



Winstar Display Co., LTD

華凌光電股份有限公司



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SPECIFICATION

CUSTOMER : _____

MODULE NO.: WF43GTIAEDNNO#

APPROVED BY: (FOR CUSTOMER USE ONLY)	 PCB VERSION: DATA:
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SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
			黃升杰
ISSUED DATE: 2013. 11. 25			

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



DOC. FIRST ISSUE

VERSION

DATE _____

REVISÉ
PAGE NO.

SUMMARY

$$\begin{array}{c} 0 \\ 1 \end{array}$$

2012.11.9
2013.11.25

8

First issue
Modify the brightness specifications

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1. Module Classification Information

W F 43 G T I A E D N 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 : 4.3 ” TFT
- ④ Model serials no.
- ⑤ Backlight Type : F→CCFL, White T→LED, White
- ⑥ LCD Polarize I→Transmissive, W. T, 6:00
Type/ Temperature L→Transmissive, W.T,12:00
range/ Gray Scale
Inversion Direction
- ⑦ A : TFT LCD G : TFT+FR
B : TFT+FR+CONTROL BOARD H : TFT+D/V BOARD
C : TFT+FR+A/D BOARD I : TFT+FR+D/V BOARD
D : TFT+FR+A/D BOARD+CONTROL BOARD J : TFT+POWER BD
E : TFT+FR+POWER BOARD
F : TFT+CONTROL BOARD
- 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 4.3' color TFT-LCD panel. The 4.3' 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	480 x RGBx272(TFT)	dots
Module dimension	105.5(W) x 67.2(H) x 2.95(D)	mm
Active area	95.04 x 53.86	mm
Dot pitch	0.066 x 0.198	mm
LCD type	TFT, Negative, Transmissive	
View Direction	12 o'clock	
Gray Scale Inversion Direction	6 o'clock	
Backlight Type	LED, Normally White	

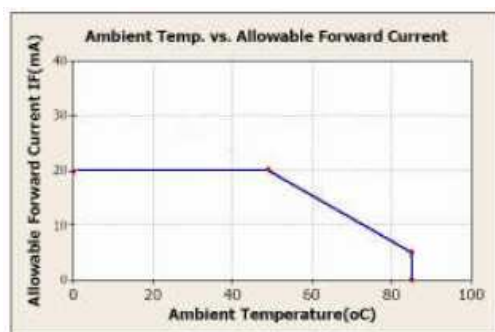
*Color tone slight changed by temperature and driving voltage.

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

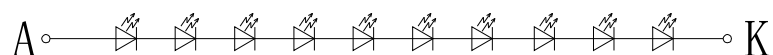
5.1. Operating conditions:

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	VCC	—	3.1	3.3	3.5	V
Digital operation current	Icc	-		17	25	mA

5.2 LED driving conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current		-	20	-	mA	
Power Consumption			640	680	mW	
LED voltage	VBL+	30	32	34	V	Note 1
LED Life Time		-	50,000	-	Hr	Note 2,3,4

