



Description	5" TFT LCD Module with Touch Panel
Model Name	TY500TFT800480 Rev01
Product Revision	01
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Doc. Revision	01

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1. Summary

This specification applies to 5" TFT LCD module with a LED backlight unit, a touch panel, and 40-pin TTL interface. This module supports 800*RGB*480 WVGA mode and displays up to 16 million colors.

2. Features

- a. Thin and light weight. The thickness measures 4.75 mm of weight 88g only.
- b. WVGA (800x480 pixels) resolution.
- c. 3.3V TTL interface

3. General Specifications

Parameter	Specifications	Unit	
Screen Size	5" (Diagonal)	inch	
Display format	800* RGB * 480	dot	
Active area	108(H) x 64.8(V)	mm	
Pixel size	135 x 135	μm	
Surface treatment	Touch Panel (TP), 10% haze		
Pixel Configuration	RGB - stripe		
Outline dimension	118.5(H) x 77.55(V) x 4.75(T) with TP	mm	
Weight	88	g	
View angle direction	6 O'Clock		
Temperature	Operation	-20 - 70	°C
	Storage	-30 - 80	°C

4. Absolute Maximum Ratings (GND = 0V)

Item	Symbol	Condition	Min	Max	Unit	Remark	
Power Voltage	V _{cc}	GND = 0	-0.3	7	V	Note 1	
Input logic voltage	High level	V _{IH}	GND = 0	0.7V _{cc}	V _{cc}	V	
	Low level	V _{IL}	GND = 0	0	0.3V _{cc}	V	

Note 1: Device subject to permanent damage if stresses applied beyond those absolute maximum ratings above.

5. Electrical Characteristics

5.1 Recommended Operation Condition (GND = 0V, Ta = 25°C)

Parameter	Symbol	Rating			Unit	Condition
		Min.	Typ.	Max.		
Power Supply Voltage	V _{CC}	2.7	3.3	3.6	V	
Operating Current	I _{DD}	-	110	-	mA	
Frame Frequency	f _{Frame}	-	60	-	Hz	
Dot Data Clock	DCLK	-	33.26	-	MHz	
Power Consumption	PLCD	-	363	-	mW	

5.2 LED Driving Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Power Consumption	P _{LED}		924	-	mW	
LED current	I _{LED}	-	40		mA	
LED voltage	V _{LED}	-	23.1	-	V	

6. AC Characteristics

6.1 AC Timing Characteristics

- Sync Mode

Parameter		Symbol	Rating			Unit	Note
			Min.	Typ.	Max.		
CLK	Frequency	F _{CPH}	-	33.26	-	MHz	
	Period	T _{CPH}	-	30.06	-	ns	
	Pulse duty	T _{CWH}	40	50	60	%	
HS	Period	T _H	-	1056	-	T _{CPH}	
	Pulse width	T _{WH}	1	128	-	T _{CPH}	
	First horizontal data time	T _{HS}	STHD[7:0]+88			T _{CPH}	1
	Active time	T _{HA}	-	800	-	T _{CPH}	
VS	Period	T _V	-	525	-	T _H	
	Pulse width	T _{wv}	1	2	-	T _H	
	DEN time	T _{VS}	STVD[7:0]+8			T _H	2
	Active time	T _{VA}	-	480	-	T _H	
VS falling to HS falling time		T _{HV}	-4	-	4	T _{CPH}	

