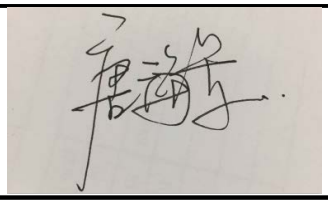
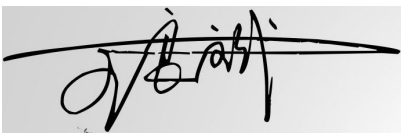
SPECIFICATION FOR VS043CSN02V2

Project No.（模块型号）	**VS043CSN02V2**
Product type（产品类型）	Standard LCD Module 480(RGB)x 272 Pixels 4.3 " TFT LCD
Customer（客户）	
Signature by customer(客户核准）:	

Prepared （制定）	Checked（审核）	Approved（核准）
		

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CONTENTS

Document revision history:

DOCUMENT REVISION	DATE	DESCRIPTION	PREPARED BY	APPROVED BY
V00	2018.01.11	First Release.	THJ	

2. General Description

- 4.3 " （16:9diagonal), 480 (RGB)x 272pixels, 16M colors, Transmissive, TFT LCD module.
- Viewing Direction: 6 O'clock (Gray Scale Inversion Direction)
- Optimum Viewing Direction: 12 O'clock
- Driving IC: ST7282
- 24-bit RGB interface
- Logic voltage: 3.0-3.6V
- Without touch panel.

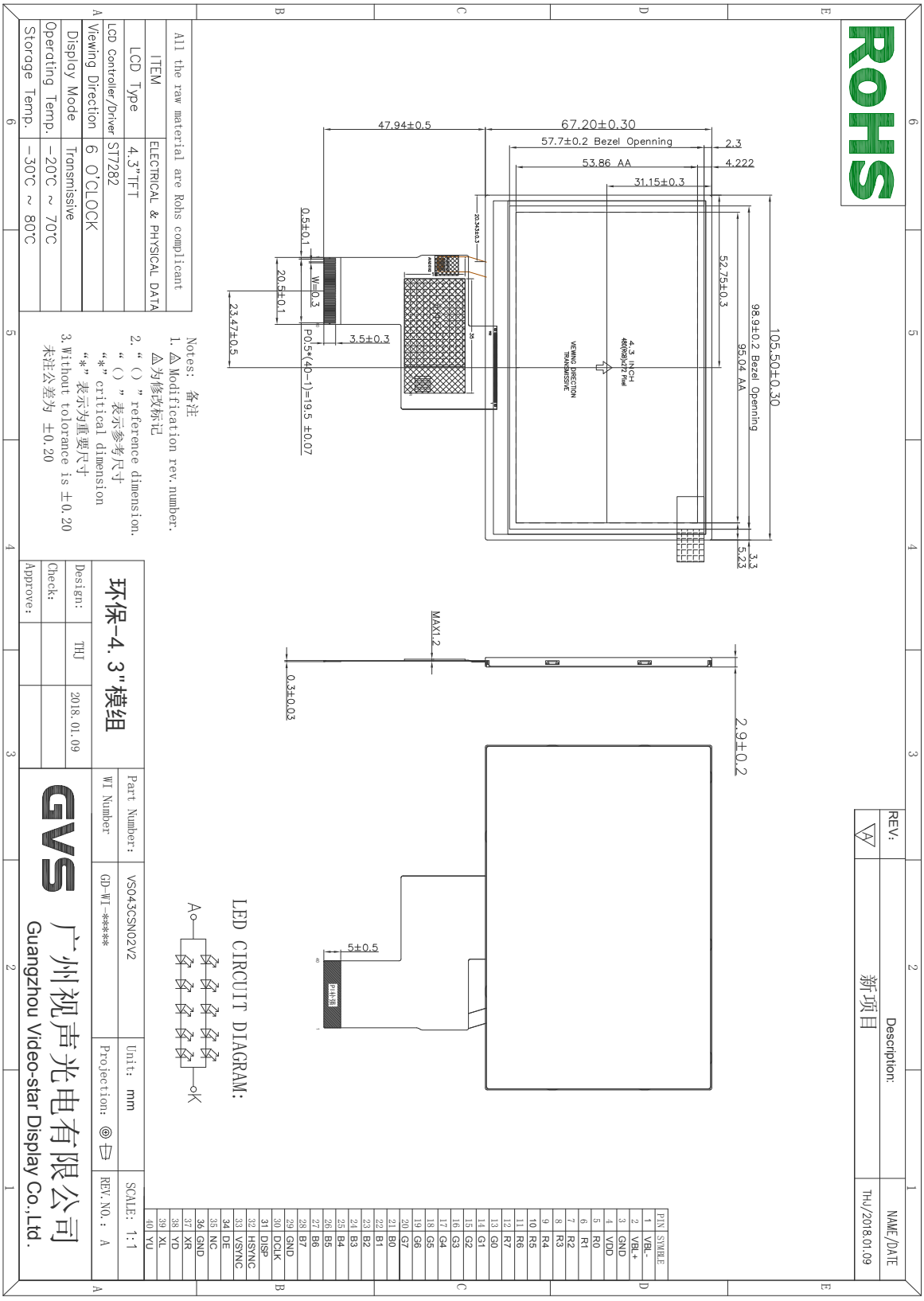
3. Mechanical Specifications

The mechanical detail is shown in Fig. 1 and summarized in Table 1 below.

Table 1

Parameter		Specifications	Unit
Outline dimensions		105.5(W) x67.2(H) x2.9(D)	mm
	active area	95.04(W) x 53.86(H)	
	Display format	480 (RGB)x272	pixels
	Color configuration	RGB stripes	-
Weight		TBD	grams

Figure 1: Outline Drawing



4.Interface signals

Table 2: Pin assignment

Pin No. 序号	Symbol 符号	I/O	Description 描述	When not in use 不用时
1	LEDK	P	Backlight LED Cathode	
2	LEDA	P	Backlight LED anode	
3	GND	p	System Ground	
4	VDD	p	Power supply for logic operation	
5~12	R0~R7	I	Data bus	Note 1
13~20	G0~G7	I	Data bus	Note 1
21~28	B0~B7	I	Data bus	Note 1
29	GND	p	System Ground	
30	CLK	I	Pixel clock signal	Note 2
31	DISP	I	Display on/off control	
32	HSYNC	I	Horizontal Sync signal	
33	VSYNC	I	Vrtical Sync signal	
34	DEN	I	Data Enable	
35	NC		NC	
36	GND	P	System Ground	
37	XR	I	DUMMY	
38	YD	I	DUMMY	
39	XL	I	DUMMY	
40	YU	I	DUMMY	

Note: The voltage power of the interface logic pin depend on “VDD” and “GND”, Such as DBn, R0~R7，G0~G7，B0~B7,IMn and function pins

备注：逻辑接口 PIN 电压取决于“VDD”和“GND”，如 DBn,R0~R7，G0~G7，B0~B7, IMn 和功能 PIN

I: input, O: output, P: Power

Note 1: When input 18 bits RGB data, the two low bits of R,G and B data must be grounded.

Note 2: Data shall be latched at the falling edge of DCLK.

