



## TFT DISPLAY MODULE DATA SHEET



Datasheet Release 2016-09-19 for  
[CFAF240320A-032T-TS](#) and [CFAF240320A-032T](#)

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### Datasheet Revision History

CFAF240320A-032T and CFAF240320A-032T-TS Datasheet Release 2016-09-19  
Caution note and slight change to Forward Current made in [LED BACKLIGHT CHARACTERISTICS \(Pg. 28\)](#). Some unnecessary sections were removed from the datasheet. The displays have not changed.

CFAF240320A-032T and CFAF240320A-032T-TS Datasheet Release: 2015-09-21  
In section LED BACKLIGHT CHARACTERISTICS, corrected from  
“The backlight is edge-lit with 4 white LEDs in **parallel**.”  
to  
“The backlight is edge-lit with 4 white LEDs in **series**.”  
and corrected from  
“Forward Current ( $I_{LED}$ ) = **80 mA**”  
to  
“Forward Current ( $I_{LED}$ ) = **20 mA**”

CFAF240320A-032T and CFAF240320A-032T-TS Data Sheet Release 2015-03-13

- Combined the CFAF240320A-032T preliminary data sheet published 2012-05-04 and the CFAF240320A-032T-TS data sheet published 2015-01-23 into this one updated data sheet.
- Expanded information to match current data sheet standards.
- Minor corrections to ELECTRICAL SPECIFICATIONS.

Data Sheet Release 2015-01-23 for CFAF240320A-032T only:

- Removed “Preliminary” watermark on Data Sheet.
- On this page, notices About Variations and About Volatility were added.
- Display module weight is added to Mechanical Specifications (Pg. 7) (23 grams).
- See important note added at the bottom of Display Module Outline Drawing (Pg. 8). This drawing shows the TFT with the touch screen (CFAF240320A-032T-TS). Except for the “TP” dimensions and the overall depth, all other dimensions are identical. The depth for CFAF240320-032T listed in the preliminary Data Sheet under Mechanical Specifications (Pg. 7) was correct and has not changed.
- Operating and storage temperature range was corrected in Absolute Maximum Ratings (Pg. 10). The temperature range now matches what was previously stated in Physical Characteristics (Pg. 6).
- In Details Of Interface Pin Functions (Pg. 12), changed touch panel (touch screen) pins to NC (No Connect.) The CFAF240320A-032T has no touch screen. However, we do sell a touch screen version of this TFT module CFAF240320A-032T-TS.
- In addition to Reliability Test Results, additional information was added in new section RELIABILITY AND LONGEVITY (Pg. 20). Box drop test results was removed.
- Text for cautions and handling precautions was rewritten in new section CARE AND HANDLING PRECAUTIONS (Pg. 22).

Preliminary Data Sheet Release: 2012-04-25  
New product.



### Hardware Updates

To see update notices, check the Product Notices tab on the product page. Product pages without a tab do not have product notices.

### About Variations

We work continuously to improve our products. Because display technologies are quickly evolving, these products may have component or process changes. Slight variations (for example, contrast, color, or intensity) between lots are normal. If you need the highest consistency, whenever possible, order and arrange delivery for your production runs at one time so your displays will be from the same lot.

### About Volatility

This display module has volatile memory.

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All specifications in Datasheets and on our website are, to the best of our knowledge, accurate but not guaranteed. Corrections to specifications are made as any inaccuracies are discovered.

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## MAIN FEATURES

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- These display modules have a full color active matrix TFT (Thin Film Transistor) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device.
- The 240 x RGB x 320 (262K ) display modules are composed of a transmissive TFT an integrated driver IC, an FFC/FPC flexible cable, and a white LED backlight unit.
  - The *CFAF240320A-032T-TS* has a 4-wire analog resistive touch screen.
  - The *CFAF240320A-032T* does not have a touch screen.
- Active Area for both display modules is 3.2" diagonal, 48.60 (W) x 64.80 (H) millimeters (1.91" (W) x 2.55" (H)).
- Host interface choices:
  - 8-bit, 9-bit 8-bit, 16-bit, 18-bit parallel
  - 3 wire & 4 wire SPI
  - DOT-CLK interface / Generic RGB
- Requires only a single source 3.3v for both power supply and logic.
- For interface information and other details on the integrated ILITEK ILI9325 or compatible driver, see [controller data-sheets](#) on our website.
- The display module's 45-pin FFC/FPC flexible cable mates with standard 0.5 mm ZIF sockets such as [609-1196-1-ND](#) available from Digi-Key.
- Transmissive display with edge-lit LED backlight (4 white LEDs). The white LED backlight has anode (A,+) and cathode (K -) pins brought out on a separate flexible tail.
- 9:00 o'clock viewing angle (polarizer viewing direction). Use in portrait or landscape orientation.
- Temperature operation range is from -20°C to +70°C.
- To get you started, free downloadable sample code is under the DATASHEETS & FILES tab on the display module's website page.
- RoHS compliant. CrystalFontz America and factory are ISO certified.
- To make prototyping quick and easy, we offer these display modules mounted on carrier boards ([CFAF240320A-032T-CB](#) and [CFAF240320A-032T-TS-CB](#)). The carrier boards support a current driver for the LED backlight of the display.



# MECHANICAL SPECIFICATIONS

## PHYSICAL CHARACTERISTICS

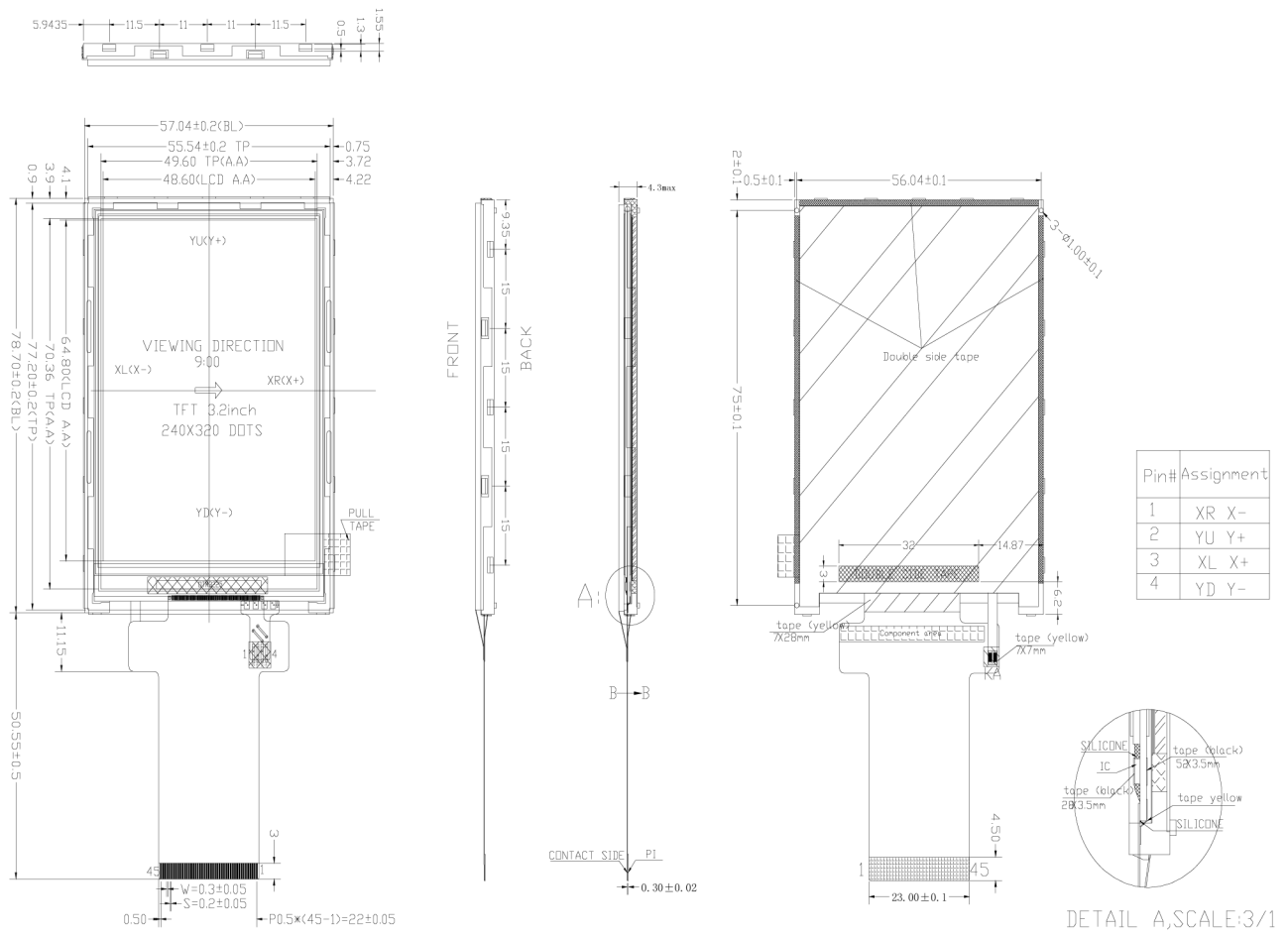
ITEM	SPECIFICATION
<b>Active Area</b>	
Active Area Diagonal	Inches: 3.2"
Active Area Width	Millimeters: 48.60 (W) mm Inches: 1.91" (W)
Active Area Height	Millimeters: 64.80 (H) mm Inches: 2.55" (H)
<b>Viewing Area</b>	<i>CFAF240320A-032T:</i> Millimeters: 50.60 (W) x 66.80 (H) mm Inches: 1.99" (W) x 2.62" (H)  <i>CFAF240320A-032T-TS</i> Touch Screen Viewing Area is same as Active Area.
<b>Display Modules Outline Dimensions</b>	
Overall Modules Width	Millimeters: 57.04 (W) mm Inches: 2.25" (W) mm
Overall Module Height With FFC/FPC Flexible Tails Unfolded*	Millimeters: 129.25 (H) mm Inches: 5.19" (H) mm
Overall Module Height Without FFC/FPC Flexible Tails	Millimeters: 78.70 (H) mm Inches: 3.09" (H) mm
<i>*For reference only. Shape and length of tail may vary.</i>	
Module Depth	<i>CFAF240320A-032T:</i> Millimeters: 3.10 (D) mm Inches: 0.12" (D)  <i>CFAF240320A-032T-TS:</i> Millimeters: 4.3 (D) mm Inches: 0.17" (D)
<b>Weight</b>	<i>CFAF240320A-032T</i> 23 grams  <i>CFAF240320A-032T-TS:</i> 33 grams
<b>FFC/FPC Flexible Tail</b>	
FPC/FFC Tail Connector Pitch	0.5 mm



