Osptek Display

TFT LCD SPECIFICATION

Model No:

YDP154BT003-V1

Revision Record

Rev No.	Date	Description
V.0	2022-07-06	First Release

CONTENTS

Revision Record

Contents

1.General Specifications

No.	Item	Specification	Unit	Remark
1	LCD Size	1.54	inch	-
2	Panel Type	IPS	-	-
3	Resolution	240 x RGB x 240	Pixel	-
4	Display Mode	Normally Black		-
5	Number of Colors	262K	-	-
6	Viewing Direction	All	-	Note1
7	NTSC	50%	-	Typ.
8	Contrast Ratio	800	-	
9	Luminance	250	cd/m2	Typ.
10	Module Size	37.95(H)x44.85(V)x3.17(D)	mm	Note1
11	Panel Active Area	27.72x27.7	mm	Note1
12	Pixel Pitch	0.1155X 0.1155	mm	-
13	Pixel Arrangement	RGB-stripe		-
14	Weight	TBD	g	-
15	Driver IC	ST7789T3	-	-
16	TP Driver IC	CST816D	bit	-
17	Light Source	3 white LEDs	-	-
18	Interface	SPI	-	-
19	Operating Temperature	-20~+70	℃	-
20	Storage Temperature	-30~+80	℃	-

Note 1: Please refer to the mechanical drawing；

2.Pin Assignments

Pin No.	Symbol	Function
1	LEDK	Backlight cathode
2	GND	Ground
3	FMARK	Synchronization
4	SDA	Serial data input pin/ouput pin in serial interface operation
5	SCLK	Serial input CLK
6	RS	Register select signal. 0:index register; 1:data register。
7	CS	Chip select pin
8	RESET	Chip reset signal
9	IOVCC(1.8V)	I/O Circuit Power Supply
10	VCC(2.8V)	Analog Power Supply for LCM（2.8V）
11	VCC(2.8V)	Analog Power Supply for LCM（2.8V）
12	GND	Ground
13	GND	Ground
14	LEDA	Backlight anode
15	LEDA	Backlight anode

TP PINS

1	VCC	Analog Power Supply for LCM
2	SCL	Serial input CLK
3	SDA	Serial data input pin/ouput pin in serial interface operation
4	INT	The signal interrupts
5	RST	Chip reset signal
6	GND	Ground

3. Electrical Specification

3.1Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Supply Voltage	VDD	- 0.3 ~ +4.6	V
Supply Voltage (Logic)	VDDI	- 0.3 ~ +4.6	V
Driver Supply Voltage	VGH-VGL	-0.3 ~ +30.0	V

3.2 Typical Operation Conditions

Parameter	Symbol	Condition	Specification			Unit	Related Pins
			MIN.	TYP.	MAX.		
Power & Operation Voltage							
System Voltage	VDD	Operating voltage	2.4	2.75	3.3	V	
Interface Operation Voltage	VDDI	I/O Supply Voltage	1.65	1.8	3.3	V	
Gate Driver High Voltage	VGH		12.2		14.97	V	Note 4
Gate Driver Low Voltage	VGL		-12.5		-7.16	V	
Gate Driver Supply Voltage		| VGH-VGL |	19.36		27.47	V	Note 5
Input / Output							
Logic-High Input Voltage	VIH		0.7VDDI		VDDI	V	Note 1
Logic-Low Input Voltage	VIL		VSS		0.3VDDI	V	Note 1
Logic-High Output Voltage	VOH	IOH = -1.0mA	0.8VDDI		VDDI	V	Note 1
Logic-Low Output Voltage	VOL	IOL = +1.0mA	VSS		0.2VDDI	V	Note 1
Logic-High Input Current	IIH	VIN = VDDI			1	uA	Note 1
Logic-Low Input Current	IIL	VIN = VSS	-1			uA	Note 1
Input Leakage Current	IIL	IOH = -1.0mA	-0.1		+0.1	uA	Note 1
VCOM Voltage							
VCOM amplitude	VCOM			VSS		V	
Source Driver							
Source Output Range	Vsout		VAN		VAP	V	
Gamma Reference Voltage(Positive)	VAP		4.45		6.4	V	Note 6
Gamma Reference Voltage(Negative)	VAN		-4.6		-2.65	V	
Source Output Settling Time	Tr	Below with 99% precision			20	us	Note 2
Output Offset Voltage	VOFFSET				35	mV	Note 3

3.3 Backlight Circuit Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit
LED Current	I_B		60	-	mA
LED Voltage	Vf		3.2		V
Power Consumption	P_{BL}	-		-	mW

3.4 LCD Current Consumption

Item	Symbol	Typ.	Max.	Unit
Full Mode	VCI	-	-	mA
Test Condition：VCI=2.8V，IOVCC=2.8V； Interface Driver type ： Row flip or column flip； TN Type=>All Black Pattern. IPS Type=>All White Pattern. Temperature：25℃.				
Sleep Mode	VCI	-	-	uA
Test Condition：VCI=2.8V，IOVCC=2.8V； DC/DC converter is enabled. Internal oscillator is started and panel scanning is started. Temperature：25℃.				

