Shenzhen Leadtek Electronics Co.,Ltd

PRODUCT SPECIFICATION

TFT-LCD MODULE

Module No：LTK101FHNCT19-V0

☑ Preliminary Specification

☐ Approval Specification

Designed by	Checked by	Approved by
jona	tom	lan

Final Approval by Customer

Approved by	Comment
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※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	2023.04.10	

1.General Specifications

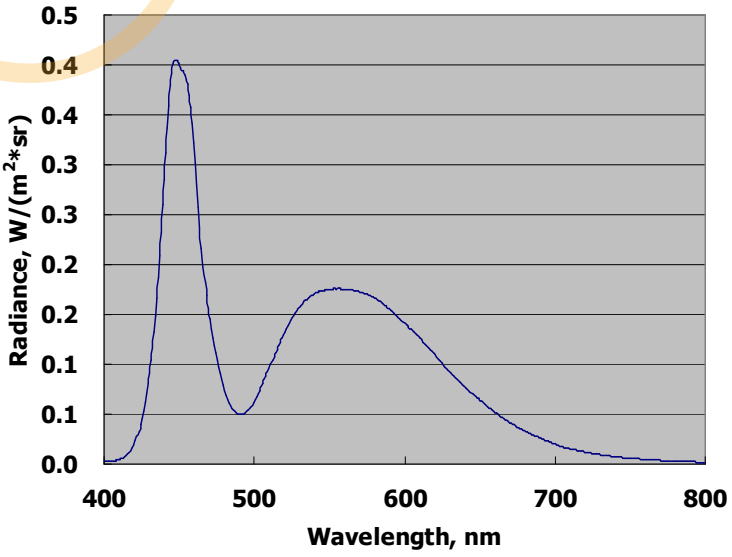
NO	Item	Specification	Unit	Remark
1	LCD Size	10.1		-
2	Panel Type	IPS		
4	Resolution	1200 x RGB x 1920	pixel	-
5	Display Mode	Normally Black	-	-
6	Number of Colors	16.7M		-
7	Viewing Direction	ALL FULL	-	-
8	NTSC	66%		TYP
9	Contrast Ratio	1000		TYB
10	Luminance	300	cd/㎡	TYB
11	TP+LCM Module Size	146.8 (W) x239.37(L) x4.23(H)	mm	Note
12	Panel Active Area	135.36 (W) x 216.57 (L)	mm	Note
13	Pixel Pitch	37.6 x 112.8	mm	UM
14	Weight	TBD		-
15	Driver IC	OTA7290B+OTA7290B		
16	Driver IC RAM Size	RAMLESS	bit	-
17	Light Source	32 white LED in 4S8P	-	-
18	Interface	MIPI 4Line	-	
19	Drive IC	GT9271	mm	-
20	Construction	G+G	mm	
21	Surface Hardness	6H	-	
22	Operating Temperature	-20~+60	℃	-
23	Storage Temperature	-30~+70	℃	-

Note : Please refer to the mechanical drawing;

2. Optical Characteristics

Item		Symbol	Conditions	Specifications			Unit	Note
				Min.	Typ.	Max.		
Transmittance (w/o APCF)		T%	Viewing normal angle $\theta_X = \theta_Y = 0°$	3.53%	4.04%		%	All left side data are based on INX's following condition – 1.LC : AAS . 2.CF : CG 70% CF. 3.Light Source : INX LED BLU. 4.Polarizer : CF:SRW062APN1LT4 TFT:SRW062AWL2/APFV3 5.Machine : DMS 803, (ConoScope for View Angle). 6. VLC dark ≦ 0.3 V, VLC white ≧ 4.1 V 7.Back light structure: Diffuser+BEF+BEF+ Diffuse
Contrast Ratio		CR		800	1000		--	
Response Time		$T_{on} + T_{off}$			25		ms	
Viewing Angle	Hor.	θ_{X+}		80	85		deg.	
		θ_{X-}		80	85			
	Ver.	θ_{Y+}		80	85			
		θ_{Y-}		80	85			
CF only Color Chromaticity (CIE 1931)	Red	Rx	Viewing normal angle $\theta_X = \theta_Y = 0°$	0.631	0.651	0.671	-	Under C light Simulation
		Ry		0.311	0.331	0.351	-	
	Green	Gx		0.255	0.275	0.295	-	
		Gy		0.54	0.56	0.58	-	
	Blue	Bx		0.12	0.14	0.16	-	
		By		0.075	0.095	0.115	-	
	White	Wx		0.28	0.3	0.32	-	
		Wy		0.305	0.325	0.345	-	
	Color Gamut				65		%	