ITEM (Continued)	SPECIFICATION
CFAF240320A-032T-TS Touch Screen Connector Pitch	1.0 mm
Tails Bend Radius	>R.5.0 mm
<p><i>Tail Notes:</i> The display module's 45-pin FFC/FPC flexible cable mates with standard 0.5 mm ZIF sockets such as <a href="#">609-1196-1-ND</a> available from Digi-Key.</p> <p>The CFAF240320A-032T-TS touch screen FFC/FPC flexible tail mates with 1.00 mm pitch spaced ZIF sockets such as <a href="#">609-1883-1-ND</a> or <a href="#">609-1886-1-ND</a> from Digi-Key.</p>	



# DISPLAY MODULE OUTLINE DRAWING



CIRCUIT DIAGRAM



This drawing shows the touch screen (TP) on CFAF240320A-032T-TS. The CFAF240320A-032T has identical dimensions except it has no touch screen. Without the touch screen, depth is 3.1 mm.

Drawing deemed accurate but not guaranteed.

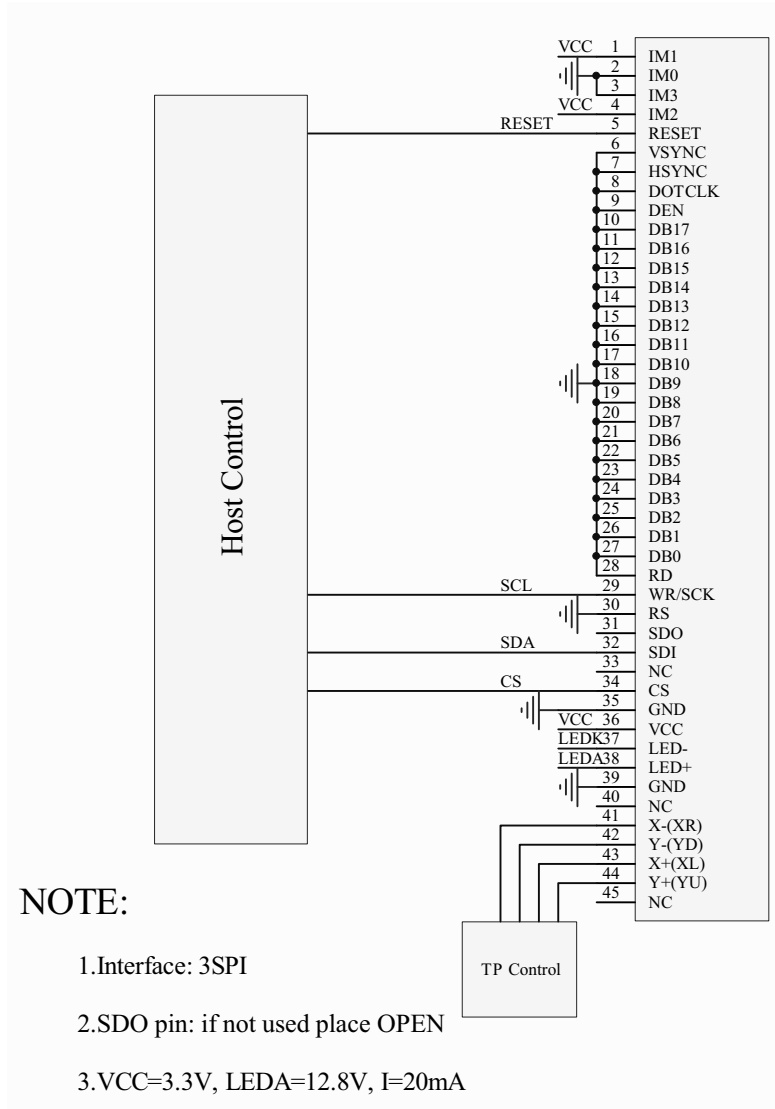




## SYSTEM BLOCK DIAGRAMS

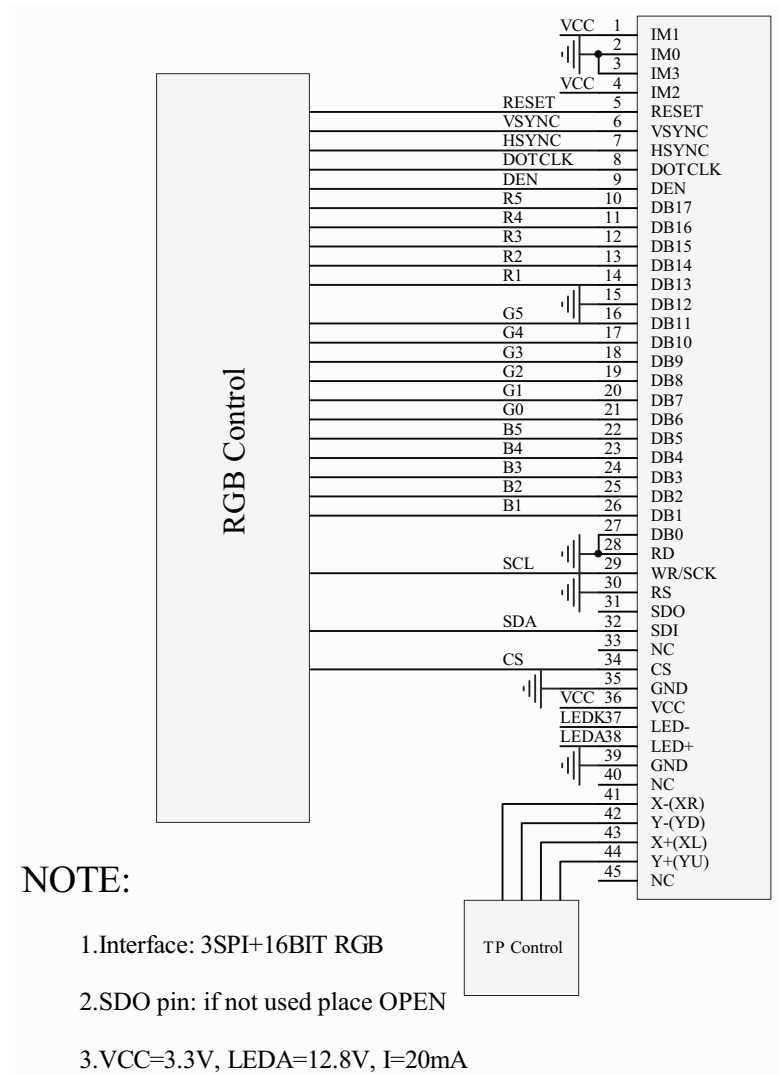
Pin descriptions are shown for the various interfaces below. These diagrams are for the *CFAF240320A-032T-TS*, which has a touch screen. For the *CFAF240320A-032T* (no touch screen), pins 41-44 are "NC". Make no connection.

