Shenzhen Leadtek Electronics Co.,Ltd

PRODUCT SPECIFICATION

TFT-LCD MODULE

Module No：LTK070P3078W-06KC-V0

☑ Preliminary Specification

☐ Approval Specification

Designed by	Checked by	Approved by
		

Final Approval by Customer

Approved by	Comment

※The specification of “TBD” should refer to the measured value of sample . If there is difference between the design specification and measured value, we naturally shall negotiate and agree to solution with customer.

Revision History

Version	Contents	Date	Note
V0	Original	2020.04.03	

Contents

1.0 General Description

1.1 Introduction

LTK070P3078W-06KC-V0 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 and a driving circuit.This TFT LCD has a 7.0 (16:9) inch diagonally measured active display area with (1024 horizontal by600 vertical pixel) resolution.

1.2. Features

7 (16:9 diagonal) inch configuration
Compatible with NTSC & PAL system
Image Reversion: UP/DOWN and LEFT/RIGHT
ROHS design

1.3. General information

Item	Specification	Unit
Outline Dimension	164.5(H) x 99.6 (V) x4.52(D)	mm
Display area	154.22 (H) x 85.92 (V)	mm
Number of Pixel	1024 (H) x3(RGB)x 600 (V)	pixels
Pixel pitch	0.1506 (H) x3(RGB)x 0.1432 (V)s	mm
Pixel arrangement	RGB Vertical stripe	
Display mode	Normally Black,FFS	
Color Filter Array	RGB vertical stripes	
Backlight	White LED	
Weight	TBD	g
Interface	MIPI	

2.0 Absolute Maximum Ratings

2.1 Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Operating Temperature	Topa	-10	50	℃	
Storage Temperature	Tstg	-20	60	℃	

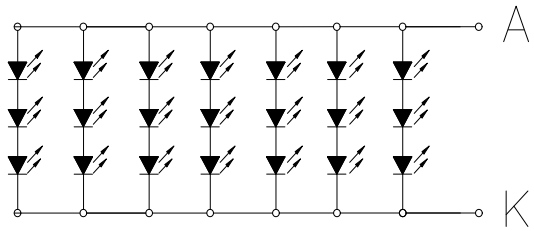
2.2 Back-light Unit:

PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
LED Current	IF	–	140	–	mA	–	–
LED Voltage	VF	9	9.9	10.5	V	–	–
Life Time		–	20000	–	Hr.	I≦140mA	–
Color	White						

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)Ta=25±2℃

(3)Test condition: LED Current 140mA



LED电路图

CIRCUIT DIAGRAM (3*7=21 LED)

3.0 Optical Characteristics

3.1 Optical specification

Ta = 25°C, VCC=3.3V

ITEM		SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT	NOTE
Constrast Ratio		CR	Point-5	700	900		--	1, 2, 3
Luminance(CEN)		Lw	Point-5		200		cd/m^2	1, 3
Luminance Uniformity		ΔL		70	75		%	1, 3
Response Time (White - Black)		Tr +Tf	Point-5	-	20	40	ms	1, 3, 5
NTSC		-	Point-5	45	50	-	%	1, 3
Viewing Angle	Left	Deg.	CR≧10 Point-5		85	--	°	1, 4
	Right	Deg.			85			1, 4
	Upper	Deg.			85	--	°	1, 4
	Lower	Deg.			85			1, 4
Color Coordinate	White	Wx Wy	Point-5	0.273 0.289	0.313 0.329	0.353 0.369	--	1, 3
	Red	Rx Ry			-			
	Green	Gx Gy			-			
	Blue	Bx By			-			

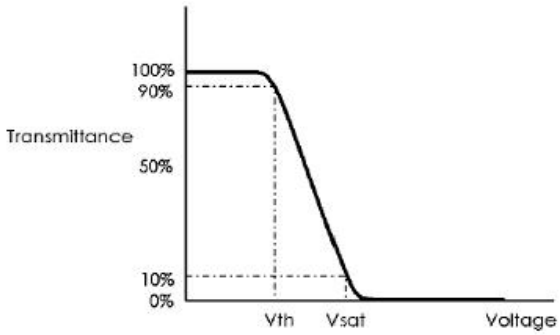
3.2 Measuring Condition

- Measuring surrounding : dark room
- Ambient temperature : 25±2℃
- 30min. warm-up time.

