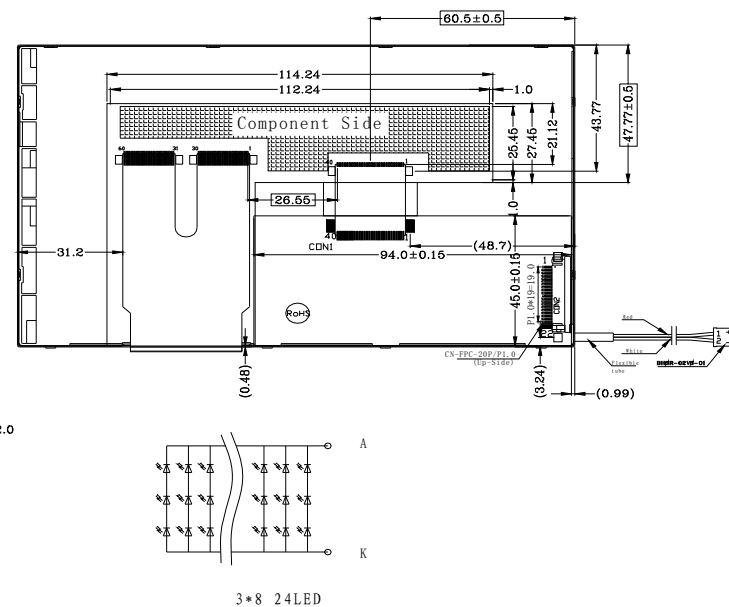
Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.

Note3: Vibration test will be conducted to the product itself without putting it in a container.

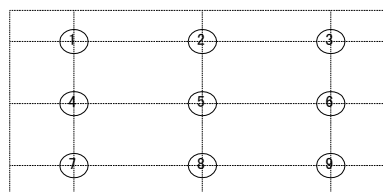
12. Contour Drawing



PIN NO	SYMBOL	PIN NO	SYMBOL
1	GND	11	DB4
2	VDD	12	DB5
3	NC	13	DB6
4	A0	14	DB7
5	WR	15	CS
6	RD	16	NC
7	DB0	17	NC
8	DB1	18	RST
9	DB2	19	NC
10	DB3	20	NC



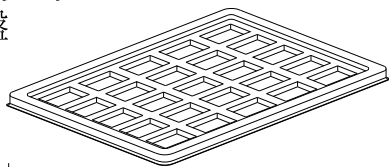
重要尺寸!
The non-specified tolerance of dimension is $\pm 0.3\text{mm}$.



13. Package specification

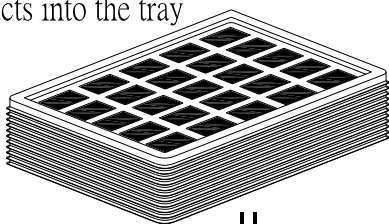
<table><tr><td>LCM Model</td><td>WF70HTIFGDAN0#</td></tr><tr><td>Drawing NO.</td><td></td></tr></table>		LCM Model	WF70HTIFGDAN0#	Drawing NO.		LCM 包裝規格書 LCM Packaging Specifications	<table><tr><td>Approve</td><td>Check</td><td>Contact</td></tr><tr><td></td><td></td><td></td></tr><tr><td>DATE</td><td>初版</td><td>版次 Ver</td></tr><tr><td>13'2/20</td><td>13'2/20</td><td>0</td></tr></table>	Approve	Check	Contact				DATE	初版	版次 Ver	13'2/20	13'2/20	0
LCM Model	WF70HTIFGDAN0#																		
Drawing NO.																			
Approve	Check	Contact																	
DATE	初版	版次 Ver																	
13'2/20	13'2/20	0																	
1.包裝材料規格表（Packaging Material）:(per carton)																			
NO.	Item	Model	Dimensions	Quantity															
1	成品（LCM）	WF70HTIFGDAN0#	165 x 104.8 x 5.2	TBD															
2	TRAY 盤 (2)	TBD	TBD	TBD															
3	BP01 內盒(3)Product Box	PK3R1XXXXXXXXXXXX0001	332 x 280 x 100	TBD															
4	泡棉(4)Foam	-----	283 x 230 x 8	TBD															
5	外紙箱(5)Carton	PK4Q1XXXXXXXXXXXX0000	565 x 340 x 320	TBD															
6																			
7																			
8																			
9																			
2.單箱數量規格表(Packaging Specifications and Quantity) :																			
(1)LCM quantity per box : no per tray TBD x no of tray TBD = TBD																			
(2)Total LCM quantity in carton : quantity per box TBD x no of boxes TBD = TBD																			
特 記 事 項 (REMARK)																			
1. Label Specifications : <table><tr><td>MOOEL: LOT NO : QUANTITY: CHECK:</td></tr></table>		MOOEL: LOT NO : QUANTITY: CHECK:																	
MOOEL: LOT NO : QUANTITY: CHECK:																			

Use empty tray
空盤

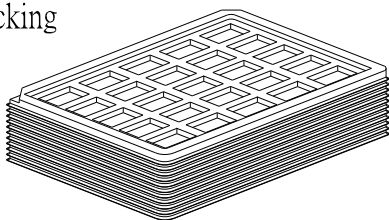


+

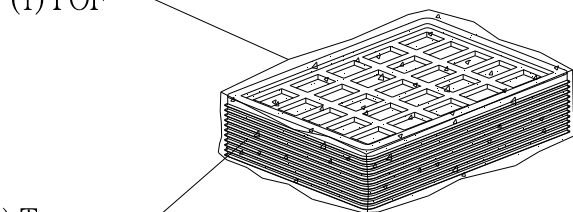
Put products into the tray



Tray stacking



(1) POF

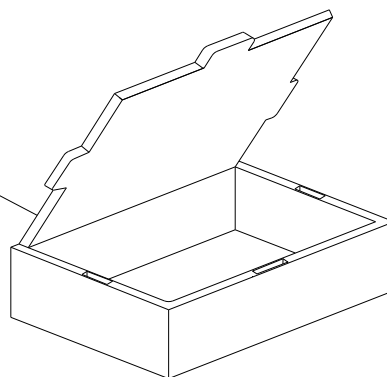


(2) Tray

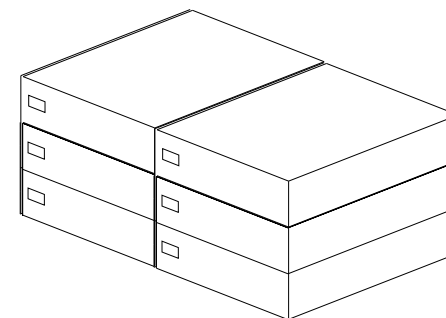
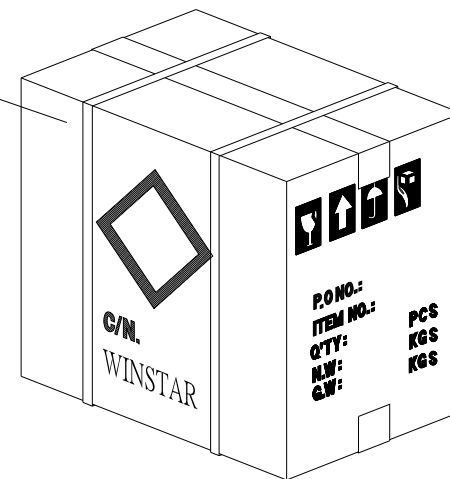
(4) 泡棉Foam



(3) Product Box



(5) Caton



14. Initial Code For Reference

```
void Initial_code()  
{  
    TBD  
}
```



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 <<



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 : / /