



RAYSTAR

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RFC570B-SCW-LNN

SPECIFICATION

CUSTOMER:

APPROVED BY	
PCB VERSION	
DATE	

FOR CUSTOMER USE ONLY

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY

Release DATE:

TFT Display Inspection Specification: <https://www.raystar-optronics.com/download/products.htm>

Precaution in use of TFT module: <https://www.raystar-optronics.com/download/declaration.htm>

Revision History

VERSION	DATE	REVISED PAGE NO.	Note
0	2015/12/24		First issue
A	2016/01/21		Modify Static electricity test
B	2016/08/11		Modify Vibration test
C	2016/11/17		Modify Summary
D	2019/01/10		Add Uniformity
E	2019/10/09		Modify Contour Drawing

Contents

1. Module Classification Information
2. Summary
3. General Specification
4. Interface
5. Contour Drawing
6. Block Diagram
7. Absolute Maximum Ratings
8. Electrical Characteristics
9. TIMING TABLE
10. Optical Characteristics
11. Reliability
12. Other

2.Summary

TFT 5.7" is a TN transmissive type color active matrix TFT liquid crystal display that use amorphous silicon TFT as switching devices. This module is a composed of a TFT_LCD module, It is usually designed for industrial application and this module follows RoHs,

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3.General Specifications

- Size: 5.7 inch
- Dot Matrix: 320 x RGBx240(TFT) dots
- Module dimension: 160.0(W) x 109.0(H) x 15.0(D)mm
- Active area: 115.20 x 86.40 mm
- Dot pitch: 0.12 x 0.36 mm
- LCD type: TFT, Normally White, Transmissive
- View Direction: 12 o'clock
- Gray Scale Inversion Direction: 6 o'clock
- Aspect Ratio: 4:3
- Backlight Type: LED, Normally White
- With /Without TP: Without TP
- Surface: Glare

*Color tone slight changed by temperature and driving voltage.

4.Interface

4.1. LCM PIN Definition

Pin	Symbol	Function	Remark
1	LED+	Power supply for Backlight +	
2	LED-	Power supply for Backlight -	
3	RX3+	+ LVDS differential data input	
4	RX3-	- LVDS differential data input	
5	GND	Ground	
6	RXC+	+ LVDS differential clock input	
7	RXC-	- LVDS differential clock input	
8	GND	Ground	
9	RX2+	+ LVDS differential data input	
10	RX2-	- LVDS differential data input	
11	GND	Ground	
12	RX1+	+ LVDS differential data input	
13	RX1-	- LVDS differential data input	
14	GND	Ground	
15	RX0+	+ LVDS differential data input	
16	RX0-	- LVDS differential data input	
17	L/R	Shift direction of device internal shift register control.	Note 1,2
18	U/D	Up/down selection	Note 1,2
19	VCC	Digital power: 3V~3.6V	
20	VCC	Digital power: 3V~3.6V	
21	NC	No connection	
22	NC	No connection	
23	NC	No connection	
24	NC	No connection	

25	NC	No connection	
26	NC	No connection	
27	NC	No connection	
28	NC	No connection	
29	NC	No connection	
30	RESET	Hardware reset	

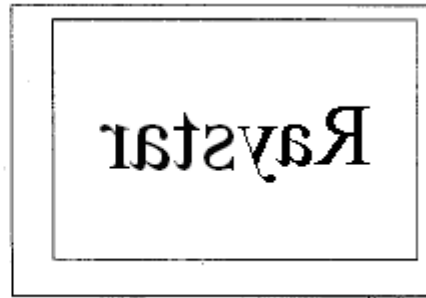
Note 1: Selection of scanning mode

Setting of scan control input		Scanning direction
U/D	L/R	
L	H	Up to down, left to right
H	L	Down to up, right to left
L	L	Up to down, right to left
H	H	Down to up, left to right

