PRODUCT SPECIFICATIONS
Preliminary Specification

Module No: VISLCD-090HYA50Q4

PRODUCT TYPE: TFT   MODULE

VERSION: A0

Huayuan:

APPROVED BY	CHECKED BY	DESIGNED BY
		Jiang

Customer:

APPROVED BY	TESTED BY	INSPECTION RESULT

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Shenzhen HuaYuan disPlaY control teChniQue.,Ltd
深圳市芯云显控技术有限公司
Shenzhen Chiloud display control Co.,Ltd

Revision History

Version	Contents	Date	Note
A	Original	2019-07-10	

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1. Technology Specifications

1.1 Features

The LCD adopts one backlight with High brightness 27-lamps white LED.

Construction: . 9 ″ a-Si color TFT-LCD ,White LED backlight and FPC .

1.2 General Specifications

No.	Item	Specification
1	LCD size	8.95 inch
2	Resolution	800 (RGB)X480
3	Display mode	Normally white
4	Pixel pitch	82.5(H)×232.7 (V) um
5	Active area	198(H)x111.696(V) mm
6	Module size	210.7(H)X126.5(V)X5.2(D)mm
7	Pixel arrangement	RGB-stripe
8	Interface	RGB 24BIT

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1.3 Interface Pin Connection

Pin No	Symbol	Description
1-2	LED+	LED back light(Anode)
3-4	LED-	LED back light(Cathode)
5	GND	Power ground
6	VCOM	Common voltage
7	DVDD	Power for Digital Circuit
8	MODE	DE/SYNC mode select
9	DE	Data ENABLE signal for RGB I/F mode
10	VS	Vertical Sync Input
11	HS	Horizontal Sync Input
12-19	B7-B0	BLUE Data bus
20-27	G7-G0	GREEN Data bus
28-35	R7-R0	RED Data bus
36	GND	Power ground
37	DCLK	Dot clock signal for RGB interface operation.
38	GND	Power ground
39	L/R	Left / right selection
40	U/D	Up/down selection
41	VGH	Gate ON Voltag
42	VGL	Gate OFF Voltage
43	AVDD	Power for Analog Circuit
44	RESET	Global reset pin.
45	NC	No connection
46	VCOM	Common Voltage
47	DITHB	Dithering function
48	GND	Power ground
49	NC	No connection
50	NC	No connection

Note 1: DE/SYNC mode select. Normally pull high. When select DE mode, MODE="1", VS and HS must pull high. When select SYNC mode, MODE= "0", DE must be grounded.
Note 2: When input 18 bits RGB data, the two low bits of R,G and B data must be grounded.
Note 3: Data shall be latched at the falling edge of DCLK.

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1.4 ELECTRICAL SPECIFICATION

Item	Symbol	Specification			Unit
		Min.	Typ	Max.	
TFT gate on voltage	VGH	16.3	17.0	17.7	V
TFT gate off voltage	VGL	-5.7	-5.0	-4.3	V
TFT common electrode voltage	Vcom	3.2	4.2	5.2	V

1.5 DC Characteristics

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power Voltage	DV_{DD}	3.0	3.3	3.6	V	-
	AV_{DD}	10.2	10.4	10.6		
	V_{GH}	15.0	16.0	17.0		
	V_{GL}	-7.7	7.0	-6.3		
Input signal Voltage	VCOM		TBD			
Input High Voltage	V_{IH}	0.7VD	-	VDD	V	Digital input pins
Input Low Voltage	V_{IL}	GND	-	0.3VD	mA	Digital input pins
Output High	V_{OH}	0.8VD	-	VDD	mA	Digital input pins
Output High	V_{OL}	GND	-	0.2VD	W	Digital input pins
(Panel+LSI) Power Consumption	Black Mode		TBD		mA	
	Sleeping Mode		TBD		uA	
Clock Frequency	F_{CLK}	26.4	33.3	46.8	MHz	-

1.6 LED Back Light Specification (21 White Chips)

Item	Symbol	Condition	Min	Typ	Max	Unit
Forward Voltage	Vf	If=180mA	-	9.2	-	V
Uniformity (with L/G)	$\triangle B_p$	If=180mA	-	80	-	%
Luminance for LCM	/	If=180mA	-	350	-	cd/m^2
Backlight Power Consumption	WBL	If=180mA	-	640	-	mW
Backlight Color	White					