Note 1 : There are 1 Groups LED



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

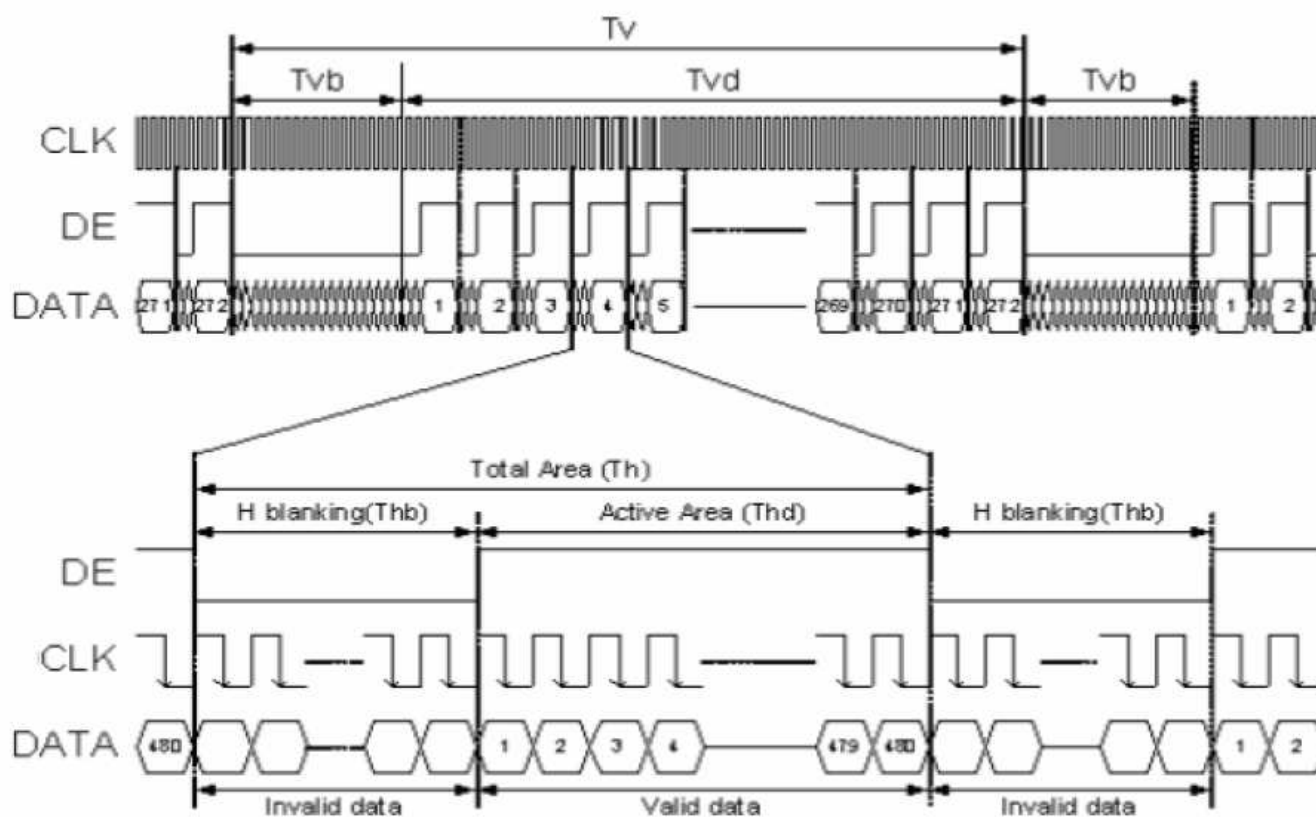
Parameter	Symbol	Rating			Unit	Condition
		Min.	Typ.	Max.		
Low level input voltage	V _{IL}	0	-	0.3 VCC	V	
Hight level input voltage	V _{IH}	0.7 VCC	-	VCC	V	

