

SPECIFICATION FOR APPROVAL

DESCRIPTION: 10.1"LCD Module _____

CUSTOMER: _____

Product No: BR101DHI3625-A4 _____

V.1 Released Date: 2022.12.05 _____

Revision: .04 _____

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APPROVED SIGNATURES			

Specification

Record of Revisions

Rev	Date	Sub-Model	Description of change
V01	2022.04.19	101DHI3625-A4 V.1	Preliminary Product Specification was first issued.
V02	2022.07.26	101DHI3625-A4 V.1	Add Package Specification (P20)
V03	2022.12.01	101DHI3625-A4 V.1	Modify Package Specification (P20)
V04	2022.12.05	101DHI3625-A4 V.1	Update Box size (P20)

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1. General description

1.1 Introduction

Hontron Mode 101DHI3625-A4 V.1 is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT LCD panel, a driving circuit and a back light system. This TFT LCD has a 10.1 (16:10) inch diagonally measured active display area with WXGA (1280horizontal by 800 vertical pixel) resolution.

1.2 Features

10.1 (16:10 diagonal) inch configuration

16.7M color 8bit LVDS interface

RoHS Compliance

1.3 Applications

Mobile NB

Automotive

Multimedia applications and Other AV system

1.4 General information

Item		Specification	Unit
Outline Dimension		229.46x 149.1 x 2.5 (typ)	mm
Display area		216.96(W) x 135.60(H)	mm
Number of Pixel		1280 x RGB(H) x 800(V)	pixels
Dot pitch		0.1695(W) x 0.1695(H)	mm
Pixel arrangement		RGB Vertical stripe	
Display mode		Normally Black	
Surface treatment		Antiglare	
Weight		160	G
Back-light		Single LED (Side-Light type)	
Power	B/L System	2.3	W
Consumption	TFT Panel	1.3	W

Note: TFT Panel power consumption including DC-DC circuit power consumption.

1.5 Mechanical Information

item		Min.	Typ.	Max.	Unit
Module Size	Horizontal(H)	229.26	229.46	229.66	mm
	Vertical(V)	148.85	149.1	149.3	mm
	Depth(D)	2.3	2.5	2.7	mm

2.0 ABSOLUTE MAXIMUM RATINGS

2.1 Electrical Absolute Rating

2.1.1 TFT LCD Module

Item	Symbol	Min.	Max.	Unit.	Note
Power supply voltage	VDD	-0.3	3.9	V	GND=0

2.1.2 Back-Light Unit

Item	Symbol	MIN.	TYP.	MAX.	Unit	Note
Forward voltage	LED_VDD	7.8	9.6	10.2	V	(1)(2)
Forward current	If	--	240	--	mA	(1)(2) (3)
Power Consumption	PBL	--	2.3	--	W	

Note:

(1) Permanent damage may occur to the LCD module if beyond this specification. Functional operation should be restricted to the conditions described under normal operating conditions.

(2) $T_a = 25 \pm 2^\circ\text{C}$

(3) Test Condition: NA

2.2 Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Remarks
Operating Temperature	Topa	-20	+70	°C	
Storage Temperature	Tstg	-30	+80	°C	

3.0 OPTICAL CHARACTERISTICS

3.1 Optical specification:

Item	Symbol	Temp.	Min.	Typ.	Max.	Unit	Condition
Response Time(Tr+Tf)	Tr	25°C		25	--	msec	$\theta = 0^\circ, \varphi = 0^\circ$ (Note 1,3)
	Tf	25°C			--		
Contrast Rate	Cr	25°C	600	800	--	--	$\theta = 0^\circ, \varphi = 0^\circ$ LED:ON, LIGHT:OFF(Note1,2)
Brightness	YL	25°C	350	400	--	Cd/m2	I=240mA(Note1,4)
Visual angle range front and rear	θ_t	25°C	80	85		De-gree	$\phi = 90^\circ, (12' \text{ clock}) CR \geq 10$ (Note 1,4)
	θ_b		80	85			$\phi = 270^\circ, (6' \text{ clock}) CR \geq 10$ (Note 1,4)
Visual angle range left and right	θ_l	25°C	80	85		De-gree	$\phi = 180^\circ, (9 \text{ o'clock}) CR \geq 10$ (Note 1,4)
	θ_r		80	85			$\phi = 0^\circ, (3 \text{ o'clock}) CR \geq 10,$ (Note 1,4)
Brightness uniformity	BUNI		75			%	$\Theta = 0$ (Note5,7)
Visual angle			free				(Note 6)
Item	Symbol	Transmissivity			Conditions		
		Min.	Typ.	Max.			
Red	XR				Reference: LCD Panel, CIE (x, y) chromaticity (Note 1,4)		
	YR						
Green	XG						
	YG						
Blue	XB						
	YB						
White	XW	0.26	0.31	0.36			
	YW	0.28	0.33	0.38			

