

What is differential capacitive sensing?

Differential capacitive sensors are used in several sensing systems such as accelerometers, gyroscopes, pressure sensors, position sensors and force sensors [1,2,3,4,5,6,7,8]. In a differential configuration, capacitive sensing principles offer the effective reduction of common-mode noise and parasitic effects.

What is a multi-electrode differential capacitive sensing circuit?

Conclusion A multi-electrode differential capacitive sensing circuit is designed and realized for the read-out of a multi-axis capacitive force-torque sensor. The sensing circuit is based on a new method for measuring differential capacitance by using a relaxation oscillator.

What is differential capacitance sensor?

Differential capacitance sensors are highly accurate, stable and rugged. They have a wide operating range. --> Their solid frame bounds the motion of the two isolating diaphragms such that the sensing diaphragm cannot move past its elastic limit. This gives the differential capacitance sensor excellent resistance to over pressure damage.

Is there a fully differential interface circuit for differential capacitive sensors?

Together with the accelerometer, we also propose a novel fully differential interface circuit for differential capacitive sensors, based on the autobalanced bridge theory where capacitive sensor variations are balanced through voltage-controlled impedances placed in the bridge branches.

What is a multi-layer ring differential Capacitive displacement sensor?

A multi-layer ring differential capacitive displacement sensor is presented. At the same volume, the change in capacitance is greater. The signal processing circuit adopts CAV444 integrated circuit. The sensor has strong anti-interference ability.

How does a differential capacitance sensor transmitter work?

An electrically insulating fill fluid (usually a liquid silicone compound) transfers motion from the isolating diaphragms to the sensing diaphragm, and also doubles as an effective dielectric for the two capacitors. The diagram below shows the internal parts of a modern differential capacitance sensor transmitter from Rosemount:

This paper presents a novel differential design consisting of three interdigital capacitor structure to improve sensitivity and avoid environment interference. The frequency shift of the designed ...

In modern electronic transmitters using the differential capacitance sensor technology, capacitive pressure measurement involves sensing the change in capacitance that results from the movement of a diaphragm.

Differential capacitive sensing can therefore be found in many sensor systems such as accelerometers [3], [4], [5], gyroscopes [6], [7], [8], pressure sensors [9], flow sensors ...

Through the multi-layer concentric ring and differential structure, increase the positive area of the capacitor plate greatly, the capacitance displacement sensor probe in this ...

Diode-bridge type capacitance detection circuit was developed in order to detect very small variation of differential capacitances in higher resolution. The circuit was designed ...

This paper presents a current-mode interface circuit for capacitive sensors, with the main features being its ability to produce a differential output from a single-ended sensor (using a...

Introduction. Microelectromechanical systems (MEMS) pressure sensors applications include medical [], commercial [] and industrial [] uses. Traditional MEMS pressure sensor technologies are piezoelectric [], ...

Another common electrical pressure sensor design works on the principle of differential capacitance, most of capacitance differential pressure transmitter use it. In this ...

The sensor is built up as an interdigitated differential capacitor and is driven in a high frequency detection circuitry with an overall electromechanical closed-loop configuration. ...

In this paper we present an oscillating conditioning circuit, operating a capacitance-to-time conversion, which is suitable for the readout of differential capacitive ...

In this work we present the development of an integrated CMOS analog interface able to convert differential capacitive sensors variations into a DC voltage. The ...

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