Rocktech Displays Limited

LCD Module Specification

Module P/N: RK070HI153

Version: 1.0

Description : 7.0 inch TFT 800*1280 pixels with LED backlight ,All viewing angle 400 nits brightness

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Revision History

Date	Rev.	Page	Description
2025-05-30	1.0	All	First Issue

CONTENTS

1. General Features

Item	Spec	Remark
Display Mode	Normally Black Transmissive	
Viewing Direction	Free	IPS
Input Signals	MIPI	
Outside Dimensions(mm)	99.65(W) x160.85(H) x2.43(D)	
Active Area(mm)	94.20(W)×150.72(H)	
Number of Pixels	800(RGB)×1280	
Dot Pitch(mm)	0.11775 (W) x 0.11775 (H)	
Pixel Arrangement	RGB Vertical stripes	

2. Absolute Maximum Ratings

The following are maximum values which, if exceeded may cause operation or damage to the unit.

ITEM	Sym.	Min.	Typ.	Max.	Unit	Remark
Power for Circuit Driving	VDD	-0.3	-	3.6	V	
	AVDD	-0.3		6.6	V	
	VGH	-0.3		25.0	V	
	VGL	-16.0		0.0	V	
Storage Humidity	H_{ST}	10	-		%RH	At 25±5℃
Storage Temperature	T_{ST}	-30	-	80	℃	
Operating Ambient Humidity	H_{OP}	10	-		%RH	
Operating Ambient temperature	T_{OP}	-20	-	70	℃	

3. Electrical Specification

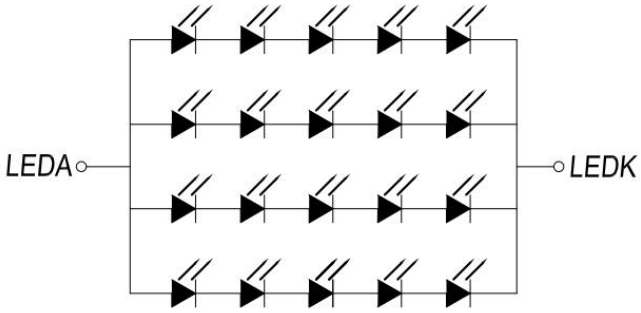
3.1 Driving TFT LCD Panel

Item		Sym.	Min	Typ.	Max	Unit	Note
Supply Voltage		IOVCC	1.7	1.8	1.9	V	
		VCC	2.65	3.3	3.3	V	
Logic Input Voltage	Low Voltage	V_{IL}	0	-	0.3IOVCC	V	
	High Voltage	V_{IH}	0.7IOVCC	-	IOVCC	V	
Logic Output Voltage	Low Voltage	V_{OL}	0	-	0.2IOVCC	V	
	High Voltage	V_{OH}	0.8IOVCC	-	-	V	

3.2 Driving LED Backlight

Item	Sym.	Min	Typ.	Max	Unit	Note
Backlight driving voltage	V_F	-	15.4	-	V	
Backlight driving current	I_F	60	80	100	mA	
Backlight Power Consumption	W_{BL}	-	1232	-	mW	
Life Time	-	-	50,000	-		Note 1

Note 1: If LED is driven by high current, high ambient temperature & humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.



LED Diagram Circuit

4.Optical Specifications

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 30 minutes in a dark environment at 25 ℃. The values specified are at an approximate distance 500mm from the LCD surface at a viewing angle of Φ and θ equal to 0°.

