



Description	7" TFT LCD Module with Touch Panel
Model Name	TY700TFT800480
Product Revision	02
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1. Summary

This specification applies to 7" 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 262,144 colors.

2. Features

- a. Thin and light weight. The thickness measures 7.35 mm of weight 222g only.
- b. WVGA (800x480 pixels) resolution.
- c. 3.3V TTL interface

3. General Specifications

Parameter		Specifications	Unit
Screen Size		7" (Diagonal)	inch
Display format		800* RGB * 480	dot
Active area		152.4 x 91.44	mm
Pixel size		190.5 x 190.5	μm
Surface treatment		Touch Panel (TP), 7% haze	
Pixel Configuration		RGB vertical stripe	
Outline dimension		165.8(W) x 105.2(H) x 7.35(D) with TP	mm
Weight		222	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	Vcc	GND = 0	-0.3	6	V	-
Input Logic Voltage	Vi	GND = 0	-0.3	Vcc + 0.3	V	Note 1

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}	3.0	3.3	3.6	V	
Input logic voltage	High level	V_{IH}	0.7V _{CC}	-	V _{CC}	V	Note 2
	Low level	V_{IL}	0	-	0.3V _{CC}		Note 2

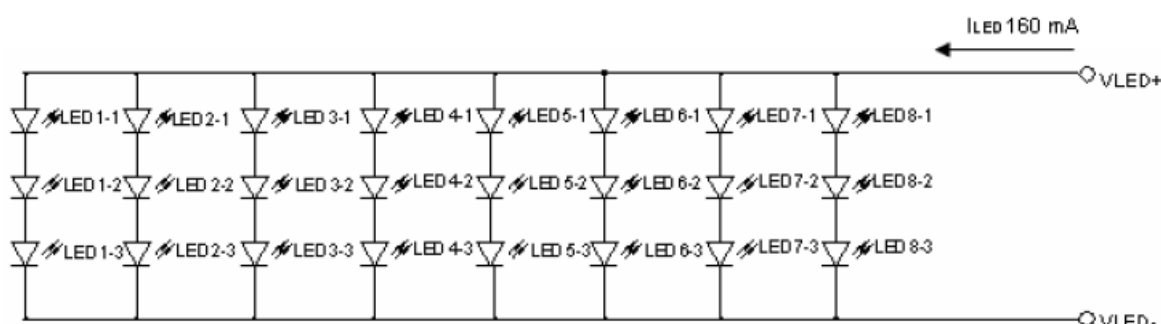
Note 2: DCLK, DE, R0-R5, G0-G5, B0-B5.

5.2 LED Driving Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current	I_{LED}	-	160	-	mA	Note 3
LED voltage	V_{LED}	-	9.9	-	V	
LED Life Time	-	10,000	20,000	-	Hour	Note 4

Note 3: There are 8 Groups LED as shown below, $V_{LED} = 9.9V$, $I_{LED} = 160mA$

Note 4: Brightness to be decreased to 50% of the initial value



5.3 TFT-LCD current consumption

Parameter	Symbol	Rating			Unit	Condition
		Min.	Typ.	Max.		
LCD power current	I_{CC}	-	200	260	mA	Black pattern
LED power current	I_{LED}	-	160	200	mA	