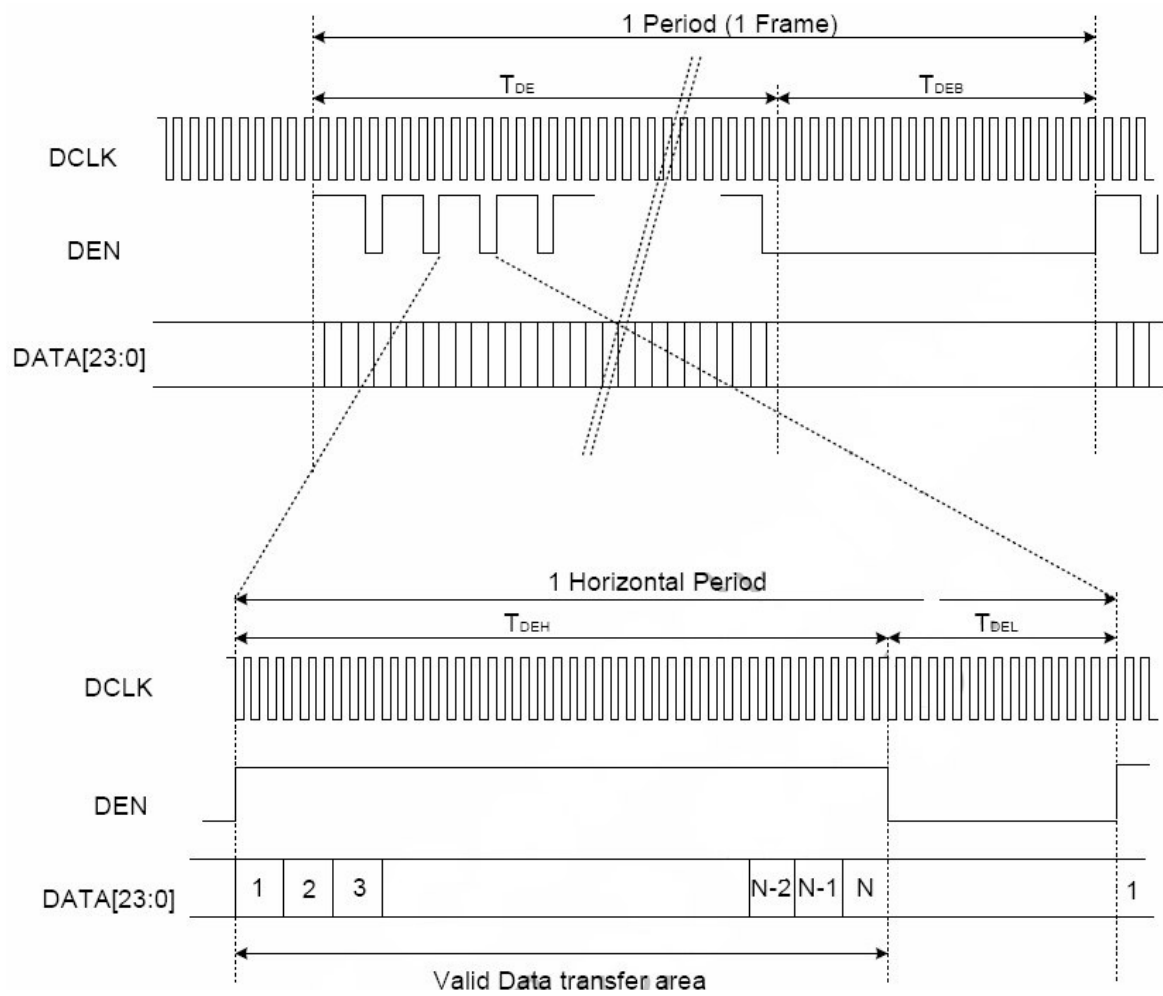
Note 1: T_{HS} + T_{HA} < T_H, STHD[7:0] default = 128