5. Absolute Maximum Ratings

5.1 Electrical Maximum Ratings – for IC Only

Table 3: Electrical Maximum Ratings – for IC

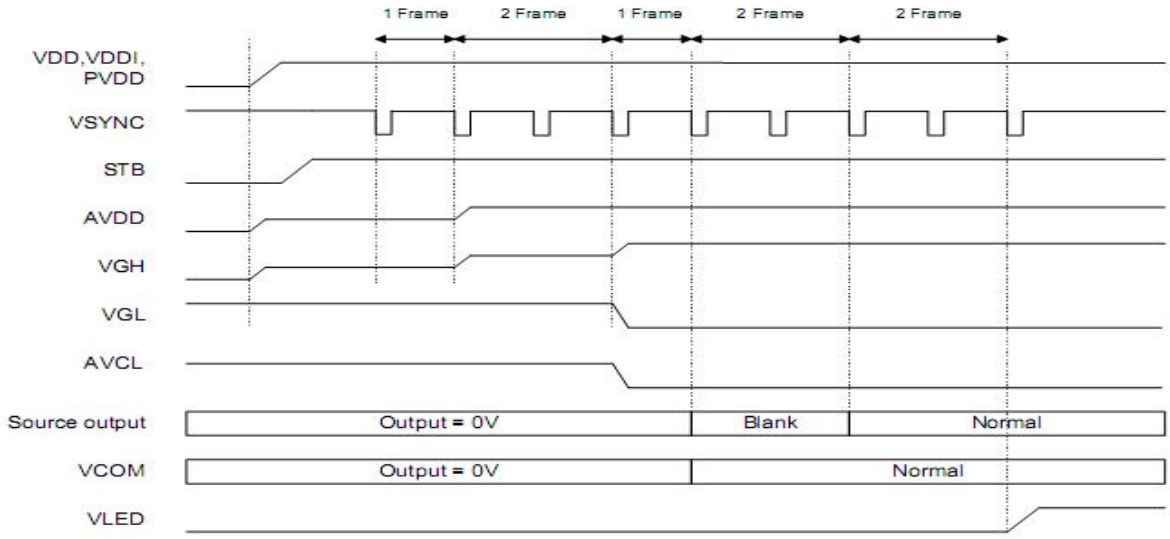
Parameter	Symbol	Min.	Max.	Unit	Note
Power supply voltage (VCC)	VDD	-0.3	+3.6	V	1

Note:

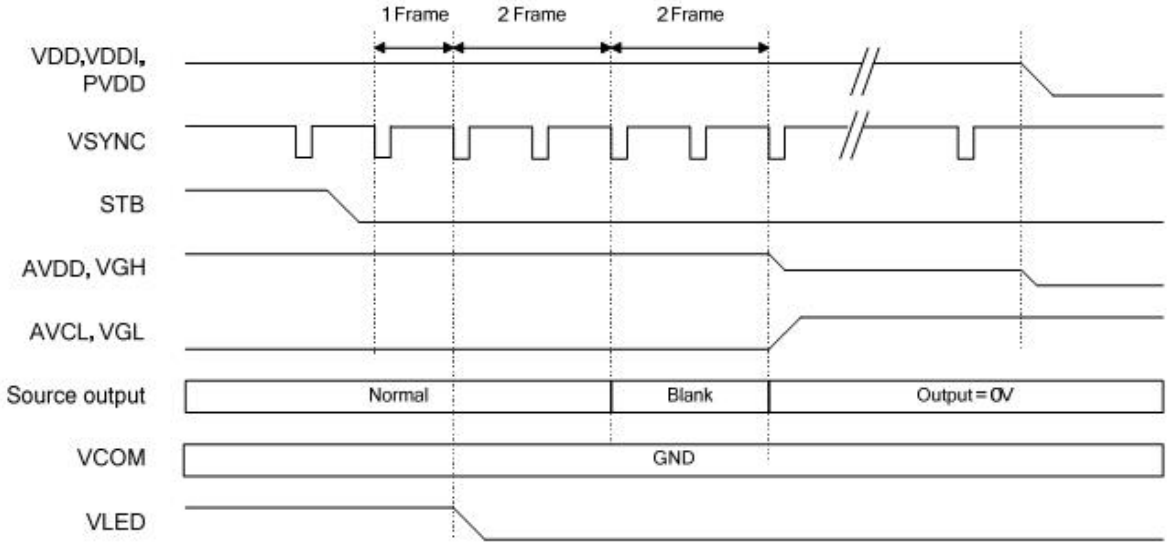
1. VDD GND must be maintained.
2. The modules may be destroyed if they are used beyond the absolute maximum ratings.

5.2 power sequence

5.2.1 power On sequence



5.2.2 power off sequence



6. Electrical Specifications

6.1 Typical Operation Conditions (At Ta = 25 °C,)

Table 4

ITEM	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
Digital Power Supply Voltage For	VDD	3	3.3	3.6	V	-

6.2 Backlight Driving Conditions

Table 5

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Forward Current	IF	-	35	40	60	mA	
Forward voltage	VF	IF=40mA	14	16	17	V	Note 1
Uniformity	△	IF=40mA	75	80	-	%	
Luminance (on the module surface,BM-7)	LV	IF=40mA	550	600	-	cd/m^2	
LED life time	-	IF=40mA	20,000	-	-	Hr	Note 2

Note 1: The LED Supply Voltage is defined by the number of LED at Ta=25℃ and IL =40mA.

Note 2: The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25℃ and IL =40mA. The LED lifetime could be decreased if operating IL is lager than 40mA.

7. Optical Characteristics

(Contrast、RT、viewing angle results are usingCPT LCD+ EWVPolarizer+ GVS’s BLU)

Table 6: Optical specifications

Items		Symbol	Condition	Specifications			Unit	Note
				Min.	Typ.	Max.		
Contrast Ratio		CR		250	350		-	
Response Time		$T_{R+}T_F$		--	30	45	ms	
	White	X_W		0.292	0.312	0.322	-	
		Y_W		0.335	0.358	0.368	-	
Viewing angle	Hor.	Φ1(3 o’clock)	Center CR≥10	60	70		deg.	
		Φ2(9 o’clock)		60	70			
	Ver.	θ2(12 o’clock)		40	50			
		θ1(6 o’clock)		60	70			
NTSC ratio				-	50	-	%	

Note 1: Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63 / L0

L63: Luminance of gray level 63

L0: Luminance of gray level 0

CR = CR (10)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note 5.

Note 2: Definition of Response Time (TR, TF):

