



HDMI TFT LCD DISPLAY MODULE



Datasheet Release Date 2022-08-03
for

CFAM1280800A1-101TC

Crystalfontz America, Inc.

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1. General Information

Datasheet Revision History

Datasheet Release: **2022-08-03**
Datasheet for the CFAM1280800A1-101TC 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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2. Module Description

This 10.1-inch display module includes a 1280x800 IPS TFT display, a capacitive touch screen, and a control board with HDMI interface. This display module has two 40-pin connectors, that pass-through the Raspberry Pi's (RPi) 40-pin connector – so all of the RPi's functionality is still available.

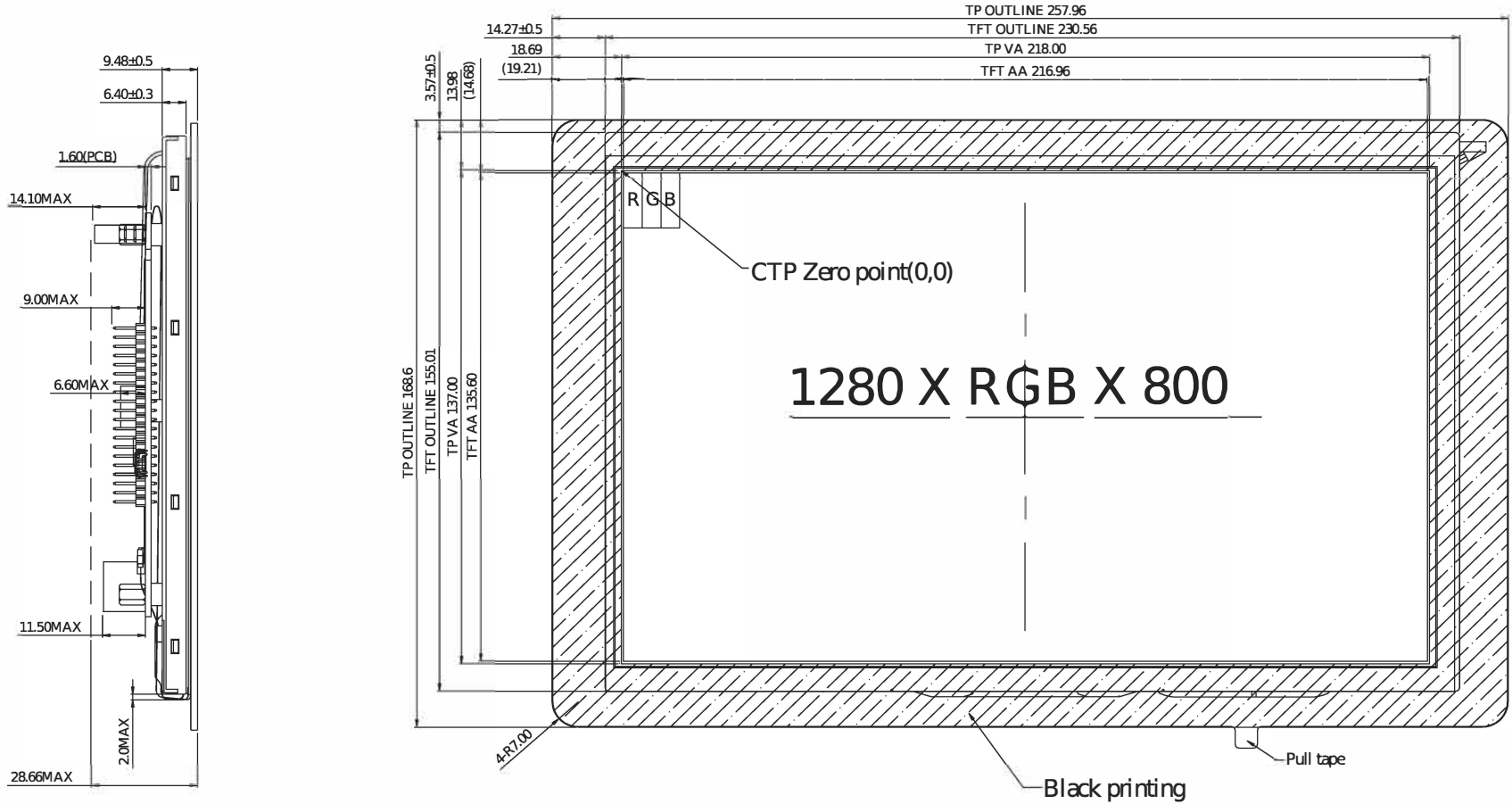
3. Features

- 1280*800 Dot Matrix
 - IPS Transmissive
 - White LED Backlight
 - Operating Temperature: -20°C to +70°C
 - Aspect Ratio: 16:10
 - Interface: HDMI
 - Capacitive Touch (GT928 or equivalent controller)
 - Compatible OS: Windows and Linux (including Raspbian and OS X)