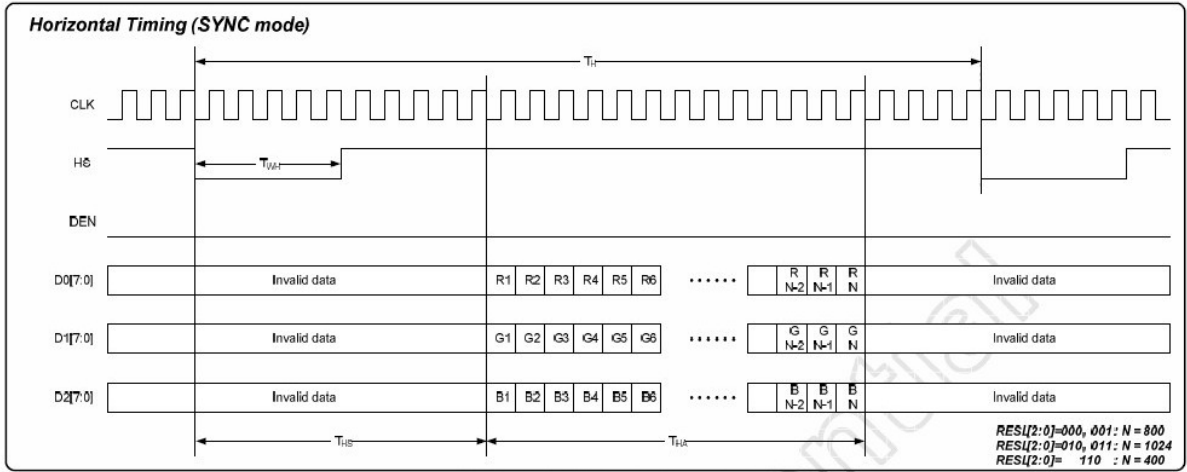
Note 2: STVD[7:0] default = 27

- DEN mode

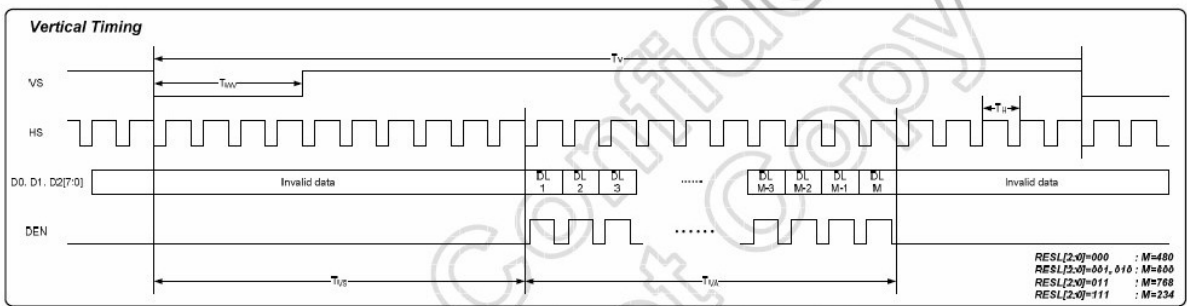
Parameter		Symbol	Rating			Unit
			Min.	Typ.	Max.	
CLK	Frequency	F _{CPH}	-	33.26	-	MHz
	Period	T _{CPH}	-	30.06	-	ns
	Pulse duty	T _{CWH}	40	50	60	%
HS	Period	T _{DEH} + T _{DEL}	1000	1056	1200	T _{CPH}
	Pulse width	T _{DH}	-	800	-	T _{CPH}
	Frame blanking	T _{HS}	10	45	110	T _{DEH} +T _{DEL}
	Frame width	T _{EP}	-	480	-	T _{DEH} +T _{DEL}

