FEATURES

* High Sensitivity
* Integrated Electrical Heater
  for Calibration Procedures
* Large Sensing Area
* Low Nonuniformity
* Low Nonlinearity
* Broad Spectral Response
* Ambient Temperature Operation
* High Reliability
* Hermetically Sealed
* Excellent Long-Term Stability

TECHNICAL DESCRIPTION

The TS-76 thermopile is a combination of a thin film thermopile (76 thermocouples) with a meandered thin-film heating element and a thermally equalizing Ag layer, where all layers are electrically isolated against each other. Due to the heater, simple electrical calibrations and (long-term) stability tests are possible. Although all elements of an electrically calibrated or electrically substituted radiometer are included, the TS-76 thermopile is generally not used as an absolute radiometer but as a secondary or transfer standard. The absorbing layer is made of Ag or Au black. The multijunction thin-film thermopile is manufactured from BiSb and Sb in a multilayer technique by microlithographic methods.

The sensor with a receiving area of 7 mm in diameter (total thickness without absorbing layer: about 9 µm) is supported on a thin Si₃N₄/SiO₂ membrane formed by anisotropic etching of the Si wafer, where the membrane and Si chip dimensions are 8 mm x 8 mm and 12.5 mm x 12.5 mm, respectively. The chip is generally mounted onto a socket and housed in a special metallic package backfilled with Xe gas. The entrance window is wedge-shaped with an angle of about 1.5°.
Receiving Area: 38.5 (7 mm Φ)
Number of Junctions: 76
Resistance: kΩ 4 ... 5
Filling Gas: Xe
DC Responsivity: V/W 8 ... 10
Responsivity TC: %/K - 0.54 ... - 0.57
Time Constant: s 1
NEP: nW Hz¹/₂ < 2
Nonuniformity: % ± 1 within a central area of 5 mm Φ
Nonlinearity: % < 1 below 1 mW
Heater Resistance: kΩ 6 ... 7
Spectral Response: Flat from UV to IR dependent on Window Material
Window Materials: Quartz (Suprasil), CaF₂, KRS-5
Package: Metallic package (6 pins)

Window Material | Useful Spectral Range (μm) | Transmission (%) |
-----------------|----------------------------|-----------------|
Quartz           | 0.2 ... 3                  | 90              |
CaF₂            | 0.2 ... 9                  | 90              |
KRS-5           | 0.6 ... 42                 | 70              |

Applications
- Large Area Radiation Sensor
- Radiation Sensor as a Secondary or Transfer Standard

Literature