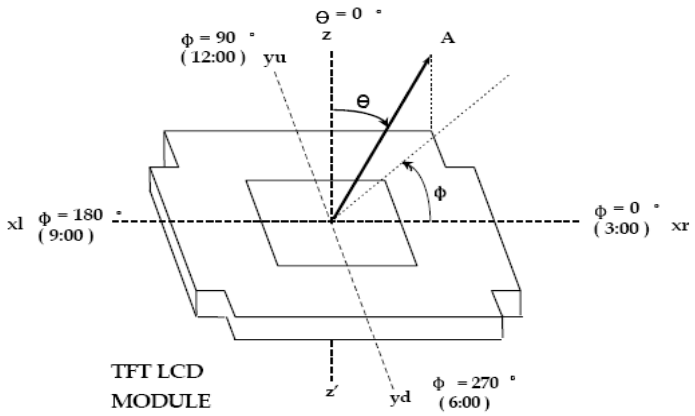
4.Optical Specification

4.1 LCM Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Viewing Angle Range	Left	θ_L	CR≧10	-	80	-	degree
	Right	θ_R		-	80	-	
	Top	θ_T		-	80	-	
	Bottom	θ_B		-	80	-	
Response Time		Ton+Toff	θ=Φ=0°	-	30		ms
Contrast Ratio		CR	θ=Φ=0°		800	-	-
Luminance		L	θ=Φ=0°	-		-	cd/m^2
Color Chromaticity (CIE1931)	White	W_x	Normal θ=Φ=0°	-0.02	0.308	+0.02	-
		W_y			0.327		
	Red	R_x			0.610		
		R_y			0.329		
	Green	G_x			0.299		
		G_y			0.567		
	Blue	B_x			0.143		
		B_y			0.111		
Uniformity		U_L	θ=Φ=0°	80	-	-	%
Flicker		-	-	No Visible			-

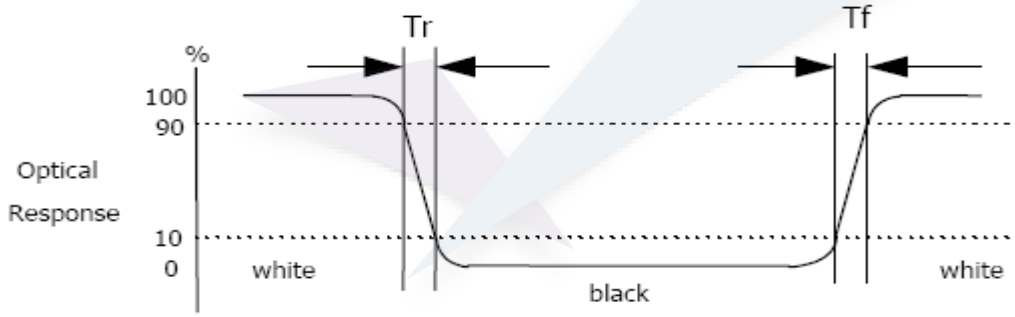
4.2 Measurement system

4.2.1 LCM Viewing Angle



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.

4.2.2 Response time



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.