Item	Sym.	Values			Unit	Note
		Min.	Typ.	Max.		
1)Contrast Ratio	C/R	600	800	-		FIG.1
2)Module Luminance	L	350	400	-	cd/m^2	
3)Response time	Tr+Tf	-	30	40	ms	FIG.2
4)Viewing Angle	θ_T	-	80	-	Degree	FIG.3
	θ_B	-	80	-		
	θ_L	-	80	-		
	θ_R	-	80	-		
5)Chromaticity	Wx	0.281	0.321	0.361		
	Wy	0.306	0.346	0.386		
	Rx	-	-	-		
	Ry	-	-	-		
	Gx	-	-	-		
	Gy	-	-	-		
	Bx	-	-	-		
	By	-	-	-		

◆ Measurement System

Notes:

1. Contrast Ratio(CR) is defined mathematically as :

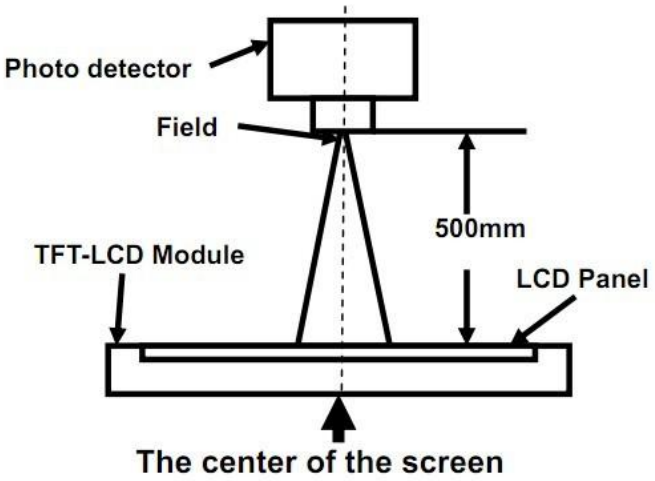
$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

2. Surface luminance is the center point across the LCD surface 500mm from the surface with all pixels displaying white. For more information see FIG 1.

3. Response time is the time required for the display to transition from white to black (Rising Time, Tr) and from black to white (Falling Time, Tf). For additional information see FIG 2.

4. Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see FIG 3.

FIG. 1 Optical Characteristic Measurement Equipment and Method



Item	Photo detector	Field
Contrast Ratio	SR-3A	1°
Luminance		
Chromaticity		
Lum Uniformity		
Response Time	BM-7A	2°

FIG. 2 The definition of Response Time

The response time is defined as the following figure and shall be measured by switching the input signal for “black” and “white”.

Response Time = Rising Time(Tr) + Falling Time(Tf)

- Rising Time(Tr) : Full White 90% → Full White 10% Transmittance.
- Falling Time(Tf) : Full White 10% → Full White 90% Transmittance.

