



深圳市一众显示科技有限公司

SHEN ZHEN TEAM SOURCE DISPLAY TECH. CO, LTD.

TFT-LCD Module Specification

Module NO.: TST043WQHS-99C

Version: V1.0

APPROVAL FOR SPECIFICATION

APPROVAL FOR SAMPLE

For Customer' s Acceptance:	
Approved by	Comment

TSD		
Presented by	Reviewed by	Approved by

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1. LCM Specification

1.1 Description

TST043WQHS-99C(is a transmissive type color active matrix liquid crystal display(LCD) which uses amorphous thin film transistor(TFT) as switching devices. This product is composed of a TFT LCD panel, a drive IC, a FPC, and a LED-backlight unit,and a **capacitive touch panel**. The active display area is 4.3inches diagonally measured and the native resolution is 480*RGB*272.Features of this product are listed in the following table.

1.2 Functions & Features

Table 1.1 Module Functions & Features

Parameter	Value	Unit
LCD Mode	TFT/Transmissive	-
Color Depth	16.7M	-
Display Resolution	480*RGB*272	pixels
LCD Module Size	105.5 (H)*67.2(V)*4.25(T)(Exclude FPC)	mm
CTP+LCM Size	123.04(H)*84.46(V)*4.77(T)	mm
Active Area (A.A.)	95.04 (L)* 53.86 (W)	mm
Pixel Arrangement	RGB-stripe	-
Viewing Direction	ALL	
Display Mode	Normally Black	
LCD Controller/Driver	ST7282	-
IC Package Type	COG	-
Interface	RGB24-bit	-
Power Supply Voltage	3.3	V
Backlight	White LED*12	pcs
Brightness	600(Typ)	cd/m ²
TP/Lens	With CTP (FT5446)	-

3. Pin Descriptions (参见 P5 页模组图)

Pin No.	Symbol	Description
1	LED-	Cathode of LED backlight
2	LED+	Anode of LED backlight
3	GND	Power ground
4	VDD	Power voltage
5	R0	Red data (LSB)
6	R1	Red data
7	R2	Red data
8	R3	Red data
9	R4	Red data
10	R5	Red data
11	R6	Red data
12	R7	Red data (MSB)
13	G0	Green data (LSB)
14	G1	Green data
15	G2	Green data
16	G3	Green data
17	G4	Green data
18	G5	Green data
19	G6	Green data
20	G7	Green data(MSB)
21	B0	Blue data(LSB)
22	B1	Blue data
23	B2	Blue data
24	B3	Blue data
25	B4	Blue data
26	B5	Blue data
27	B6	Blue data
28	B7	Blue data(MSB)
29	GND	Power ground
30	DCLK	Pixel clock
31	DISP	Display on/off
32	HSYN	Horizontal sync signal
33	VSYNC	Vertical sync signal
34	DE	Data enable
35	NC	NO connect
36	GND	Power ground
37	XR	NC
38	YD	NC
39	XL	NC
40	YU	NC

4. Electrical Units

4.1 Absolute Maximum Ratings

The absolute maximum ratings are list on Table 4.1. When used out of the absolute maximum ratings, the LCM may be permanently damaged. Using the LCM within the following electrical characteristics limit is strongly recommended for normal operation. If these electrical characteristic conditions are exceeded during normal operation, the LCM will malfunction and cause poor reliability.

Table 4.1 Module Absolute Maximum Ratings

Item	Symbol	Unit	Value	Note
Power Supply Voltage (1)	VCC	V	-0.3 to + 3.6	
Power Supply Voltage (2)	VGH ~ VSS	V	10.0 to +20.0	
Power Supply Voltage (3)	VSS ~ VGL	V	5.0 to +15.0	
Operating Temperature	Top	°C	-20 to +70	
Storage Temperature	Tst	°C	-30 to +80	
Operating Humidity	Hop	%(RH)	10~90	

(VSS=0V)

