SPECIFICATION

CUSTOMER :

MODULE NO.:   **WF101ATCAHLNNZ#**

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

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
			葉虹蘭
ISSUED DATE: 2015/01/27			

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

RECORDS OF REVISION			DOC. FIRST ISSUE	
VERSION	DATE	REVISED PAGE NO.	SUMMARY	
0	2015/01/27		First issue	

Contents

1.Module Classification Information

W	F	101	A	T	C	A	H	L	N	N	Z	#
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：10.1'' TFT	
④	Model serials no.	
⑤	Backlight Type：	F→CCFL, White　　　　　　　T→LED, White S→LED, High Light 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

	Solution:							
⑧	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 10.1' color TFT-LCD panel. The 10.1' 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	10.1	inch
Dot Matrix	1024 RGB X 600	dots
Module dimension	235(W) x143(H) x 3.0(D)	mm
Active area	222.72 (H) x 125.28(V)	mm
Dot pitch	0.2175(W) x 0.2088(H)	mm
LCD type	TFT, Normally White, Transmissive	
View Direction	12 o'clock	
Gray Scale Inversion Direction	6 o'clock	
Backlight Type	LED,Normally White	
With /Without TP	Without TP	
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	-10	—	+60	℃
Storage Temperature	TST	-20	—	+70	℃

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℃
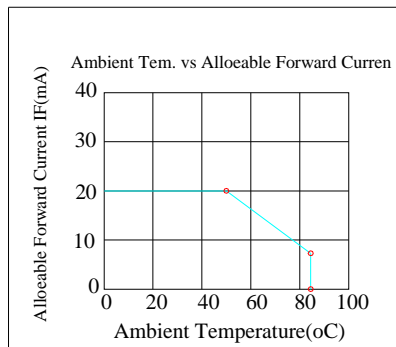
5.Electrical Characteristics

5.1. Typical Operation Conditions (At Ta = 25 ℃,)

ITEM	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
Digital Power Supply Voltage For LCD	VDD	3	3.3	3.6	V	-
Analog Power Supply Voltage	AVDD	--	10.4	11	V	-
Gate On Power Supply Voltage	VGH	22	21	20	V	-
Gate Off Power Supply Voltage	VGL	-8.5	-8	-7	V	-
Common Power Supply Voltage	VCOM	--	3.8	--	V	Note1
Logic Input Voltage	VIH	0.7*DVDD	-	DVDD	V	-
	VIL	GND	-	0.3*DVDD	V	

Note1.Please adjust VCOM to make the flicker level be minimum.

5.2. Backlight Driving Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Supply voltage of white LED backlight	VL	9.0	9.6	10.5	V	Note 1
Current for LED backlight	IL	135	140	150	mA	
Uniformity	△	70	75	-	%	
LED life time	-	20,000	-	-	Hr	Note2

Note 1: The LED Supply Voltage is defined by the number of LED at Ta=25℃ and IL =140mA.
Note 2: The "LEDlife time" is defined as the module brightness decrease to 50%original brightness at Ta=25℃ and IL =140mA. The LED lifetime could be decreased if operating IL is lager than 140mA.

6.Timing Characteristics

DE mode

Item	Symbol	Values			Unit	Remark
		Min.	**Typ.**	**Max.**		
Horizontal Display Area	thd	-	1024	-	DCLK	
DCLK Frequency	fclk	40.8	51.2	67.2	MHz	
One Horizontal Line	th	1114	1344	1400	DCLK	
HS Blanking	Thb+thfp	90	320	376	DCLK	
Vertical display area	tvd	-	600	-	H	
VSYNC period time	tv	610	635	800	H	
VSYNC blanking	tvb+tvfp	10	85	200	H	

7.Optical Characteristics

Item		Symbol	Condition.	Min	Typ.	Max.	Unit	Remark
Response time		Tr	$\theta=0°$ 、 $\Phi=0°$	-	4	-	.ms	Note 3
		Tf		-	4	-	.ms	Note 3
Contrast ratio		CR	At optimized viewing angle	-	600	-	-	Note 4
Color Chromaticity	White	Wx	$\theta=0°$ 、 $\Phi=0$	0.245	0.295	0.345	-	Note 2,5
		Wy		0.281	0.331	0.381	-	
Viewing angle (Gray Scale Inversion Direction)	Hor.	ΘR	CR$\geqq$10	-	65	-	Deg.	Note 1
		ΘL		-	65	-		
	Ver.	ΦT		-	55	-		
		ΦB		-	65	-		
Brightness		-	-	140	160	-	cd/m^2	Center of display