4. Mechanical Data

Item	Specification (mm)	Specification (inch, reference)
Overall Width and Height	257.96 (W) x 168.6 (H) x 28.7 (D)	10.2 (W) x 6.6 (H) x 1.1 (D)
Viewing Area	218.00 (W) x 137.00 (H)	8.583 (W) x 5.394 (H)
Active Area	216.96 (W) x 135.60 (H)	8.542 (W) x 5.339 (H)
Dot Pitch	0.1695 (W) x 0.1695 (H)	0.0067 (W) x 0.0067 (H)
Weight (Typical)	710 grams	25 ounces

5. Mechanical Drawings

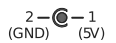


Units: Millimeters
 Tolerance: 0.3 mm

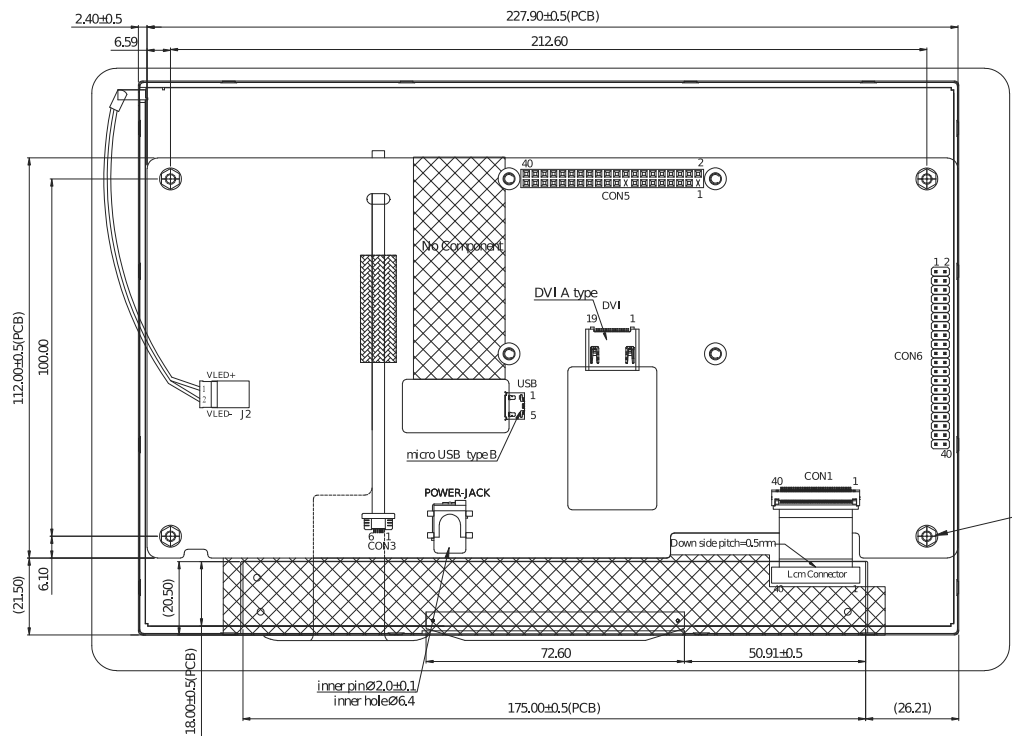
CON5				CON6			
Pin	Symbol	Pin	Symbol	Pin	Symbol	Pin	Symbol
1	NC	21	GPIO09	1	3.3V	21	GPIO09
2	5V	22	GPIO25	2	5V	22	GPIO25
3	GPIO02	23	GPIO11	3	GPIO02	23	GPIO11
4	5V	24	GPIO08	4	5V	24	GPIO08
5	GPIO03	25	GND	5	GPIO03	25	GND
6	GND	26	GPIO07	6	GND	26	GPIO07
7	GPIO04	27	ID_SD	7	GPIO04	27	ID_SD
8	GPIO14	28	ID_SC	8	GPIO14	28	ID_SC
9	GND	29	GPIO05	9	GND	29	GPIO05
10	GPIO15	30	GND	10	GPIO15	30	GND
11	GPIO17	31	GPIO06	11	GPIO17	31	GPIO06
12	BL-PWM (GPIO18)	32	GPIO12	12	BL-PWM (GPIO18)	32	GPIO12
13	GPIO27	33	GPIO13	13	GPIO27	33	GPIO13
14	GND	34	GND	14	GND	34	GND
15	GPIO22	35	GPIO19	15	GPIO22	35	GPIO19
16	GPIO23	36	GPIO16	16	GPIO23	36	GPIO16
17	NC	37	GPIO26	17	3.3V	37	GPIO26
18	GPIO24	38	GPIO20	18	GPIO24	38	GPIO20
19	GPIO10	39	GND	19	GPIO10	39	GND
20	GND	40	GPIO21	20	GND	40	GPIO21