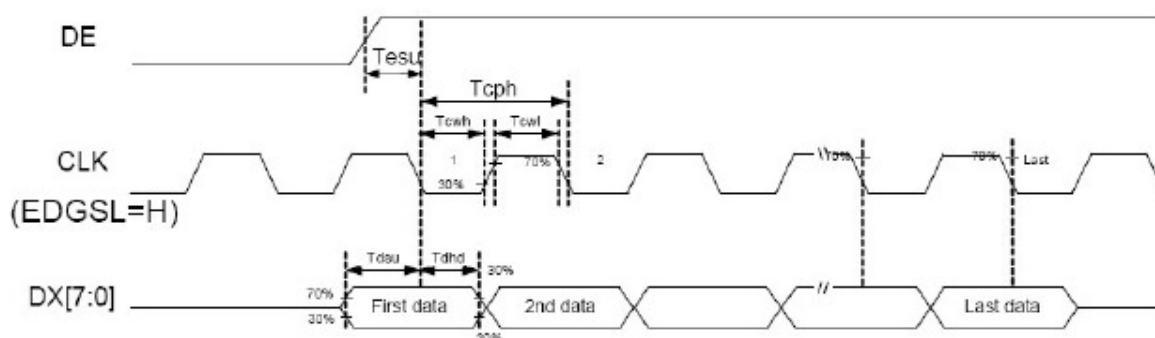
6. AC Characteristics

6.1 AC Electrical Characteristics

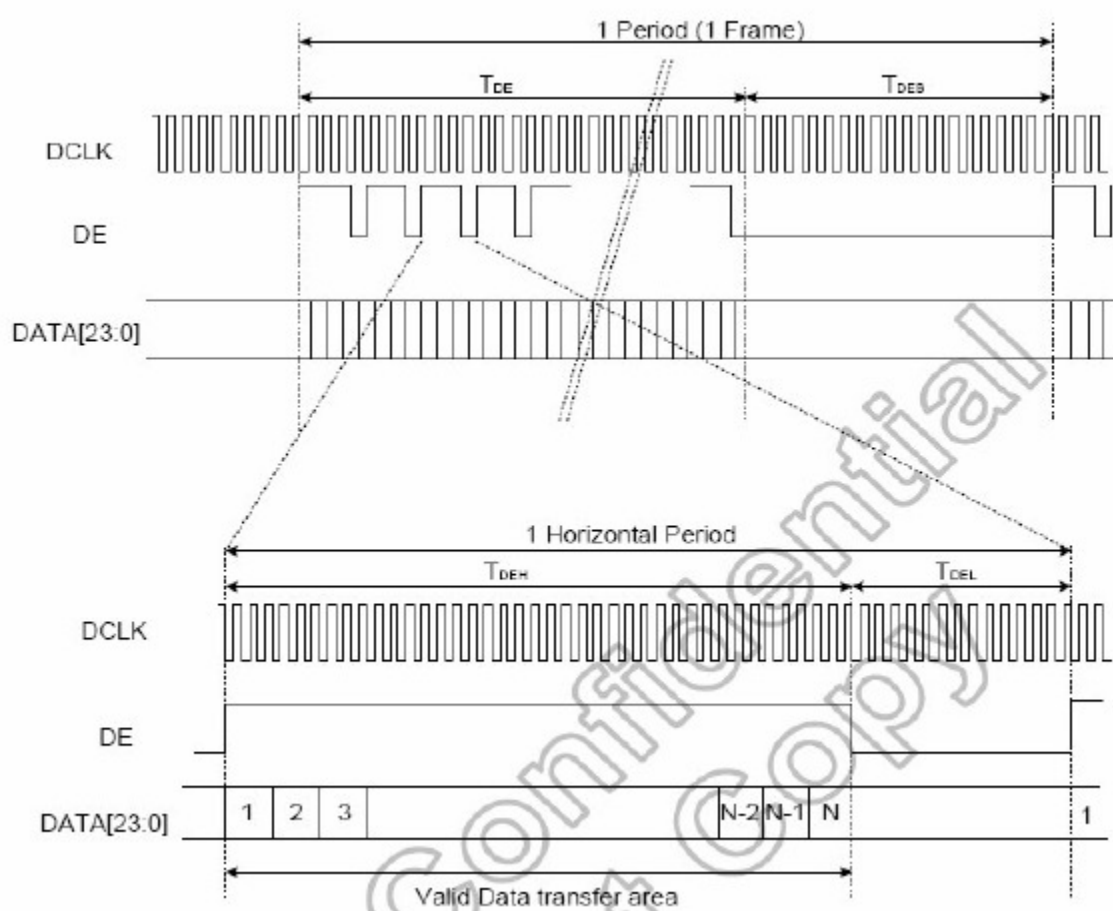
Parameter	Symbol	Rating			Unit
		Min.	Typ.	Max.	
Data setup time	T_{dsu}	6	-	-	ns
Data hold time	T_{dhd}	6	-	-	ns
DE setup time	T_{esu}	6	-	-	ns
CLK frequency	F_{CPH}	29.40	33.26	42.48	MHz
CLK period	T_{CPH}	23.50	30.06	34.01	ns
CLK pulse duty high	T_{CWH}	40	50	60	%
CLK pulse duty low	T_{CWL}	40	50	60	%
DE period	$T_{DEH} + T_{DEL}$	1000	1056	1200	T_{CPH}
DE pulse width	T_{DEH}	-	800	-	T_{CPH}
DE frame blanking	T_{DEB}	10	45	110	$T_{DEH} + T_{DEL}$
DE frame width	T_{DE}	-	480	-	$T_{DEH} + T_{DEL}$

