深圳市一众显示科技有限公司

SHEN ZHEN TEAM SOURCE DISPLAY TECH. CO, TD.

TFT-LCD Module Specification

Module NO.: TST050WVBS-S24-B0

Version: V1.0

☐ APPROVAL FOR SPECIFICATION ☐ APPROVAL FOR SAMPLE

For Customer's Acceptance:	
Approved by	**Comment**

Team Source Display:		
Presented by	**Reviewed by**	**Organized by**

Version No.	Date	Content	Remark
V1.0	2025-06-18	First Released	

Contents

1. NOTATION OF THE MODULE NUMBER:

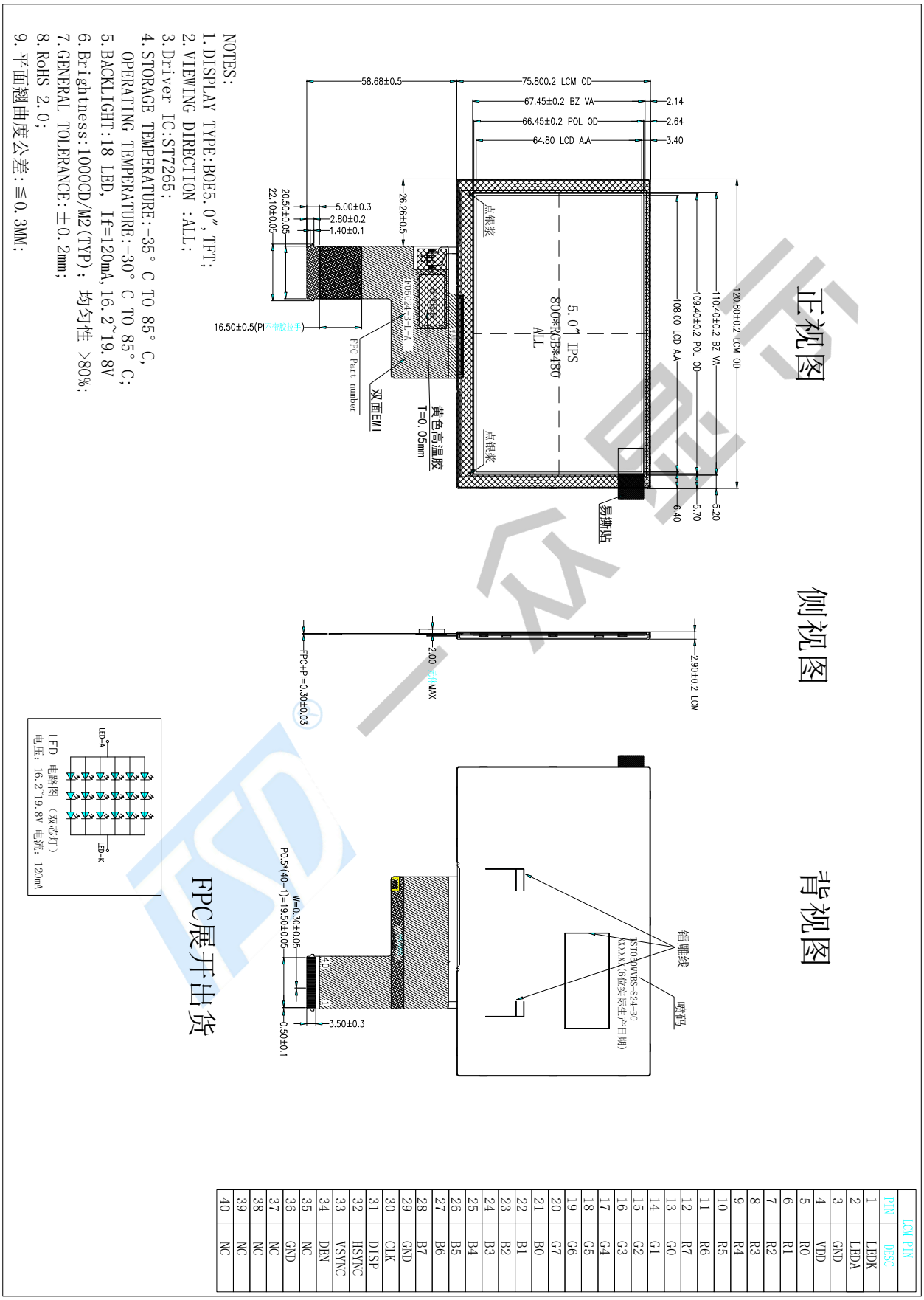
TS T 043 WQ H S - 67* * ……
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