*Note(1) INX LED BLU Spectrum:



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

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63 / L0

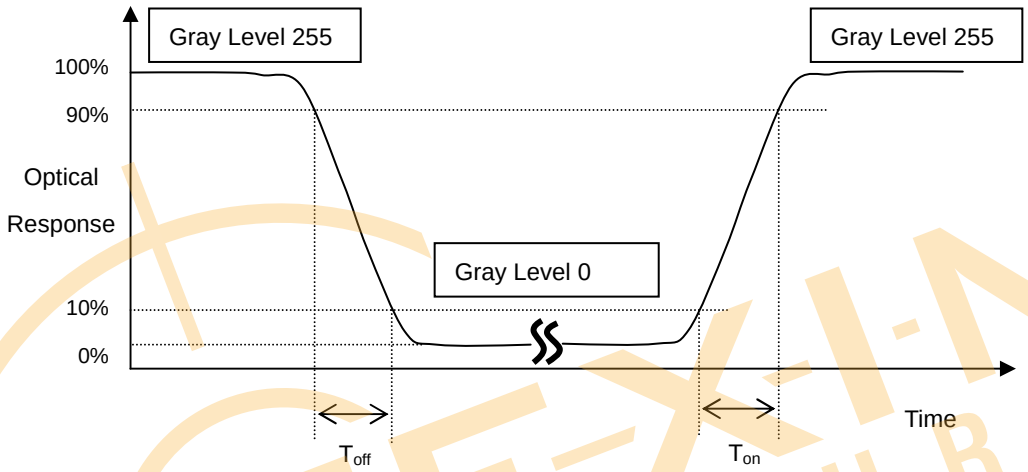
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

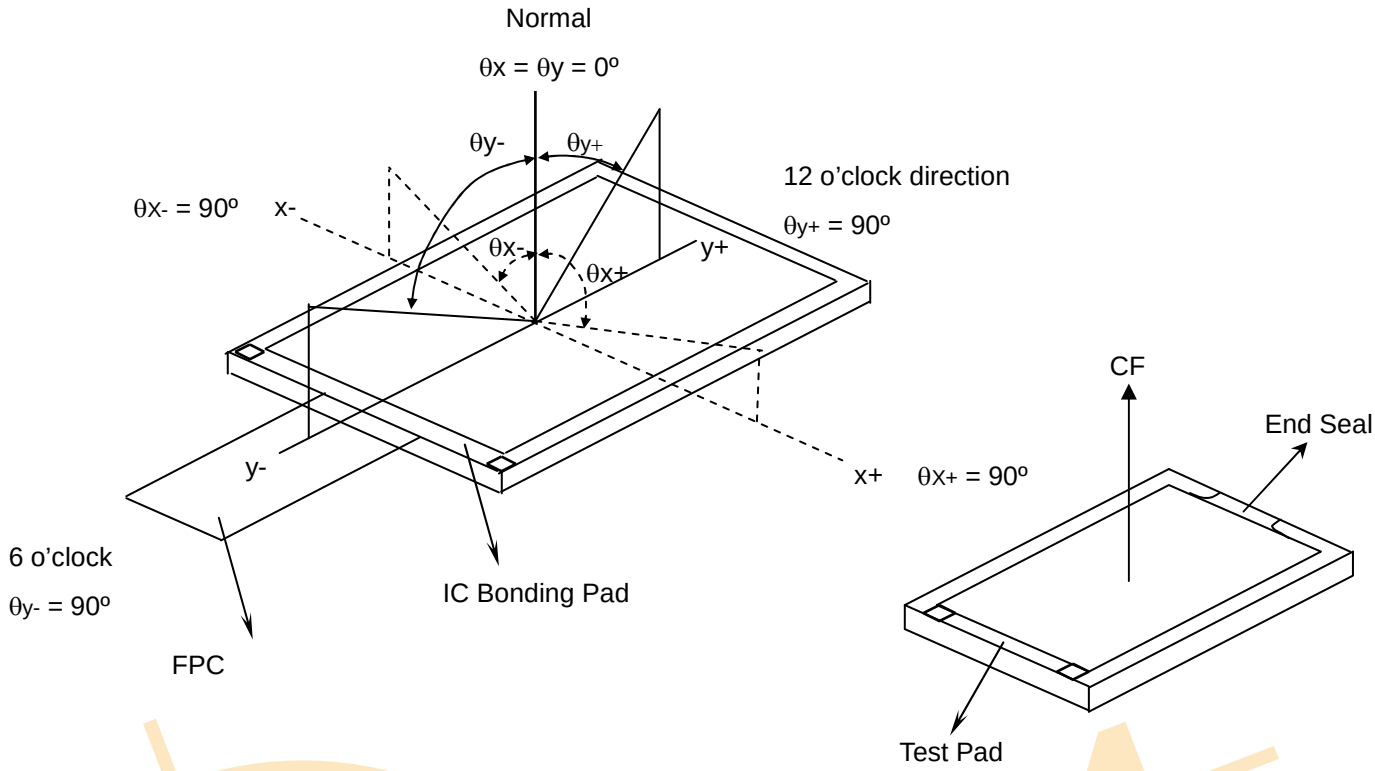
CR = CR (5)