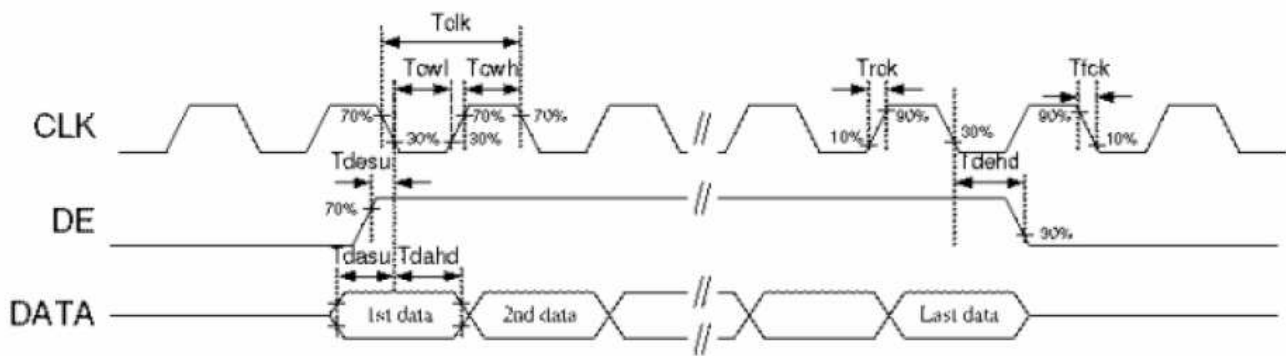
7. AC Characteristics

Parallel DE mode RGB input timing table

Signal	Symbol	Min	Typ	Max	Unit
CLK frequency	Tcl	7	9	12	MHz
DEV period time	Tv	277	288	400	H
DEV display area	Tvd	272			H
DEV blanking	Tvb	5	16	128	H
DEH period time	Th	520	525	800	CLK
DEH display area	Thd	480			CLK
DEH blanking	Thb	40	45	320	CLK
CLK cycle time	Tclk	83	110	143	ns
Clock width of high level	Tcwh	40	50	60	%
Clock width of low level	Tcwl	40	50	60	%
Clock rising time	trck		-	9	ns
Clock falling time	tfck		-	9	ns
Data Setup Time	tdesu	10	-	-	ns
Data Hold Time	tdahd	10	-	-	ns
DE Setup Time	tdesu	10	-	-	ns
DE Hold Time	tdehd	10	-	-	ns

7.1 Timing Diagram





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	400	500	-	-	Note 4
Color Chromaticity	White	$\theta = 0^\circ$ 、 $\Phi = 0$	0.24	0.29	0.34		Note 2,5
	Wy		0.26	0.31	0.36		
Viewing angle	Hor.	ΘR	60	70		Deg.	Note 1
		ΘL	60	70			
	Ver.	ΦT	40	50			
		ΦB	60	70			
Brightness	-	-	400	500	-	cd/m ²	Center of display

Ta=25±2°C, IL=20mA

Note 1: Definition of viewing angle range

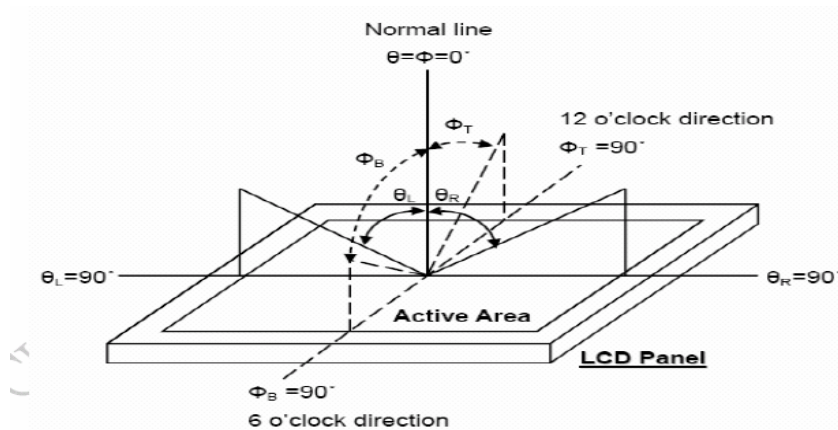


Fig. 8-1 Definition of viewing angle

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.

