



SPECIFICATION FOR VS043IIN14V0

Project No.	VS043IIN14V0	
Customer		
Module No.		
Product type	Standard LCD Module 480(RGB)x 272 Pixels 4.3 " TFT LCD	
Signature by customer:		
Prepared	Checked	Approved



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Document revision history:

DOCUMENT REVISION	DATE	DESCRIPTION	PREPARED BY	APPROVED BY
V00	2013.08.19	First Release.	Tiger	
V01	2013.10.09	Update Inspection criteria	ZXP	
V02	2013.12.26	Modify the format	Tiger	



2. General Description

- 4.3 " (diagonal), 480 (RGB)x 272pixels, 16M colors, Transmissive, TFT LCD module.
- Viewing Direction: 6 O'clock.
- Driving IC: ILI6480BQ
- 24-bit RGB interface
- Logic voltage: 3.0-3.6V (typ.).
- Without touch panel.

3. Mechanical Specifications

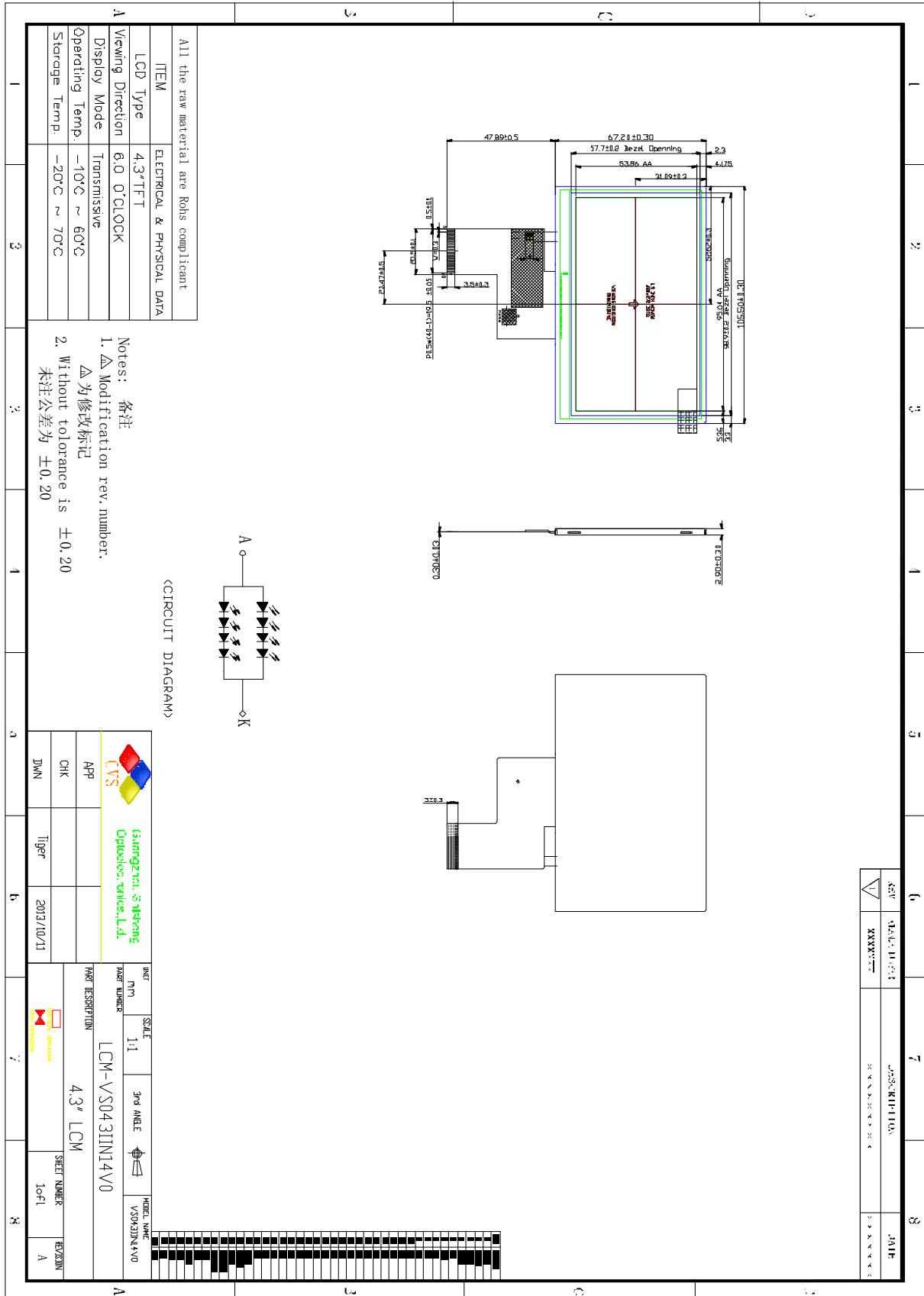
The mechanical detail is shown in Fig. 1 and summarized in Table 1 below.