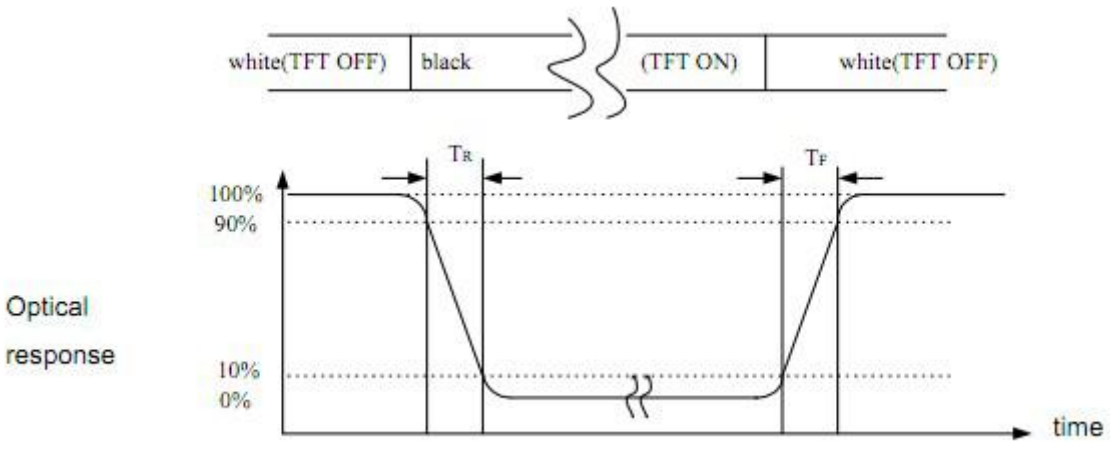


Figure 2

Note 3: Viewing Angle

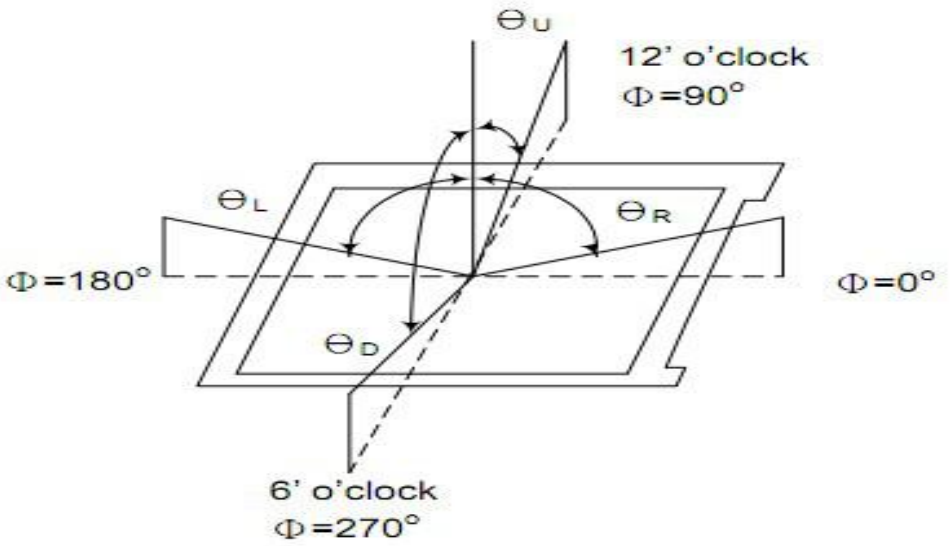
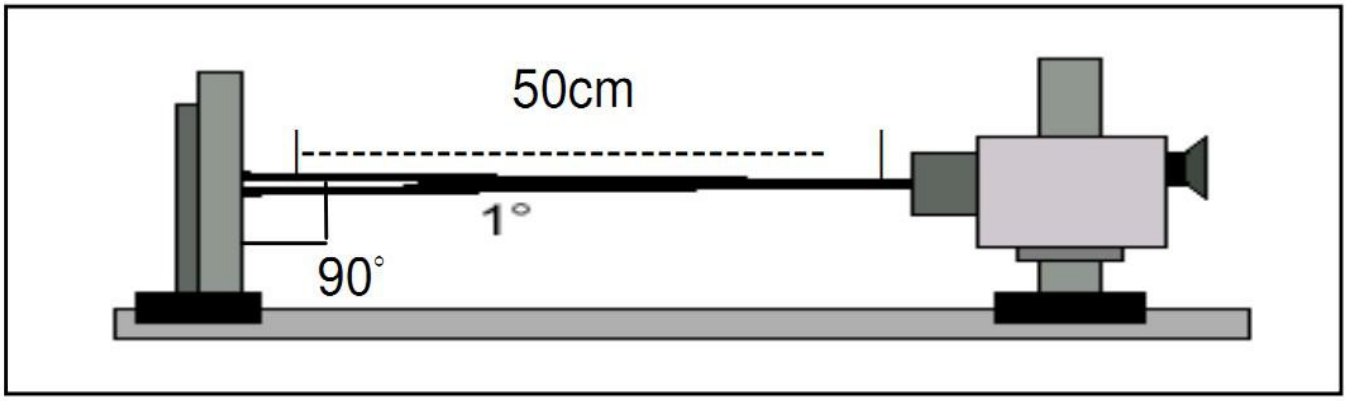


Figure 3

The above "Viewing Angle" is the measuring position with Largest Contrast Ratio; not for good image quality. View Direction for good image quality is 12 O'clock. Module maker can increase the "Viewing Angle" by applying Wide View Film.

Note 4: Measurement Set-Up:

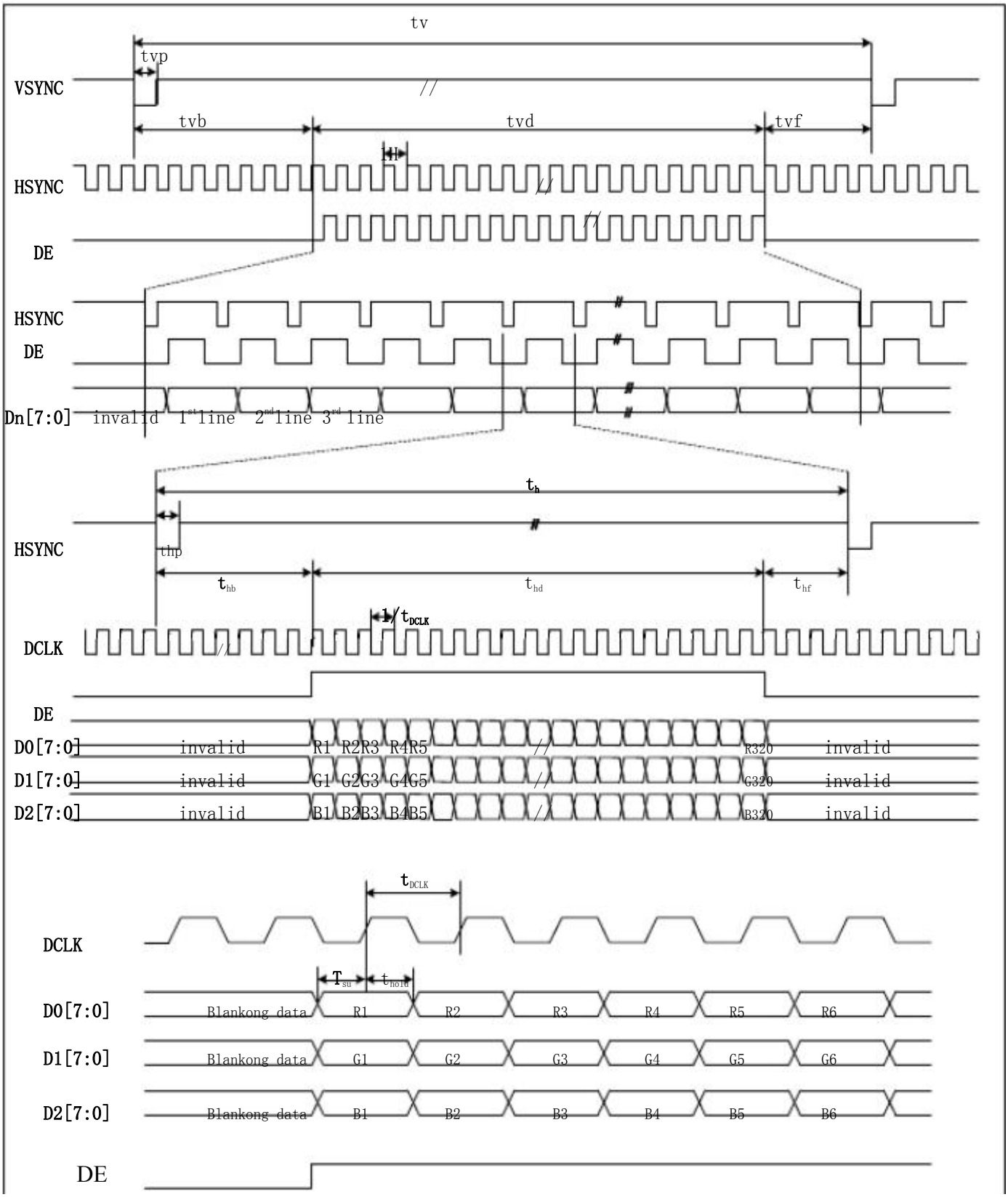
The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



Figure

8. Data input Characteristics

Parallel RGB Interface



Parallel RGB Input Signal Timing

Parameter	Symbol	Min.	Typ.	Max.	Unit.	Note
DCLK Frequency	1/tDCLK	8	9	12	MHz	
Horizontal Period	th	485	531	598	tDCLK	
Horizontal Display	thd	-	480	-	tDCLK	
Horizontal Back Porch	thb	3	43	43	tDCLK	
Horizontal Front Porch	thf	2	8	75	tDCLK	
Horizontal Pulse Width	thp	2	4	75	tDCLK	
Vertical Period	tv	276	292	321	th	
Vertical Display Period	tvd	-	272	-	th	
Vertical Back Porch	tvb	2	12	12	th	
Vertical Front Porch	tvf	2	8	37	th	
Vertical Pulse Width	tvp	2	4	37	th	
Data setup time	tsu	12	-	-	ns	
Data hold time	thold	12	-	-	ns	

