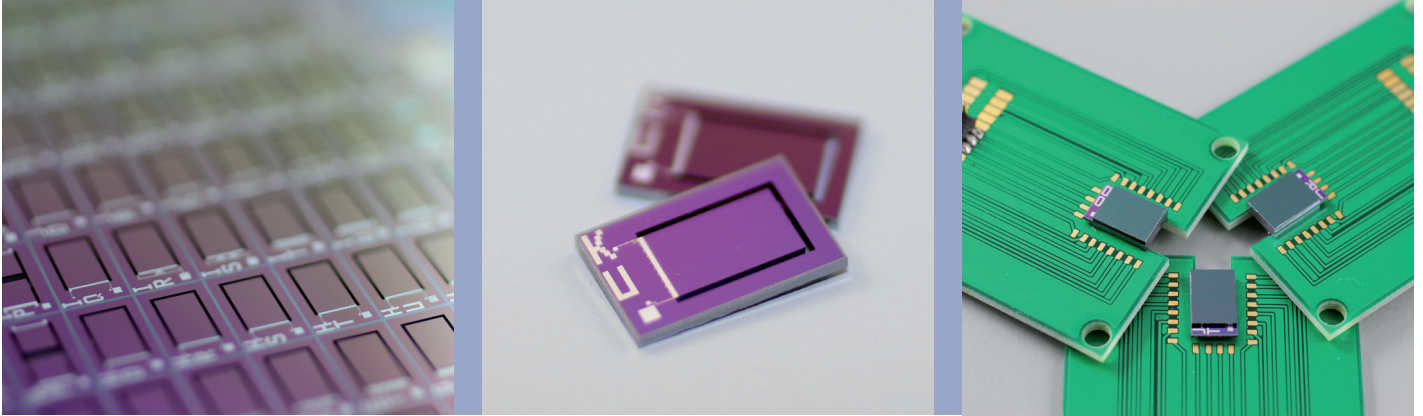


WAKE UP GENERATOR MEMS

ALUMINUM NITRIDE BASED PIEZOELECTRIC

ULTRA-LOW POWER APPLICATIONS



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All information contained in this datasheet is preliminary and subject to change. Furthermore, the described systems, materials and processes are not commercial products.

For measuring mechanical events MEMS inertial sensors are the common solutions. This event can be movement of objects, machines and bodies, shocks or impacts. Industrial used MEMS with the electrostatic working principle are small, precise and have low energy consumption. But, established inertial MEMS have to measure continuously, even if a mechanical event is rare. For wireless Microsystems this results in a continuous consumption of electricity of a limited energy source, e.g. a battery. Especially for the condition monitoring of rare events a continuous measuring is highly energy inefficient.

A Wake up generator (PDIG – Power Down Interrupt Generator) is a Fraunhofer ENAS patented smart solution energy and size limited applications with detection of mechanical events. The PDIG is a piezoelectric MEMS based on thin film aluminum nitride. If any mechanical event occurs, the PDIG generates electric energy by itself and “wake up” any electric circuit, e.g. inertial sensors. This wake up module with ASIC control requires less than 300 nA current

consumption. In result the life time of an independent battery based system increases significantly.

The PDIG and the ASIC control form a custom adapted system, which can wake up a downstream electronic for any specific mechanical event. High sensitive PDIGs are able to switch on a device from sleeping mode for less than 0.08 g acceleration. The system can also be adapted to detect shocks or similar events in harsh environments. To satisfy the requirements of the costumer multiple smart adaptable solutions are available.

PDIG

- Lead-free CMOS compatible technology
- Intrinsic energy generation
- Ultra-Low-Power application
- Energy consumption < 300 nA (Sleeping mode)
- Wide range of applications
- Development of customized wake up solution