ELECTRONIC ASSEMBLY
new display design

ePAPER 4.3" - 800X600 PIXEL

ab 1 Stück lieferbar !

Maße:
104 x 75 x 1,2 mm

TECHNISCHE DATEN

* KONTRASTREICHSTE ePAPER LCD ANZEIGE
* WEITER BLINKWINKELBEREICH
* ELEKTROPHORETISCH-AKTIV-MATIRX DISPLAY (ePAPER) 4,3" MIT 800x600 PIXEL
* BETRIEBSTEMPERATURBEREICH 0°...+50°C (LAGERTEMPERATUR -25°..+75°C)
* STANDBY-POWER 0W (INHALT LESBAR)
* 16 GRAUSTUFEN

BESTELLBEZEICHNUNG

ePAPER DISPLAY 4,3" 800X600   **EA EPA43-A**

DOCUMENT REVISION HISTORY 1:

DOCUMENT REVISION FROM TO	DATE	DESCRIPTION	CHANGED BY	CHECKED BY
A	2012.07.09	First Release.	LIANG YUN	LIN SHI CHAO

CONTENTS

Technische Änderung vorbehalten.
Wir übernehmen keine Haftung für Druckfehler und Applikationsbeispiele.

Seite 3

Specification of LCD Module Type

1. General Description

EA EPA43-A 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（SVGA）， and the active area is 4.3 inch diagonal.

- 800×600 display
- White Reflectance above 40%
- Contrast Ratio above 8:1
- 4:3 aspect ratio
- Wide viewing angle
- Ultra low power consumption
- Reflective mode
- Bi -stable display
- Commercial temperature range
- Landscape, portrait modes
- Hard-coat antiglare display surface
- E-book reader.

2. Mechanical Specifications

The mechanical detail is shown in Fig. 1 and summarized in Table 1 below.

Parameter	Specifications	Unit	Remark
Screen Size	4.3'	Inch	
Display Resolution	800×600	Pixel	
Active Area	66.0 (H)×88.0(V)	mm	
Pixel Pitch	0.11×0.11	mm	
Pixel Configuration	Rectangle		
Outline Dimension	74.6(W)×104. 0(H) ×1.26(D)	mm	

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Technische Änderung vorbehalten.
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Panel

Driver

26PIN Input

Figure 2: Block Diagram

Technische Änderung vorbehalten.
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Seite 5
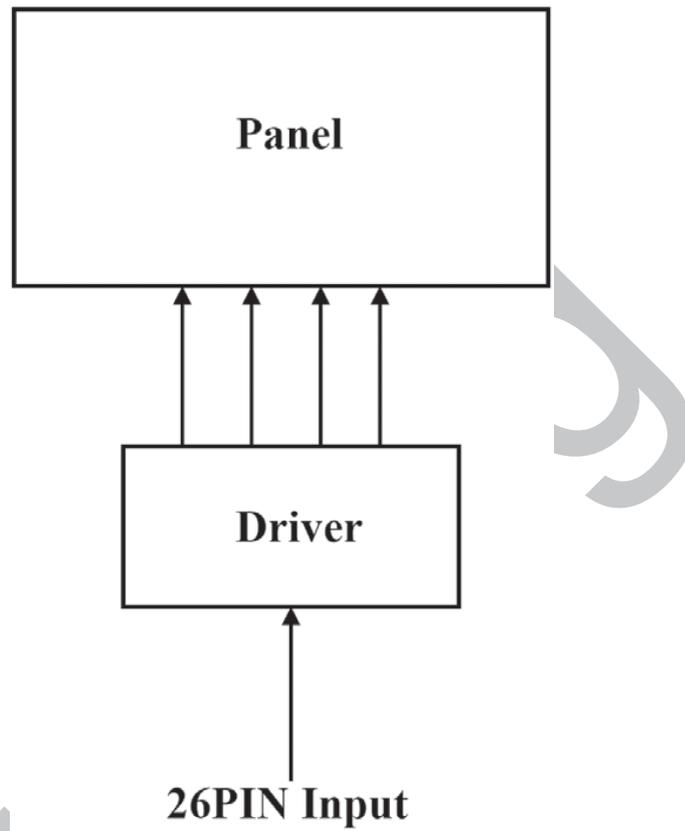
3. Interface signals