Note:LED Circuit

Backlight LED Circuit

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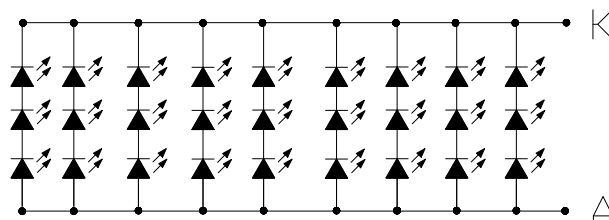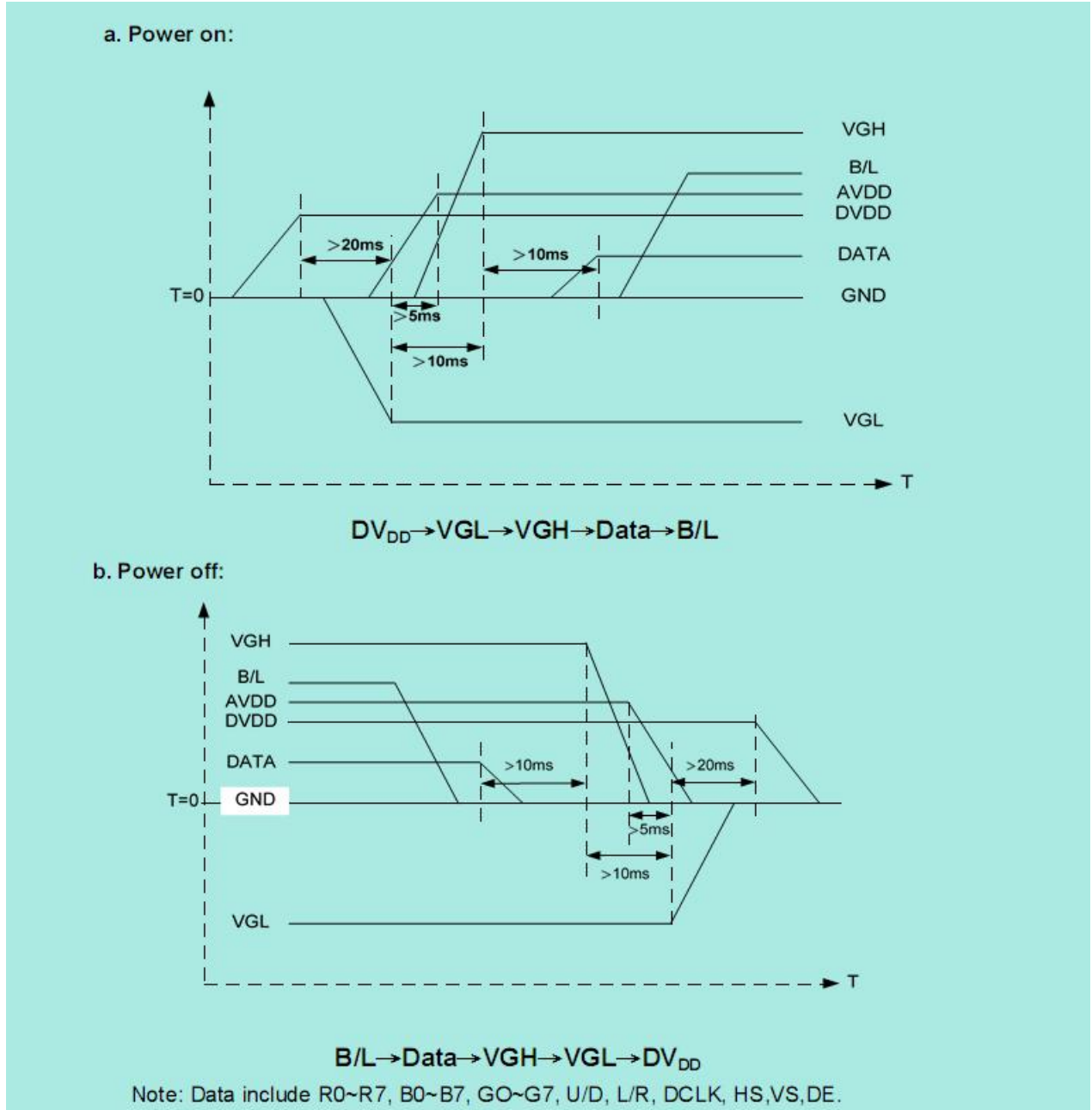
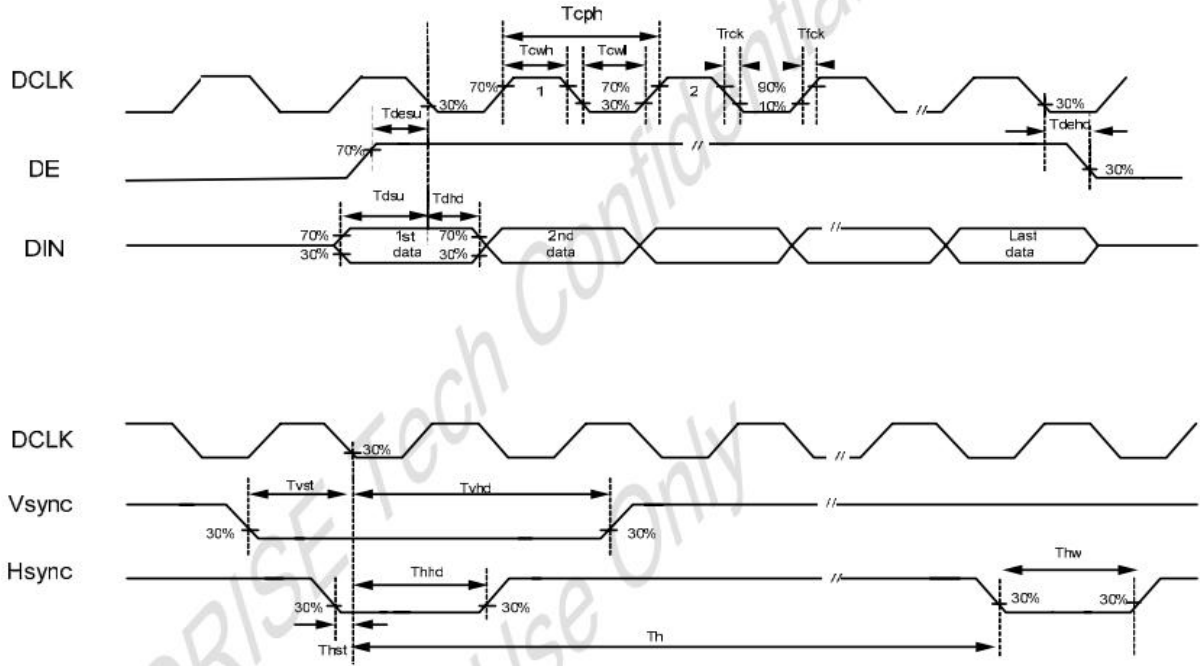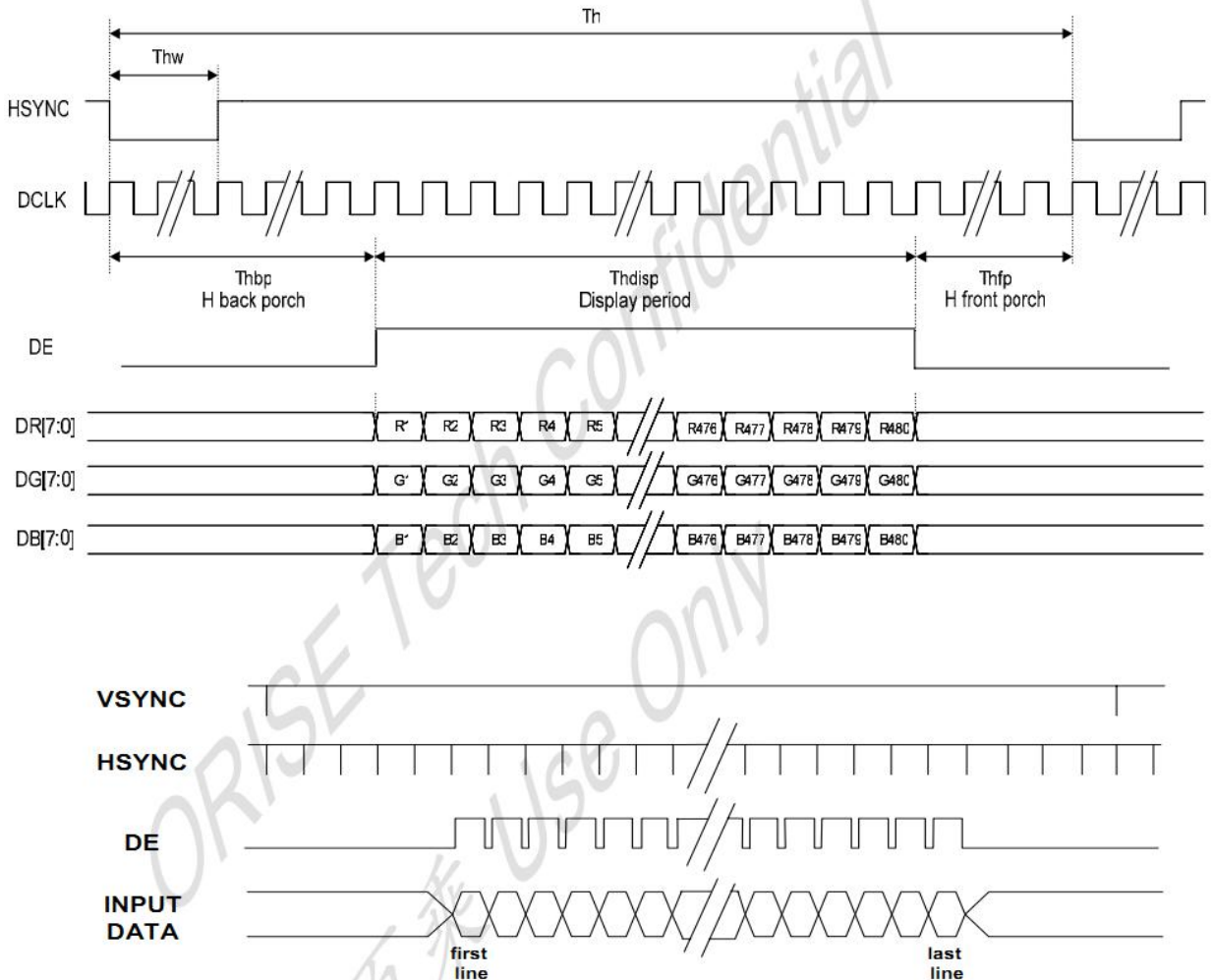## 2.8 AC Timing Diagram