序号	描述
①	TS：表示 Team Source Display
②	T:TFT;　M:外加转接 PCB 的模组（注：本身带 TCON 板的不用加 M）；O：OLED
③	表示产品 AA 区尺寸，第一个数字表示十位，第二个数字表示个位，第三个数字表示小数点十分位。如 043 表示 4.3 寸，101 表示 10.1 寸。尺寸精确到小数点后 1 位，采用四舍五入原则，如 3.97 则归为 4.0 寸。
④	表示分辨率。 QQ：128*160/128*128　QC：176*220　QV：240*320/320*240/240*240 HV：320*480/320*320　WQ：480*272　VG：640*480 WV：800*480/480*800/480*480　SV：800*600　WS:1024*600　XG:1024*768 WX：1280*800/1280*720　HD：720*1280/800*1280/720*720 FH：1080*1920/1920*1080　WU：1920*1200
⑤	表示显示面板厂家 A：AUO　B：BOE　C：CHIMEI　D:CTO 华锐　G：Giantplus　H：HSD　I：InnoLux L：Laibao　P：Panda　R：Sharp S：CTC　T：Tianma　V：IVO　U:Truly 信利
⑥	表示驱动 IC 厂家 I：ILITEK　H：Himax　S:Sitronix　E:Fitipower　G:Galaxycore　V:NewVision M：SOLOMON　N:Novatek　O：Orise　W：SinoWealth　R：Raydium　F:FocalTech C:Chipone
⑦	流水号或流水号+版本号。流水号按产品先后顺序递增；在原有型号基础的一些改款，可以增加版本号 A，B，D~O，Q~Z，禁止用 C 和 P，以免跟序号 8 混淆。 例：TST043WQHS-67B、TST035QVIH-28D
⑧	表示是否带触摸屏。P：表示带电阻触摸屏；C 表示带电容触摸屏；省略字母的表示不带，即单独的显示屏模组。例：TST043WQHS-67BC，TST035QVIH-28DC
⑨	产品的特殊属性。比如客户的特殊要求，在原有基础上增加特殊物料，可以加尾辍“-Mylar”、“-O”“-ALU”等

2. General Information

NO	Item	Contents	Unit
(1)	Module outsize（mm）	120.80(H)x75.80(V)x2.90(T)	mm
(2)	Lcd active aera（mm）	108.00 (W)X64.80 (H) mm	mm
(3)	Display resolution（dot）	800(H)x3(RGB)x480(V)	dot
（4）	Screen size（inch）	5.0’’TFT	
(5)	Color configuration	RGB Vertical stripe	-
(6)	Support color	16.7M	-
(7)	Display mode	IPS / Transmission / Normally Black	
(8)	Viewing direction	ALL	-
(9)	Lcd type	A-Si TFT	-
(10)	Driver IC	ST7265	-
(11)	Interface	RGB	-

3.External Dimensions



LCM PIN		
PIN	DESC	
1	LEDK	
2	LEDA	
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	HSYNC	
33	VSYNC	
34	DEN	
35	NC	
36	GND	
37	NC	
38	NC	
39	NC	
40	NC	

4. Interface Description

PIN NO.	PIN NAME	DESCRIPTION
1	LED-	LED backlight (Cathode).
2	LED+	LED backlight (Anode).
3	GND	Ground for logic.
4	VDD	Power supply for voltage.
5-12	R0-R7	Red Data.
13-20	G0-G7	Green Data.
21-28	B0-B7	Blue Data.
29	GND	Ground for logic.
30	PCLK	Dot clock signal input. Latching input data at its rising edge.
31	DISP	Display on/off.
32	HSYNC	Horizontal sync input. Negative polarity.
33	VSYNC	Vertical sync input. Negative polarity.
34	DE	Data enable input. Active high to enable the input data bus.
35	NC	No connection.
36	GND	Ground for logic.
37	NC(XR)	RTP control pin, no use please NC.
38	NC(YD)	RTP control pin, no use please NC.
39	NC(XL)	RTP control pin, no use please NC.
40	NC(YU)	RTP control pin, no use please NC.