6.2 Timing Chart

Clock and data input waveforms

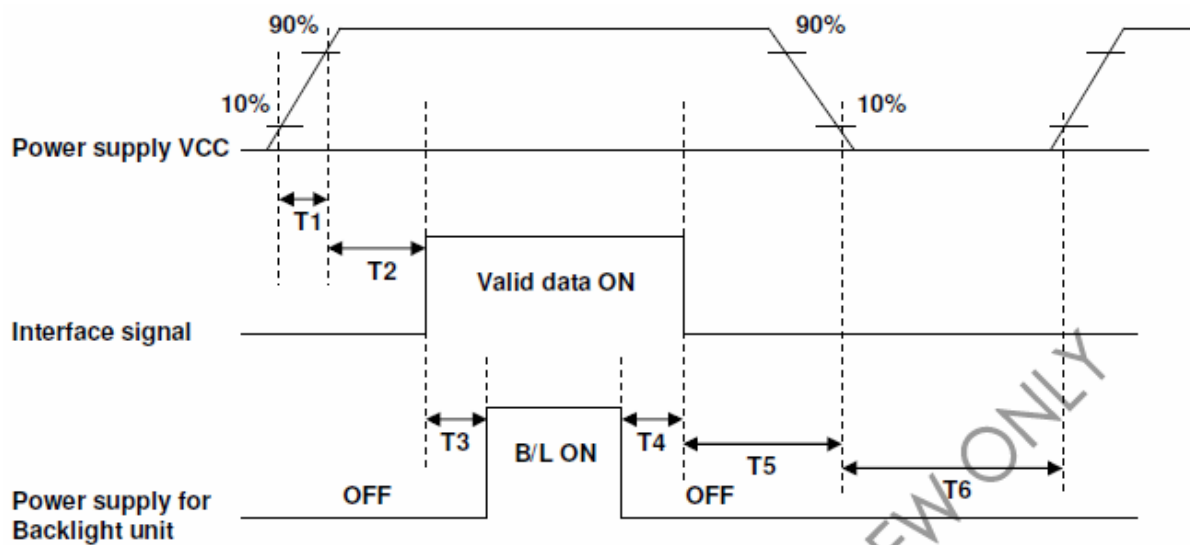


6.3 Data input format



7. Power ON/OFF Sequence

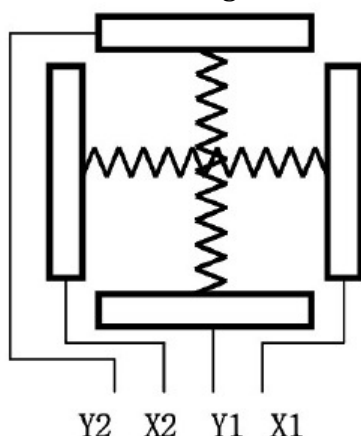
The LCD panel power ON/OFF sequence specified below.



Parameter	Min.	Typ.	Max.	Unit
T1	1		2	ms
T2	0	60		ms
T3	200			ms
T4	200			ms
T5	1			ms
T6	1000			ms

8. Touch Panel

8.1 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

8.2 Electrical Characteristics of the Touch Panel

Item	Min.	Typ.	Max.	Unit	Note
Linearity	-	-	1.5	%	
Terminal resistance	500	-	1100	Ω	X (Film side)
	100	-	500	Ω	Y (Film side)
Insulation resistance	20	-	-	M Ω	At DC25V, 60sec
Voltage	-	-	5	V	DC
Chattering	-	-	10	ms	ON/OFF
Transparency	84	-	-	%	Non-glare
Haze rate	5	7	9	%	

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.