Table 1

Parameter	Specifications	Unit
Outline dimensions	105.5(H) x67.2(V) x2.9(D)	mm
		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.	Symbol	Description
1	LEDK	Backlight LED Cathode
2	LEDA	Backlight LED anode
3	GND	System Ground
4	VCC	Power supply for logic operation
5~12	R0~R7	Data bus
13~20	G0~G7	Data bus
21~28	B0~B7	Data bus
29	GND	System Ground
30	CLK	Pixel clock signal
31	DISP	Display on/off control
32	HSYNC	Horizontal Sync signal
33	VSYNC	Vrtical Sync signal
34	DEN	Data Enable
35	NC	NC
36	GND	System Ground
37	XR	Touch panel pin
38	YD	Touch panel pin
39	XL	Touch panel pin
40	YU	Touch panel pin

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 (VDD)	VCC	-0.3	+3.6	V	1

Note:

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



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	VCC	3	3.3	3.6	V	-

6.2 Backlight Driving Conditions

Table 5

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Supply voltage of white LED backlight	VL	12	12.6	13.5	V	Note 1
Current for LED backlight	IL	38	40	50	mA	
Uniformity	△	75	80	-	%	
Luminance (on the module surface, BM-7)	LV	220	250	-	cd/m ²	
LED life time	-	20,000	-	-	Hr	Note 2

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

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

7. Optical Characteristics

Table 6: Optical specifications

Items	Symbol	Condition	Specifications			Unit	Note
			Min.	Typ.	Max.		
Contrast Ratio	CR		400	500		-	
Response Time	T _R			10	20	ms	
	T _F			15	30	ms	
White	X _W		0.26	0.31	0.36	-	
	Y _W		0.28	0.33	0.38	-	
Viewing angle	Hor.	φ1(3 o'clock)	60	70		deg.	
		φ2(9 o'clock)	60	70			
	Ver.	θ2(12 o'clock)	40	50			
		θ1(6 o'clock)	60	70			

Note 1: Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = L_{63} / L_0$$

L₆₃: Luminance of gray level 63

L₀: Luminance of gray level 0

$$\text{CR} = \text{CR} (10)$$

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):