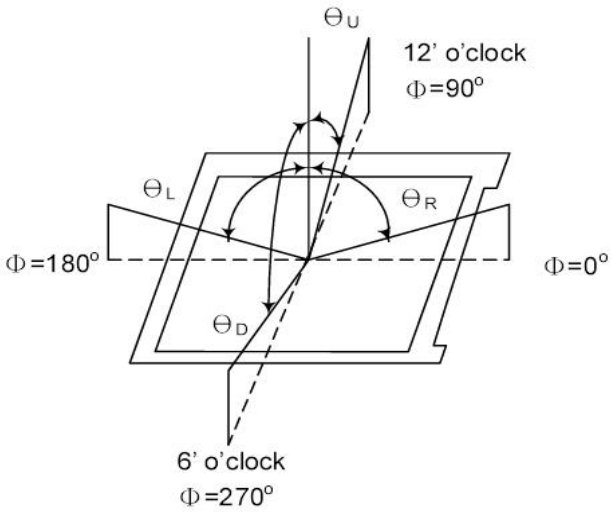
3.3 Measuring Equipment

- TOPCON BM-7
- Measuring spot size : field 2°

Note (1) Definition of Vsat and Vth (at 20℃)



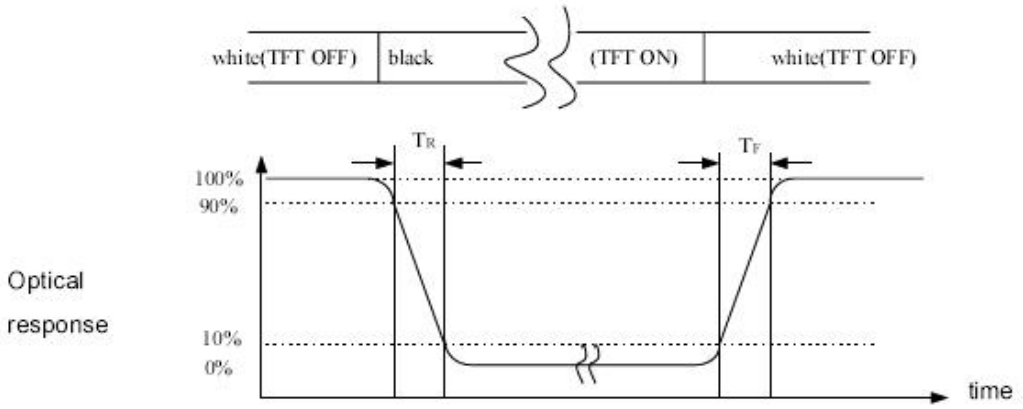
Note (2) Definition of Viewing Angle :



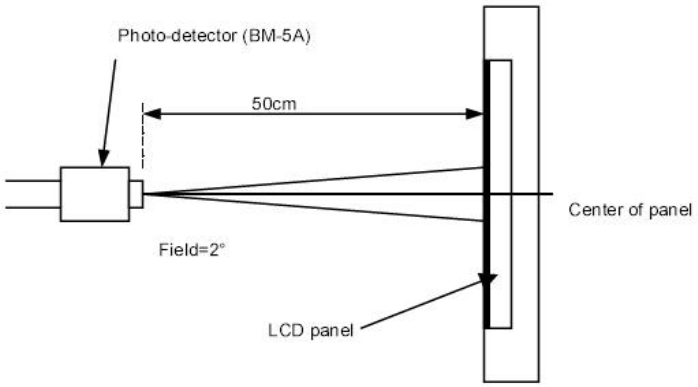
Note (3) Definition of Contrast Ratio(CR) :
measured at the center point of panel