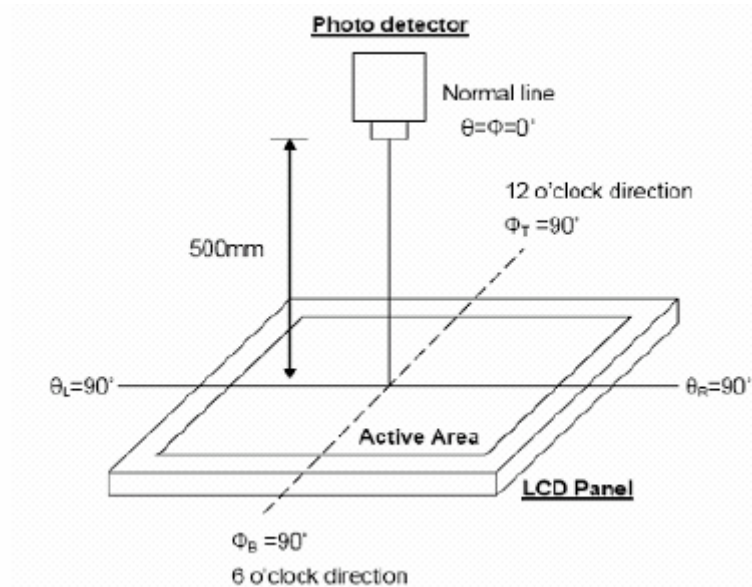


Fig. 8-2 Optical measurement system setup

Note 3: Definition of Response time:

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%.

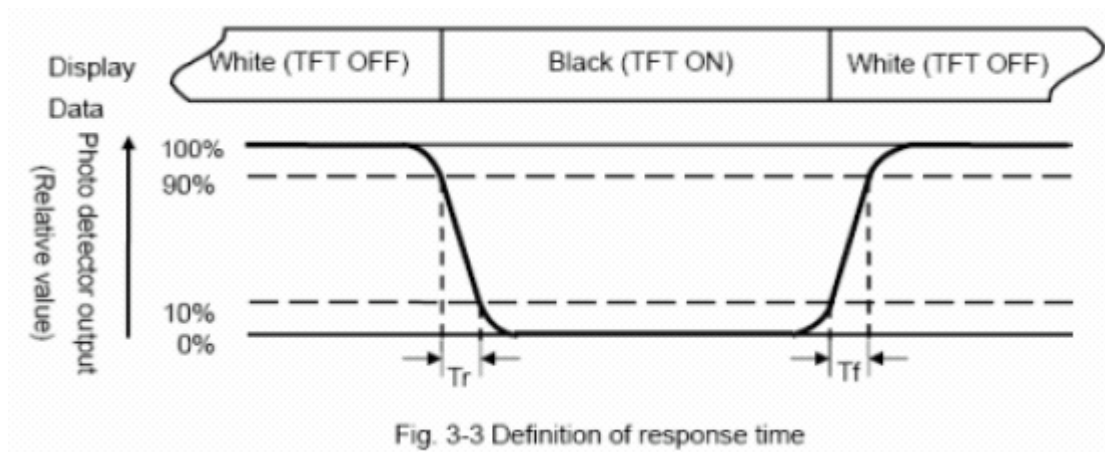


Fig. 3-3 Definition of response time

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.

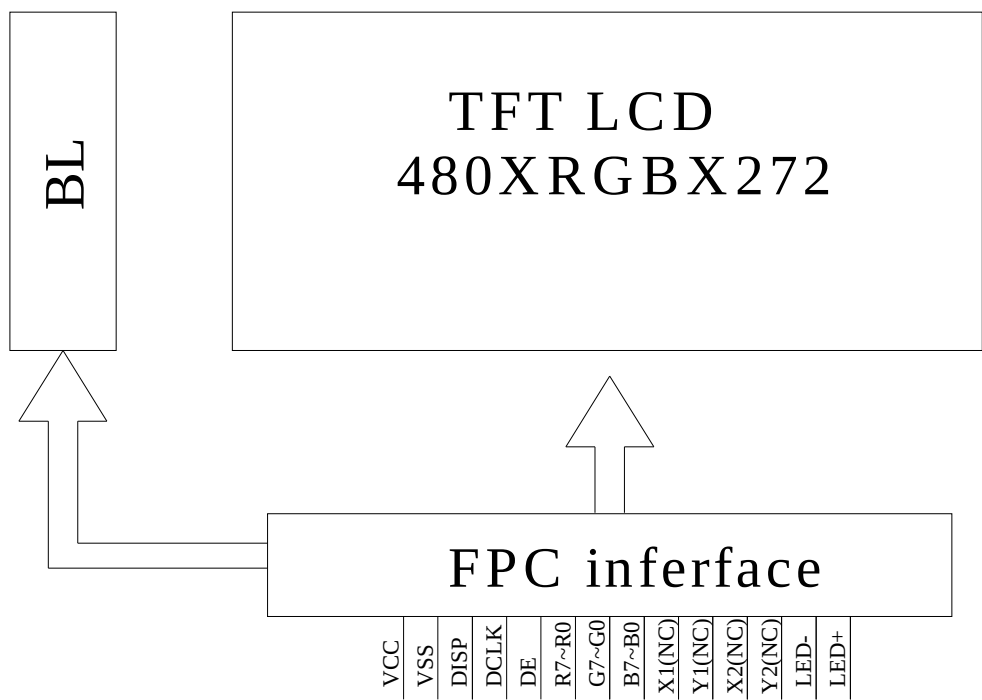
Note 6: All input terminals LCD panel must be ground while measuring the center area of the panel.

