TFT DISPLAY SPECIFICATION



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Product Specifications

Customer	**Standard**
Description	**1.54” E-PAPER DISPLAY**
Model Name	**WAA0154BA4#A2N1AA-FC**
Date	**2024/09/03**
Revision	**1.0**

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

1. Over View

WAA0154BA4#A2N1AA-FC is a TFT active matrix electrophoretic display with front light. 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.

2.Features

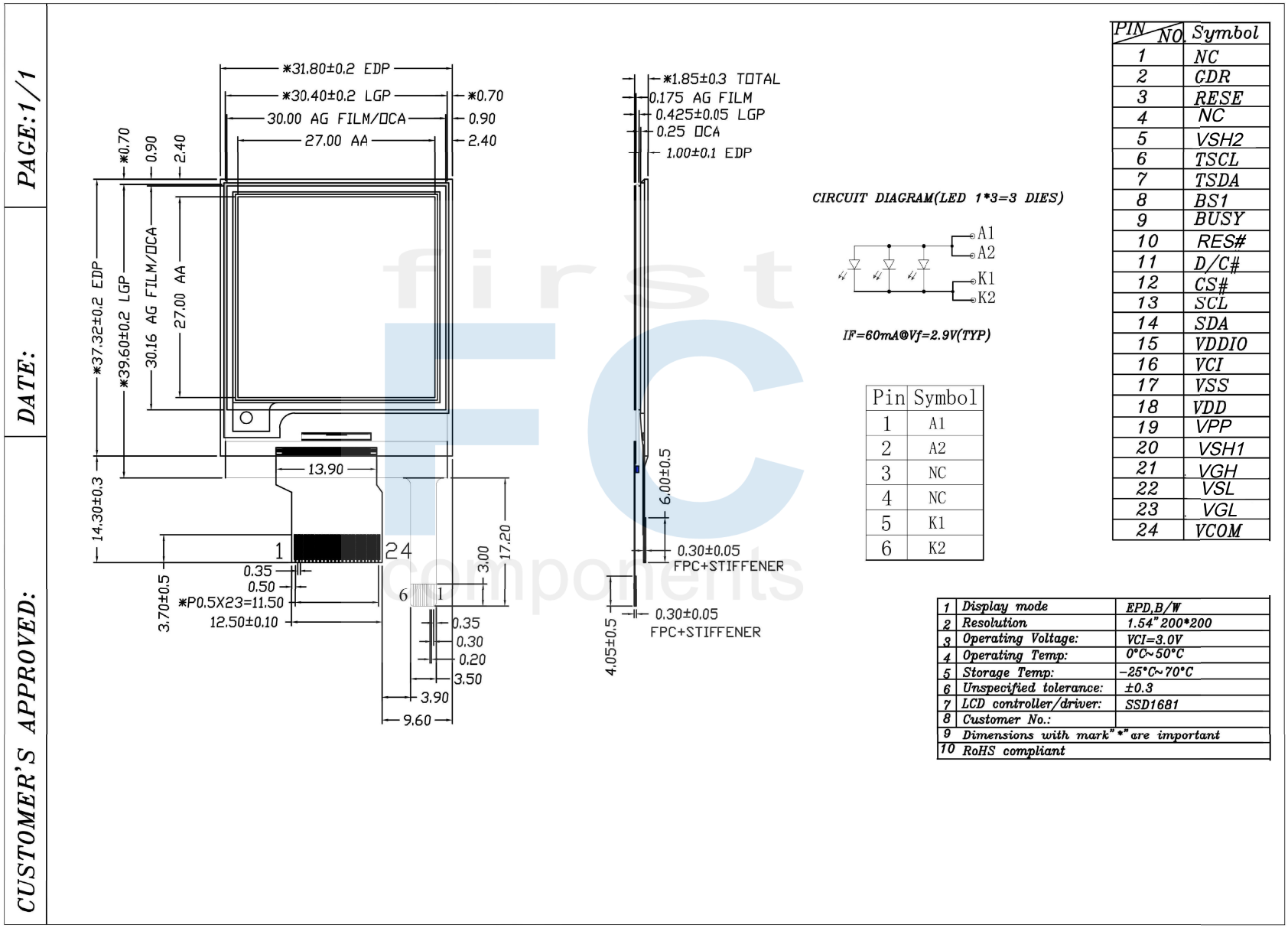
- High contrast
- High reflectance
- Ultra wide viewing angle
- Ultra low power consumption
- Pure reflective mode
- Bi-stable
- Commercial temperature range
- Landscape, portrait mode
- Antiglare hard-coated front-surface
- Low current sleep mode
- On chip display RAM
- Serial peripheral interface available
- 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

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3.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) ×1.85(D)	mm	
Weight	3.15±0.5	g	

4. Mechanical Drawing of EPD module



5. 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	

7.Electrical Characteristics

7-1. Absolute maximum rating

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	°C
Storage Temp range	TSTG	-25 to+70	°C
Optimal Storage Humidity	HSTGo	55±10	%RH

7-2. Panel DC Characteristics

The following specifications apply for: VSS=0V, VCI=3.0V, TOPR =23ºC

Parameter	Symbol	Conditions	Applicable pin	Min.	Typ.	Max	Units
Single ground	V_{SS}	-	-	-	0	-	V
Logic supply voltage	V_{CI}	-	VCI	2.2	3.0	3.7	V
Core logic voltage	V_{DD}		VDD	1.7	1.8	1.9	V
High level input voltage	V_{IH}	-	-	0.8 V_{CI}	-	-	V
Low level input voltage	V_{IL}	-	-	-	-	0.2 V_{CI}	V
High level output voltage	V_{OH}	IOH = - 100uA	-	0.9 VCI	-	-	V
Low level output voltage	V_{OL}	IOL = 100uA	-	-	-	0.1 V_{CI}	V
Typical power	P_{TYP}	V_{CI} =3.0 V	-	-	4.5	-	mW
Deep sleep mode	P_{STPY}	V_{CI} =3.0 V	-	-	0.003	-	mW
Typical operating current	Iopr_V_{CI}	V_{CI} =3.0 V	-	-	1.5	-	mA
Full update time	-	25 °C	-	-	2	-	sec
Fast update time	-	25 °C	-	-	1.5	-	sec
Partial update time	-	25 °C	-	-	0.26	-	sec
Sleep mode current	Islp_V_{CI}	DC/DC off No clock No input load Ram data retain	-	-	20		uA
Deep sleep mode current	Idslp_V_{CI}	DC/DC off No clock No input load Ram data not retain	-	-	1	5	uA

Notes:

1) Refresh time: the time it takes for the whole process from the screen change to the screen stabilization.

2) The difference between different refresh methods:

Full refresh: The screen will flicker several times during the refresh process;