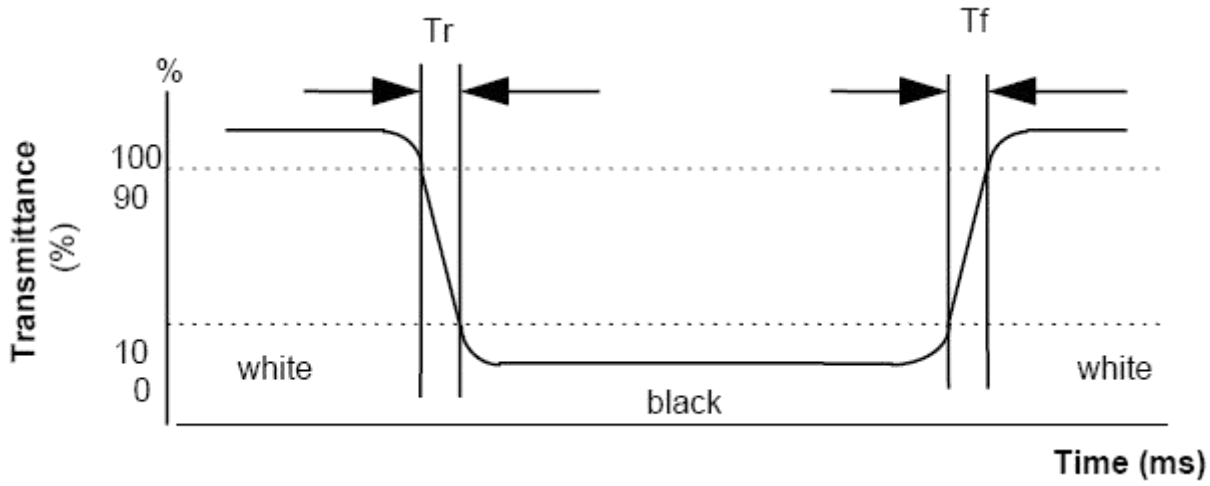
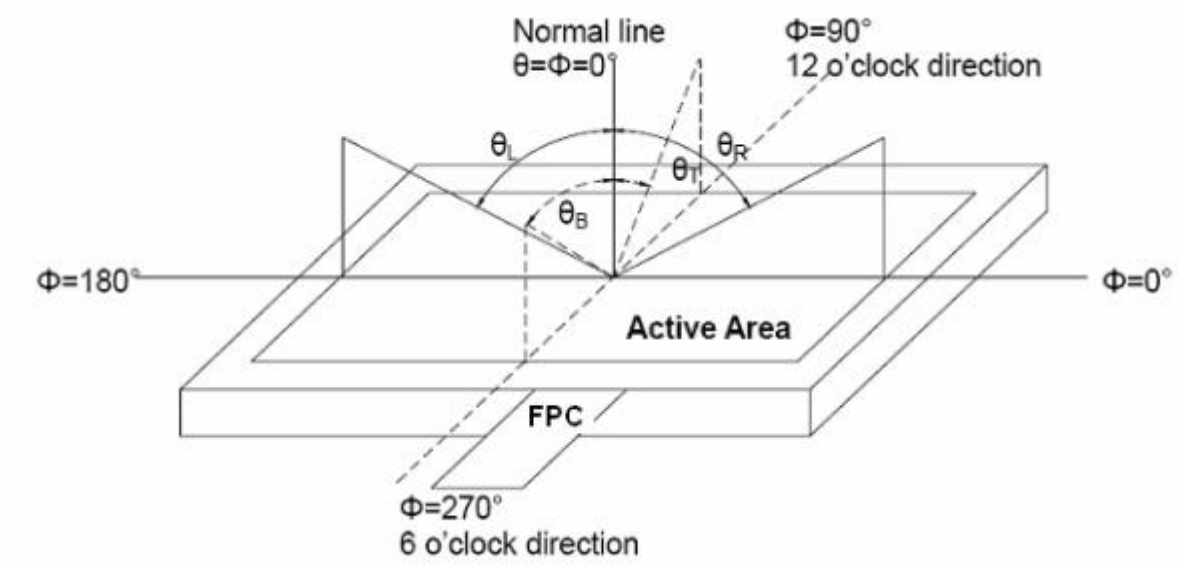