9. Environmental / Reliability Test 环境/可靠性测试

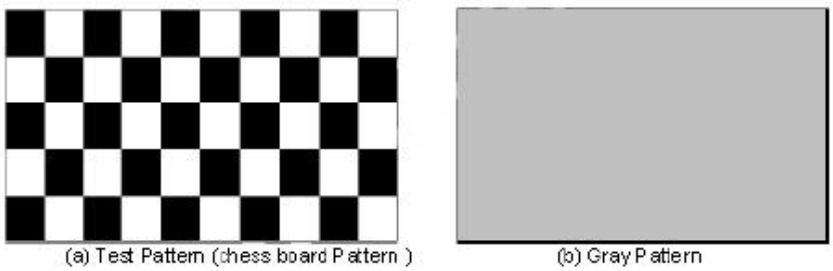
9.1 Temperature and Humidity 温湿度

Table 8

Test Item 试验项目	Test Condition 试验条件	Test result determinant gist 测试结果判定要点
High temperature storage 高温存放	80±2℃;96H	Inspection after 2~4hours storage at room temperature, the sample shall be free from defects: 试验结束后,已测试的 LCD 样品必须在室内正常温湿度环境下放置 2~4 个小时以上才能进行功能和外观检查， 样品不允许有以下缺陷： 1.Air bubble in the LCD; 模块中有气泡； 2.Sealleak; 封口松脱； 3.Non-display; 不显示； 4.missing segments; 漏笔； 5.Glass crack; 玻璃破碎； 6.Current Idd is twice higher than initial value. 电流 Idd 大于初时值的 2 倍； 7, the surface shall be free from damage. 表面无损伤. 8. The electrical characteristics requirements shall be satisfied. 需要满足模块电气性能。
Low temperature storage 低温存放	-30±2℃;96H	
High temperature operation 高温运行	70±2℃;96H	
Low temperature operation 低温运行	-20±2℃;96H	
Damp Proof Test 防潮试验	60℃±3℃,90%±3%RH;96H	
Temperature Shock 冷热冲击	-20±2℃,30min→60±2℃,30min; 10cycle	
Vibration Test 振动试验	Frequency：10Hz~55Hz~10Hz Amplitude：1.5mm, X， Y， Z direction for total 0.5hours(Packing condition)	
Image Sticking 图像残影	25℃±2℃；4hrs	Note1

Note: 注意：

1: Operation with test pattern sustained for 4 hrs, then change to gray pattern immediately.
运行测试模式 4 小时，然后马上切换为灰阶模式。
After 5 mins, the mura must be disappeared completely .5 分钟后，色差完全消失；



2. The test samples should be applied to only one test item. 每个被测试的模块只能用于其中的一个测试项目。
3. Sample size for each test item is 5~10pcs. 每个测试项目的样品数量为 5～10 片.
4. For Damp Proof Test, Pure water(Resistance＞10MΩ) should be used. 对于防潮试验，试验箱的用水必须是电阻大于 10M 欧姆的纯水。

5. In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part. 如果由静电引起产品故障,当放置一段时间后能够恢复正常， 则不视为产品缺陷。

9.2 Electrostatic Discharge(with BL) 静电(带背光)

Test Item 试验项目	Test Condition 试验条件	Remark 注意	
ESD	150pF，330Ω， Contact:±4KV,Air:±8KV	1	Class B
	200pF，0Ω，±200V contact test	2	

Note: Measure point :测试点

1. LCD glass and metal bezel 液晶玻璃和金属边框
2. IF connector pins 连接拼
3. ESD class B:some performance degradation allowed. Self-recoverable. No data lost,no hardware failures.
   ESD B 级：允许一些性能缺陷在自我重启后可恢复。
   没有数据丢失，没有硬件故障。

10. Inspection Criteria

10.1. Scope

The incoming inspection standards shall be applied to TFT –LCD Modules(hereinafter called "Modules") that supplied by Guangzhou Video-Star Display Co., Ltd.

10.2. Incoming Inspection

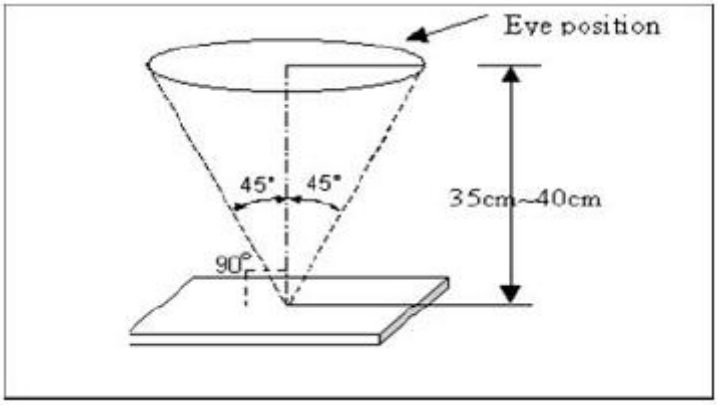
The customer shall inspect the modules within twenty calendar days of the delivery date （the "inspection period）at its own cost. The result of the inspection （acceptance or rejection）shall be recorded in writing,and a copy of this writing will be promptly sent to the seller, If the results of the inspecting from buyer does not send to the seller within twenty calendar days of the delivery date. The modules shall be regards as acceptance.Should the customer fail to notify the seller within the inspection period, the buyers right to reject the modules. Shall be lapsed and the modules shall be deemed to have been accepted by the buyer.

10.3 Inspection Sampling Method

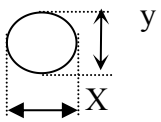
10.3.1. Lot size: Quantity per shipment lot per model
10.3.2. Sampling type: Normal inspection, Single sampling
10.3.3. Inspection level: II
10.3.4. Sampling table: GB/T2828.1-2003
10.3.5. Acceptable quality level （AQL）
Major defect: AQL=0.65
Minor defect: AQL=1.00

10.4 Inspection Conditions:

10.4.1 Ambient conditions:
a. Temperature: Room temperature 25±5℃
b. Humidity: (60±10) ％RH
c. Illumination: Single fluorescent lamp non-directive (300 to 700 Lux)
10.4.2 Viewing distance
The distance between the LCD and the inspector's eyes shall be at least 35~40㎝.
10.4.3 Viewing Angle
U/D: 45º/45º, L/R: 45º/45º



10.5 Defects are classified as major defects and minor defects according to the degree of defectiveness defined herein.

<table>
<tr><th>No</th><th>Item</th><th>Criterion for defects</th><th>Defect type</th></tr>
<tr><td>1</td><td>Black/white spot defect (in displaying)</td><td>
black/white spot definition
Φ= (x+y)/2


1. black/white spot defect (≤4.0inch)
<table>
<tr><th>area
size（mm）</th><th colspan="2">Acceptable number
A</th><th>B</th><th>C</th></tr>
<tr><td>Φ≤0.1</td><td colspan="2">ignore</td><td rowspan="4">ignore</td></tr>
<tr><td>0.1＜Φ≤0.15</td><td colspan="2">3</td></tr>
<tr><td>0.15＜Φ≤0.25</td><td colspan="2">2</td></tr>
<tr><td>Φ＞0.25</td><td colspan="2">0</td></tr>
</table>
2. black/white spot defect (>4.0inch)
<table>
<tr><th>area
size（mm）</th><th colspan="2">Acceptable number
A</th><th>B</th><th>C</th></tr>
<tr><td>Φ≤0.15</td><td colspan="2">ignore</td><td rowspan="4">ignore</td></tr>
<tr><td>0.15＜Φ≤0.25</td><td colspan="2">2</td></tr>
<tr><td>0.25＜Φ≤0.35</td><td colspan="2">1</td></tr>
<tr><td>Φ＞0.35</td><td colspan="2">0</td></tr>
</table>
</td><td>Minor</td></tr>
</table>

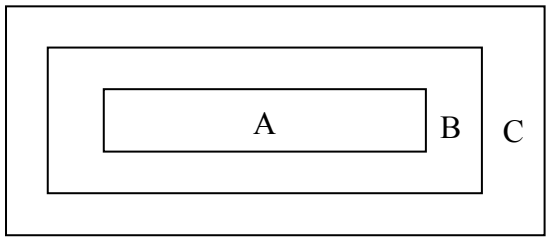
<table>
<tr>
<td>2</td>
<td>Black/white line defect (in displaying)</td>
<td>1. black/white line defect (All inch)
<table>
<tr><td colspan="2">size（mm）</td><td colspan="3">Acceptable number</td></tr>
<tr><td rowspan="2">L(length)</td><td rowspan="2">W(width)</td><td colspan="3">area</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>10＜L</td><td>0.03＜
W≤0.04</td><td colspan="2">5</td><td rowspan="4">ignore</td></tr>
<tr><td>5.0＜
L≤10</td><td>0.04＜
W≤0.06</td><td colspan="2">3</td></tr>
<tr><td>1.0＜
L≤5.0</td><td>0.06＜
W≤0.07</td><td colspan="2">2</td></tr>
<tr><td>L≤1.0</td><td>0.07＜
W≤0.09</td><td colspan="2">1</td></tr>
</table></td>
<td>Minor</td>
</tr>
</table>

