Shenzhen Leadtek Electronics Co.,Ltd

PRODUCT SPECIFICATION

TFT-LCD MODULE

Module No：LTK061FTBLM11-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.

1.Document Revision History

Version	Contents	Date	Note
V0	NEW	2024.03.09	

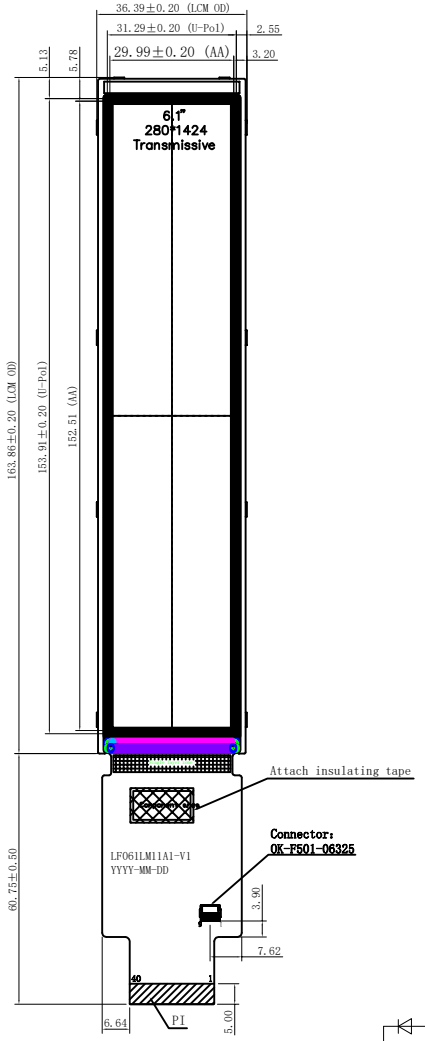
2. General Description

NO	Item	Specification	Unit
1	LCD Size	TFT"6.1	inch
2	Panel Type	IPS	mm
3	Resolution	280 x RGB x 1424	pixel
4	Display Mode	Normally Black	-
5	Number of Colors	16.7M	-
6	Viewing Direction	ALL	-
7	LCM Module size	36.39(W)×163.86(H)×4.36(T)	mm
8	Panel Active Area	29.99(W)×152.51(H)	mm
9	Pixel Pitch	0.1071 (H) x 0.1070 (V)	mm
10	LCM Driver	NV3051F1	
11	Light Source	White LED	
12	LCM Interface	MIPI	bit

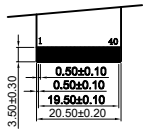
Note : Please refer to the mechanical drawing

3. Mechanical Drawing

FrontView



Side View



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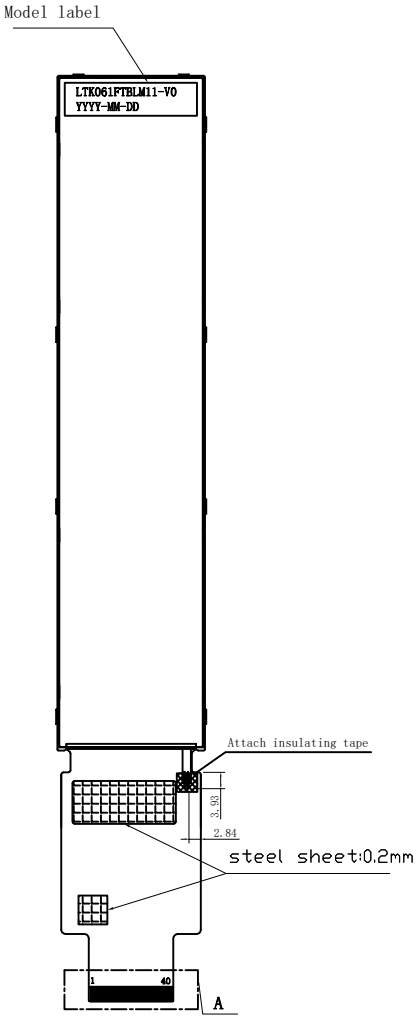
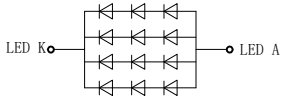
Back View