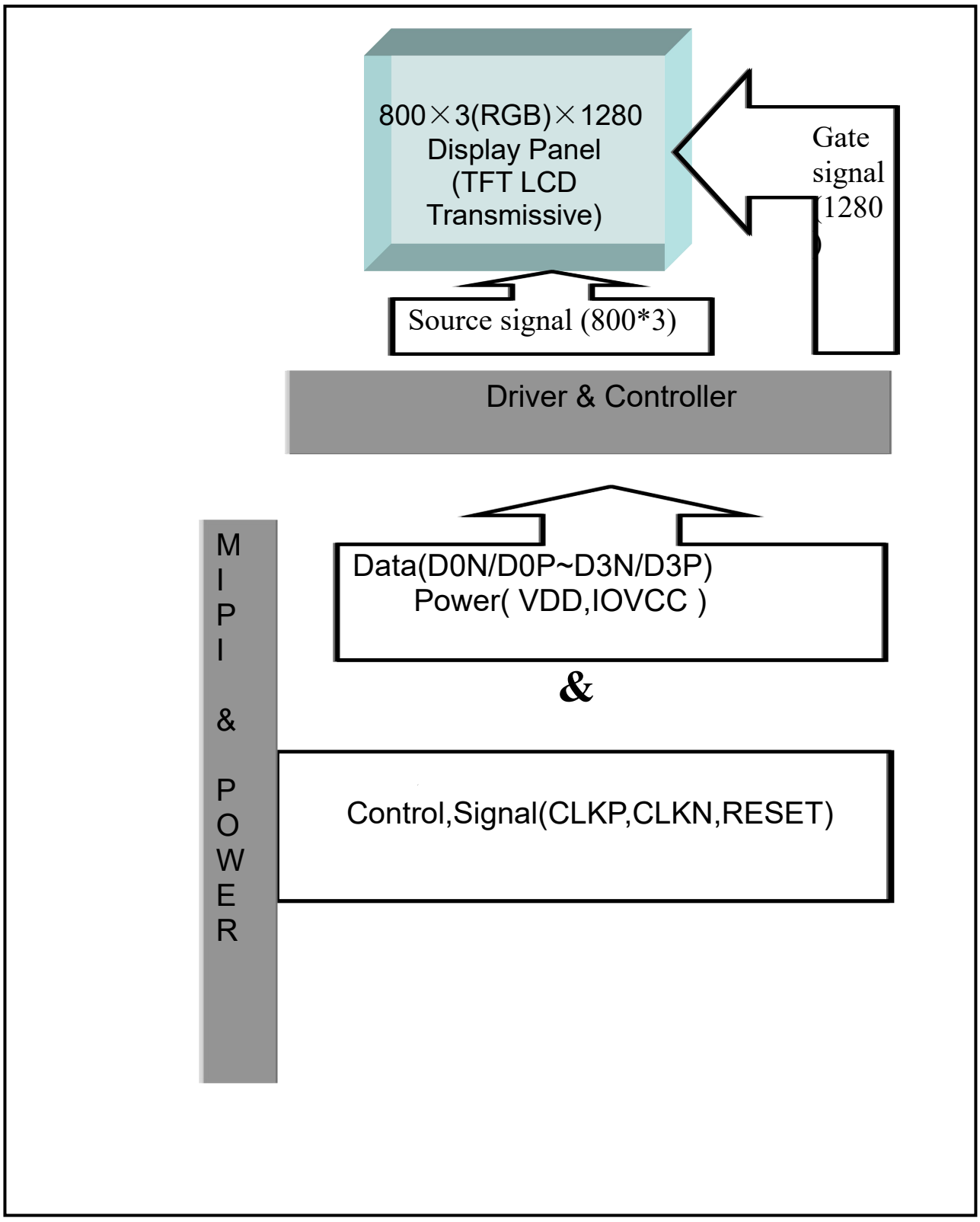


