

Display Elektronik GmbH

DATA SHEET

E-PAPER MODULE

DEE 800600A8 – W

4,3“

E-PAPER DISPLAY

Product Specification

Ver.: 0

08.05.2024

Version	Content	Date	Producer
0	New release	08.05.2024	JQ

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1 General Description

DEE 800600A8-W is an Active Matrix Electrophoretic Display(AM EPD), High-Resolution AM TFT Black/White display module can be used in portable electronic devices, such as E-book Reader. The module is a TFT-array driving electrophoretic display, with integrated circuits including source and gate drivers. The resolution of the module is 800 × 600, and the active area is 4.3 inch diagonal.

2 Features

- ◆ 800×600 display
- ◆ White Reflectance above 42%(0 minute)
- ◆ Contrast Ratio above 15:1(0 minute)
- ◆ 4:3 aspect ratio
- ◆ 230 dpi
- ◆ Wide viewing angle
- ◆ Ultra low power consumption
- ◆ Reflective mode
- ◆ Bi -stable display
- ◆ Commercial temperature range
- ◆ Landscape, portrait modes
- ◆ Hard-coat antiglare display surface

3 Application

E-book reader.

4 Pin Assignment

No.	Pin Name	Description
1	VNEG	Negative power supply source driver
2	VGL	Negative power supply gate driver
3	VSS	Ground
4	NC	NO Connection
5	NC	NO Connection
6	VDD	Digital power supply drivers
7	VSS	Ground
8	CLK	Clock source driver
9	VSS	Ground
10	LE	Latch enable source driver
11	OE	Output enable source driver
12	SPH	Start pulse source driver
13	D0	Data signal source driver
14	D1	Data signal source driver
15	D2	Data signal source driver
16	D3	Data signal source driver
17	D4	Data signal source driver
18	D5	Data signal source driver
19	D6	Data signal source driver
20	D7	Data signal source driver
21	VCOM	Common connection
22	NC	NO Connection
23	NC	NO Connection
24	NC	NO Connection
25	NC	NO Connection
26	VSS	Ground
27	NC	NO Connection
28	CPV	Shift clock input
29	STV	Start pulse gate driver
30	NC	NO Connection
31	VBORDER	Border connection
32	VSS	Ground
33	VPOS	Positive power supply source driver
34	VGH	Positive power supply gate driver

5 Electrical Characteristics

5.1 Module interface description

This module can be driven by ASIC AVT6201A Timing Controller(T-Con).

5.2 Module DC characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Signal ground	VSS		-	0	-	V
Logic Voltage supply	VDD		3.0	3.3	3.6	V
	IVDD	VDD=3.3V		3.0		mA
Gate Positive supply	VGH		21	22	23	V
	IVGH			0.35		mA
Gate Negative supply	VGL		-21	-	-19	V
	IVGL			3.0		mA
Source Positive supply	VPOS		14.6	15	15.4	V
	IPOS	VPOS=15V	-	20	-	mA
Source Negative supply	VNEG		-15.4	-15	-14.6	V
	INEG	VNEG=-15V		-20		mA
Asymmetry source	VASYM	VPOS+VNEG	-80	0	80	mV
Common voltage	VCOM		-2.5	Adjusted	0	V
	ICOM		-	-1.5	-	mA
Standby power module	PSTBY			-	0.4	mW
Typical power module	PTYP		-	600	1100	mW
Operating temperature	Top		0		50	°C
Operating relative humidity	RHop		0		70	%
Storage temperature	Tst		-25	-	70	°C
Storage relative humidity	RHst		30		60	%

Notes:

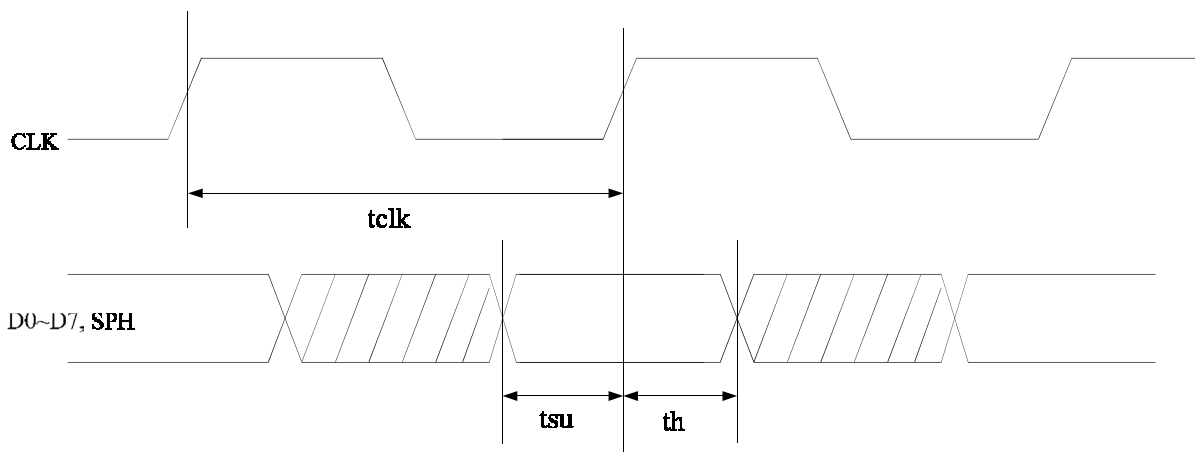
1. The maximum power and maximum current are specified for the worst case power consumption.
2. The typical power is measured when “typical images” are displayed.
3. The standby power is the consumed power when the module controller is in standby mode.
4. The listed electrical/optical characteristics are only guaranteed under the controller & waveform provided by supplier.