PIN	DESCRIPIION
1	GND
2	DOP
3	DON
4	GND
5	D1P
6	D1N
7	GND
8	CLKP
9	CLKN
10	GND
11	D2P
12	D2N
13	GND
14	D3P
15	D3N
16	GND
17	GND
18	IOVCC-1.8V
19	IOVCC-1.8V
20	CTP-VDD-3.3V
21	CTP-SDA-1.8V
22	CTP-SCL-1.8V
23	CTP-GND
24	RSTB
25	STBYB(GND)
26	CTP-INT
27	GND
28	K
29	K
30	GND
31	NC
32	GND
33	GND
34	NC
35	A
36	A
37	GND
38	VDD-3.3V
39	VDD-3.3V
40	CTP-RESET

Notes:

1. Display : 6.1", TFT
2. Resolution: 280xRGBx1424
3. LCD Viewing Direction: ALL
5. Display Mode: Normally BLACK
6. LCM Bringhtness: 450cd/m²(TYP)
7. unmark Tolerance:±0.2
8. OPERATING TEMP: -20° C~+70° C
9. STORAGE TEMP: -30° C~+80° C
10. Requirements on Environmental Protection: ROHS



IF=80mA, VF=12.0V(TYP)

REV	DESCRIPTION	DATE	NAME
3			
2			
1			
0	NEW	2024.01.06	Jerry

LEADTEK COMPANY LIMITED

LEADTEK DISPLAY

SCALE:1/1	UNIT:mm	PAGE:1/1		Approve	Check	Drawn
Part No:	LTK061FTBLM11		VER:V0	Ian	Kevin	Jerry
Customer No:						

4.0 Interface Pin Connection

	Symbol	Function
1	GND	Power ground.
2	MIPI_D0+	MIPI_DP0+ are differential data signal line
3	MIPI_D0-	MIPI_DP0- are differential data signal line
4	GND	Power ground.
5	MIPI_D1+	MIPI_DP1+ are differential data signal line
6	MIPI_D1-	MIPI_DP1- are differential data signal line
7	GND	Power ground.
8	MIPI_CLK+	CLOCK Lane positive-end input pin
9	MIPI_CLK-	CLOCK Lane engative-end input pin
10	GND	Power ground.
11	MIPI_D2+	MIPI_DP2+ are differential data signal line
12	MIPI_D2-	MIPI_DP2- are differential data signal line
13	GND	Power ground.
14	MIPI_D3+	MIPI_DP3+ are differential data signal line
15	MIPI_D3-	MIPI_DP3- are differential data signal line
16	GND	Power ground.
17	GND	Power ground.
18	IOVCC(1.8V)	A supply voltage to the digital circuit. (1.8V)
19	IOVCC(1.8V)	A supply voltage to the digital circuit. (1.8V)
20	TP-VDD	Not connect
21	TP-SDA	Not connect
22	TP-SCL	Not connect
23	TP-GND	Not connect
24	RSTB	Reset signal（Low: Active).
25	STBYB	Not connect
26	TP-INT	Not connect
27	GND	Power ground.
28	LED-	LED cathode.

29	LED-	LED cathode.
30	GND	Power ground.
31	NC	Not connect
32	GND	Power ground.
33	GND	Power ground.
34	NC	Not connect
35	LED+	LED anode.
36	LED+	LED anode.
37	GND	Power ground.
38	VCC(3.3V)	A supply voltage to the digital circuit. (3.3V)
39	VCC(3.3V)	A supply voltage to the digital circuit. (3.3V)
40	TP-RESET	Not connect

5.0 Absolute Maximum Ratings

5.1 Electrical Absolute Rating

5.1.1 TFT LCD Module

Item	Symbol	Min.	Max.	Unit	Note
Power supply voltage	IOVCC	1.65	3.3	V	GND=0
Power supply voltage	VCI	2.65	3.3	V	GND=0
Back-light supply voltage	VF	11.2	12	V	GND=0

Note (1) Stresses above those listed under "Absolute Maximum Rating" may cause permanent damage to the device. These are stress ratings only. Functional operation of this device at indicated in the operational sections(6.1) of this specification.