6.2 AC Timing Diagrams

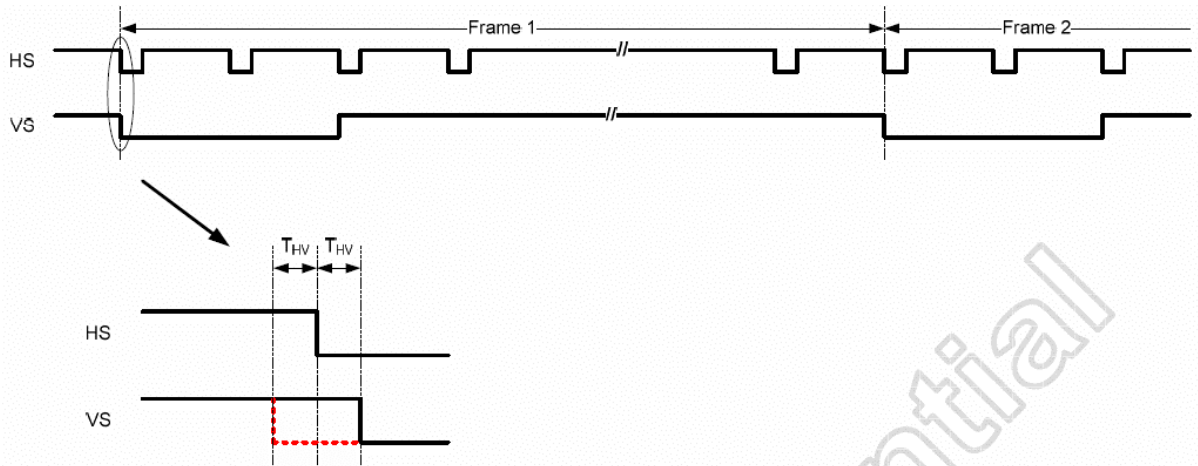


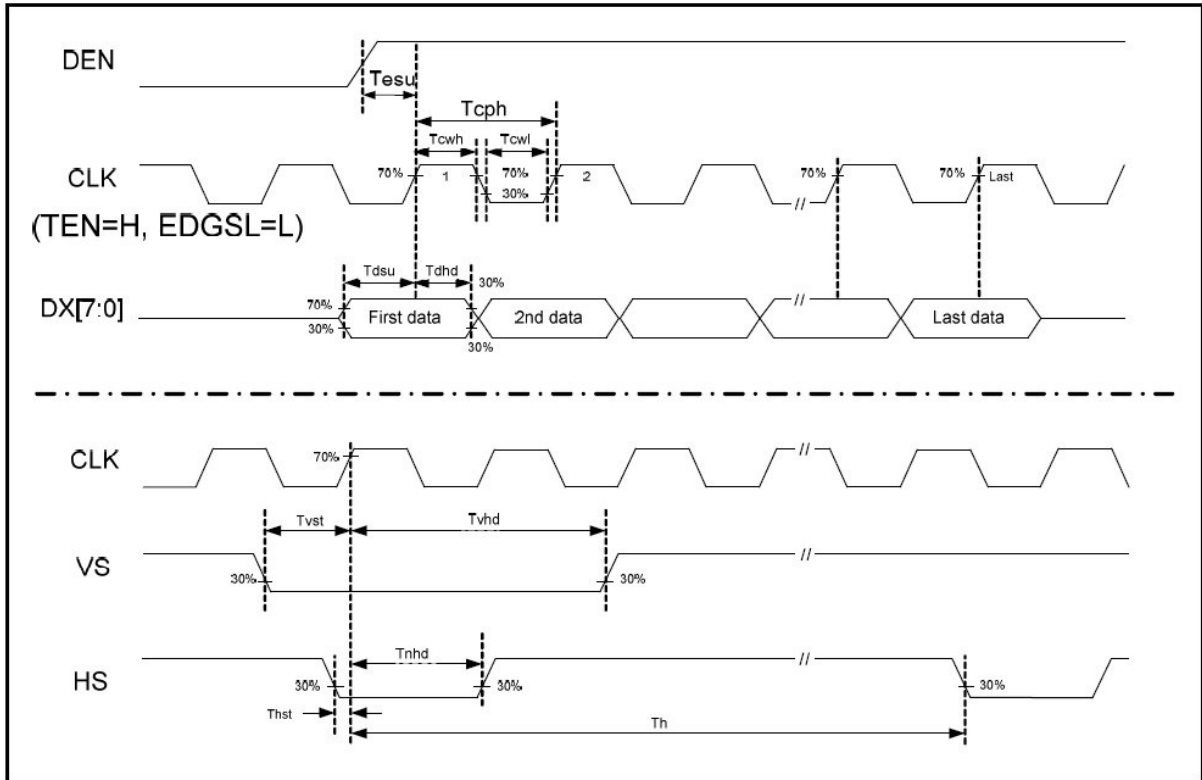


SYNC Mode Horizontal Data Format



