DisplayModule

DM-TFT50-404

5.0" IPS 800x480 DISPLAY PANEL WITH CAPACITIVE TOUCH –RGB

Contents

1 Revision History

Date	Changes
2020-05-21	First release

2 Main Features

Item	Specification	Unit
Size	5.0	inch
Display mode	Transmissive /Normally Black	-
Driver element	TFT active matrix	-
Pixel arrangement	RGB vertical stripe	-
Viewing angle	ALL	o'clock
Display Colors	16.7M	Colors
Resolution	800 x 480	pixel
Controller IC	ST7262	-
LCD Interface	16/18/24 BIT RGB	-
CTP Driver IC	GT911	-
Active Area	108.0(H) x 64.80(V)	mm
Panel Dimension	120.70 x 75.90 x 4.38	mm
Pixel Pitch	0.135(H) x 0.135(V)	mm
LCM And CTP Bonding Technology	Tape Bonding	-
Weight	TBD	g

3 Pin Description

3.1 Panel Pin Description

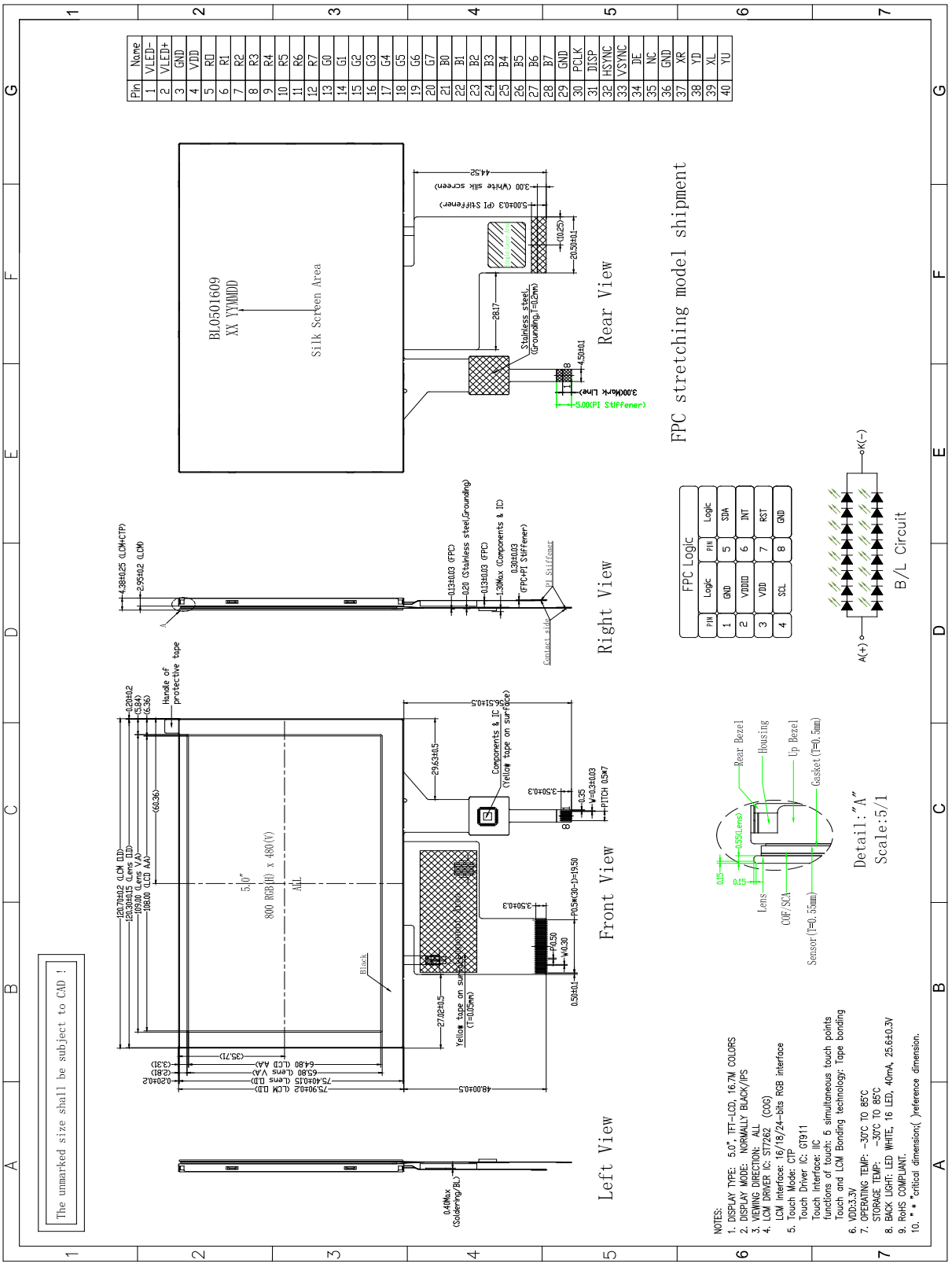
Pin No.	Symbol	Function Description
1	LED-	Cathode pin of backlight.
2	LED+	Anode pin of backlight.
3	GND	Ground
4	VDD	Power supply for digital circuits
5-12	R0-R7	8 bit data bus display red data.
13-20	G0-G7	8 bit data bus display green data.
21-28	B0-B7	8 bit data bus display blue data.
29	GND	Ground
30	PCLK	Pixel clock input pin.
31	DISP	DISP sets the display mode. DISP: L = Standby mode; H = Normal display mode
32	HSYNC	Horizontal sync signal input PIN.
33	VSYNC	Vertical sync signal input PIN.
34	DE	Data input enable applied to the RGB interface. Display access is enabled when DE is “H”.
35	NC	-
36	GND	Ground
37	XR(NC)	Touch panel Right Glass Terminal
38	YD(NC)	Touch panel Bottom Film Terminal
39	XL(NC)	Touch panel Left Glass Terminal
40	YU(NC)	Touch panel Top Film Terminal

