Abstracts

Correlative signal processing in wireless SAW sensor applications to provide multiple-access capability

G. Ostermayer. "Correlative signal processing in wireless SAW sensor applications to provide multiple-access capability." 2001 Transactions on Microwave Theory and Techniques 49.4 (Apr. 2001, Part II [T-MTT] (Special Issue on Microwave Acoustic Wave Devices for Wireless Communications and Sensing)): 809-816.

We present a new method of evaluating the information of interest in the output response of surface acoustic wave (SAW) sensors. A well-known spread-spectrum technique is used to get the sensor information from an individually addressed SAW sensor. On-off keying-coded SAW sensors are picked out of a number of sensors by correlating the sensor response signal with a replica of the known response signal of a particular sensor. The influence of a measurement quantity (e.g., temperature, pressure, current, voltage,...) on a SAW sensor can be observed as a scaling of time and shape of the sensor response signal. This scaling factor is evaluated by use of correlative signal processing techniques. A main advantage of this method is the capability of multiple access, i.e., to distinguish different sensors in the range of a single interrogation system. Since this technique makes it possible to deal with sensor response signals overlapping in the time domain, sensors can remain short and, therefore, cheap. The principle of operation, limits of the method, and experimental results for temperature measurements are also presented.

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