### 3-Wire SPI



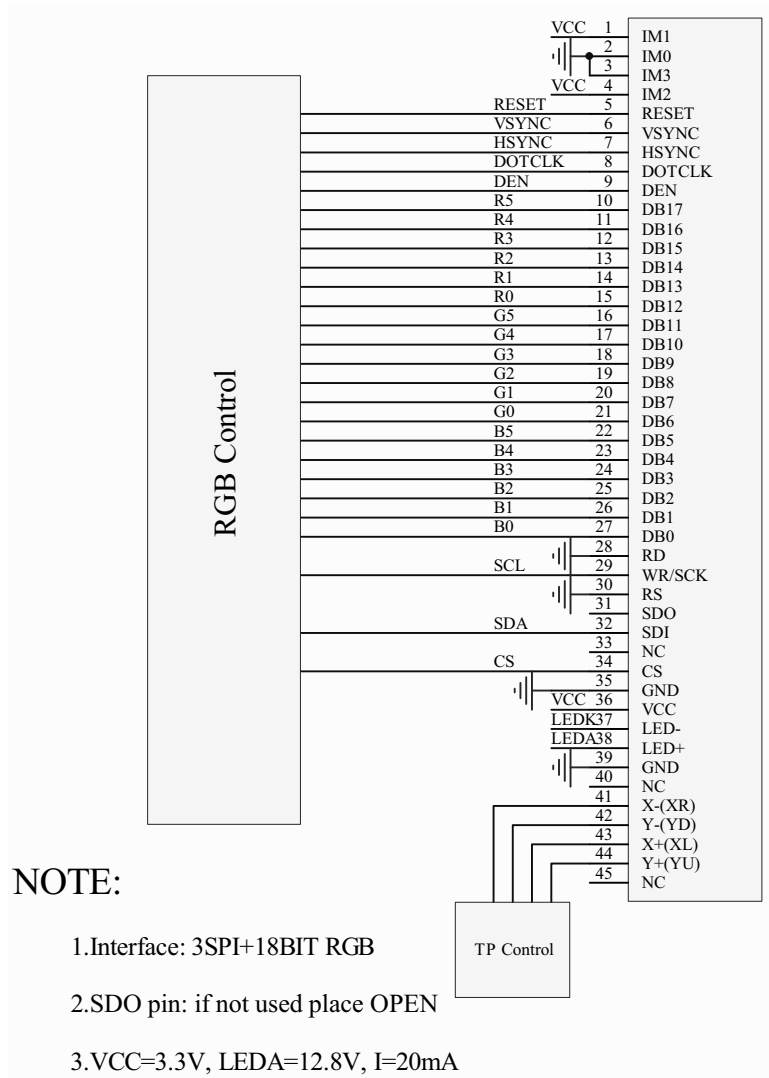


### 3-Wire SPI + 16-Bit RGB



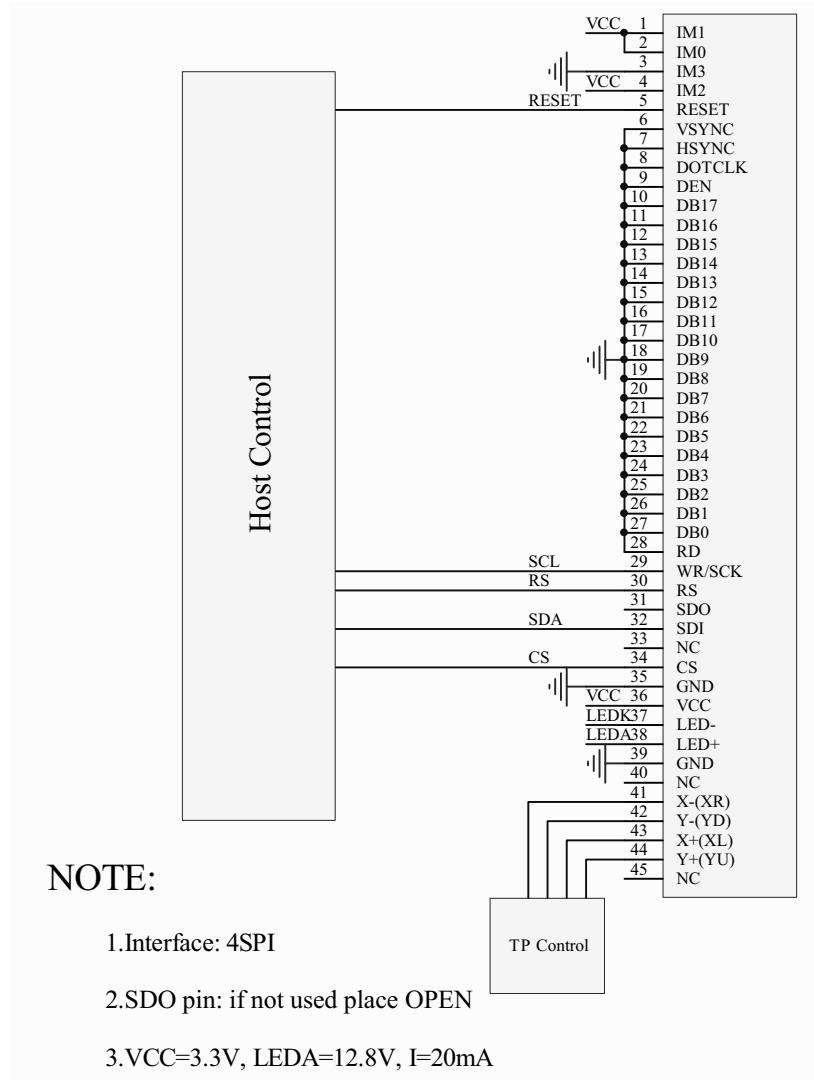


### 3-Wire SPI + 18-Bit RGB



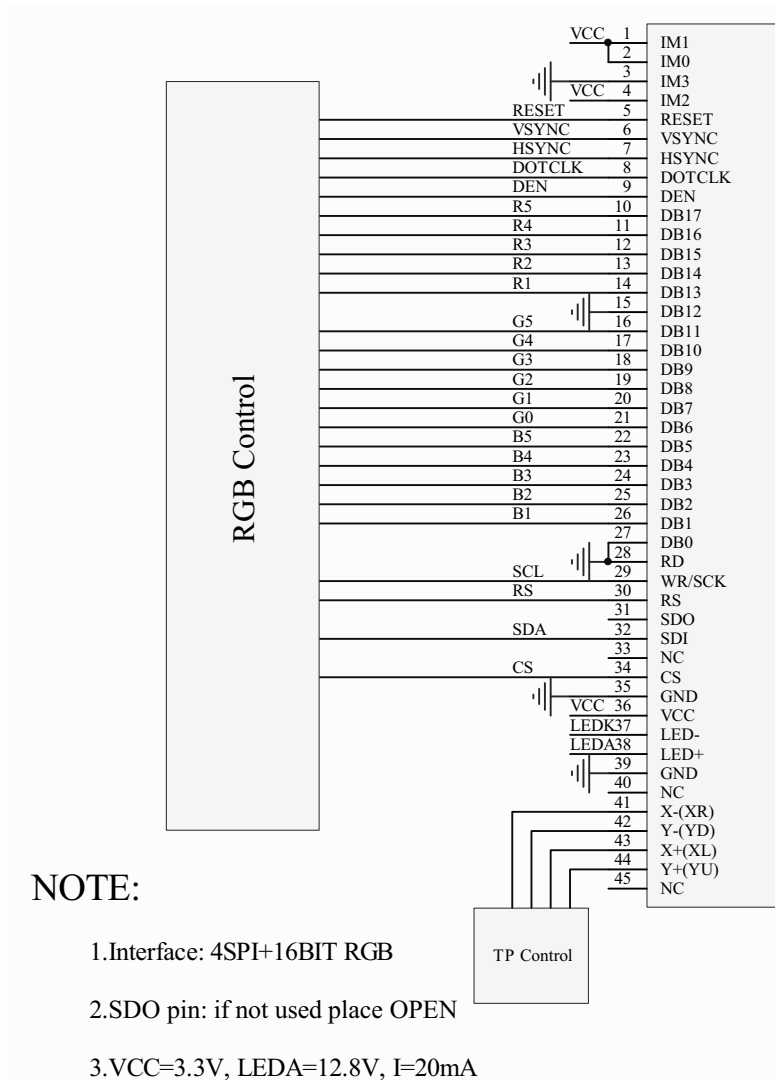


### 4-Wire SPI



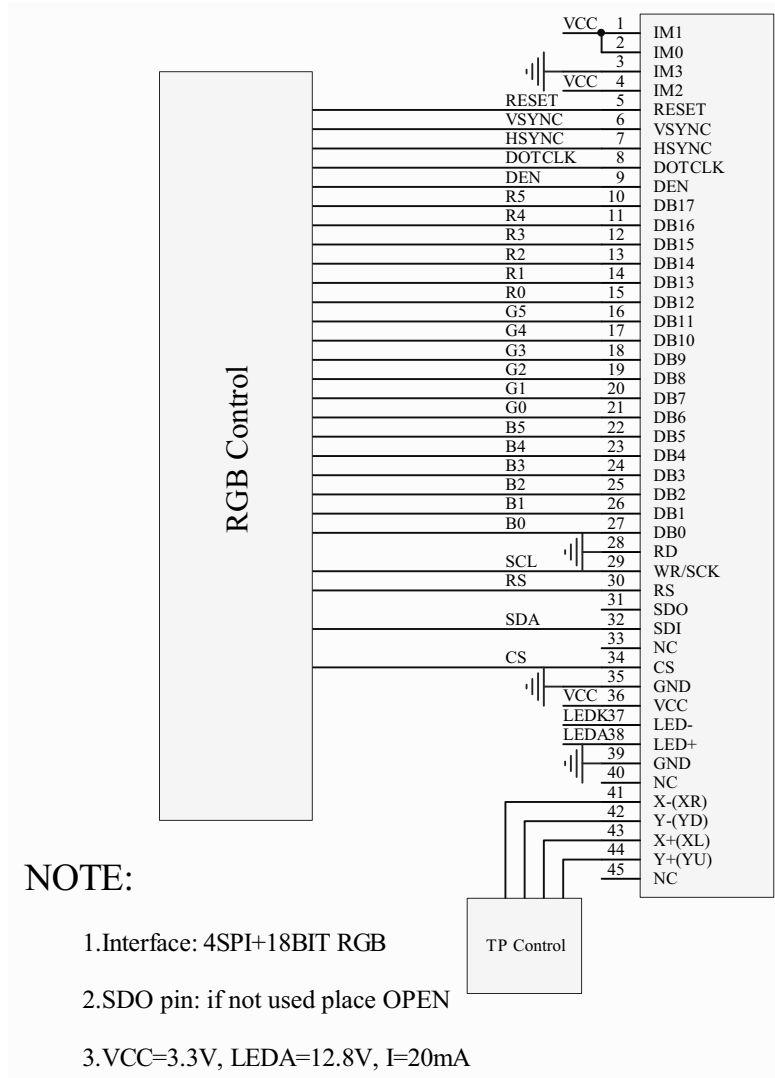


### 4-Wire SPI + 16-Bit RGB



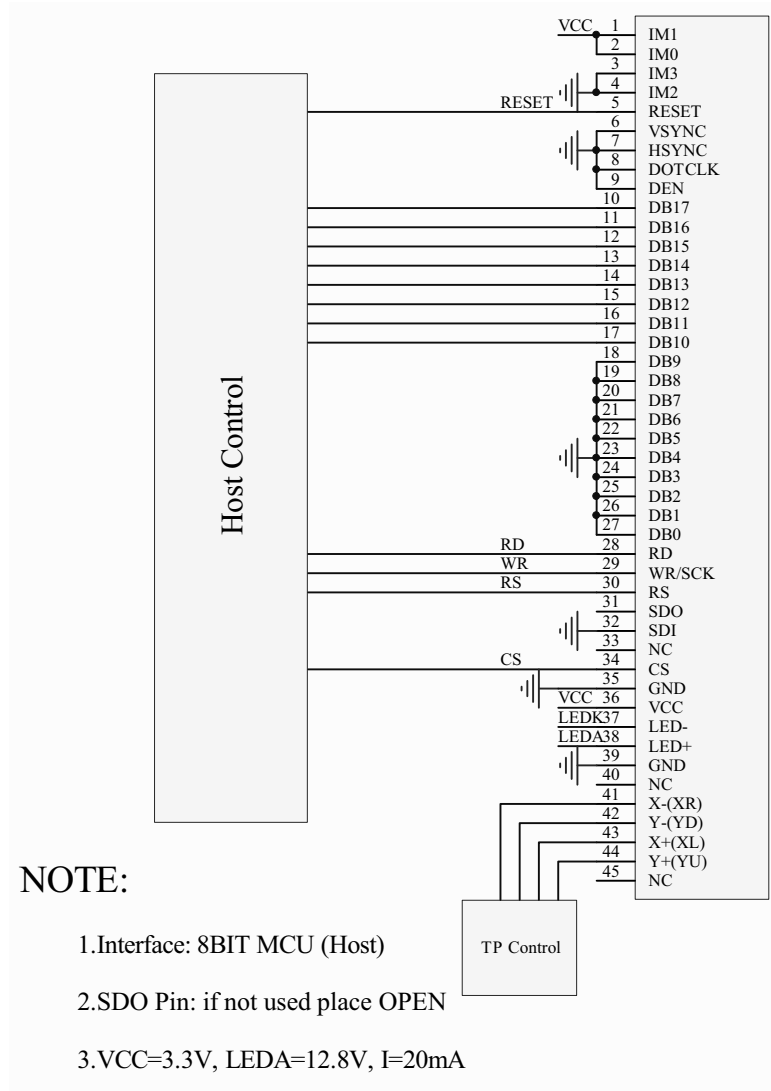


### 4-Wire SPI + 18-Bit RGB



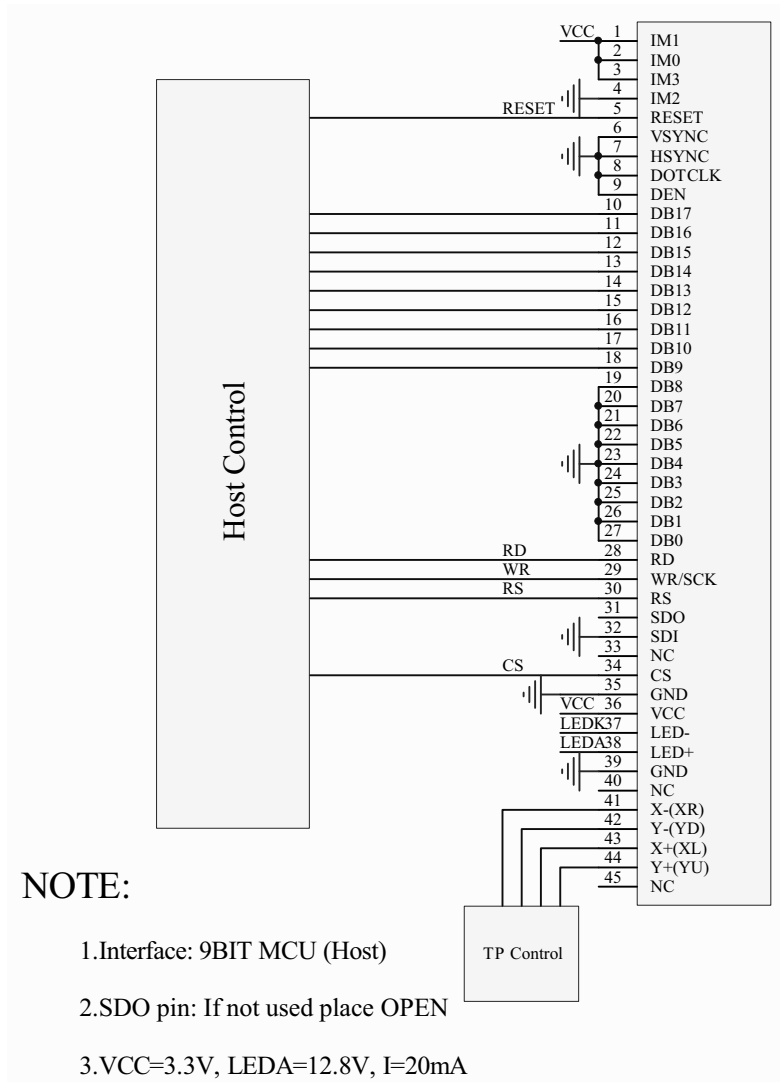


### 8-Bit Parallel





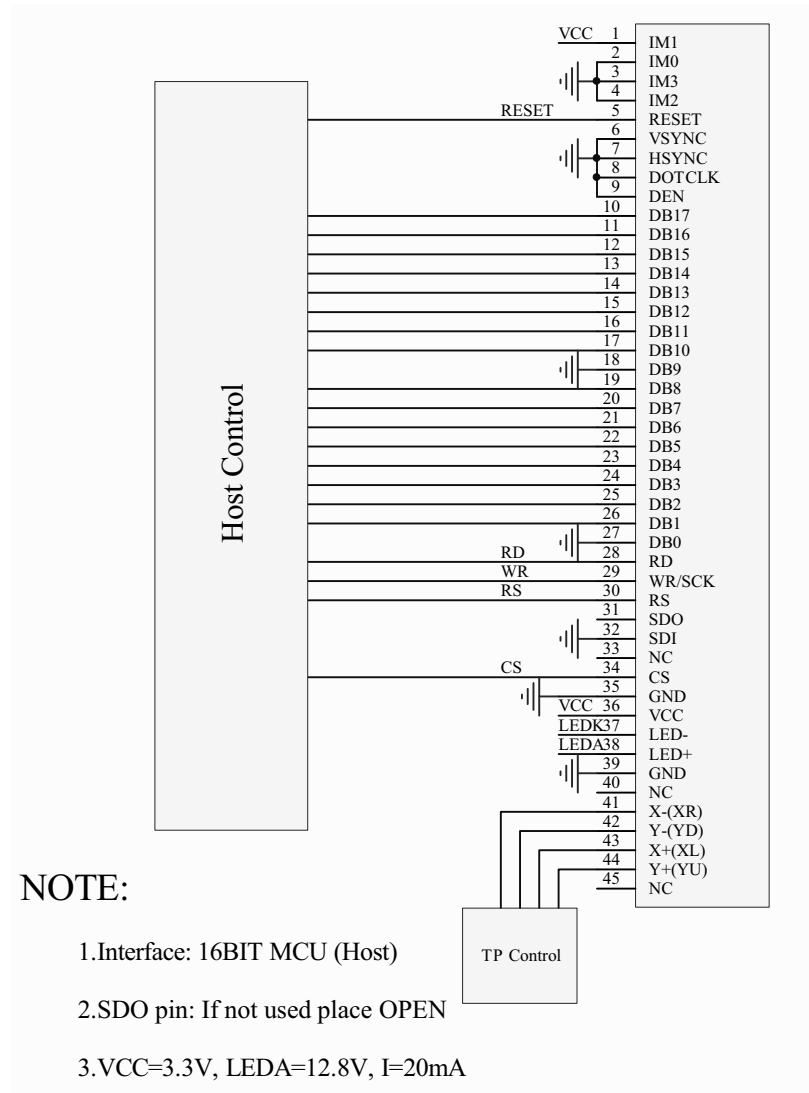
### 9-Bit Parallel





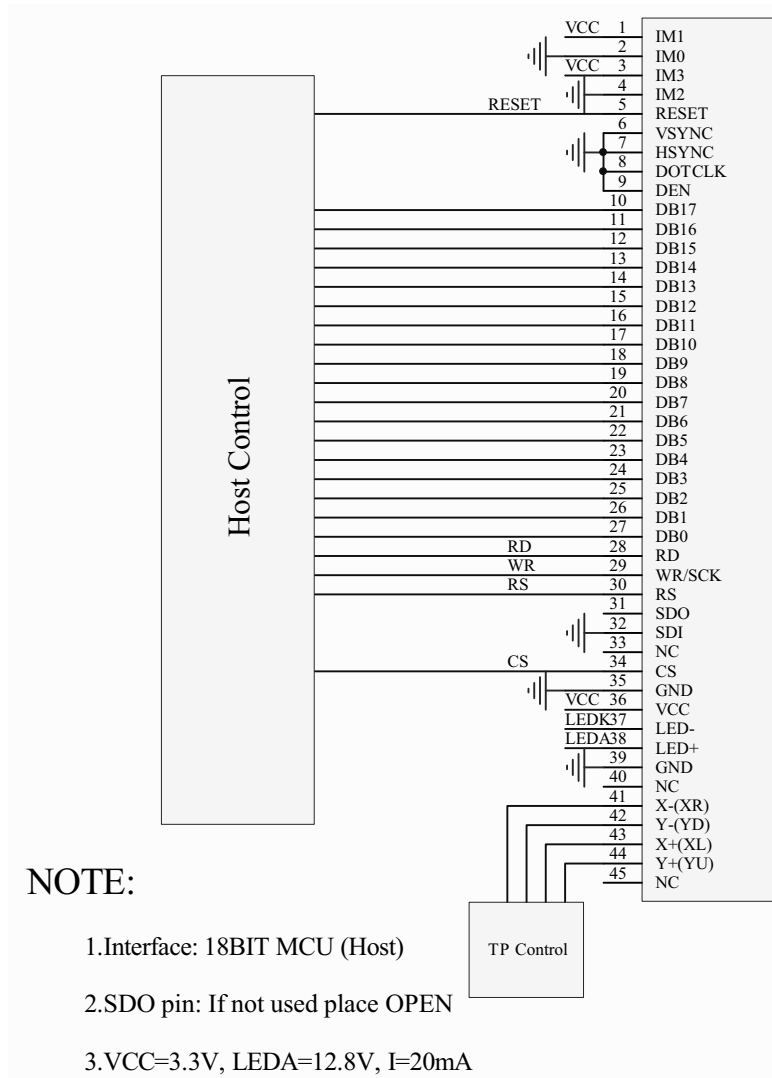


## 16-Bit Parallel





## 18-Bit Parallel



## LCD DUTY AND BIAS

DRIVING METHOD	SPECIFICATION
Duty <sup>1</sup>	1/320
Bias <sup>2</sup>	1/18

<sup>1</sup>The duty cycle, also known as duty ratio or multiplex rate, is the fraction of total frame time that each row of the LCD is addressed.