3.2 Measuring Condition

Measuring surrounding: dark room ,LED current IL:240mA

Ambient temperature: 25±2oC

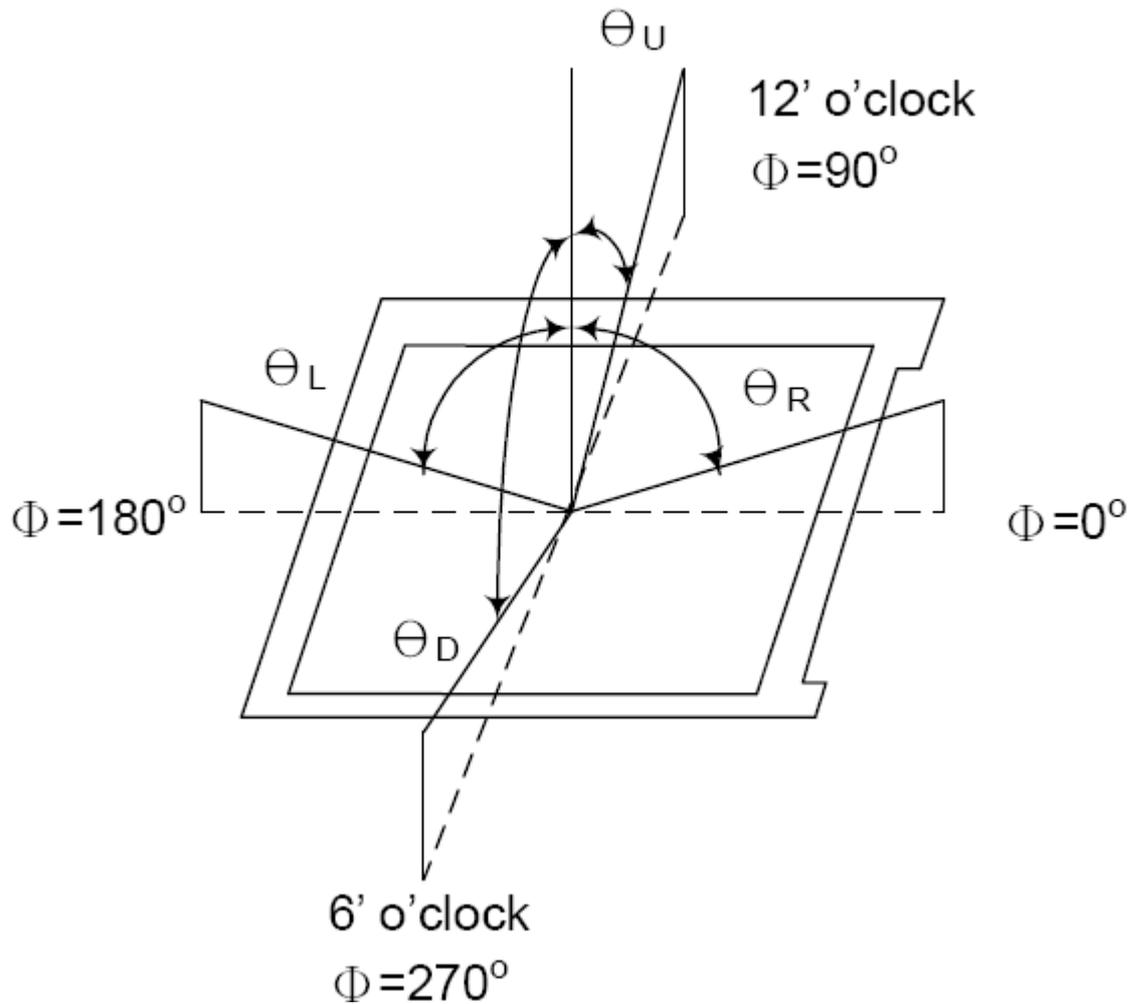
15min. warm-up time.

3.3 Measuring Equipment

FPM520 of Westar Display technologies, INC., which utilized SR-3 for Chromaticity and BM-5A for other optical characteristics. Measuring spot size:

20 ~ 21 mm

Note (1) Definition of Viewing Angle :

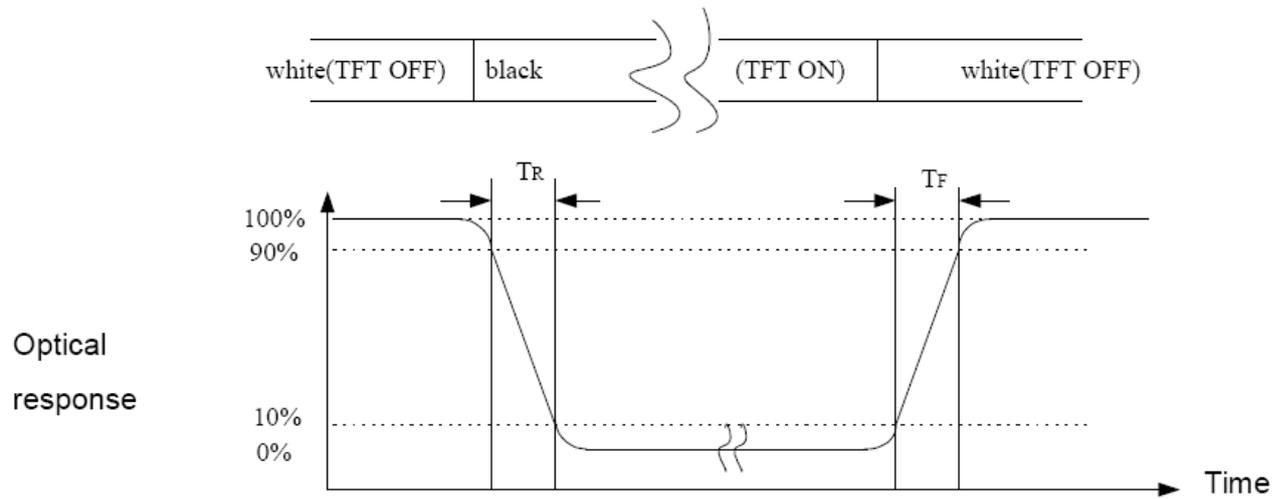


Note (2) Definition of Contrast Ratio (CR):