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

*Note (3) Definition of Response Time (T_{on}, T_{off}):



*Note(4) Definition of Viewing Angle

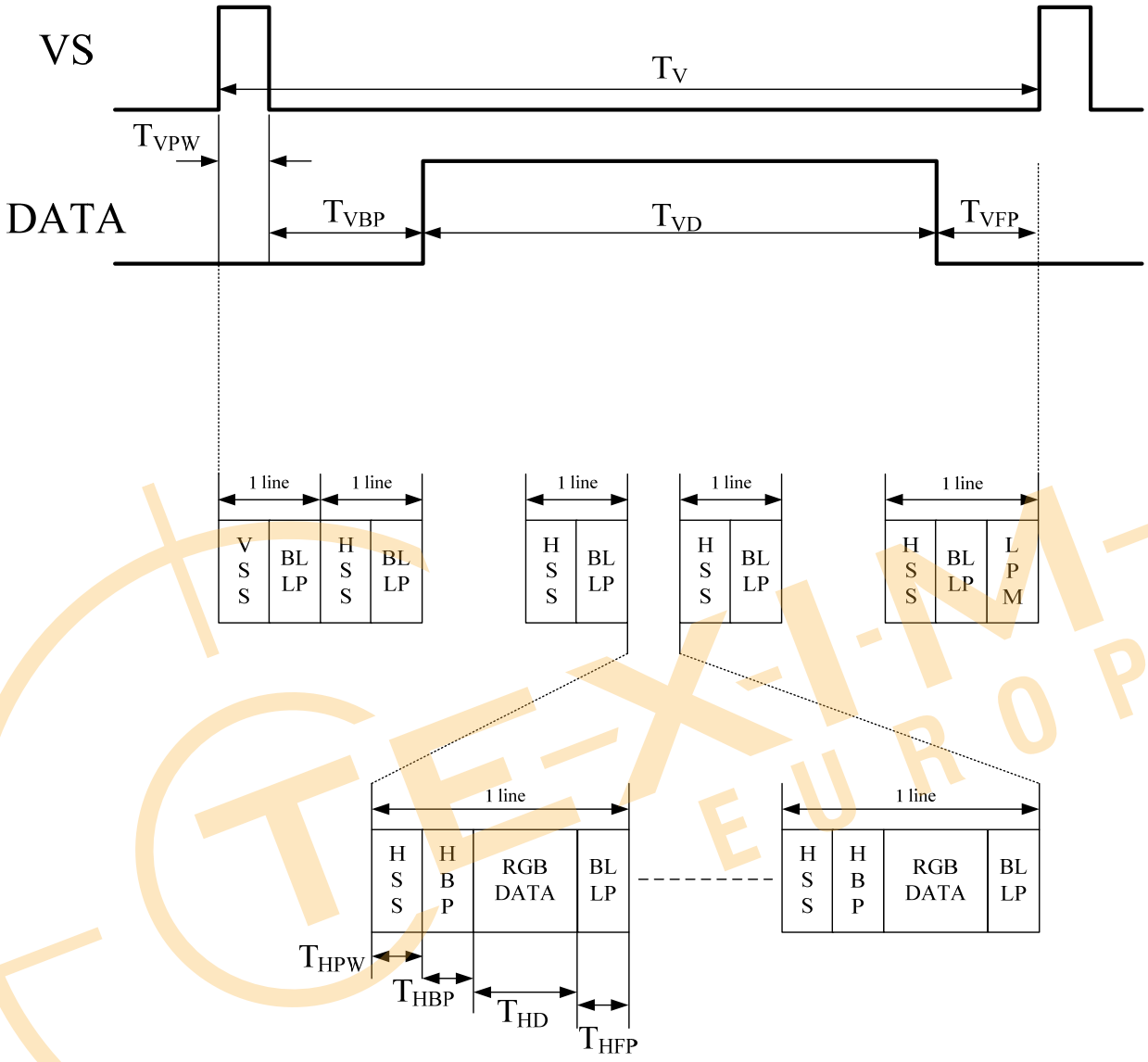


*Note (5) Measurement Set-Up:

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.

3. DATA INPUT FORMAT

3.1. Data Input Format for MIPI



3.2. Input Timing Table

1200RGBx1920 (4 Data Lanes)

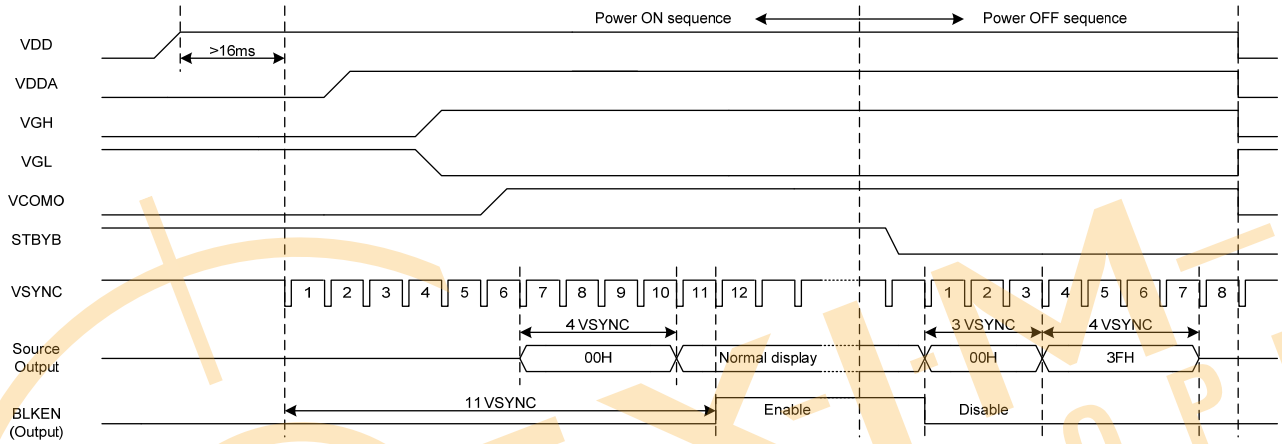
Parameter	Symbol	Min.	Typ.	Max.	Unit
MIPI data frequency	FDATA	955	999	1000	Mbps
Horizontal display area	THD		1200		pixel
HS period time	TH	1275	1341	1342	pixel
HS pulse width	THPW	1	1	1	pixel
HS back porch	THBP	32	60	60	pixel
HS front porch	THFP	42	80	81	pixel
Vertical display area	TVD		1920		H
VS period time	TV	1981	1981	1982	H
VS pulse width	TVPW	1	1	1	H
VS back porch	TVBP		25		H
VS front porch	TVFP	35	35	36	H