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

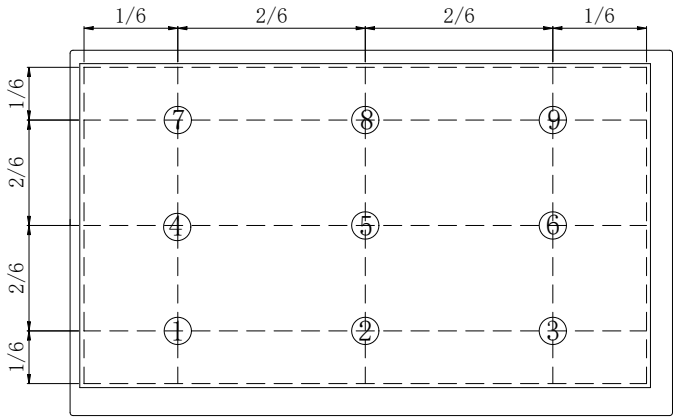
Note (4) Definition of Response Time : Sum of T_R and T_F



Note (5) Definition of optical measurement setup



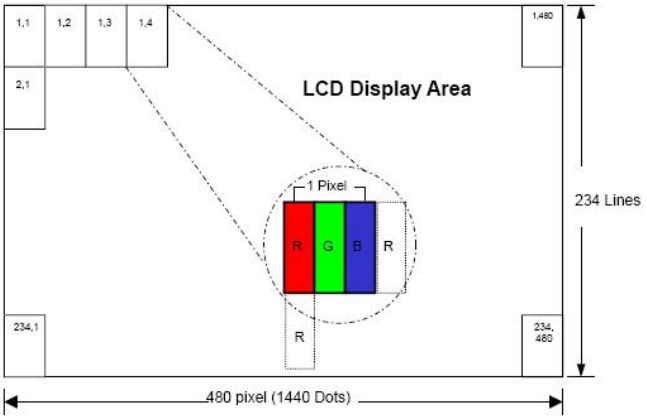
Note (6) Definition of brightness uniformity



Note (7) Rubbing Direction (The different Rubbing Direction will cause the different optima view direction.

4.0 Block Diagram

4.1 TFT-LCD Module



5.0 Interface Pin Connection

Pin No.	Symbol	Function	Remark
1-2	LED+	LED Anode	
3	VGH	Gate ON Voltage	
4	VGL	Gate OFF Voltage	
5	UPDN	Gate Up or Down scan control	
6	SHLR	Source Right or Left sequence	
7-8	LED-	LED Cathode	
9	AVDD	Power for Analog Circuit	
10	GND	Ground	
11	RXIN3P	MIPI Data lane3 input	
12	RXIN3N		
13	GND	Ground	
14	RXIN2P	MIPI Data lane2 input	
15	RXIN2N		
16	GND	Ground	
17	RXCLKP	MIPI CLK input	
18	RXCLKN		
19	GND	Ground	
20	RXIN1P	MIPI Data lane1 input	
21	RXIN1N		
22	GND	Ground	
23	RXIN0P	MIPI Data lane0 input	
24	RXIN0N		
25	GND	Ground	
26	STBYB	Standby mode	
27	RESET	Global reset pin	
28	VDD	Power Supply	
29	VDD	Power Supply	
30	VCOM	Common Voltage	

6. Electrical Characteristics

6.1 TFT LCD Module

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	DV_{DD}	1.7	1.8	2.0	V	
	V_{GH}	17	18	19	V	
	V_{GL}	-6.6	-6	-5.4	V	
	AV_{DD}	9.4	9.6	9.8	V	
	VCOM	2.95	3.15	3.35	V	
Input signal voltage	V_{IH}	0.7DV_{DD}	-	DV_{DD}	V	(2)
	V_{IL}	0	-	0.3DV_{DD}	V	(2)
Current of power supply	I_{DD}	-	-		mA	DV DD=2.0V
	I_{ADD}	-	-		mA	AV_{DD}=9.6V
	I_{GH}	-	-		uA	V_{GH}=18V
	I_{GL}	-	-		mA	V_{GL}=-6V

Note (1): The brightness of LCD panel could be changed by adjusting the AC component of VCOM.