DVI	
Pin	Symbol
1	RX2+
2	GND
3	RX2-
4	RX1+
5	GND
6	RX1-
7	RX0+
8	GND
9	RX0-
10	RXC+
11	GND
12	RXC-
13	NC
14	NC
15	SCL
16	SDA
17	GND
18	5V
19	Detect

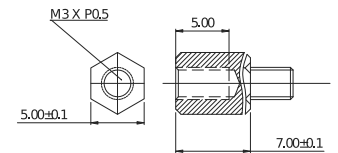
POWER JACK	
Pin	Symbol
1	5V
2	GND
3	NC



USB	
Pin	Symbol
1	5V
2	D-
3	D+
4	NC
5	GND



Hex Standoffs: 4-M3*P0.5



Hex Standoffs SCALE: 3/1

Units: Millimeters
Tolerance: 0.3 mm

6. Interface Pin Function

6.1. LCM Pin Definition (CON6) – Pass through of RPi's 40-pin header

Pin	Symbol	Function
1	3.3V	Raspberry Pi: Power 3.3V ¹
2	5V	Raspberry Pi: Power 5V
3	GPIO02	Raspberry Pi: GPIO02
4	5V	Raspberry Pi: Power 5V
5	GPIO03	Raspberry Pi: GPIO03
6	GND	Raspberry Pi: GND
7	GPIO04	Raspberry Pi: GPIO04
8	GPIO14	Raspberry Pi: GPIO14
9	GND	Raspberry Pi: GND
10	GPIO15	Raspberry Pi: GPIO15
11	GPIO17	Raspberry Pi: GPIO17
12	BL-PWM GPIO18	Backlight Enable, Active low Raspberry Pi: GPIO18
13	GPIO27	Raspberry Pi: GPIO27
14	GND	Raspberry Pi: GND
15	GPIO22	Raspberry Pi: GPIO22
16	GPIO23	Raspberry Pi: GPIO23
17	3.3V	Raspberry Pi: Power 3.3V ¹
18	GPIO24	Raspberry Pi: GPIO24
19	GPIO10	Raspberry Pi: GPIO10
20	GND	Raspberry Pi: GND
21	GPIO09	Raspberry Pi: GPIO09
22	GPIO25	Raspberry Pi: GPIO25
23	GPIO11	Raspberry Pi: GPIO11
24	GPIO08	Raspberry Pi: GPIO08
25	GND	Raspberry Pi: GND
26	GPIO07	Raspberry Pi: GPIO07
27	ID_SD	Raspberry Pi: ID_SD
28	ID_SC	Raspberry Pi: ID_SC
29	GPIO05	Raspberry Pi: GPIO05
30	GND	Raspberry Pi: GND
31	GPIO06	Raspberry Pi: GPIO06
32	GPIO12	Raspberry Pi: GPIO12
33	GPIO13	Raspberry Pi: GPIO13
34	GND	Raspberry Pi: GND
35	GPIO19	Raspberry Pi: GPIO19
36	GPIO16	Raspberry Pi: GPIO16
37	GPIO26	Raspberry Pi: GPIO26
38	GPIO20	Raspberry Pi: GPIO20
39	GND	Raspberry Pi: GND
40	GPIO21	Raspberry Pi: GPIO21