Table 2

1	VNEG	Negative power supply source driver
2	VPOS	Positive power supply source driver
3	VSS	Ground
4	VDD	Digital power supply drivers
5	CLK	Clock source driver
6	LE	Latch enable source driver
7	OE	Output enable source driver
8	SHR	Shift direction source driver
9	SPH	Start pulse source driver
10	D0	Data signal source driver
11	D1	Data signal source driver
12	D2	Data signal source driver
13	D3	Data signal source driver
14	D4	Data signal source driver
15	D5	Data signal source driver
16	D6	Data signal source driver
17	D7	Data signal source driver
18	VCOM	Common connection
19	VGH	Positive power supply gate driver
20	VGL	Negative power supply gate driver
21	GMODE2	Output mode selection gate driver (H)
22	GMODE1	Output mode selection gate driver (H)
23	L/R	Shift direction gate driver
24	STV	Start pulse gate driver
25	CPV	Shift clock input
26	VBORDER	Border connection

4. Electrical Specifications

4.1 Electrical Maximum Ratings

Table 4

Parameter	Symbol	Rating	Unit
Logic Supply Voltage	VDD	-0.3 to +7	V
Positive Supply Voltage	VPOS	+18	V
Negative Supply Voltage	VNEG	-18	V
Supply Voltage for logic	VPOS- VNEG	36	V
Supply Voltage	VGG	-0.3 to +45	V
Supply Voltage	VEE	-25.0 to +0.3	V
Supply Voltage	VGG-VEE	-0.3 to +45	V
Operating Temp. range	TOTR	0 to +50	℃
Storage Temp. range	TSTG	-25 to +70	℃

4.2 Module DC characteristics

Table 5

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	-			uA
Gate Positive supply	VGH		7	-	VGL+50	V
	IVGH			100		uA
Gate Negative supply	VGL		-25	-	-5	V
	IVGL			100		uA
Source Positive supply	VPOS		-0.3	15	20	V
	INEG	VPOS=-15V	-	14	-	mA
Source Negative supply	VNEG		-16	-15	-10	V
	IPOS	VNEG=15V		-14		mA
Asymmetry source	VASYM	VPOS+VNEG	-80	0	80	mV
Common voltage	VCOM		-2.5	Adjusted	-1.0	V
	ICOM		-	0.8	-	mA
Standby power module	PSTBY			-	0.26	mW
Typical power module	PTYP		-	260	800	mW
Operatingtemperature			0		50	℃
Storage temperature			-20	-	70	℃
Maximum imageupdate time at 25℃				960	1200	ms

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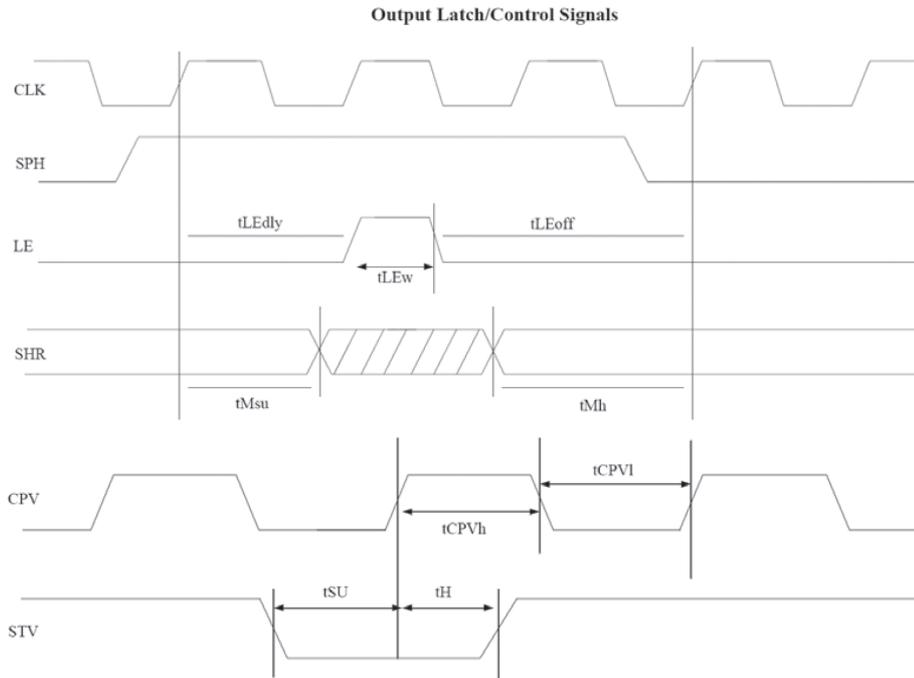
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1. The maximum power and maximum current are specified for the worst case power consumption.
2. The typical power is measured when "typical images" are displayed.
3. The standby power is the consumed power when the module controller is in standby mode.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

