DisplayModule

DM-TFTR109-448

1.09" 240 X 240 TFT TRANSMISSIVE ROUND DISPLAY MODULE-SPI

Contents

1 Revision History

Date	Changes
2022-7-1	First release

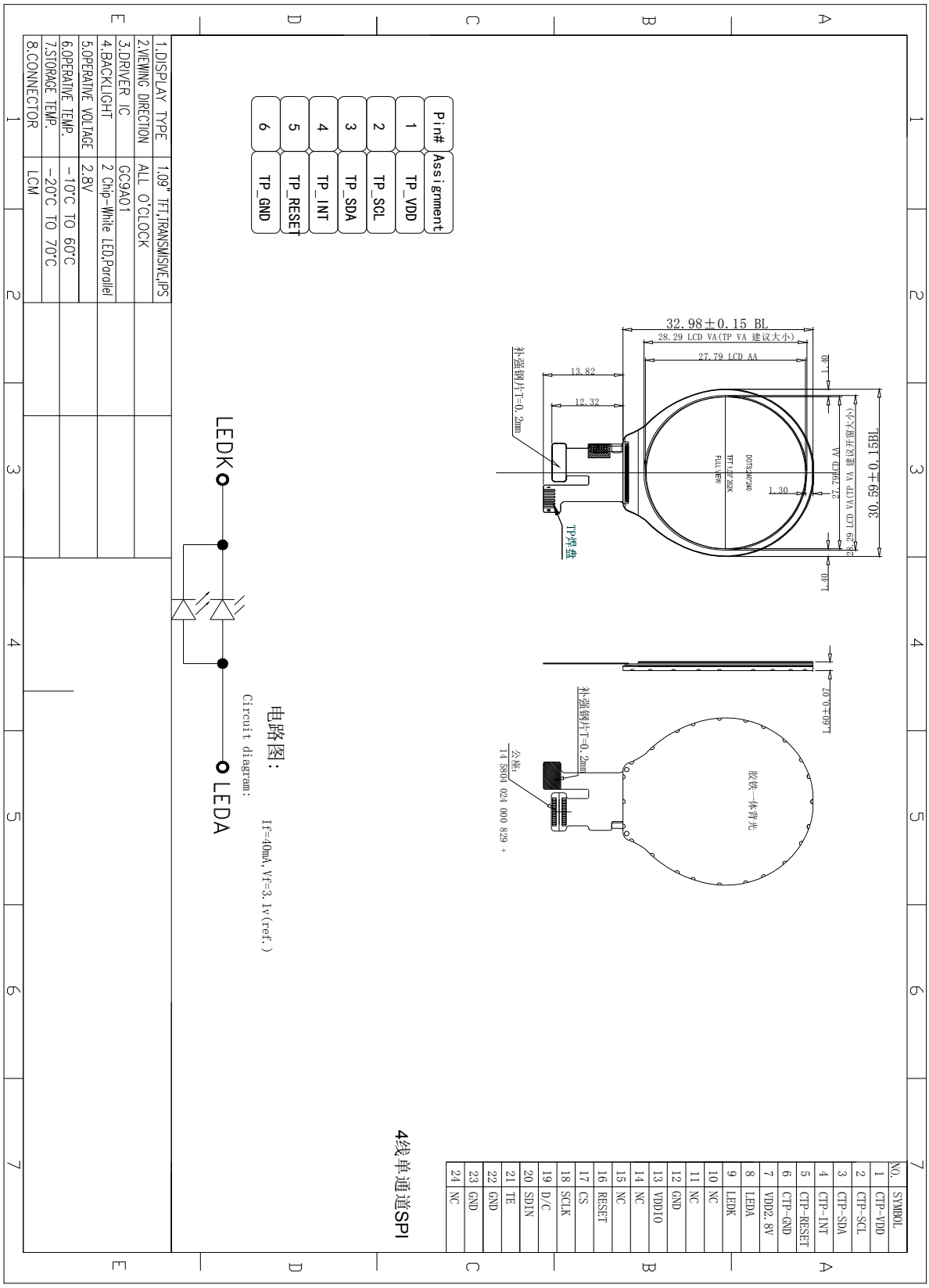
2 Main Features

Item	Specification	Unit
Diagonal Size	1.09	inch
Resolution	240 RGB x 240	pixel
Drive IC	GC9A01	-
Interface	4 Line SPI	-
Active Area	27.79 x 27.79	mm
Module Dimension	30.59(H) x 33.0(V) x 1.60(D)	mm
Colors	262K	
Luminance	400	Cd/m^2
View angle	ALL	-
Display Type	TFT TRANSMISSIVE	
Backlight	2 LED Parallel	
Operating Temp	-10℃~ +60℃	℃
Storage Temp	-20℃~ +70℃	℃
Weight	TBD	g