FIG. 3 The definition of Viewing Angle

Use Fig. 1(Test Procedure) under Measurement System to measure the contrast from the measuring direction specified by the conditions as the following figure.



5. Block Diagram

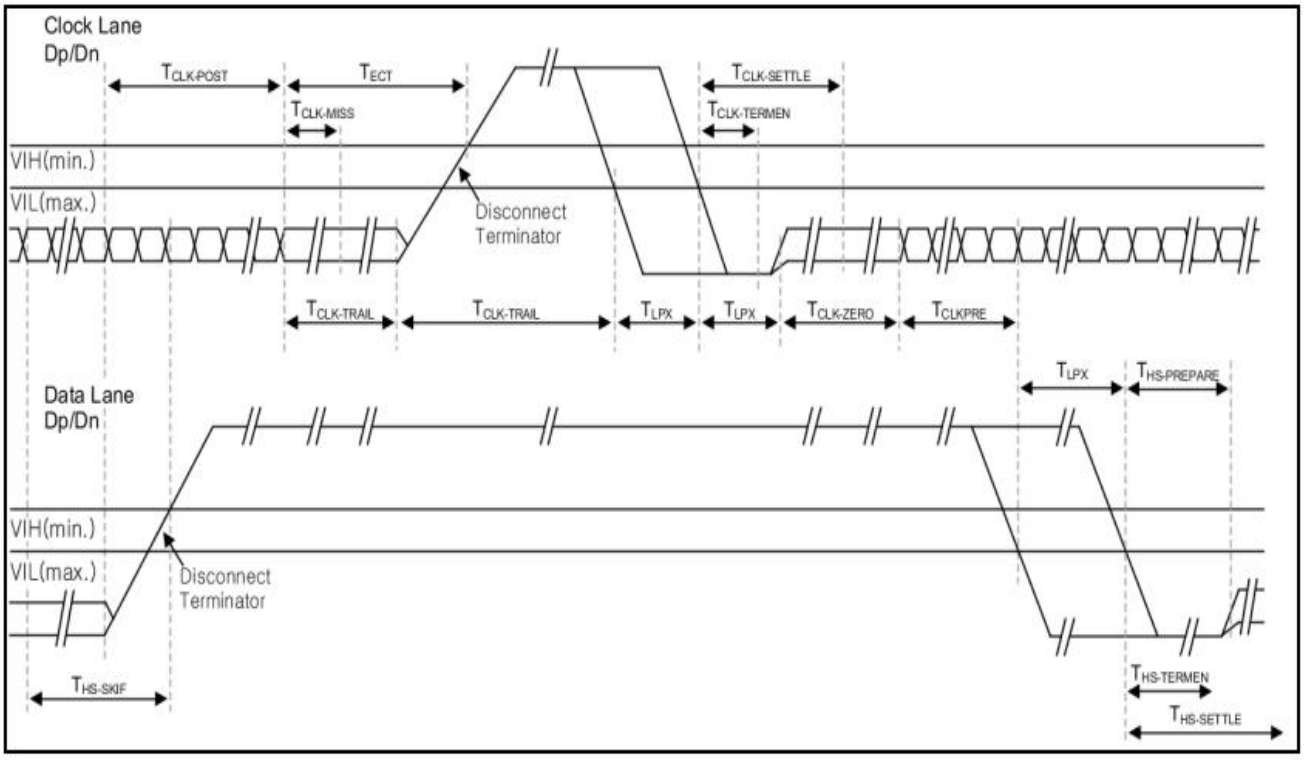


6.Pin Description

Item	Terminal	Functions
1	LEDA1	The anode of the backlight
2	LEDA2	The anode of the backlight
3	LEDA3	The anode of the backlight
4	NC	NC
5	LEDK1	The cathode of the backlight
6	LEDK2	The cathode of the backlight
7	LEDK3	The cathode of the backlight
8	LEDK4	The cathode of the backlight
9	GND	Power ground
10	GND	Power ground
11	MIPI_D2P	Positive polarity of low voltage differential data2 signal
12	MIPI_D2N	Negative polarity of low voltage differential data2 signal
13	GND	Power ground
14	MIPI_D1P	Positive polarity of low voltage differential data1 signal
15	MIPI_D1N	Negative polarity of low voltage differential data1 signal
16	GND	Power ground
17	MIPI_CLKP	positive polarity of low voltage differential clock signal
18	MIPI_CLKN	Negative polarity of low voltage differential clock signal
19	GND	Power ground
20	MIPI_D0P	Positive polarity of low voltage differential data0 signal
21	MIPI_D0N	Negative polarity of low voltage differential data0 signal
22	GND	Power ground
23	MIPI_D3P	Positive polarity of low voltage differential data3 signal
24	MIPI_D3N	Negative polarity of low voltage differential data3 signal
25	GND	Power ground
26	NC	NC
27	RESET	The reset signal pin
28	NC	NC
29	IOVCC_1.8V	Power supply 1.8V
30	VDD	Power supply 2.8-3.3V
31	VDD	Power supply 2.8-3.3V

