



CHARACTER LCD MODULE DATASHEET



Datasheet Release Date 2020-03-26
for
CFAH0802A-NYG-JT

Revision B0

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1. General Information

Datasheet Revision History

Datasheet Release: **2020-03-26**

Datasheet for the CFAH0802A-NYG-JT character LCD 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 is an 8 character by 2-line small LCD display with no backlight. This module has a built in Sitronix ST7066U controller. The Sitronix ST7066U is compatible with the industry standard Hitachi HD44780 controller.

Please see [Sitronix ST7066U LCD Controller Datasheet](#) for further reference.

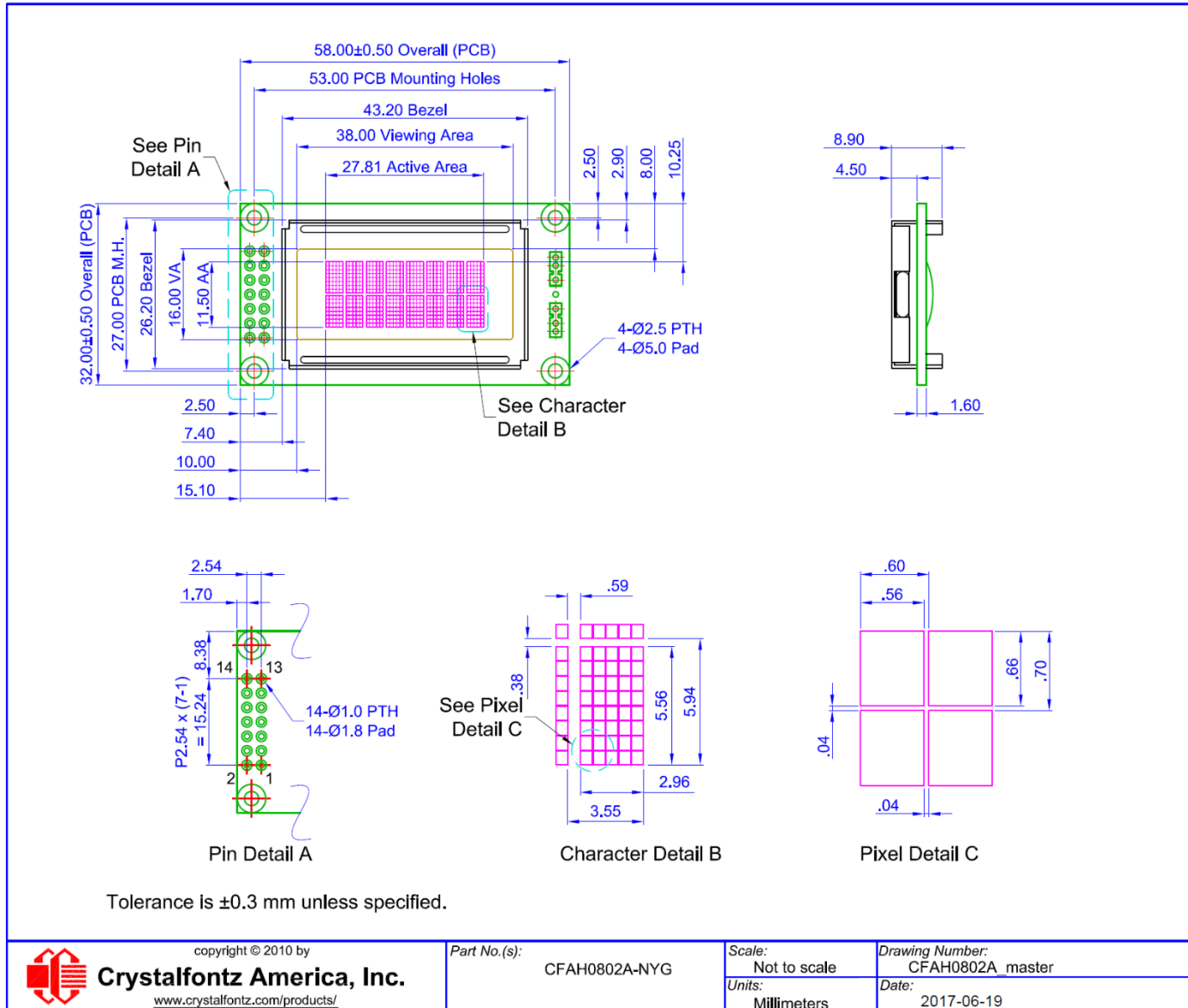
3. Features

- Built-in Controller: ST7066 (or equivalent)
- STN Positive, Yellow-green, Reflective Mode
- +5v Power Supply
- Viewing Direction: 6 o'clock
- 1/16 Duty
- No backlight
- Wide Temperature Operation: -20°C to +70°C
- Interface: 6800 (default), optional SPI / I²C