3 Pin Description

Pin No.	Symbol	Function Description
1-6	GND	Connect CTP.
7	VDD28	Power supply (+2.8V) for logic circuit.
8	LEDA	Back light power supply positive.
9	LEDK	Back light power supply negative.
10-11	NC	Don’t need to connect.
12	GND	Power Ground
13-14	VDDIO	Power supply (+1.8V/+2.8V) IO circuit.
15	GND	Power Ground
16	RESET	Reset control signal
17	CS	Chip select signal(low active).
18	D/C	Serial communication clock line (SCLK).
19	WR	Data or command select pin (RS).
20	SDIN	Serial communication data line.
21	TE	Tear effect.
22-23	GND	Power Ground
24	NC	Don’t need to connect.

4 Mechanical Drawing



Pin#	Assignment
1	TP_VDD
2	TP_SCL
3	TP_SDA
4	TP_INT
5	TP_RESET
6	TP_GND

NO.	SYMBOL
1	CTP-VDD
2	CTP-SCL
3	CTP-SDA
4	CTP-INT
5	CTP-RESET
6	CTP-GND
7	VDD2.8V
8	LEDA
9	LEDK
10	NC
11	NC
12	GND
13	VDDIO
14	NC
15	NC
16	RESET
17	CS
18	SCLK
19	D/C
20	SDIN
21	TE
22	GND
23	GND
24	NC

1.DISPLAY TYPE	1.09" TFT,TRANSMISIVE,IPS
2.VIEWING DIRECTION	ALL O'CLOCK
3.DRIVER IC	GC9A01
4.BACKLIGHT	2 Chip-White LED,Parallel
5.OPERATIVE VOLTAGE	2.8V
6.OPERATIVE TEMP.	-10°C TO 60°C
7.STORAGE TEMP.	-20°C TO 70°C
8.CONNECTOR	LCM

5 Electrical Characteristics

5.1 Absolute Maximum Ratings

Item	Symbol	Min	Max	Unit
Supply Voltage for logic	Vcc1,Vcc2	-0.3	4.6	V
Input Voltage	VIN	-0.3	VCC+0.3	V
Operating Temperature	T_{OP}	-10	+60	℃
Storage Temperature	T_{ST}	-20	+70	℃
Humidity	RH	-	90%(Max60C)	RH

5.2 Electrical Characteristics

Item	Symbol	Min	Typ	Max	Unit
Supply Voltage for logic	Vcc-Vss	2.8	3.0	3.2	V
Input Current	I_{dd}	-	10	-	V
Input Voltage 'H' level	Vih	0.7Vdd	-	Vdd	V
Input Voltage 'L' level	V_{il}	-Vss	-	0.2Vdd	V
Output Voltage 'H' level	I_{oh}	0.8Vcc	-	10	mA
Output Voltage 'L' level	V_{ol}	-Vss	15	0.2Vcc	uA