7. Timing Characteristics

7.1. LP Power Mode Transmission



7.2. Reset Operation

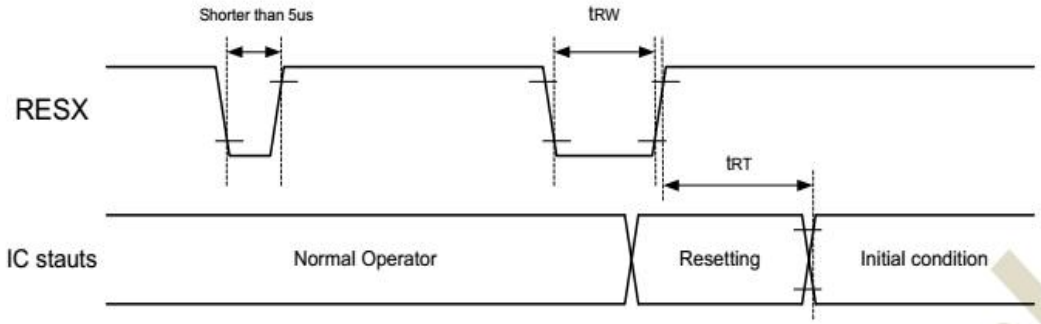


Figure 11.1: Reset input timings

Symbol	Parameter	Related pins	Min.	Max.	Unit
t_{RW}	Reset pulse width(2)	RESX	10	-	μs
t_{RT}	Reset complete time(3)	-	-	5 (Note 5)	ms
		-	-	120 (Note 6, 7)	ms

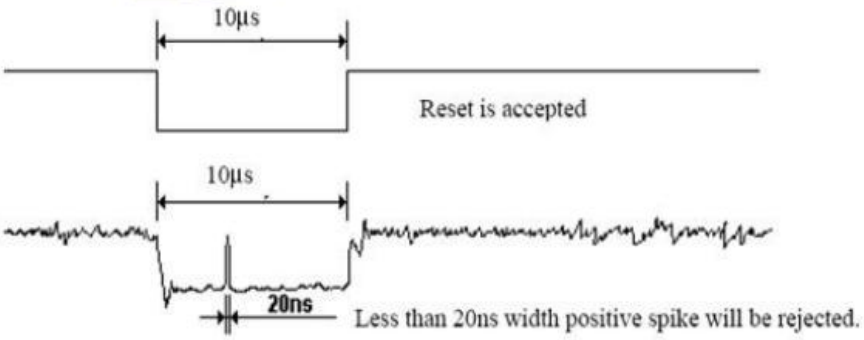
Note: (1) The reset complete time also required time for loading ID bytes from OTP to registers. This loading is done every time when there is HW reset cancel time (tRT) within 5 ms after a rising edge of RESX.

(2) Spike due to an electrostatic discharge on RESX line does not cause irregular system reset according to the table below.

RESX Pulse	Action
Shorter than 5 μs	Reset Rejected
Longer than 10 μs	Reset
Between 5 μs and 10 μs	Reset Start