4.3 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
Data hold time	tH	300	-	-	ns	STV
Clock CLK cycle time	tclk	40	-	DC	ns	Below table
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
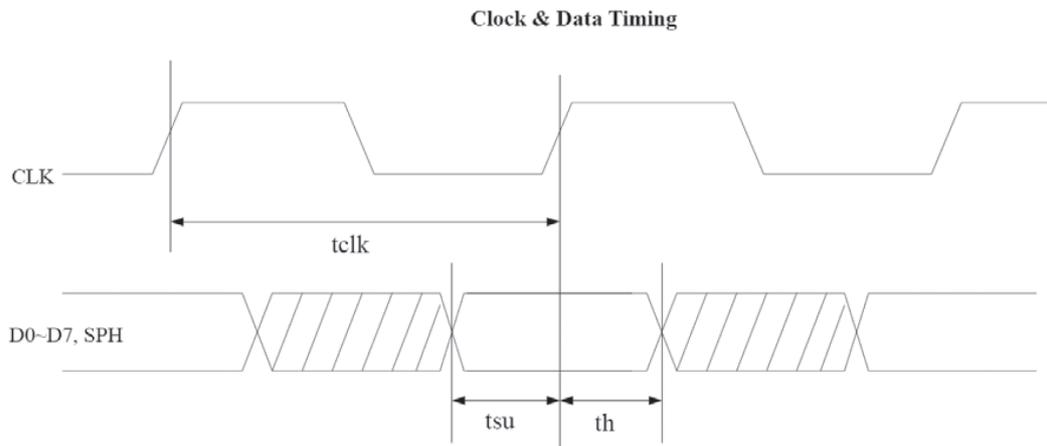
5 Power On Sequence

VDD -> VNEG -> VPOS (Source Driver)

VEE -> VGG (Gate Driver)

Technische Änderung vorbehalten.
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Seite 9
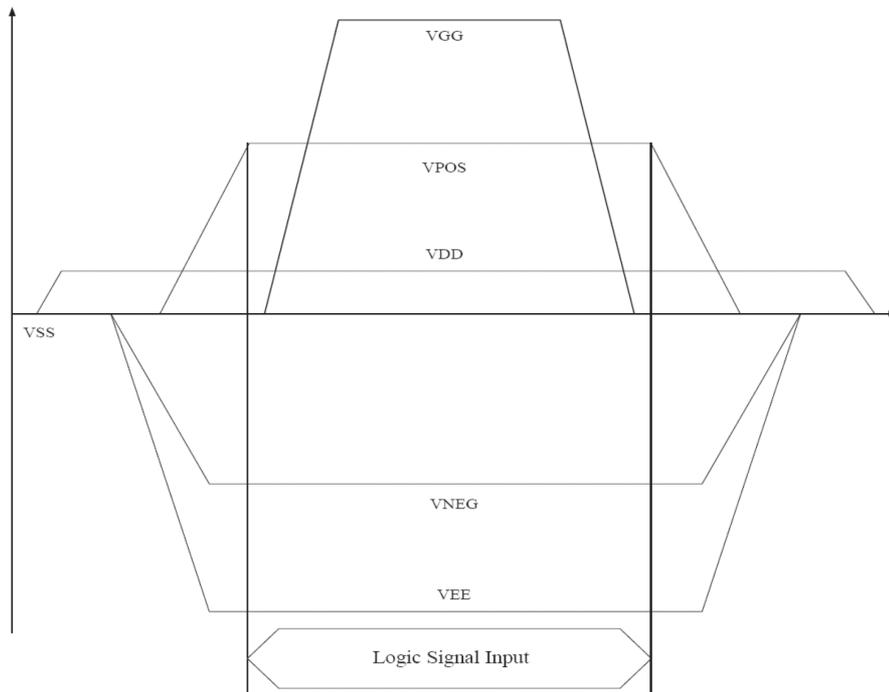
6 Optical Specification

