



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-72

Version: V1.3

☐ APPROVAL FOR SPECIFICATION

☐ APPROVAL FOR SAMPLE

For Customer' s Acceptance:	
Approved by	Comment

TSD		
Presented by	Reviewed by	Approved by
Hcr	Aron	Aron

Document Revision History

[illegible]

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1. LCM Specification

1.1 Description

TST043WQHS-72(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. 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.

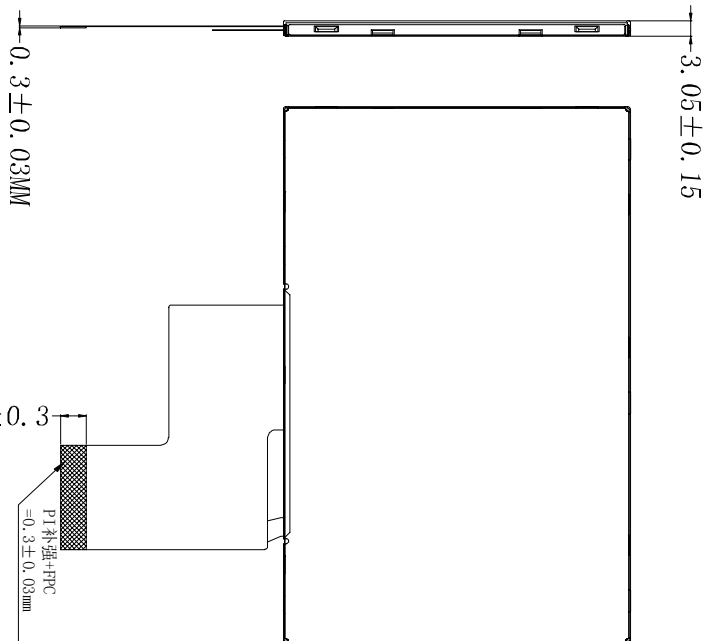
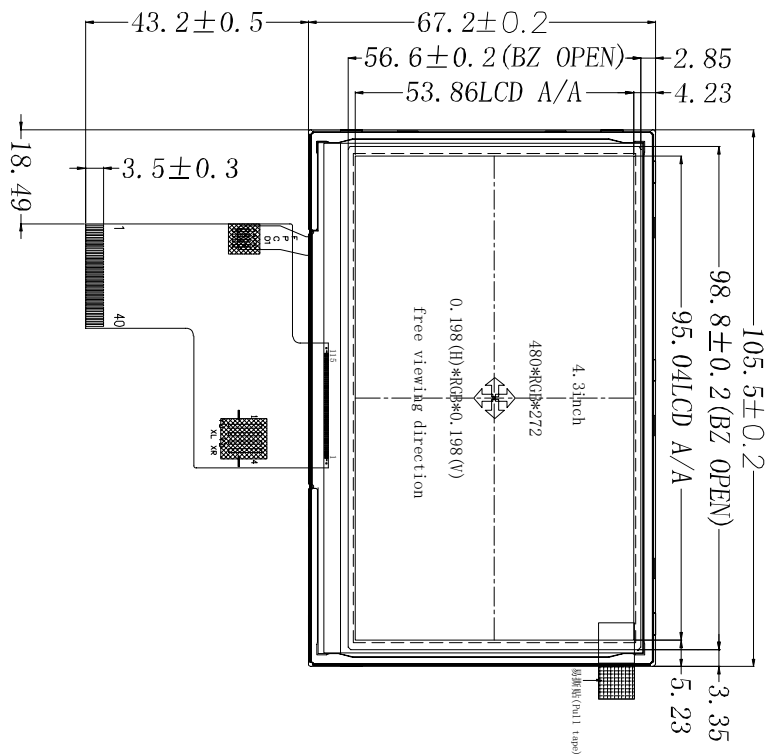
1.2 Functions & Features

Table 1.1 Module Functions & Features

Parameter	Value	Unit
LCD Mode	TFT/Transmissive	-
Color Depth	16.7M	-
Display Resolution	480*RGB*272	pixels
Module Size	105.5 (H)*67.2(V)*3.05(T)(Exclude FPC)	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	750(Typ)	cd/m ²