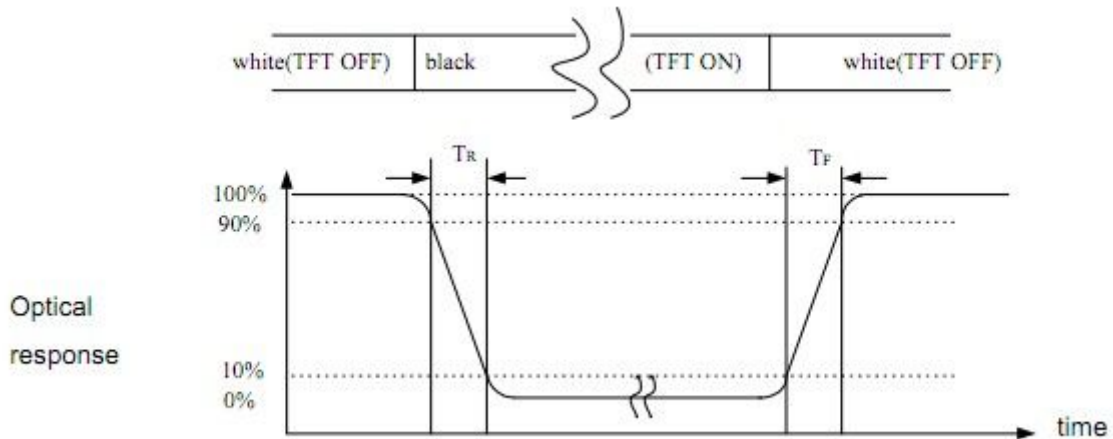


Figure 2

Note 3: Viewing Angle

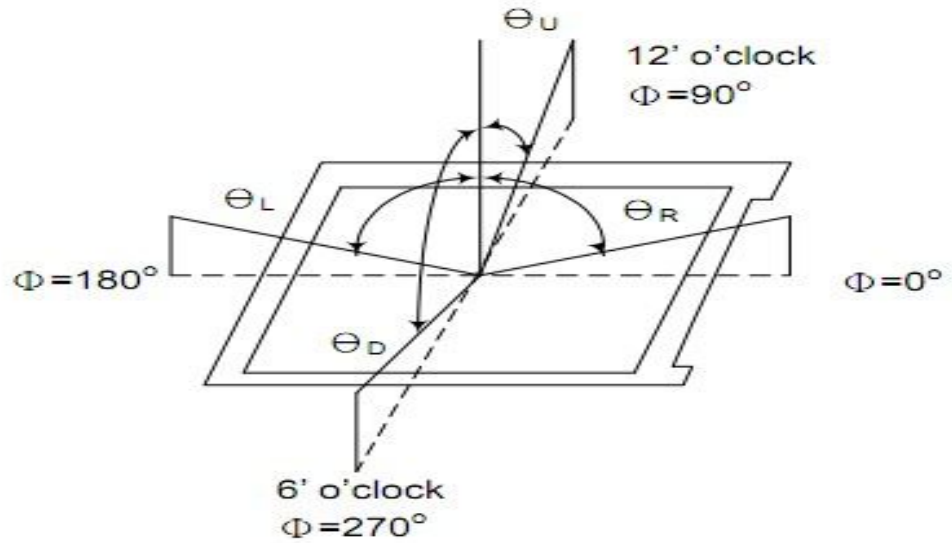


Figure 3

The above “Viewing Angle” is the measuring position with Largest Contrast Ratio; not for good image quality. View Direction for good image quality is 6 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.

