1.9inch Segment e-Paper V1.1

User Manual

Revision History

Version	Content	Date	Page
1.0	New creation	2024/12/27	All

Contents

1. OVERVIEW

1.9inch Segment e-Paper V1.1 is a Segment Electrophoretic Display Module which can be used in thermometer. The module is integrated circuits including Segment drivers.

2. FEATURES

- ✧ White reflectance above 35% (0 minute)
- ✧ Contrast ratio above 9:1 (0 minute)
- ✧ Wide viewing angle
- ✧ Ultra low power consumption
- ✧ Reflective mode
- ✧ Bi-stable display
- ✧ Commercial temperature range
- ✧ I2C interface

3. MECHANICAL SPECIFICATIONS

3.1 DIMENTIONS

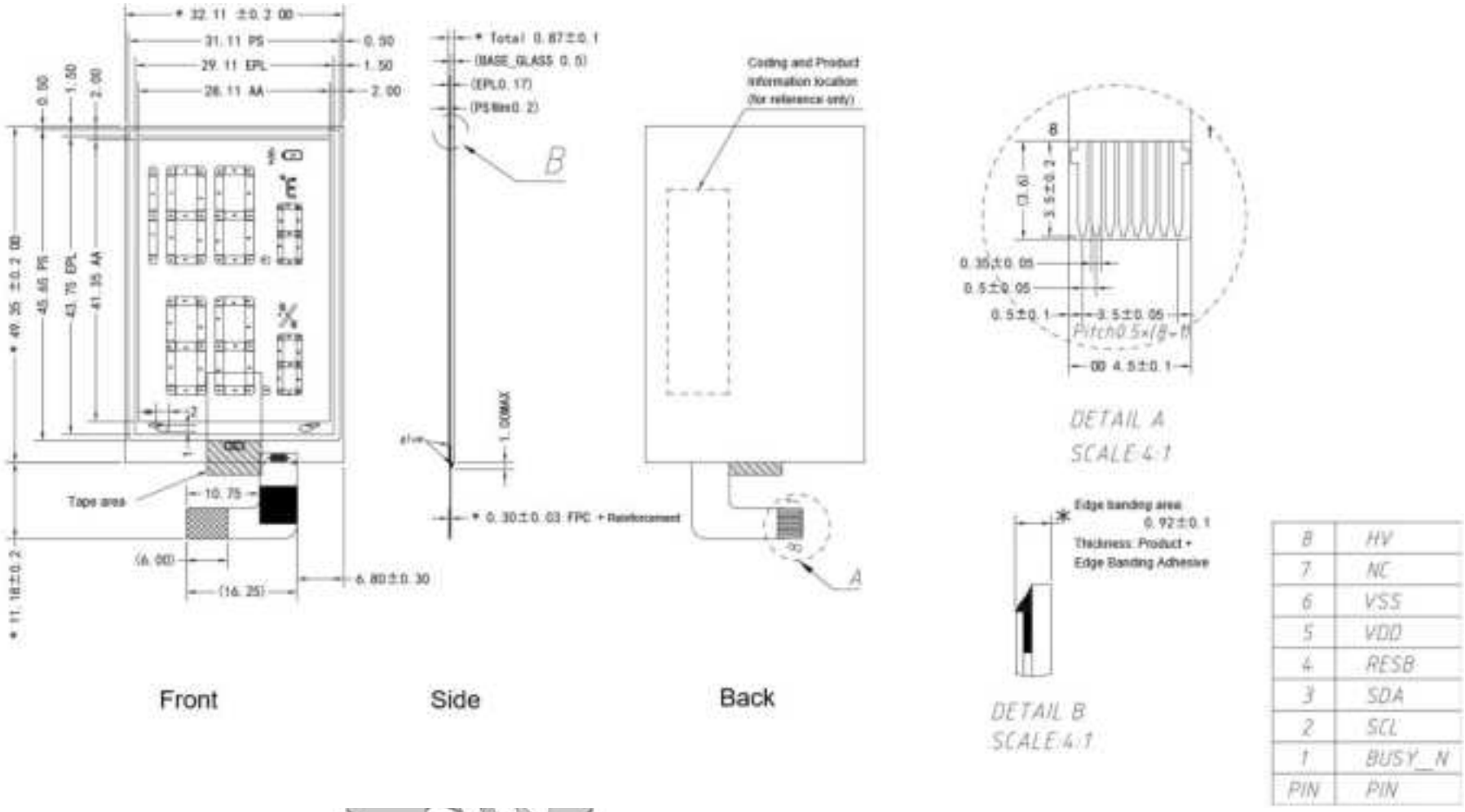
Parameter	Value	Unit
Display Resolution	91segment+1Vcom+1BG	segment
Active Area Dimensions Diameter	28.11*41.35	mm
Overall Dimensions Width Height Thickness	32.11*49.35*0.87±0.1	mm

3.2 ELECTRICAL CONNECTOR

Service	Connector	Number of pins
Interface	FPC pitch=0.5mm	8

The position of the interface width FPC = (8+1) *0.5=4.5 mm

3.3 MECHANICAL DRAWING OF EPD MODULE



8	HV
7	NC
6	VSS
5	VDD
4	RESB
3	SDA
2	SCL
1	BUSY_N
PIN	PIN

Note: 1. Display module 1.9″ array for EPD; 2.Unspecified tolerance is ±0.20; 3. Materials confirm to RoHS standards;
4. The mark ✱ for control dimensions, ( ) for reference dimensions; 5. Product thickness(THK) includes: Top glass + EPL + PS film.