9. Interface

9.1. LCM PIN Definition

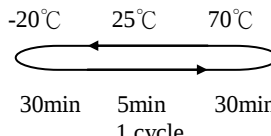
Pin	Symbol	I/O	Function	Remark
1	LED-	P	Power for LED backlight cathode	
1	LED+	P	Power for LED backlight anode	
3	GND	P	Power ground	
4	VDD	P	Power voltage	
5	R0	I	Red data (LSB)	
6	R1	I	Red data	
7	R2	I	Red data	
8	R3	I	Red data	
9	R4	I	Red data	
10	R5	I	Red data	
11	R6	I	Red data	
12	R7	I	Red data (MSB)	
13	G0	I	Green data (LSB)	
14	G1	I	Green data	
15	G2	I	Green data	
16	G3	I	Green data	
17	G4	I	Green data	
18	G5	I	Green data	
19	G6	I	Green data	
20	G7	I	Green data (MSB)	
21	B0	I	Blue data (LSB)	
22	B1	I	Blue data	
23	B2	I	Blue data	
24	B3	I	Blue data	
25	B4	I	Blue data	
26	B5	I	Blue data	
27	B6	I	Blue data	
28	B7	I	Blue data (MSB)	
29	GND	P	Power ground	
30	CLK	I	Pixel clock	
31	DISP	I	Display on/off	
32	NC	-	No connection	
33	NC	-	No connection	
34	DE	I	Data Enable	
35	NC	-	No connection	
36	GND	P	Power ground	
37	NC	-	No connection	
38	NC	-	No connection	
39	NC	-	No connection	
40	NC	-	No connection	