5.3 Module AC characteristics

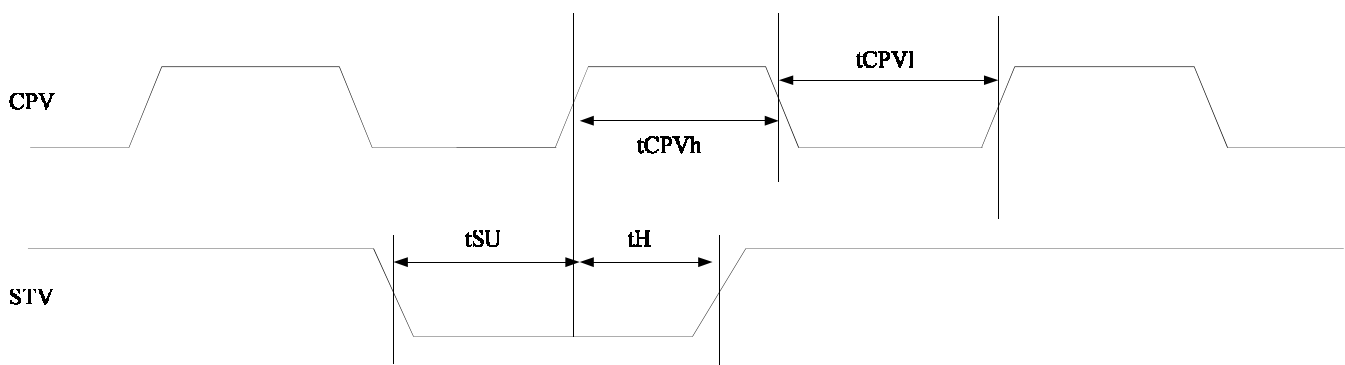
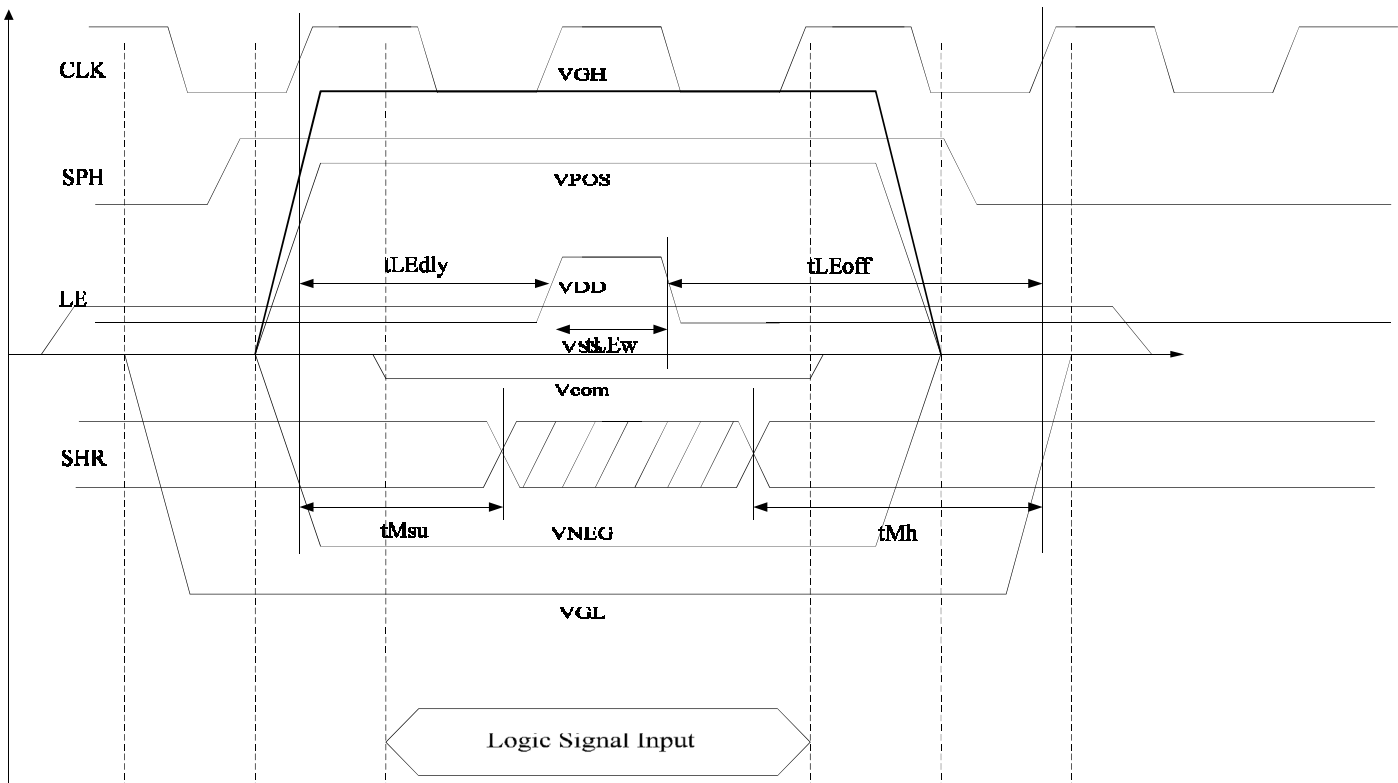
Note: VDD=3.0V to 3.6V, unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	App Pin
Clock frequency	fcpv			200	kHz	CPV
Clock CPV high time	tCPVh	0.5	-	-	us	
Clock CPV low time	tCPVl	0.5	-	-	us	
Data setup time	tSU	100	-	-	ns	CPV STV
Data hold time	tH	300	-	-	ns	Below table
Clock CLK cycle time	tclk	40	-	-	ns	
D0 .. D7, SPH setup time	tsu	8	-	-	ns	
D0 .. D7, SPH hold time	th	8	-	-	ns	
LE on delay time	tLEdly	40	-	-	ns	
LE high-level pulse width	tLEw	40	-	-	ns	
LE off delay time	tLEoff	40	-	-	ns	
SHR setup time	tMsu	100	-	-	ns	
SHR hold time	tMh	10	-	-	ns	