5. Absolute Maximum Ratings

Parameter	SYMBOL	Min	Max	Unit	Remarks
LC operating Voltage	V_{OP}	---	5.0	V	Ta=25±2℃
Operating Temperature (Humidity)	T_{OP}	-30	+85	℃	---
	RH	---	90	%	At 60℃
Storage Temperature (Humidity)	T_{ST}	-35	+85	℃	---
	RH	---	90	%	At 60℃

6. Electrical Characteristics

Parameter	SYMBOL	Value	UNIT	Remarks
Logic power supply voltage	VCC	2.4~3.3	V	Ta= +25℃
I/O power supply	IOVCC	1.65~3.3	V	---
TFT Gate ON Voltage	VGH	12	V	10~14
TFT Gate OFF Voltage	VGL	-11.5	V	-14~-11.5
TFT Common Electrode Voltage	VCOMH	1.0	V	---
	VCOML	-1.0	V	---

7.Timing Characteristics.

Please refer to the ST7265 specification

8. Backlight Characteristics.

Item	Symbol	MIN	TYP	MAX	UNIT	Test Condition	Note
Supply Voltage	Vf	16.2	18.0	19.8	V	If=120mA	-
Supply Current	If	-	120	-	mA		-
Luminous Intensity for LCM	-	900	1000	-	Cd/m^2		Note1
Uniformity for LCM	-	80		-	%		Note2
Number of LED	-		18	-	Piece		-
Backlight Color	White						

9.Optical Characteristics

Item of electro-optical characteristics	Symbol		Condition	Min	Typ	Max	Unit	Remark
Contrast ratio	CR		Ø=Ψ=o² Ta=25℃ I_f=120mA	1000	1200	--		Note3
Response time	Tr+Tf			--	30	40	Msec	Note4/8
Viewing anle range	Ø (CR≥10)		Up(12H) Down(6H) Left(9H) Right(3H)	70	80	--	Deg	Note5/8/9
				70	80	--	Deg	
				70	80	--	Deg	
				70	80	--	Deg	
Module Chromaticity CIE(x, y)	White	x	¢=Ψ=o² Ta=25℃	0.278	0.308	0.338		Note6
		y		0.309	0.339	0.369		
	Red	x		0.595	0.625	0.655		
		y		0.283	0.313	0.338		
	Green	x		0.282	0.312	0.342		
		y		0.534	0.564	0.594		
	Blue	x		0.111	0.141	0.171		
		y		0.113	0.143	0.173		
NTSC				50	55		%	Note6

Note1. Surface luminance is the LCD surface from the surface with all pixels displaying white For more information see FIG 1.

Lv=Average Surface Luminance with all white pixels (P1,P2,P3,P4,P5)

Note2. The uniformity in surface luminance (& White) is determined by measuring luminance at each test position 1 through 5,and then dividing the maximum luminance of 5 points luminance by minimum luminance of 5 points luminance.For more information see FIG 1.

Note3. Contrast Ratio(CR) is defined mathematically by the following Formula. For more information see FIG 1:

Note4. Response time is the time required for the display to transition from White to black(Rise Time Tr) and from black to white(Decay Time Tf) For additional information see FIG 2..

Note 5. Viewing angle is the angle at which the contrast ratio is greater than 2. For TFT module the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface For more information see FIG 3.

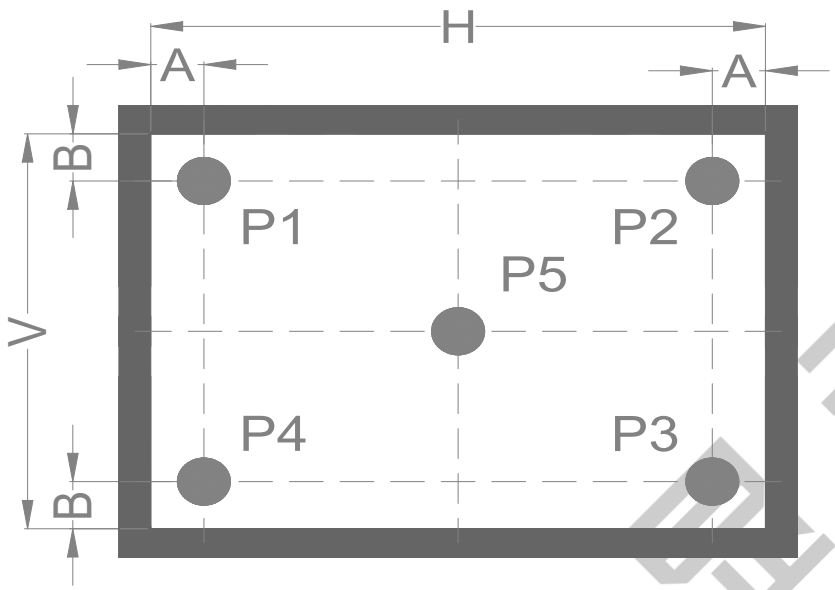
Note 6. CIE(x,y) chromaticity, The x,y value is determined by screen active area position 5 For more information see FIG 1.