<sup>2</sup>The drive bias, also known as voltage margin, is related to the number of voltage levels used when driving the LCD. Bias is defined as 1/(number of voltage levels-1). The more segments driven by each driver(1), the higher number of voltage levels are required. There is a direct relationship between the bias and the duty.



## ELECTRICAL SPECIFICATIONS

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### ABSOLUTE MAXIMUM RATINGS

Ambient Temperature (Ta) = 25°C			
Absolute Maximum Ratings	Symbol	Minimum	Maximum
Supply Voltage For Logic	V <sub>CC</sub>	-0.3v	+3.3v
Logic Signal Input Voltage	V <sub>IN</sub>	-0.3v	V <sub>CC</sub> +0.3v
Operating Temperature	T <sub>OP</sub>	-20°C	+70°C
Storage Temperature	T <sub>ST</sub>	-30°C	+80°C
Humidity	RH	0%	90%

**Caution**  
*These are stress ratings only. Functional operation of the display module at these or any other conditions beyond those listed under [Recommended DC Characteristics \(3.0v Operation\) \(Pg. 20\)](#) is not implied.*

*Extended exposure to the absolute maximum ratings listed above may affect device reliability. Stresses beyond those listed above can cause permanent damage.*

*Background color changes slightly depending on ambient temperature. This phenomena is reversible.*



## RECOMMENDED DC CHARACTERISTICS (3.0V OPERATION)

This is a summary of the two display modules' major operating parameters. For detailed information, see the ILITEK ILI9325 driver datasheet at [controller datasheets](#) on our website.

RECOMMENDED DC CHARACTERISTICS	SYMBOL	MINIMUM	TYPICAL	MAXIMUM
Supply Voltage For Logic	$V_{CC}$	+2.7v	+2.8	+3.3v
Current Consumption	$V_{OP}$	—	8 mA	—
Input High Voltage	$V_{IH}$	$+0.7v * V_{CCI}$ for $V_{CC} = +2.8v$ $V_{IH} = +0.7v * +2.8v = +1.96v$	—	$V_{CCI}$
Input Low Voltage	$V_{IL}$	0v ( $V_{SS}/GND$ )	—	$+0.3v * V_{CC}$ for $V_{CC} = +2.8v$ $V_{IL} = +0.3v * +2.8v = 0.84v$
Output High Voltage	$V_{OH}$	$+0.8v * V_{CCI}$ for $V_{CC} = +2.8v$ $V_{IH} = +0.7v * +2.8v = +2.24v$	—	$V_{CCI}$
Output Low Voltage	$V_{OL}$	0v (GND)	—	$+0.2v * V_{CC}$ for $V_{CC} = +2.8v$ $V_{IL} = +0.3v * +2.8v = 0.56v$



