TFT DISPLAY SPECIFICATION



WINSTAR Display Co.,Ltd.
華凌光電股份有限公司

Represented by:

first FC components
FIRST Components s.r.l.
www.first-components.com
technical@first-components.com
+39 0332 1888005

Product Specifications

Customer	**Standard**
Description	**1.54” E-PAPER DISPLAY**
Model Name	**WAA0154BA4#A2N0AA-FC**
Date	**2024/07/10**
Revision	**1.0**

	Design Engineering		
	Approval	**Check**	**Design**

Over View

WAA0154BA4#A2N0AA-FC is an active matrix electrophoretic display, with interface and a reference system design. The 1.54” active area contains 200×200 pixels, and has 1-bit black/white full display capabilities. An integrated circuit contains gate buffer, source buffer, interface, timing control logic, oscillator, DC-DC, SRAM, LUT, VCOM and border are supplied with each panel.

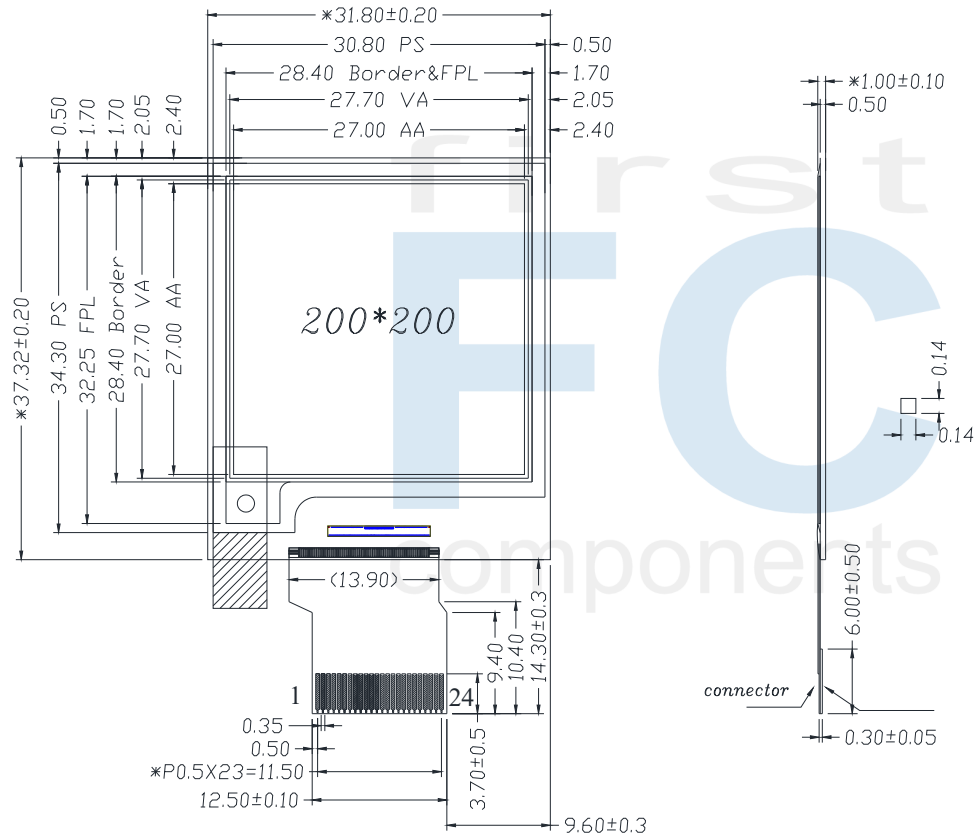
Features

- High contrast
- High reflectance
- Ultra wide viewing angle
- Ultra low power consumption
- Pure reflective mode
- Bi-stable
- Commercial temperature range
- Landscape, portrait mode
- Antiglare hard-coated front-surface
- Low current sleep mode
- On chip display RAM
- Serial peripheral interface available
- On-chip oscillator
- On-chip booster and regulator control for generating VCOM, Gate and source driving voltage
- I2C Signal Master Interface to read external temperature sensor
- Available in COG package IC thickness 300um