4. Mechanical Data

Item	Specification (mm)	Specification (inch, reference)
Overall Width and Height	58.0 (W) x 32.0 (H) x 8.9 (D)	2.283 (W) x 1.259 (H) x 0.350 (D)
Viewing Area	38.0 (W) x 16.0 (H)	1.496 (W) x 0.629 (H)
Active Area	27.81 (W) x 11.5 (H)	1.095 (W) x 0.453 (H)
Character Size	2.96 (W) x 5.56 (H)	0.117 (W) x 0.219 (H)
Character Pitch	3.55 (W) x 5.94 (H)	0.139 (W) x 0.234 (H)
Dot Size	0.56 (W) x 0.66 (H)	0.022 (W) x 0.026 (H)
Dot Pitch	0.60 (W) x 0.70 (H)	0.024 (W) x 0.028 (H)
Weight (Typical)	16 grams	0.56 ounces

5. Mechanical Drawing

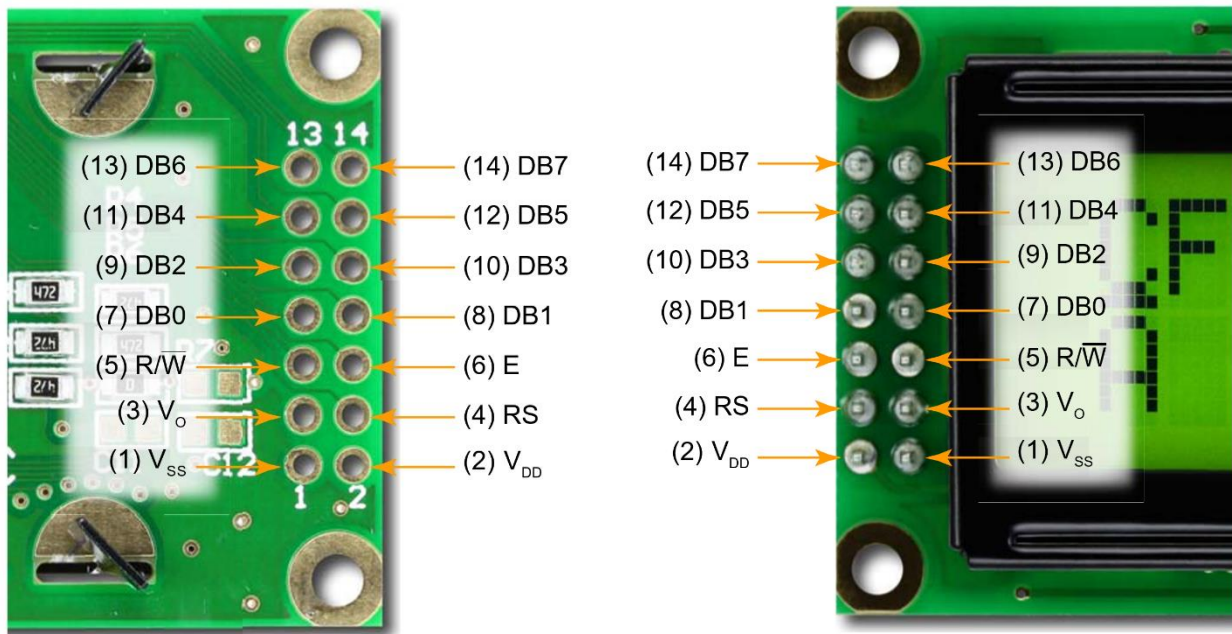


6. Interface Pin Function

6.1. Pin Function Table

Pin No.	Symbol	Function
1	V _{SS}	Ground
2	V _{DD}	Supply Voltage for Logic
3	V _O	Supply Voltage for LCD
4	RS	H: Data L: Instruction Code
5	R/W	H: Read L: Write
6	E	Chip Enable Signal
7	DB0	Data Bus Line
8	DB1	Data Bus Line
9	DB2	Data Bus Line
10	DB3	Data Bus Line
11	DB4	Data Bus Line
12	DB5	Data Bus Line
13	DB6	Data Bus Line
14	DB7	Data Bus Line

6.2. Pin Function Quick Reference Diagrams



7. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Supply Voltage for Logic	$V_{DD} - V_{SS}$	-0.3	-	7	V	(1)(2)
Supply Voltage for LCD	$V_{DD} - V_O$	-0.3	-	13	V	(1)(2)
Input Voltage	V_I	V_{SS}	-	V_{DD}	V	-
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.

