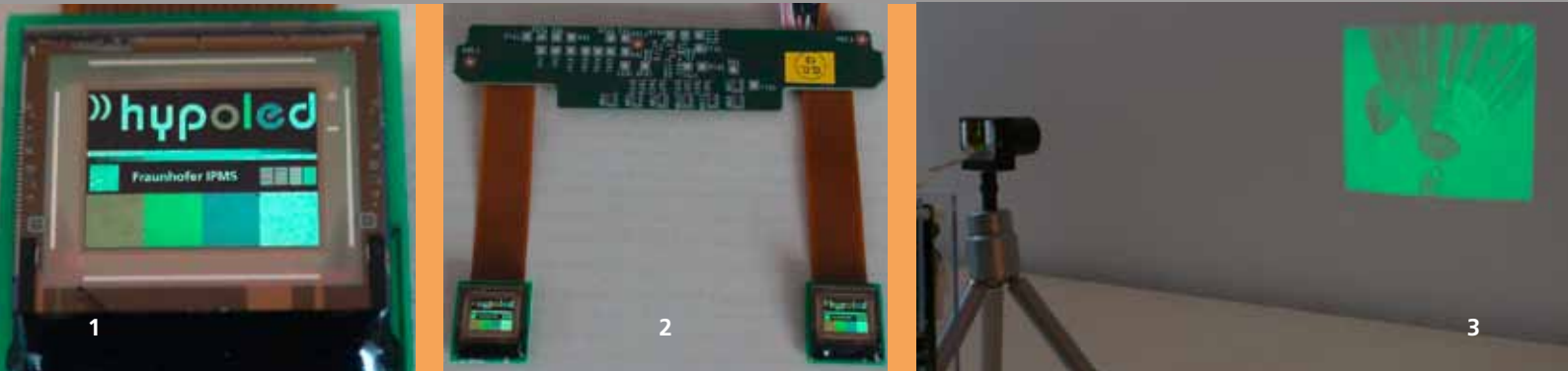




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- 1 HYPOLed micro display showing test image.
- 2 Support board with two micro displays for HMD application.
- 3 HYPOLed micro projector with a monochrome green display.

VGA TRUE COLOR OLED MICRO-DISPLAY FOR HMD AND MICRO-PROJECTION APPLICATIONS

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The target of HYPOLed is the development of a next-generation virtual display platform using novel electronic and optical component technologies for both head-mounted displays (HMD) and mobile projection applications. At the centre of the project is a new OLED microdisplay technology. Microdisplays are very small displays that are viewed under optical magnification. They combine a high quality 'virtual image' similar in size to that seen from a desktop monitor, with very low power consumption. This approach enables video, web pages or high-resolution still images to be viewed on portable consumer products with extended battery life. In future these microdisplays will be seen in hands-free (wearable) systems and micro-projectors for use with 3G mobile phones, computed games and personal DVD/MP4 players.

Features

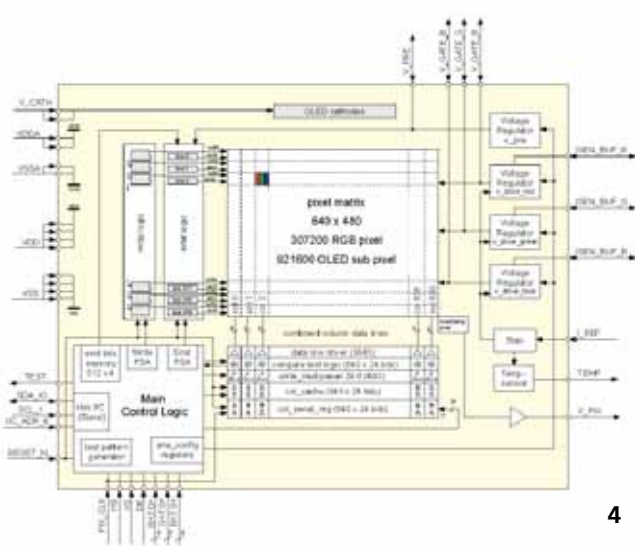
- VGA resolution (640 x 480)
- active area 7.68 x 5.76 mm²
- chip size 12 x 11 mm²
- 60 chip pads
- 44 pin flex connector from carrier board
- high brightness (up to 30,000 cd/m² monochrome)
- monochrome / full color versions
- 1.8 V power supply and negative OLED voltage
- digital pixel cell (PWM principle)
- 24 bit parallel digital video interface
- I²C configuration interface
- 50/60 Hz frame rate
- color, contrast and gamma correction by I²C
- temperature monitoring



