

Accepted Manuscript

Title: Wireless passive pressure sensor based on sapphire direct bonding for harsh environments

Authors: Wangwang Li, Ting Liang, Wenyi Liu, Pinggang Jia, Yulei Chen, Jijun Xiong, Cheng Lei, Yingping Hong, Yongwei Li



PII: S0924-4247(18)30905-1
DOI: <https://doi.org/10.1016/j.sna.2018.08.020>
Reference: SNA 10944

To appear in: *Sensors and Actuators A*

Received date: 28-5-2018
Revised date: 20-7-2018
Accepted date: 12-8-2018

Please cite this article as: Li W, Liang T, Liu W, Jia P, Chen Y, Xiong J, Lei C, Hong Y, Li Y, Wireless passive pressure sensor based on sapphire direct bonding for harsh environments, *Sensors and amp; Actuators: A. Physical* (2018), <https://doi.org/10.1016/j.sna.2018.08.020>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Wireless passive pressure sensor based on sapphire direct bonding for harsh environments

Wangwang Li, Ting Liang*, Wenyi Liu, Pinggang Jia, Yulei Chen, Jijun Xiong, Cheng Lei,
Yingping Hong, Yongwei Li

Science and Technology on Electronic Test & Measurement Laboratory, North University of
China, Taiyuan 030051, China;

* Correspondence: liangtingnuc@nuc.edu.cn;

Highlights

- A wireless passive high-temperature pressure sensor based on sapphire direct bonding technology is proposed.
- A more compact sensor with a greater sensitivity and a large pressure range has been demonstrated.
- The proposed sensor can be mass-produced, which can reduce manufacturing costs.
- The manufacturing process is simple and can effectively avoid the deformation and collapse of the pressure cavity.
- The sapphire direct bonding structure enables a stable and low-stress design, thus effectively avoiding sensor failures caused by the mismatch in the coefficient of thermal expansion between different materials in high-temperature environments.

Abstract:

This study presents a wireless passive high-temperature pressure sensor based on sapphire direct bonding technology. The design, fabrication, and measurement of the sensor are demonstrated and discussed. Single-crystal sapphire is used to fabricate the sensor owing to its outstanding characteristics, and the prototype sensor consists of an inductance, a variable capacitance, and an embedded vacuum-sealed cavity formed by sapphire direct bonding. Compared with other

Download English Version:

<https://daneshyari.com/en/article/9952755>

Download Persian Version:

<https://daneshyari.com/article/9952755>

[Daneshyari.com](https://daneshyari.com)