<table>
<tr>
<td>3</td>
<td>Blemish & foreign matters</td>
<td>
1. Dot (≤4.0inch LCD)
<table>
<tr><td rowspan="3">size(mm)</td><td colspan="3">Acceptable number</td></tr>
<tr><td colspan="3">area</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Φ≤0.1</td><td colspan="2">ignore</td><td rowspan="4">ignore</td></tr>
<tr><td>0.10＜Φ≤0.15</td><td colspan="2">2</td></tr>
<tr><td>0.15＜Φ≤0.25</td><td colspan="2">1</td></tr>
<tr><td>0.25＜Φ</td><td colspan="2">0</td></tr>
</table>
2. Dot (>4.0inch LCD)
<table>
<tr><td rowspan="3">size(mm)</td><td colspan="3">Acceptable number</td></tr>
<tr><td colspan="3">area</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Φ≤0.15</td><td colspan="2">ignore</td><td rowspan="4">ignore</td></tr>
<tr><td>0.15＜Φ≤0.25</td><td colspan="2">2</td></tr>
<tr><td>0.25＜Φ≤0.35</td><td colspan="2">1</td></tr>
<tr><td>Φ＞0.35</td><td colspan="2">0</td></tr>
</table>
3. Blemish(≤4.0inch on touch panle or between touch panel ane LCD)
<table>
<tr><td rowspan="3">size(mm)</td><td colspan="3">Acceptable number</td></tr>
<tr><td colspan="3">AREA</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Φ≤0.1</td><td colspan="2">ignore</td><td rowspan="3">ignore</td></tr>
<tr><td>0.10＜Φ≤0.15</td><td colspan="2">1</td></tr>
<tr><td>0.15＜Φ</td><td colspan="2">0</td></tr>
</table>
</td>
<td>Minor</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td>4. Blemish(>4.0inch on touch panle or between touch panel ane LCD)
<table>
<tr><td rowspan="3">size(mm)</td><td colspan="3">Acceptable number</td></tr>
<tr><td colspan="3">AREA</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Φ≤0.15</td><td colspan="2">ignore</td><td rowspan="4">ignore</td></tr>
<tr><td>0.15＜Φ≤0.25</td><td colspan="2">2</td></tr>
<tr><td>0.25＜Φ≤0.35</td><td colspan="2">1</td></tr>
<tr><td>Φ＞0.35</td><td colspan="2">0</td></tr>
</table>
5.line(All inch LCD/touch panle)
<table>
<tr><td colspan="2">size(mm)</td><td colspan="3">Acceptable number</td></tr>
<tr><td rowspan="2">L(length)</td><td rowspan="2">W(width)</td><td colspan="3">area</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Ignore</td><td>W≤0.02</td><td colspan="2">5</td><td rowspan="4">ignor e</td></tr>
<tr><td>L≤3.0</td><td>0.02＜ W≤0.03</td><td colspan="2">3</td></tr>
<tr><td>L≤2.0</td><td>0.03＜ W≤0.05</td><td colspan="2">2</td></tr>
<tr><td>---</td><td>W＞0.05</td><td colspan="2">Treat with dot</td></tr>
</table></td><td></td></tr>
<tr><td>4</td><td>Stain on LCD panel surface</td><td>Stain which cannot be removed even when wiped lightly with a soft cloth or similar cleaning too are rejectable</td><td>Minor</td></tr>
<tr><td>5</td><td>Rust in bezel</td><td>Rust which is visible in the bezel is rejectable</td><td>Minor</td></tr>
<tr><td>6</td><td>Defect of land surface contact</td><td>Evident crevices which is visble are rejectable</td><td>Minor</td></tr>
<tr><td>7</td><td>Parts mounting</td><td>(1) failure to mount parts
(2) parts not in the specification are mounted
(3) polarith, for example,is reversed</td><td>Major
Major
Major</td></tr>
<tr><td>8</td><td>Parts alignment</td><td>(1) LSI,IC lead width is more than 50% beyond pad outline</td><td>Minor</td></tr>
</table>

		(2) Chip component is off center and more than 50% of the leads is off the pad outline	Minor
9	Conductive foreign matter	(1) on open space(gnd,manual solder)solder ball is allowed up toΦ0.1mm(1EA). (2) In case of shield space is allowed up toΦ0.2mm(1EA)	Major
10	Faculty PWB correction	(1) due to PWB copper foil pattern burnout,the patter is connected,using a jumper wire for repair;2 or more places corrected per PWB (2) short circuited part is cut,and no resist coating has been performed.	Minor Minor

area definition



LCD inspection area

A：active area

B：visible area

C：outside of visible area（Invisible area after assembling）

Visible Defect in area c，but it cannot affect product's quality ，it is allowed .

11. Suggestions for using LCD modules 使用注意事项

11.1 Handling of LCM 处理注意事项

11.1.1 The LCD screen is made of glass. Don't give excessive external shock, or drop from a high place.
液晶屏是用玻璃做成的。不要给过多的外部冲击，或从高处跌楼。

11.1.2 If the LCD screen is damaged and the liquid crystal leaks out, do not lick and swallow. When the liquid is attach to your hand, skin, cloth etc, wash it off by using soap and water thoroughly and immediately.
如果液晶屏幕损坏,液晶泄漏出去,不要舔和吞咽。当液体附着在你的手,皮肤、衣服等,请立即用肥皂和水彻底洗。

11.1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary. Do not touch the display with bare hands. This will stain the display area and degraded insulation between terminals (some cosmetics are determined to the polarizer).
请勿施加过大的压力于显示屏或连接部位，否则会引起色调变化。不要用手接触显示屏，这将弄脏显示区和降低端子之间的绝缘能力（一些外观是由偏光片决定的）。

11.1.4 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully. Do not touch, push or rub the exposed polarizers with anything harder than an HB pencil lead (glass, tweezers, etc.). Do not put or attach anything on the display area to avoid leaving marks on it. Condensation on the surface and contact with terminals due to cold will damage, stain or dirty the polarizer. After products are tested at low temperature they must be warmed up in a container before coming in to contact with room temperature air.
覆盖液晶显示模块显示平面的偏光片是软性且易被擦伤，请小心轻拿。请勿用任何硬度大于 HB 铅笔芯的物品（玻璃，镊子等） 接触、撞压或摩擦裸露偏光片。不要放置或粘附物体在显示区域上以免留下痕迹。冷凝在表面和端子将会损坏或弄脏偏光片。产品在低温下测试之后，与室温空气接触之前必须在容器内升温。

11.1.5 If the display surface becomes contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, moisten cloth with one of the following solvents
-Isopropyl alcohol
- Ethyl alcohol
Do not scrub hard to avoid damaging the display surface.
如果显示平面受污，可对平面吹热气且轻轻地用软性干布擦除。如果受污严重，用含下列一种溶剂的湿布擦除:
-甘油
-酒精
请勿用力擦拭以免损坏显示平面。

11.1.6 Solvents other than those above-mentioned may damage the polarizer. Especially, do not use the following.
-Water
-Ketone
-Aromatic solvents
Wipe off saliva or water drops immediately, contact with water over a long period of time may

cause deformation or color fading. Avoid contact with oil and fats.

除以上提到的溶剂外，其他溶剂可能会损坏偏光片，特别要避免使用以下溶剂：

-水

-酮

-芳烃溶剂

立即擦掉唾液或水滴，长时间与水接触会引起变形或褪色。避免接触油和油脂。

11.1.7 Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.

特别注意最小限度地减少电极腐蚀，电极腐蚀会因水滴、湿度冷凝或在高湿环境下通电而加速。

11.1.8 Install the LCD Module by using the mounting holes. When mounting the LCD module make sure it is free of twisting, warping and distortion. In particular, do not forcibly pull or bend the I/O cable or the backlight cable.

使用安装孔装配液晶显示模块，安装时一定不要弯曲、扭曲和变形。要特别注意不要用力拔，弯曲传输线或背光线。

11.1.9 Do not attempt to disassemble or process the LCD module.

请勿拆卸液晶显示模块。

11.1.10 NC terminal should be open. Do not connect anything.

悬空端应断开，不要连接任何器件。

11.1.11 If the logic circuit power is off, do not apply the input signals.

如果逻辑电路电源是断开的，不要施加输入信号。

11.1.12 Electro-Static Discharge Control， Since this module uses a CMOS LSI, the same careful attention should be paid to electrostatic discharge as for an ordinary CMOS IC. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

由于液晶显示模块使用 CMOS 集成，要特别注意静电放电问题。对 CMOS 器件，要特别注意静电。为防止静电损坏，注意保持合宜的工作环境。

-Before removing LCM from its packing case or incorporating it into a set, be sure the module and your body have the same electric potential. Be sure to ground the body when handling the LCD modules.