4.2 Electrical characteristics (Ta=25°C)

Table 4.2:DC Characteristic

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage	Logic	VCC	---	2.8	-	3.3	V
	Input Voltage	H level	---	0.8V _{dd}	---	V _{dd}	V
L level		V _{IL}		0	---	0.2V _{CC}	
Current Consumption		I _{DD}	With internal voltage generation; VDD=3.3V; Tamb=25°C;	---	---	TBD	mA
LCD Driving Voltage		VOP	---	---	TBD	---	V

4.3 Backlight Specification

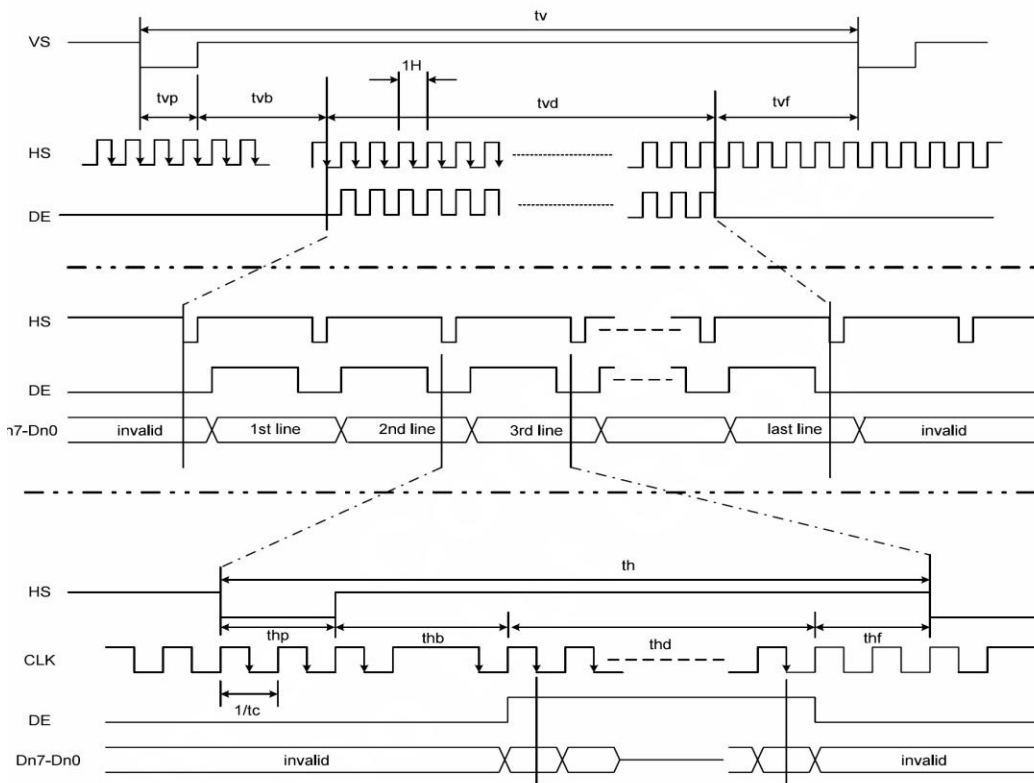
Table 4.3 Back-light Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	VF	Backlight Current IF=40mA	-	18.6	-	V
Supply Current	IF		40			mA
Life times	Lt		20000	30000	-	hours
Uniformity	B		80	-	-	%
Color	White					

Note: With 12 pcs white LED parallel connection.

5. AC Characteristics

5.1 Parallel RGB Mode Timing Diagram



Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Clock cycle	$f_{CLK}^{(1)}$	-	9	15	MHz
Hsync cycle	$1/th$	-	17.14	-	KHz
Vsync cycle	$1/tv$	-	59.94	-	Hz
Horizontal Signal					
Horizontal cycle	th	525	525	605	CLK
Horizontal display period	thd	480	480	480	CLK
Horizontal front porch	thf	2	2	82	CLK
Horizontal pulse width	thp ⁽²⁾	2	41	41	CLK
Horizontal back porch	thb ⁽²⁾	2	2	41	CLK
Vertical Signal					
Vertical cycle	tv	285	286	399	H ⁽¹⁾
Vertical display period	tvd	272	272	272	H ⁽¹⁾
Vertical front porch	tvf	1	2	227	H ⁽¹⁾
Vertical pulse width	tvp ⁽²⁾	1	10	11	H ⁽¹⁾
Vertical back porch	tvb ⁽²⁾	1	2	11	H ⁽¹⁾

Note: (1) Unit: CLK=1/ f_{CLK}, H= th,

(2) It is necessary to keep tvp+tvb=12 and thp+thb=43 in sync mode. DE mode is unnecessary to keep it.