3.2 Panel Pin Description

Pin No.	Symbol	Function Description
1	GND	Ground.
2	VDDIO	Supply voltage for I/O.
3	VDD	Supply voltage.
4	SCL	I2C clock input.
5	SDA	I2C data input and output
6	INT	External interrupt to the host.
7	RST	External Reset, Low is active.
8	GND	Ground.

4 Mechanical Drawing

4.1 Panel Mechanical Drawing



5 Electrical Characteristics

Parameter	Symbol	Min	Max	Unit	Remark
Digital Supply Voltage	VDD	-0.3	4.0	V	Note(1)
Operating temperature	TOP	-30	+85	℃	-
Storage temperature	TST	-30	+85	℃	-

Note (1): If the absolute maximum rating of even is one of the above parameters is exceeded even momentarily, the quality of the product may be degraded. Absolute maximum ratings, therefore, specify the values exceeding which the product may be physically damaged. Be sure to use the product within the range of the absolute maximum ratings.

6 Optical Characteristics

Item		Symbol	Min	Typ	Max	Unit	Remark
View Angles	Hor.	ΘL	90	80	-	-	-
		ΘR	95		-	-	-
	Ver.	ΘU	75		-	-	-
		ΘD	65		-	-	-
C.I.E. (White)		(x)	0.2731	0.3131	0.3531	-	CA-310 Test
		(y)	0.3059	0.3459	0.3859	-	
C.I.E(Red)		(x)	0.5478	0.5878	0.6278	-	
		(y)	0.3154	0.3554	0.3954	-	
C.I.E(Green)		(x)	0.3162	0.3562	0.3962	-	
		(y)	0.5194	0.5594	0.5994	-	
C.I.E(Blue)		(x)	0.1121	0.1521	0.1921	-	
		(y)	0.0705	0.1105	0.1505	-	
Contrast Ratio		CR	800	1000	-	-	Θ=0 Normal viewing angle
Response time		TR+TF	-	30	40	msec	
Uniformity		S(%)	45	50	-	%	-
Option View Direction		ALL					-

Note: Normal Mode test conditions are as follows:

-Measuring surrounding：dark room

-Ambient temperature：25±2℃

-15min. warm-up time.

