Specification For OED 1.9 inch EPD

Model NO.: MB1-019A1

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Customer Approval

Customer	Approved by	Date of Approval

Version	Content	Date	Producer
A/0	New Release	2021/10/10	JQSUN

Contents

1 General Description

MB1-019A1 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 Application

Thermometer

4 Mechanical Specification

4.1 Dimension

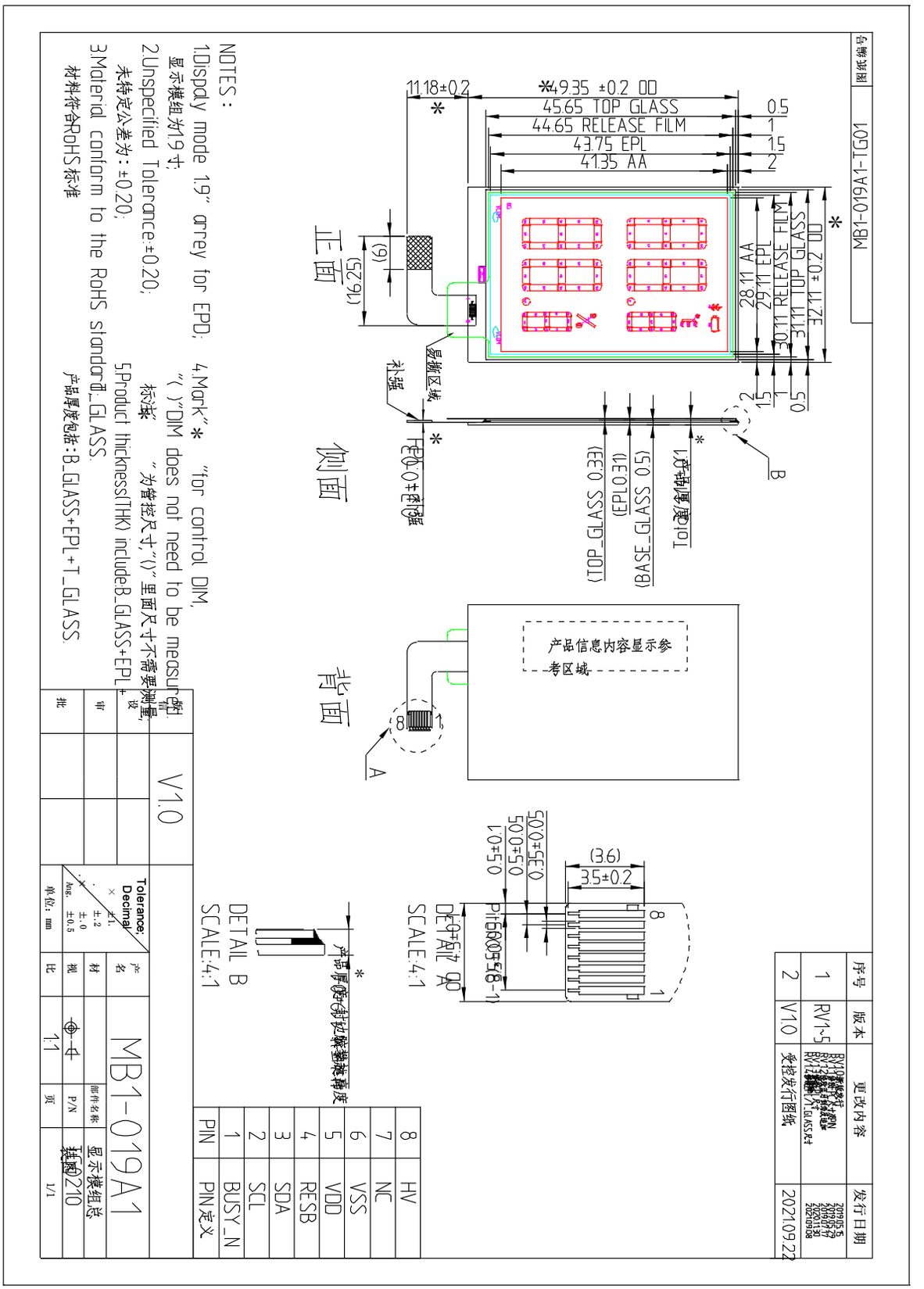
PARAMETER	VALUE	UNIT
Display Resolution	86segment+1Vcom+1BG	segment
Active Area Dimensions Diameter	41.35*28.11	mm
Overall Dimensions Width Height Thickness	 32.11 49.35 1.13±0.1	 mm mm mm
Mass of the Module	3.7	g

4.2 Electrical Connector

SERVICE	CONNECTOR	NUMBER OF PINS
Interface	FPC pitch=0.5mm	8

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

4.3 Mechanical Drawing of EPD Module



5 Input/output Pin Assignment

No.	Pin 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

6 Electrical Characteristics

6.1 Module Interface Description

This module can be driven by OED Controller.