## DETAILS OF INTERFACE PIN FUNCTIONS

NO.	SYMBOL	DISCRIPTION	I/O																																																																		
1	IM1	<table border="1"> <thead> <tr> <th>IM3</th> <th>IM2</th> <th>IM1</th> <th>IM0/ID</th> <th>Interface Mode</th> <th>DB Pin</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>Setting invalid</td> <td></td> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>Setting invalid</td> <td></td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>i80-system 16-bit interface</td> <td>DB[17:10], DB[8:1]</td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>i80-system 8-bit interface</td> <td>DB[17:10]</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>ID</td> <td>Serial Peripheral Interface (SPI)</td> <td>SDI, SDO (DB[1:0])</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> <td>0</td> <td>9-bit 3 wires Serial Peripheral Interface</td> <td>SDA, SCL, nCS</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>8-bit 4 wires Serial Peripheral Interface</td> <td>SDA, SCL, nCS, RS (D/CX)</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>Setting invalid</td> <td></td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>Setting invalid</td> <td></td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> <td>0</td> <td>i80-system 18-bit interface</td> <td>DB[17:0]</td> </tr> </tbody> </table>	IM3	IM2	IM1	IM0/ID	Interface Mode	DB Pin	0	0	0	0	Setting invalid		0	0	0	1	Setting invalid		0	0	1	0	i80-system 16-bit interface	DB[17:10], DB[8:1]	0	0	1	1	i80-system 8-bit interface	DB[17:10]	0	1	0	ID	Serial Peripheral Interface (SPI)	SDI, SDO (DB[1:0])	0	1	1	0	9-bit 3 wires Serial Peripheral Interface	SDA, SCL, nCS	0	1	1	1	8-bit 4 wires Serial Peripheral Interface	SDA, SCL, nCS, RS (D/CX)	1	0	0	0	Setting invalid		1	0	0	1	Setting invalid		1	0	1	0	i80-system 18-bit interface	DB[17:0]	
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3	IM3			I																																																																	
4	IM2																																																																				
5	RESET		Reset pin. Setting either pin low initializes the LSI. Must be reset after power is supplied.	I																																																																	
6	VSYNC	Frame synchronizing signal for RGB interface operation. fix this pin at VCI or GND when not in use.	I																																																																		
7	HSYNC	Line synchronizing signal for RGB interface operation. fix this pin at VCI or GND when not in use.	I																																																																		
8	DOTCLK	Dot clock signal for RGB interface operation. Fix this pin at VCI or GND when not in use.	I																																																																		
9	DEN	Data enable signal for RGB interface operation. fix this pin at VCI or GND when not in use.	I																																																																		
10-27	DB17-DB0	Data bus . Fix to GND level when not in use.	I/O																																																																		
28	RD	Serves as a read signal and MCU read data at the rising edge. fix this pin at VCI or GND when not in use	I																																																																		
29	WR/SCK	Write strobe signal in DBI type B operation	I																																																																		
30	RS	Display data/ command selection pin	I																																																																		
31	SDO	SPI interface output pin.–The data is output on the falling edge of the SCL signal.–If not used, let this pin open.	I																																																																		
32	SDI	Data lane in 1 data lane serial interface. The data is latched on the rising edge of the SCL signal.	I																																																																		
33	NC	NC																																																																			
34	CS	Chip select input pin (“Low” enable). fix this pin at VCI or GND when not in use.	I																																																																		



35	GND	Ground.	P
36	VCC	Supply voltage(3.3V).	P
37	LED-	Cathode pin OF backlight	P
38	LED+	Anode pin of backlight	P
39	GND	Ground.	P
40	NC	NC	
41*	X-	Touch panel Right Glass Terminal	A/D
42 *	Y-	Touch panel Bottom Film Terminal	A/D
43 *	X+	Touch panel Left Glass Terminal	A/D
44 *	Y+	Touch panel Top Film Terminal	A/D
45	NC	NC	

\* Pin descriptions 41-44 in table above are for *CFAF240320A-032T-TS* (with touch screen). Pins 41-44 for *CFAF240320A-032T* (no touch screen) are "NC". Make no connection.

## ESD (ELECTRO-STATIC DISCHARGE)

The circuitry is industry standard CMOS logic and is susceptible to ESD damage. Please use industry standard anti-static precautions as you would for any other static sensitive devices such as expansion cards, motherboards, or integrated circuits. Ground your body, work surfaces, and equipment.

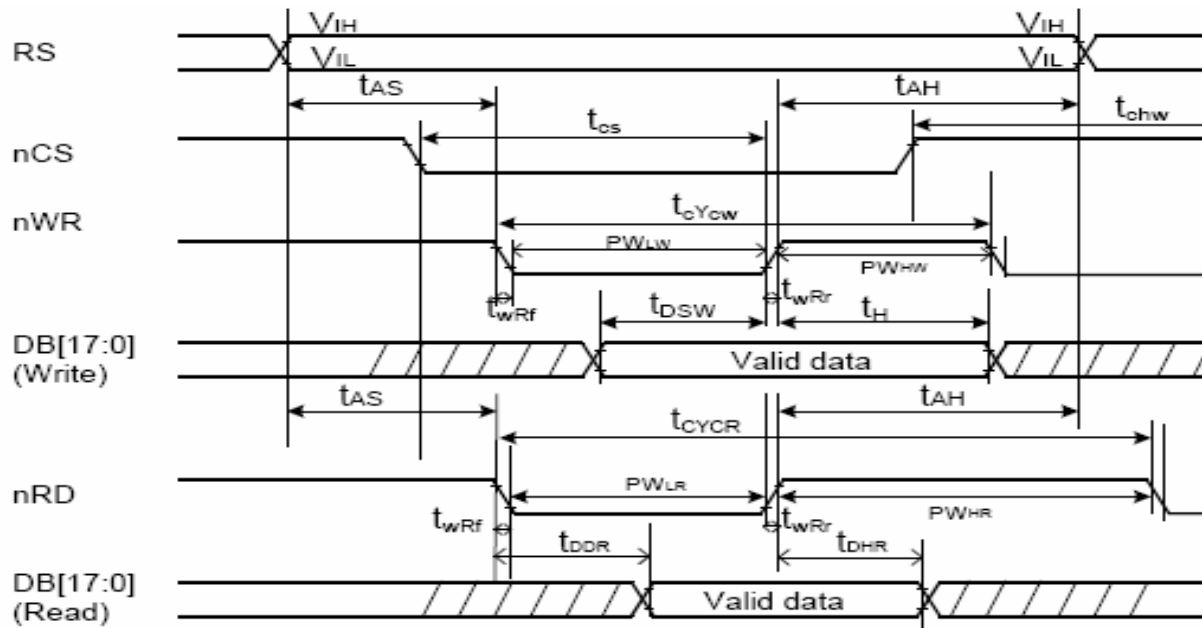


# AC CHARACTERISTICS

## DISPLAY PARALLEL 18/16/9/8-BIT INTERFACE TIMING CHARACTERISTICS (8080 SYSTEM)

Normal Write Mode (IOVCC = 1.65~3.3V)

Item	Symbol	Unit	Min.	Typ.	Max.	Test Condition
Bus cycle time	Write	$t_{CYCW}$	ns	80	-	-
	Read	$t_{CYCR}$	ns	300	-	-
Write low-level pulse width	$PW_{LW}$	ns	50	-	500	-
Write high-level pulse width	$PW_{HW}$	ns	15	-	-	-
Read low-level pulse width	$PW_{LR}$	ns	150	-	-	-
Read high-level pulse width	$PW_{HR}$	ns	150	-	-	-
Write / Read rise / fall time	$t_{WR}/t_{WR}$	ns	-	-	25	-
Setup time	Write ( RS to nCS, E/nWR )	$t_{AS}$	ns	10	-	-
	Read ( RS to nCS, RW/nRD )			5	-	-
Address hold time	$t_{AH}$	ns	5	-	-	-
Write data set up time	$t_{DSW}$	ns	10	-	-	-
Write data hold time	$t_H$	ns	15	-	-	-
Read data delay time	$t_{DDR}$	ns	-	-	100	-
Read data hold time	$t_{DHR}$	ns	5	-	-	-