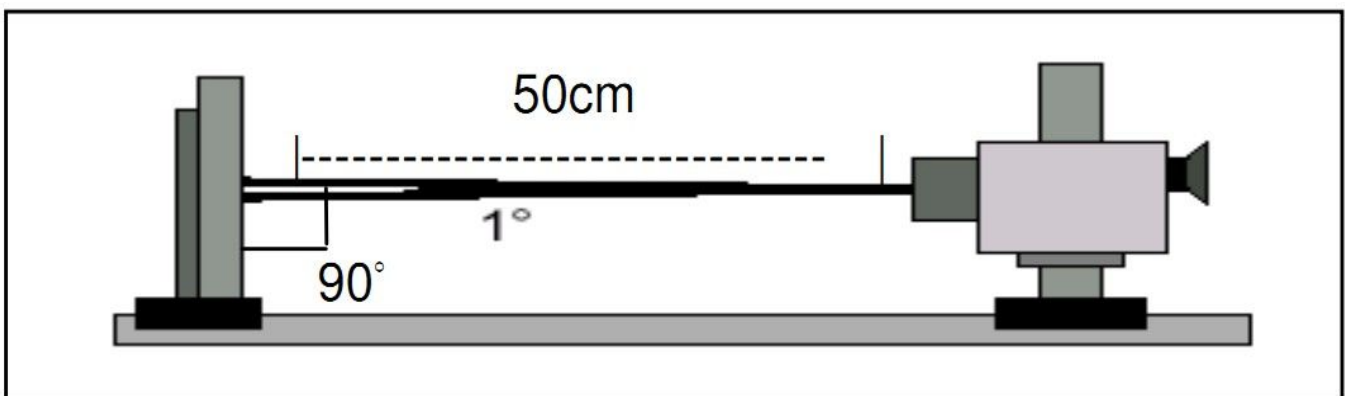
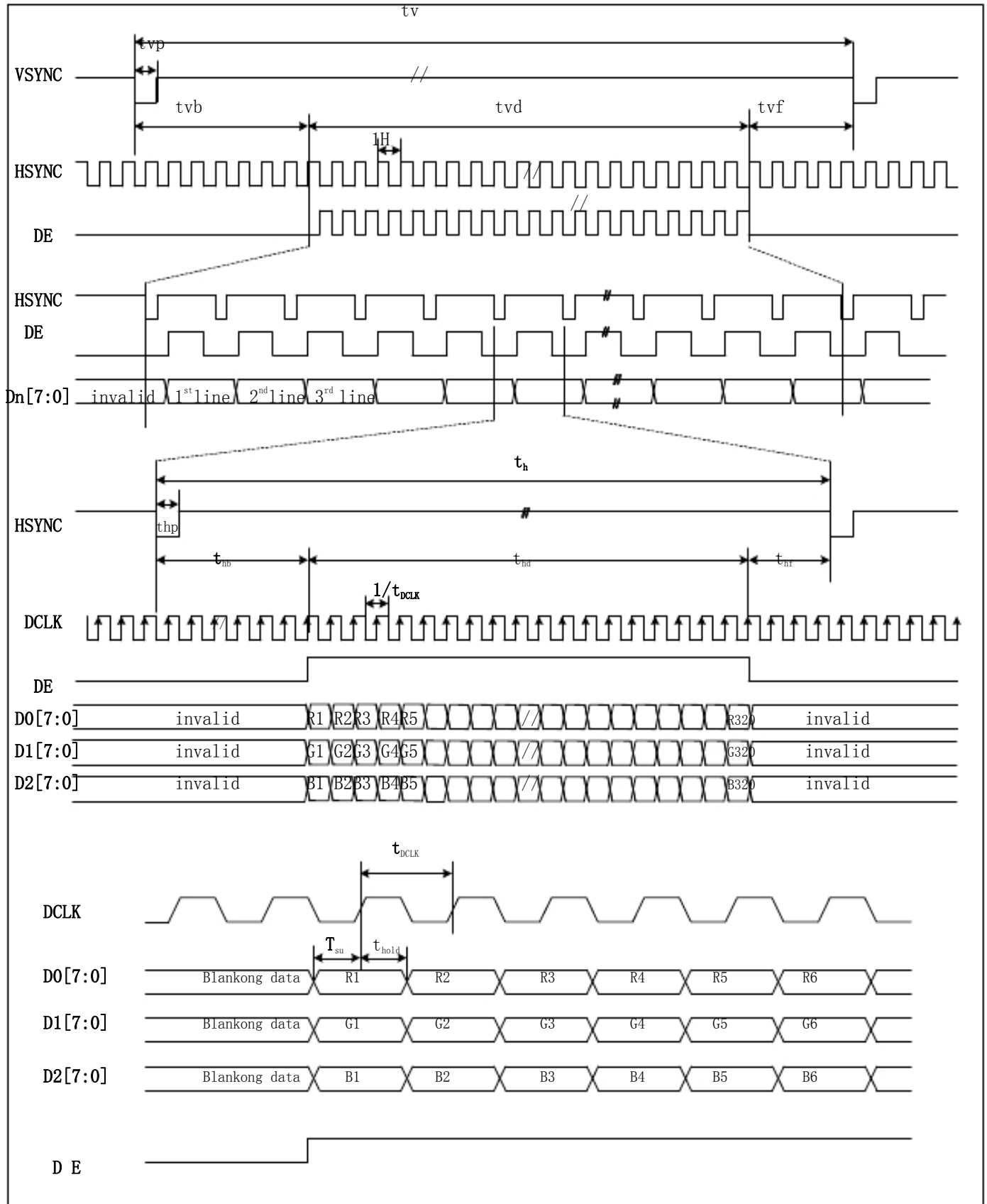


Figure 4



8. Data input Characteristics

Parallel RGB Interface





Parameter	Symbol	Min.	Typ.	Max.	Unit.	Note
DCLK Frequency	1/tDCLK	5	9	12	MHz	
Horizontal Period	th	520	525	800	tDCLK	
Horizontal Display	thd	-	480	-	tDCLK	
Horizontal Back Porch	thb	36	40	255	tDCLK	
Horizontal Front Porch	thf	4	5	65	tDCLK	
Horizontal Pulse Width	thp	1	-	-	tDCLK	
Vertical Period	tv	277	288	400	th	
Vertical Display Period	tvd	-	272	-	th	
Vertical Back Porch	tvb	3	8	31	th	
Vertical Front Porch	tvf	2	8	97	th	
Vertical Pulse Width	tvp	1	-	-	th	
Data setup time	tsu	12	-	-	ns	
Data hold time	thold	12	-	-	ns	



