

One-dimensional light modulator

Wire bonded light modulator

Fraunhofer IPMS develops and manufactures micro mirror based light modulators (MOEMS, micro opto electromechanical system) in a wide variety of types and configurations. A very versatile type among that is the one-dimensional (1D) light modulator. Such a device can be used in a wide range of applications. Examples are computer to plate (CTP), laser direct imaging (LDI), waferlevel packaging / interconnect, holography, material marking and processing and IP protection. A 1D light modulator device consists of up to several thousand pixels arranged in a line. Each pixel can be switched to black, white or even arbitrary gray values with very high speed. The micro mirror design is optimized for a high frame rate by means of low mass, minimized momentum of inertia and optimized damping. The micro mirror surface can be optically coated for improved reflectivity. The micro mirror pitch is 10 μm .

Each pixel is composed of a number of micro mirrors, aligned in a row and deflecting similarly. These mirrors can tilt and thereby create a dark spot in the corresponding image plane. This concept allows for, in principle, very long pixels with uniform surface properties. Illumination of the larger area in turn allows for reduction of power density at the light modulator surface and hence enables the way to high power applications.

The key features are:

resolution: up to 8000 pixels

- analogue gray values
- frame rate: 1.0 MHz (future perspective: up to 1.6 MHz)
- Ultraviolet to visible wavelength range (future option: near-infrared)

Part of



Layout of part of a 1D light modulator.

Contact

Tina Hoffmann
+49 351 8823-430
tina.hoffmann@
ipms.fraunhofer.de

Fraunhofer Institute for
Photonic Microsystems IPMS
Maria-Reiche-Str. 2
01109 Dresden, Germany
www.ipms.fraunhofer.de