

ST Enabling AR/MR Applications



Microactuator
Technologies

Microactuator
Components
for AR / MR

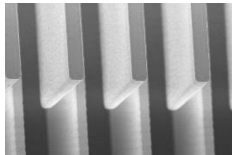
MEMS Mirrors

MEMS Speakers

A Wide Range of Actuation Technologies

Mass Production with the Main MEMS Actuator Technologies

+ Electro-Static

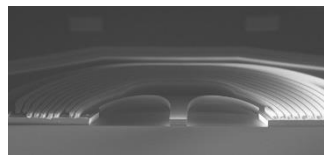


Staggered comb fingers

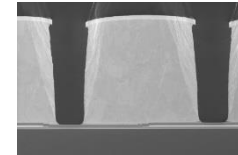


In-plane comb fingers

C Electro-Magnetic

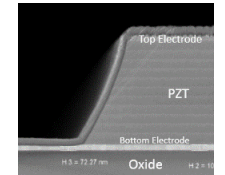
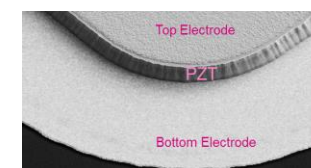


Thick metal layers integrated with silicon mechanical structure



Thick metal cross section for coil

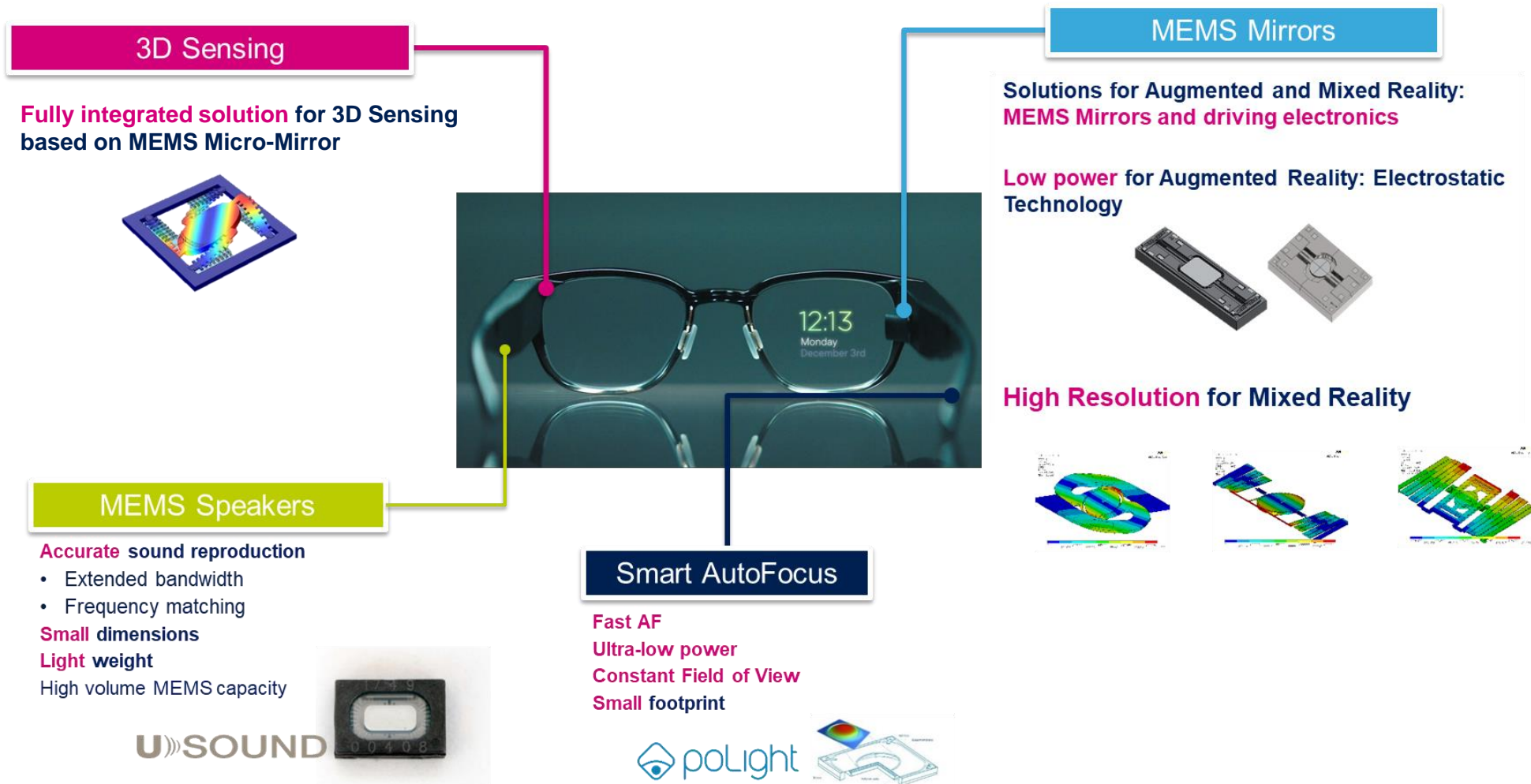
↕ Piezo-Electric



PεTRA™

Changing the MEMS Landscape

Microactuator Components for AR/MR



Mega1 Laser Beam Scanning Projector

MEMS Mirrors & Drivers for LBS Projection



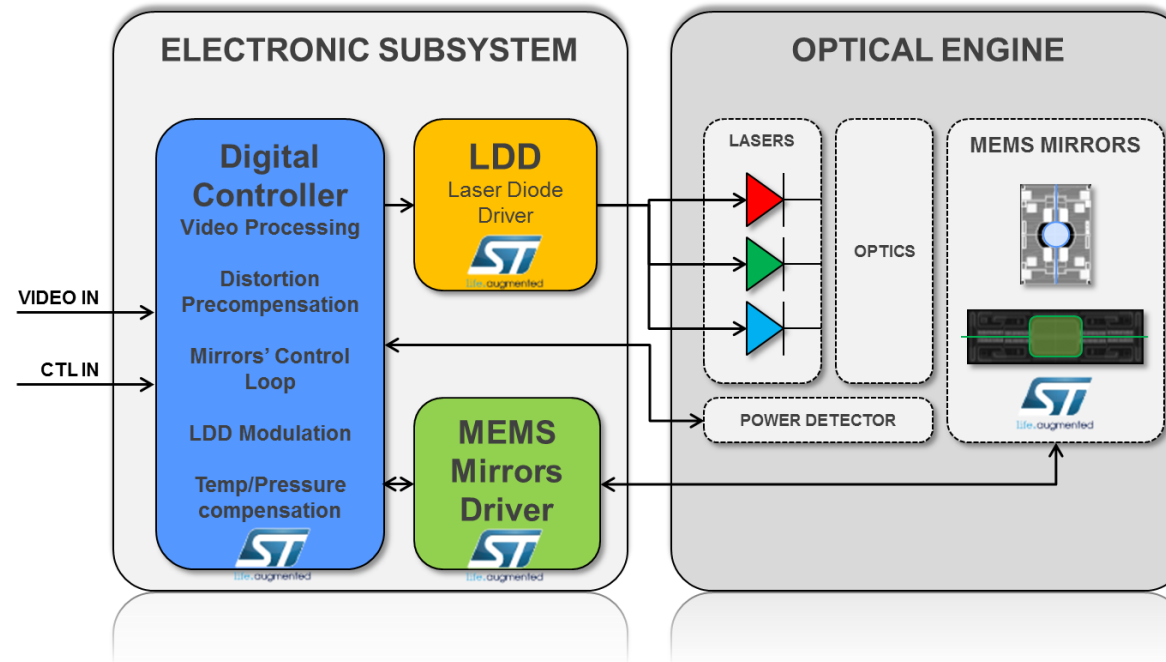
Augmented Reality Development System

- Single-Eye Projection
- Display

MEMS Mirrors for Augmented Reality

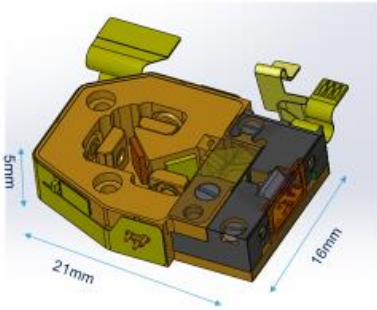
ST is a One-Stop-Shop for LBS Solutions