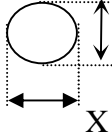
9. Environmental / Reliability Test

Table 8

Test Item	Sample Type	Test Condition	Test result determinant gist
High temperature storage	Normal temperature	60±3℃;96H	the inspection of appearance and function character.
	Wide temperature	70±3℃;96H	
Low temperature storage	Normal temperature	-10±3℃;96H	
	Wide temperature	-20±3℃;96H	
High temperature /humidity storage	Normal temperature	50℃±3℃,85%±3%RH;96H	
	Wide temperature	60℃±3℃,85%±3%RH;96H	
High temperature operation	Normal temperature	60±3℃;96H	No objection of the function character; no fatal objection of the appearance.
	Wide temperature	70±3℃;96H	
Low temperature operation	Normal temperature	-10±3℃;96H	
	Wide temperature	-20±3℃;96H	
High temperature /humidity operation	Normal temperature	40℃±3℃,85%±3%RH;96H	
	Wide temperature	50℃±3℃,85%±3%RH;96H	
Temperature Shock	Normal temperature	-10±3℃,30min→60±3℃,30min;10cycle	inspect the objections appearance、function & the whole structure
	Wide temperature	-20±3℃,30min 70±3,30min;10cycle	The inspection of appearance、function & the whole structure

10. Inspection Criteria

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

No	Item	Criterion for defects	Defect type																																														
1	Black/white spot defect (in displaying)	<p>black/white spot definition</p>  $\Phi = \frac{(x+y)}{2}$ <p>1. black/white spot defect (I)</p> <table border="1"> <thead> <tr> <th rowspan="2">area size (mm)</th> <th colspan="3">Acceptable number</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.1$</td> <td colspan="3">ignore</td> </tr> <tr> <td>$0.10 < \Phi \leq 0.15$</td> <td colspan="3">3</td> </tr> <tr> <td>$0.15 < \Phi \leq 0.25$</td> <td colspan="3">2</td> </tr> <tr> <td>$\Phi > 0.25$</td> <td colspan="3">0</td> </tr> </tbody> </table> <p>2. black/white spot defect (II)</p> <table border="1"> <thead> <tr> <th rowspan="2">area size (mm)</th> <th colspan="3">Acceptable number</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.3$</td> <td colspan="3">ignore</td> </tr> <tr> <td>$0.30 < \Phi \leq 0.50$</td> <td colspan="3">5 (space between is 20mm)</td> </tr> <tr> <td>$0.50 < \Phi \leq 1.00$</td> <td colspan="3">3 (space between is 50mm)</td> </tr> <tr> <td>$1.00 < \Phi$</td> <td colspan="3">0</td> </tr> </tbody> </table>	area size (mm)	Acceptable number			A	B	C	$\Phi \leq 0.1$	ignore			$0.10 < \Phi \leq 0.15$	3			$0.15 < \Phi \leq 0.25$	2			$\Phi > 0.25$	0			area size (mm)	Acceptable number			A	B	C	$\Phi \leq 0.3$	ignore			$0.30 < \Phi \leq 0.50$	5 (space between is 20mm)			$0.50 < \Phi \leq 1.00$	3 (space between is 50mm)			$1.00 < \Phi$	0			Minor
area size (mm)	Acceptable number																																																
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2	Black/white line defect (in displaying)	<p>1. black/white line defect (I)</p> <table border="1"> <thead> <tr> <th colspan="2">size (mm)</th> <th colspan="3">Acceptable number</th> </tr> <tr> <th rowspan="2">L(length)</th> <th rowspan="2">W(width)</th> <th colspan="3">area</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>$10 < L$</td> <td>$0.03 < W \leq 0.04$</td> <td colspan="3">5</td> </tr> <tr> <td>$5.0 < L \leq 10$</td> <td>$0.04 < W \leq 0.06$</td> <td colspan="3">3</td> </tr> <tr> <td>$1.0 < L \leq 5.0$</td> <td>$0.06 < W \leq 0.07$</td> <td colspan="3">2</td> </tr> </tbody> </table>	size (mm)		Acceptable number			L(length)	W(width)	area			A	B	C	$10 < L$	$0.03 < W \leq 0.04$	5			$5.0 < L \leq 10$	$0.04 < W \leq 0.06$	3			$1.0 < L \leq 5.0$	$0.06 < W \leq 0.07$	2			Minor																		
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$L \leq 1.0$	$0.07 < W \leq 0.09$	1	
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2. black/white line defect(II)