8.3 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

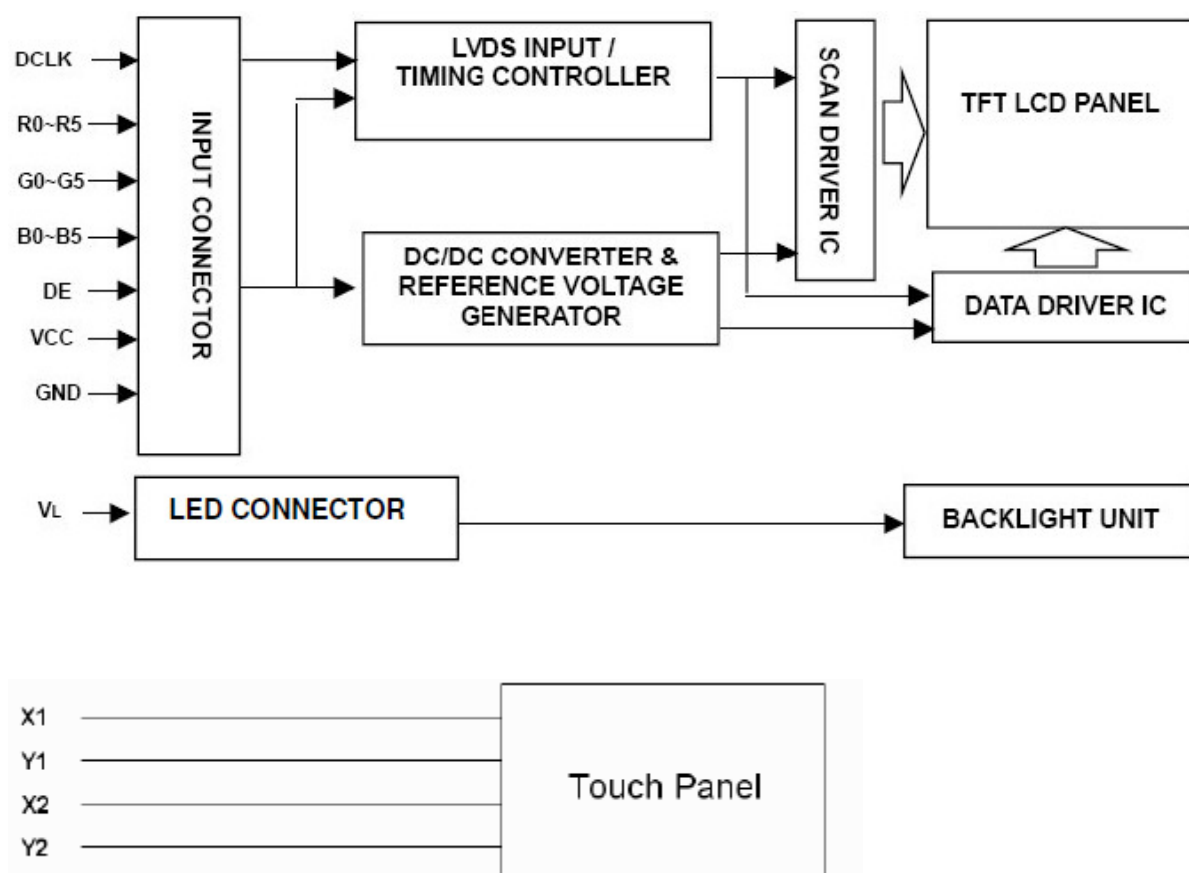
9. Interface

9.1 LCM PIN Definition

Pin No.	Symbol	Description	Remark
1	GND	Power Ground	
2	GND	Power Ground	
3	NC	Not Connect	
4	V _{cc}	Power Supply for Digital Circuit	
5	V _{cc}	Power Supply for Digital Circuit	
6	V _{cc}	Power Supply for Digital Circuit	
7	V _{cc}	Power Supply for Digital Circuit	
8	NC	Not Connect	
9	DE	Data Enable	
10	GND	Power Ground	
11	GND	Power Ground	
12	GND	Power Ground	
13	B5	Blue Data 5 (MSB)	
14	B4	Blue Data 4	
15	B3	Blue Data 3	
16	GND	Power Ground	
17	B2	Blue Data 2	
18	B1	Blue Data 1	
19	B0	Blue Data 0 (LSB)	
20	GND	Power Ground	
21	G5	Green Data 5 (MSB)	
22	G4	Green Data 4	
23	G3	Green Data 3	
24	GND	Power Ground	
25	G2	Green Data 2	
26	G1	Green Data 1	
27	G0	Green Data 0 (LSB)	
28	GND	Power Ground	
29	R5	Red Data 5 (MSB)	
30	R4	Red Data 4	
31	R3	Red Data 3	
32	GND	Power Ground	
33	R2	Red Data 2	
34	R1	Red Data 1	
35	R0	Red Data 0 (LSB)	
36	GND	Power Ground	
37	GND	Power Ground	
38	CLK	Clock Signals; Latch Data at the Falling Edge	
39	GND	Power Ground	
40	GND	Power Ground	

Note: User's connector part number is PF050-40ZSG-F09-S manufactured by UJU or equivalent

9.2 Block Diagram



9.3 Backlight Driving Part

Pin No.	Symbol	Description
1	VLED+	Red, LED Anode
2	VLED-	White, LED Cathode

Note: The backlight interface connector is a model SM02B-BHSS-1-TB manufactured by JST or equivalent. The matching connector part number is BHSR-20VS-1 manufactured by JST or equivalent.

10. 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 : 180G, 2ms Waveform: Half Sinusoidal Wave Shock Time: 2ms 3 Axis for all six faces/each	
8	Vibration Test (non-operating)	Frequency Range: 10-500Hz Sweep: 1.5G Amplitude: 0.37 oct/min For 3 Axis 1hrs/axis	
9	Thermal Shock Test	-20°C (0.5Hr) - +70°C (0.5Hr) for 100 cycles	