MIPI CLK Speed:340Mbps(170MHZ)
H back porch:160
H front porch:160
H pulse width:10
V back porch:23
V front porch:12
V pulse width:1

MIPI command 如:

```
regw(0x80,0xAC);
regw(0x81,0xB8);
regw(0x82,0x09);
regw(0x83,0x78);
regw(0x84,0x7F);
regw(0x85,0xBB);
regw(0x86,0x70);
```

注：請用 MIPI 短包（0x15）下初始化

6.2 TFT-LCD Current Consum

ITEM	SYMBOL	CONDITION	MIN	TYPE	MAX	UNIT	NOTE
Gate on power current	IVGH	VGH =18V	- -	0.5	1	mA	Note1
Gate off power current	IVGL	VGL= -6V	- -	0.5	1	mA	Note1
Digital power current	IDVDD	DVDD = 3.3V	- -	30	45	mA	Note1
Analog power current	IAVDD	AVDD = 9.6V	- -	35	45	mA	Note1
Total Power Consumption	PC		- -	447	604	mW	Note1

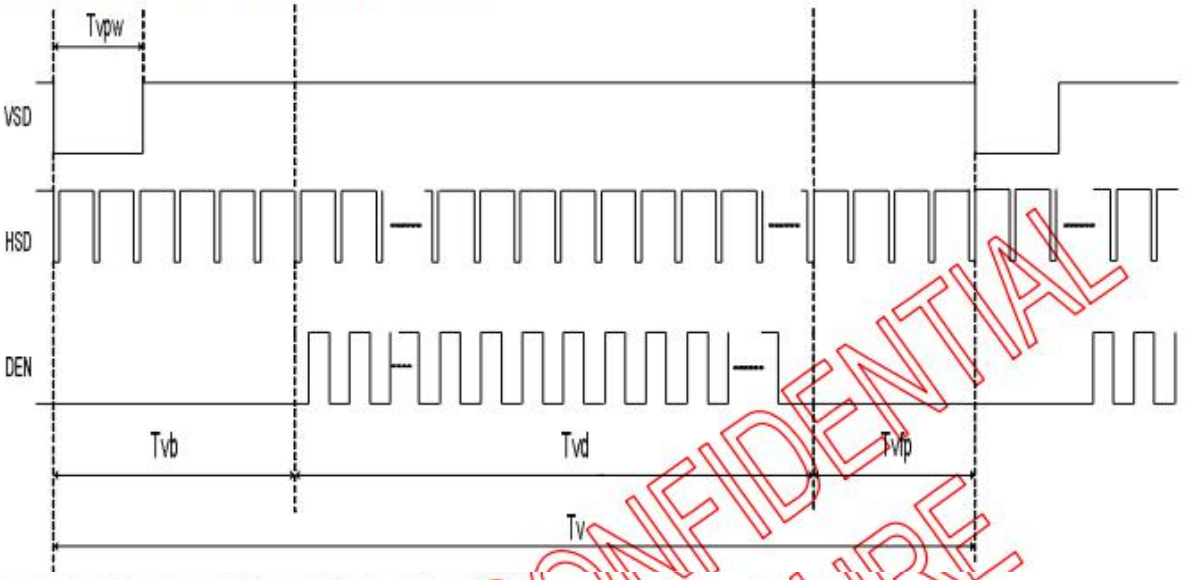
Note1: Typ. specification : Gray-level test Pattern
Max. specification : Black test Pattern