6.1 Optical characteristics

Parameter	Conditions	Values			Units	Notes
		Min.	Typ.	Max		
White Reflectivity	White	35	40		%	
Contrast Ratio (CR)		8:1				1
Image Update Time:	GC16(T=0℃)		1500	1600	ms	
	GC16(T=25℃)		960	1200		
	GC16(T≥35℃)		760	960		
	DU (T=0℃)		500	540		
	DU(T≥20℃)		300	360		
Image Sticking(Ghosting)		-2.0	1.0	2.0		2

(Tamb=25℃, fv=50Hz,Vepd=+/-15V; supply voltage module is 3.3VDC. Measurements are made with Eye-One Pro Spectrophotometer.)

Notes:

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

2. Ghosting Testing:

 2.1. Testing Pattern
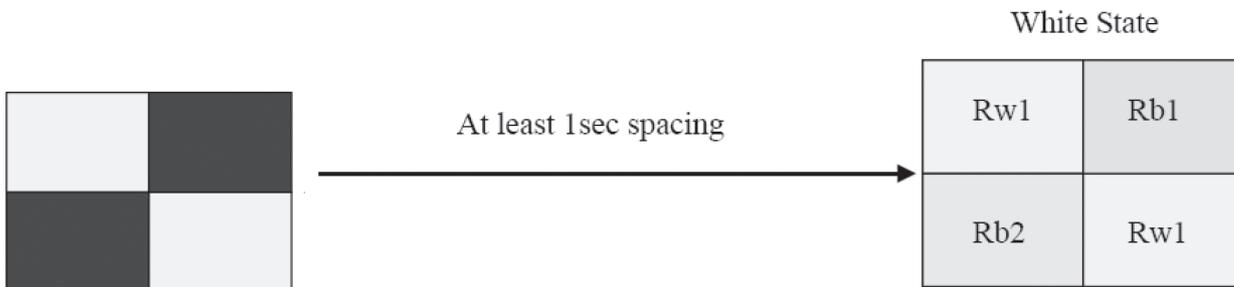
White State

2.2.Refresh process：Init----GC White----4 checkerboard PatternGC）----GC White.

2.3. Measuring the reflectance of all 4 checkerboard areas when final white state by Eye-one device.

2.4. Rw: reflectance of area transited from white state; Rb: reflectance of area transited from dark(black) state.

2.5. Calculating averages of WS-to-WS and DS-to-WS transitions:

 Rw(ave)=(Rw1+Rw2)/2，Rb(ave)=(Rb1+Rb2)/2，G=Rw(ave)-Rb(ave).

7 Handling, Safety, and Environment Requirements

Warning

The display glass may break when it is dropped or bumped on a hard surface. Handle with care. Should the display break, do not touch the electrophoretic material. In case of contact with electrophoretic material, wash with water and soap.

Caution

The display module should not be exposed to harmful gases, such as acid and alkali gases, which corrode electronic components. Disassembling the display module Disassembling the display module can cause permanent damage and invalidates the warranty agreements.

