DisplayModule

DM-TFT144-399

1.44" 128 × 128 TFT LCD DISPLAY MODULE - SPI

Contents

1 Revision History

Date	Changes
2019-09-03	First release

2 Main Features

Item	Specification	Unit
Diagonal Size	1.44	inch
LCD Type	TFT TRANSMISSIVE	-
Resolution	128 x 128	pixel
Controller IC	ST7735S	-
Interface	4wire SPI	-
Active Area	25.50 x 26.50	mm
Module Dimension	29.50 x 36.50 x 2.25	mm
Pixel Pitch	0.20 x 0.20	mm
Viewing Direction	12	o'clock
Weight	TBD	g

3 Pin Description

3.1 Panel Pin Description

Pin No.	Symbol	Function Description
1	NC	No connection
2	GND	Ground
3	LED-	Cathode of Backlight
4	LED+	Anode of Backlight （3.0V-3.4V）
5	GND	Ground
6	/RESET	LCM Reset pin
7	A0	Register select pin RS='1': Display data. RS='0': Command data.
8	SDA	Serial data input / output.
9	SCK	Serial clock pin.
10	VCC	Power supply for Analog（2.8V-3.3V）
11	IOVCC	Power supply for interface(1.8V-3.3V)
12	CS	Chip select pin ("Low" enable)
13	GND	Ground
14	NC	No connection

Note1: IOVCC Connected to VCC(In application, IOVCC and VCC can be connected together to supply voltage of 2.8~3.3V.)

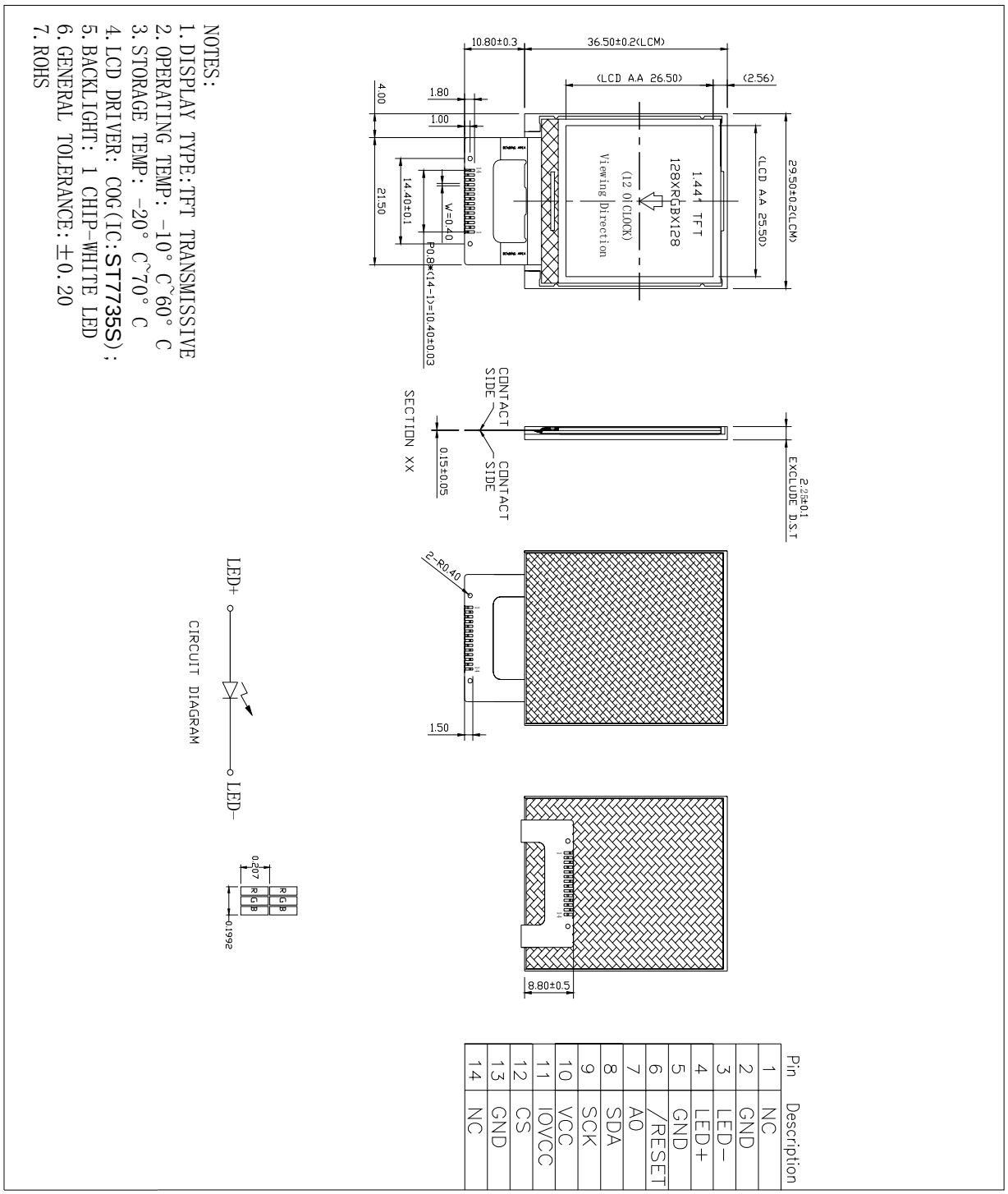
Note2: Backlit LED can be powered individually, or they can share a set of voltages with the VCC.

