



CFAF800480A-050T-TS

TFT DISPLAY MODULE DATASHEET



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CONTENTS

1. Introduction	3
2. Mechanical Data	3
3. Mechanical Drawing	4
4. Interface Pin Function	5
5. System Block Diagram	6
6. Absolute Maximum Ratings	7
7. Electrical Characteristics	7
8. Optical Characteristics `	7
9. Backlight Characteristics	8
10. Typical Backlight Driver Circuit	8
11. Horizontal Input Timing	9
12. Vertical Input Timing	9
13. LCD Module Precautions	10
14. General Information	11

1. Introduction

This display is a color active matrix Thin Film Transistor (TFT), Liquid Crystal Display (LCD), that uses amorphous silicon TFT as a switching device. This module is composed of a TFT LCD panel, a driving circuit and a back-light system with a 5.0 (15:9) inch diagonally measured active display area.

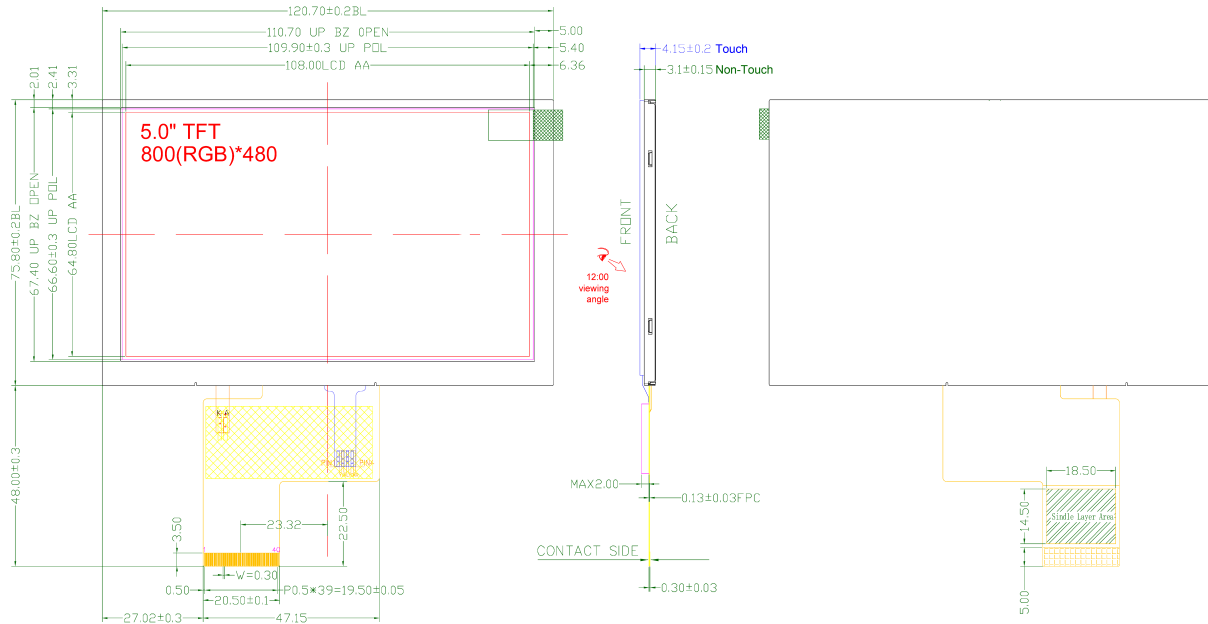
1.1. Main Features

- Full-color (262K) 800xRGBx480 display module consists of a TFT panel, a driver IC, an FFC/FPC flexible cable, and an LED backlight. Please note that this display module does not include an onboard LCD controller.
- Resistive touch screen
- Product page: <https://www.crystalfontz.com/product/cfaf800480a050tts>
(non-touch version: <https://www.crystalfontz.com/product/cfaf800480c1050t>)
- This module is designed for 3.3 v systems. It does not require a 5v supply.
- Host interface is DOT-CLK interface / Generic 24-bit RGB.
- 12:00 o'clock viewing angle (polarizer viewing direction). The entire display can be rotated for portrait or landscape orientation.
- Operating temperature range is -20°C to +70°C.
- Crystalfontz America, Inc. is ISO 9001:2008 certified.
- A Declaration for Conformity, RoHS, and REACH:SVHC are available under the "Datasheets & Files" tab on the web page for each display.