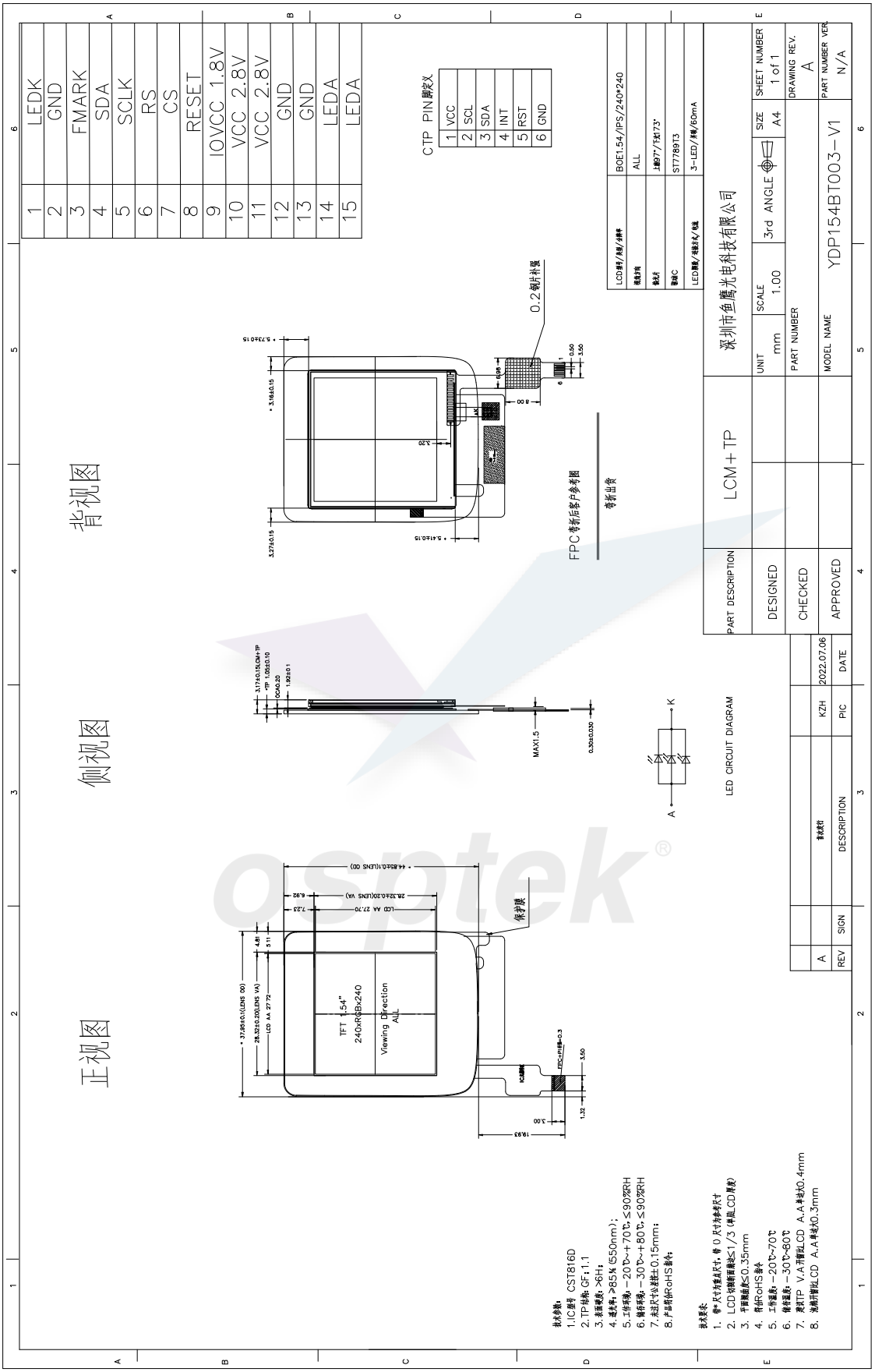
4.2.3 Contrast Ratio (CR)

Contrast Ratio (CR) is defined mathematically as:

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

Surface luminance is the center point across the LCD surface 500mm from the surface with all pixels displaying white.

5. Mechanical Drawing



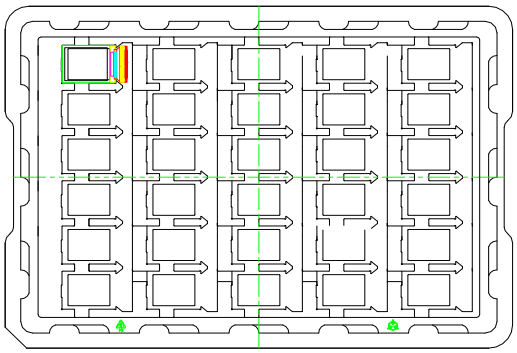
6. Reliability Test Items

Test Item	Test Condition	Test result determinant gist
High temperature storage	80±3℃，24H；	Inspection after 2~4hours storage at room temperature, the sample shall be free from defects: 1.Air bubble in the LCD; 2.Non-display; 3.Glass crack; 4.The electrical characteristics requirements shall be satisfied.
Low temperature storage	-30±3℃，24H；	
High temperature operation	70±3℃，24H；	
Low temperature operation	-20±3℃，24H；	
High temperature /humidity	60℃±3℃,90%±3%RH，24H；	
Thermal Shock	-30℃/0.5h~+80℃/0.5h for a total 24 cycles；	
Vibration Test	Frequency 10Hz~55Hz~10Hz Amplitude：1.5mm, X，Y，Z direction for total 1H；(Packing condition)	
ESD test	±2KV, Human Body Mode, 150pF/330Ω； ±8KV, Air Mode, 150pF/330Ω；	