2.8.1 Clock and Data Input Timing Diagram

2.8.2 Display parallel RGB Interface Timing characteristics

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2.8.3 Parallel RGB Input Timing Table

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Horizontal Display Area	thd	-	800	-	DCLK	
DCLK Frequency	fclk	26.4	33.3	46.8	MHz	
One Horizontal Line	th	862	1056	1200	DCLK	
HS pulse width	thpw	1	-	40	DCLK	
HS Blanking	thb	46	46	46	DCLK	
HS Front Porch	thfp	16	210	354	DCLK	

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Vertical Display Area	tvd	-	480	-	TH	
VS period time	tv	510	525	650	TH	
VS pulse width	tvpw	1	-	20	TH	
VS Blanking	tvb	23	23	23	TH	
		7	22	147	TH	

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2.9 Optical specifications

Item		Symbol	Conditions	Specifications			Unit	Note
				Min.	Typ.	Max.		
Transmittance		T%	Viewing normal angle $\theta_X = \theta_Y = 0°$	5.6	6.2	-	%	All left side data are based on Innolux's following condition – 1.LC : TN 2.Light Source :Innolux LED BLU 3.Film : NWF-LN-SEGAGS1/ NWF-LN-SEG 4.Machine : DMS 803 5. VLC dark > 4.6V, VLC white < 0.2V
Contrast Ratio		CR		500	800	-	-	
Response Time (by Quick)		$T_{on} + T_{off}$		-	25	35	ms	
Viewing Angle	Hor.	θ_{X+}	Center CR>10	75	80	-	deg.	
		θ_{X-}		75	80	-		
	Ver.	θ_{Y+}		75	80	-		
		θ_{Y-}		75	80	-		
Color Chromaticity (CIE 1931)	Red	Rx	Viewing normal angle $\theta_X = \theta_Y = 0°$	0.566	0.586	0.606	-	Under BLU Simulation
		Ry		0.319	0.339	0.359	-	
	Green	Gx		0.301	0.321	0.341	-	
		Gy		0.569	0.589	0.609	-	
	Blue	Bx		0.138	0.158	0.178	-	
		By		0.105	0.125	0.145	-	
	White	Wx		0.277	0.297	0.317	-	
		Wy		0.302	0.322	0.342	-	
Color Gamut		CG		40	50	--	%	