4. FUNCTIONAL DESCRIPTIONS

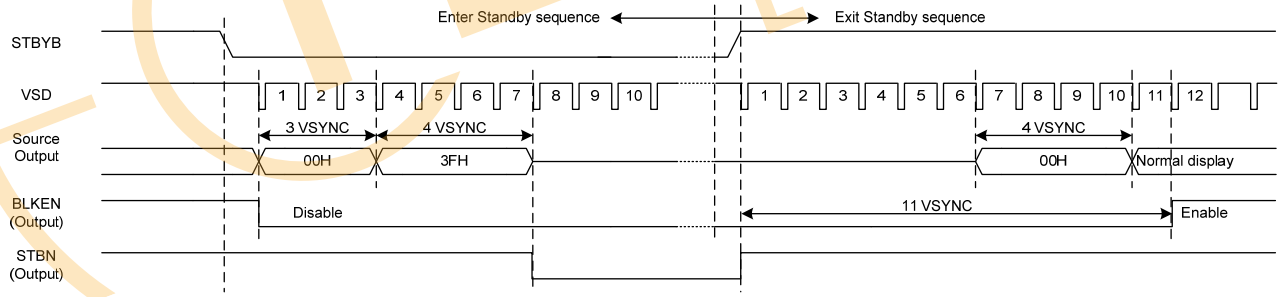
4.1. Power On/Off Sequence

In order to prevent IC from power on reset fail, the rising time (T_{POR}) of the digital power supply VDD should be maintained within the given specifications. Refer to “AC Characteristics” for more detail on timing.

Power-On/Off Timing Sequence:



Enter and Exit Standby Mode Sequence:



5. Interface Pin Connection

PIN NO	SYMBOL	DESCRIPTION
1	NC	No connect
2	VDDIN(3.3V)	Power Voltage for digital circuit 3.3V.
3	VDDIN (3.3V)	Power Voltage for digital circuit 3.3V.
4	GND	Ground.
5	Reset	Global reset pin.
6	NC	No connect.
7	GND	Ground.
8	MIPI_D0N	MIPI-D0Nare differential small amplitude signals.
9	MIPI_D0P	MIPI-D0Pare differential small amplitude signals.
10	GND	Ground.
11	MIPI_D1N	MIPI-D1Nare differential small amplitude signals.
12	MIPI_D1P	MIPI-D1Pare differential small amplitude signals.
13	GND	Ground.
14	MIPI_CLKN	MIPI-CLKNare differential small amplitude signals.
15	MIPI_CLKP	MIPI-CLKPare differential small amplitude signals.
16	GND	Ground.
17	MIPI_D2N	MIPI-D2Nare differential small amplitude signals.
18	MIPI_D2P	MIPI-D2Pare differential small amplitude signals.
19	GND	Ground.
20	MIPI_D3N	MIPI-D3Nare differential small amplitude signals.
21	MIPI_D3P	MIPI-D3Pare differential small amplitude signals.
22	GND	Ground.
23	NC	No connect.
24	NC	No connect
25	GND	Ground.
26	NC	No connect.
27	NC	No connect.
28	NC	No connect.
29	NC	No connect.
30	GND	Ground.
31	VLED-	Power for LED backlight (Cathode)
32	VLED-	Power for LED backlight (Cathode)
33	NC	No connect.
34	ID	ID PIN Pull High, If not use, please not connect.
35	NC	No connect.
36	NC	No connect.
37	NC	No connect.
38	NC	No connect.
39	VLED+	Power for LED backlight (Anode)
40	VLED+	Power for LED backlight (Anode)

6. 0 Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit
Analog Supply Voltage	VDD	3.3	3.6	V
Operating Temperature	TOP	-20	+60	°C
Storage Temperature	TST	-30	+70	°C