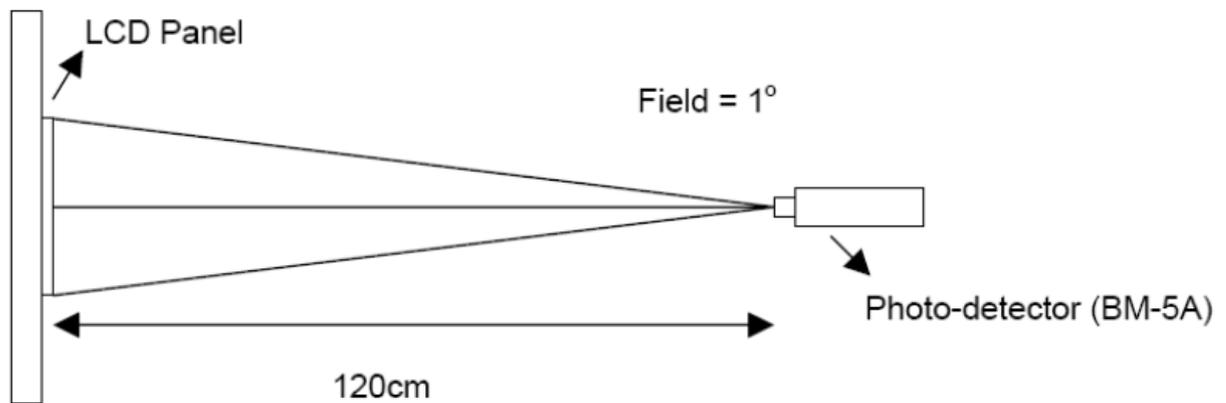
Measured at the center point of panel

$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

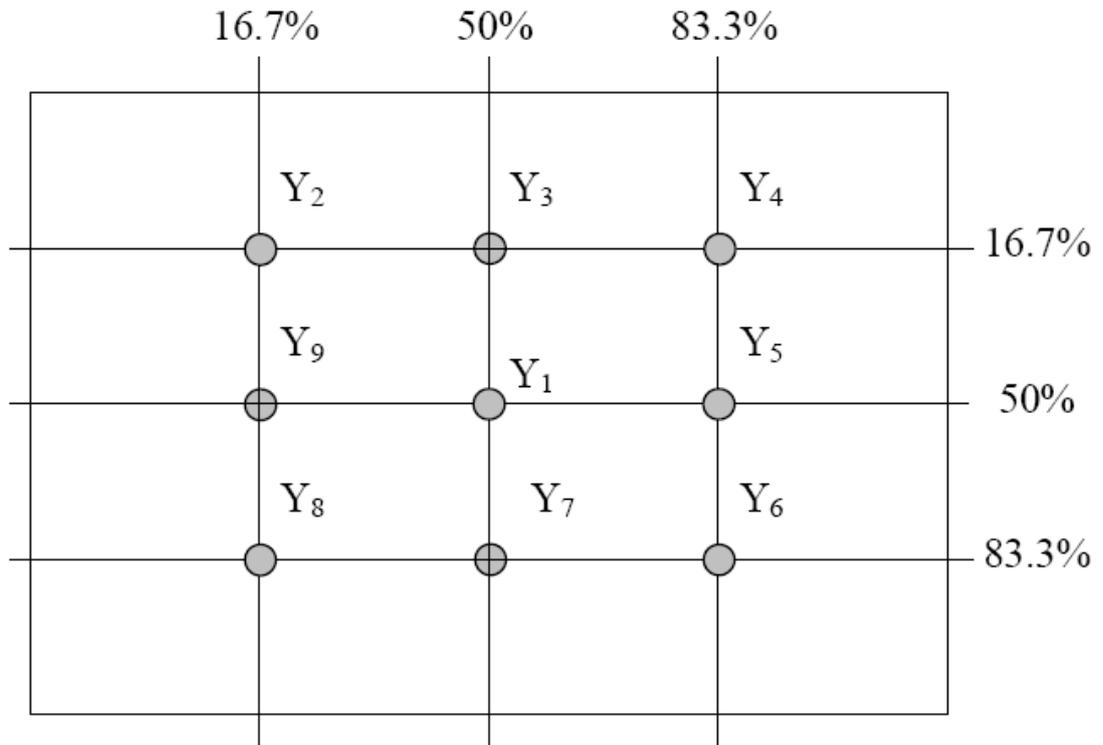
Note (3) Definition of Response Time: Sum of TR and TF



Note (4) Definition of optical measurement setup



Note (5) Definition of brightness uniformity



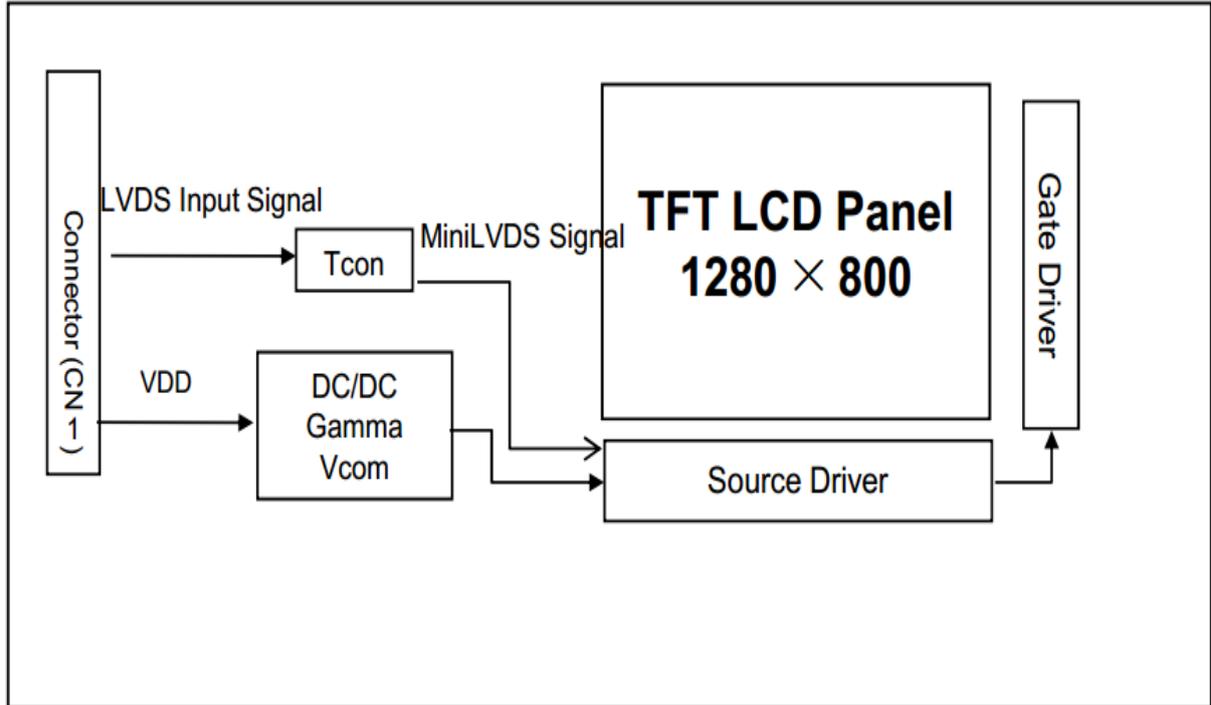
$$\text{Luminance uniformity} = \frac{(\text{Min Luminance of 9 points})}{(\text{Max Luminance of 9 points})} \times 100\%$$

Note (6) Rubbing Direction (The different Rubbing Direction will cause the different optimal view direction).