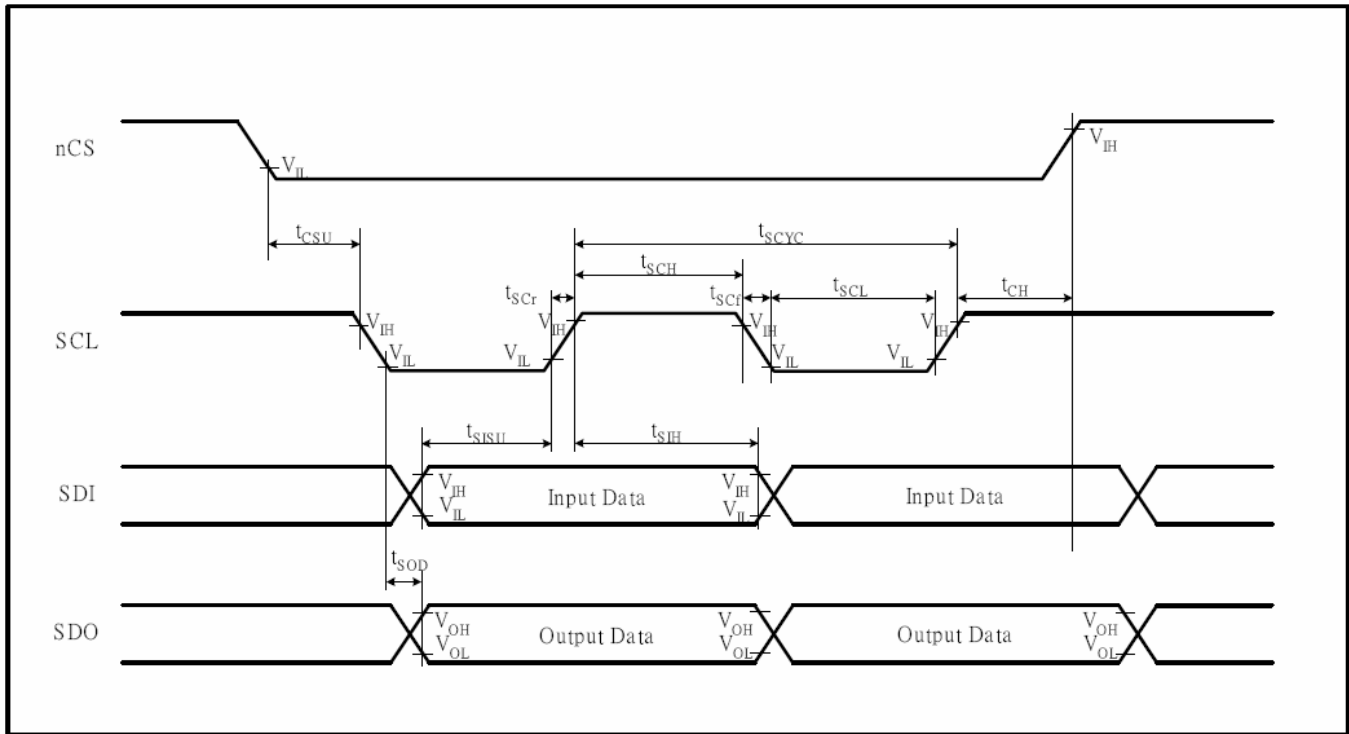




## SERIAL DATA TRANSFER INTERFACE TIMING CHARACTERISTICS

(IOVCC= 1.65 ~ 3.3V)

Item	Symbol	Unit	Min.	Typ.	Max.	Test Condition
Serial clock cycle time	Write ( received )	$t_{SCYC}$	Ns	100	-	-
	Read ( transmitted )	$t_{SCYC}$	ns	200	-	-
Serial clock high – level pulse width	Write ( received )	$t_{SCH}$	ns	40	-	-
	Read ( transmitted )	$t_{SCH}$	ns	100	-	-
Serial clock low – level pulse width	Write ( received )	$t_{SCL}$	ns	40	-	-
	Read ( transmitted )	$t_{SCL}$	ns	100	-	-
Serial clock rise / fall time	$t_{SCr}, t_{SCf}$	ns	-	-	5	
Chip select set up time	$t_{CSU}$	ns	10	-	-	
Chip select hold time	$t_{CH}$	ns	50	-	-	
Serial input data set up time	$t_{SISU}$	ns	20	-	-	
Serial input data hold time	$t_{SIH}$	ns	20	-	-	
Serial output data set up time	$t_{SOD}$	ns	-	-	100	
Serial output data hold time	$t_{SOH}$	ns	5	-	-	



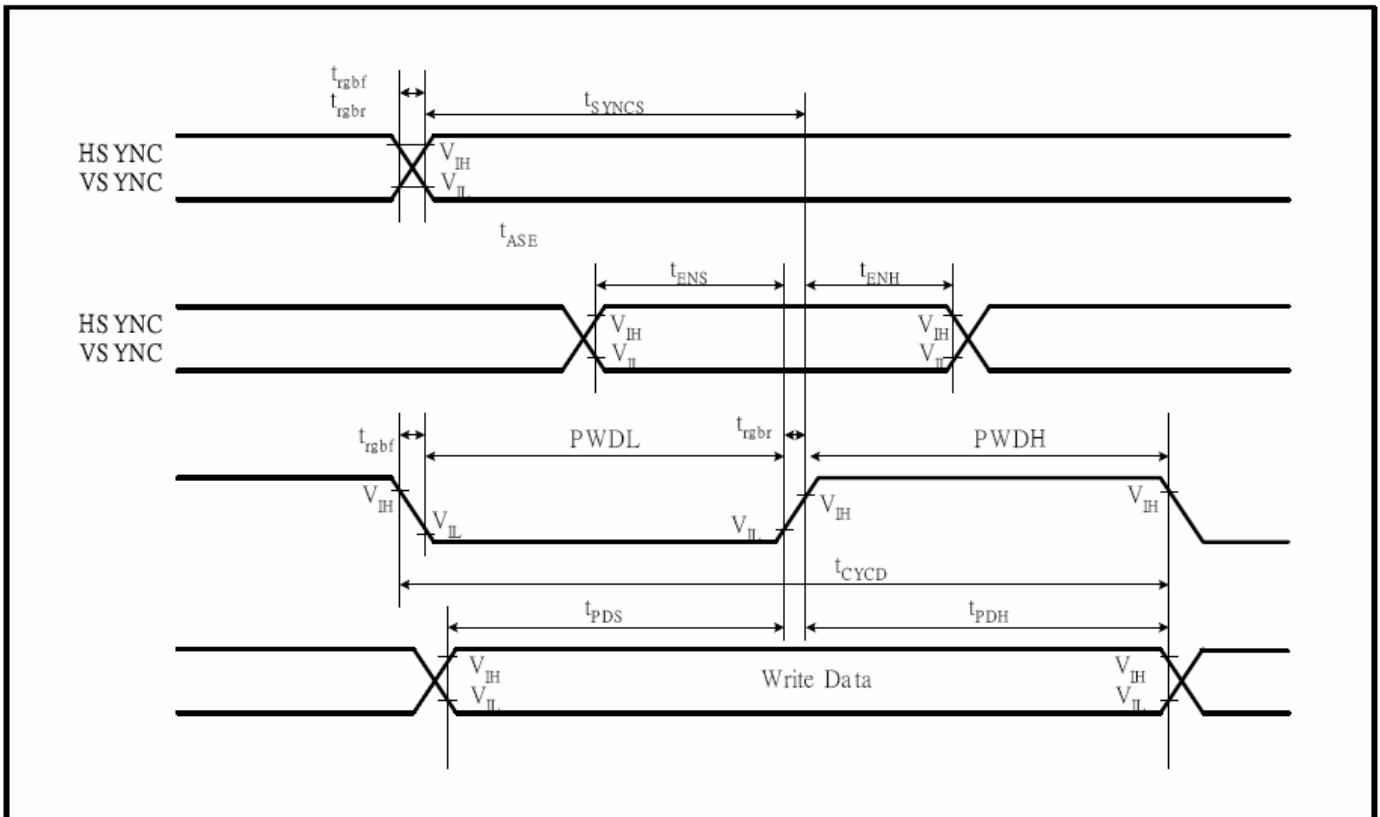




## RGB INTERFACE TIMING CHARACTERISTICS

### 18/16-bit Bus RGB Interface Mode (IOVCC = 1.65 ~ 3.3V)

Item	Symbol	Unit	Min.	Typ.	Max.	Test Condition
VSYNC/HSYNC setup time	$t_{SYNCS}$	ns	0	-	-	-
ENABLE setup time	$t_{ENS}$	ns	10	-	-	-
ENABLE hold time	$t_{ENH}$	ns	10	-	-	-
PD Data setup time	$t_{PDS}$	ns	10	-	-	-
PD Data hold time	$t_{PDH}$	ns	40	-	-	-
DOTCLK high-level pulse width	PWDH	ns	40	-	-	-
DOTCLK low-level pulse width	PWDL	ns	40	-	-	-
DOTCLK cycle time	$t_{CYCD}$	ns	100	-	-	-
DOTCLK, VSYNC, HSYNC, rise/fall time	$t_{rghr}, t_{rghf}$	ns	-	-	25	-