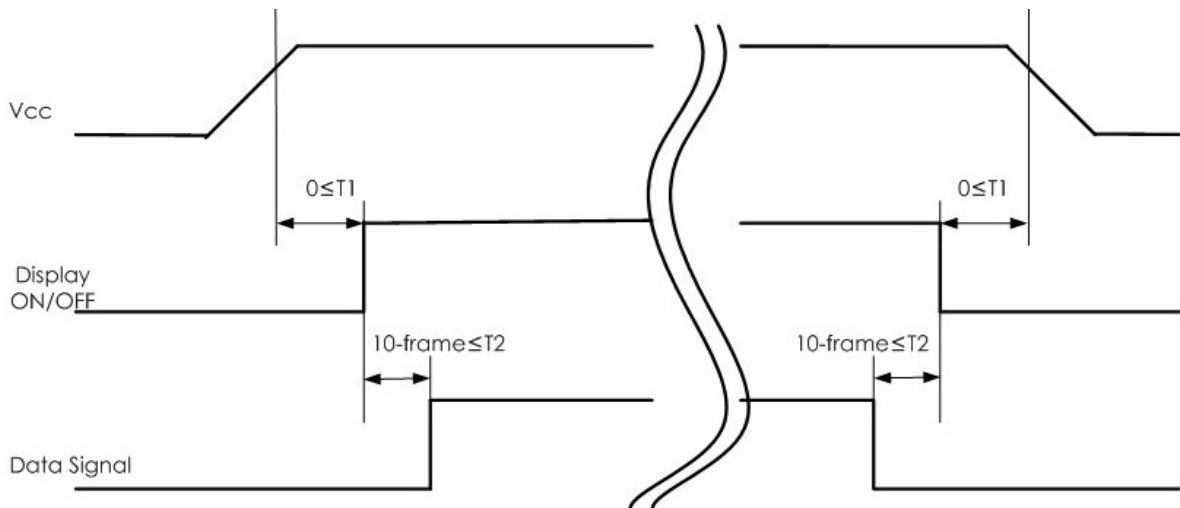
SYNC Mode Vertical Data Format





7. Power Sequence

The LCD panel power ON/OFF sequence is as below.