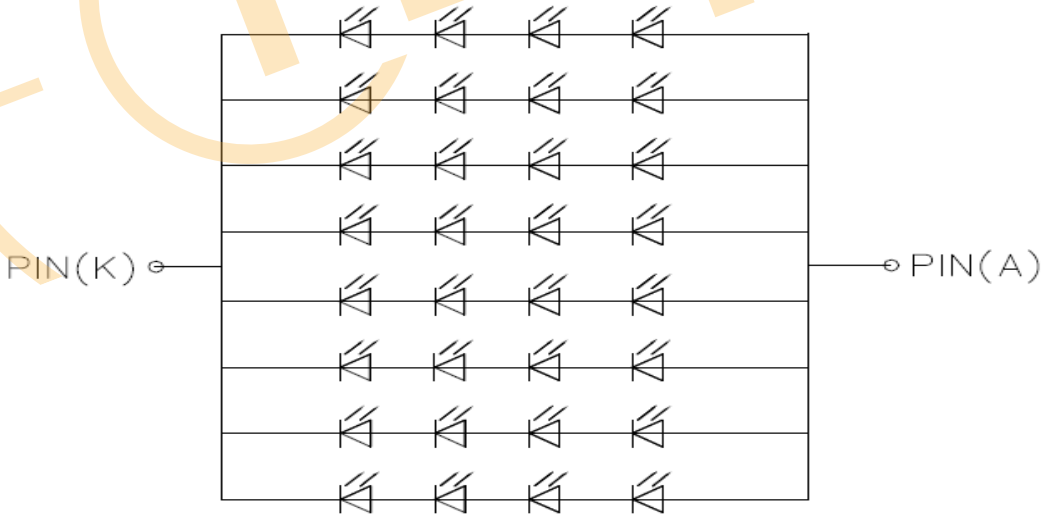
6.1 Back-light Unit

PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
LED Current	IF	–	160	–	mA	–	–
LED Voltage	VF	–	12	–	V	–	–
Luminous instensity		–	300	-	Cd/m2	–	–
Life Time		–	25000	–	Hr.	I≦160mA	–
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 160mA



If= 160 mA (20mA/LED)
Vf= 12 V (typ)

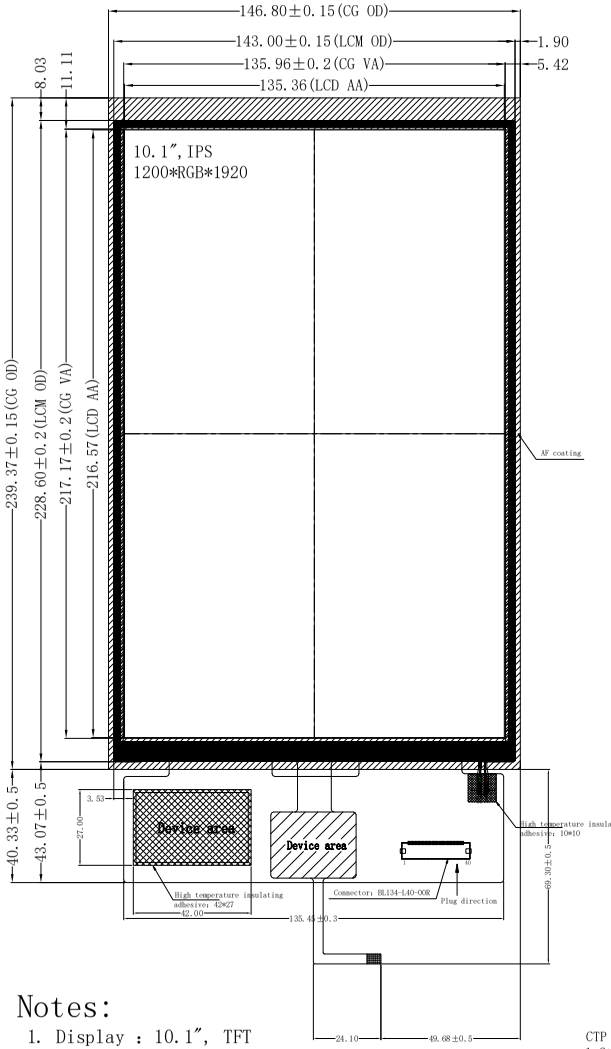
7. Reliability test items

NO	Item	Conditions	Remark
1	High Temperature Storage	Ta=+70℃,24hrs	
2	Low Temperature Storage	Ta=-30℃,24hrs	
3	High Temperature Operation	Ta=+60℃,24hrs	
4	Low Temperature Operation	Ta=-20℃,24hrs	
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	