10. BLOCK DIAGRAM



11. Reliability

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

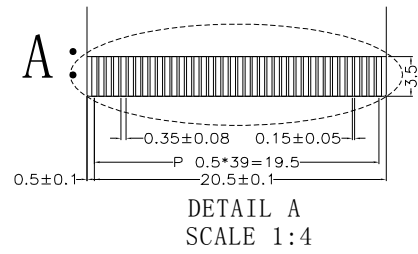
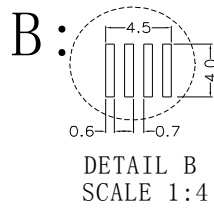
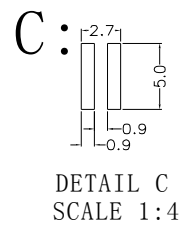
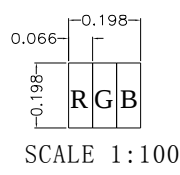
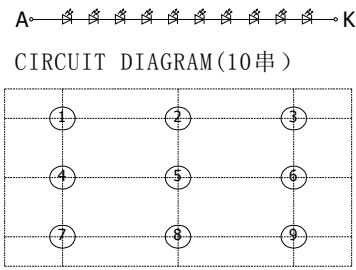
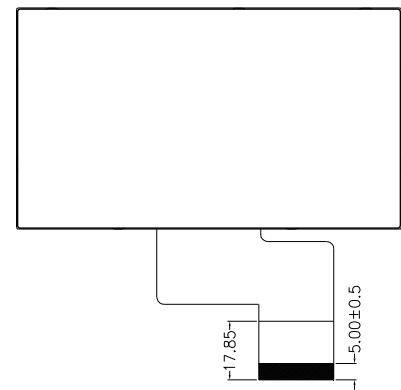
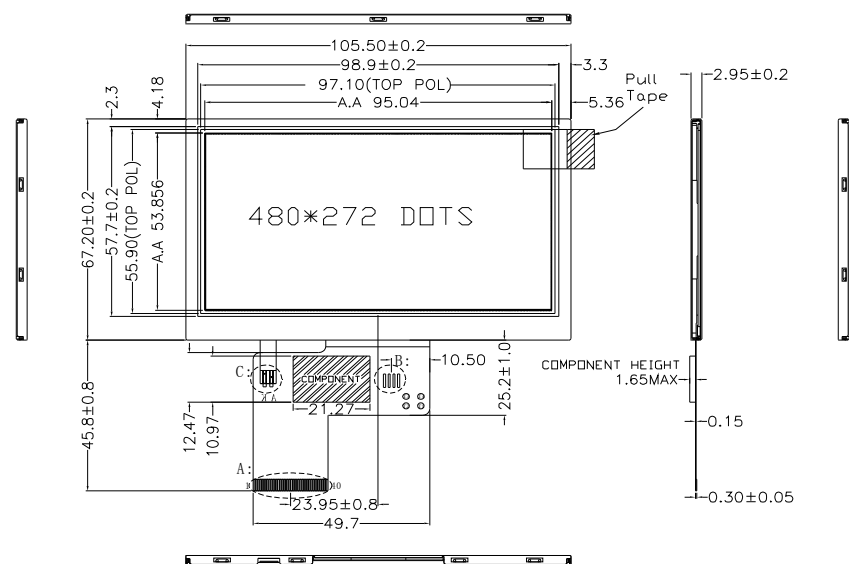
Environmental Test			
Test Item	Content of Test	Test Condition	Note
High Temperature storage	Endurance test applying the high storage temperature for a long time.	80℃ 200hrs	2
Low Temperature storage	Endurance test applying the high storage temperature for a long time.	-30℃ 200hrs	1,2
High Temperature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



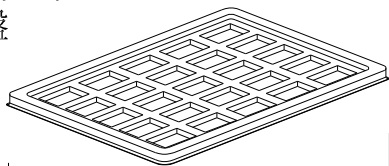
PIN NO.	SYMBOL
1	LED-
2	LED+
3	GND
4	VDD
5	R0
6	R1
7	R2
8	R3
9	R4
10	R5
11	R6
12	R7
13	G0
14	G1
15	G2
16	G3
17	G4
18	G5
19	G6
20	G7
21	B0
22	B1
23	B2
24	B3
25	B4
26	B5
27	B6
28	B7
29	GND
30	CLK
31	DISP
32	NC
33	NC
34	DE
35	NC
36	GND
37	NC
38	NC
39	NC
40	NC

