



# Fraunhofer COMEDD

FRAUNHOFER RESEARCH INSTITUTION FOR ORGANICS, MATERIALS AND ELECTRONIC DEVICES COMEDD



- 1  $\mu$ Q QVGA OLED microdisplay.
- 2 Electrical symbol.

## QVGA OLED MICRODISPLAY $\mu$ Q

### Fraunhofer Research Institution for Organics, Materials and Electronic Devices COMEDD

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#### Brief Description

The  $\mu$ Q provides a complete digital microdisplay solution with a very high level of electronic and optical integration. Its P-OLED technology offers class-leading image quality coupled with ultra-low power consumption, thus makes it best suitable for portable, battery-driven devices.

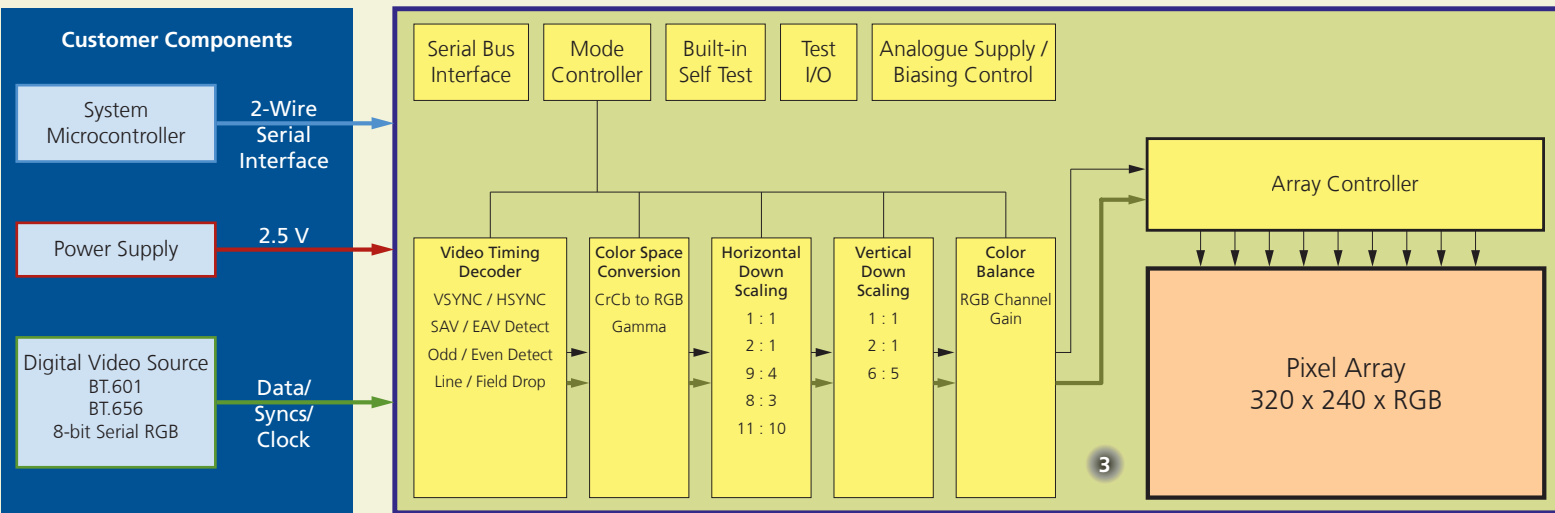
Due to its self-luminous OLED technology it does neither require any extra light source nor associated optics. Together with its high level of integration, its single supply voltage requirement and its integrated flex assembly it allows absolutely lowest system cost.

The  $\mu$ Q is ideally suited for Electronic Viewfinders (EVFs) in digital/video cameras and night scopes as well as for Personal Media Viewers or Head Mounted Displays (HMDs) for Virtual and Augmented Reality applications.

#### Benefits

- Enables much longer runtimes of portable, battery-driven devices through ultra-low power consumption (<25 mW)
- Lower system costs compared to other LCD-, LCoS- or DLP-based microdisplay solutions due to no extra light source and related costly optics
- Single 2.5 V supply voltage allows cost-efficient system architectures
- No need for extra display driver chips due to integrated, highly configurable display driver electronics
- Simple direct connection to ICs from all major vendors enabled by integrated digital video interface and decoder
- Glue-less integration through integrated flex assembly enables smaller and more light-weight products





**Features**

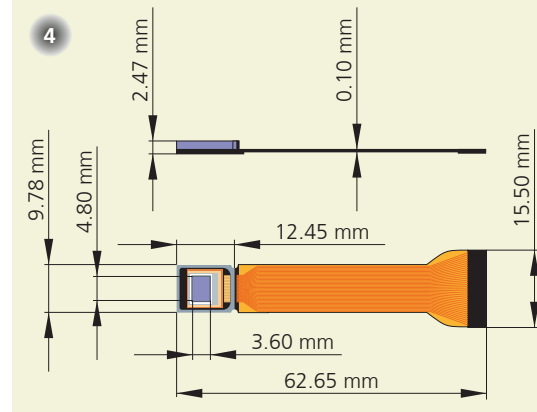
- QVGA 320 x 240 x RGB resolution
- 230 k pixel, with pixel pitch of 15.0 μm
- Active area of 0.24" (6.0 mm) diagonal
- Luminance (typical) 120 cd/m<sup>2</sup>
- Contrast > 10,000 : 1, fill factor 82%
- Supports frame rates from 50 ... 120 fps
- Response time < 10 μs, blurring-free
- Color depth video 18-bit, still 24-bit
- Color Space Conversion: 4:2:2 YCbCr into RGB values
- Build-in Gamma de-correction ensures compatibility with other different image standards
- Scaling horizontal & vertical planes
- Formats to be displayed in QVGA in their correct aspect ratio without cropping: NTSC (720 x 480), PAL (768 x 576), VGA (640 x 480), CIF (352 x 288)
- Supports WVGA (16:9) to QVGA (4:3) via anamorphic lens
- BT656, BT.601 and serial RGB digital video interfaces
- Serialized RGB input format over D[7:0]
- 50 mW (BT.656), < 25 mW (serial RGB) power consumption
- Operating temperature -20 to +60 °C
- Single supply voltage 2.5 V ±10%

- Integrated charge pump to generate needed 6 V for OLED
- 2-wire serial I<sup>2</sup>C interface for control
- Internal test pattern generator

**Availability**

Available in small and medium quantities in combination with customer-specific development or /and research efforts on process, component or /and system level.

**For R&D and evaluation purposes only.**



3 System & block diagram.

4 Mechanical dimensions.