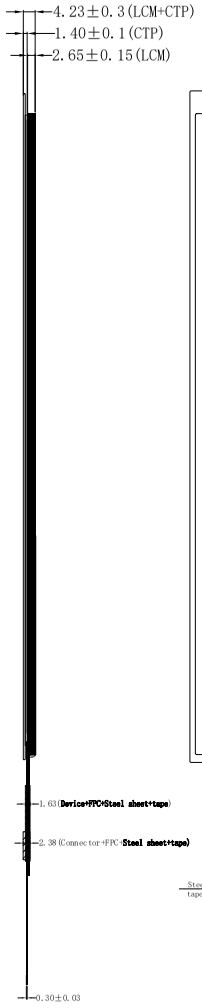
Note: All tests above are practiced at module type.
There is no display function NG issue occurred, All the cosmetic specification is judged before the reliability stress.

8. Mechanical Drawing

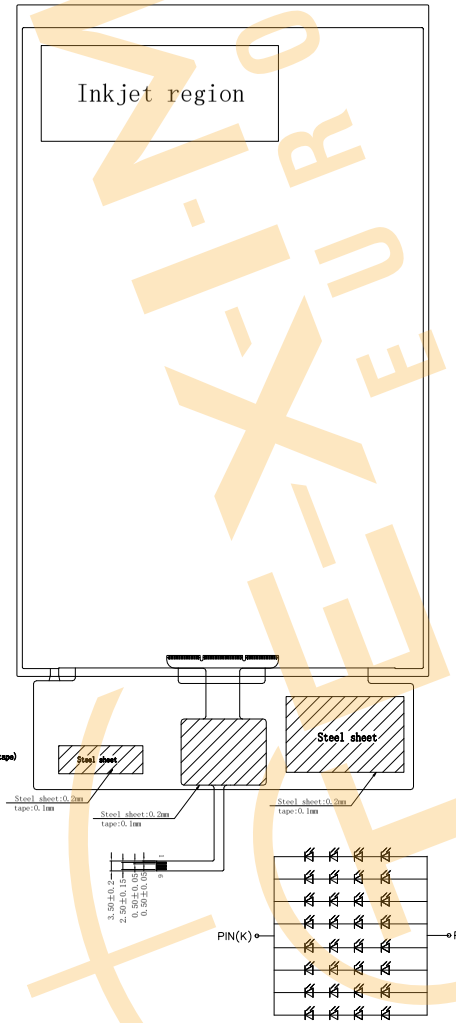
Front View



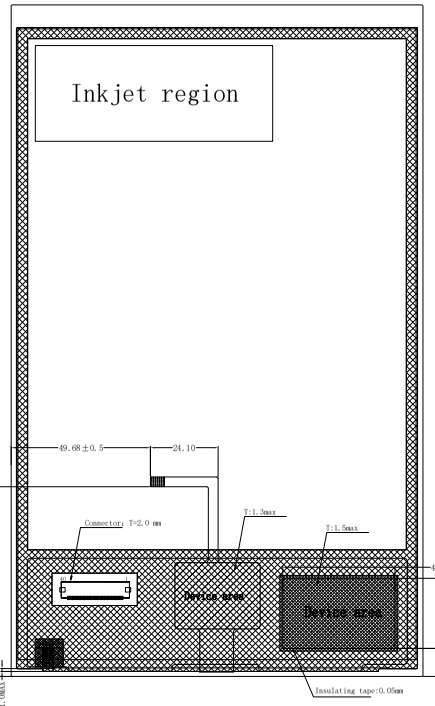
Side View



Back View



Back View



PIN	SYMBOL
1	NC
2	VDDIN
3	VDDIN
4	GND
5	RESET
6	NC
7	GND
8	MIPI_D0N
9	MIPI_D0P
10	GND
11	MIPI_D1N
12	MIPI_D1P
13	GND
14	MIPI_CKN
15	MIPI_CKP
16	GND
17	MIPI_D2N
18	MIPI_D2P
19	GND
20	MIPI_D3N
21	MIPI_D3P
22	GND
23	NC
24	NC
25	GND
26	NC
27	NC
28	NC
29	NC
30	GND
31	LEDK
32	LEDK
33	NC
34	ID
35	NC
36	NC
37	NC
38	NC
39	LEDA
40	LEDA