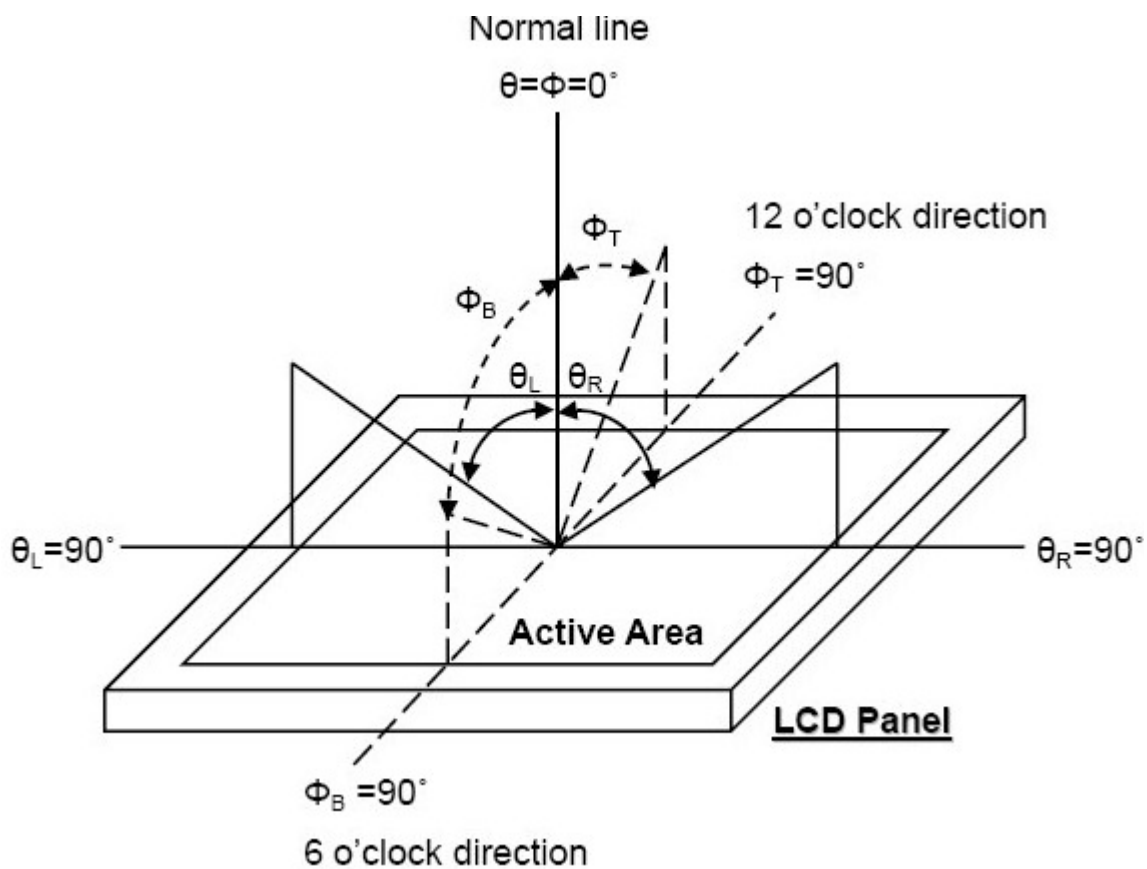


8. Optical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit	Note
Brightness			250	300	-	Cd/m ²	
Response time	TR	$\Theta = 0$	-	15	-	ms	
	TF		-	35	-	ms	
Contrast ratio	CR	At optimized viewing angle	360	400	-	-	
Color Chromaticity	White	Wx	0.26	0.31	0.36	-	
		Wy	0.28	0.33	0.38	-	
Viewing Angle	Hor	Θ_R	-	70	-	Deg	Note 1
		Θ_L	-	70	-		
	Ver	ϕ_H	-	60	-	Deg	
		ϕ_L	-	70	-		

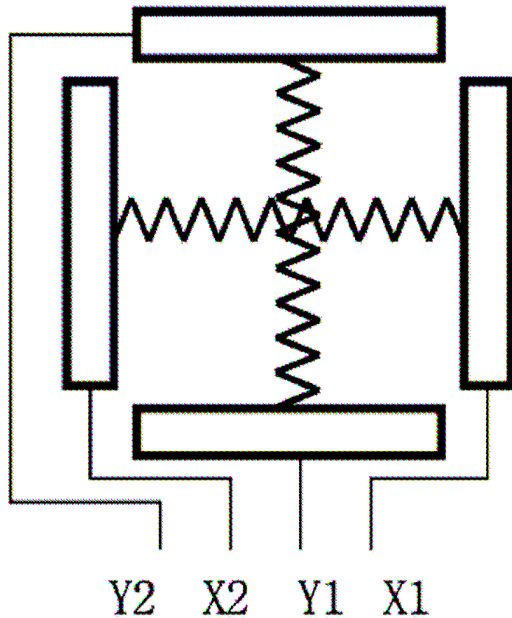
Ta=25±2°C, ILED=40mA

Note 1: Definition of viewing angle range



9. Touch Panel

9.1 Block Diagram



Top View

X : Upper electrode
Y : Lower electrode

PIN	Symbol	I/O	Function
1	X1	Right	Right electrode - differential analog
2	Y1	Bottom	Bottom electrode - differential analog
3	X2	Left	Left electrode - differential analog
4	Y2	Top	Top electrode - differential analog