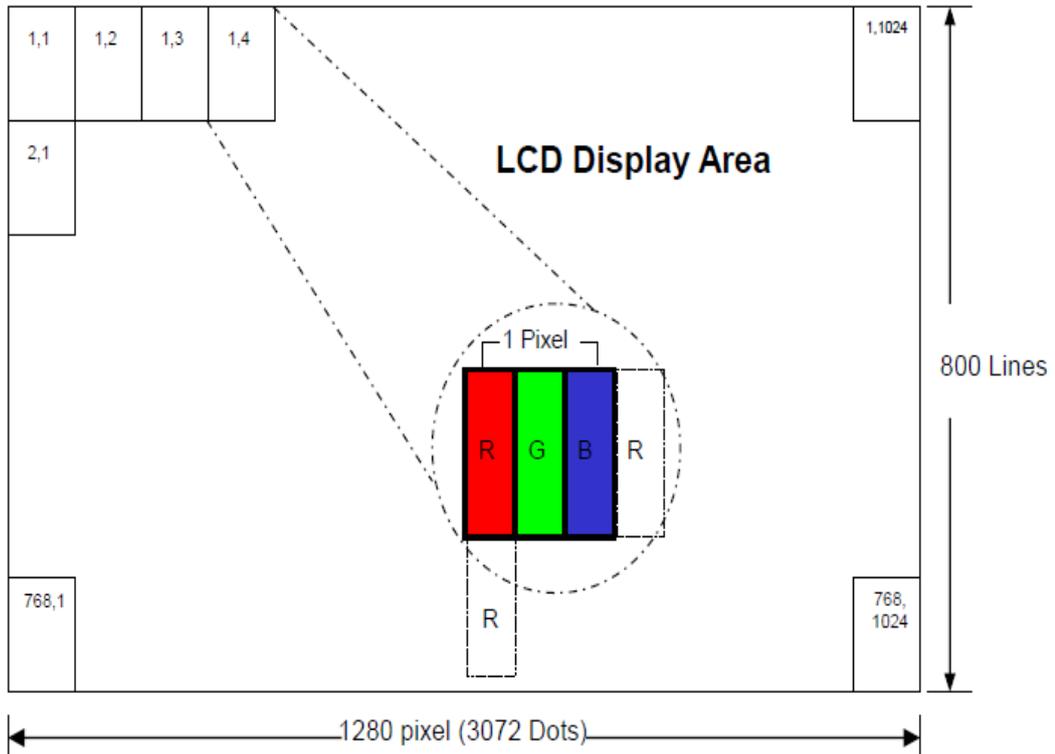
Note (7) Measured at the brightness of the panel when all terminals of LCD panel are electrically open.

4.0 BLOCK DIAGRAM

4.1 TFT LCD Module



4.2 Pixel Format



5.0 INTERFACE PIN CONNECTION

5.1 A 40PIN connector is used for the module electronics interface the recommended model is BL121-G40-1LR or equivalent

Pin No.	Symbol	I/O	Function	Remark
1	NC	_	No connection	
2	VDD	P	power supply	
3	VDD	P	power supply	
4	NC	_	No connection	
5	NC	_	No connection	
6	NC	_	No connection	
7	GND	P	Power Ground	
8	Rxin0N	I	-LVDS differential data	
9	Rxin0P	I	+LVDS differential data	
10	GND	P	Ground	
11	Rxin1N	I	-LVDS differential data	
12	Rxin1P	I	+LVDS differential data	
13	GND	P	Ground	
14	Rxin2N	I	-LVDS differential data	
15	Rxin2P	I	+LVDS differential data	
16	GND	P	Ground	
17	RCLKN	I	- LVDS differential clock input	
18	RCLKP	I	+ LVDS differential clock input	
19	GND	P	Ground	
20	Rxin3N	I	-LVDS differential data	
21	Rxin3P	I	+LVDS differential data	
22	GND	P	Ground	
23	NC	_	No connection	
24	NC	_	No connection	
25	GND	P	power Ground	

26	LED_PWM(NC)	-	No connection	
27	LED_EN(NC)	-	BL Enable Control or Not connected	
28	LVBIT(NC)	--	No connection	
29	NC	_	No connection	
30	GND	P	Power Ground	
31	LED -	P	LED Cathode	
32	LED -	P	LED Cathode	
33	DIR(NC)	_	No connection	
34	UPDN(NC)	_	No connection	
35	NC	_	No connection	
36	NC	-	No connection	
37	NC	-	No connection	
38	NC	-	No connection	
39	LED+	P	LED Anode	
40	LED+	P	LED Anode	

I: input O: output ,P: power

Notes: CABC_EN: High voltage is Enable; Low Voltage or Open is disable

6.0 ELECTRICAL CHARACTERISTICS

6.1 TFT LCD Module

Item	Symbol	Min.	Type	Max.	Unit.	Note
Power supply voltage	VDD	3.0	3.3	3.6	V	GND=0
Power for Analog circuit					V	GND=0
Power on gate voltage					V	GND=0
Power off gate voltage					V	AGND=0
Input signal voltage					V	
Input logic high voltage					mA	
Input logic low voltage					V	
LED Reverse Voltage					mA	Each LED
LED Forward Current					V	Each LED

6.2 Back-Light Unit

The backlight system is an edge-lighting type with 30LED.

The characteristics of the LED are shown in the following tables.