CTP interface

1	INT
2	SDA
3	SCL
4	RST
5	GND
6	VDD3.3

Notes:

1. Display : 10.1″, TFT
2. Resolution: 1200xRGBx1920
3. View Direction: ALL
4. LCD Driver IC: OTA7290B+OTA7290B
5. LCM Brightness:350 cd/m²(TYP)
   LCM+CTP Brightness:300 cd/m²(TYP)
6. GENERAL TOLERANCE:±0.2
7. OPERATING TEMP: -20° C~ +60° C
8. STORAGE TEMP: -30° C~ +70° C
9. Requirements on Environmental Protection: ROHS

CTP NOTE:
1. G+G+FPC+OCA
   LENS GLASS: 0.7mm
   SENSOR GLASS: 0.55mm
   IC: GT9271
2. Operation Voltage: 2.8V~3.3 V
3. Transmittance: ≥82%
4. The cover hardness: 6H

If= 160 mA(20mA/LED)
Vf= 12 V(typ)

REV	DESCRIPTION	DATE	NAME
3			
2			
1			
0	NEW	2023.03.29	IAN

LEADTEK COMPANY LIMITED

LEADTEK DISPLAY

SCALE:1/1	UNIT:mm	PAGE:1/1		Approve	Check	Drawn
Part No:	LTK101FHNCT19		VER:V0		JONA	IAN
Customer No:						

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 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.

9.3 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.

9.4 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.

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 employing 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.Use fingerstalls of soft gloves in order to keep clean display quality, when persons handle the LCD module for incoming inspection or assembly.
9.6.2 When the surface is dusty, please wipe gently with absorbent cotton or other soft material.
9.6.3 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.
9.6.4 When cleaning the adhesives, please use absorbent cotton wetted with a little petroleum benzine or other adequate solvent.

9.7 Static Electricity

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

9.8 Disposal

When disposing LCD module, obey the local environmental regulations.

9.9 OTHERS

9.9.1 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.
9.9.2 Please pay attention to a panel side of LCD module not to contact with other materials in preserving it alone.
9.9.3 For the packaging box, please pay attention to the followings:
9.9.3.1 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.
9.9.3.2 Please do not pile them up more than 6 boxes. (They are not designed so.) And please do not turn over.
9.9.3.3 Please handle packaging box with care not to give them sudden shock and vibrations. And also please do not throw them up.
9.9.3.4 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.)

10.0 Packing form

7.1 Packing form 1

TBD

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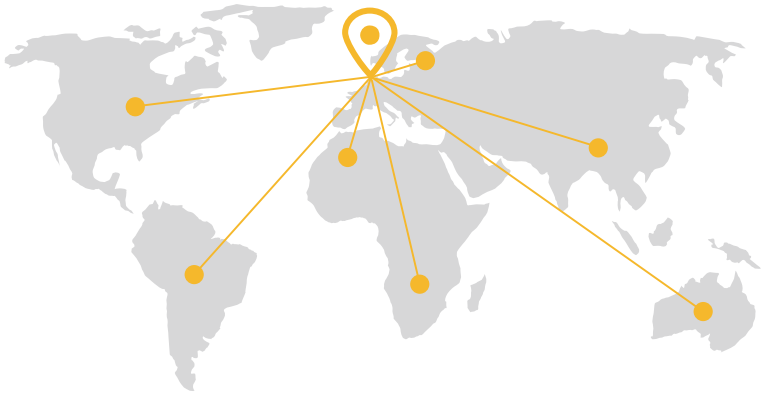
Texim Europe - contact details



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