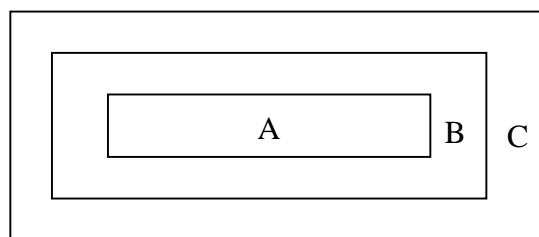
size(mm)		Acceptable number		
L(length)	W(width)	area		
		A	B	C
$20 < L$	$0.05 < W \leq 0.07$	5		ignore
$10 < L \leq 20$	$0.07 < W \leq 0.09$	3		
$5.0 < L \leq 10$	$0.09 < W \leq 0.10$	2		
$L \leq 5.0$	$0.10 < W \leq 0.15$	1		



3	Blemish & foreign matters	1. dot (LCD)	Minor																																		
		<table border="1"> <thead> <tr> <th rowspan="3">size(mm)</th> <th colspan="3">Acceptable number</th> </tr> <tr> <th colspan="3">area</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.1$</td> <td colspan="3">ignore</td> </tr> <tr> <td>$0.10 < \Phi \leq 0.15$</td> <td colspan="3">2</td> </tr> <tr> <td>$0.15 < \Phi \leq 0.25$</td> <td colspan="3">1</td> </tr> <tr> <td>$0.25 < \Phi$</td> <td colspan="3">0</td> </tr> </tbody> </table>		size(mm)	Acceptable number			area			A	B	C	$\Phi \leq 0.1$	ignore			$0.10 < \Phi \leq 0.15$	2			$0.15 < \Phi \leq 0.25$	1			$0.25 < \Phi$	0										
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4	Stain on LCD panel	Stain which cannot be removed even when wiped lightly with a soft cloth or similar cleaning too are	Minor																																		

	surface	rejectable	
5	Rust in bezel	Rust which is visible in the bezel is rejectable	Minor
6	Defect of land surface contact	Evident crevices which is visible are rejectable	Minor
7	Parts mounting	(1) failure to mount parts (2) parts not in the specification are mounted (3) polarity, for example, is reversed	Major Major Major
8	Parts alignment	(1) LSI, IC lead width is more than 50% beyond pad outline (2) Chip component is off center and more than 50% of the leads is off the pad outline	Minor Minor
9	Conductive foreign matter	(1) on open space (gnd, manual solder) solder ball is allowed up to $\Phi 0.1\text{mm}$ (1EA). (2) In case of shield space is allowed up to $\Phi 0.2\text{mm}$ (1EA)	Major
10	Faculty PWB correction	(1) due to PWB copper foil pattern burnout, the pattern 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

11.1 Handling of LCM

1. The LCD screen is made of glass. Don't give excessive external shock, or drop from a high place.
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.
3. Don't apply excessive force on the surface of the LCM.
4. If the surface is contaminated ,clean it with soft cloth. If the LCM is severely contaminated , use Isopropyl alcohol/Ethyl alcohol to clean. Other solvents may damage the polarizer . The following solvents is especially prohibited: water , ketone Aromatic solvents etc.
5. 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.
6. 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.
7. Don't disassemble the LCM.
8. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
 - Be sure to ground the body when handling the LCD modules.
 - Tools required for assembling, such as soldering irons, must be properly grounded.
 - To reduce the amount of static electricity generated, do not conduct assembling and other work under dry conditions.
 - 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.
9. Do not alter, modify or change the the shape of the tab on the metal frame.
10. Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.
11. Do not damage or modify the pattern writing on the printed circuit board.
12. Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal connector
13. Except for soldering the interface, do not make any alterations or modifications with a soldering iron.
14. Do not drop, bend or twist LCM.

11.2 Storage

1. Store in an ambient temperature of 5 to 45 ° C, and in a relative humidity of 40% to 60%. Don't expose to sunlight or fluorescent light.
2. Storage in a clean environment, free from dust, active gas, and solvent.
3. Store in antistatic container.