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

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

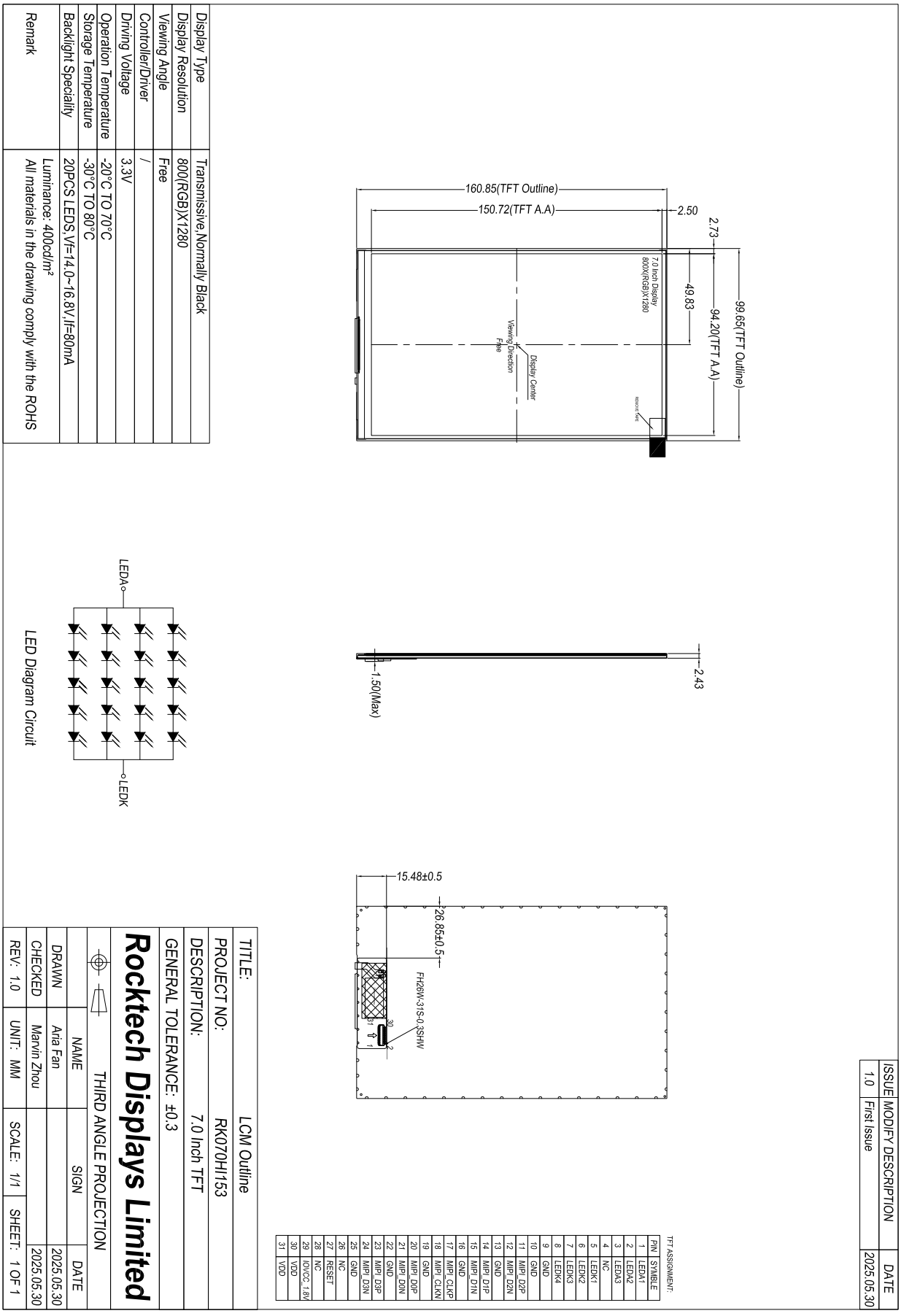


(5) When Reset is applied during Sleep In Mode.

(6) When Reset is applied during Sleep Out Mode.

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

8. Outline Dimension



Display Type	Transmissive,Normally Black
Display Resolution	800(RGB)X1280
Viewing Angle	Free
Controller/Driver	/
Driving Voltage	3.3V
Operation Temperature	-20°C TO 70°C
Storage Temperature	-30°C TO 80°C
Backlight Speciality	20PCS LEDS,Vf=14.0~16.8V,If=80mA
Remark	Luminance: 400cd/m² All materials in the drawing comply with the ROHS

TFT ASSIGNMENT:

PIN	SYMBLE
1	LEDA1
2	LEDA2
3	LEDA3
4	NC
5	LEDK1
6	LEDK2
7	LEDK3
8	LEDK4
9	GND
10	GND
11	MIPI_D2P
12	MIPI_D2N
13	GND
14	MIPI_D1P
15	MIPI_D1N
16	GND
17	MIPI_CLKP
18	MIPI_CLKN
19	GND
20	MIPI_D0P
21	MIPI_D0N
22	GND
23	MIPI_D3P
24	MIPI_D3N
25	GND
26	NC
27	RESET
28	NC
29	IOVCC: 1.8V
30	VDD
31	VDD

ISSUE	MODIFY DESCRIPTION	DATE
1.0	First Issue	2025.05.30

TITLE: LCM Outline

PROJECT NO: RK070HI153

DESCRIPTION: 7.0 Inch TFT

GENERAL TOLERANCE: ±0.3

Rocktech Displays Limited

THIRD ANGLE PROJECTION

	NAME	SIGN	DATE
DRAWN	Aria Fan		2025.05.30
CHECKED	Marvin Zhou		2025.05.30
REV: 1.0	UNIT: MM	SCALE: 1/1	SHEET: 1 OF 1