1. Pins 1 and 17 are limited to output of 3.3v,100mA due to the TFT power limit



6.2. LCM Pin Definition (CON6) – Pass through of RPi's 40-pin header, no 3.3v

Pin	Symbol	Function
1	NC	No Connection
2	5V	Raspberry Pi: Power 5V
3	GPIO02	Raspberry Pi: GPIO02
4	5V	Raspberry Pi: Power 5V
5	GPIO03	Raspberry Pi: GPIO03
6	GND	Raspberry Pi: GND
7	GPIO04	Raspberry Pi: GPIO04
8	GPIO14	Raspberry Pi: GPIO14
9	GND	Raspberry Pi: GND
10	GPIO15	Raspberry Pi: GPIO15
11	GPIO17	Raspberry Pi: GPIO17
12	BL-PWM GPIO18	Backlight Enable, Active low Raspberry Pi: GPIO18
13	GPIO27	Raspberry Pi: GPIO27
14	GND	Raspberry Pi: GND
15	GPIO22	Raspberry Pi: GPIO22
16	GPIO23	Raspberry Pi: GPIO23
17	NC	No Connection
18	GPIO24	Raspberry Pi: GPIO24
19	GPIO10	Raspberry Pi: GPIO10
20	GND	Raspberry Pi: GND
21	GPIO09	Raspberry Pi: GPIO09
22	GPIO25	Raspberry Pi: GPIO25
23	GPIO11	Raspberry Pi: GPIO11
24	GPIO08	Raspberry Pi: GPIO08
25	GND	Raspberry Pi: GND
26	GPIO07	Raspberry Pi: GPIO07
27	ID_SD	Raspberry Pi: ID_SD
28	ID_SC	Raspberry Pi: ID_SC
29	GPIO05	Raspberry Pi: GPIO05
30	GND	Raspberry Pi: GND
31	GPIO06	Raspberry Pi: GPIO06
32	GPIO12	Raspberry Pi: GPIO12
33	GPIO13	Raspberry Pi: GPIO13
34	GND	Raspberry Pi: GND
35	GPIO19	Raspberry Pi: GPIO19
36	GPIO16	Raspberry Pi: GPIO16
37	GPIO26	Raspberry Pi: GPIO26
38	GPIO20	Raspberry Pi: GPIO20
39	GND	Raspberry Pi: GND
40	GPIO21	Raspberry Pi: GPIO21

6.3. DVI connector

Pin	Symbol	Function
1	Rx2+	+LVDS Differential Data Input
2	GND	Ground
3	Rx2-	- LVDS Differential Data Input
4	Rx1+	+ LVDS Differential Data Input
5	GND	Ground
6	Rx1-	- LVDS Differential Data Input
7	Rx0+	+ LVDS Differential Data Input
8	GND	Ground
9	Rx0-	- LVDS Differential Data Input
10	RxC+	+ LVDS Differential Clock Input
11	GND	Ground
12	RxC-	-LVDS Differential Clock Input
13	NC	No Connection
14	NC	No Connection
15	SCL	Data Display Channel Clock
16	SDA	Data Display Channel Data
17	GND	Ground
18	5v	Power supply
19	Detect	Hot plug detect

7. Raspberry Pi Configuration

This module is compatible with Raspberry Pi 3 and 4. For Raspberry Pi 4, it can be used with either HDMI output, but specify hdmi:0 or hdmi:1 In the configuration file, add the following:

```
gpu_mem=128
hdmi_force_hotplug=1
hdmi_group=2
hdmi_mode=87
hdmi_cvt 1280 800 60 5 0 0 0
hdmi_drive=1
```

8. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Operating Temperature	T _{OP}	-20	+70	°C	-
Storage Temperature	T _{STG}	-30	+80	°C	-

9. Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage for LCM	V _{DD}	-	4.9	5.0	5.1	V
Supply Current for LCM	I _{DD}	V _{DD} = 5.0V T _A =25°C	-	1.7	2.6	A
LED Lifetime	-	-	-	50k	-	Hours

10. Optical Characteristics

Item		Symbol	Condition	Min	Typ	Max	Unit
Viewing Angle	Hor.	Θ_R	$CR \geq 10$	70	80	-	Degree
		Θ_L		70	80	-	
	Ver.	Φ_T		70	80	-	
		Φ_B		70	80	-	
Contrast Ratio		CR	At Optimized Viewing Angle	800	1000	-	-
Response Time		$T_R + T_F$	$\theta=0^\circ, \phi=0$	-	25	35	ms
Brightness ¹		-	Center of Display	800	900	-	cd/m ²
Color Chromaticity	White	W_x	$\theta=0^\circ, \phi=0$	0.272	0.322	0.372	-
		W_y		0.294	0.344	0.394	

1. The backlight brightness can be adjusted using the PWM signal. A higher duty cycle corresponds to lower brightness.
2. The operation frequency for the PWM signal is 1k-10kHz

11. LCD Module Precautions

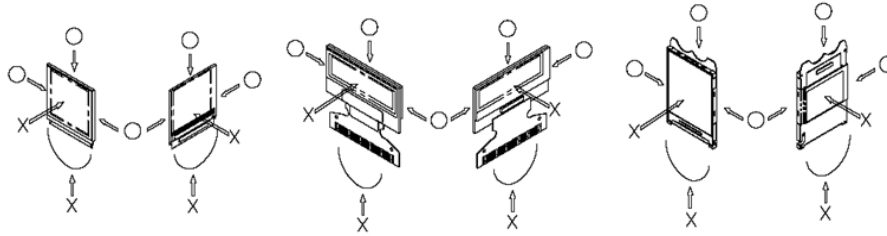
These precautions help ensure personal safety, module performance, and compliance of environmental regulations when using an LCD module.