12. Product ID Rule

Product Name(e.g)

VS

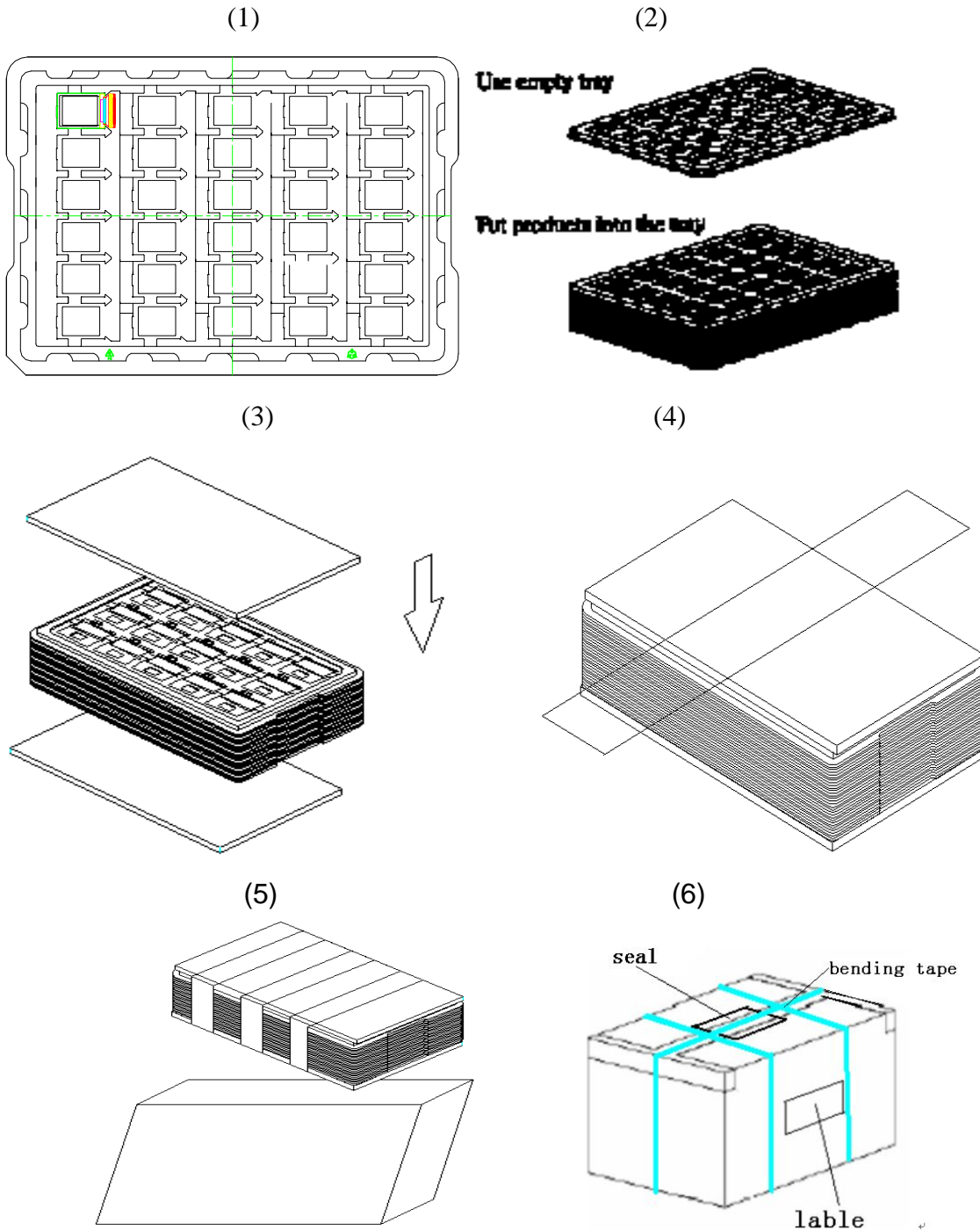
① ② ③ ④ ⑤ ⑥ ⑦

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(FIT) 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	With TP	01	Product Serial NO.	V0	The new product
N	Without TP			V1	The first Change
				V2	The Second Change

13. Packing (Reference only)

13.1 Packing Method



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 : VS043IIN14V0
- Q`ty : Quantity in one box
- Serial No. : Refer the description as below.
- Date : Packing Date
- FG Code : FG Code of Product