2. Mechanical Data

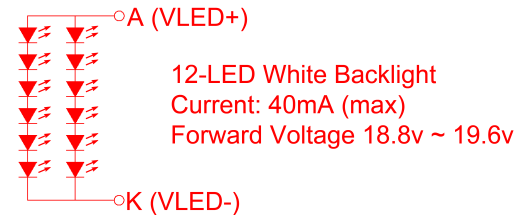
Item	Specification (mm)	Specification (inch, reference)
Overall Module Dimension	120.70 (W) x 75.80 (H) x 4.15 (D)	4.258 (W) x 2.674 (H) x 0.146 (D)
Active Area	108.0 (W) x 64.80 (H)	3.809 (W) x 2.286 (H)
Pixel Pitch	0.108 (W) x 0.108 (H)	0.004 (W) x 0.004 (H)
Weight (Typical)	92 grams	3.25 ounces

3. Mechanical Drawing



Pin	Name
1	VLED-
2	VLED+
3	GND
4	VDD
5	R0
6	R1
7	R2
8	R3
9	R4
10	R5
11	R6
12	R7
13	G0
14	G1
15	G2
16	G3
17	G4
18	G5
19	G6
20	G7
21	B0
22	B1
23	B2
24	B3
25	B4
26	B5
27	B6
28	B7
29	GND
30	PCLK
31	DISP
32	HSYNC
33	VS YNC
34	DE
35	NC
36	GND
37	XR(NC)
38	YD(NC)
39	XL(NC)
40	YU(NC)

Display Type: STN TFT
 Interface: 24-bit RGB
 Viewing Angle: 12:00 preferred
 Operating Temperature: -20°C ~ +7°C
 Storage Temperature: -30°C ~ +80°C