9.2 Electrical Characteristics of the Touch Panel

Item	Min.	Typ.	Max.	Unit	Note
Linearity	-	-	1.5	%	
Terminal resistance	200	-	900	Ω	X (Film side)
	200	-	900	Ω	Y (Film side)
Insulation resistance	20	-	-	M Ω	At DC25V, 60sec
Voltage	-	-	5	V	DC
Chattering	-	-	10	ms	ON/OFF
Transparency	-	80	-	%	Non-glare
Haze rate	-	-	10	%	

Note: Avoid using the Touch Panel with a hard tip such as ball pens. A polyacetal pin of tip size R0.8mm \varnothing is recommended to operate the Touch Panel.

9.3 Mechanical characteristics

Item	Min.	Typ.	Max.	Unit	Note
Activation force	-	-	100	g	1
Durability-surface scratching	Write 100,000	-	-	characters	2
Durability-surface pitting	1,000,000	-	-	Touches	3
Surface hardness	3	-	-	H	

Note 1: Stylus pen input R0.8mmØ polyacetal pen or Finger

Note 2: Measurement for surface area

- scratch 100,000 times straight lines on the Film with a stylus change every 20,000 times.

- Force = 150g. Speed = 60mm/sec

- Stylus = R0.8mmØ polyacetal tip

Note 3: Pit 1,000,000 times on the Film with a R0.8mmØ silicon rubber

10. Interface

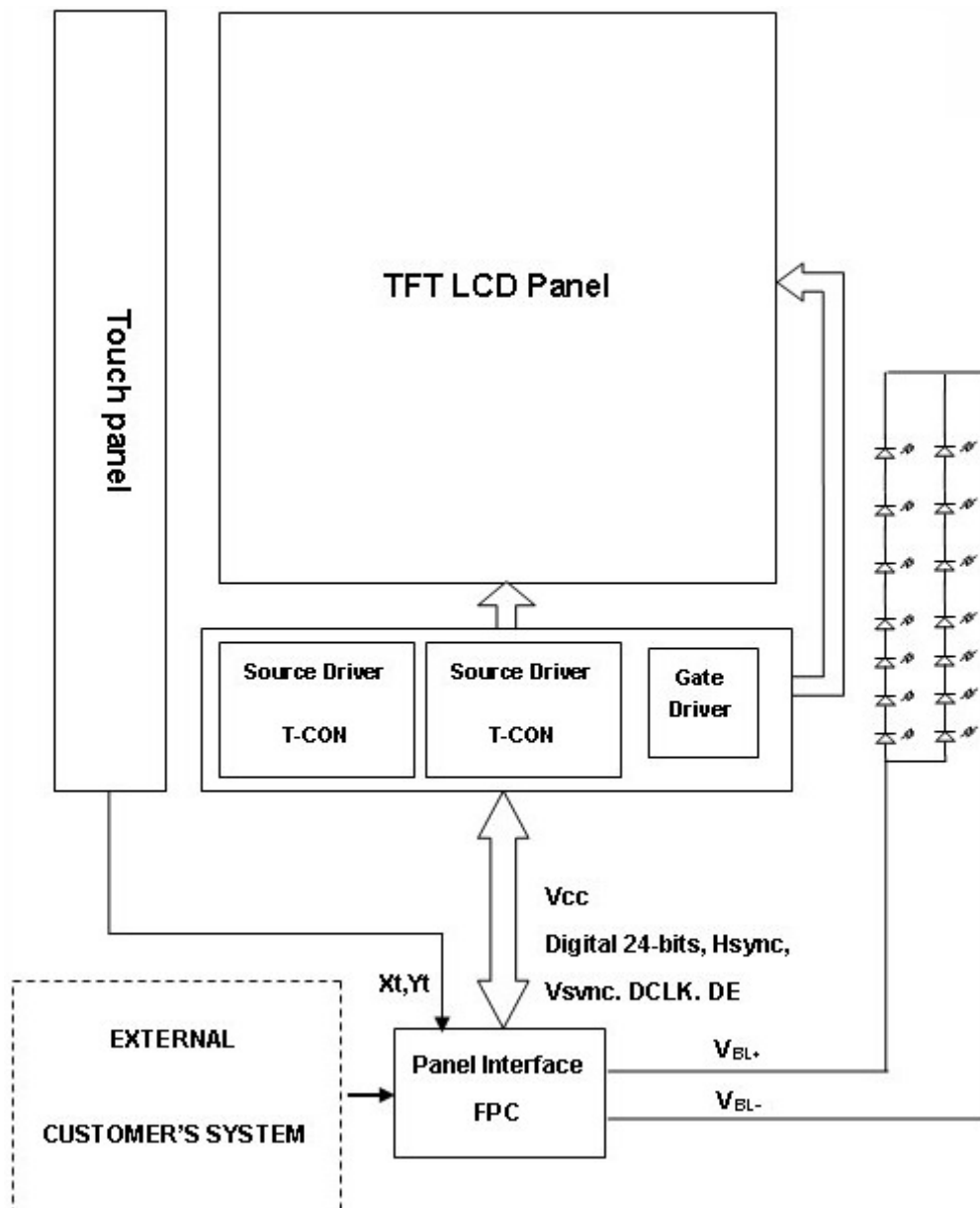
10.1 LCM PIN Definition

Pin No.	Symbol	Description	Remark
1	VLED-	LED GND	
2	VLED+	LED power	
3	DGND	Digital Ground	
4	V _{cc}	Power Supply for Digital Circuit (+3.3V)	
5	R0	Red Data 0	
6	R1	Red Data 1	
7	R2	Red Data 2	
8	R3	Red Data 3	
9	R4	Red Data 4	
10	R5	Red Data 5	
11	R6	Red Data 6	
12	R7	Red Data 7	
13	G0	Green Data 0	
14	G1	Green Data 1	
15	G2	Green Data 2	
16	G3	Green Data 3	
17	G4	Green Data 4	
18	G5	Green Data 5	
19	G6	Green Data 6	
20	G7	Green Data 7	
21	B0	Blue Data 0	
22	B1	Blue Data 1	
23	B2	Blue Data 2	
24	B3	Blue Data 3	
25	B4	Blue Data 4	
26	B5	Blue Data 5	
27	B6	Blue Data 6	
28	B7	Blue Data 7	
29	DGND	Digital Ground	
30	DCLK	Dot Data Clock	
31	DISP	Display On/Off	Note 2
32	Hsync	Horizontal Sync	
33	Vsync	Vertical Sync	
34	DE	Data Enable Control	Note 1
35	NC	Not connected	
36	DGND	Digital Ground	
37	X1	Right (TP)	
38	Y1	Bottom (TP)	
39	X2	Left (TP)	
40	Y2	Up (TP)	

