**Description**

The basic crystal of the pressure sensor with dielectric insulation and piezoresistive layers made of polycrystalline silicon is manufactured by methods of silicon planar technology. The elastic element of the sensor is formed by anisotropic etching.

A technology that allows obtaining a prescribed dependence of polycrystalline silicon conductivity on temperature for compensation for the temperature dependence is developed.

**Technical specifications**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance of the resistive strain sensors, Ohm</td>
<td>1000± 100</td>
</tr>
<tr>
<td>Supply current, mA</td>
<td>5</td>
</tr>
<tr>
<td>Output signal at the nominal pressure, mV</td>
<td>20</td>
</tr>
<tr>
<td>Initial disbalance for T = 20 °C, mV</td>
<td>less than 5</td>
</tr>
<tr>
<td>Temperature shift of the initial disbalance by 100 °C, mV</td>
<td>less than 1</td>
</tr>
<tr>
<td>Working range of temperatures, °C</td>
<td>from –60 to 300</td>
</tr>
<tr>
<td>Temperature factor of the output signal, (°C)^-1</td>
<td>less than 0.04%</td>
</tr>
<tr>
<td>Pressure sensitivity depending on the membrane thickness, Pa^-1</td>
<td>1⋅10^-8 - 3⋅10^-10</td>
</tr>
<tr>
<td>Size of the sensor crystal, mm^2</td>
<td>4x4 (1.8x1.8 for membrane)</td>
</tr>
</tbody>
</table>

**Technical appraisal and economic benefits**

The proposed resistive strain sensors are more economical as compared to foreign analogs.

**Application areas**

Pressure measurement within the range of 1-150 bar.

- Aviation.
- Oil and gas industry.
- Scientific research: automation of technological processes.

**Development stage**

A pilot lot of resistive strain sensors has been manufactured at the Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences and transferred to the Institute of Theoretical
and Applied Mechanics and Budker Institute of Nuclear Physics of the Siberian Branch of the Russian Academy of Sciences.

**Patent situation**
Know-how is available for individual elements.

**Commercial offers**
Organization of production of resistive strain sensors up to 10,000 pcs per year.

**Estimated cost**
$3-5 per one resistor.

**Contacts**
Cand.Sc. Sergey D. Luchinin, Scientific Secretary
Institute of Semiconductor Physics, Siberian Branch of the Russian Academy of Sciences
13, Prosp. Akademika Lavrentyeva, Novosibirsk, 630090, Russia
Phone: (383) 333-24-88
Fax: (383) 333-27-71
E-mail: luch@isp.nsc.ru
http://www.isp.nsc.ru/