

SINGLE COLOR AND RGB MICRO-DISPLAYS FOR AUGMENTED REALITY ALD-MD-0001, ALD-MD-1001, ALD-MD-2001, ALD-MD-3001

Optimizing Power Efficiency and Form Factor for Augmented Reality Optical Engines

Main features

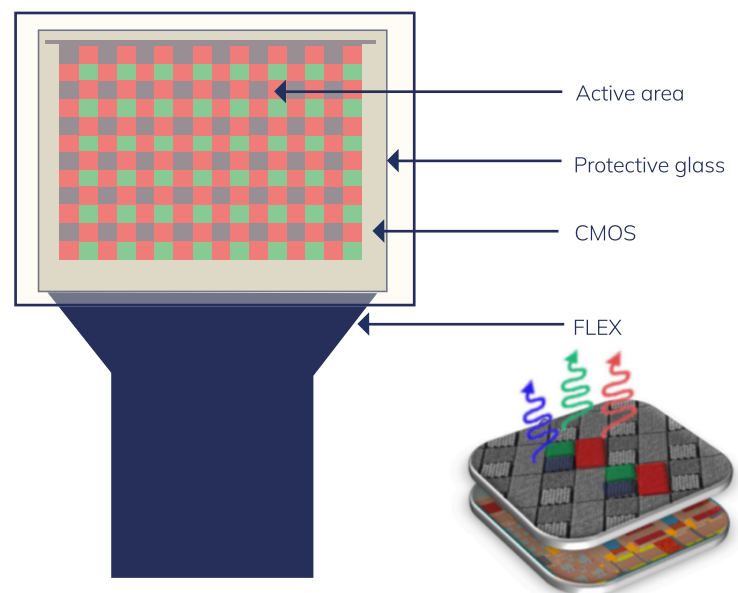
- **Micro-Display Specifications:**
 - **Subpixel Pitch:** 2.475µm
 - **Resolution:**
 - 720p for RGB (ALD-MD-3001)
 - QHD for Single Color (ALD-MD-0001, ALD-MD-1001, ALD-MD-2001)
 - **Display Size:** 0.29 inches
 - DPI of 5130 (RGB)
 - DPI of 10260 (Single Color)
 - **Brightness:** Exceeds 1 million nits (for both white and single color options)
- **Ready for Integration:** Comes with a full video interface module, ready for seamless system integration.
- **Color Options:** Single Color Displays: Red (ALD-MD-2001), Green (ALD-MD-1001), or Blue (ALD-MD-0001)

Advanced Features

- ✓ Subpixel Pitch: 2.475µm

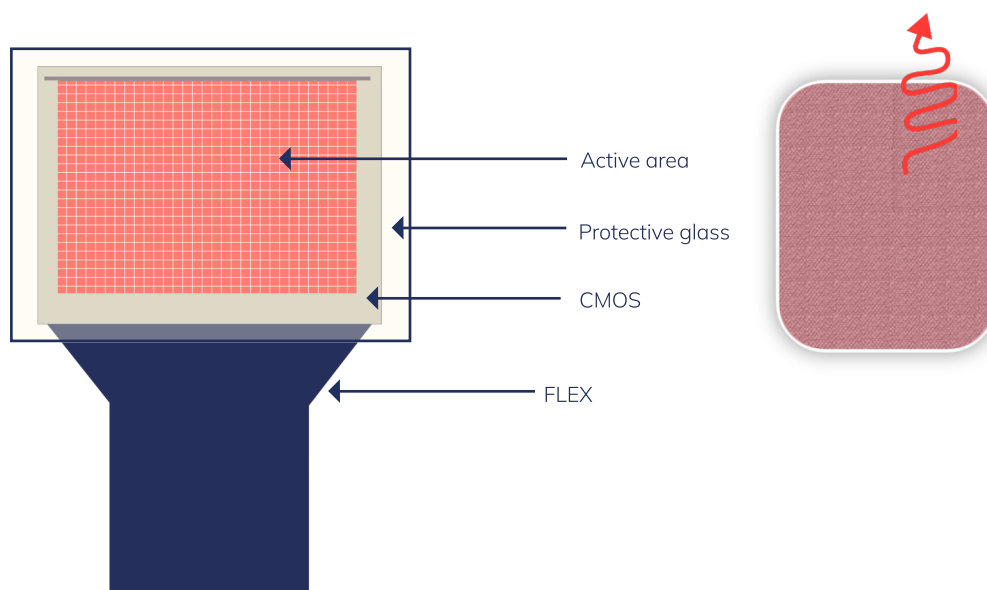
RGB

- ✓ Pixel Arrangement: 1280 x 720 (RGB), X and Y direction subpixels



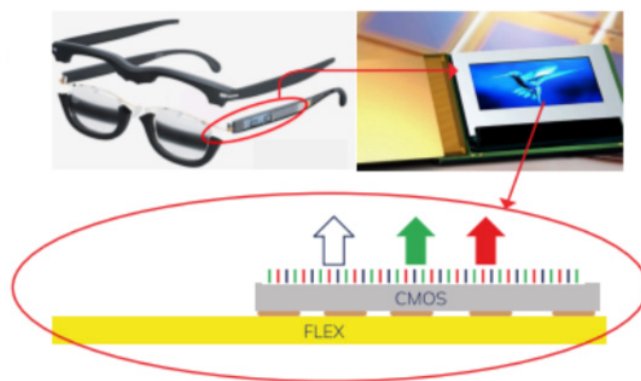
Single Color

- ✓ Pixel Arrangement: 2560 x 1440 (Single Color), X and Y direction subpixels



Distinctive features

- ✓ **Material and Structure:** Utilizes Gallium Nitride (GaN) nanowires grown on silicon substrates, capable of displaying either single colors (Red, Green, Blue) or all three RGB colors.
- ✓ **Ultra-compact Micro-Display Module:** Integrates a unique monolithic RGB or single color array capable of achieving a subpixel pitch as small as $2\mu\text{m}$, perfectly sized for a compact 3mm x 5mm area, supporting both 720p and QHD resolutions.
- ✓ **Directional Emission:** Achieved through the periodic arrangement of nanowires, enhancing coupling efficiency with optical waveguides. Emission optimized within a $\pm 20^\circ$ cone, without the need for micro-lenses, which enhances red and green emissions for single color displays. This enables compatibility with cube optical combiners and avoids ghost images.
- ✓ **Power Efficiency:** Exceptionally low power consumption due to high directionality, achieving two to six times more light directed into the waveguide, resulting in two to six times system-level power savings.
- ✓ **Cost-Effective Manufacturing:** Leveraging advanced techniques to grow native RGB and single-color LEDs on 8-inch or 12-inch silicon wafers.



Applications

The ALD-MD-3001 (RGB) and ALD-MD-0001/1001/2001 (Single Color) are specifically tailored for outdoor augmented reality glasses, offering:



- **Outdoor Brightness:** Sufficient brightness for visibility in sunlight.
- **High Resolution:** Allows precise viewing of fine details.
- **High Power Efficiency:** Supports extensive battery life due to efficient power use.
- **Compactness:** Fits elegantly within eyeglasses branches.
- **Compatibility:** Works well with cube optical combiners due to high directivity.



For more information or to place an order, contact us
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