Observe general precautions that are common to handling delicate electronic components. The glass can break and front surfaces can easily be damaged. Moreover the display is sensitive to static electricality and other rough environmental conditions.
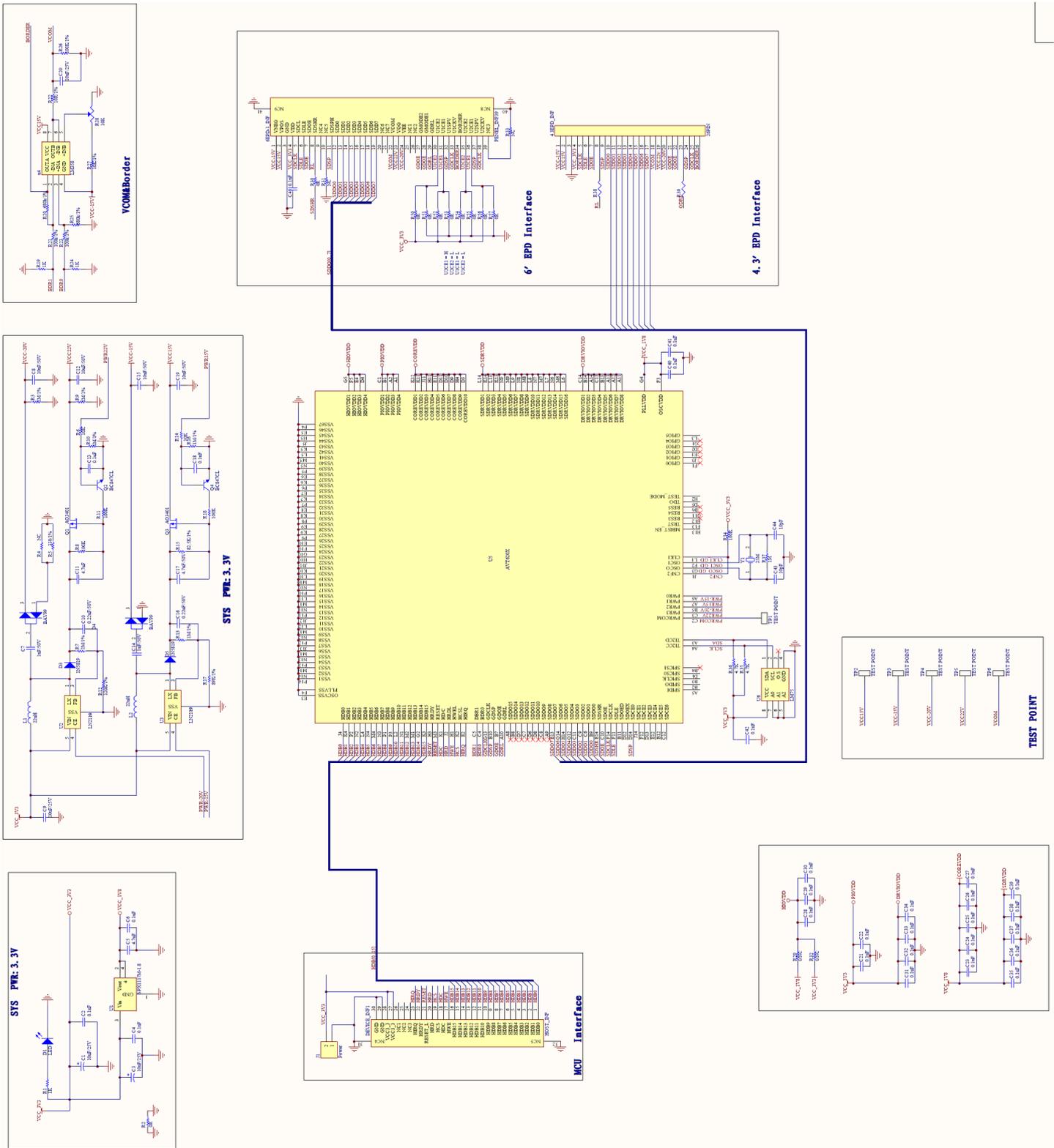
8. Reliability test

No.	TEST	CONDITION	METHOD	REMARK
1	High-Temperature Operation	T = +50°C, RH = 30% for 240 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 240 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 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 theend 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.