6. Optical Specifications

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 30 minutes in a dark environment at 25°C. The values specified are at an approximate distance 50cm from the TFT-LCD surface at a viewing angle of Φ and θ equal to 0° .

Measurement condition: Refer to next pages (C-light source, Halogen Lamp)

*1): with Polarizer *2): without Polarizer *3): Only Color Filter glass

Items		Symbol	Condition	Specifications			Unit			
				Min.	Typ.	Max.				
Contrast Ratio		CR		640	800	-	-			
Response Time		T _R		-	30	-	ms			
		T _F					ms			
Chromaticity	Red	X _R	$\Theta=0$	-0.03	+0.03		-			
		Y _R					-			
	Green	X _G					0.61	-		
		Y _G					0.33	-		
	Blue	X _B					0.36	-		
		Y _B					0.59	-		
	White	X _W					0.15	-		
		Y _W					0.11	-		
Viewing angle	Hor.	L(3 o'clock)	Center CR≥10				deg.			
		R(9 o'clock)						-	80	-
	Ver.	U(12 o'clock)						-	80	-
		D(6 o'clock)						-	80	-
Color Gamut(NTSC)		-	$\Theta=0$	45	50	-	%			
Brightness(With LCD)		IV	White	550	600	650	cd/m ²			

7.Touch Panel specifications

7.1 Mechanical characteristics

DESCRIPTION	INL SPECIFICATION	REMARK
Touch Panel Size	4.3	
Outline Dimension (OD)	123.04(H) x 84.46(V) mm	Cover Lens Outline
Product Thickness	1.43mm(max)	With FPC and frame D.S.T
Glass Thickness	0.7mm	
Ink View Area	96.46x55.46mm	
Input Method	5 Fingers	
Activation Force	Touch	
Surface Hardness	≥6H	

7.2 Electrical characteristics

DESCRIPTION		SPECIFICATION
Operating Voltage		DC 2.8~3.3V
Power Consumption (IDD)	Active Mode	12~4.5mA
	Sleep Mode	TBD
Interface		I ² C
Controller IC		FT5446
Resolution		480*272

7.3 Interface timing characteristics

PARAMETER	MIN	MAX	UNIT
SCL Frequency	-	400K	Hz
Bus Free Time Between a STOP and START Condition	4.7	-	uS
Hold Time (repeated) START Condition	4.0	-	uS
Data Setup Time	250	-	nS
Setup Time for Repeated START Condition	4.7	-	uS
Setup Time for STOP Condition	4.0	-	uS

8. Reliability Test Items

No.	Test Items	Test Condition	Remarks
1	High Temperature Storage	T = 80°C for 240hr	Module (Without Contamination)
2	Low Temperature Storage	T = -30°C for 240hr	
3	High Temperature Operating	T = 70°C for 240hr	
4	Low Temperature Operating	T = -20°C for 240hr (But no condensation of dew)	
5	High Temp. and High Humidity Operating	T = 50°C /90% for 240hr (But no condensation dew)	
6	Thermal Shock	-20±2°C~25~70±2°C×10cycles (30min.) (5min.) (30min.)	
7	ESD test	Voltage:±8KV R: 330Ω, C:150pF,Air discharge, 10time	
8	Packing Shock	1corner, 3edge, 6face / 1.0mDrop	Packing
9	Packing Vibration	Frequency: 10Hz~55Hz~10Hz Amplitude: 1.5mm, X, Y, Z direction for total 3hours	