Ta=25±2℃

Note 1: Definition of viewing angle range
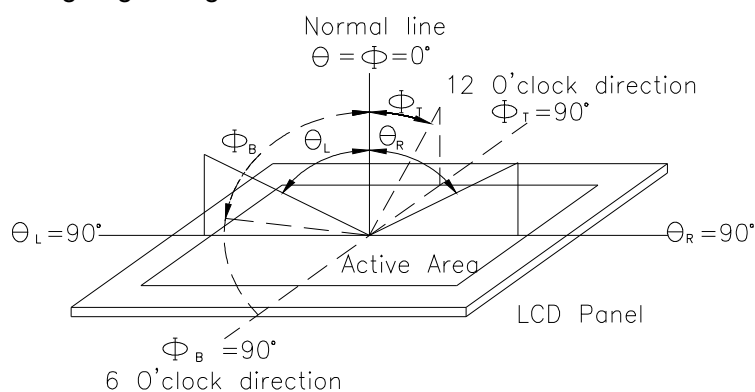
Fig. 7.1. Definition of viewing angle

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.
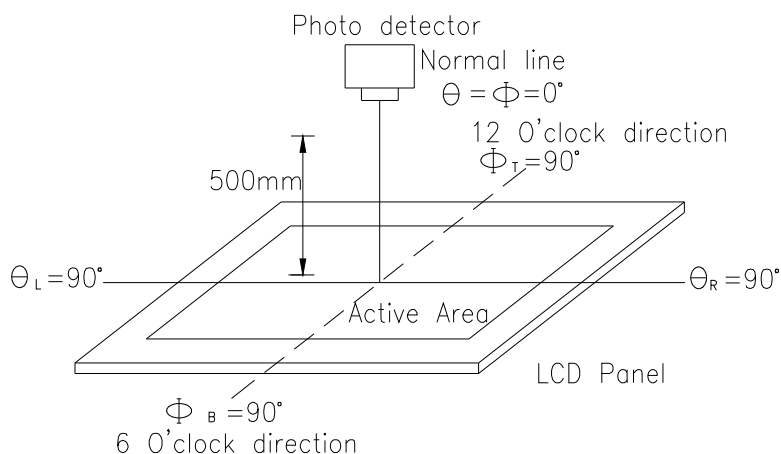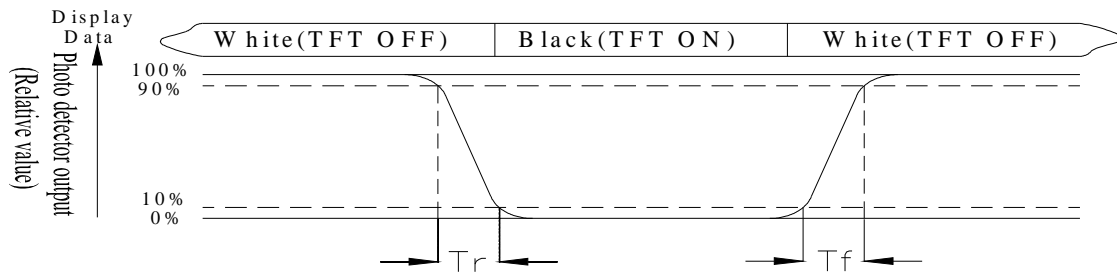

Fig. 7.2. Optical measurement system setup

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 $Vi = V_{i50} \pm 1.5V$
Black $Vi = V_{i50} \pm 2.0V$
"±" 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.
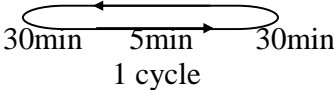
8.Interface

8.1. TFT LCD MODULE

PinNo.	Symbol	Description
1	VCOM	Common voltage
2	VDD	Digital power
3	VDD	Digital power
4	NC	Not connect
5	RESET	Global reset pin. Active low to enter reset state. Suggest to connecting with an RC reset circuit for stability. Normally pull high. (R=10KΩ，C=1μF)
6	STBYB	Standby mode, normally pull high STBYB="1", normal operation STBYB="0",timing control, source driver will turn off, all output are high-Z
7	GND	Digital ground
8	NIND0	Negative LVDS differential data inputs
9	PIND0	Positive LVDS differential data inputs
10	GND	Digital ground
11	NIND1	Negative LVDS differential data inputs
12	PIND1	Positive LVDS differential data inputs
13	GND	Digital ground
14	NIND2	Negative LVDS differential data inputs
15	PIND2	Positive LVDS differential data inputs
16	GND	Digital ground
17	NINC	Negative LVDS differential clock inputs
18	PINC	Positive LVDS differential clock inputs
19	GND	Digital ground
20	NIND3	Negative LVDS differential data inputs
21	PIND3	Positive LVDS differential data inputs
22	GND	Digital ground
23	NC	Not connect
24	NC	Not connect
25	GND	Digital ground
26	NC	Not connect
27	NC	Not connect
28	SELB	6-bit/8-bit input select SELB = L , 8-bit ; SELB = H , 6-bit
29	AVDD	Analog power
30	GND	Digital ground
31	VLED-	LED Cathode
32	VLED-	LED Cathode
33	SHLR	Left or right display control
34	UPDN	Up / down display control
35	VGL	Negative power for TFT
36	NC	Not connect
37	NC	Not connect