Item	Symbol	Min.	Typ.	Max.	Unit	Note
LED Voltage	VL	7.8	9.6	10.2	V	(2)
LED current	IL	--	240	--	mA	
Operating LED life time	Hr	50000	-	-	Hour	(1)(2)

Note (1) LED life time (Hr) can be defined as the time in which it continues to operate under the condition: $T_a=25\pm 3^{\circ}\text{C}$, typical IL value indicated in the above table until the brightness becomes less than 50%.

Note (2) The “LED life time” is defined as the module brightness decrease to 50% original brightness at $T_a=25^{\circ}\text{C}$. The LED lifetime could be decreased if operating IL is larger. The constant current driving method is suggested.

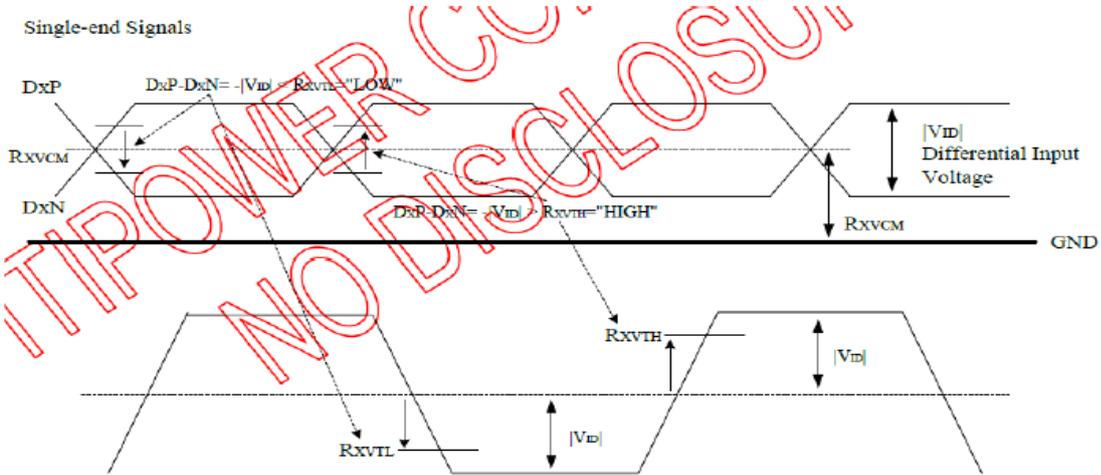
6.3 LVDS interface DC and AC Characteristics

DC Electrical Characteristics

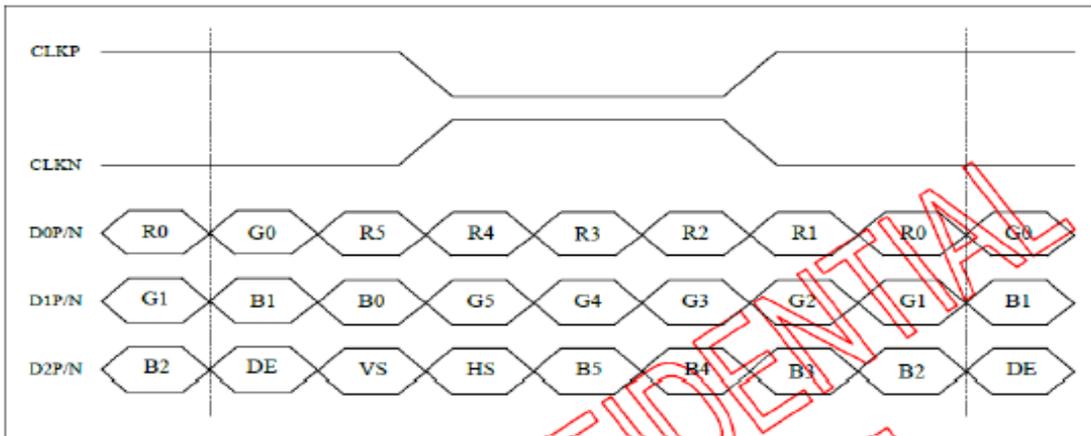
Item	Symbol	Min.	Typ.	Max.	Unit
Differential Input High Threshold Voltage	R_{XVTH}	100	200	300	mV
Differential Input Low Threshold Voltage	R_{XVTL}	-300	-200	-100	mV
Differential Input Common Mode Voltage	R_{XVCM}	1.0	1.2	1.4	V
Differential input Voltage	$ V_{ID} $	200	-	600	mV