5.2 Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Operating Temperature	Topa	-20	70	℃	
Storage Temperature	Tstg	-30	80	℃	

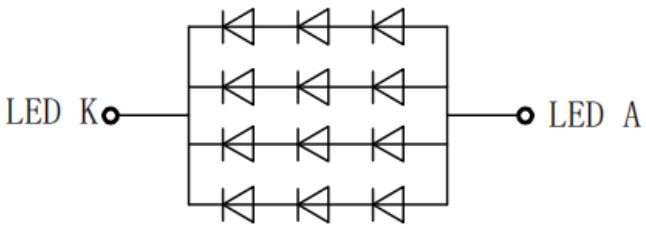
5.3 Back-light Unit:

PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
LED Current	IF	–	80	–	mA	–	–
LED Voltage	VF	–	12	–	V	–	–
LCM Brightness	Lv	–	450	–	Nits	@CA310	
Life Time		–	30000	–	Hr.	I≦20mA	–
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℃

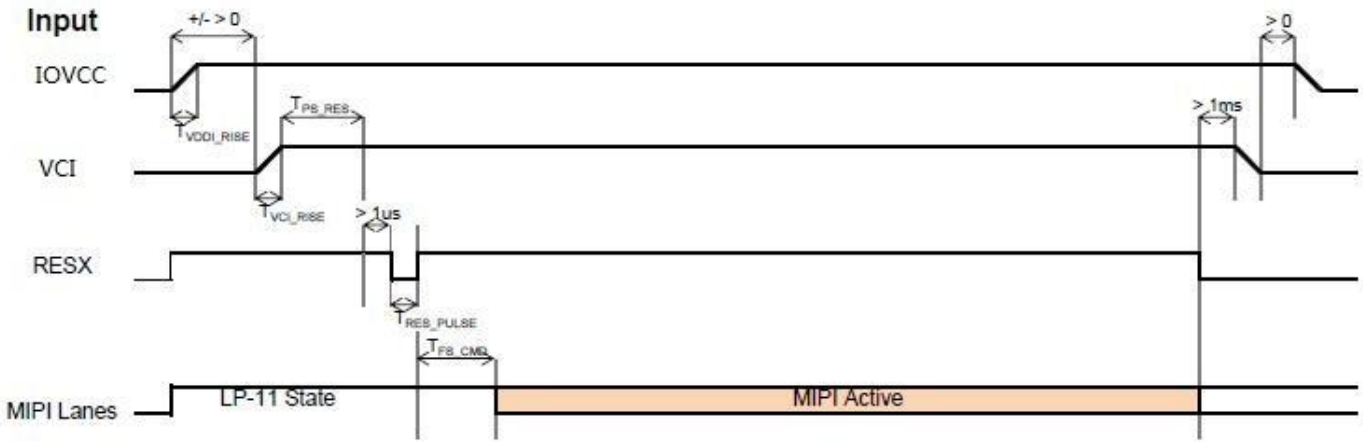
(3)Test condition: LED Current 80mA



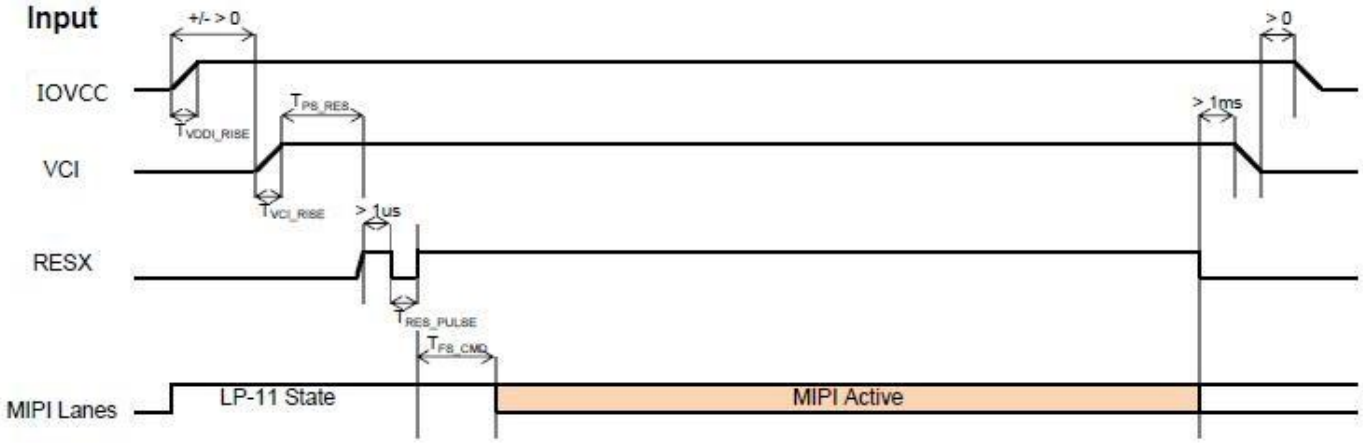
IF=80mA, VF=12.0V(TYP)