7 DC Characteristics

Item	Symbol	Min	Typ.	Max	Unit
Digital Supply Voltage	VDD	3.3	-	3.6	V
Normal mode Current consumption	IDD	-	30	-	mA
Low Level Input Voltage	VIL	GND		0.3 VDD	V
High Level Input Voltage	VIH	0.7VDD		VDD	V
Low Level Output Voltage	VOL	GND		GND+0.4	V
High Level Output Voltage	VOH	VDD-0.4		-	V

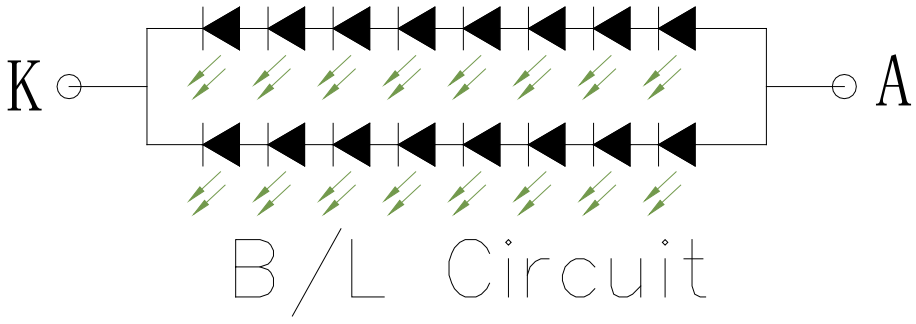
8 LED Backlight Characteristics

The back-light system is edge-lighting type with 16 chips LED

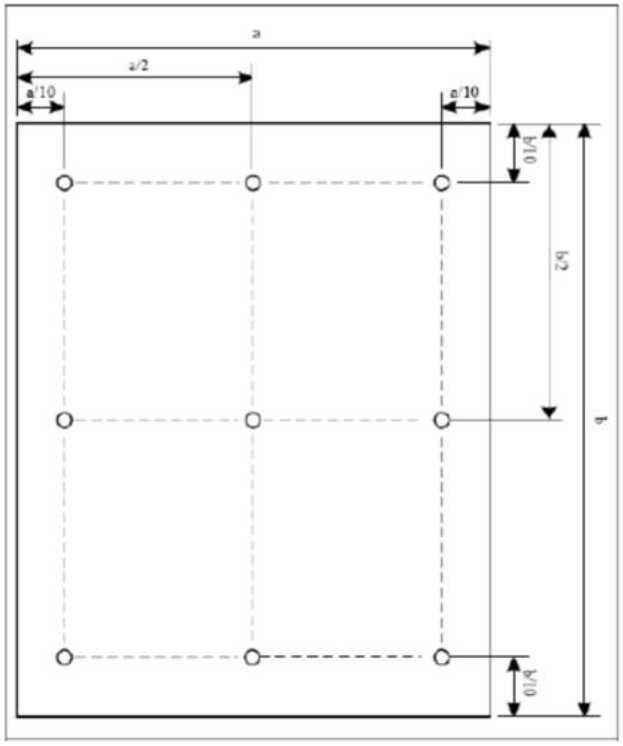
Parameter	Symbol	Min	Typ	Max	Unit	Remark
Forward voltage	V_F	-	25.6	-	V	
Forward current	I_F	30	40	-	mA	
LCM Luminance	L_V	530	580	-	cd/m^2	Note3
LED life time	Hr	-	50000	-	Hour	Note1,2
Uniformity	Avg	80	-	-	%	Note3

Note1: LED life time (Hr) can be defined as the time in which it continues to operate under the condition: Ta=25±3 ℃, typical IL value indicated in the above table until the brightness becomes less than 50%.

Note2:The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25℃ and IL=40mA. The LED lifetime could be decreased if operating IL is larger than 40mA. The constant current driving method is suggested..