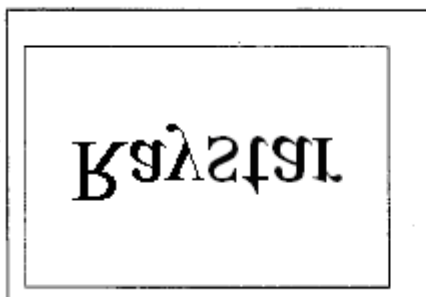
Note 2: Definition of scanning direction Refer to the figure as below:



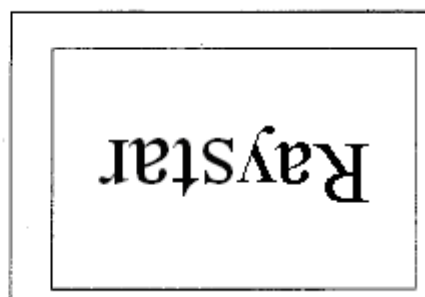
U/D=L, L/R=H



U/D=L, L/R=L

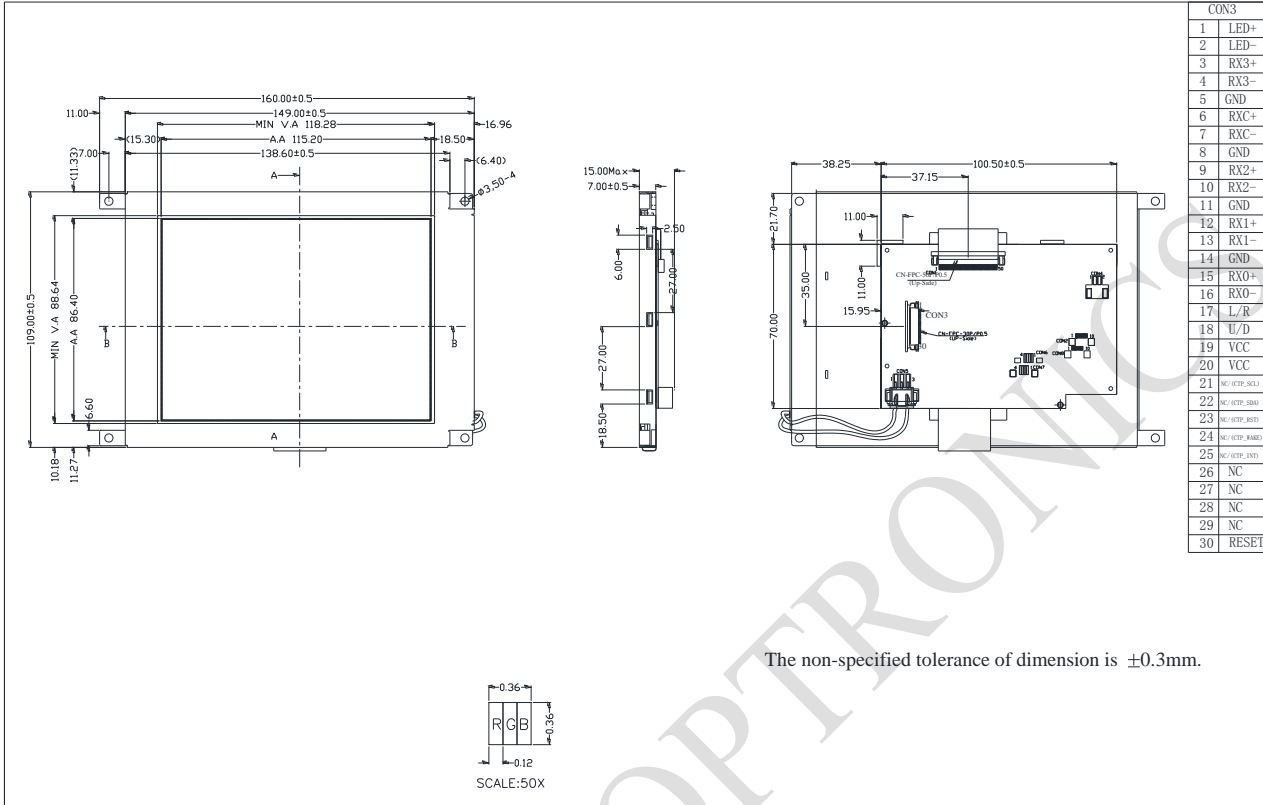


U/D=H, L/R=H

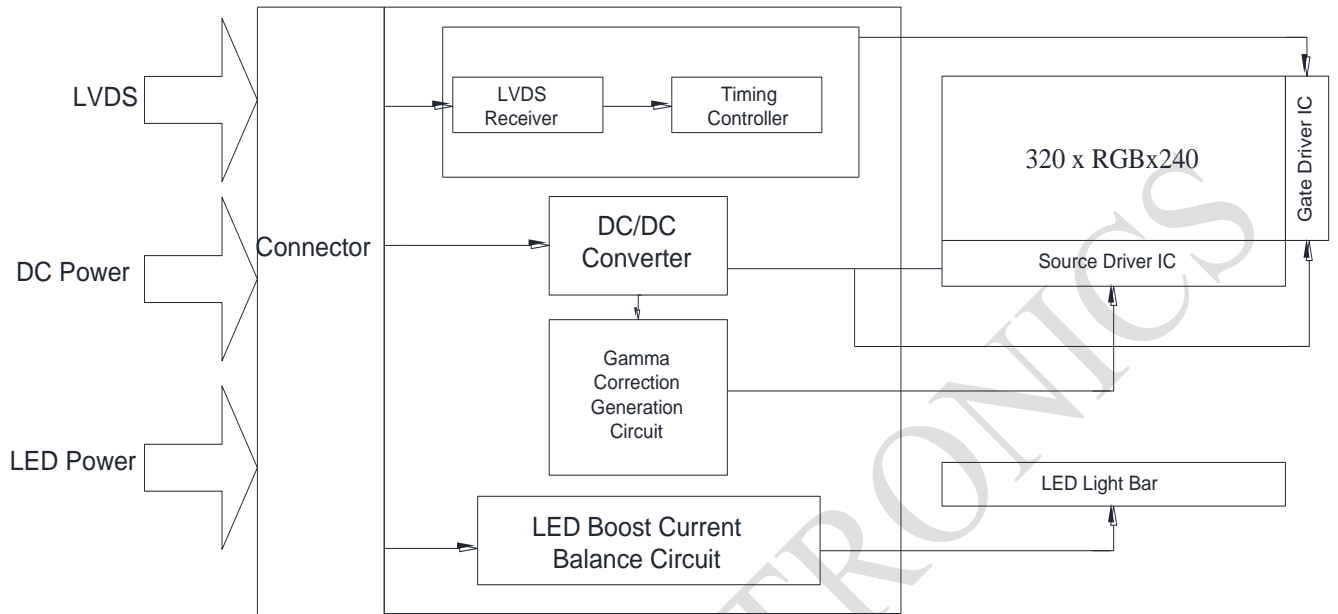


U/D=H, L/R=L

5. Contour Drawing



6. Block Diagram



7. Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	0	—	+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

- 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

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8. Electrical Characteristics