256 gray pattern

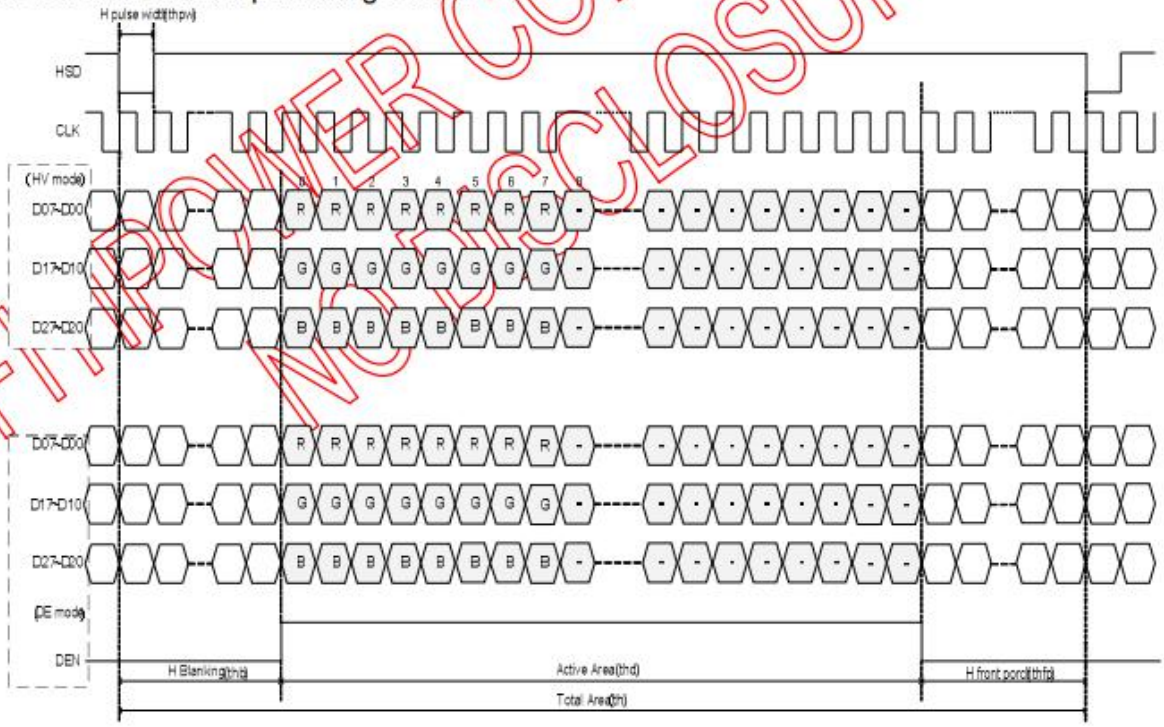
Black Pattern

6.3 Timing Diagram of Interface Signal

- Equivalent vertical input timing format



- Equivalent horizontal input timing format



FIND POWER CONFIDENTIAL NO DISCLOSURE

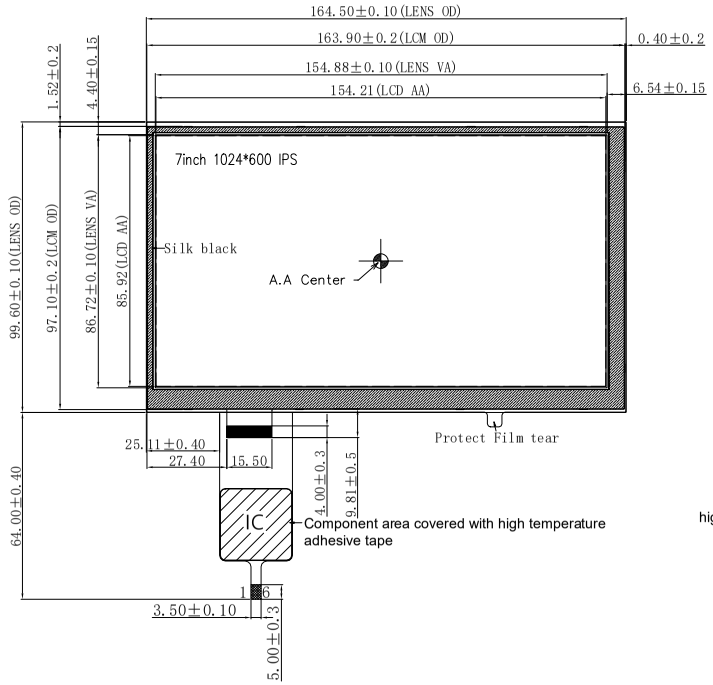
ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT	Note
DE MODE	Dot Clock	1/tCLK	45	51.2	57	MHz	
	DCLK pulse duty	Tcwh	40	50	60	%	
	Horizontal total Time	tH	1324	1344	1364	tCLK	
	Horizontal effective Time	tHA		1024		tCLK	
	Horizontal Blank Time	tHB	300	320	340	tCLK	
	Vertical total Time	tV	625	635	645	tH	
	Vertical effective Time	tVA		600		tH	
	Vertical Blank Time	tVB	25	35	45	tH	
SYNC MODE	Horizontal total Time	TH	1324	1344	1364	tCLK	
	Horizontal Pulse Width	Thpw		20	-	tCLK	thb + thpw =160DCLK is fixed
	Horizontal Back Porch	Thb		140	-	tCLK	
	Horizontal Front Porch	Thfp	140	160	180	tCLK	
	Horizontal effective Time	THA		1024		tCLK	
	Vertical total Time	TV	625	635	645	tH	
	Vertical Pulse Width	Tvpw		3	-	th	tvpw + tvb =23th is fixed
	Vertical Back Porch	Tvb	-	20	-	th	
	Vertical Front Porch	Tvfp	2	12	22	th	