6.4 LVDS Signal timing Diagram of Interface Signal

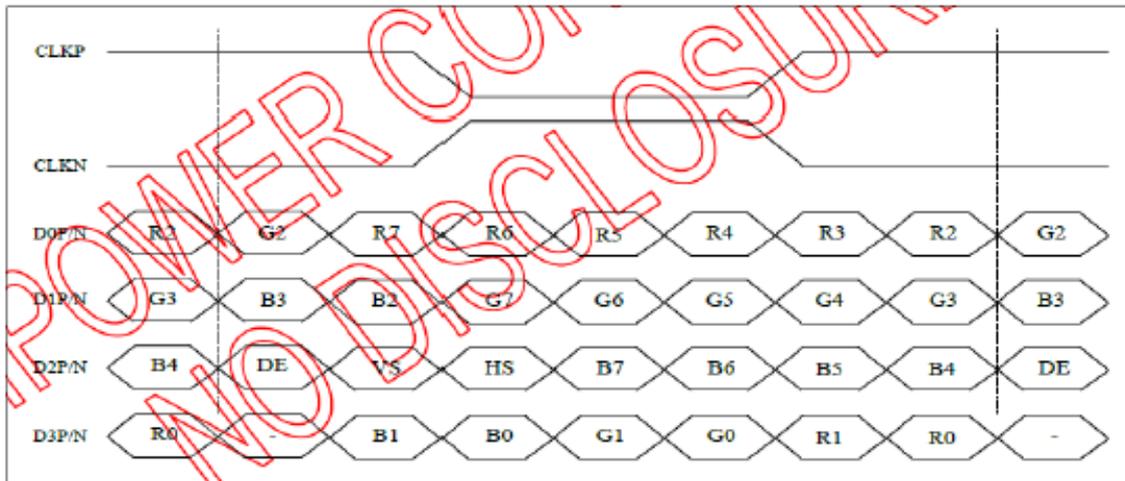
6.4.1 AC Electrical characteristics



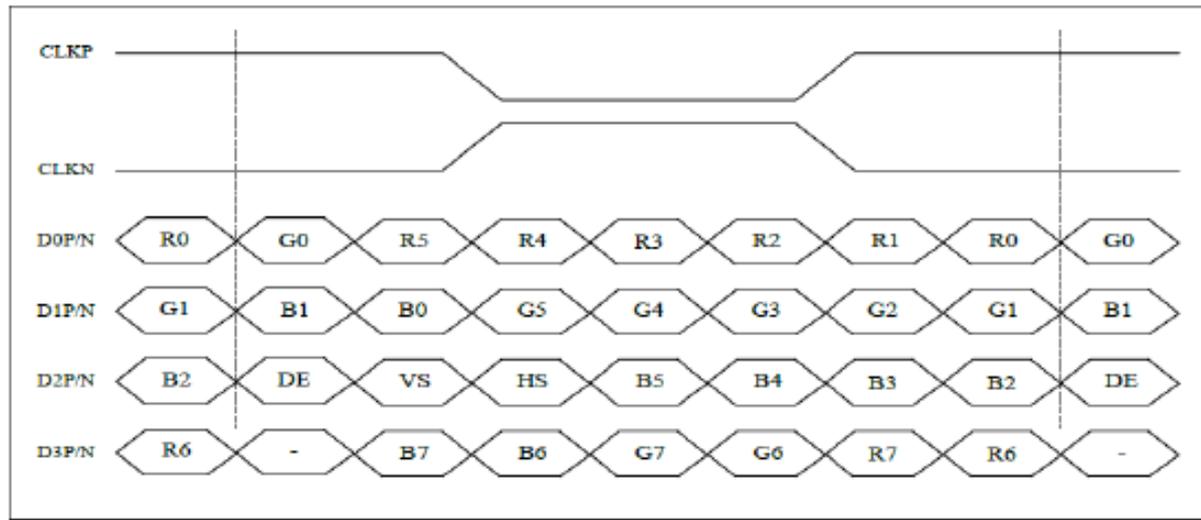
6.4.2 6bit LVDS input



6.4.3 8bit LVDS input(JEIDA format)



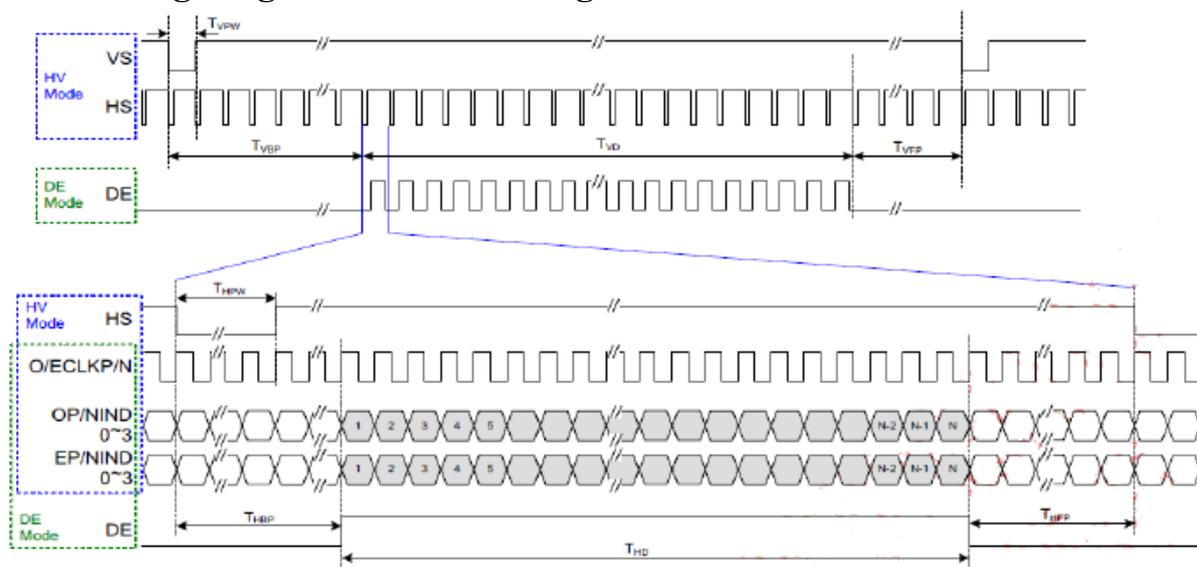
6.4.4 8bit LVDS input(VESA format)



6.4.5: Interface timing

Item	Symbol	Min.	Typ.	Max.	Unit
Frame Rate	--		60		Hz
Vertical Total Time	T_V		838		line
Vertical Display Time	T_{VD}		800		line
Vertical Blanking Time	$T_{VBP} + T_{VFP}$		38		line
Horizontal Total Time	T_H		1440		clock
Horizontal Display Time	T_{HD}		1280		clock
Horizontal Blanking Time	$T_{HBP} + T_{HFP}$		160		clock
Clock Rate	$1/T_{Clock}$		72.4		MHz

6.4.6 Timing Diagram of interface Signal



7.0 Reliability test items

NO.	Item	Conditions	Remark	
1	High Temperature Storage	Ta=+80℃,240hrs	Inspection after 2~4 hours storage at room temperature, the sample shall be free from defects 1. Air bubble in the LCD 2. Sealleak 3. non-display 4. missing segments 5. glass crack 6. current idd is twice higher than initial value.	
2	Low Temperature Storage	Ta=-30℃,240hrs		
3	High Temperature Operation	Ta=+70℃,240hrs		
4	Low Temperature Operation	Ta=-20℃,240hrs		
5	High Temperature and High Humidity(Operation)	Ta=+60℃, 90%RH, 240hrs		
6	Thermal cycling Test (non operation)	-20℃(30min)→+70℃(30min),100cycles		
7	Electrostatic discharge	200V 200pf(0ohm) 1time/each terminal		
8	Vibration	1. Random: 1.04 Grms,5~500HZ, X/Y/Z,30min/each direction 2. Sine: Freq. Range:8~33.3hz Stoke:1.3mm Sweep:2.9G,33.3~400HZ X/Z:2hr,Y:4hr,cyc:15min		
9	Shock	100G,6ms,±X, ±Y, ±Z 3 times for each direction		JIS C7021,A-10 (Condition)
10	Vibration(with carton)	Random:0.015G ^ 2/HZ, 5~200HZ -6dB/octave,200~400HZ XYZ each dirction:2hr		
11	Drop (with carton)	Height:60cm 1corner,3edges,6surfaces		JIS Z0202

Note:

1. There is no display function NG issue occurred, all the cosmetic specification is judged before the reliability stress.

