

A Thin Film Polysilicon-Aluminium Thermocouple

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(Received June 22, 1990; accepted October 29, 1990)

Key words: thermocouple, infrared detector

A thermocouple detector for infrared radiation is presented. The sensor is made with silicon planar technology. It has a diaphragm of silicon nitride, which is heated by the radiation. The temperature difference is measured by thermocouples of silicon and aluminium. The sensor has a sensitivity of $E = 55 \text{ V/W}$ and a time constant of 15 ms.

1. Introduction

In this letter, a thermal detector for infrared radiation using the thermoelectric effect is presented. The sensor has a diaphragm of silicon-nitride suspended on a silicon chip. The diaphragm is structured by anisotropic etching. A black layer on the diaphragm absorbs the infrared radiation. In this manner, a temperature difference used to measure the radiation power is generated between the diaphragm and the chip. The temperature difference is measured by a set of thermocouples. The materials used for the interconnections are polysilicon and aluminium. Figure 1

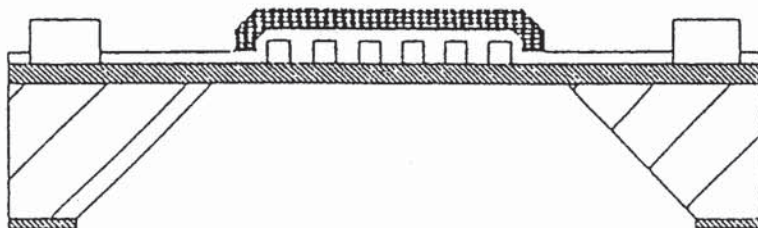


Fig. 1. Cross section of the thermopile detector.