	Vertical Valid	Tvd		600		th	

7.0 Reliability test items

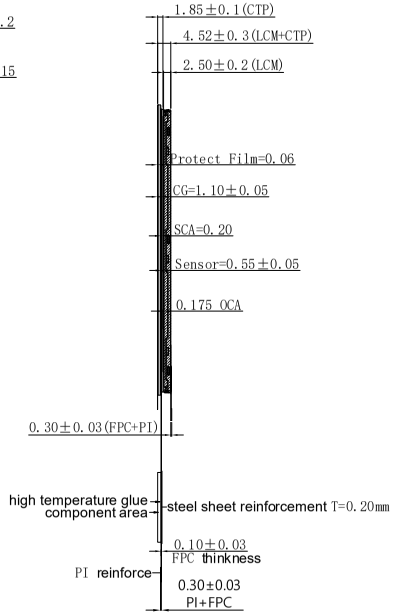
NO	Item	Conditions	Remark
1	High Temperature Storage	Ta=+60℃,48hrs	
2	Low Temperature Storage	Ta=-20℃,48hrs	
3	High Temperature Operation	Ta=+50℃,48hrs	
4	Low Temperature Operation	Ta=-10℃,48hrs	
5	High Temperature and High Humidity (operation)	Ta=+40℃,90%RH,48hrs	
6	Thermal Cycling Test (non operation)	-20℃(0.5hr)→+60℃(0.5hr),100cycles	
7	Vibration	1.Random:1.04G,10-500HZ,X,Y,Zdirection 30min/each direction 2.Sweep sine:1.5G, 5~500Hz, X/Y/Z,30min/each direction	
8	Shock	100G,6ms, ±X, ±Y, ±Z 3 time for each direction	JIS C7021, A-10 (Condition A)
9	Vibration (with carton)	Random:1.04Grms, 10~500Hz, X/Y/Z 45min/each direction Fixed:5Hz, 1.5Grms, X/Y/Z 45min/each direction	
10	Drop (with carton)	Height: 60cm 1 corner, 3 edges, 6 surfaces	JIS Z0202
11	Electrostatic Discharge	±200V,200PF,0Ω1 time/each terminal	

Note: All tests above are practiced at module type.
There is no display function NG issue occurred, All the cosmetic specification is judged before the reliability stress.