液晶显示模块移出包装盒和安装之前， 要保证模块和人体具有相同的电位。处理模块时，可靠接地。

-Tools required for assembling, such as soldering irons, must be properly grounded. Make certain the AC power source for the soldering iron does not leak. When using an electric screwdriver to attach LCM, the screwdriver should be of ground potentiality to minimize as much as possible any transmission of electromagnetic waves produced sparks coming from the commutator of the motor.

-使用工具如电烙铁，要可靠接地，并确保烙铁使用交流电，不要漏电。用电批固定模块时，电批应接地，尽可能降低电动换向器火花产生的电磁波。

-To reduce the amount of static electricity generated, do not conduct assembling and other work under dry conditions. To reduce the generation of static electricity be careful that the air in the work is not too dry. A relative humidity of 50%-60% is recommended. As far as possible make the electric potential of your work clothes and that of the work bench the ground potential.

-为减少静电产生，不在干燥组装或其它操作。为降低静电，工作场地一定不要太干燥。
建议相对湿度为 50%-60%　。尽可能使你的工作服和工作台接地。

- The LCD module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.

-液晶显示模块表面有一个保护膜。需要小心操作以减少撕保护膜时静电的产生。

11.1.13 Since LCM has been assembled and adjusted with a high degree of precision, avoid applying excessive shocks to the module or making any alterations or modifications to it.

由于液晶显示模块由高精度装配和调节制成，应避免对模块过大的冲击或做任何更改。

-Do not alter, modify or change the shape of the tab on the metal frame.

-不要改动金属架上的翼片形状。

-Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.

-不要在印制电路板上钻额外的孔，修改形状或更改印制线路板上元件的位置。

-Do not damage or modify the pattern writing on the printed circuit board.

-不要更改或损坏印制线路板上的图案。

-Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal connector.

-绝对不要更改斑马条（导电胶条）或导电纸连接器。

-Except for soldering the interface, do not make any alterations or modifications with a soldering iron.

-除焊接接口外，不要用烙铁做任何更改。

-Do not drop, bend or twist the LCM.

-不要扔、弯和扭模块

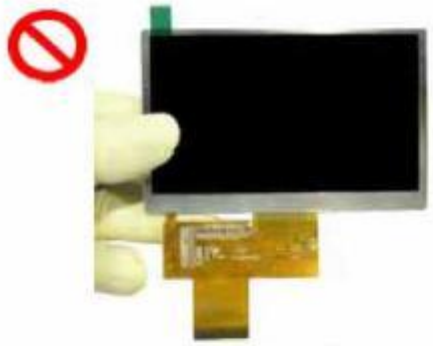
11.2. Handing Precautions for LCM　模块操作规范

11.2.1 LCM is easy to be damaged. Please note below and be careful for handling
液晶显示模块很容易被损坏，请注意以下并小心操作

11.2.2 Correct handling;　正确操作

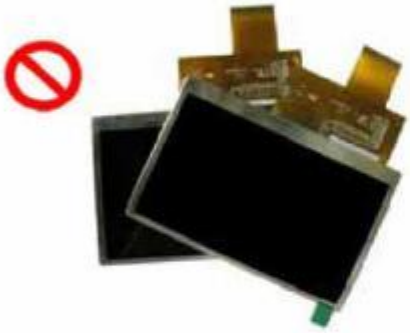
As above picture,please handle with anti-static gloves around LCM edges.
像上面的图片，请戴抗静电手套，并拿模块边缘。

11.2.3 Incorrect handling; 错误操作



Please don't hold the surface of panel,
请不要拿模块的表面

Please don't stretch the FPC
请不要拉扯 FPC



Please don't stack LCM.
请不要把模块叠在一起

Please don't hold the surface of IC.
请不要拿 IC 的表面

Please don't press LCM
请不要挤压模组

Please don't operation with sharp stick
请不要用尖锐物体操作

11.3. Storage Precautions 储存注意事项

11.3.1 When storing the LCD modules, the following precaution are necessary.
液晶显示模块的存储依照以下几点：

11.3.1.1 Store them in a sealed polyethylene bag. If properly sealed, there is no need for the desiccant.
使用聚乙烯袋密封，如果密封得当，不需要干燥剂。

11.3.1.2 Store them in a dark place. Do not expose to sunlight or fluorescent light, keep the temperature between 0°C and 35°C, and keep the relative humidity between 40%RH and 60%RH.
避光保存，避免直接暴露在太阳光或黄光灯下，保持温度在 0~35 摄氏度之间,保持相

对湿度在 40%RH 和 60%RH 之间。

11.3.1.3 The polarizer surface should not come in contact with any other objects (We advise you to store them in the anti-static electricity container in which they were shipped).

偏光片表面避免接触其他物质（建议存放在货运防静电包装中）。

11.3.2 Others 其它

9.3.2.1 Liquid crystals solidify under low temperature (below the storage temperature range) leading to defective orientation or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subject to a low temperature.

液晶在低温会凝固（低于储存温度范围以下），会导致缺陷或产生气泡（黑或白）。如果模块处于低温下，也会产生气泡。

11.3.2.2 If the LCD modules have been operating for a long time showing the same display patterns, the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can be regained by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.

如果液晶显示模块长时间工作于同一个显示图案，换屏时会出现鬼影，也会出现轻微的对比度不均。停止使用一段时间后可恢复到正常状态。此现象不会严重影响性能可靠性。

11.3.2.3 To minimize the performance degradation of the LCD modules resulting from destruction caused by static electricity etc., exercise care to avoid holding the following sections when handling the modules.

工作为最小限度地降低由静电等导致液晶显示模块性能降低，使用模块时慎重使用下列区域：

- Exposed area of the printed circuit board.

-印制电路板裸露区域。

-Terminal electrode sections.

-印制电路板引出端子区域。

11.4. Using LCD modules 使用液晶显示模块

11.4.1 Installing LCD Modules 安装液晶显示模块

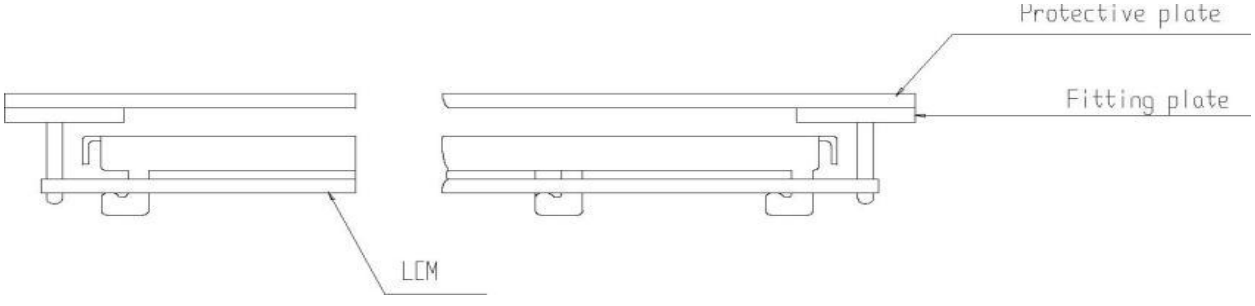
The hole in the printed circuit board is used to fix LCM as shown in the picture below.

Attend to the following items when installing the LCM.