*Note (1)   Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.
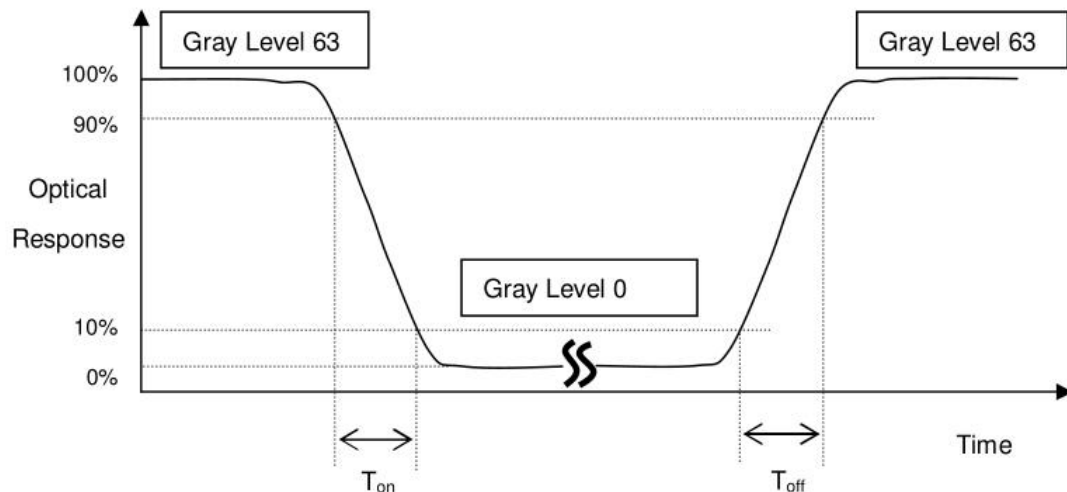
Contrast Ratio (CR) = L63 / L0

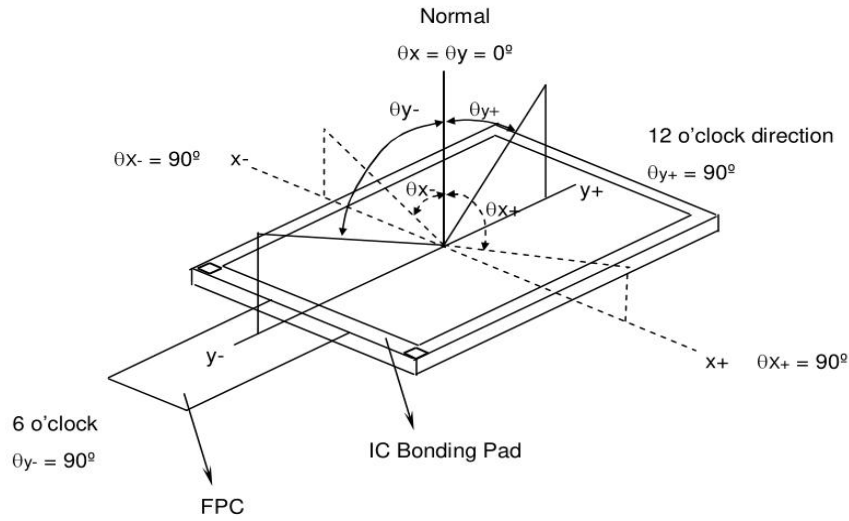L63: Luminance of gray level 63

L 0: Luminance of gray level 0

CR = CR (5)

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

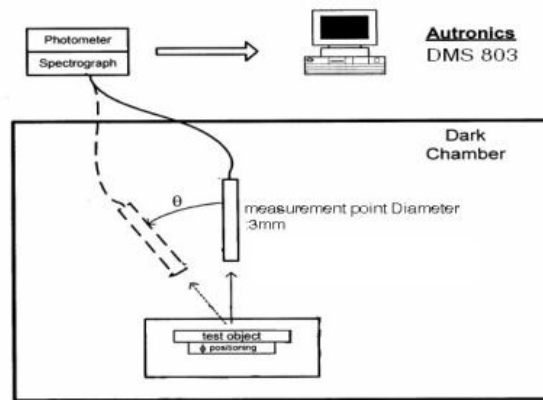*Note (2)   Definition of Response Time (T_{on}, T_{off}):