2. the test samples should be applied to only one test item

3. for damp proof test, Pure water(resistance>10M ohm)should be used

4. 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

5. Failure Judgment Criterion: Basic Specification, Electrical Characteristic, Mechanical Charateristic, Optical Characteristic

9.0 GENERAL PRECAUTION

9.1 Use Restriction

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life threatening or otherwise catastrophic.

9.2 Disassembling or Modification

Do not disassemble or modify the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display. HannStar does not warrant the module, if customers disassemble or modify the module.

9.3 Breakage of LCD Panel

9.3.1. If LCD panel is broken and liquid crystal spills out, do not ingest or inhale liquid crystal, and do not contact liquid crystal with skin.

9.3.2. If liquid crystal contacts mouth or eyes, rinse out with water immediately.

9.3.3. If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.

9.3.4. Handle carefully with chips of glass that may cause injury, when the glass is broken.

9.4 Electric Shock

9.4.1. Disconnect power supply before handling LCD module.

9.4.2. Do not pull or fold the LED cable.

9.4.3. Do not touch the parts inside LCD modules and the fluorescent LED's connector or cables in order to prevent electric shock.

9.5 Absolute Maximum Ratings and Power Protection Circuit

9.5.1. Do not exceed the absolute maximum rating values, such as the supply voltage variation, input voltage variation, variation in parts' parameters, environmental temperature, etc., otherwise LCD module may be damaged.

9.5.2. Please do not leave LCD module in the environment of high humidity and high temperature for a long time.

9.5.3. It's recommended to employ protection circuit for power supply.

9.6 Operation

9.6.1 Do not touch, push or rub the polarizer with anything harder than HB pencil lead.

9.6.2 Use fingerstalls of soft gloves in order to keep clean display quality, when persons handle the LCD module for incoming inspection or assembly.

9.6.3 When the surface is dusty, please wipe gently with absorbent cotton or other soft material.

9.6.4 Wipe off saliva or water drops as soon as possible. If saliva or water drops contact with polarizer for a long time, they may causes deformation or color fading.

9.6.5 When cleaning the adhesives, please use absorbent cotton wetted with a little petroleum benzine or other adequate solvent.

9.7 Mechanism

Please mount LCD module by using mouting holes arranged in four corners tightly.

9.8 Static Electricity

9.8.1 Protection film must remove very slowly from the surface of LCD module to prevent from electrostatic occurrence.

9.8.2. Because LCD module use CMOS-IC on circuit board and TFT-LCD panel, it is very weak to electrostatic discharge. Please be careful with electrostatic discharge. Persons who handle the module should be grounded through adequate methods.

9.9 Strong Light Exposure

The module shall not be exposed under strong light such as direct sunlight. Otherwise, display characteristics may be changed.

9.10 Disposal

When disposing LCD module, obey the local environmental regulations.