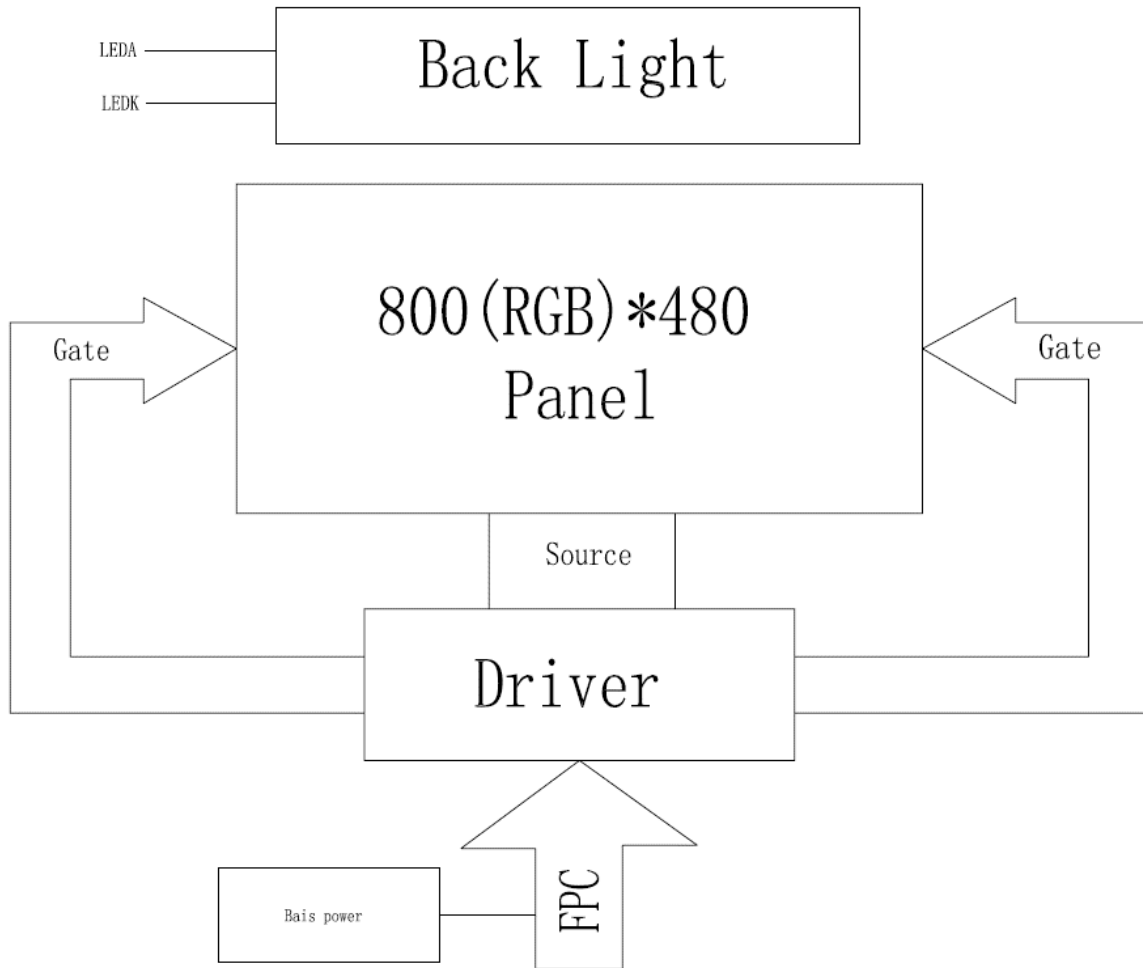


4. Interface Pin Function

Pin	Symbol	Direction	Function
1	V _{LED-}	P	Cathode Pin of Backlight
2	V _{LED+}	P	Anode Pin of Backlight
3	GND	P	Ground
4	V _{DD}	P	Power Supply Voltage (3.3v)
5-12	R0-R7	I/O	Red Data Input
13-20	G0-G7	I/O	Green Data Input
21-28	B0-B7	I/O	Blue Data Input
29	GND	P	Ground
30	P _{CLK}	I	Dot clock signal for RGB interface operation. Fix this pin at V _{CI} or GND when not in use.
31	D _{ISP}	I	Standby setting for testing. This pin should be connected to V _{DDIO} in normal operation mode. When connected to GND, the IC is in the standby mode.
32	H _{SYNC}	I	Line synchronizing signal for RGB interface operation. Fix this pin at V _{CI} or GND when not in use.
33	V _{SYNC}	I	Frame synchronizing signal for RGB interface operation. Fix this pin at V _{CI} or GND when not in use.
34	D _E	I	Data enabled signal for RGB interface operation. Fix this pin at V _{CI} or GND when not in use.
35	NC	-	No Connection
36	GND	P	Ground
37	YU	A/D	Touch Panel Top Right Glass Terminal
38	XL	A/D	Touch Panel Lift Film Terminal
39	YD	A/D	Touch Panel Bottom Terminal
40	XR	A/D	Touch Panel Right Film Terminal



5. System Block Diagram



6. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Digital Supply Voltage	V _{DD}	-0.5	5.0	V	(1)(2)
Digital Interface Supply Voltage	V _{DDIO}	-0.5	V _{DD} +0.3	V	(1)(2)
Operating Temperature	T _{OP}	-20	+70	°C	-
Storage Temperature	T _{ST}	-30	+80	°C	-

Notes:

- (1) These are stress ratings only. Extended exposure to the absolute maximum ratings listed above may affect device reliability or cause permanent damage.
- (2) Functional operation should be restricted to the limits in the Electrical Characteristics table below.

