05.21.98 MEMS sensors and mechanical gadgets enter the mainstream

EDN Staff - May 21, 1998
MEMCAD 4.0 has a solver framework that supports such physics disciplines as electrostatics, for the creation of complex EDA meets available in unamplified and amplified versions. The company uses micromachined silicon to produce a range of airflow sensors. The sensors capacitance-readout to 10 bar. The MS4010 contains no active circuitry but rather delivers a capacitive signal for measurements in versions that cover 0 to 1.2 bar (1 bar is one atmosphere, or 14.7 psi) and 0 to 100 kPa (1 bar). Another top-piston-fit pressure sensor from Motorola covers 0 to 1.45 psi with full-scale differential pressure applied. It is available in a top-piston-fit package, having a cap with a threaded connection for mounting. The sensor is designed for use in hostile environments, such as those found in industrial processes, where pressures can reach up to 25,000 psi.

A micromachined pressure sensor for hostile environments measures pressures of 0 to 25,000 psi. It is designed for use in applications where high-pressure resistance is required, such as in drilling operations where pressures can reach 15,000 psi or more. Another top-piston-fit pressure sensor from Motorola covers 0 to 1.45 psi with full-scale differential pressure applied. It is available in a top-piston-fit package, having a cap with a threaded connection for mounting. The sensor is designed for use in hostile environments, such as those found in industrial processes, where pressures can reach up to 25,000 psi.

Theoretically, there's no limit (aside from production yields) on the number of pixels a TI chip can produce. This is due to the high resolution and high frame rate capabilities of these chips. The Model 3265 is available in ±25 and ±50g versions, which have acceleration sensitivities of 80 mV/g and 160 mV/g, respectively. These chips are used in a wide range of applications, including automotive safety systems, industrial robots, and consumer electronics. They offer high accuracy and reliability, making them ideal for applications that require precise motion control.

For several years, TI has been at the forefront of the microelectromechanical systems (MEMS) industry, which involves the design, fabrication, and application of miniaturized mechanical and electronic components. The company has developed a wide range of MEMS-based products, including pressure sensors, accelerometers, and gyroscopes, which are used in a variety of applications, including automotive, aerospace, and consumer electronics. The ICs have a supply current of about 1 mA, making them energy-efficient and suitable for battery-powered devices. The devices operate from a 2.7 to 5.5V supply, over -40°C to 125°C temperature range.

MEMS devices can provide optical modulation, switching, and other light-control mechanisms. Another promising nonsensor application for microelectronics and microsystems technology is in the field of fiber-optic communications. For example, a fiber-optic gyroscope can be used to measure the rotation rate of a vehicle or spacecraft. This technology is becoming increasingly important as the demand for high-precision navigation systems grows.微电子学和微系统技术在光学调制、开关和其他光控制机制方面提供了可能。另一个有希望的非传感器应用是微电子学和微系统技术在光纤通信领域。例如，光纤陀螺仪可用于测量车辆或航天器的旋转速率。这项技术正变得越来越重要，因为对高精度导航系统的需求在增长。

Micromachined structures can provide optical modulation, switching, and other light-control mechanisms. Another promising nonsensor application in the field of fiber-optic communications. For example, a fiber-optic gyroscope can be used to measure the rotation rate of a vehicle or spacecraft. This technology is becoming increasingly important as the demand for high-precision navigation systems grows.
At an increasing rate, MEMS are coming out of the labs and into production. Bulk-micromachined MEMS make good pressure sensors; less costly surface micromachining suits accelerometers. Sensors are only the tip of the MEMS iceberg; the devices have a host of other applications. Yield is the only limiting factor in making MEMS; as processes improve, more and more complex MEMS will hit the market.