Note7. NTSC ratio; For more information see FIG 3.

Note8. For Viewing angle and response time testing, the testing data is base on Autronic-Melchers' s ConoScope. Series Instruments. For contrast ratio, Surface Luminance, Luminance uniformity and CIE, the testing data is base on BM-7 photo detector.

Note9. For TFT transmissive module. Gray scale reverse occurs in direction of panel viewing angle

FIG. 1. Measuring method for Contrast ratio, surface luminance, Luminance uniformity,CIE (x, y) chromaticity.



A : 5mm
B : 5mm
H, V : Active Area
Light spot size Ø =5mm, 500mm distance from the LCD surface to detector lens measurement instrument is luminance meter BM-7

FIG. 2. The definition of Response Time

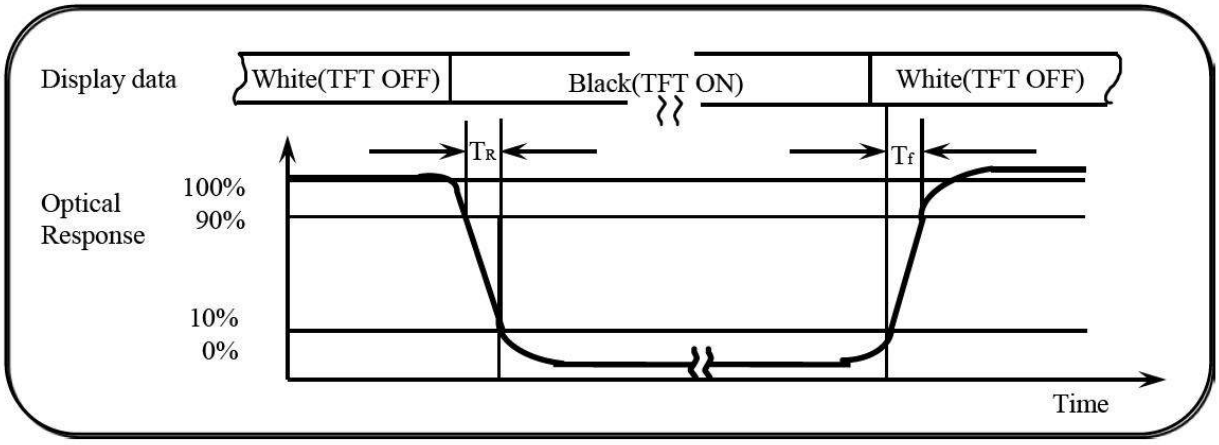
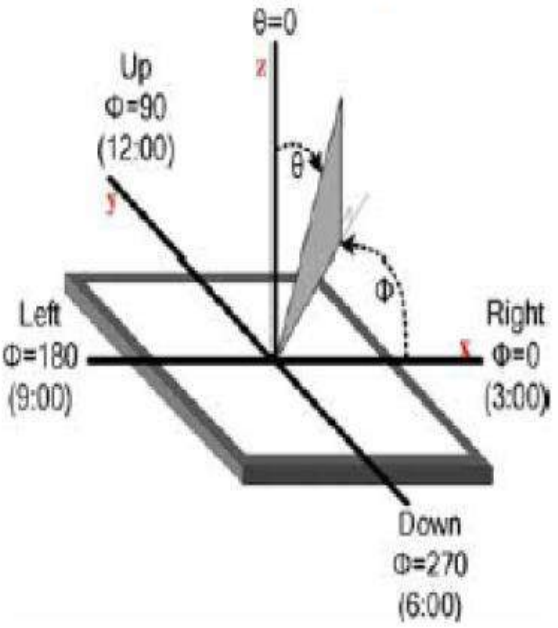