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

13. Package specification

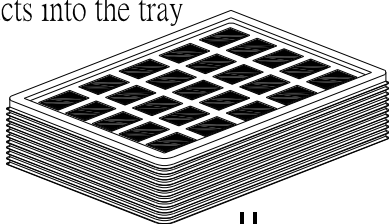
<table><tr><td>LCM Model</td><td>WF43GTIAEDNN0#</td></tr><tr><td>Drawing NO.</td><td></td></tr></table>		LCM Model	WF43GTIAEDNN0#	Drawing NO.		LCM 包裝規格書 LCM Packaging Specifications	<table><tr><td>Approve</td><td>Check</td><td>Contact</td></tr><tr><td></td><td></td><td></td></tr><tr><td>DATE</td><td>初版</td><td>版次 Ver</td></tr><tr><td>12'11/15</td><td>12'11/15</td><td>0</td></tr></table>	Approve	Check	Contact				DATE	初版	版次 Ver	12'11/15	12'11/15	0
LCM Model	WF43GTIAEDNN0#																		
Drawing NO.																			
Approve	Check	Contact																	
DATE	初版	版次 Ver																	
12'11/15	12'11/15	0																	
1.包裝材料規格表（Packaging Material）:(per carton)																			
NO.	Item	Model	Dimensions	Quantity															
1	成品（LCM）	WF43GTIAEDNN0#	105.5 x 67.2 x 2.95	396															
2	TRAY 盤 (2)	PKCA1XXXXXXXXXXXXX0233	315 x 265 x 13.5	66															
3	BP01 內盒(3)Product Box	PK3R1XXXXXXXXXXXXX0001	332 x 280 x 100	6															
4	泡棉(4)Foam	-----	283 x 230 x 8	6															
5	外紙箱(5)Carton	PK4Q1XXXXXXXXXXXXX0000	565 x 340 x 320	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 6 x no of tray 11 = 66																			
(2)Total LCM quantity in carton : quantity per box 66 x no of boxes 6 = 396																			
特 記 事 項 (REMARK)																			
1. Label Specifications : <table><tr><td>MOOEL:</td></tr><tr><td>LOT NO :</td></tr><tr><td>QUANTITY:</td></tr><tr><td>CHECK:</td></tr></table>		MOOEL:	LOT NO :	QUANTITY:	CHECK:	2.Rotate tray 180 degrees and place on top of stack. (TRAY 盤相疊時,需旋轉 180 度)													
MOOEL:																			
LOT NO :																			
QUANTITY:																			
CHECK:																			

Use empty tray
空盤

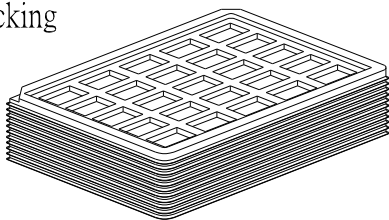


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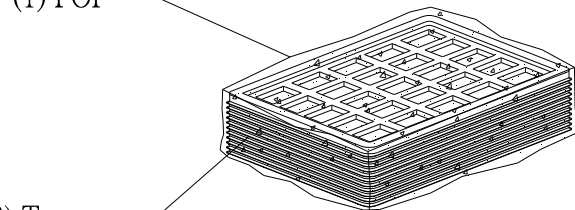
Put products into the tray



Tray stacking



(1) POF

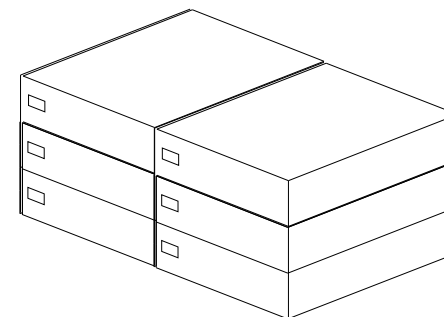
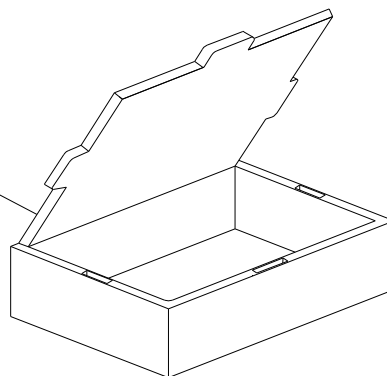


(2) Tray

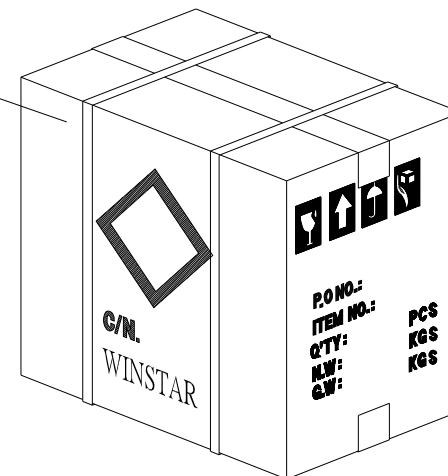
(4) 泡棉Foam



(3) Product Box



(5) Caton





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：_____/_____/_____