3.2 Module Pin Description

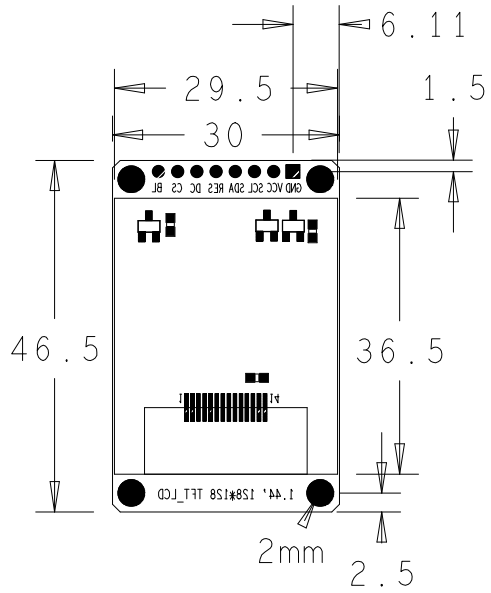
Pin No.	Symbol	Function Description
1	GND	Ground
2	VCC	Power Supply 3.3V~5.5V
3	SCL	SPI Clock
4	SDA	SPI DATA
5	RES	OLED reset Pin.
6	D/C	Data/Command Control This pin is Data/Command control pin.
7	CS	Chip Select This pin is pulled low to active. Connect to ground if no used .
8	BLK	LCD Backlight Control The default is float, and the backlight is turned off at low power.

4 Mechanical Drawing

4.1 Panel Mechanical Drawing



4.2 Module Mechanical Drawing



5 Optics & Electrical Characteristics

5.1 Optical Characteristics

Item	Symbol	Min	Typ	Max	Unit	Remark
View Angles TOP	ΘU	-	TBD	-	°	θ=φ=0°
View Angles Bottom	ΘD	-	TBD	-	°	
View Angles Right	ΘR	-	TBD	-	°	
View Angles Left	ΘL	-	TBD	-	°	
Response Time	T_R	-	TBD	-	ms	25℃; θ=0°
	T_F	-	TBD	-	ms	
Contrast Ratio	CR	-	≥10	-	-	θ=0°

The above “viewing angle” is the measuring position with the largest contrast ratio. Not for good image quality. Viewing direction for good image quality is 12 O’clock.

5.2 Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V	-0.3	4.6	V
Operation Supply Voltage	V_T	-0.3	V_{CC}+0.3	V
Operating Temperature	T_{OPR}	-20	70	℃
Storage Temperature	T_{STG}	-30	80	℃

5.3 DC Characteristics

Item	Symbol	Condition	Min	Typ.	Max	Unit
Logic Supply Voltage	V_{CC}		2.7	2.8	3.3	V
Low Level Input Voltage	T_{IL}		-0.3	-	0.2 x IOVCC	V
High Level Input Voltage	T_{IH}		0.8 x IOVCC	-	IOVCC	V

5.4 Backlight Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Remark
LED module Forward voltage	V_{LED}	3.0	3.2	3.4	V	
LED module current	V_{LED}	-	20	-	mA	
L/G Surface Luminance	L_S	1800	-	-	Cd/m^2	Note 1
LCM Surface brightness uniform	L_D	80	-	-	%	Note 2

Note 1:Test condition is:

(1) Center point on active area.