11.1. Modules

- Avoid excessive physical and electrical shocks to module.
- Do not drop, bend, or twist the LCD display module.
- Do not make extra holes, modify the shape, or change the components of the printed circuit board.
- Do not disassemble the LCD display module.
- Do not operate the LCD display module outside the absolute maximum rating.
- Only solder to the I/O terminals.
- Store in an anti-static electricity container and clean environment.
- Do not display static information for long periods of time to avoid burn in.
- Crystalfontz has the right to change passive components on the display module. Resistors, capacitors and other passive components may have different appearance and color.
- Crystalfontz has the right to change the PCB revision/version in order to satisfy the supply stability, management optimization, the best product performance, etc., under the premise of not affecting the electrical characteristics and external dimensions.

11.2. Handling Precautions

- The display panel is made of glass. Do not apply mechanical impacts, stress or pressure to the LCD display module. Pressure applied to or near the display surface may damage the cell structure.
- If the display panel is broken and the internal organic substance leaks out, do not inhale or touch the organic substance.
- Clean the surface of the polarizer using Scotch Mending Tape No. 810 or an equivalent
 - Never breathe on the surface or wipe the surface using a cloth containing solvent such as ethyl alcohol, as the surface of the polarizer will become cloudy.
 - Water, ketone, and aromatic solvents may ruin the polarizer.
- Do not over bend the film with electrode pattern layouts. This can affect the display performance.



- Do not apply stress to the LSI chips and the surrounding molded sections.
- Do not apply input signals while the logic power is off.
- Prevent damage by electrostatic discharge (ESD) when handling the LCD display module:
 - Ground personnel handling LCD display modules.
 - Ground tools used for assembly such as soldering irons.
 - To suppress generation of ESD, avoid carrying out assembly work under dry environments.
 - Remove the protective film applied to the display panel slowly as ESD may be generated.
- Protective film is applied to the surface of the display panel. Remove the film before assembly. If the LCD display module has been stored for a long period of time, residue adhesive material of the protection film may remain on the surface of the display panel after the film has been removed. In such a case, remove the residue material as discussed above.

11.3. Storing Precautions

- Store LCD display modules in ESD preventative bags. Avoid exposure to direct sunlight and fluorescent lamps. Avoid high temperature and high humidity environments and low temperature environments. We recommend storing these modules in the packaged state in which they were shipped from Crystalfontz.
- Do not let water drops or dew adhere to the packages or bags.
- If electric current is applied when water is on the surface of the LCD display module, the module may become dewed. If a dewed LCD display module is placed under high humidity environments the electrodes may become corroded.

11.4. Designing Precautions

- The absolute maximum ratings cannot be exceeded for LCD display module. If these values are exceeded, panel damage may happen.
- Satisfy the VIL and VIH specifications and, ensure the signal line cable is as short as possible to avoid signal noise. Avoid occurrence of mutual noise interference with the neighboring devices.
- Install excess current preventative unit (fuses, etc.) to the power circuit.
When fastening the LCD display module, fasten the external plastic housing section.
- If the power supply to the LCD display module is forcibly shut down, we cannot guarantee the quality of this LCD display module.
- Connection (contact) to any other potential than the above may lead to rupture of the IC.

11.5. Disposing Precautions

- Request qualified companies handle the industrial waste when disposing of the LCD display modules. Observe all relevant laws and regulations.

11.6. Other Precautions

- When an LCD display module operates for a long period of time with a fixed pattern, the fixed pattern may remain as an after image or a slight contrast deviation may occur.
 - If the operation is interrupted and left unused for a while, normal state can be restored.
 - This will not cause a problem in the reliability of the module.
- To protect the LCD display module from performance drops by static electricity rapture, etc., do not touch the following sections whenever possible while handling the LCD display modules:
 - Pins and electrodes
 - Pattern layouts such as the TCP & FPC
- Design the product and installation method so that the LCD driver may be shielded from light in actual usage and during the inspection processes.
- This LCD display module stores the operation state data by the commands and the indication data. When exposed excessive external noise, the internal status may change. Therefore, it is necessary to suppress noise generation or to protect from influences of noise on the system design.
- Periodically refresh the operation statuses in the software (reset the commands and retransfer the display data), to cope with catastrophic noise.