- MEMS Mirrors embedding position sensing, MEMS drivers and Laser Diode Drivers
- Control Loop and Video Processing HW and SW
- Building the Ecosystem for LBS-based AR Glasses



Redefining System Integration

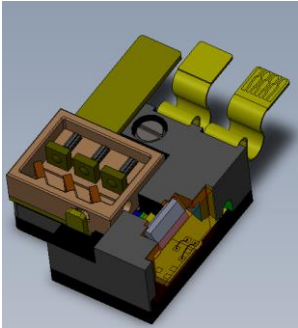
Current Generation



Platform Available Today

- Optical Module: 16 x 21 x 5 mm

ST Platform for 2020: Enabling System Integration



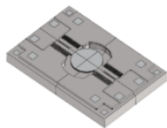
New Platform introduction in 2020

- Optical Module: 10 x 11 x 5 mm

70% volume reduction

Electrostatic Mirrors

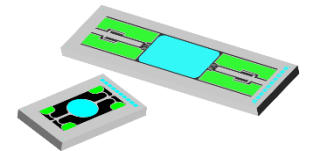
Horizontal Mirror



Vertical Mirror

Introducing New MEMS Mirror – MP 2021

- Improved Resolution: +60% (up to 720p)
- Reduced current consumption: -50%
- Increased FoV: +20% (65 deg diagonal)



Controllers and Laser Diode Drivers

- Dedicated MEMS controller
- Standard LDD (available in the market)

Controllers and Laser Diode Drivers

- New Laser Diode Driver: high resolution and sharp images
- Integration with application processor: reduced system complexity and consumption