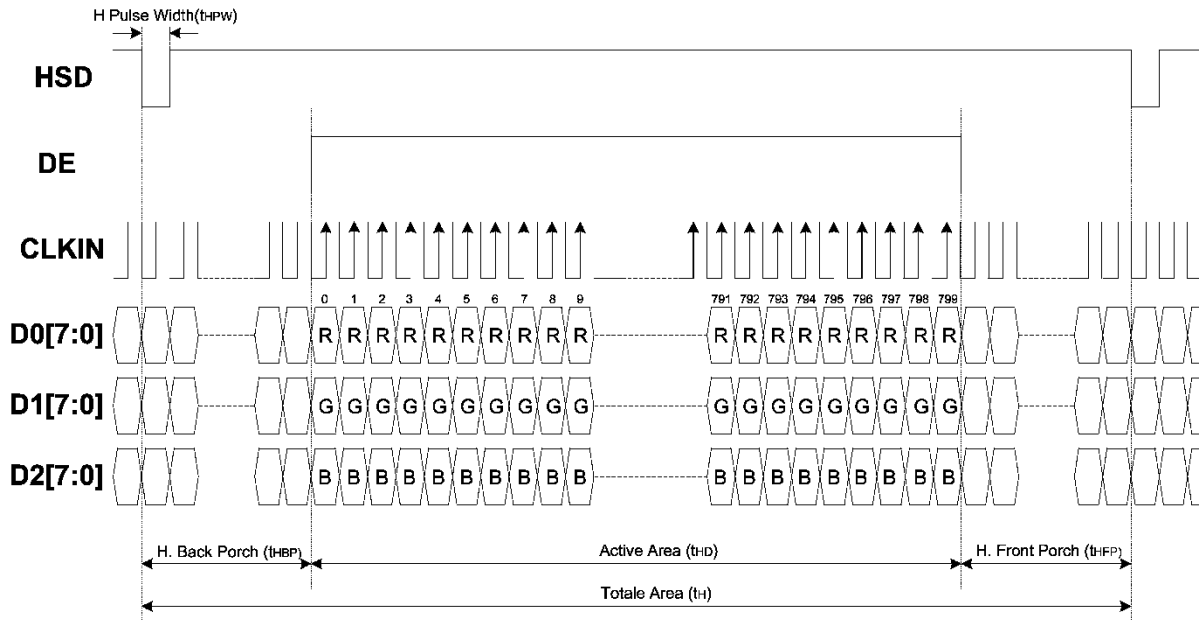
7. Electrical Characteristics

Item	Symbol	Min	Typ	Max	Unit
Digital Supply Voltage	V _{DD}	3.0	3.3	4.2	V
Digital Interface Supply Voltage	V _{DDIO}	3.0	3.3	4.2	V
Current Consumption for Normal Operation	I _{DD}	-	200	-	mA
High-level Input	V _{IH}	0.7 V _{DDIO}	-	V _{DDIO}	V
Low-level Input	V _{IL}	GND	-	0.3 V _{DDIO}	V
High-level Output @0.1mA	V _{OH}	0.8 V _{DDIO}	-	V _{DDIO}	V
Low-level Output @0.1mA	V _{OL}	GND	-	0.2 V _{DDIO}	V

8. Optical Characteristics

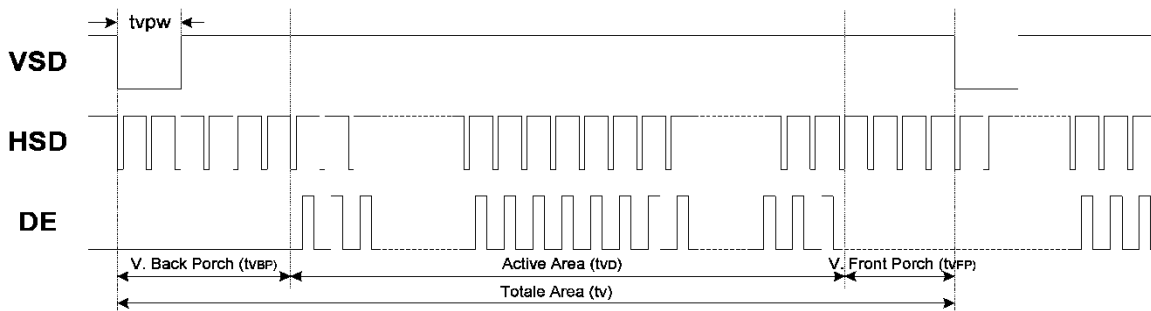
Item	Symbol	Condition	Min	Typical	Max	Unit
Color Gamut	S(%)	-	-	60	-	%
Contrast Ratio	CR	-	600	800	-	-
TFT Response Time	T rise	-	-	5	10	ms
	T fall		-	15	25	ms
Red Chromaticity	R _x	-	0.588	0.608	0.628	ms
	R _y		0.296	0.316	0.336	ms
Green Chromaticity	G _x	-	0.285	0.305	0.325	ms
	G _y		0.536	0.566	0.576	ms
Blue Chromaticity	B _x	-	0.115	0.135	0.155	ms
	B _y		0.117	0.137	0.157	ms
White Chromaticity	W _x	-	0.285	0.305	0.325	ms
	W _y		0.314	0.334	0.354	ms
Viewing Angle, Horizontal	θ _{x+}	Center CR≥10	-	60	-	°
	θ _{x-}			60		
Viewing Angle, Vertical	θ _{y+}		-	50	-	°
	θ _{y-}			70		
Viewing Direction	12 o'clock					