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*Note(3)   Definition of Viewing Angle

Normal
$\theta x = \theta y = 0^\circ$

$\theta y-$ $\theta y+$

$\theta x- = 90^\circ$ x-

12 o'clock direction
$\theta y+ = 90^\circ$

$\theta x-$
$\theta x+$
y+

y-

x+ $\theta x+ = 90^\circ$

6 o'clock
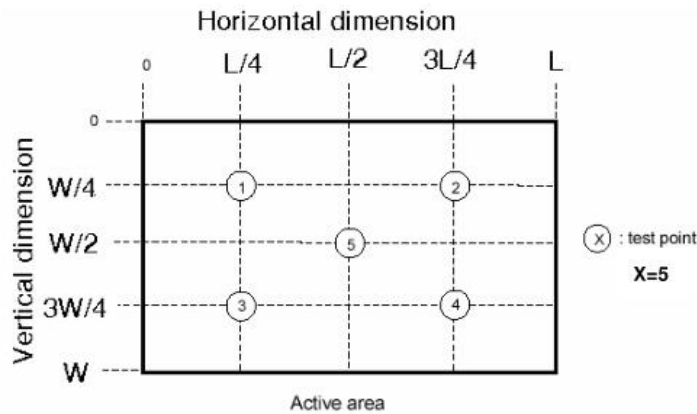$\theta y- = 90^\circ$

IC Bonding Pad

FPC

*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.

Photometer
Spectrograph

Autronics
DMS 803

Dark
Chamber

θ measurement point Diameter :3mm

test object
positioning

*Note (5)

Horizontal dimension

L/4   L/2   3L/4   L

0

W/4   ①   ②

W/2   ⑤

3W/4   ③   ④

W

Active area

Vertical dimension

Ⓧ : test point
X=5

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3. Reliability Test Conditions And Methods

Item	Test Conditions		Remark
High Temperature Storage	Ta = 70℃	96hrs	
Low Temperature Storage	Ta =-20℃	96hrs	
High Temperature Operation	Ts = 60℃	96hrs	
Low Temperature Operation	Ta = -10℃	96hrs	
Operate at High Temperature and Humidity	60℃, 90%RH max.	96hrs	Operation
Thermal Shock	-20℃~ +70℃ 10 cycles 1Hrs/cycle		Non-operation
Vibration Test	Frequency:10Hz~55Hz~10Hz Amplitude:1.5mm X,Y,Z direction for total 3hours (Packing Condition)		
Drooping Test	Drop to the ground from 1M height one time every side of carton. (Packing Condition)		
Electrostatic Discharge	Contact=±4KV, class B Air=±8KV, class B		

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4. Handling Precautions

4.1 Mounting method

The LCD panel of FEXDA LCD 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.

4.2 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.

4.3 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.

4.4 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 high temperature/humidity

4.5 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

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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.

4.6 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

4.7 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

5. Precaution for use

5.1

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.

5.2

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 FEXDA , 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.

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6. Outline Dimension

所有图纸确认OK：

PIN	DESCRIPTION
1~2	LED+
3~4	LED−
5	GND
6	Vcom
7	DVDD
8	MODE
9	DE
10	VS
11	HS
12~19	B7~B0
20~27	G7~G0
28~35	R7~R0
36	GND
37	DCLK
38	GND
39	L/R
40	U/D
41	VGH
42	VGL
43	AVDD
44	RESET
45	NC
46	VCOM
47	DITHB
48	GND
49	NC
50	NC

VF=9.2V IF=180MA
LED 电路图

DISPLAY TYPE	7.0" TFT	OPERATING VOLTAGE	3.3V
DRIVER IC	TBD	POLARIZE TYPE	NEGATIVE,TRANSMISSIVE
VIEWING DIRECTION	6 O'clock	LUMINANCE	350cd/m²
OPERATING TEMP	−10℃~60℃	CONNECTION METHOD	FPC
STORAGE TEMP	−20℃~70℃	UNSPECIFIED TOLERANCE	±0.20mm

PART NO.	
MODEL NO.	
SCALE:1/1 UNIT:mm	DATE 2019-01-03
APPROVE	CHECK	DISINER
PAGE：1/1	