

Portable IMS-based VOC-Detection for environmental, quality and biomedicine analysis

Portable Detection of VOCs

The selective detection of low concentrated (ppm ... ppb) substances under ambient conditions plays a major role in different applications. Volatile organic compounds (VOCs) are one exemplary group of substances that must be reliably detected in a large number of applications:

Applications

Environmental sensing

- detection of harmful substances and emissions



Quality control

- unmasking counterfeit products



Biomedicine

- detection of marker substances for non-invasive diagnostics (e.g. breath gas analysis)



In these applications, there is an enormous demand for devices that have the following characteristics:

- compact size for portable use
 - need for miniaturized sensors
- easy-to-use instrumentation
 - automated /KI-assisted interpretation of the measured data/spectra
- large market volume for existing and also new markets
 - mass production technology like MEMS microtechnologies
- selective and sensitive detection of single VOCs
 - Experience and know-how on sensor concepts like ion mobility spectrometry, sample analysis and pretreatment

Figure 1: IMS Demonstrator



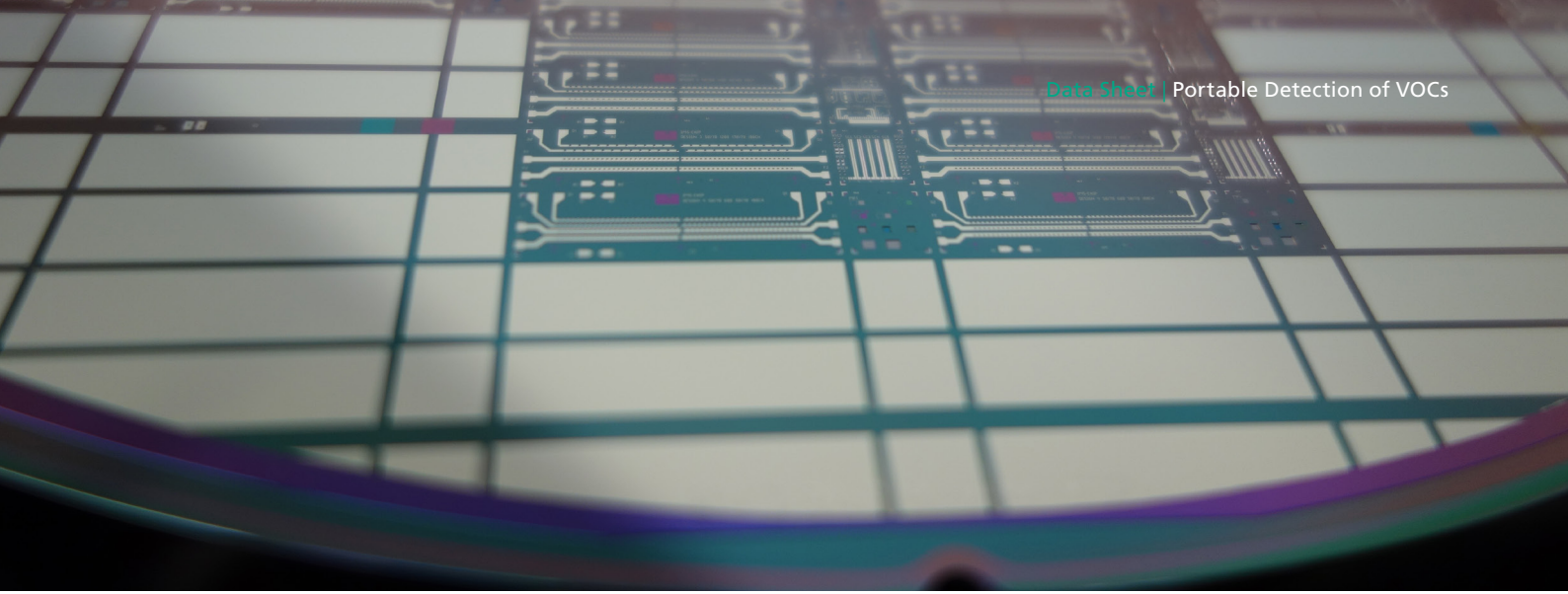


Figure 2: Waferlevel IMS-Chip

Approach of Fraunhofer IPMS – chip-based IMS for VOC detection

The Fraunhofer IPMS developed a miniaturized chip-based component for ion mobility spectrometry (IMS). IMS is a detection technology and allows the identification of single VOCs in a gas mixture under ambient conditions. Typical concentrations range from ppb to ppm. A demonstration system with required components is available. Core component of this setup is the innovative IMS chip device. Based on this demonstrator, next steps are applications-specific development and hence, an integration of this IMS chip module into portable instruments, that can be used in various fields of application.

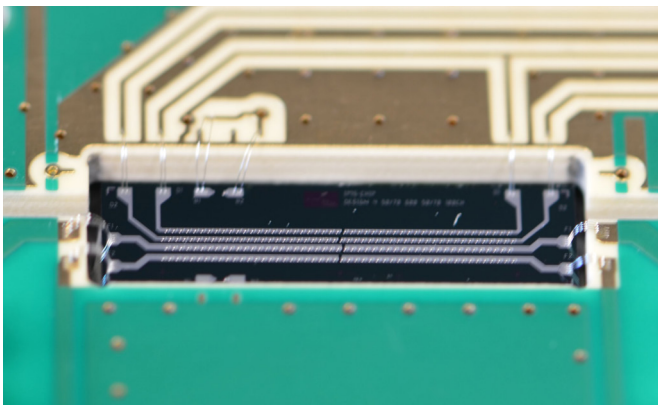


Figure 3: IMS-Chip with PCB

What we offer:

- IMS-based chip devices and experience in sensors development
- application-specific further development of our available laboratory demonstrator
- sensor components as a basis for future device developments

Who are we looking for:

- partners from industry and science to further develop the existing concept in an application-specific context
- Aims of further development:
 - Integration of our components in an application-related demonstrator, proof of functionality based on application
 - expanding the performance and functionality of existing technology and sensor functionality

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