8.1. Operating conditions:

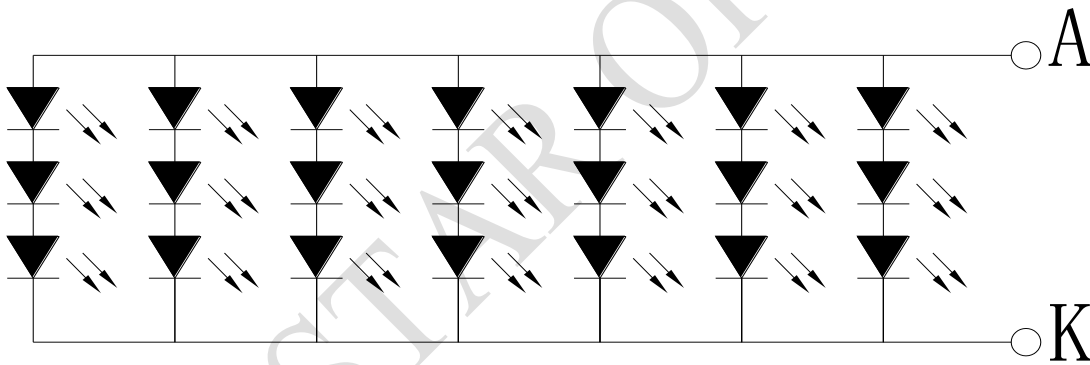
Item	Symbol	Condition	Min	Typ	Max	Unit	Remark
Supply Voltage For LCM	VCC	—	3.0	3.3	3.6	V	—
Supply Current For LCM	ICC	—	—	210	315	mA	Note1
Input High Volt.	VIH	—	0.7 VCC	—	VCC	V	—
Input Low Volt.	VIL	—	0	—	0.3 VCC	V	—

Note 1 : This value is test for VCC =3.3V , Ta=25 °C only

8.2. LED driving conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current	-	-	140	-	mA	-
Power Consumption	-	1260	-	1470	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

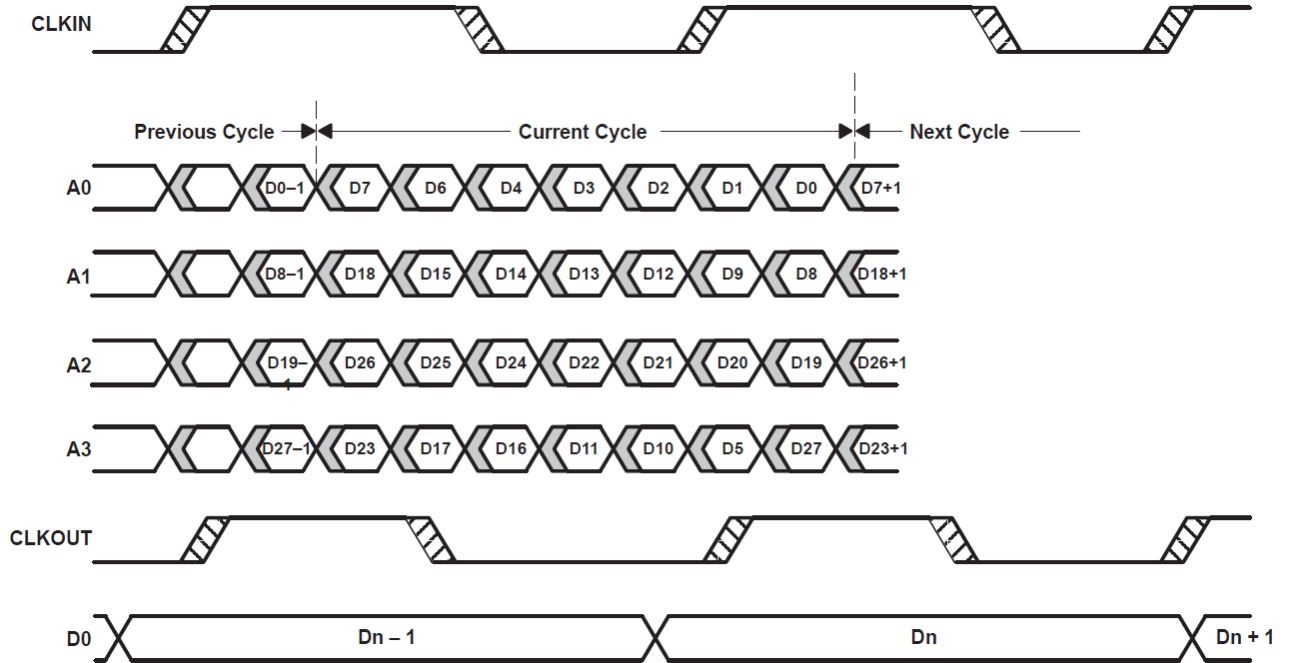


Note 2 : Ta = 25 °C

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

Note 4 : The single LED lamp case.