印制线路板上的孔用来固定液晶显示屏，如下图所示。安装液晶显示模块时，注意以下事项：

11.4.1.1 Cover the surface with a transparent protective plate to protect the polarizer and LC cell.

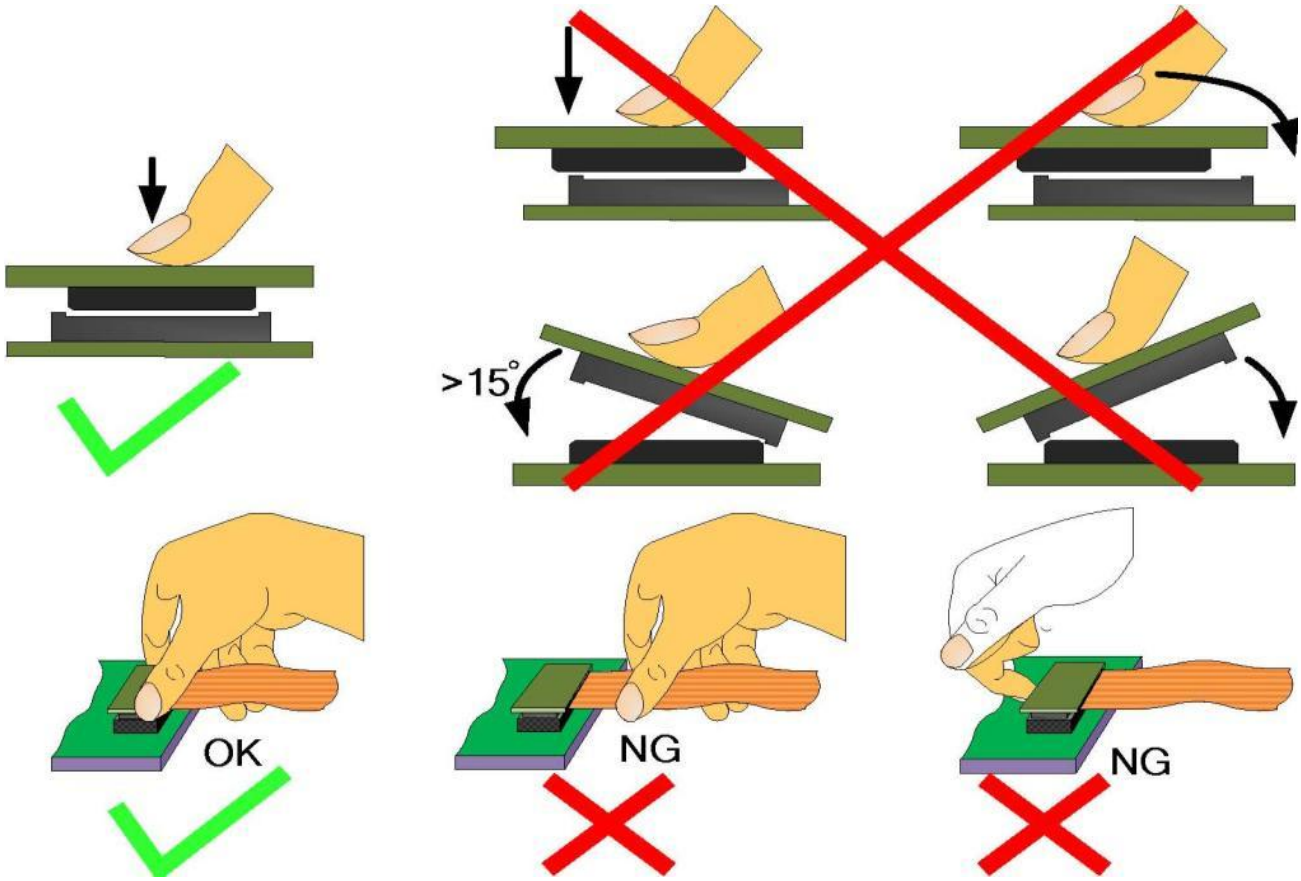
贴一层透明保护膜来保护偏光片和液晶盒。



11.4.1.2 When assembling the LCM into other equipment, the spacer to the bit between the LCM and the fitting plate should have enough height to avoid causing stress to the module surface, refer to the individual specifications for measurements. The measurement tolerance should be ±0.1mm.
将模块安装进入其它设备时， 模块和安装板之间间隔应有足够的高度以避免模块表面受压。参照专业度量技术标准。量度公差应是±0.1 毫米。

11.4.2 Precaution for assemble the module with BTB connector:
用板对板连接器安装液晶显示模块注意事项：

Please note the position of the male and female connector position, don't assemble or assemble like the method which the following picture shows
请注意连接器的公母及连接位置，请勿出现下图所示的连接方式。



11.4.3 Precaution for soldering the LCM 焊接模块注意事项

	Manual soldering 手工焊接	Machine drag soldering 机器拖焊	Machine press soldering 机器压焊
No RoHS Product 非环保产品	290°C ~350°C. Time : 3-5S.	330°C ~350°C. Speed : 4-8 mm/s.	300°C ~330°C. Time : 3-6S. Press: 0.8~1.2Mpa
RoHS Product	340°C ~370°C. Time : 3-5S.	350°C ~370°C. Time : 4-8 mm/s.	330°C ~360°C. Time : 3-6S.

环保产品			Press: 0.8~1.2Mpa

11.4.3.1 If soldering flux is used, be sure to remove any remaining flux after finishing to soldering operation (This does not apply in the of a non-halogen type of flux). It is recommended that you protect the LCD surfaccase e with a cover during soldering to prevent any damage due to flux spatters.

如果使用助焊剂，完成焊接后一定要清除剩余的助焊剂（除非卤化物助焊剂）。

建议焊接时用盖子保护显示屏面以避免因焊剂油溅出造成的任何损坏。

11.4.3.2 When soldering the electroluminescent panel and PC board, the panel and board should not be detached more than three times. This maximum number is determined by the temperature and time conditions mentioned above, though there may be some variance depending on the temperature of the soldering iron.

焊接背光源和线路板时， 不应装卸多于三次。尽管焊接温度会有变化， 但不应超过上面提到的焊接温度和时间最大值。

11.4.3.3 When remove the electroluminescent panel from the PC board, be sure the solder has completely melted, the soldered pad on the PC board could be damaged.

从线路板上移除背光源时，要保证焊锡已完全熔化，不要损坏线路板上的焊接位。

11.4.4 Precautions for Operation 工作运行注意事项:

11.4.4.1 Viewing angle varies with the change of liquid crystal driving voltage (VLCD). Adjust VLCD to show the best contrast.

视角应随液晶驱动电压(VLCD) 变化而变化.调整 VLCD 可显示最好的对比度。

11.4.4.2 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.

在液晶驱动电压内来操作模块是必要的。超过限定电压会缩短液晶寿命。直流电会引起液晶的电化学反应，导致液晶老化，因此要避免直流电驱动液晶。

11.4.4.3 Response time will be extremely delayed at lower temperature than the operating temperature range and on the other hand at higher temperature LCD's show 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 operating temperature.

液晶响应时间在低温时比常温要慢，高温时，液晶底色会深。然而,这并不是指液晶显示屏工作异常,显示屏在温度恢复时，效果会恢复正常。

11.4.4.4 If the display area is pushed hard during operation, the display will become abnormal. However, it will return to normal if it is turned off and then back on.

如果在运行过程中显示区受到挤压,显示将会异常.然而挤压中断,将恢复正常。

11.4.4.5 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.

接线端冷凝会引起电化学反应而断路。因此必须在最大的操作温度之内，湿度小于 50% 的条件下使用液晶显示模块。

11.4.4.6 Input logic voltage before apply analog high voltage such as LCD driving voltage when power on. Remove analog high voltage before logic voltage when power off the module. Input each signal after the positive/negative voltage becomes stable.
开机时，先让逻辑电压，再接通模拟高压， 如显示屏驱动电压。关机时，先断开模拟高压，再关逻辑电压。正负电源都稳定后再送控制信号。

11.4.4.7 Please keep the temperature within the specified range for use and storage. Polarization degradation, bubble generation or polarizer peel-off may occur with high temperature and high humidity.
模块在操作和存储规格范围内使用。高温高湿可能会引起偏振退化，起泡，偏光片脱落等问题。

11.4.5 Safety 安全

9.4.5.1 It is recommended to crush damaged or unnecessary LCDs into pieces and wash them off with solvents such as acetone and ethanol, which should later be burned.
建议将损坏的液晶显示屏压成碎片，用溶剂诸如丙酮,乙醇冲洗掉，迟后烧掉。

11.4.5.2 If any liquid leaks out of a damaged glass cell and comes in contact with the hands, wash off thoroughly with soap and water.
如果任何液体从液晶盒泄漏出且与手接触,要用肥皂和水彻底清洗。

