Infineon DPS310 Capacitive Pressure Sensor: Structure and Cost Analysis

Description: The first barometric sensor from Infineon for the consumer market is targeting altitude, GPS, indoor and weather forecasting applications in portable devices. This MEMS sensor positions Infineon to compete with STMicroelectronics and Bosch Sensortec.

Infineon's DPS310 pressure-sensing device is manufactured using a proprietary MEMS technology developed for and already sold for several years in the automotive market. The sensing element in the DPS310 is based on a flexible silicon membrane formed above an air cavity with a controlled gap and defined internal pressure. The membrane is very small compared to traditional silicon micro-machined membranes. Moreover, Infineon has developed a capacitive sensor to be more accurate and less sensitive to temperature change compared to piezoresistive solutions.

For the DPS310, Infineon has introduced two important innovations. The first is a two-die solution more scalable than the monolithic solution used for some automotive pressure sensors.

The second innovation is a plastic metallized lid to replace the classic metal lid. The device comes in a tiny 2×2.5×0.9mm HLGA molded package.

The report presents a detailed analysis of the sensor's structure and cost. Comparison with the characteristics of the STMicroelectronics pressure sensor LPS22HB and the Bosch Sensortec BMP280 highlights differences in technical choices made by the companies.

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Company Profile and Supply Chain

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- Package opening
- Package cross-section

ASIC die

- View, dimensions, and marking
- Delayering and process
- Cross-section

MEMS Die

- View, dimensions and marking
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- Cross-section reference capacitor
- Process characteristics

Comparison

Manufacturing Process Flow

ASIC front-end process

- ASIC wafer fabrication unit
MEMS process flow
- MEMS wafer fabrication unit
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- Package assembly unit

Cost Analysis

Yield hypotheses

- ASIC front-end cost
- ASIC back-end 0: probe test and dicing
- ASIC wafer and die cost
- MEMS front-end cost
- MEMS back-end 0: probe test and dicing
- MEMS front-end cost per process step
- MEMS wafer and die cost
- Back-end: packaging cost
- Back-end: packaging cost per process step
- Back-end: final test cost
- Pressure sensor component cost

Estimated Price Analysis

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