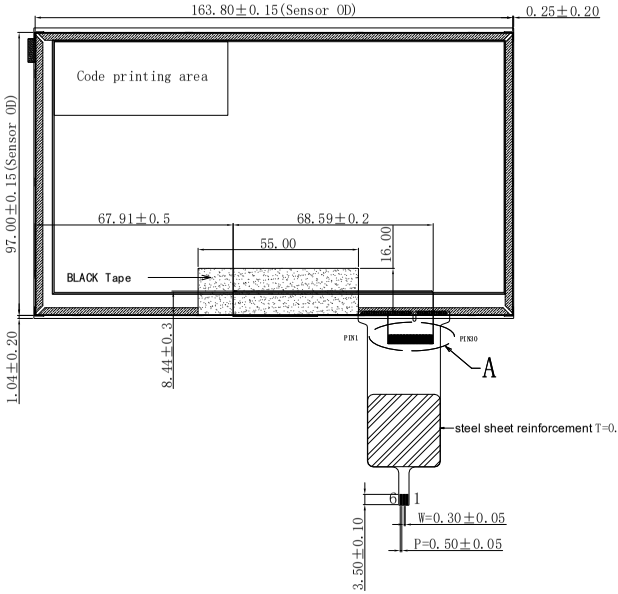
Front View



Side View

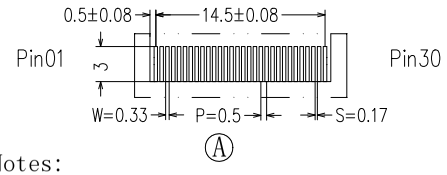


Back View



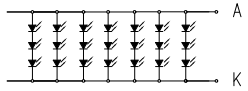
PIN FUNCTION

NO.	NAME
1	LED+
2	LED+
3	VGH
4	VGL
5	UPDN
6	SHLR
7	LED-
8	LED-
9	AVDD
10	GND
11	RXIN3P
12	RXIN3N
13	GND
14	RXIN2P
15	RXIN2N
16	GND
17	RXCLKP
18	RXCLKN
19	GND
20	RXIN1P
21	RXIN1N
22	GND
23	RXIN0P
24	RXIN0N
25	GND
26	STBYB
27	RESET
28	VDD
29	VDD
30	VCOM



Notes:
1. Display : 7.0″, TFT
2. Resolution: 1024xRGBx600
3. LCD Viewing Direction: ALL,
4. Display Mode: Normally Black
5. LCM Bringhtness: 200cd/㎡(TYP),uniformity≥80%
6. unmark Tolerance:±0.2
7. OPERATING TEMP: -10° C~ +50° C
8. STORAGE TEMP: -20° C~ +60° C
9. Requirements on Environmental Protection: ROHS

Technical requirements:
1. structure: G+G.
2. transmittance: ≥86%(550nm).
3. All unmarked tolerance: ±0.15mm.
4. IC: ILI2511
5. Toughened degrees: 110g steel ball, 40cm drop height is not broken, surface hardness Test: ≥6H (pencil hardness test)
6. CG unmarked hole and edge≤0.20mm.
7. operate temperature: W0.7;-20℃~60℃, 20~85%RHW1;, storage temperature:W0.7;-30~70℃, 10-95%RHW1;
all material compliant with ROHS.
8. Key management dimensions.



LED 电路图 3C*7B

1	VDD
2	D-
3	D+
4	GND
5	GND
6	GND

REV	DESCRIPTION	DATE	NAME
3			
2			
1			
0	NEW	2022.10.17	IAN

LEADTEK COMPANY LIMITED

LEADTEK DISPLAY

SCALE:1/1	UNIT:mm	PAGE:1/1		Approve	Check	Drawn
Part No:	LTK070P3078W-06KC	VER:V0				IAN
Customer No:						

9.0 Packing form

9.1 Packing form 1

TBD

10.0 General Precaution

10.1 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.