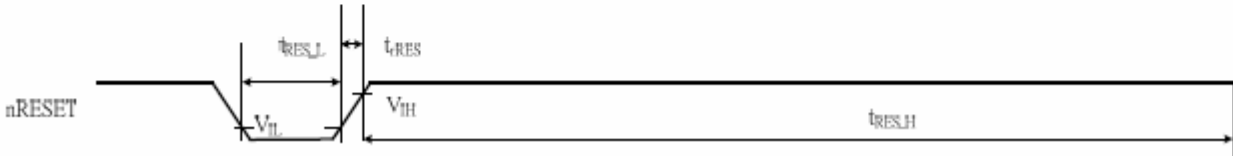




## RESET TIMING

Reset Timing Characteristics (IOVCC = 1.65 ~ 3.3 V)

Item	Symbol	Unit	Min.	Typ.	Max.
Reset low-level width	$t_{RES,L}$	ms	1	-	-
Reset rise time	$t_{RES}$	$\mu$ s	-	-	10
Reset high-level width	$t_{RES,H}$	ms	50	-	-

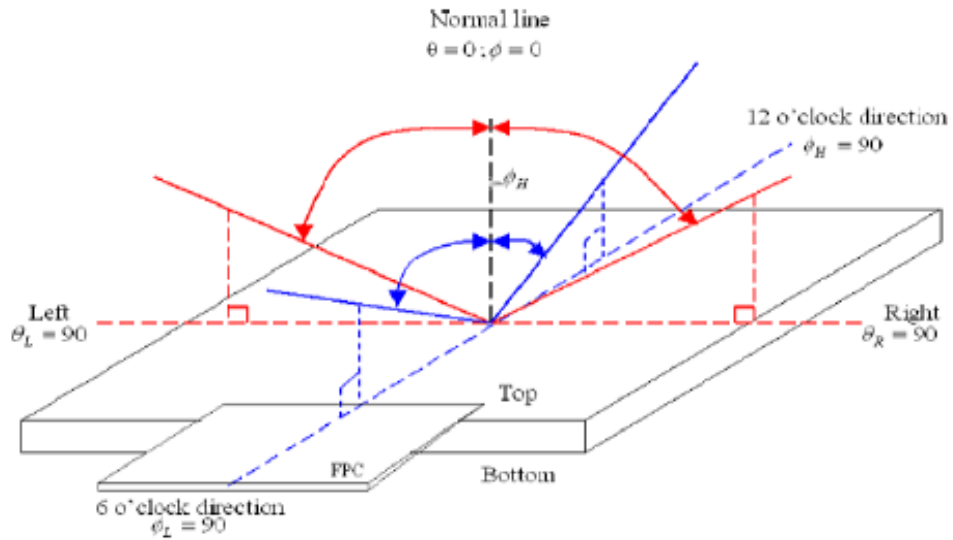




## OPTICAL SPECIFICATIONS

The following items are measured under stable conditions. The optical characteristics are measured in a dark room with measuring equipment: LCD-7200, BM-5A, BM-7, PR-650, EZ-Contrast.

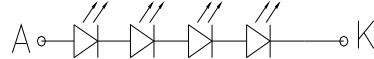
ITEM	SYMBOL	ADDITIONAL TEST CONDITIONS	MINIMUM	TYPICAL	MAXIMUM	
Red Chromaticity	Rx	$\theta = \varphi - 0^\circ$	0.621	0.641	0.661	
	Ry		0.327	0.347	0.367	
Green Chromaticity	Gx		0.284	0.304	0.324	
	Gy		0.553	0.573	0.593	
Blue Chromaticity	Bx		0.115	0.135	0.155	
	By		0.101	0.121	0.141	
White Chromaticity	Wx		0.292	0.312	0.332	
	Wy		0.321	0.341	0.361	
Viewing Direction					>9:00	





# LED BACKLIGHT CHARACTERISTICS

The backlight is edge-lit with 4 white LEDs in series.



These display modules use LED backlights. LED backlights are easy to use, but they are also easily damaged by abuse.

LED Backlight Characteristics White Edge-lit with 4 LEDs in series.			
Ambient temperature: TA = 25°C			
PARAMETER	MINIMUM	TYPICAL	MAXIMUM
Forward Current (I <sub>LED</sub> )*		15 mA	20 mA
Forward Voltage (V <sub>LED</sub> )	+12.3v (Typ)	+12.8v (Typ)	+13.3v (Typ)

### CAUTION

Do not drive the LEDs at any current over their rated maximum of 20mA (15mA recommended for longer life). Be aware that the forward voltage of white LEDs can vary (LED to LED, batch to batch, and over time) by a significant amount. We recommend using a constant current LED power supply such as the AP3036, NCP5007, FAN5333, or similar to drive the LEDs. Do not use a constant voltage source to drive the LEDs.

#### Caution

Ensure that you have proper current and voltage control for your backlight before connecting the backlight circuit.

#### Note

We recommend that the LED backlight be dimmed or turned off during periods of inactivity to conserve its lifetime.



# RELIABILITY AND LONGEVITY

## DISPLAY MODULE RELIABILITY TEST RESULTS

RELIABILITY TEST RESULTS			
TEST	CONDITION	SAMPLE SIZE	TEST RESULT
Low Temperature	-20°C, 96 Hours	3 displays	Pass
Thermal Humidity	40°C, 90% RH, 96 Hours		Pass
Temperature Cycle On/Off	-20°C, 70°C, On/Off, 20 Cycles On cycle: >10 seconds Off cycle: <10 seconds		Pass
High Temperature Storage	80°C, 96 Hours		Pass
Low Temperature Storage	-30°C, 96 Hours		Pass
Thermal Shock Resistance	See test description.	3 displays	Pass

One test cycle is:

1. Test Low for 30 minutes.
2. Normal temperature for 5 minutes.
3. Test High for 30 minutes.
4. Normal temperature for 5 minutes.
5. Take out and dry at Normal temperature and allow to stand for 24 hours.

Repeat these steps for a total of 5 cycles.



## DISPLAY MODULE RELIABILITY

PART NUMBER	SPECIFICATION
CFAF240320A-032T CFAF240320A-032T-TS	Brightness will be >50% of a new display module's initial brightness for at least 10,000 hours of operation when driving the backlight at or below 20 mA.
<p><i>Under operating and storage temperature specification limitations, humidity non-condensing) RH up to 65%, and no exposure to direct sunlight. Value listed above is approximate and represents typical lifetime.</i></p> <p><i>The white LEDs dim over time, especially if driven with high currents. The dimming may not be noticeable when a single display is installed. However, if a new display is installed next to a display that has been on continuously for a very long time, you will see the difference. To preserve the lifetime of white LEDs, we recommend that white LED backlights are dimmed or turned off when not needed. Also, please do not use more current than you need to achieve your brightness requirements.</i></p>	

## DISPLAY MODULE LONGEVITY (EOL/REPLACEMENT POLICY)

CrystalFontz is committed to making all of our display modules available for as long as possible. For each display module we introduce, we intend to offer it indefinitely. We do not preplan a display module's obsolescence. The majority of display modules we have introduced are still available.

We recognize that discontinuing a display module may cause problems for some customers. However, rapidly changing technologies, component availability, or low customer order levels may force us to discontinue ("End of Life" EOL) a display module. For example, we must occasionally discontinue a display module when a supplier discontinues a component or a manufacturing process becomes obsolete. When we discontinue a display module, we will do our best to find an acceptable replacement display module with the same fit, form, and function.

In most situations, you will not notice a difference when comparing a "fit, form, and function" replacement display module to the discontinued display module. However, sometimes a change in component or process for the replacement display module results in a slight variation, perhaps an improvement, over the previous design.

Although the replacement display module is still within the stated Datasheet specifications and tolerances of the discontinued display module, changes may require modification to your circuit and/or firmware. Possible changes include:

- **Backlight LEDs.** Brightness may be affected (perhaps the new LEDs have better efficiency) or the current they draw may change (new LEDs may have a different VF).
- **Controller.** A new controller may require minor changes in your code.
- **Component tolerances.** Display module components have manufacturing tolerances. In extreme cases, the tolerance stack can change the visual or operating characteristics.

Please understand that we avoid changing a display module whenever possible; we only discontinue a display module if we have no other option. We will post Part Change Notices on the product's web page as soon as possible. If interested, you can subscribe to future part change notifications.



## SOURCES FOR DRIVER LIBRARIES AND SAMPLE CODE

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### SOURCES FOR DRIVER LIBRARIES

Driver libraries may save you a lot of time and help you develop a more professional product. Possible library sources are [easyGUI](#), [RAMTEX](#), [Micrium](#), and [Segger](#).

### SOURCE FOR SAMPLE CODE

Free downloadable sample code is available under the Datasheets & File tab on the web pages for these display modules.