E-Paper

Basics of the E-Paper Technology

1975 Development at the Xerox Palo Alto Research Center

1990 Formation of the MIT Spin off Eink

Operating mode of the E-Paper technology:

The E INK fluid consists of pellets which contain negatively charged black – and positively charged white flakes. They are enclosed in the sphere.

The medium (pellet) is embedded in a light oil. By applying voltage, the flakes can be drawn either to the front– or back of the layer / fluid to display the desired content.
Construction of an E-Paper:

Layer 1: transparent protection foil, waterproof
Layer 2: E Ink film
Layer 3: Baseplate, PCB, FPC, Glass, PET
Layer 4: Protection foil, waterproof

Remark: Layer 1 can be removed if the baseplate is glass type.

The structure of an e-paper is obvious:

Layer 1 is a transparent, waterproof protective foil, which is followed by layer 2, the actual E Ink film. The 3rd layer includes the base substrate which may consist of PCB, FPC, PET or glass. A waterproofed protection foil in Layer 4 is finally covering the construction.

E-paper, also named as electrophoretic displays or in short form EPDs, are high-resolution and can by partial addressing of the particles represent several scales of grey.

E-Paper are available as:

- Graphic E-Paper: Glass based E-Paper within standard sizes.
- Colors E: B/W and B/W/R
- Segment E-Paper: Customized
- Color: B/W
- Basic materials: Glass, PCB, FPC, PET

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Advantages of E-Papers:

- Bi-stable Display
  Power consumption only by changing of display content
  Powerless during periods of unchanged representation of the displayed content
  Information can be displayed unchanged over a long period of time
- High Contrast
- Wide viewing angle from all sides
- High-resolution
- Representation of grey scales
- Partial update, since Release 3.0
- Very low overall height
- Reflective – good readability without backlighting –
- Good readability in direct sun exposure
- Suitable for battery applications.

Currently valid data for the service life time, switching cycles and Temperature:

- By manufacturer guaranteed:
  - 1.000.000 Refreshes – or
  - 5 Years
- -20°C up to +50°C as standard temperature range
- -15°C up to +10°C in “freeze” design
- -25°C up to +10°C in “deep freeze” design
E–Paper compared to other technologies:

<table>
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<th>Specific application criteria</th>
<th>E–Paper</th>
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<th>PMOLED</th>
<th>LCD</th>
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<td>Operating temperature</td>
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<td>-20°C − +70°C</td>
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<td>Ultra wide temperature</td>
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<td>Storage temperature</td>
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Access to E–Paper production via ADKOM:

- leading E–Paper producer with own production lines
- Authorized E INK partner since 2011

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Standard size graphik E-Paper

An actual release of the standard sizes available you will find at:


All sizes of our partner’s own series production. Thereby:

• better scheduling
• better availability
• direct knowledge about changes and EOL notices

ADKOM Services around E-Papers:

• Design—in services
• Development, design and production of controller boards