

Laser Systems for Semiconductor Industry

EPIC Online Technology Meeting, 9th of June 2020

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System Solutions for Semiconductor / Electronics Processing

3D-Micromac in a nutshell:

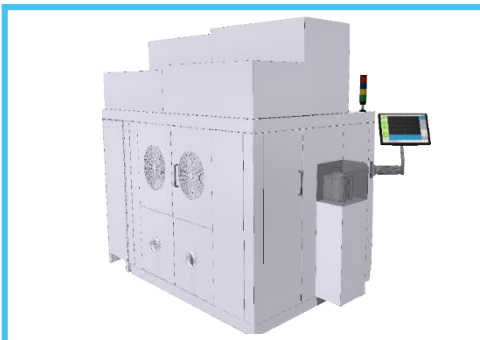
- Founded in 2002
- Over 170 employees
- Based in Chemnitz, Germany
- Customer application center & contract manufacturing
- Over 500 installations worldwide



Ohmic contact
formation
microPRO™ XS for OCF



Magnet sensor formation
microVEGA™ xMR



Dopant activation
microPRO™ DA



Microdiagnostics
microPREP™ PRO

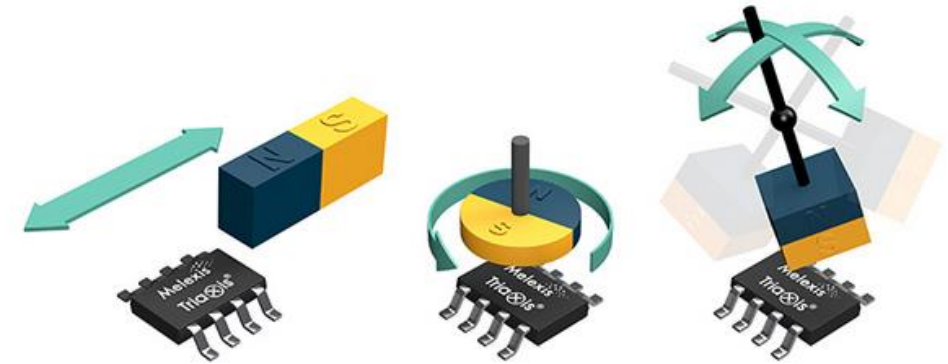
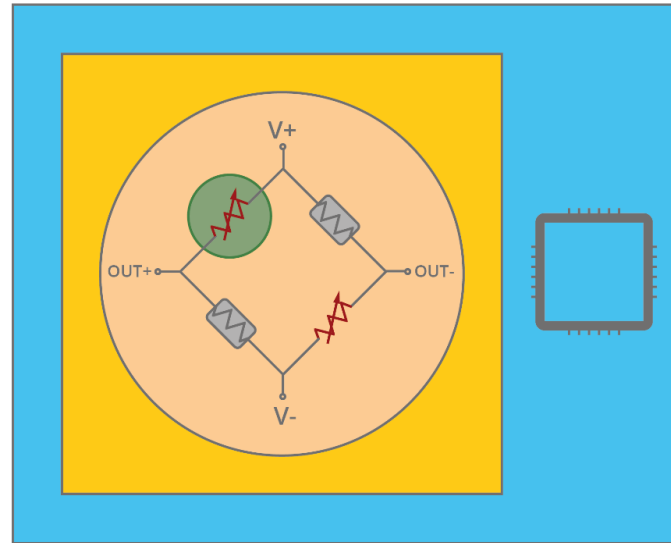
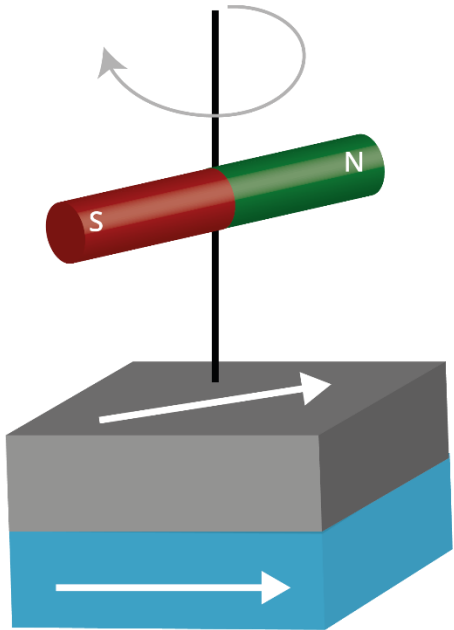


Wafer dicing
microDICE™



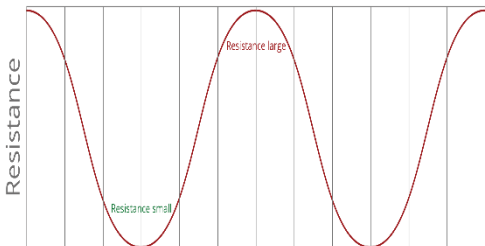
Laser Lift-Off
microMIRA™

Motivation for Laser Formation of Integrated Magnet Sensors



Source: www.melexis.com

... for position sensor, e-compass ...



Use magneto resistive effect...

...in a sensor bridge...

....with integrated logic ...

Applikation:

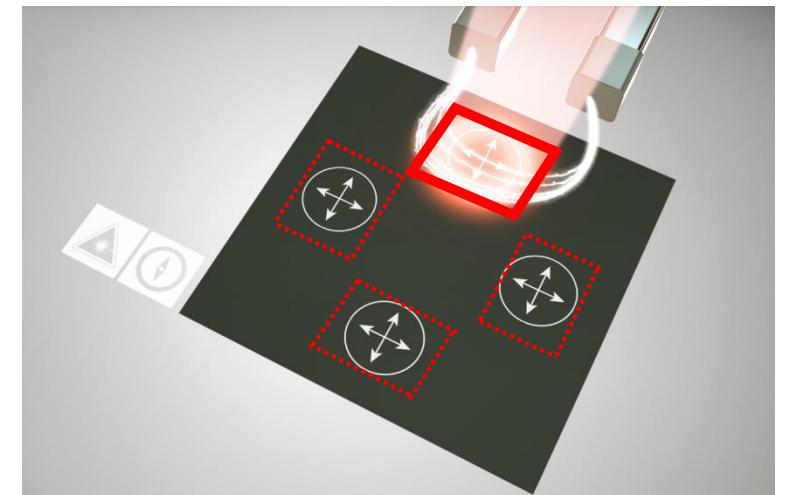
- Brushless DC motor
- Steering wheel of a car
- E-compass in mobile phone
- E-compass in VR-goggles
- ...

Requirements and Solutions

Requirement	Solution
Various sensor size	→ Motorized aperture
Product depending position / sensor spacing	→ Synchronization of laser pulse and motion
Adapt magnetic field strength	→ Variable z-position of laser
Various number of different magnetic orientations	→ Freely programmable rotation of magnet unit
Best sensitivity by homogenous processing	→ Usage of modified gauss profile
Minimum spacing between sensors	→ Sharp masking of spot, precise synchronization

Throughput micro VEGA xMR: 520.000 Sensors p.h.!

Tool is production approved!



Outlook and Conclusion

Outlook:

- Evaluation of further application
- Improvement of in situ process control
- Increase of throughput:
 - Synchronization motion & laser pulses
 - Stable first pulse / Pulse picking
- Higher pulse energy for larger sensor area

Conclusion: micro VEGA for xMR is a game changing and cost saving solution for integrated monolithic magnet sensor production.



Thank you for your attention!

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