FIG. 3. The definition of viewing angle



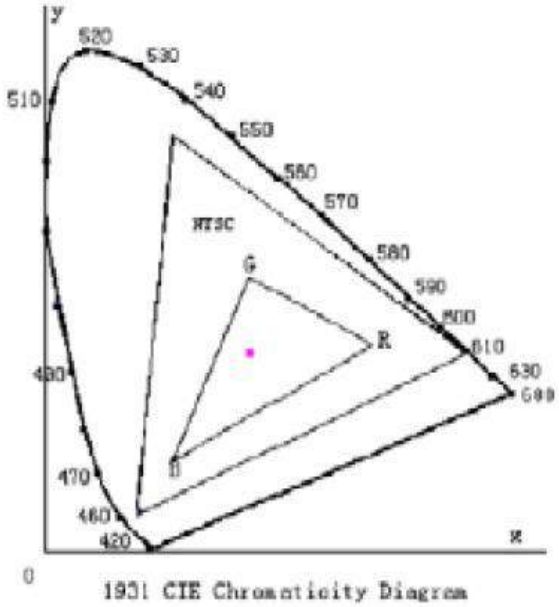


Fig.4. 1931 CIE chromaticity diagram

10. Reliability Test Condition and Method

NO.	TEST ITEMS	TEST CONDITION	INSPECTION AFTER TEST
①	High Temperature Storage	85℃±2℃×240Hours	Note 1, Note2
②	Low Temperature Storage	- 35℃±2℃×240Hours	Note 1, Note2
③	High Temperature Operating	85℃±2℃×240Hours	Note 1, Note2
④	Low Temperature Operating	- 30℃±2℃/240Hours	Note 1, Note2
⑤	Storage at High Temperature and Humidity	+60℃, 90%RH/240hrs	Note 1, Note2

⑥	Thermal Shock	1 cycle is : -35℃(30min) ~25℃（5min） +85℃(30min), total 10 cycle.	Note 1, Note2
⑦	Vibration Test	Frequency range:10~55Hz Amplitude: 1.5mm Frequency:10Hz~55Hz~10Hz 20 minutes for each direction of X. Y. Z. (Total 1 hour)	
⑧	Package Drop Test	Height: 1m, drop 1 corner, 3 edges, 6 surfaces	
⑨	Electro Static Discharge	150pF/330Ω +-4kV contact discharge; +-8kV air discharge. 5 points on the LCD surface	

Note 1: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.
Note 2: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

11. Inspection Standard

10.1 Inspection conditions is as follows:

1) Viewing angle is within +-30° from vertical direction, as fig 1

2) Viewing angle is the angle defined in the drawing

3) Ambient temperature is approximately 25+-5° C

4) Ambient luminance is about 300~500 Lux.

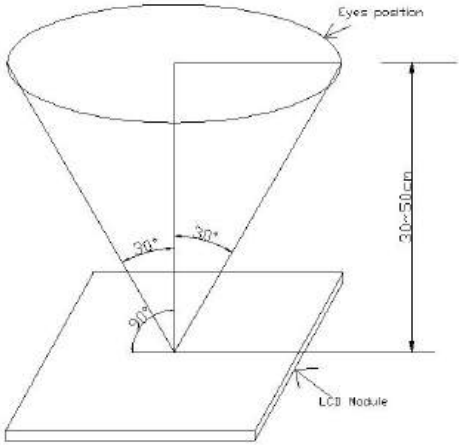
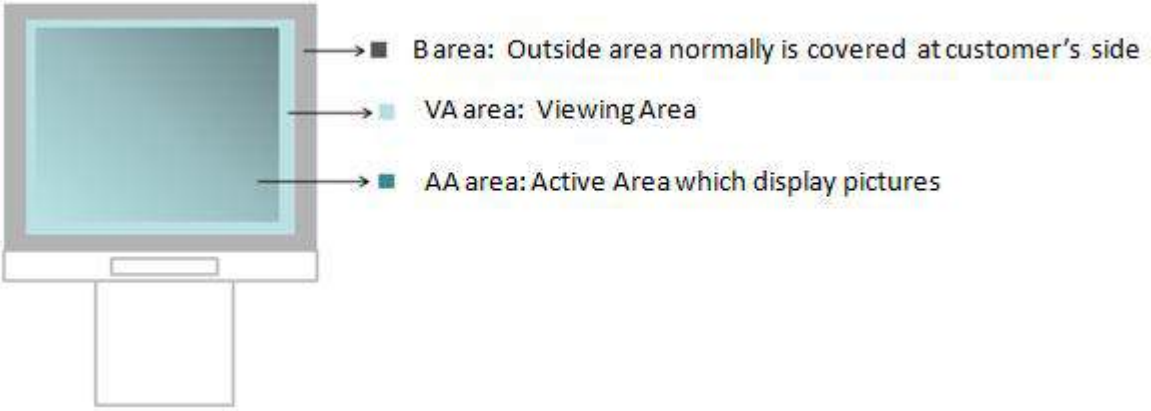