10.2 Asembly Precaytton

10.2.1 Please use the mounting hole on the module side in installing and do not bending or wrenching LCD in assembling. And please do not drop, bend or twist LCD module in handling.
10.2.2 Please design display housing in accordance with the following guide lines.
10.2.2.1 Housing case must be destined carefully so as not to put stresses on LCD all sides and not to wrench module. The stresses may cause non-uniformity even if there is no non-uniformity statically.
10.2.2.2 Keep sufficient clearance between LCD module back surface and housing when the LCD module is mounted. The clearance in the design is recommended taking into account the tolerance of LCD module thickness and mounting structure height on the housing.
10.2.3 Please do not push or scratch LCD panel surface with any-thing hard. And do not soil LCD panel surface by touching with bare hands. (Polarizer film, surface of LCD panel is easy to be flawed.)
10.2.4 Please do not press any parts on the rear side such as source IC, gate IC, and FPC during handling LCD module. If pressing rear part is unavoidable, handle the LCD module with care not to damage them.
10.2.5 Please wipe out LCD panel surface with absorbent cotton or soft cloth in case of it being soiled.
10.2.6 Please wipe out drops of adhesives like saliva and water on LCD panel surface immediately. They might damage to cause panel surface variation and color change.
10.2.7 Please do not take a LCD module to pieces and reconstruct it. Resolving and reconstructing modules may cause them not to work well.

10.3 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.

10.4 Breakage of LCD Panel

10.4.1 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.
10.4.2 If liquid crystal contacts mouth or eyes, rinse out with water immediately.
10.4.3 If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.
10.4.4 Handle carefully with chips of glass that may cause injury, when the glass is broken.

10.5 Absolute Maximum Ratings and Power Protection Circuit

10.5.1 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.
10.5.2 Please do not leave LCD module in the environment of high humidity and high temperature for a long time.
10.5.3 It's recommended employing protection circuit for power supply.
10.6 Operation
10.6.1 Do not touch, push or rub the polarizer with anything harder than HB pencil lead.Use fingerstalls of soft gloves in order to keep clean display quality, when persons handle the LCD module for incoming inspection or assembly.
10.6.2 When the surface is dusty, please wipe gently with absorbent cotton or other soft material.
10.6.3 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.
10.6.4 When cleaning the adhesives, please use absorbent cotton wetted with a little petroleum benzine or other adequate solvent.

10.7 Static Electricity

10.7.1 Protection film must remove very slowly from the surface of LCD module to prevent from electrostatic occurrence.
10.7.2 Because LCD module uses CMOS-IC on TFT-LCD panel, it is very weak to electrostatic discharge. Please be careful with electrostatic discharge.
10.7.3 Persons who handle the module should be grounded through adequate methods.

10.8 Disposal

When disposing LCD module, obey the local environmental regulations.

10.9 OTHERS

10.9.1 A strong incident light into LCD panel might cause display characteristics' changing inferior because of polarizer film, color filter, and other materials becoming inferior. Please do not expose LCD module direct sunlight land strong UV rays.
10.9.2 Please pay attention to a panel side of LCD module not to contact with other materials in preserving it alone.
10.9.3 For the packaging box, please pay attention to the followings:
10.9.3.1 Packaging box and inner case for LCD are designed to protect the LCDs from the damage or scratching during transportation. Please do not open except picking LCDs up from the box.
10.9.3.2 Please do not pile them up more than 6 boxes. (They are not designed so.) And please do not turn over.
10.9.3.3 Please handle packaging box with care not to give them sudden shock and vibrations. And also please do not throw them up.
10.9.3.4 Packing box and inner case for LCDs are made of cardboard. So please pay attention not to get them wet. (Such like keeping them in high humidity or wet place can occur getting them wet.)