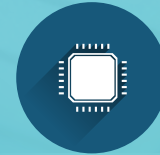


Component



Piezoelectric Micromachined Ultrasonic Transducer

Fast Facts

- Monolithic integrated piezoelectric thin film AlN and AlScN
- MUTs with single or multiple acoustic channels
- Plug'n'play functionality with conventional ultrasonic electronics
- Technology platform for large frequency ranges from 50 kHz to 20 MHz
- High bandwidth
- Highly linear performance
- Beam steering function available
- Technology functionalized to work unpacked in air or liquids
- Reliable and reproducible Si or SOI technology (150 mm and 200 mm)
- No Curie temperature, no aging of the piezoelectric material, no depolarization

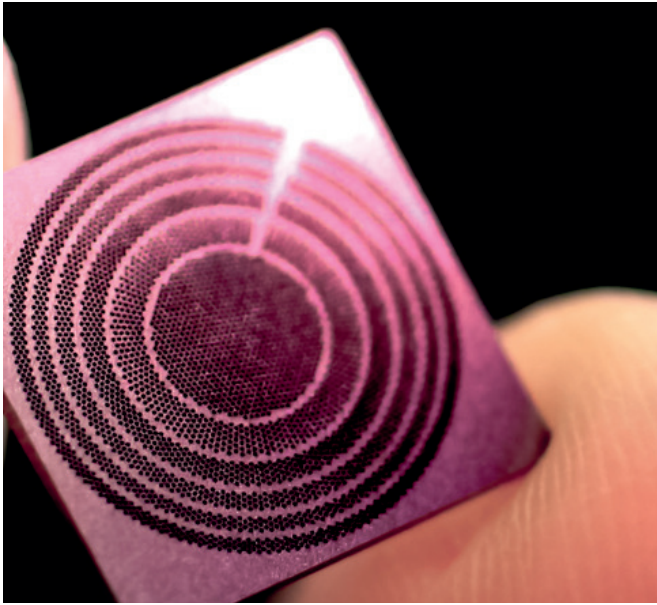
General Description

A PMUT (piezoelectric micromachined ultrasonic transducer) is a microsystem using piezoelectric materials for acoustic mapping of the environment. Compared to bulk ultrasonic devices, PMUTs are better to integrate, e.g. for medical imaging devices. Furthermore, they also have a smaller size and a higher

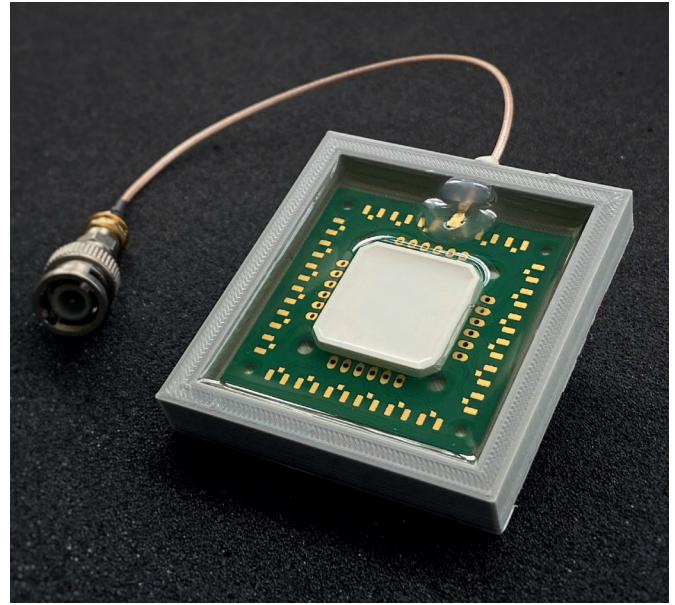
resolution. This development enables medical, endoscopic in-vivo imaging devices and ultrasonic radar for autonomous mobility and industrial machines. PMUTs require low voltages and have a highly linear performance. Aluminum nitride (AlN) or aluminum scandium nitride (AlScN) is used as the transducer material. It is highly capable for an integration into existing MEMS processes. The moderate piezoelectric coefficients and low dielectric constants of Al(Sc)N are optimal for applications, which require a combination of sensors and actuators. The transducer principle and the electric impedance of PMUTs are similar to conventional ultrasonic systems. Therefore, most of the PMUTs can be used with conventional ultrasonic electronic as plug'n'play components.

More Features

- Resonance frequency from 50 kHz to 20 MHz
- High bandwidth with 100 percent
- High actuator energy in transmit mode
- Low actuation voltages (< 10 V)
- High voltage possible (> 100 V)
- High sensitivity in receive mode
- No bias voltage needed



Fabricated and diced silicon based piezoelectric micromachined ultrasonic transducer with radial symmetric array.



Plug'n'play PMUT evaluation system.

Suggested Applications

- PMUTs for industry 4.0
- PMUTs for autonomous systems
- PMUTs for medical ultrasound
- PMUTs for medical photo acoustic imaging
- PMUTs for consumer electronics
- PMUTs for automotive
- Design and technology customizable for specific applications
- Technology transfer service for MEMS foundries available

Sample Request

Order samples and test the PMUT technology. Standardized samples with one acoustic channel and a sensor size of 12 mm² – 75 mm² are available for proof of concept. The center frequency is 1.5 – 2 MHz and the bandwidth is approx. 100 percent. The PMUTs can be covered with an acoustic matching layer and are waterproof. The system can be connected via SMA/BNC adapter to various electronics and is generally compatible with conventional ultrasonic electronics. The samples are typically in stock or available on short notice.

In cooperation with



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All information contained
in this fact sheet is prelimi-
nary and subject to change.
Furthermore, the described
system is not a commercial
product.