11.4.6 Limited Warranty 有限责任

Unless agreed between Video-Star Diaplay and the customer, Video-Star Diaplay will replace or repair any of its LCD modules which are found to be functionally defective when inspected in accordance with Video-Star Diaplay LCD acceptance standards (copies available upon request) for a period of one year from date of production. Cosmetic/visual defects must be returned to Video-Star Diaplay within 90 days of shipment. Confirmation of such date shall be based on data code on product. The warranty liability of Video-Star Diaplay limited to repair and/or replace on the terms set forth above. Video-Star Diaplay will not be responsible for any subsequent or consequential events.
除视声光电和客户之间另有协议外，自生产之日起一年内，根据视声光电的液晶显示屏品质标准，视声光电将对有功能缺陷的液晶显示模块换货或返工。外观/视觉缺陷产品，必须在出货后 90 天内归还视声光电。以产品上标识日期为准。视声光电保修责任仅限于对符合上述规定的货品进行返工和/或换货。对此后发生的任何情况，视声光电均不承担任何责任。

11.4.7 Return LCM under warranty 模块保修

11.4.7.1 No warranty can be granted if the precautions stated above have been disregarded. The typical examples of violations are :
保修是以上述注意事项未被忽视为先决条件的。典型的违反例子如下:

-Broken LCD glass.
-断裂的液晶显示屏玻璃。

-PCB eyelet is damaged or modified.
-印制线路板孔修改或损坏。

-PCB conductors damaged.

-线路板导体损坏。

-Circuit modified in any way, including addition of components.

-线路随意变更，包括元件变化。

-PCB tampered with by grinding, engraving or painting varnish.

-印制电路板已修改，如研磨，雕刻，绘涂等。

-Soldering to or modifying the bezel in any manner.

-焊接或变动模块

11.4.7.2Module repairs will be invoiced to the customer upon mutual agreement. Modules must be returned with sufficient description of the failures or defects. Any connectors or cable installed by the customer must be removed completely without damaging the PCB eyelet, conductors and terminals.

模块维修清单将按双方协议送呈客户。模块详细缺陷描述须模块一并退回。顾客安装的连接器或电缆必须在不破坏线路板孔，线路和引线端条件下全部移去。

12. Product ID Rule

Product Name(e.g)

VS □□□ □ □ □ □□ □□

① ② ③ ④ ⑤ ⑥ ⑦

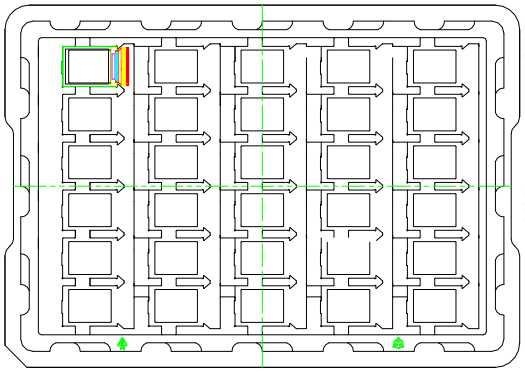
①(Company)		② (Size)		③LCD Company		④IC Company	
Code	**Description**	**Code**	**Description**	**Code**	**Description**	**Code**	**Description**
VS	Guangzhou Video-Star Display Co., Ltd.	035 040 043	3.5” 4.0” 4.3”	A B C D H I L M N O P R S T V W Y	AUO BOE CPT HYDIS HSD INNOLUX LGD CMI TOPSUN ORTUSTECH SHARP ARIMA LAIBAO TM IVO WINTEK TRULY	E F H I L N O R S U V	EK(FITI) FT HIMAX ILI LGD NT OTM RENESAS ST UC NV(New Vision)

⑤TP With and Without		⑥Serial number（2-4digits）		⑦REV（1-2Digits）	
Code	**Description**	**Code**	**Description**	**Code**	**Description**
T N	With TP Without TP	01	Product Serial NO.	V0 V1 V2	The new product The first Change The Second Change

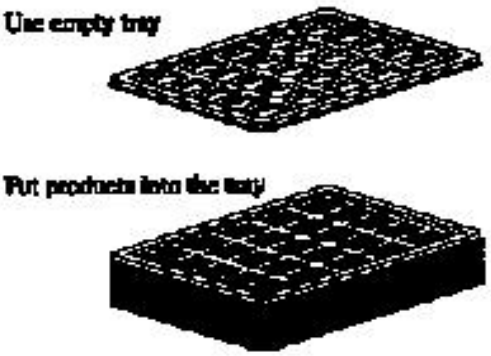
13. Packing (Reference only)

13.1 Packing Method

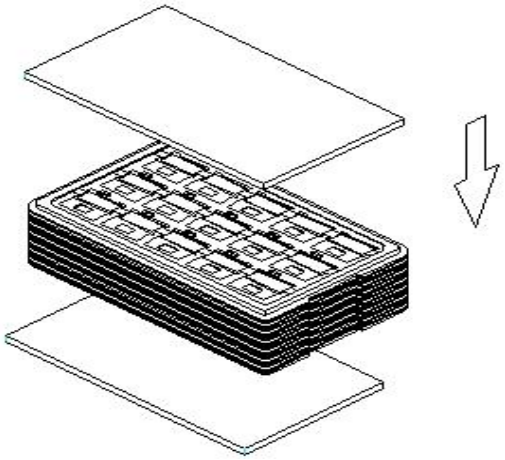
(1)



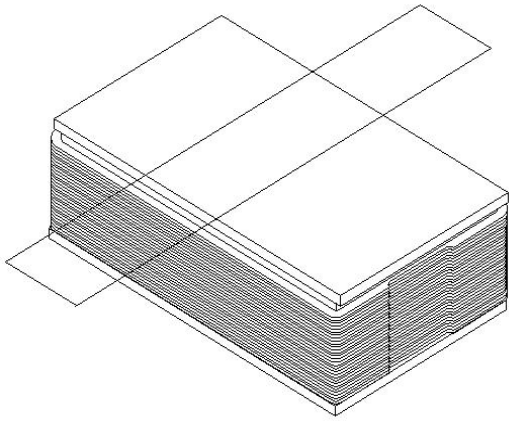
(2)



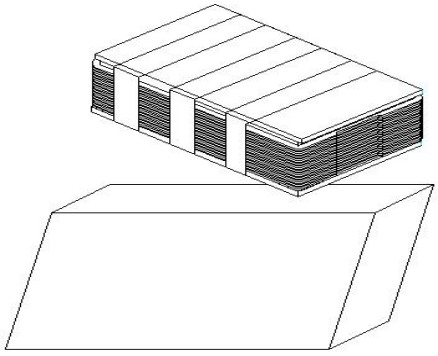
(3)



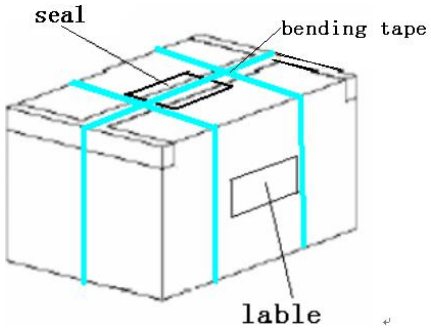
(4)



(5)



(6)



1. Put module into tray cavity:
2. Tray stacking
3. Put 1 cardboard under the tray stack and 1 cardboard above:
4. Fix the cardboard to the tray stack with adhesive tape:
5. Put the tray stack into carton.

6. Carton sealing with adhesive tape.

13.2 Box label

The box label followed by is affixed to a shipped product at the specified location on each packing box.

1) Label Size: 80 mm (L) ´ 60 mm (W)

2) Contents

- Model : VS043CSN02V2
- Q`ty : Quantity in one box
- Serial No. : Refer the description as below.
- Date : Packing Date
- FG Code : FG Code of Product

14. PRIOR CONSULT MATTER 提前商议事项

1 For Video-Star Diaplay standard products, we keep the right to change material, process ... for improving the product property without prior notice to our customer.

对于视声光电的标准产品，我们保留在不通知客户的情况下,为提高产品性能而改变原材料及加工方法等的权利。

2 For OEM products, if any changes are needed which may affect the product property, we will consult with our customer in advance.

对于 OEM 产品，如果需要做任何会影响到产品性能的改变，我们会提前和客户商议。

3 If you have special requirement about reliability condition, please let us know before you start the design on our samples.

如对可靠性条件有特殊要求，请在模块设计开发前通知我们。