5.3 Backlight Unit

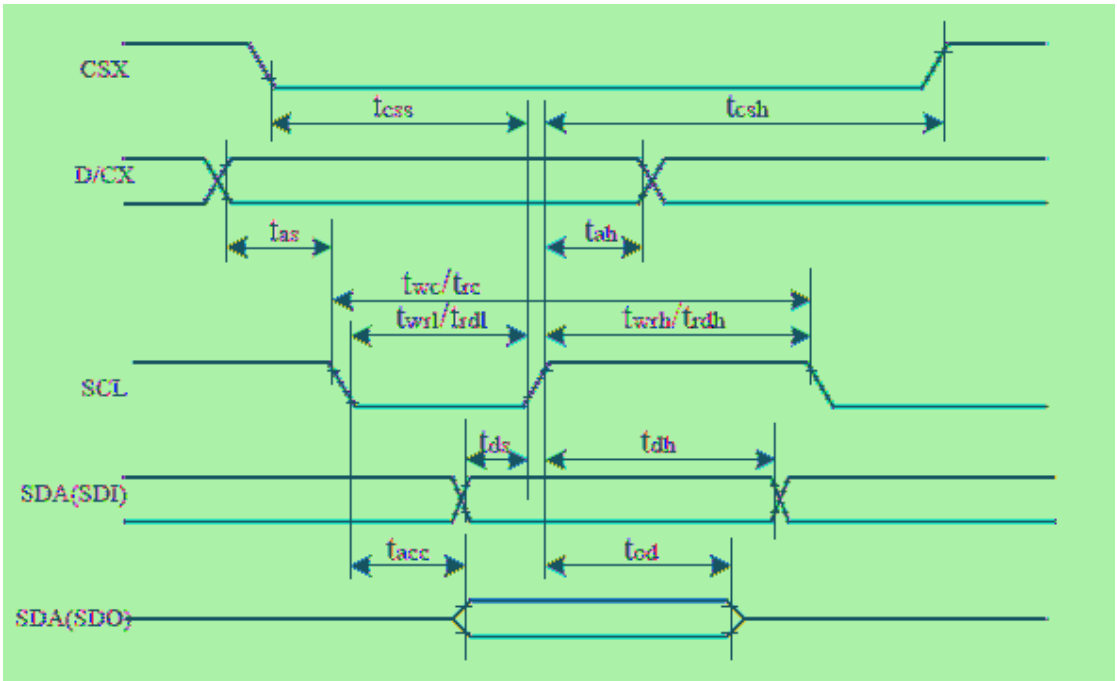
Item	Symbol	Min	Typ	Max	Unit	Remark
Forward voltage	Vf	2.8	3.1	3.2	V	-
LCM Luminance	Lv	-	200	-	cd/m^2	If=40mA
Number of LED	-	2			Piece	-
Connection mode	P	parallel			-	-

Using condition:constant current driving method IF=40mA(+/-10%)

5.4 Timing Characteristics

5.4.1 Display Serial Interface Timing Characteristics (4-line SPI system)

Signal	Symbol	Parameter	min	max	Unit	Description
CSX	tcss	Chip select time (Write)	20	-	ns	
	tcsh	Chip select hold time (Read)	40	-	ns	
SCL	twc	Serial Clock Cycle (Write)	10	-	ns	
	twrh	SCL "H" Pulse Width (Write)	5	-	ns	
	twrl	SCL "L" Pulse Width (Write)	5	-	ns	
	trc	Serial Clock Cycle (Read)	150	-	ns	
	trdh	SCL "H" Pulse Width (Read)	60	-	ns	
	trdl	SCL "L" Pulse Width (Read)	60	-	ns	
D/CX	tas	D/CX setup time	10	-	ns	
	tah	D/CX hold time (Write/Read)	10	-	ns	
SDA/SDI (Input)	tds	Data setup time (Write)	5	-	ns	
	tdh	Data hold time (Write)	5	-	ns	
SDA/SD0 (Output)	tacc	Access time (Read)	10	-	ns	