Focals by North

First All-Day Wearable Fashion Smart Glasses Based on ST LBS Displays

- Low Power and Compact Size for Augmented Reality
- Focal 2.0 in the market from Q1 2021:
 - 10x improved retinal display – no calibration required
 - 40% dimension reduction



Accuvein - AV500

Vein Visualization has Emerged as the Standard of Care

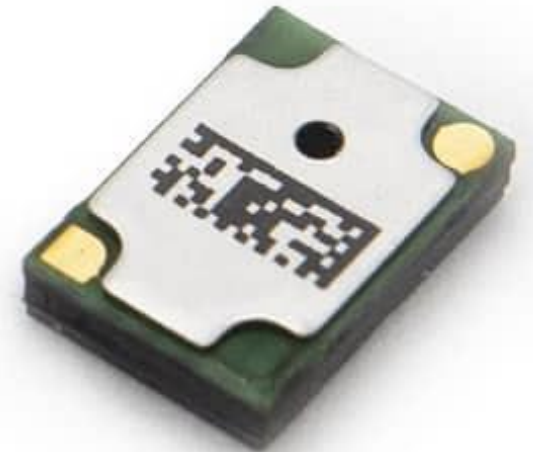
- ST Laser Beam Scanning (LBS) technology enabling **visible** and **IR** projection



Usound: MEMS Microspeakers

MEMS Speaker Technology Enables Intelligent Miniaturized Devices.

- Seamless integration into acoustic devices for everyday use
 - 6.7 x 4.7 x 1.56 mm³
- Longer battery life due to the speaker's low power consumption
 - 27 mW – White Noise @ 60 dB
- Competitive sound pressure level
 - 73 dB SPL @10KHz



USound – Fauna Audio Eyewear

- Powered by USound's MEMS speaker which enables a stylish, lightweight design
- Two-way audio system integrated in each temple lets you be the only one to hear your music, podcast or phone call, but always being able to perceive the surroundings