Note 1: DE=H: data can be access, DE=L, data cannot be accessed

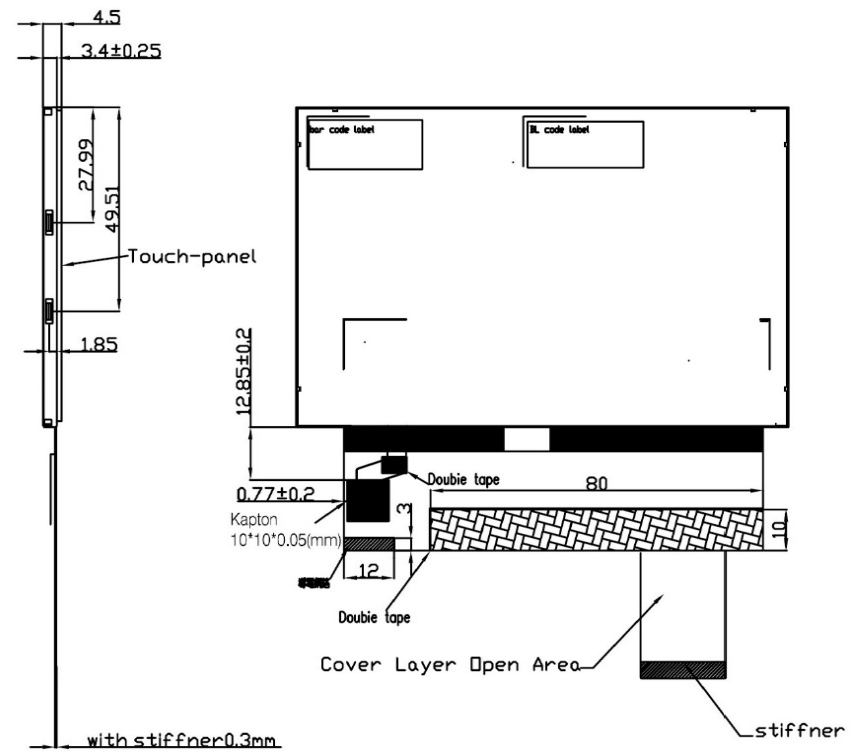
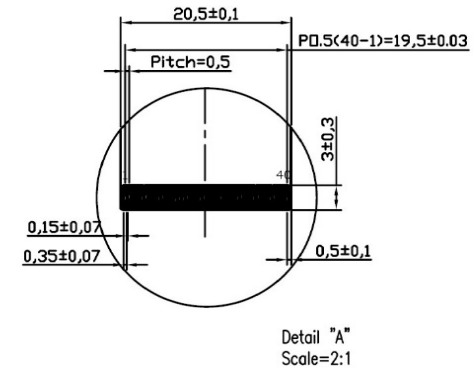
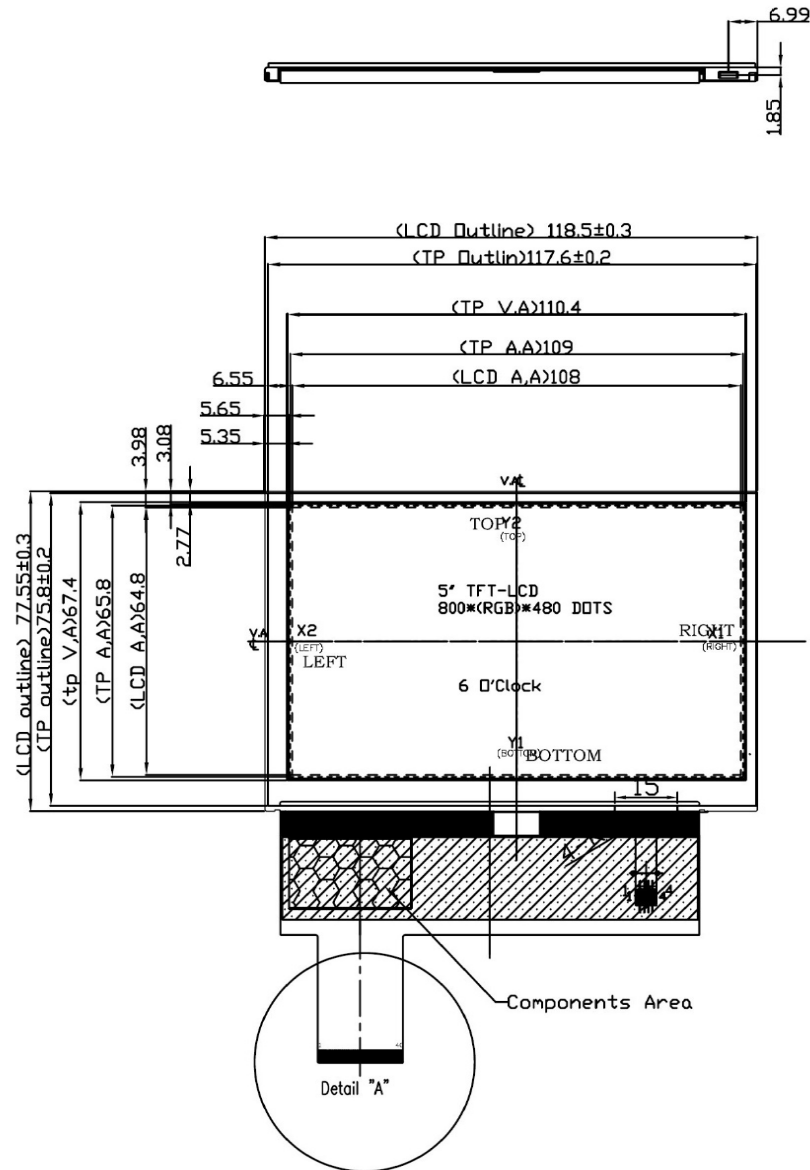
Note 2: Usually pull high

10.2 Block Diagram



11. Quality Assurance

No.	Test Items	Test Condition	Note
1	High Temperature Storage Test	Ta = 80°C Dry 240h	
2	Low Temperature Storage Test	Ta = -30°C Dry 240h	
3	High Temperature Operation Test	Ta = 70°C Dry 240h	
4	Low Temperature Operation Test	Ta = -20°C Dry 240h	
5	High Temperature and High Humidity Operation Test	Ta = 60°C 90%RH 240h	
6	Electro Static Discharge Test	Panel surface / top case Contact / Air: ±6KV/±8KV, 150pF, 330Ω	Non-operating
7	Shock Test (non-operating)	Shock level : 100G, 6ms Waveform: Half Sinusoidal Wave Number of shocks: 3 times for each ±X, ±Y, ±Z direction	
8	Vibration Test (non-operating)	Frequency Range: 10-55Hz Amplitude: 1.5mm Sweep time: 11 min Test period: 6 cycles for each direction of X, Y, Z	
9	Thermal Shock Test	-20°C (0.5Hr) - +70°C (0.5Hr) for 200 cycles	



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