Mechanical Specifications

Parameter	Specifications	Unit	Remark
Screen Size	1.54	Inch	
Display Resolution	200(H)×200(V)	Pixel	Dpi:184
Active Area	27.0(H)×27.0(V)	mm	
Pixel Pitch	0.14×0.14	mm	
Pixel Configuration	Square		
Outline Dimension	31.80(H)×37.32(V) ×1.0(D)	mm	
Weight	2.18±0.5	g	

Mechanical Drawing of EPD module



PIN NO.	Symbol
1	NC
2	GDR
3	RESE
4	NC
5	VSH2
6	TSCL
7	TSDA
8	BS1
9	BUSY
10	RES#
11	D/C#
12	CS#
13	SCL
14	SDA
15	VDDIO
16	VCI
17	VSS
18	VDD
19	VPP
20	VSH1
21	VGH
22	VSL
23	VGL
24	VCOM

1	Display mode	EPD,B/W
2	Resolution	1.54" 200*200
3	Operating Voltage:	VCI=3.0V
4	Operating Temp:	0°C~50°C
5	Storage Temp:	-25°C~70°C
6	Unspecified tolerance:	±0.2
7	LCD controller/driver:	SSD1681
8	INTERFACE:	SPI
9	Dimensions with mark"*" are important	
10	RoHS compliant	

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Input /Output Pin Assignment

No.	Name	I/O	Description	Remark
1	NC		Do not connect with other NC pins	Keep Open
2	GDR	O	N-Channel MOSFET Gate Drive Control	
3	RESE	I	Current Sense Input for the Control Loop	
4	NC	NC	Do not connect with other NC pins	Keep Open
5	VSH2	C	Positive Source driving voltage(Red)	
6	TSCL	O	I^2C Interface to digital temperature sensor Clock pin	
7	TSDA	I/O	I^2C Interface to digital temperature sensor Data pin	
8	BS1	I	Bus Interface selection pin	Note 5-5
9	BUSY	O	Busy state output pin	Note 5-4
10	RES#	I	Reset signal input. Active Low.	Note 5-3
11	D/C#	I	Data /Command control pin	Note 5-2
12	CS#	I	Chip select input pin	Note 5-1
13	SCL	I	Serial Clock pin (SPI)	
14	SDA	I	Serial Data pin (SPI)	
15	VDDIO	P	Power Supply for interface logic pins It should be connected with VCI	
16	VCI	P	Power Supply for the chip	
17	VSS	P	Ground	
18	VDD	C	Core logic power pin VDD can be regulated internally from VCI. A capacitor should be connected between VDD and VSS	
19	VPP	P	FOR TEST	
20	VSH1	C	Positive Source driving voltage	
21	VGH	C	Power Supply pin for Positive Gate driving voltage and VSH1	
22	VSL	C	Negative Source driving voltage	
23	VGL	C	Power Supply pin for Negative Gate driving voltage VCOM and VSL	
24	VCOM	C	VCOM driving voltage	

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Electrical Characteristics

Parameter	Symbol	Rating	Unit
Logic supply voltage	VCI	-0.5 to +4.0	V
Logic Input voltage	VIN	-0.5 to VCI +0.5	V
Logic Output voltage	VOUT	-0.5 to VCI +0.5	V
Operating Temp range	TOPR	0 to +50	ºC
Storage Temp range	TSTG	-25 to+70	ºC
Optimal Storage Temp	TSTGo	23±2	ºC
Optimal Storage Humidity	HSTGo	55±10	%RH

Optical Specifications

Specifications

Measurements are made with that the illumination is under an angle of 45 degree, the detection is perpendicular unless otherwise specified

Symbol	Parameter	Conditions	Min	Typ.	Max	Units	Notes
R	White Reflectivity	White	30	35	-	%	8-1
CR	Contrast Ratio	Indoor	8:1		-		8-2
GN	2Grey Level	-		DS+(WS-DS)*n(m-1)			8-3
T update	Image update time	at 25 °C		3	-	sec	
Life		Topr		1000000times or 5years			

Notes:

8-1. Luminance meter: Eye-One Pro Spectrophotometer.

8-2. CR=Surface Reflectance with all white pixel/Surface Reflectance with all black pixels.

8-3. WS: White state, DS: Dark state