5.2.1 Power Sequence

Case A:



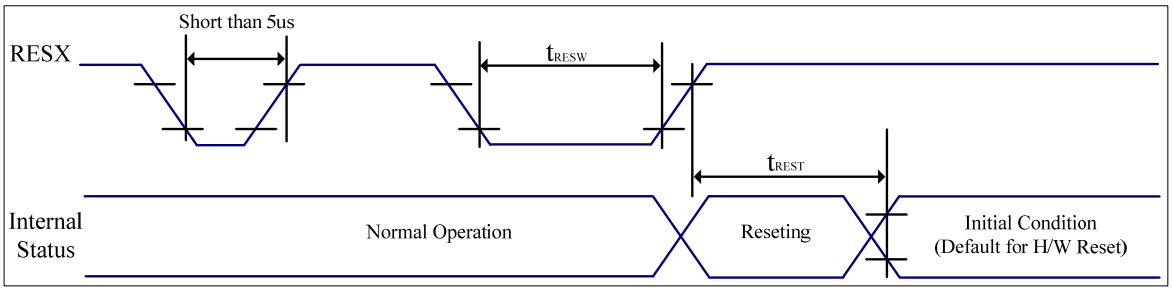
Case B:



Symbol	Characteristics	Min.	Typ.	Max.	Units
T_{IOVCC_RISE}	IOVCC Rise time	10	-	-	us
T_{VCI_RISE}	Case A: VCI Rise time	130	-	-	us
	Case B: VCI Rise time	40			
T_{PS_RES}	IOVCC /VCI on to Reset high	10	-	-	ms
T_{RES_PULSE}	Reset low pulse time	10	-	-	us
T_{FS_CMD}	Reset to first command	10	-	-	ms

5.2. 2 AC characteristic

5.2.2.1 Reset timing characteristics



VSS=0V, IOVCC=1.65V to 3.6V, VCI=2.5V to 6.0V,Ta = -30℃ to 70℃

Symbol	Parameter	Related Pins	MIN	TYP	MAX	Note	Unit
T_{resw}	*1) Reset low pulse width	RESX	10	-	-	-	us
T_{rest}	*2) Reset complete time	-	-	-	5	When reset applied during Sleep in mode	ms
		-	-	-	120	When reset applied during Sleep out mode	ms

Table: Reset input timing

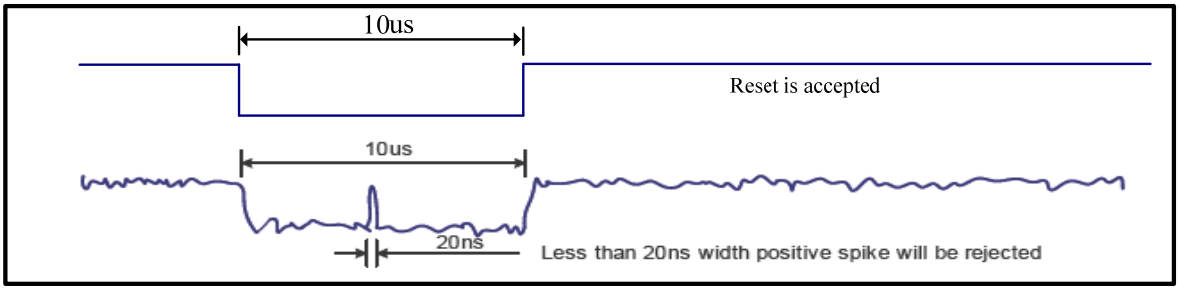
Note 1: Due to an electrostatic discharge on RESX line,spike does not cause irregular system reset according to the table below.