5.4.2 Reset Input Timing

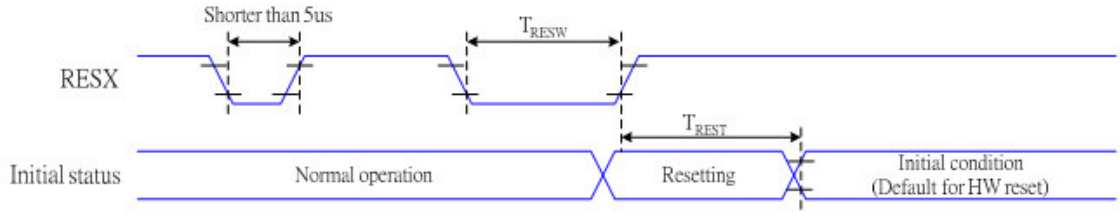


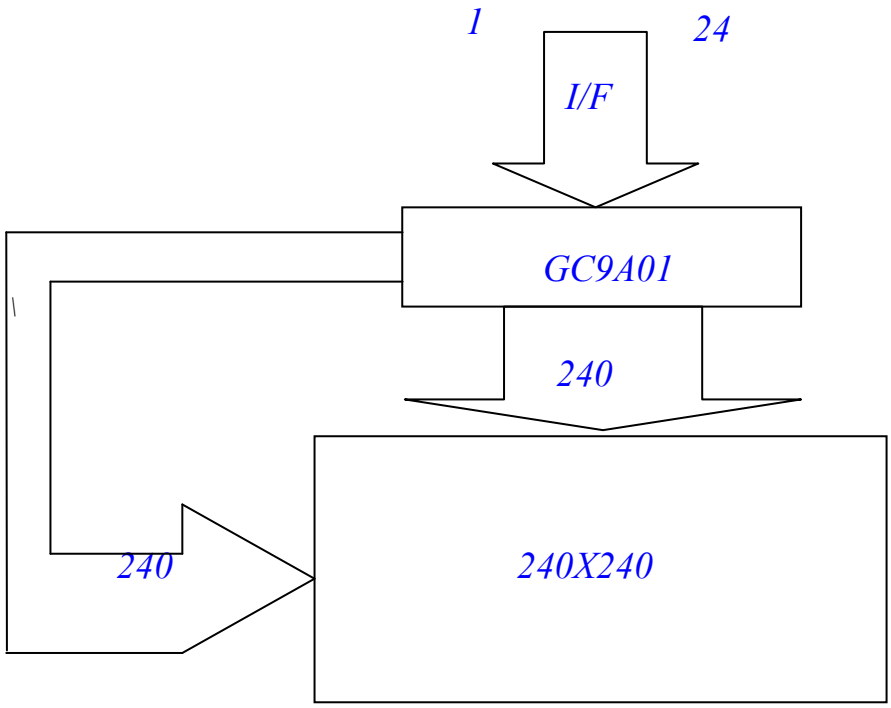
Table 9.16.1 Reset timing

Related Pins	Symbol	Parameter	MIN	MAX	Unit
RESX	tRESW	Reset pulse duration	10	-	us
	tREST	Reset cancel	-	5	ms
				120	ms

Notes:
1. The reset cancel includes also required time for loading ID bytes, VCOM setting and other settings from EEPROM (or similar device) to registers. This loading is done every time when there is HW reset cancel time (tRT) within 5 ms after a rising edge of RESX.
2. Spike due to an electrostatic discharge on RESX line does not cause irregular system reset according to the table below:

RESX Pulse	Action
Shorter than 5us	Reset Rejected
Longer than 9us	Reset
Between 5us and 9us	Reset starts

5.4.3 Block Diagram of LCM



6 Reliability

Test Item	Content of Test	Test Condition	Note
High Temperature Storage	Endurance test applying the high storage temperature for a long time.	90℃ 96hrs	2
Low Temperature Storage	Endurance test applying the high storage temperature for a long time.	-40℃ 96hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	85℃ 96hrs	-
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-30℃ 96hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 60℃,90%RH max, for 96hrs under no-load condition excluding the polarizer. Then taking it out and drying it at normal temperature.	60℃,90%RH 96hrs	1,2
Thermal Shock Resistance	The sample should be allowed stand the following 10 cycles of operation.	-30℃/85℃ 20 cycles	-
Vibration Test	Endurance test applying the vibration during transportation and using.	Frequency range:10~55Hz, Stroke:1.5mm Sweep:10Hz~55 Hz~10Hz 2 hours for each direction of X.Y.Z. (6 hours for total) (Package condition).	3
Static Electricity Test	Endurance test apply the electric stress to the terminal.	C=150pF, R=330,5points /panel Air:±8KV, 5times; Contact:±6KV, 5 times; (Environment: 15℃~35℃, 30%~60%).	-

Note1: No dew condensation to be observed.

Note2: The function test shall be conducted after 4 hours storage at the normal. Temperature and humidity after remove from the rest chamber.

Note3: Test performed on product itself, not inside a container

7 Warranty and Conditions

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