APPLIKATIONSBEISPIEL

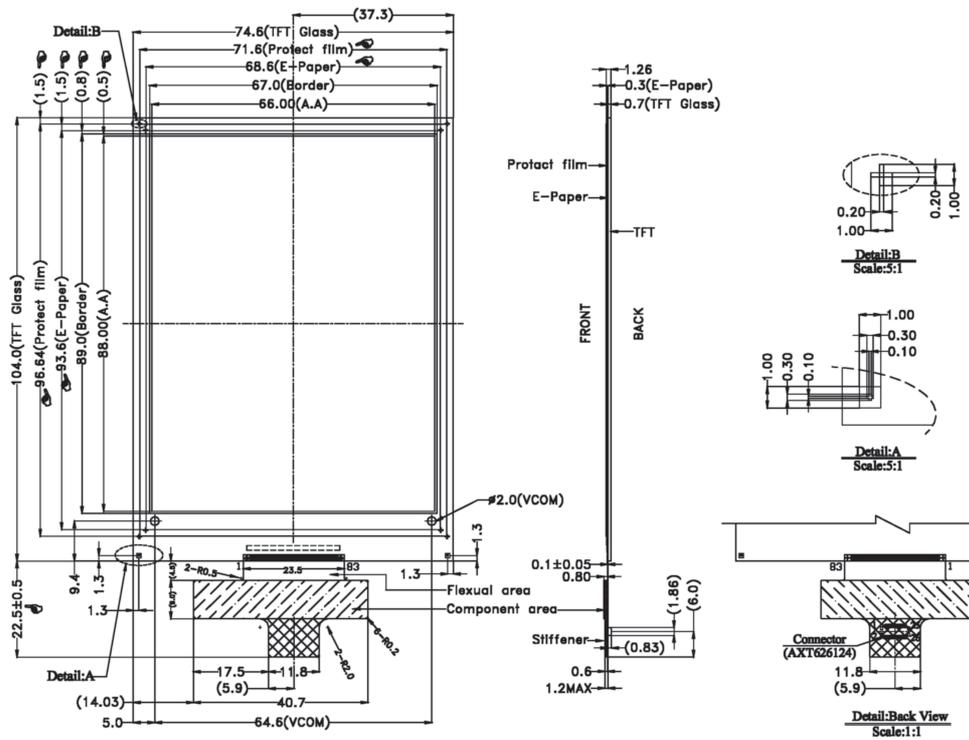Im folgenden sehen Sie die Standardbeschaltung des EA EPA43-A.

Technische Änderung vorbehalten.
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Kind suggestion: VA of customer's application should be 0.5mm smaller than LCD VA in each side.

Detail:B

(37.3)
74.6(TFT Glass)
71.6(Protect film)
68.6(E+Paper)
67.0(Border)
66.00(A.A)

(1.5) (1.5) (0.8) (0.5)

1.26
0.3(E-Paper)
0.7(TFT Glass)

Protect film
E-Paper
TFT

FRONT   BACK

104.0(TFT Glass)
96.64(Protect film)
93.6(E-Paper)
89.0(Border)
88.00(A.A)

Detail:B
Scale:5:1

0.20
1.00
0.20
1.00

1.00
0.30
0.10
1.00
0.30
0.10

Detail:A
Scale:5:1

2.0(VCOM)

22.5±0.5
9.4
1.3
1.3
1.3

2~R0.5
23.5
B3
1.3

Flexual area
Component area

0.1±0.05
0.80

Stiffener
(0.83)

Connector
(AXT626124)

B3   1

11.8
(5.9)

Detail:A
17.5
(5.9)
11.8
40.7
(14.03)
5.0
64.6(VCOM)

0.6
1.2MAX

(1.86)
(6.0)

Detail:Back View
Scale:1:1

Achtung !
Handhabungs-
vorschriften
beachten

Elektrostatisch
gefährdete
Bauelemente

Quotation No:	
Display Type	4.3" Array for EPD
Display Resolution	DOTS:800*600 (Pixel size:0.11mm*0.11mm)
Viewing Angle	/
Max.Ratio and Bias Level	/
Controller/Driver	/
Logic Voltage	3.0V~3.6V
Driving Voltage	/
Operation Temperature	0° C~+50° C
Storage Temperature	-20° C~+70° C
Backlight Speciality	No backlight
Remark	Hard-coat antiglare display suface

Hinweis:
- Die Oberfläche des Displays ist durch eine selbsklebende Schutzfolie vor dem Verkratzen geschützt. Bitte bei Bedarf entfernen.
- Das Display ist sehr zerbrechlich

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