Pressure Sensor Using Contact–resistance Change

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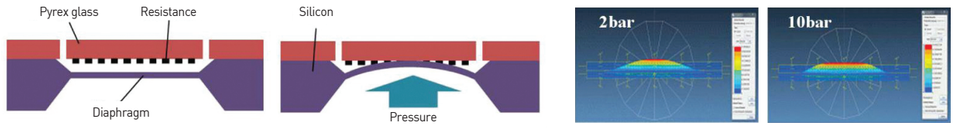
New type of sensor detecting pressure using the change in the electric resistance from physical contact of the elastically deformed diaphragm and pressure sensor array; original technology for circuit technology–free sensor chip for signal amplification/temperature compensation



(a) initial state (b) with applied pressure (c) Contact analysis results

Client / Market

- IT industry : Pressure sensor, level sensor, load cell, touch sensor, tactile sensor
- Industrial fields : Automation process, building air conditioning system, firefighting safety management and environment monitoring system

Necessity of this Technology

- Existing semiconductor type pressure sensor has benefits of outstanding cost–effectiveness, possibility of miniaturization, high–performance and mass production, but the pressure strength depending on applied pressure is weak and temperature drift effect is relatively big.
- Also, the signal is weak, which requires separate signal treatment technology and circuit technology for signal amplification and noise reduction.

Technical Differentiation

- Proposed pressure sensor is appropriate for pressure detection in stages and can be realized with the MEMS technology or general machining. By controlling the pressure switch array's resistor interval or the curve of the resistor shape, the measured value by stage can be changed and linearized.
- The working pressure range can be adjusted with the diaphragm design, and as it does not require an electric signal amplifier and compensation circuit, its simple structure is superior to existing sensor in terms of technology and price competitiveness (30% lower than existing sensor)

DESIRED PARTNERSHIP

Technology Transfer | Licensing | Joint Research | Other

TECHNOLOGY READINESS LEVEL [TRL]

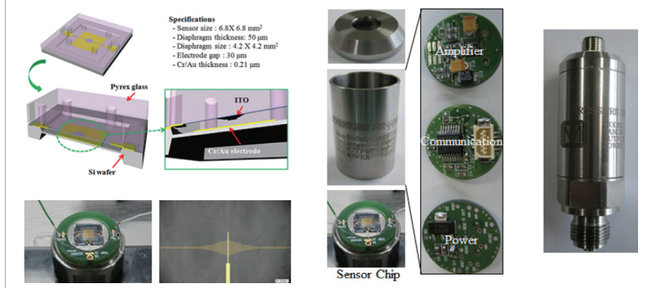
Research, basic explanation | Project concept or idea development | Technology idea verification | Prototype development | Trial product production/ evaluation in similar environment | Pilot field demonstration | Development and optimization of commercial model | Commercial product demonstration | Mass production and initial market launch

- Original technology for low–cost, high durability sensor chip to replace existing semiconductor type pressure sensor (level, limit switch)

Excellence of Technology

- This technology is an original sensor chip technology using pressure/load detection method without a signal amplification circuit and designed with low–power driving circuit, which is completely different from existing domestic/international patented technology.
- Through minimization of electric circuit, durability and reliability are improved and the manufacturing cost is reduced to secure price competitiveness with the manufacturing cost 30% lower than for existing technology.

Sensor Prototype



Current Intellectual Property Right Status

PATENT

- Micro Pressure Sensor (KR0773759)
- Linearity–compensated Micro Pressure Sensor (KR0828067)
- High Pressure Switch Using the Contact Resistance Changes (KR1518265)

KNOW–HOW

- Sensor chip linearization design following pressure measurement area
- Sensor durability test assessment technology
- Extra–high voltage limit switch allowing fine adjustment of set pressure error