10. Packing Specification

10.1 Packing quantity in one carton: 30PCS.

10.2 Carton Size :525mm*365*250 by K=K material

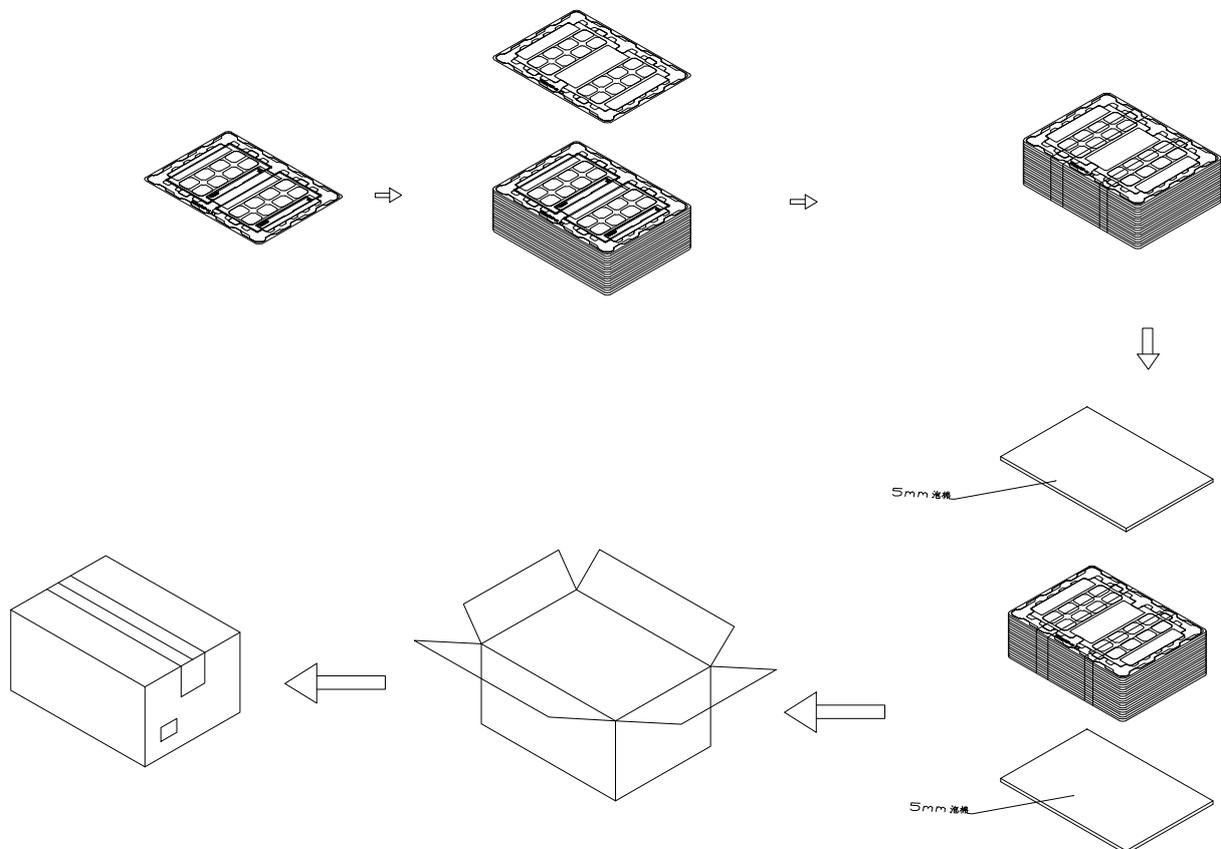
10.0 PACKAGE SPECIFICATION

10.1 Packing form

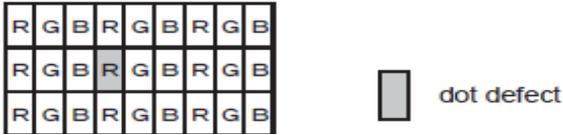
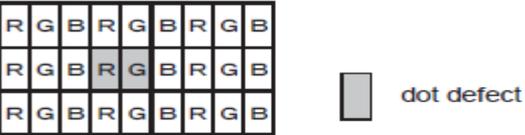
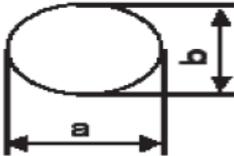
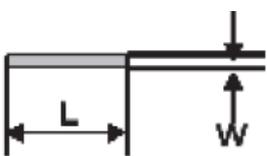
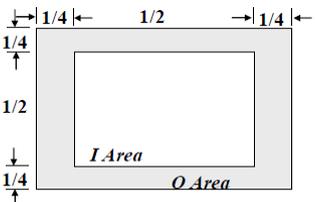
LCM Model	LCM Qty. in the box	Box Size (mm)	Note
101DHI3625-A4 V.1	38 pcs/box	435±5 x 325±5 x 220±5	

11.2 Packing assembly drawings

- 1, 一盘装2个屏
- 2, - 箱装19盘加上盖一个空盘
- 3, 纸箱内上下加5mm泡棉
- 4, 纸箱尺寸: 435(L) * 325(W) * 220mm(H)
- 5, 一箱装38PCS屏



11. Visuals Specification: 1) Note

General	<p>1. Customer identified anomalies not defined within this inspection standard shall be reviewed by Hontron, and an additional standard shall be determined by mutual consent.</p> <p>2. This inspection standard about the image quality shall be applied to any defect within the effective viewing area and shall not be applicable to outside of the area.</p> <p>3. Inspection conditions</p> <p>Luminance : 500 Lux min.</p> <p>Inspection distance : 300 mm.</p> <p>Temperature : 25±5°C</p> <p>Direction : Directly above</p>		
Definition of inspection item	Dot defect	Bright dot defect	<p>The dot is constantly “on” when power applied to the LCD, even when all “Black” data sent to the screen. Inspection tool: 5% Transparency neutral density filter. Count dot: If the dot is visible through the filter. Don’t count dot: If the dot is not visible through the filter.</p> 
		Black dot defect	<p>The dot is constantly “off” when power applied to the LCD, even when all “White” data sent to the screen.</p>
		Adjacent dot	<p>Adjacent dot defect is defined as two or more bright dot defects or black dot defects.</p> 
External inspection	Bubble ,scratch(foreign Particle polarizer, Cell, Backlight)		Visible operating (all pixels “Black” or “White”) and non operating.
	Appearance inspection	Does not satisfy the value at the spec.	
Others	LED wires	Damaged to the LED wires, connector, pin, functional failure or appearance failure.	
Definition of Size	<p>Definition of circle :  $d = (a + b) / 2$</p> <p>definition of linear size </p> <p>definition Area I/O </p>		

2) Standard

Classification		Inspection item		Judgment Standard		
Defect (in LCD glass)	Dot defect	Area		I	O	
		Bright dots(Note: Visible under:ND5%) 1:D≤0.15mm:No count); D>0.15mm acceptable: 2		N≤2		
		Dark dots (0.15mm<D≤0.3mm), D>0.3mm Not allowable		N≤4		
		Bright dot-2Adjacent		N≤0		
		Dark dot-2Adjacent		N≤0		
		Dark or bright dots-3 and more adjacent(note6)		N≤0		
		Total bright and dark dots		N≤4		
		Minimum distance between bright dots		15mm		
		Minimum distance between dark dots		5mm		
		Minimum distance between bright and bright dots		5mm		
	Other	White dot ,dark dot (circle)	Size (mm)		Acceptable number	
			d≤0.2		Neglected	
			0.2mm<D≤0.3mm		N≤4	
			0.3mm<D≤0.4mm		N≤2	
D>0.4mm			Not allowable			
Visual defect	Foreign partial	Circular foreign material: dark/bright sport	Visible under:ND5% 1:D≤0.15mm:No count 2:0.15mm<D≤0.3mm,N≤4 3:D>0.3mm:Not allowable			
		Linear foreign material: bright or dark line	Invisible under ND5% 0.1mm<W≤0.3mm, 0.3mm<L≤1.5mm,N≤2 Visible under ND5% 0.05mm≤w≤0.1mm, 0.3mm≤L≤0.7mm,N≤1			
	Polarizer	Linear scratch	1:BM:No Count 2:Pixel area 0.05mm≤w≤0.2mm, 1.0mm≤L≤5.0mm,N≤2			
		Bubble peeling	1:BM:No Count 2:Pixel area 0.15mm≤D<0.3mm,N≤4			
	Mura & leak		ND5%			