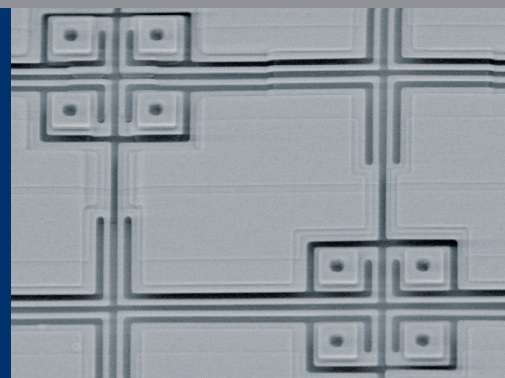
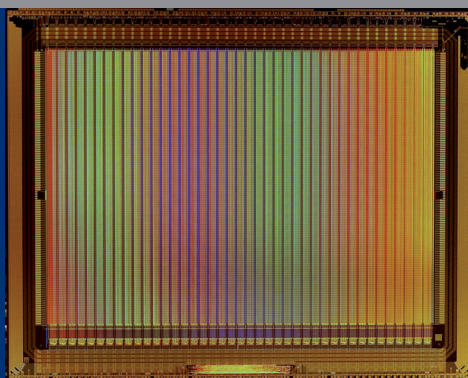
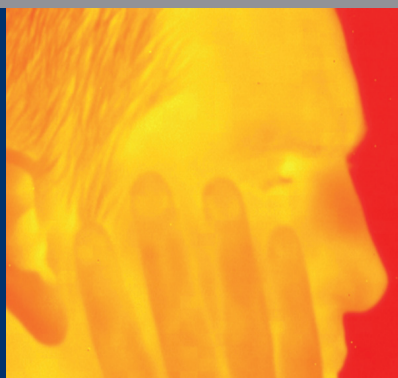




- 1 IR Image
- 2 Bolometer Readout IC
- 3 SEM Image of a Microbolometer

NEW UNCOOLED LONG-WAVE INFRARED DETECTOR

Fraunhofer IMS presents a new generation of uncooled infrared focal plane arrays (IRFPA) with a pixel pitch of 17 μm and a resolution of 320 x 240 pixel (QVGA). The detector allows the measurement of the emitted radiation of warm bodies in the long-wave infrared band (8 μm – 14 μm) for thermal imaging applications.

Examples for applications of IRFPAs are thermography, pedestrian detection for automotive (night vision), firefighting, or surveillance and security.

IRFPA

The IRFPA based on uncooled microbolometer with a pixel pitch of 17 μm and is realized with a QVGA resolution. The IRFPA is designed for a high sensitivity with a noise equivalent temperature difference NETD of < 80 mK at a frame frequency of 30 Hz. A novel readout architecture which utilizes massively parallel on-chip Sigma-Delta-ADCs located under the microbolometer array results in a high performance digital readout. In addition to several thousand Sigma-Delta-ADCs the readout circuit consists

of a configurable sequencer for controlling the readout clocking signals and a sensor for measuring the temperature of the IRFPA.

Parameters of Fraunhofer QVGA-IRFPA

Parameter	Value
Image format	320 x 240
Pixel pitch	17 μm
Frame frequency	30 Hz
Output Signal	16 bit (digital)
Temperature range	-40 °C – +70 °C
NETD	< 80 mK

The microbolometers are located in a vacuum package to achieve a higher sensitivity due to thermal isolation. Since packaging is a significant part of the IRFPA's price Fraunhofer IMS uses a chip-scaled package (CSP) to reduce the production costs. The CSP consists of an IR-transparent window with double-sided antireflection coating and a soldering frame for maintaining the vacuum. The IRFPAs are completely fabricated at Fraunhofer-IMS on 200 mm CMOS wafers with an additional surface micromachining process.

Fraunhofer Institute for Microelectronic Circuits and Systems IMS

Finkenstr. 61
D - 47057 Duisburg
Phone +49 203 37 83-0
Fax +49 203 37 83-266
www.ims.fraunhofer.de

Contact

Michael Bollerott
Phone +49 203 37 83-227
vertrieb@ims.fraunhofer.de