38	VGH	Positive power for TFT
39	VLED+	LED Anode
40	VLED+	LED Anode

9.Reliability

Content of Reliability Test (Wide temperature, -10℃~60℃)

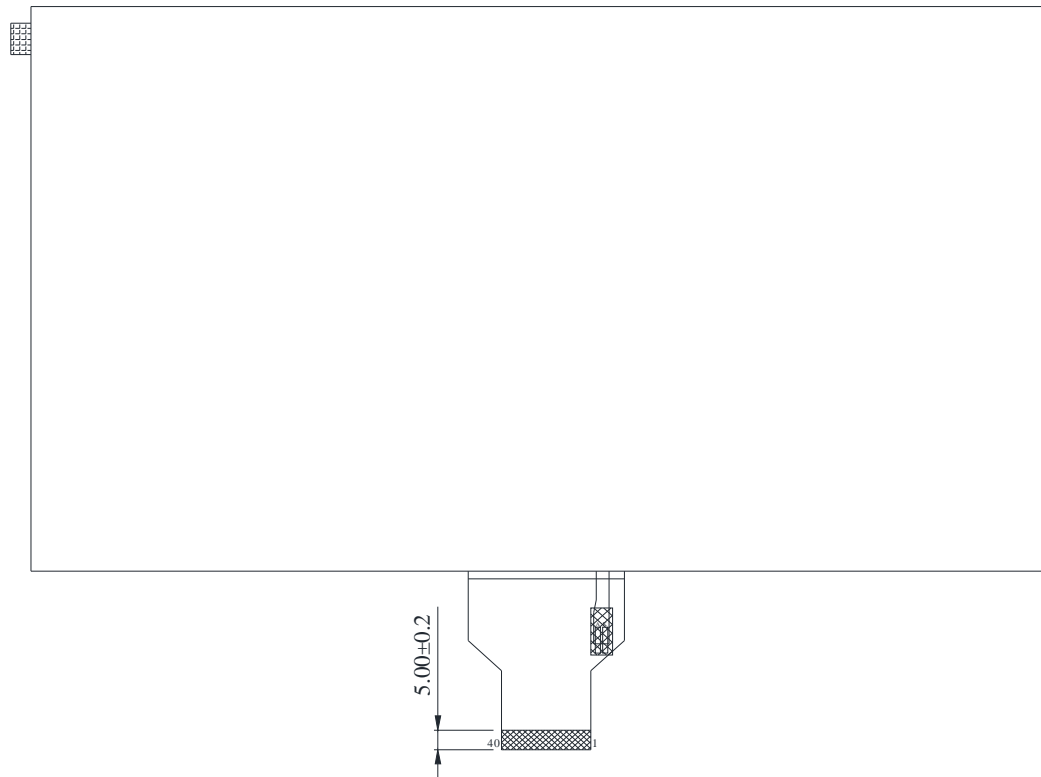| Environmental Test			
Test Item	**Content of Test**	**Test Condition**	**Note**
High Temperature storage	Endurance test applying the high storage temperature for a long time.	70℃ 200hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-20℃ 200hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	60℃ 200hrs	――
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-10℃ 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 　-10℃　　25℃　　60℃ 30min　　5min　　30min 1 cycle	-10℃/60℃ 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.

10.Contour Drawing

PIN NO.	SYMBOL	PIN NO.	SYMBOL
1	VCOM	21	RXin3+
2	VDD	22	GND
3	VDD	23	NC
4	NC	24	NC
5	Reset	25	GND
6	STBYB	26	NC
7	GND	27	NC
8	RXin0-	28	SELB
9	RXin0+	29	AVDD
10	GND	30	GND
11	RXin1-	31	LED-
12	RXin1+	32	LED-
13	GND	33	L/R
14	RXin2-	34	U/D
15	RXin2+	35	VGL
16	GND	36	NC
17	RXCLKN-	37	NC
18	RXCLKN+	38	VGH
19	GND	39	LED+
20	RXin3-	40	LED+

235.00±0.3
226.00
222.72(AA)
5.35
6.94
116.70
3.00±0.2
4.15
5.76
68.40
143.00±0.3
128.50
125.28(AA)
45.30±0.8
Component Area
H MAX:1.2mm
3.50
35.86
40
0.30±0.05
P0.5*39=19.50±0.05
106.45±0.8
20.50

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

5.00±0.2

40

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

winstar

LCM Sample Estimate Feedback Sheet

Module Number： <u>   </u>

1、Panel Specification：

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

2、Mechanical Specification：

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

3、Relative Hole Size：

1. Pitch of Connector：　□ Pass　　　　□ NG , <u>   </u>
2. Hole size of Connector：□ Pass　　　□ NG , <u>   </u>
3. Mounting Hole size：　□ Pass　　　　□ NG , <u>   </u>
4. Mounting Hole Type：　□ Pass　　　　□ NG , <u>   </u>
5. Others：　　　　　　　□ Pass　　　　□ NG , <u>   </u>

4、Backlight Specification：

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

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**：_____/_____/_____