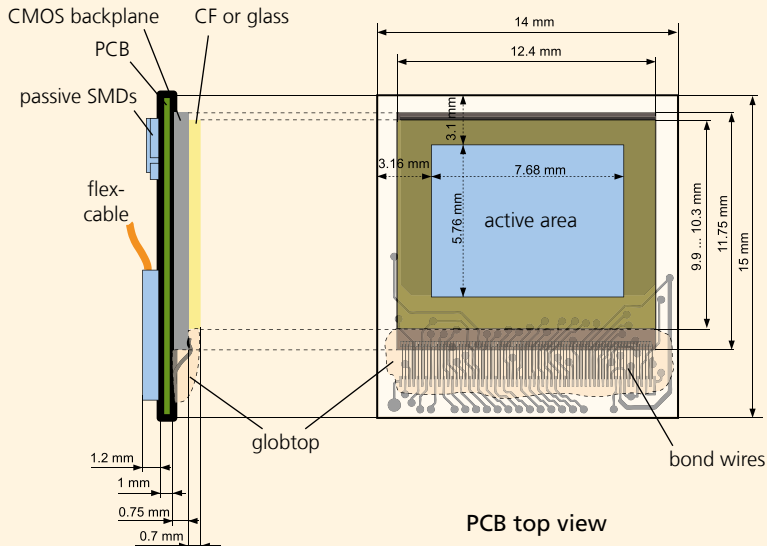
Quality Management

We are certified

Voluntary participation in regular monitoring according to ISO 9001:2008



4



5

PCB top view

General Description

The μ DIC (micro Display Integrated Circuit) is a true color VGA OLED micro-display. Digital video data received from the 24 bit parallel interface will be stored in the 24 bit digital pixel cells. An initial data write phase is followed by an emitting phase and the addressed OLED is switched on and off depending on the value stored into the pixel cell. This is realized by pulse width modulation (PWM), also realizing refresh of stored pixel values. A default emitting schedule is preset inside the μ DIC. Modified schedules for contrast and gamma correction can be programmed via I²C.

The chip is realized in a 180 nm CMOS process and operates with a core supply of 1.8 V. All digital inputs and outputs are 1.8 V interfaces. An effective OLED voltage up to 6.7 V (depending on specific OLED deposition) could be reached with a negative voltage of -5.0 V at the common OLED cathode.

Acknowledgement

This work was (in parts) funded by the European Commission within the HYPOLED project (High-Performance OLED-Microdisplays for Mobile Multimedia HMD and Projection Applications, ICT-2007.3.2-217067).

¹ HMD support board in fig. 2 provided by project partner Mobintech A/S.

)) hypoled

www.hypoled.org



Parameter

Supply Voltage:	1.8 V / -2 ... -5 (... -7) V (OLED cathode)
Storage / Operating Temperature:	0° C to + 70 / 60° C
Total power consumption:	65 mW (HMD) ... 300 mW (projector)
Pixel pitch:	12 μ m
Frame rate:	40 ... 60 Hz
Color depth:	monochrome ... 24 bit
Contrast:	$\geq 100 : 1$
Luminance (white with color filter for HMD)	100 nits
Luminance (monochrome green for projector)	30 knits

4 HYPOLED micro display block diagram.

5 Dimensions of the micro display PCB.