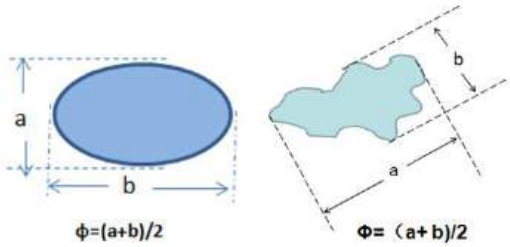
fig1

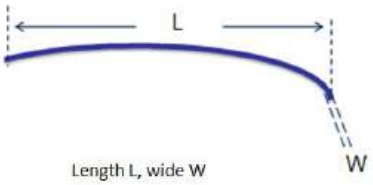
10.2 LCD area definition



10.3 Inspection Items and Standard

No	Items	Acceptable Standard	Defect Class
10.3.1	**Dimensions**	**Dimension out of drawing is not allowed**	**Major**
10.3.2	**Missing segment**	**Not allowed**	**Major**
10.3.3	**No display**	**Not allowed**	**Major**
10.3.4	**Abnormal display**	**Not allowed**	**Major**
10.3.5	**Backlight no brightness**	**Not allowed**	**Major**

<table>
<tr><td>10.3.6</td><td>TP no function, shift</td><td>Not allowed</td><td>Major</td></tr>
<tr><td>10.3.7</td><td>Spot defect
(Foreign material, bright spot, dark spot, dot defect etc.)</td><td>
<table>
<tr><th colspan="4">Spot defect</th></tr>
<tr><td rowspan="2">Area
Defect size</td><td colspan="3">Acceptable number</td></tr>
<tr><td>AA</td><td>VA</td><td>B</td></tr>
<tr><td>Φ≤0.1</td><td colspan="3">ignore</td></tr>
<tr><td>0.1<Φ≤0.15</td><td>2</td><td>2</td><td rowspan="3">ignore</td></tr>
<tr><td>0.15<Φ≤0.2</td><td>1</td><td>1</td></tr>
<tr><td>0.2<Φ</td><td>0</td><td>0</td></tr>
<tr><td colspan="4">1.Distance between spots need be bigger than 10mm.
2. Ignore means it is acceptable, but spot cluster(3 spots in 1mm² area) is not allowed.
3. Most 3 spots in the whole LCM.</td></tr>
</table>


</td><td>Minor</td></tr>
<tr><td>10.3.8</td><td>Line defect (Foreign material, scratch, etc.)</td><td>
<table>
<tr><th colspan="5">Line Defect</th></tr>
<tr><td colspan="2">Size</td><td colspan="3">Acceptable Number</td></tr>
<tr><td>L</td><td>W</td><td>AA</td><td>VA</td><td>B</td></tr>
<tr><td>ignore</td><td>W<0.01</td><td colspan="3">Ignore</td></tr>
<tr><td>L≤3</td><td>0.01≤W≤0.03</td><td>2</td><td>2</td><td rowspan="4">Ignore</td></tr>
<tr><td>L≤3</td><td>0.03≤W≤0.05</td><td>1</td><td>1</td></tr>
<tr><td>L>3</td><td>W>0.01</td><td>0</td><td>0</td></tr>
<tr><td>Ignore</td><td>w>0.05</td><td>Treat as spot</td><td>Treat as spot</td></tr>
<tr><td colspan="5">Distance between two lines need bigger than 10mm.</td></tr>
</table>