2. Mechanical Specification

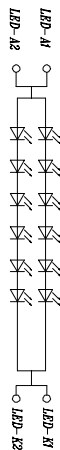
LCD Type	4.3" TFT, Transmissive, Normally black, FFS
Resolution	480(RGB)*272
View Direction	free
Driver IC	ST7282
Color Depth	16.7M
Interface Types	RGB24-bit
Operating voltage	VDD=3.3V
Backlight LEDs	12 LEDs, 40mA, 18.6V
Surface luminance	700(cd/m ²), 750(typ)cd/m ² , IF=40mA
Operating temperature	-20 °C ~ 70 °C
Storage Temperature	-30 °C ~ 80 °C
Storage Humidity	60% ~ 90% max



LCM PIN Definition

Pin	Symbol	Description
1	LED1	Power for LED
2	LED2	Power for LED
3	LED3	Power for LED
4	LED4	Power for LED
5	LED5	Power for LED
6	LED6	Power for LED
7	LED7	Power for LED
8	LED8	Power for LED
9	LED9	Power for LED
10	LED10	Power for LED
11	LED11	Power for LED
12	LED12	Power for LED
13	LED13	Power for LED
14	LED14	Power for LED
15	LED15	Power for LED
16	LED16	Power for LED
17	LED17	Power for LED
18	LED18	Power for LED
19	LED19	Power for LED
20	LED20	Power for LED
21	LED21	Power for LED
22	LED22	Power for LED
23	LED23	Power for LED
24	LED24	Power for LED
25	LED25	Power for LED
26	LED26	Power for LED
27	LED27	Power for LED
28	LED28	Power for LED
29	LED29	Power for LED
30	LED30	Power for LED
31	LED31	Power for LED
32	LED32	Power for LED
33	LED33	Power for LED
34	LED34	Power for LED
35	LED35	Power for LED
36	LED36	Power for LED
37	LED37	Power for LED
38	LED38	Power for LED
39	LED39	Power for LED
40	LED40	Power for LED

Note: Customers are advised to use constant current source to drive backlight.



Version	Need to pay attention to	the key size with *	比例 (Proportion)	设计 (DESIGN)	审核 (AUDITING)	批准 (APPROVED)
A0	变更记录 (Change History)	日期 (Date)	视 角 (View)	单 位 (Unit)	页 面 (Page)	1 / 1
A1	按实际做出来的样品调整亮度参数	2019-6-24	M M	产品型号 (Product Type)	TST043WQHS-72	HCR
A2	更换上铁框, 开口尺寸加大。	2019-7-11	M M	图纸版本 (Version)	A2	Arion

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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	NC	NO connect
38	NC	NO connect
39	NC	NO connect
40	NC	NO connect

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		Sym bol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage	Logic	VCC	---	2.8	-	3.3	V
Input Voltage	H level	V _{IH}	---	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

