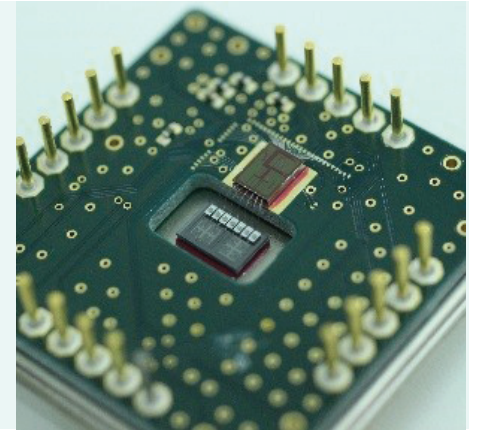
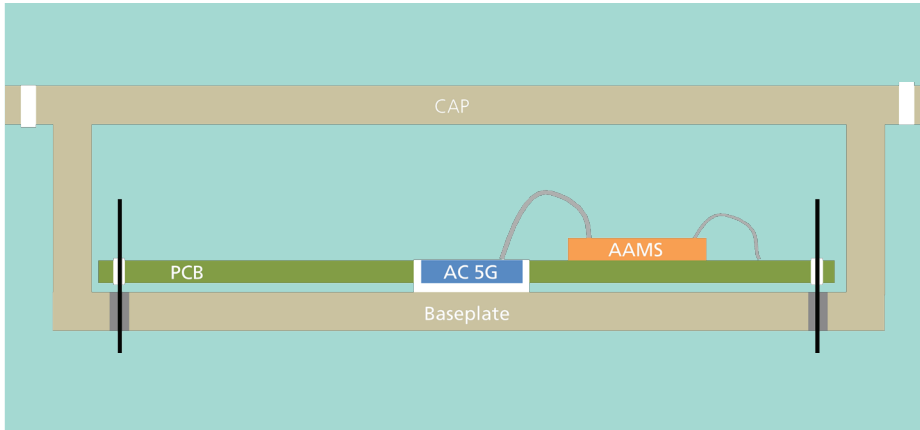


# 2-AXIS 5G-ACCELEROMETER



## Contact

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### Figures:

Schematic cross section and picture of the final 5G-accelerometer system.

Photo acknowledgments: Fraunhofer ENAS

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

The showed demonstrator is a MEMS based 2-axis 5G-accelerometer. It consists of the MEMS transducer, the read-out and control electronics (ASIC) and a printed circuit board with passive devices. All components are mounted into a commercial standard package. Table 1 summarizes the accelerometer specification.

Parameters	Sign	Value	Unit
Measurement range	±	5	g
Bandwidth		500	Hz
Resolution		14	Bit
Resolution (LSB at 14 bit)		0.3	mg
Operation temperature range		-40...+85	°C
Shock resistance		50	G
Noise		200	µg / √Hz
Power supply	+	5	Volt

Figure 1 sketches the final 5G-accelerometer in principle. The AC-5G represents the MEMS-transducer and the AAMS represents the ASIC.

The 5G-accelerometer is realized as a Micro-Electrical-Mechanical-System (MEMS). Such an accelerometer system consists of two major parts:

1. A micromechanical-electrical transducer that transforms any mechanical displacement into a capacitance change. Within the project a 2-axis (x-y) transducer is used, which is fabricated by means of an ENAS-specific BDRIE technology approach.
2. An ASIC with an analog-switched capacitor module for transducer readout and control, a digital module for further signal processing with memory and trim unit, and an interface carried out as serial peripheral interface (SPI). The ASIC is fabricated by XFAB using their HX018 - 180 nm technology.

In order to get a full-functional accelerometer device, both major parts are completed by:

- PCB, what accommodates the ASIC together with its outer (passive) circuitry
- A package, what takes up the PCB as well as the transducer and thus combines these parts to the final accelerometer device.