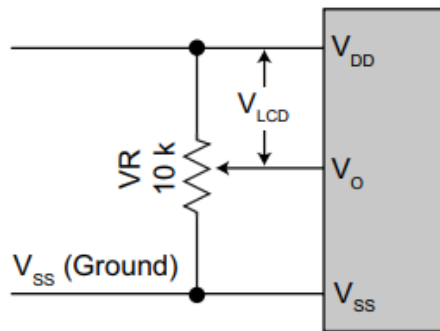
8. Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage for Logic	$V_{DD} - V_{SS}$	-	4.5	5.0	5.5	V
Supply Voltage for LCD	$V_{DD} - V_O$	$T_a=20^{\circ}\text{C}$	-	-	5.5	V
		$T_a=25^{\circ}\text{C}$	4.2	4.35	4.5	V
		$T_a=70^{\circ}\text{C}$	3.5	-	-	V
High-level Input	V_{IH}	-	$0.7 \times V_{DD}$	-	V_{DD}	V
Low-level Input	V_{IL}	-	V_{SS}	-	0.6	V
High-level Output	V_{OH}	-	3.9	-	V_{DD}	V
Low-level Output	V_{OL}	-	0	-	0.4	V
Supply Current	I_{DD}	$V_{DD} = 5.0\text{V}$	1.0	1.2	1.5	mA

9. Optical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
View Angle	θ	$CR \geq 2$	0	-	20	$\phi = 180^{\circ}$
	θ	$CR \geq 2$	0	-	40	$\phi = 0^{\circ}$
	θ	$CR \geq 2$	0	-	30	$\phi = 90^{\circ}$
	θ	$CR \geq 2$	0	-	30	$\phi = 270^{\circ}$
Contrast Ratio	CR	-	-	3	-	-
Response Time	T rise	-	-	150	200	ms
	T fall	-	-	150	200	ms

10. Typical V_O Connections for Display Contrast



Set V_O to +1v such that $V_{LCD} = +4v$ as an initial setting. Using the potentiometer VR, adjust V_O for optimal display appearance.

CrystalFontz recommends allowing field adjustment of V_O for all designs. The optimal value of V_O changes with temperature, variations in V_{DD} , and viewing angle. V_O will also vary module-to-module and batch-to-batch due to normal manufacturing variations. If exposing adjustments to V_O is not possible, CrystalFontz recommends enabling adjustment of V_O as part of a product's final test.

Although a potentiometer is shown as a typical connection, V_O can be driven by a microcontroller, using either a DAC or a filtered PWM. Displays that require V_O to be negative may require a level shifting circuit.

11. Character Generator ROM (CGROM)

Upper 4 bit Lower 4 bit	LLLL	LLLH	LLHL	LLHH	LHLL	LHLH	LHHL	LHHH	HLLL	HLLH	HLHL	HLHH	HHLL	HHLH	HHHL	HHHH
LLLL	CG RAM (1)			0	1	2	3	4				5	6	7	8	9
LLLH	(2)	!	0	1	2	3	4				5	6	7	8	9	:
LLHL	(3)	"	0	1	2	3	4				5	6	7	8	9	;
LLHH	(4)	#	0	1	2	3	4				5	6	7	8	9	<
LHLL	(5)	\$	0	1	2	3	4				5	6	7	8	9	=
LHLH	(6)	%	0	1	2	3	4				5	6	7	8	9	>
LHHL	(7)	&	0	1	2	3	4				5	6	7	8	9	?
LHHH	(8)	'	0	1	2	3	4				5	6	7	8	9	@
HLLL	(1)	(	0	1	2	3	4				5	6	7	8	9	[
HLLH	(2)	)	0	1	2	3	4				5	6	7	8	9]
HLHL	(3)	*	0	1	2	3	4				5	6	7	8	9	^
HLHH	(4)	+	0	1	2	3	4				5	6	7	8	9	_
HHLL	(5)	,	0	1	2	3	4				5	6	7	8	9	~
HHLH	(6)	-	0	1	2	3	4				5	6	7	8	9	°
HHHL	(7)	.	0	1	2	3	4				5	6	7	8	9	´
HHHH	(8)	/	0	1	2	3	4				5	6	7	8	9	

12. 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.

12.1. Modules

- Avoid applying excessive shocks to the module or making any modifications to it.
- Do not make extra holes on the printed circuit board, modify its shape or change the components of the LCD display module.
- Do not disassemble the LCD module.
- Do not drop, bend or twist the LCD module.
- Do not operate the LCD module above its absolute maximum ratings described in this datasheet.
- Solder only to the I/O terminals. Use care when removing solder—it is possible to damage the PCB, for modules with an FPC, use an appropriate ZIF connector.
- Do not reverse polarity to the power supply connections. Reversing polarity will immediately ruin the module.
- Store LCD modules in a clean and static safe environment.

12.2. Handling Precautions

- Take care to not damage the glass display panel
- If the display panel is broken, organic liquid crystal may leak out, avoid bodily contact with this fluid and dispose of the broken module properly.
- Avoid the application of pressure to the display module, as pressure may damage the LCD module's cell structure.
- Polarizers installed on LCD modules are soft and susceptible to scratching, avoid contact between the polarizer and abrasive surfaces.
- Do not use any solvents or liquid to clean the LCD display module, should an LCD need cleaning, contaminants can be removed with plain office tape or oil free compressed air.
- Ensure any mounting solution of the LCD module secures the module fully and protects the module from mechanical stresses
- Do not operate LCD modules in the presence of excessive humidity or condensation
- Dispose of any electronic waste properly. Do not place this module in the normal trash. Please contact local waste management from procedures to dispose of electronic waste.
- Do not place weight on the module.