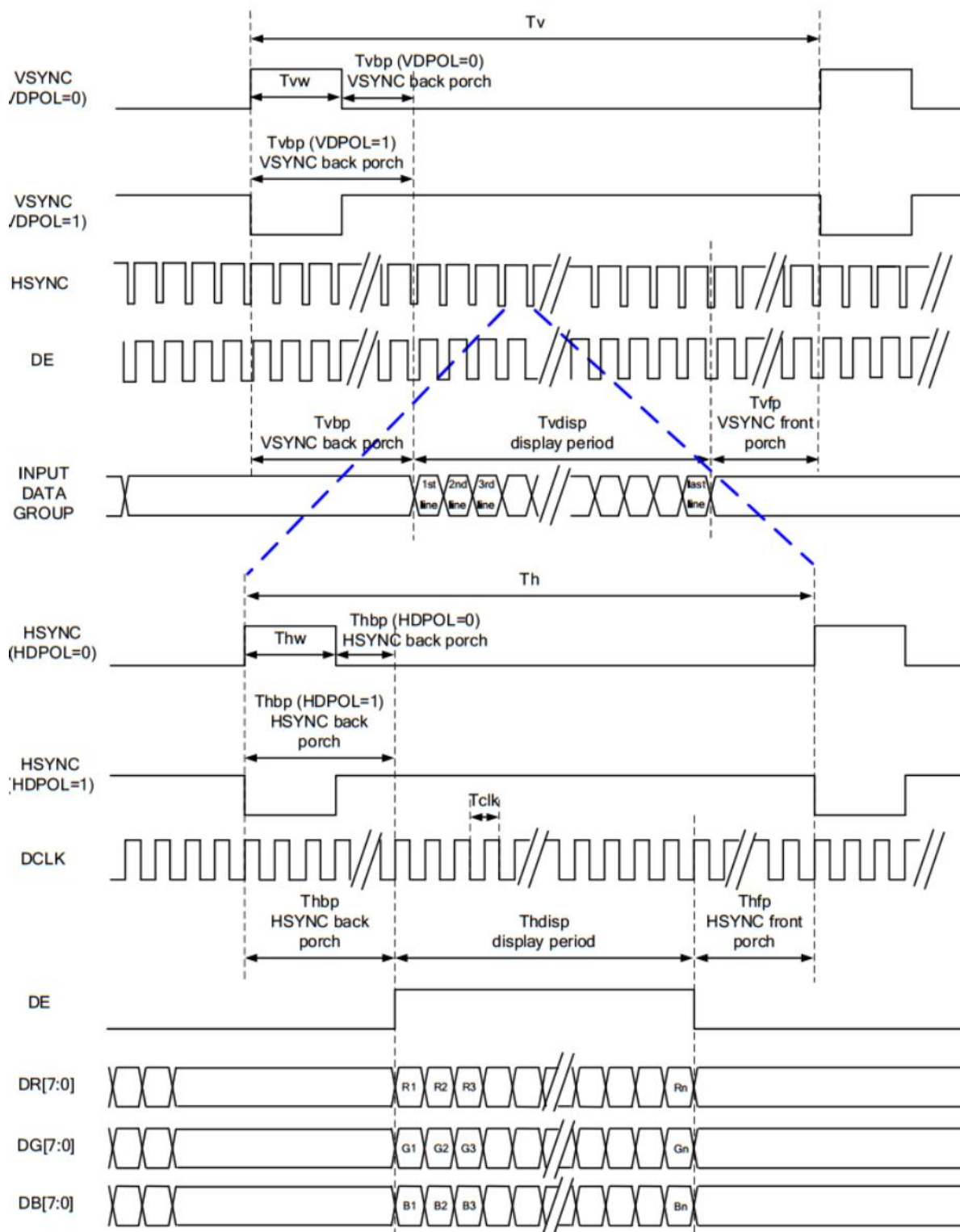
Table 4.3 Back-light Characteristics

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



Parallel 24-bit RGB Input Timing (PVDD=VDD=VDDI= 3.3V, AGND= 0V, TA=25°C)

480RGB X 272 Resolution Timing Table						
Item	Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency	Fclk	8	9	12	MHz	
DCLK Period	Tclk	83	111	125	ns	
HSYNC	Period Time	Th	485	531	598	DCLK
	Display Period	Thdisp		480		DCLK
	Back Porch	Thbp	3	43	43	DCLK
	Front Porch	Thfp	2	8	75	DCLK
	Pulse Width	Thw	2	4	43	DCLK
VSYNC	Period Time	Tv	276	292	321	HSYNC
	Display Period	Tvdisp		272		HSYNC
	Back Porch	Tvbp	2	12	12	HSYNC
	Front Porch	Tvfp	2	8	37	HSYNC
	Pulse Width	Tvw	2	4	12	HSYNC

Note: It is necessary to keep Tvbp =12 and Thbp =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	Θ=0	640	800	-	-	
Response Time		T _R		-	30	-	ms	
		T _F					ms	
Chromaticity	Red	X _R		-0.03	0.61	+0.03	-	
		Y _R					0.33	-
	Green	X _G					0.36	-
		Y _G					0.59	-
	Blue	X _B					0.15	-
		Y _B					0.11	-
	White	X _W					0.33	-
		Y _W					0.36	-
Viewing angle	Hor.	L(3 o'clock)	Center CR≥10	-	80	-	deg.	
		R(9 o'clock)		-	80	-		
	Ver.	U(12 o'clock)		-	80	-		
		D(6 o'clock)		-	80	-		
Color Gamut(NTSC)		-	Θ=0	45	50	-	%	
Brightness(With LCD)		IV	White	700	750	800	cd/m ²	

7. 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	