Clock & Data Timing



Output Latch/Control Signals



6 Power On/Off Sequence

To prevent the device from damage due to latch up, the power on/off sequence shown below must be followed.

When power on: VDD -> VGL -> VNEG/VGH/VPOS -> Vcom

When power off: Vcom -> VNEG/VGH/VPOS -> VGL -> VDD

7 Mechanical Specifications

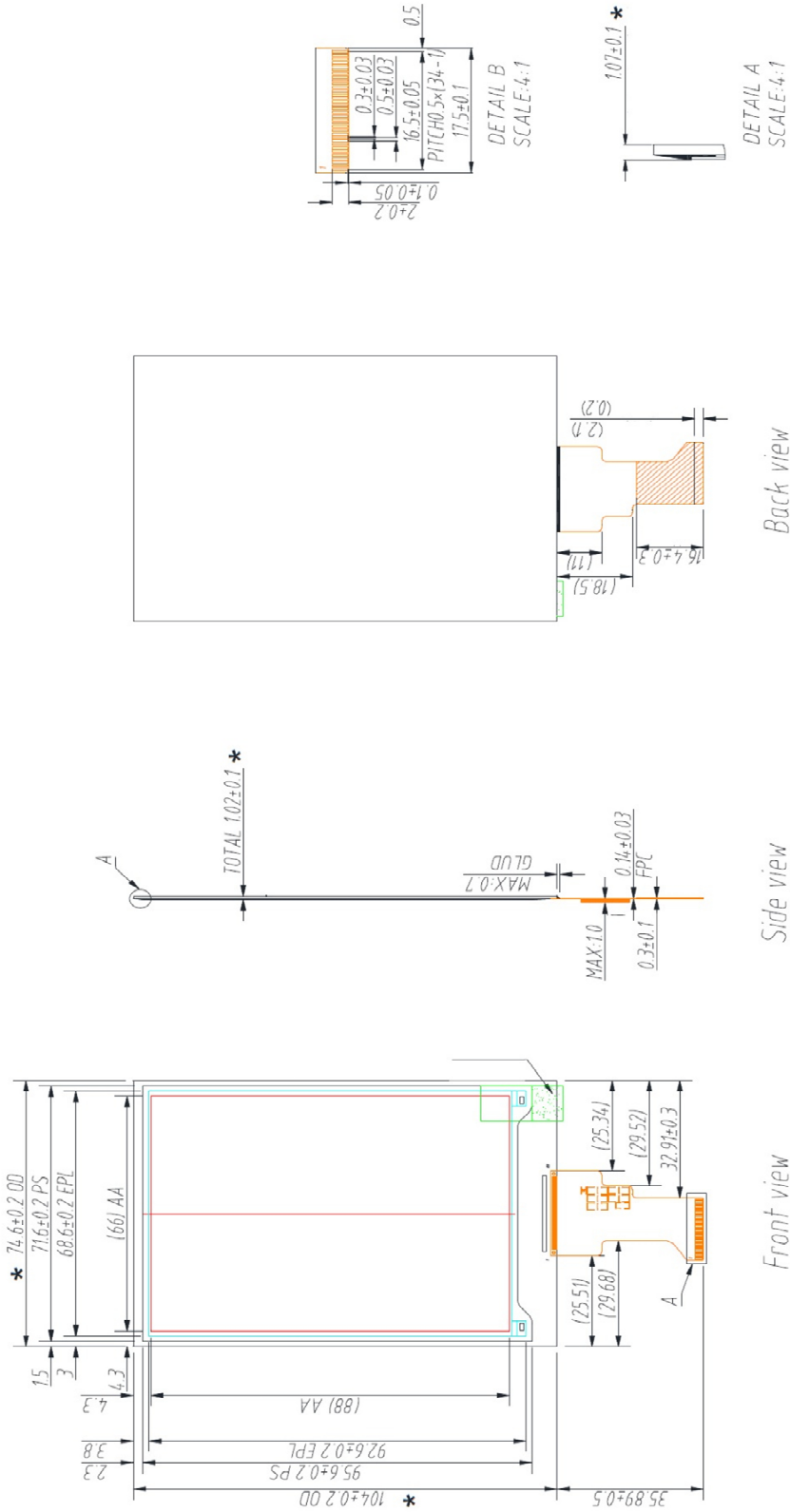
7.1 Dimension

PARAMETER	VALUE	UNIT	Remark
Display Resolution	800×600	dots	
Active area dimensions			
Width	88	mm	
Height	66	mm	
Screen size	4.3 (4 : 3 diagonal)	Inch	
Resolution	230	dpi	
Pixel pitch			
Horizontal	0.11	mm	
Vertical	0.11	mm	
Pixel configuration	Rectangle		
Overall dimensions			
Width	104.0	mm	
Height	74.6	mm	
Thickness	1.02	mm	
Mass of the module	TBD	g	

7.2 Electrical Connector

SERVICE	CONNECTOR	NUMBER OF PINS
Interface	FPC pitch=0.5mm	34

7.3 Mechanical Drawing of EPD Module



NOTES:

1. Display module 4.3" array for EPD; 3. Material conform to the RoHS standard;

2. Unspecified Tolerance ± 0.20 ; 4. Mark" * for control DIM, " / DIM does not need to be measured

Optical Characteristics

Parameter	Conditions	Values			Units	Notes
		Min.	Typ.	Max		
White Reflectivity	0 min	42	45		%	
Contrast Ratio (CR)	0 min	15	18			1

($T_{amb}=25^{\circ}C$, $f_v=50Hz$. 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 display module should not be exposed to harmful gases, such as acid and alkali gases, which corrode electronic components.
2. Do not apply pressure to the EPD panel in order to prevent damaging it
3. Do not connect or disconnect the interface connector while the EPD panel is in operation
4. Do not stack the EPD panels / Modules.
5. Keep the EPD Panel / Module in the specified environment and original packing boxes when storage in order to avoid scratching and keep original performance.
6. Do not disassemble or reassemble the EPD panel
7. 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
8. Please be mindful of moisture to avoid its penetration into the EPD panel, which may cause damage during operation
9. 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.
10. 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 $15^{\circ}C$ to $35^{\circ}C$, and

humidity from 30%RH to 60%RH.

11. The EPD Panel / Module 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

10. Reliability test

No.	TEST	CONDITION	METHOD	REMARK
1	High-Temperature Operation	T = +50°C, RH = 30% for 240hrs	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 240hrs	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 240 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 240 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 = 90% 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 240hrs	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 30 min] : 100 cycles	IEC 60 068-2-14	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied.
8	Package Vibration	1.04G, Frequency: 10~500Hz Direction: X,Y,Z Duration: 1 hours in each direction	Full packed for shipment	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied.
9	Package Drop Impact	Drop from height of 122 cm on concrete surface. Drop sequence: 1 corner, 3edges, 6 faces One drop for each	Full packed for shipment	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied.
10	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.
11	Stylus Tapping	POLYACETAL Pen: Top R0.8mm Load: 200gf;Speed:30times/min; Speed: 30times/min Total 13,500times,		At the end of the test, electrical, mechanical, and optical specifications shall be satisfied.

11 Block Diagram