9.TIMING TABLE



SN75LVDS82 Load and Shift Timing Sequences

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10. 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	Wx	$\theta=0^\circ$ 、 $\phi=0$	0.282	0.312	0.342	Note 2,6,7
		Wy		0.319	0.349	0.379	
Viewing angle (Gray Scale Inversion Direction)	Hor.	Θ_R	CR \geq 10	60	70	Deg.	Note 1
		Θ_L		60	70		
	Ver.	Φ_T		40	50		
		Φ_B		60	70		
Brightness	-	-	400	500		cd/m2	Center of display
Uniformity	(U)	-	75	-	-	%	Note 5

Ta=25±2°C, IL=140mA

Note 1: Definition of viewing angle range

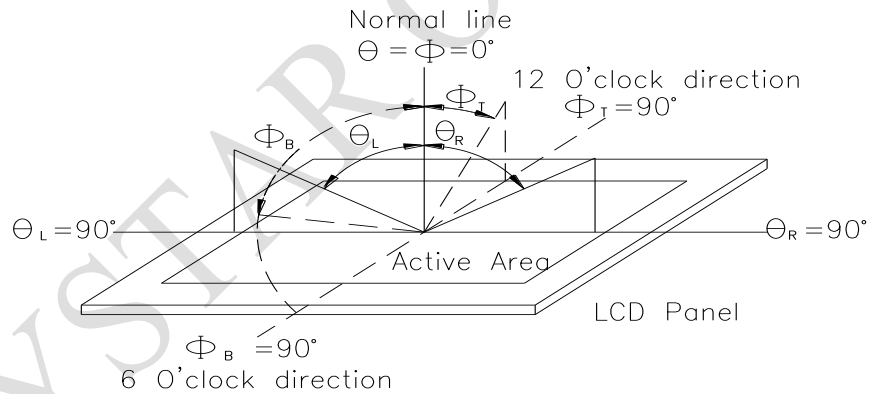


Fig. 10.1. Definition of viewing angle

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.

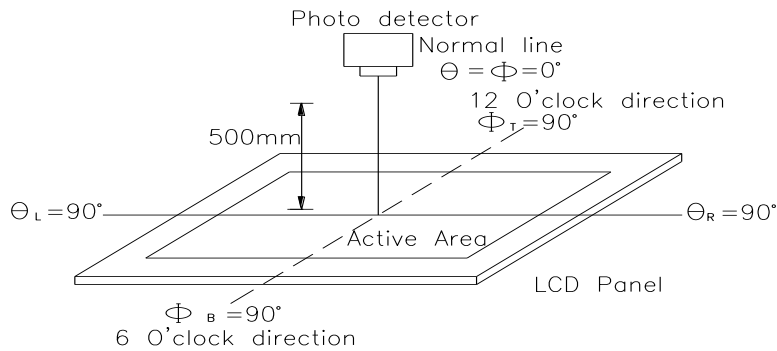
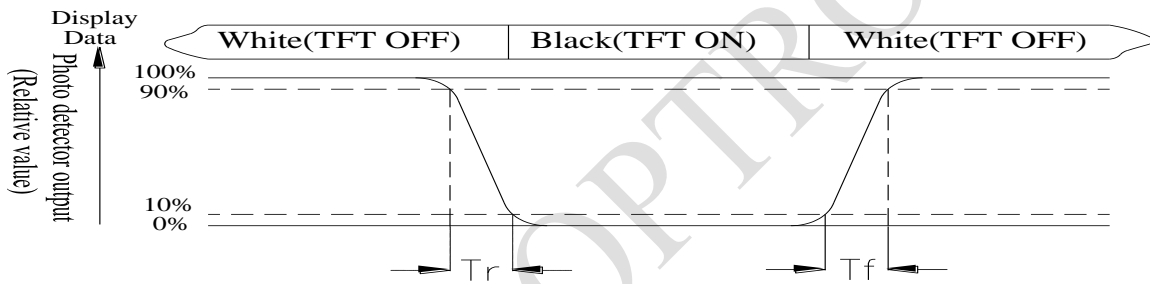


Fig. 10.2. Optical measurement system setup

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: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (reference the picture in below). Every measuring point is placed at the center of each measuring area.