4. PIN ASSIGNMENT

NO.	Name	I/O	Description
1	BUSY_N	O	L: interface is BUSY and not ready for write command and data H: interface is ready for write command and data
2	SCL	I	Serial clock for IIC interface
3	SDA	I/O	Serial data for IIC interface
4	RESB	I	Hardware Reset input pin. When RESB is “L”, initialization is executed
5	VDD	P	Core logic power pin
6	VSS	P	Ground
7	NC	/	Do not connect
8	HV	C	HV, connect the capacitance 1UF/25V

I = Input Pin, O =Output Pin, I/O = Bi-directional Pin (Input/Output), P = Power Pin, C = Capacitor Pin

5. ELECTRICAL CHARACTERISTICS

Module DC Characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Signal ground	VSS		-	0	-	V	
Logic Voltage supply	VDD		1.9	3.0	3.6	V	
	IVDD	Update	-	1	1.2	mA	
	Istop	Stop mode	-	1	-	uA	
Gate Positive supply	VPP		1.4	15	30	V	
	IVPP	Update	-	30	-	uA	
Storage	Tst	Temperature	0	-	50	℃	2.3
	RHst	Relative humidity	-	-	70%		2.3
Operating	Tst	Temperature	0	-	50	℃	1.2.3
	RHst	Relative humidity	-	-	70%		2.3

Note:

1. The temperature of panel display surface area should be 0℃ Min and 50℃ Max

2. No condensation and no frost

3. In order to keep good performance of EPD, please refer to precaution for storage condition

6. OPTICAL CHARACTERISTICS

Parameter	Condition	Value			Unit	Note
		Min.	Typ.	Max.		
White Reflectivity	0 minute	35	-	-	%	
Contrast Ratio (CR)	0 minute	9:1	-	-		1

(Tamb=25℃. Measurements are made with Eye-One Pro Spectrophotometer.)

Note:

1. CR=Surface Reflectance with all white pixels/Surface Reflectance with all black pixels

7. HANDLING, SAFETY, AND ENVIRONMENT REQUIREMENTS

1. The EPD Panel is manufactured from fragile materials such as glass and plastic, and may be broken or cracked if dropped. Please handle with care. Do not apply force such as bending or twisting to the EPD panel
2. The display module should not be exposed to harmful gases, such as acid and alkali gases, which corrode electronic components
3. Do not apply pressure to the EPD panel in order to prevent damaging it
4. Do not connect or disconnect the interface connector while the EPD panel is in operation
5. Do not stack the EPD panels / Modules
6. Keep the EPD Panel / Module in the specified environment and original packing boxes when storage in order to avoid scratching and keep original performance
7. Do not disassemble or reassemble the EPD panel
8. Use a soft dry cloth without chemicals for cleaning. Please don't press hard for cleaning because the surface of the protection sheet film is very soft and without hard coating. This behavior would make dent or scratch on protection sheet
9. Please be mindful of moisture to avoid its penetration into the EPD panel, which may cause damage during operation
10. It's low temperature operation product. Please be mindful the temperature different to make frost or dew on the surface of EPD panel. Moisture may penetrate into the EPD panel because of frost or dew on surface of EPD panel, and makes EPD panel damage.
11. High temperature, high humidity, sunlight or fluorescent light may degrade the EPD panel's performance. Please do not expose the unprotected EPD panel to high temperature, high humidity, sunlight, or fluorescent for long periods of time. Please store the EPD panel in controllable environment of warehouse and original package. Without sunlight, without condensation a temperature range of 15ºC to 35ºC, and humidity from 30%RH to 60%RH

8. RELIABILITY TEST

No.	Test	Condition	Method	Remark
1	High-Temperature Operation	T = +50°C, RH = 30% for 168 hrs	IEC 60 068-2-2Bp	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied
2	Low-Temperature Operation	T = 0°C for 168 hrs	IEC 60 068-2-2Ab	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied
3	High-Temperature Storage	T = +70°C, RH=23% for 168 hrs	IEC 60 068-2-2Bp	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied
4	Low-Temperature Storage	T = -25°C for 168 hrs	IEC 60 068-2-1Ab	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied
5	High-Temperature High-Humidity Operation	T = +40°C, RH =70% for 168 hrs	IEC 60 068-2-3CA	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied
6	High-Temperature High-Humidity Storage	T = +60°C, RH=80% for 168hrs	IEC 60 068-2-3CA	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied
7	Thermal Shock	1 cycle: [-25°C 30min] → [+70°C 30min] : 50 cycles	IEC 60 068-2-14	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied
8	Electrostatic Effect (non-operating)	Machine model +/- 250V, 0Ω, 200pF	IEC 62179, IEC 62180	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied

9. BLOCK DIAGRAM