</td><td>Minor</td></tr>
<tr><td>10.3.9</td><td>Polarizer bubble</td><td>1. Accept if not reach in Viewing Area
2. Locate in viewing area, treat as spot defect</td><td>Minor</td></tr>
<tr><td>10.3.10</td><td>Polarizer dent/bump</td><td>Φ≤1mm, N≤3</td><td>Minor</td></tr>
<tr><td>10.3.11</td><td>Mura/Light leakage</td><td>Invisible under 3% ND filter</td><td>Minor</td></tr>
</table>

12. Handling Precautions

12.1 Mounting method

The LCD panel of T S D , t h i s module consists of two thin glass plates with polarizes which easily be damaged. And since the module in so constructed as to be fixed by utilizing fitting holes in the printed circuit board.

Extreme care should be needed when handling the LCD modules.

12.2 Caution of LCD handling and cleaning

When cleaning the display surface, Use soft cloth with solvent [recommended below] and wipe lightly

- Isopropyl alcohol
- Ethyl alcohol

Do not wipe the display surface with dry or hard materials that will damage the polarizer surface.

Do not use the following solvent:

- Water
- Aromatics

Do not wipe ITO pad area with the dry or hard materials that will damage the ITO patterns

Do not use the following solvent on the pad or prevent it from being contaminated:

- Soldering flux
- Chlorine (Cl) , Salfur (S)

If goods were sent without being sili8con coated on the pad, ITO patterns could be damaged due to the corrosion as time goes on.

If ITO corrosion happen by miss-handling or using some materials such as Chlorine (CI), Salfur (S) from customer, Responsibility is on customer.

12.3 Caution against static charge

The LCD module use C-MOS LSI drivers, so we recommended that you:

Connect any unused input terminal to Vdd or Vss, do not input any signals before power is turned on, and ground your body, work/assembly areas, assembly equipment to protect against static electricity.

12.4 packing

- Module employ LCD elements and must be treated as such.
- Avoid intense shock and falls from a height.
- To prevent modules from degradation, do not operate or store them exposed direct to sunshine or

12.5 Caution for operation

- It is an indispensable condition to drive LCD's within the specified voltage limit since the higher voltage then the limit cause the shorter LCD life.
- An electrochemical reaction due to direct current causes LCD's undesirable deterioration, so that the use of direct current drive should be avoided.
- Response time will be extremely delayed at lower temperature then the operating temperature range and on the other hand at higher temperature LCD's how dark color in them. However those phenomena do not mean malfunction or out of order with LCD's, which will come back in the specified operation temperature.
- If the display area is pushed hard during operation, some font will be abnormally displayed but it resumes normal condition after turning off once.
- A slight dew depositing on terminals is a cause for electro-chemical reaction resulting in terminal open circuit.

Usage under the maximum operating temperature, 50%Rh or less is required.

12.6 storage

In the case of storing for a long period of time for instance, for years for the purpose or replacement use, the following ways are recommended.

- **Storage in a polyethylene bag with the opening sealed so as not to enter fresh air outside in it . And with no desiccant.**
- **Placing in a dark place where neither exposure to direct sunlight nor light's keeping the storage temperature range.**
- **Storing with no touch on polarizer surface by the anything else.**
  [It is recommended to store them as they have been contained in the inner container at the time of delivery from us

12.7 Safety

- **It is recommendable to crash damaged or unnecessary LCD's into pieces and wash off liquid crystal by either of solvents such as acetone and ethanol, which should be burned up later.**
- **When any liquid leaked out of a damaged glass cell comes in contact with your hands, please wash it off well with soap and water**
-

13. Precaution For Fse

13.1

A limit sample should be provided by the both parties on an occasion when the both parties agreed its necessity. Judgment by a limit sample shall take effect after the limit sample has been established and confirmed by the both parties.

13.2

On the following occasions, the handing of problem should be decided through discussion and agreement between responsible of the both parties.

- **When a question is arisen in this specification**
- **When a new problem is arisen which is not specified in this specifications**
- **When an inspection specifications change or operating condition change in customer is reported to quality Co.,ltd , and some problem is arisen in this specification due to the change**
- **When a new problem is arisen at the customer's operating set for sample evaluation in the customer site.**