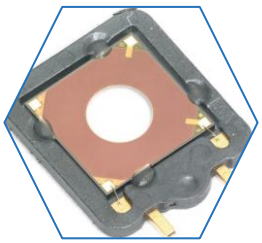
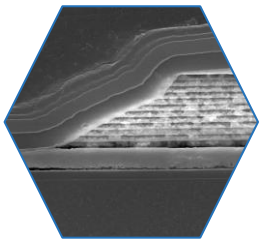
poLight TLens MEMS Autofocus

The first polymer-based actuated lens autofocus found in Xiaomi's Smartwatch Camera





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EUR 3,990

Reference:
SP20575

This full reverse costing study was conducted to provide insight on technology data, manufacturing cost, and selling price of the poLight TLens MEMS autofocus product – the first Piezoelectric MEMS autofocus technology for a camera module. This is a radical technology shift in the camera module world, thanks to the exceedingly small volume of the autofocus. It measures only 8.4mm3, and with a thickness of 0.45mm can be easily integrated in small systems like drones, smartphones, smart watches, etc. This autofocus is integrated in Xiaomi's latest smartwatch for kids: the Mitu 4 Pro.

This study details the assembly of this autofocus on an 8Mpixels camera module. Thanks to the PZT, it is faster than the traditional electromechanical autofocus, allowing for almost instantaneous focus adjustment. And with no mechanical parts aside from the membrane, the MEMS autofocus seems more robust than mechanical systems, which is vital in products for children. The piezoelectric membrane is manufactured by STMicroelectronics, which specifically developed PZT technology to add to its MEMS technology portfolio. Another specific MEMS process is the transducer, which is manufactured on glass membranes etched by micromachining – another specialty of STMicroelectronics.

The secret of this first MEMS autofocus is not only in the piezoelectric material. The design, manufacturing, and characteristics of the polymer used for the lens were developed and patented by poLight: these are key for the functionality of the autofocus component. This report focuses on an analysis of the TLens autofocus MEMS, including the MEMS transducer developed by poLight and its package. Also, the assembly of this autofocus on an 8Mpixels camera module is shown via pictures and a cross-section of the full camera module with the TLens. Thanks to the full technology analysis and patent analysis, the manufacturing process flow is reconstructed and the manufacturing cost and selling price are estimated.

COMPLETE TEARDOWN WITH

- Detailed photos
- Precise measurements
- Materials analysis
- Manufacturing process flow
- Supply chain evaluation
- Manufacturing cost analysis
- Didactic explanation of device operation
- Estimated sales price

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AUTHORS

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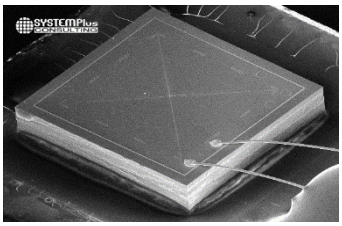

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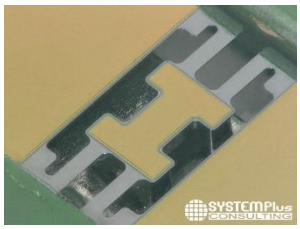

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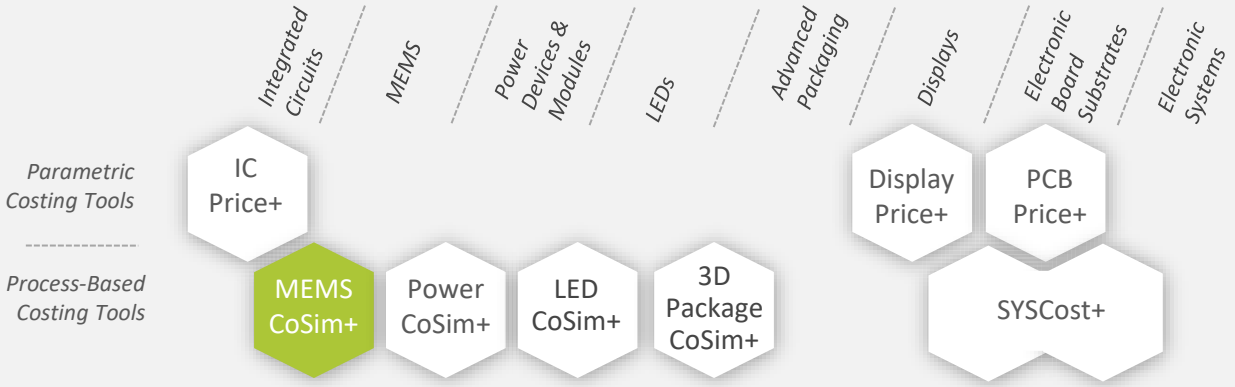
COSTING TOOLS



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