Note3: Luminance Uniformity of these 9 points is defined as below:



$$\text{uniformity} = \frac{\text{minimum luminance in 9 points(1-9)}}{\text{maximum luminance in 9 points(1-9)}}$$

$$\text{Luminance} = \frac{\text{Total Luminance of 9 points}}{9}$$

9 CTP Specification

9.1 Electrical Characteristics

Item	Symbol	Min	Max	Unit
Power Supply Voltage	VDD	2.66	3.47	V
Operating temperature	TOP	-20	+70	℃
Storage temperature	TST	-30	+80	℃

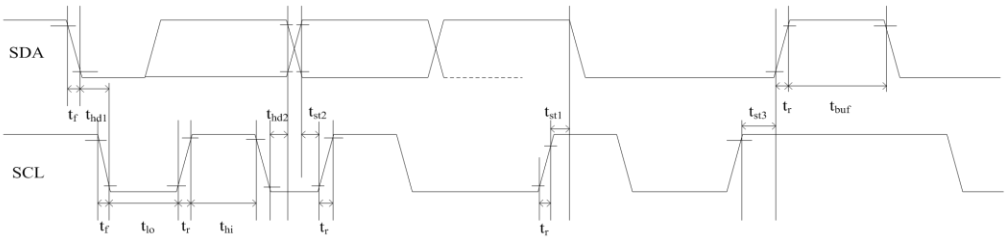
9.2 AC Characteristics

Item	Condition	Min	Typ	Max	Unit
OSC clock	AVDD=2.8V;Ta=25° C	59	60	61	MHz

AC characteristics of Oscillators

I2C interface:

GT911 provides a standard I2C interface for SCL and SDA to communicate with the host. GT911 always serves as slave device in the system with all communication being initialized by the host. It is strongly recommended that transmission rate be kept at or below 400Kbps. The I2C timing is shown below:



Test condition 1: 1.8V host interface voltage, 400Kbps transmission rate, 2K pull-up resistor

Parameter	Symbol	Min.	Max.	Unit
SCL low period	t_{lo}	1.3	-	us
SCL high period	t_{hi}	0.6	-	us
SCL setup time for Start condition	t_{st1}	0.6	-	us
SCL setup time for Stop condition	t_{st3}	0.6	-	us
SCL hold time for Start condition	t_{hd1}	0.6	-	us
SDA setup time	t_{st2}	0.1	-	us
SDA hold time	t_{hd2}	0	-	us

Test condition 2: 3.3V host interface voltage, 400Kbps transmission rate, 2K pull-up resistor

Parameter	Symbol	Min.	Max.	Unit
SCL low period	t_{lo}	1.3	-	us
SCL high period	t_{hi}	0.6	-	us
SCL setup time for Start condition	t_{st1}	0.6	-	us
SCL setup time for Stop condition	t_{st3}	0.6	-	us
SCL hold time for Start condition	t_{hd1}	0.6	-	us
SDA setup time	t_{st2}	0.1	-	us
SDA hold time	t_{hd2}	0	-	us

10 Reliability

Test Item	Content of Test	Inspection after test
High Temperature Operating	85℃,96HR	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. Missing segments/line; 4. Glass crack; 5. Current IDD is twice higher than initial value.
Low Temperature Operating	-30℃, 96HR	
High Temperature Storage	85℃, 96HR	
Low Temperature Storage	30℃, 96HR	
High Temperature & High Humidity Operating	+60℃, 90% RH ,96 hours.	
Thermal Shock (Non-operation)	-30℃,30 min ↔ 85℃,30 min, Change time:5min 20CYC.	
ESD test	C=150pF, R=330,5points/panel Air:±8KV, 5times; Contact:±6KV, 5 times; (Environment: 15℃~35℃, 30%~60%).	
Vibration (Non-operation)	Frequency range:10~55Hz, Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X.Y.Z. (6 hours for total) (Package condition).	
Box Drop Test	1 Corner 3 Edges 6 faces,80㎝(MEDIUM BOX)	

Remark:
1. The test samples should be applied to only one test item.
2. Sample size for each test item is 5~10pcs.
3. For Damp Proof Test, Pure water(Resistance＞10MΩ) should be used.
4. In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part.
5. Failure Judgment Criterion: Basic Specification, Electrical Characteristic, Mechanical Characteristic, OpticalCharacteristic.

11 Warranty and Conditions

http://www.displaymodule.com/pages/faq