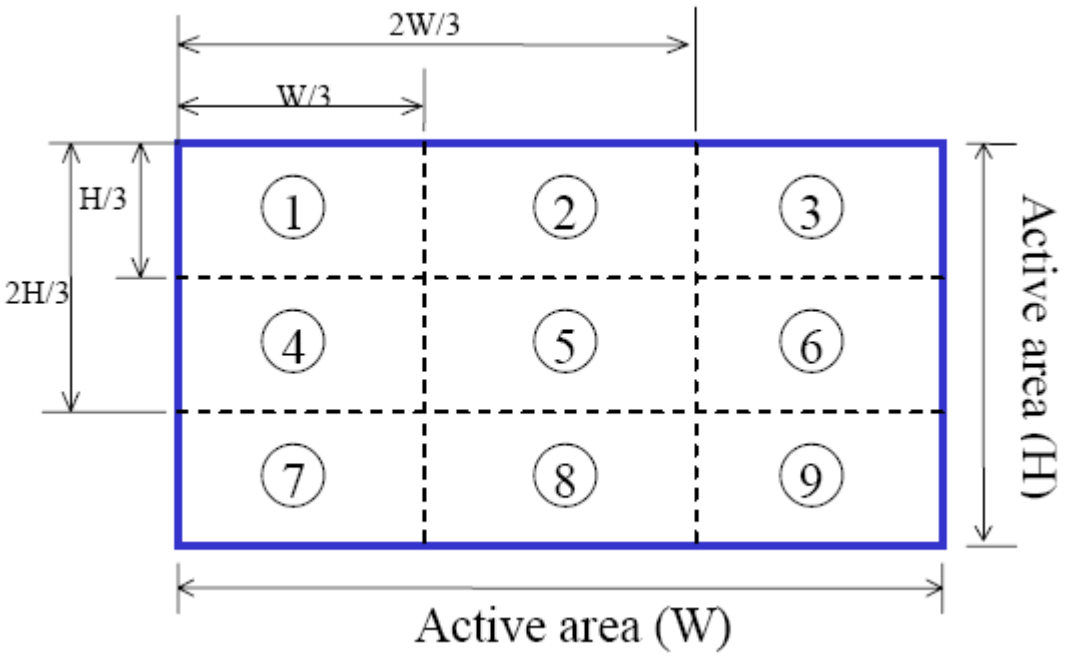
(2) Best Contrast.

Note 2:Uniform measure condition:

(1) Measure 9 point. Measure location show below;

(2) Uniform=(Min. brightness /Max. brightness)*100%

(3) Best Contrast.



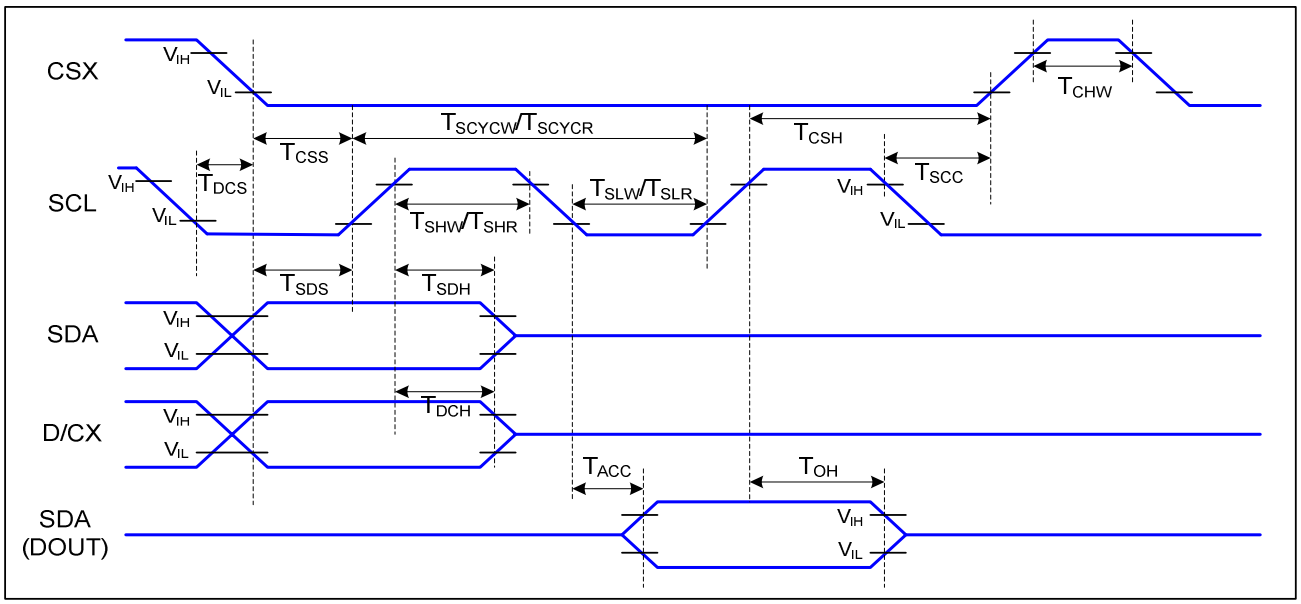
5.5 AC Characteristics

5.5.1 4-wire Serial Interface Timing Characteristics:

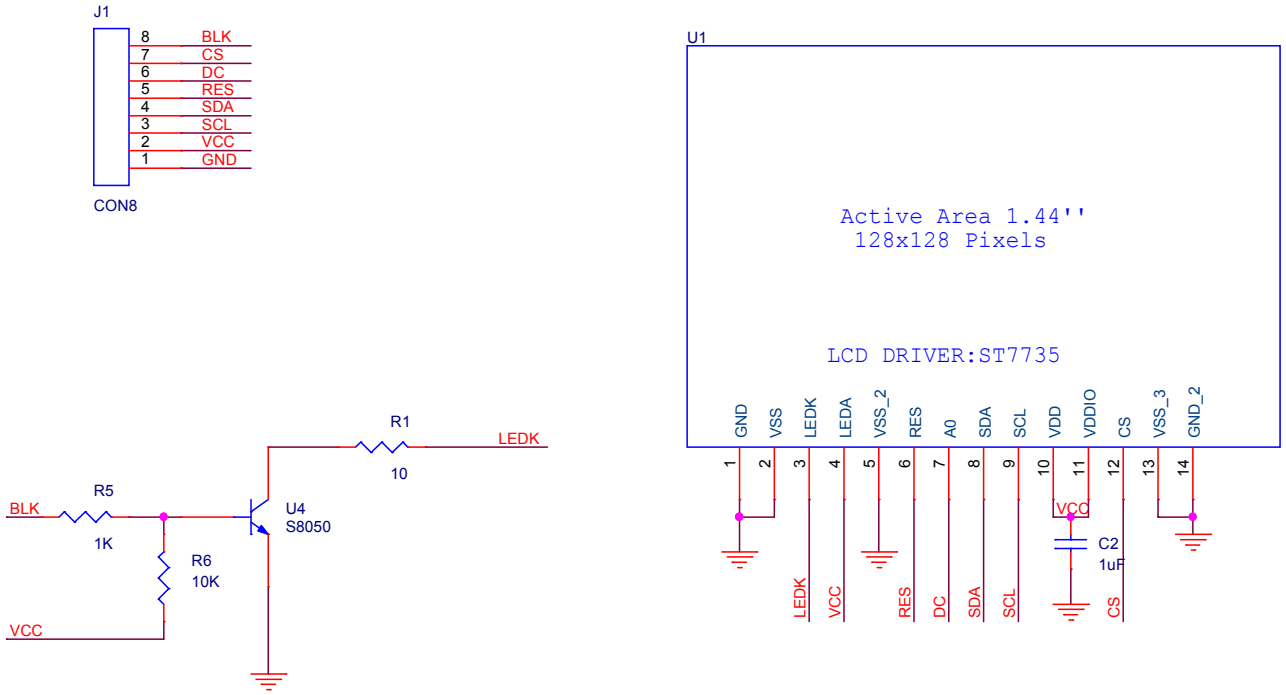
Signal	Symbol	Description	Min	Max	Unit	Remark
CSX	TCSS	Chip Select Setup Time (Write)	45	-	ns	
	TCSH	Chip Select Hold Time (Write)	45	-	ns	
	TCSS	Chip Select Setup Time (Read)	60	-	ns	
	TSCC	Chip Select Hold Time (Read)	65	-	ns	
	TCHW	Chip Select "H" Pulse Width	40	-	ns	
SCL	TSCYCW	Serial Clock Cycle (Write)	66	-	ns	-Write Command & Data Ram
	TSHW	SCL "H" Pulse Width (Write)	15	-	ns	
	TSLW	SCL "L" Pulse Width (Write)	15	-	ns	
	TSCYCR	Serial Clock Cycle (Read)	150	-	ns	-Read Command & Data Ram
	TSHR	SCL "H" Pulse Width (Read)	60	-	ns	
	TSLR	SCL "L" Pulse Width (Read)	60	-	ns	
D/CX	TDCS	D/CX Setup Time	10	-	ns	
	TDCH	D/CX Hold Time	10	-	ns	
SDA (DIN) (DOUT)	TSDS	Data Setup Time	10	-	ns	For Maximum CL=30pF For Minimum CL=8pF
	TSDH	Data Hold Time	10	-	ns	
	TACC	Access Time	10	50	ns	
	TOH	Output Disable Time	15	50	ns	

Ta=25 ℃, VDDI=1.65 ~ 3.7V, VDD=2.5 ~ 4.8V

4-line Serial Interface Timing



6 Module Schematic



7 Reliability

Test Item	Content of Test	Test Condition	Note
High Temperature Storage	Endurance test applying the high storage temperature for a long time.	80°C 240hrs	2
Low Temperature Storage	Endurance test applying the high storage temperature for a long time.	-30°C 240hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	70°C 240hrs	-
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-20 °C 240hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 60°C,90%RH max, for 96hrs under no-load condition excluding the polarizer. Then taking it out and drying it at normal temperature.	60°C,90%RH 240hrs	1,2
Thermal Shock Resistance	The sample should be allowed stand the following 10 cycles of operation	-20°C/70°C 10 cycles	-

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.

8 Warranty and Conditions

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