Luminance Uniformity (U) = $L_{min}/L_{max} \times 100\%$

L = Active area length

W = Active area width

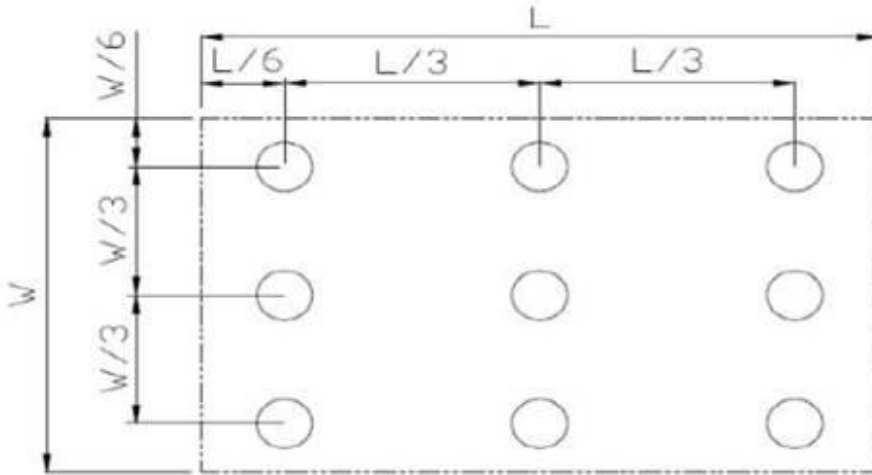


Fig10.3. Definition of uniformity

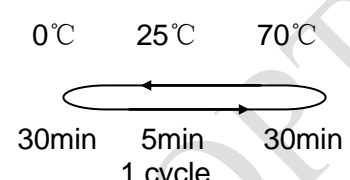
Note 6: Definition of color chromaticity (CIE 1931)

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.

11. Reliability

Content of Reliability Test (Wide temperature, 0°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.	0°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 <div style="text-align: center;">  <p>0°C 25°C 70°C</p> <p>30min 5min 30min</p> <p>1 cycle</p> </div>	0°C/70°C 10 cycles	—
Vibration test	Endurance test applying the vibration during transportation and using.	Total fixed amplitude : 1.5mm 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=±600V(contact) ,±800v(air), RS=330Ω CS=150pF 10 times	—

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.

LCM Sample Estimate Feedback Sheet

Module Number : _____

1 、 Panel Specification :

1. Panel Type :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
2. View Direction :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
3. Numbers of Dots :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
4. View Area :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
5. Active Area :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
6. Operating Temperature :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
7. Storage Temperature :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
8. Others :	_____	

2 、 Mechanical Specification :

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

3 、 Relative Hole Size :

1. Pitch of Connector :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
2. Hole size of Connector :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
3. Mounting Hole size :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
4. Mounting Hole Type :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
5. Others :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____

4 、 Backlight Specification :

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

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Module Number : _____		
5 · Electronic Characteristics of Module :		
1.Input Voltage :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
2.Supply Current :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
3.Driving Voltage for LCD :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
4.Contrast for LCD :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
5.B/L Driving Method :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
6.Negative Voltage Output :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
7.Interface Function :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
8.LCD Uniformity :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
9.ESD test :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
10.Others :	<input type="checkbox"/> Pass	<input type="checkbox"/> NG , _____
6 · Summary :		
<p style="text-align: right;">Sales signature : _____</p> <p style="text-align: right;">Customer Signature : _____ <u>Date</u> : / / _____</p>		

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