9. Reliability and Inspection Standard

No.	Test Item		Test Conditions	Remark
1	High Temperature	Storage	80℃, 120Hr	Note
		Operation	70℃, 120Hr	Note
2	Low Temperature	Storage	-30℃, 120Hr	Note
		Operation	-20℃, 120Hr	
3	High Temperature and High Humidity		40℃, 90%RH, 120Hr	Note
4	Thermal Cycling Test(No operation)		-20℃ for 30min, 70℃ for 30 min. 100 cycles. Then test at room temperature after 1 hour	Note
5	Vibration Test(No operation)		Frequency :10~55 HZ; Stroke :1.5 mm;Sweep:10HZ~55HZ~10HZ; 2hours for each direction of X, Y, Z(6 hours for total)	
6	Package Drop Test		Height:60 cm,1 corner, 3 edges, 6 surfaces	
7	Electro Static Discharge		±2KV,Human Body Mode, 100pF/1500Ω	

Note:

1) Sample quantity for each test item is 5~10pcs.
2) Note 4: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

10.PRECAUTIONS FOR USING LCD MODULES

Handing Precautions

(1) The display panel is made of glass and polarizer. As glass is fragile, it tends to become or chipped during handling especially on the edges. Please avoid dropping or jarring. Do not subject it to a mechanical shock by dropping it or impact.
(2) If the display panel is damaged and the liquid crystal substance leaks out, be sure not to get any in your mouth. If the substance contacts your skin or clothes, wash it off using soap and water.
(3) Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary. Do not touch the display with bare hands. This will stain the display area and degraded insulation between terminals (some cosmetics are determined to the polarizer).
(4) The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully. Do not touch, push or rub the exposed polarizers with anything harder than an HB pencil lead (glass, tweezers, etc.). Do not put or attach anything on the display area to avoid leaving marks on. Condensation on the surface and contact with terminals due to cold will damage, stain or dirty the polarizer. After products are tested at low temperature they must be warmed up in a container before coming is contacting with room temperature air.
(5) If the display surface becomes contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, moisten cloth with one of the following solvents
- Isopropyl alcohol
- Ethyl alcohol
Do not scrub hard to avoid damaging the display surface.
(6) Solvents other than those above-mentioned may damage the polarizer. Especially, do not use the following.
- Water
- Ketone
- Aromatic solvents
Wipe off saliva or water drops immediately, contact with water over a long period of time may cause deformation or color fading. Avoid contacting oil and fats.
(7) Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.
(8) Install the LCD Module by using the mounting holes. When mounting the LCD module make sure it is free of twisting, warping and distortion. In particular, do not forcibly pull or bend the I/O cable or the backlight cable.
(9) Do not attempt to disassemble or process the LCD module.
(10) NC terminal should be open. Do not connect anything.
(11) If the logic circuit power is off, do not apply the input signals.
(12) Since LCM has been assembled and adjusted with a high degree of precision, avoid applying excessive shocks to the module or making any alterations or modifications to it.
- Do not alter, modify or change the shape of the tab on the metal frame.
- Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.
- Do not damage or modify the pattern writing on the printed circuit board.
- Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal

connector.
- Except for soldering the interface, do not make any alterations or modifications with a soldering iron.
- Do not drop, bend or twist LCM.

Storage Precautions

When storing the LCD modules, the following precaution is necessary.
(1) Store them in a sealed polyethylene bag. If properly sealed, there is no need for the dessicant.
(2) Store them in a dark place. Do not expose to sunlight or fluorescent light, keep the temperature between 0°C and 35°C.
(3) The polarizer surface should not come in contact with any other objects. (We advise you to store them in the container in which they were shipped).

Others

Liquid crystals solidify under low temperature (below the storage temperature range) leading to defective orientation or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subject to a low temperature.
If the LCD modules have been operating for a long time showing the same display patterns, the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can be regained by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.
To minimize the performance degradation of the LCD modules resulting from destruction caused by static electricity etc., exercise care to avoid holding the following sections when handling the modules.
- Exposed area of the printed circuit board.
-Terminal electrode sections.