RESX Pulse	Action
Shorter than 5us	Reset Rejected
Longer than 10us	Reset
Between 5us and 10us	Reset starts (It depends on voltage and temperature condition.)

Note 2: During the resetting period, the display will be blanked (The display is entering blanking sequence, which maximum time is 120ms, when Reset Starts in Sleep Out mode. The display remains the blank state in Sleep In mode) , then return to default condition for H/W reset.

Note 3: During Reset Complete Time, ID1/ID2/ID3 and VCOM value in OTP will be latched to internal register. After a rising edge of RESX, there is a H/W reset complete time (Trest) which lasted 5ms.The loading operation will be done every time during this reset.

Note 4: Spike Rejection also applies during a valid reset pulse as shown below:



Note 5. It is necessary to wait 5msec after releasing RESX before sending commands. Also Sleep Out command cannot be sent for 120 msec.

6.0 OPTICAL SPECIFICATIONS

6.1 Overview

The test of optical specifications shall be measured in a dark room (ambient luminance <1lux and temperature=25±2℃) with the equipment of luminance meter system (Goniometer system and CS2000/CA310) and test unit shall be located at an approximate distance 50cm from the LCD surface at a viewing angle of θ and Φ equal to 0°. We refer to Ø=0 (=θ3) as the 3 o'clock direction (the "right"), Ø=90 (=θ12) as the 12 o'clock direction ("upward"), Ø=180 (=θ9) as the 9 o'clock direction ("left") and Ø=270(=θ6) as the 6 o'clock direction ("bottom"). While scanning θ and/or Ø, the center of the measuring spot on the Display surface shall stay fixed.

The backlight should be operating for 30 minutes prior to measurement.

5.2 Optical Specifications

<Table 6. Optical Specifications> [Ta=25±2℃]

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle range	Horizontal	Θ_3	CR > 10	80	85	-	Deg.	Note5
		Θ_9		80	85	-	Deg.	
	Vertical	Θ_{12}		80	85	-	Deg.	
		Θ_6		80	85	-	Deg.	
Contrast ratio		CR	Θ = 0°	1000	1200	-	-	HC+Clear @silicate BLU Note 5.2/5.3
Cell Transmittance		Tr	-	3.8	4.5	-	%	
Color Gamut	NTSC	CIE1931	Θ = 0°	65	70	-	%	CF@C Light Note 5.4
Chroma@CIE 1931	Red	(Rx,Ry)	Θ = 0°	Typ-0.02	(0.667,0.323)	Typ+0.02	-	
	Green	(Gx,Gy)	Θ = 0°		(0.274,0.592)		-	
	Blue	(Bx,By)	Θ = 0°		(0.133,0.126)		-	
	White	(Wx,Wy)	Θ = 0°		(0.295,0.337)		-	
Response Time		Tr+Tf	Ta= 25° C Θ = 0°	-	30	35	ms	Note 5.5

DSI Clock Burst – High Speed Mode to/from Low Power Mode

5.04.3 Timing for MIPI Characteristics.

6.0 Reliability test items

NO	Item	Conditions	Remark
1	High Temperature Storage	Ta=+80℃,48hrs	
2	Low Temperature Storage	Ta=-30℃,48hrs	
3	High Temperature Operation	Ta=+70℃,48hrs	
4	Low Temperature Operation	Ta=-20℃,48hrs	
5	High Temperature and High Humidity (operation)	Ta=+60℃,80%RH,48hrs	
6	Thermal Cycling Test (non operation)	-10℃(0.5hr)→+60℃(30min),100cycles	

Note: （1）All tests above are practiced at module type.
（2）There is no display function NG issue occurred, All the cosmetic specification is judged before the reliability stress.

7. Mechanical Drawing

8.0 Packing form

8.1 TBD

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. 11.5.3. 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.