11. Horizontal Input Timing



Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Horizontal display area	t_{HD}	-	800	-	CLKIN
CLKIN frequency	f_{clk}	-	33.3	-	MHz
Horizontal line period	t_H	862	1056	1200	CLKIN
HSD Pulse Width	t_{HPW}	1	-	40	CLKIN
HSD Back Porch	t_{HBP}	46	46	46	CLKIN
HSD Font Porch	t_{HFP}	16	210	46	CLKIN

12. Vertical Input Timing



Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Vertical Display Area	t_{vD}	-	480	-	HSD
VSD Period Time	t_v	510	525	650	HSD
VSD Pulse Width	t_{vpw}	1	-	20	HSD
VSD Back Porch	t_{vBP}	23	23	23	HSD
VSD Font Porch	t_{vFP}	7	22	147	HSD

13. LCD Module Precautions

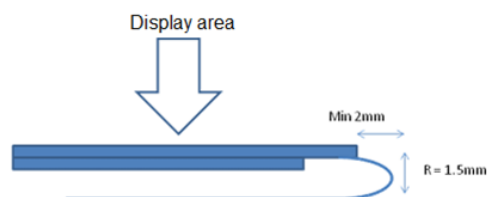
The precautions below should be followed when using LCD modules to help ensure personal safety, module performance, and compliance of environmental regulations.

13.1. Modules

- Do not alter, disassemble or modify the module.
- Do not make additional holes on the printed circuit board, modify its shape or change components.
- Do not solder anything – the connector is a ZIF FPC connector.
- Do not operate the LCD display module above the absolute maximum rating.
- Do not drop, bend or twist the LCD display module.
- Store in an anti-static electricity container and clean environment.
- LCD lifetime is limited by the backlight. Dimming or turning off the backlight can extend the module operational lifetime.

13.2. Handling Precautions

- Since the display panel is made of glass, do not apply mechanical impacts or drop it.
- If the display panel is accidentally broken, and the internal organic substance leaks out, be careful not to inhale or touch the organic substance.
- If pressure is applied to the display surface or its neighborhood of the LCD display module, the cell structure may be damaged, so be careful not to apply pressure to these sections.
- The polarizer covering the surface of the LCD display module is soft and can be easily scratched. Please be careful when handling the LCD display module.
- Clean the surface of the polarizer covering the LCD display module if it becomes soiled using following adhesion tape.
 - Scotch Mending Tape No. 810 or an equivalent
 - Do not use solvents (alcohol, acetone, water et c.), this may make the surface of the polarizer cloudy.
- Hold the LCD display module very carefully when placing the LCD display module into the system housing.
- Do not apply excessive mechanical stress or pressure to the LCD display module.
- Do not bend the FPC sharply.



- The product enclosure should protect the LCD and prevent stresses on the LCD
- Do not apply input signals while the logic power is off.
- The bar module is ESD sensitive. Use appropriate ESD-safe environment, tools and procedures.

13.3. Storage Precautions

- When storing the LCD display modules put them in static electricity preventive bags to ESD damage.
- Avoid exposure to direct sunlight, high temperature and high humidity environments.
- Do not allow the module to become wet.
- Observe the storage temperature specification.

14. General Information

Datasheet Revision History

Datasheet Release: **2018-11-07**: Added RGB timing information, more clear drawing, backlight example driving circuit.
Previous Release: **2017-09-12**: Datasheet for the CFAF800480A-050T-TS TFT graphic display module.

Product Change Notifications

You can check for or subscribe to [Part Change Notices](#) for this display module on our website.

Variations

Slight variations between lots are normal (e.g., contrast, color, or intensity).

Volatility

This display module has volatile memory.

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