7. Packing and Storage Specification(Reference Only)

7.1 Packing Method

(1)



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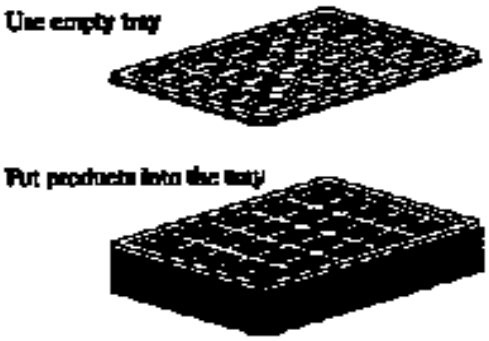

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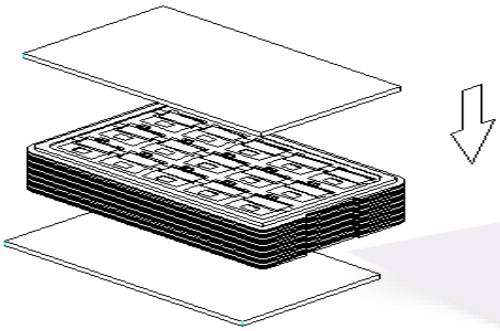

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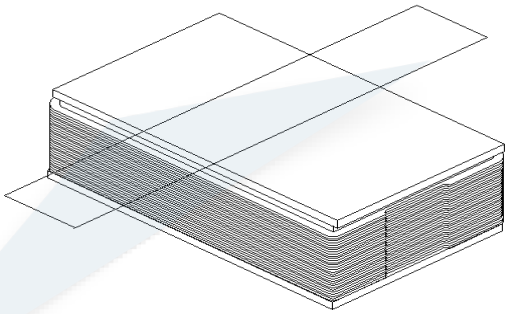

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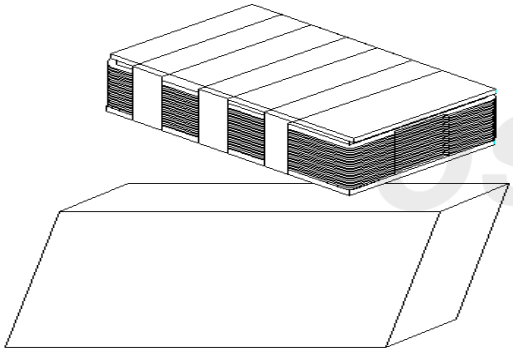

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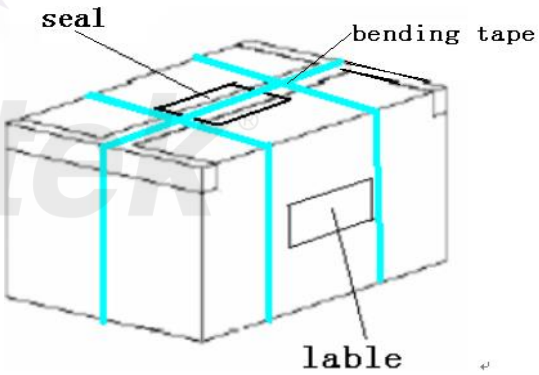

1. Put module into tray cavity. .
2. Tray stacking. .
3. Put 1 foam under the tray stack and 1 foam above. .
4. Fix the cardboard to the tray stack with adhesive tape. .
5. Put the tray stack into carton. .
6. Carton sealing with adhesive tape. .

7.2 Storage Method

1. Store in an ambient temperature of 23°C±5°C, and in a relative humidity of 55%±15%. Don't exceed 12 months and expose to sunlight or fluorescent light.
2. Store in a clean environment, free from dust, active gas, and solvent.
3. Store in antistatic container.

8. Announcements

1. Do not attempt to disassemble or process the LCD module.
2. Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached。
3. Except for soldering the interface, do not make any alterations or modifications with a soldering iron; Ensure welding temperature at 320 ° C to 350 ° C, the welding time control within the 10 s, welding note don't stay too long in the same place to avoid scald FPC.
4. Other matters in not clear before use, please contact our staff to guide.