5.2 Module DC Characteristics

Parameter	Symbol	Conditions	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	-	μA	
Gate Positive supply	VPP		14	15	30	V	
	IVPP	update	-	30	-	μA	
Storage	T_{st}	Temperature	-20	-	60	℃	2.3
	RH_{st}	Relative humidity	-	-	70%		2.3
Operating	T_{st}	Temperature	10	-	50	℃	1.2.3
	RH_{st}	Relative humidity	-	-	70%		2.3

Notes：

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

7 Optical Characteristics

Parameter	Conditions	Values			Units	Notes
		Min.	Typ.	Max		
White Reflectivity	0 minute	35	-	-	%	
Contrast Ratio (CR)	0 minute	9:1	-	-		1

(T_{amb}=25℃. Measurements are made with Eye-One Pro Spectrophotometer.)

Notes:

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

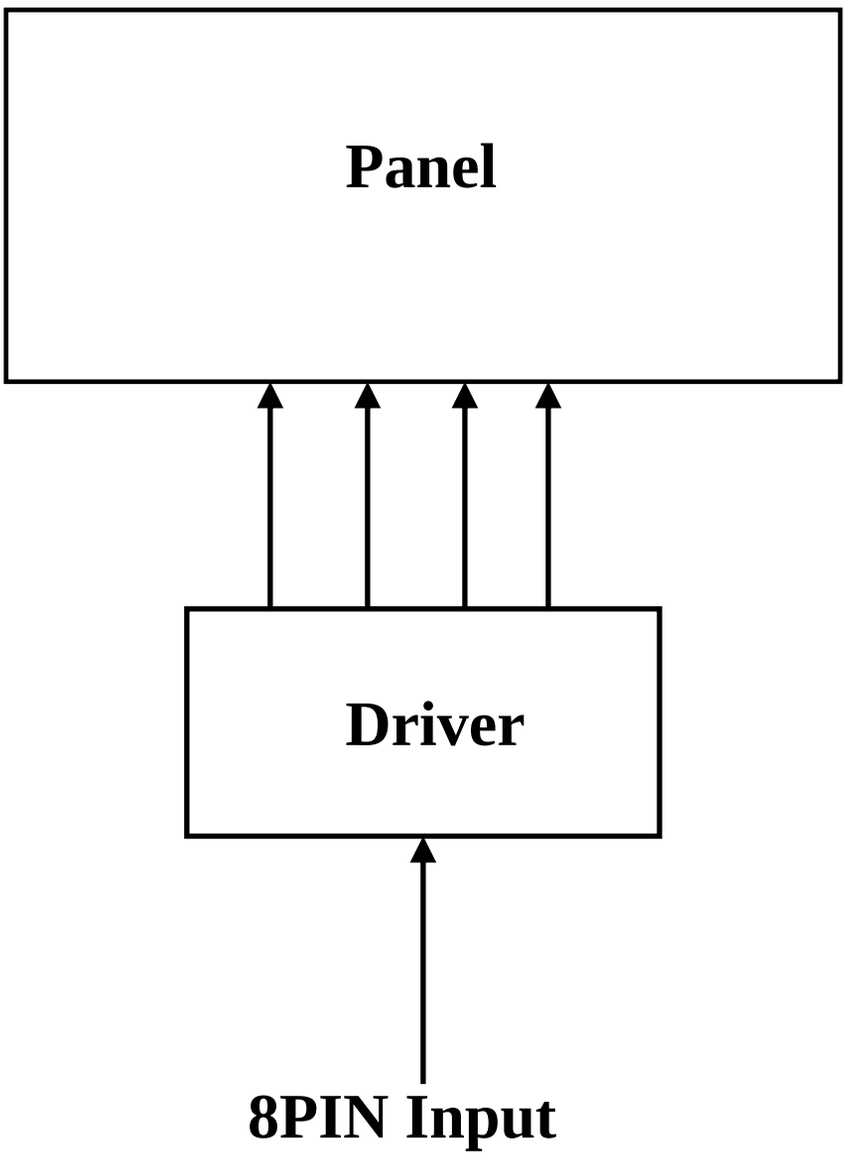
8 Handling, Safety and Environment Requirements

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 15℃ to 35℃, and humidity from 30%RH to 60%RH.

9 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 =10°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℃, RH=80% for 168 hrs	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℃ 30min]→[+70 ℃ 30 min] : 50cycles	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.

10 Block Diagram



11 Packaging

TBD

12 Mark and Bar Code definition

L9A MB1-019A1 R6C111

AWN1001001

1st line：

(A) LAA: Product date year month day，L：2021 Year ,A: Amonth ,A:10, refer to below table

Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Mark	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G
Number	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Mark	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	

(B) MB1-019A1: Module No.

(C) R6C111 : O-Paper Film LOT

2nd line：

(1) AWN1 ： Internal Code

(2) 001：Product LOT

(3) :001：Product Serial Number